

Understanding the Impact of Business Complexity on Executive Management Characteristics and Firm Performance

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This paper examines correlation between powerful top executives and firm performance in the context of complex business environments. Business complexity challenges managers. It demands powerful CEOs to have dominance to resolve disputes, allocate resources, and make final decisions on matters of disagreement. At other times, powerful top management teams are essential to collaborate and share decision-making tasks, especially in environments with less clarity, more uncertainty, fast-flux, and dynamic changes. In complex business environments, our findings support management structures with competent management teams that can quickly adapt to changing environments and can better position the firm for growth and expansion.

INTRODUCTION

Many corporate managers consider business complexity as their greatest 21st century challenge. Business complexity has emerged as a difficulty for corporate managers due to expansion of business in global markets, technology advances which increase the pace of commerce, highly specialized skills needed to develop and deliver products and services, and greater demands from varied stakeholder groups with dissimilar interests. Coping with business complexity is a major challenge for management in the 21st century (Seijts, Crossan, and Billou, 2010). This paper explores a relationship between firm management structure and firm performance measures in the context of a complex business environment which demands effective decision-making in fast-flux, ambiguous, dynamic, multi-cultural, and international settings. This study revisits our traditional views of management structure and firm performance in a dynamic business climate when judgments are made rapidly and top executives have little margin for error.

Characteristics of management structures and its influence on firm performance are often debated. One stream of literature finds CEO characteristics or actions have little explanatory effect on profitability measures of firm performance (Liebersohn and O'Conner, 1972; Finkelstein and Hambrick, 1996; Pfeffer, 1997). Conversely, another literature stream finds corporate executive actions do matter and greatly influence performance outcomes of the firms they manage (Hambrick and Mason, 1984; Tushman and Romanelli, 1985). Management can influence firm performance with powerful CEOs described as executives with dominance to resolve disputes, allocate resources, and make final decisions on matters of disagreement (Bertrand and Schoar, 2003). Prior literature finds that top executives' characteristics

directly impact firm operations, but whether powerful CEOs are better for firm performance is unclear, especially as business dynamics change.

Many researchers agree that characteristics of strong CEOs are needed to make decisions in demanding business environments which are fast-flux, multidimensional, ambiguous, time-consuming, and challenging. Corporate executives, as caregivers who are entrusted with operating firms in the best interest of firm owners, must make decisions which greatly impact firm performance and investors' wealth. With expanding business operations in global markets and increased complexity of business environments, firm executives may need to develop strong management teams to collaborate, delegate, and share decision-making tasks. Therefore, powerful CEOs may need to acquiesce to powerful management teams to be successful in complex business environments.

As a contribution to the literature, our findings suggest that some dimensions of strong top management teams (TMTs) and some dimensions of powerful CEOs both influence firm performance. We find that CEO ownership and insider CEOs on the board have greater influence on firm performance than CEO entrenchment characteristics such as CEO duality and CEO tenure. We find that measures of business complexity have significant influence on all firm performance measures studied that include profitability, market-value, internal investment, and operating efficiency ratios. We conclude that business complexity is a major challenge for corporate executives with direct impact on firm performance. Therefore, firms must adopt management structures which enable effective decision-making in fast-flux, ambiguous, dynamic, multi-cultural, and international business environments.

This paper is organized as follows: Section 2 discusses the motivation for this study with a literature review and research questions. Section 3 describes the data sample with Section 4 outlining our methodology. Empirical results are presented in Section 5 and conclusions from our findings are discussed in Section 6.

MOTIVATION FOR STUDY AND RESEARCH QUESTIONS

Powerful CEOs Negatively Impact Firm Performance

The CEO position is designed to be a center of power for coordination, efficiency and organizational discipline to enhance firm performance. Powerful CEOs have structural power with the capacity to exert their will with power derived from the position they occupy in the organizational hierarchy (Finkelstein, 1992). Executives are considered entrenched managers when they gain autonomous control which enables them to use the firm to further their own interests rather than the interests of shareholders (Weisbach, 1988).

Dominant CEOs often restrict information flow and make unilateral decisions despite others' disagreement which has a negative effect on decision-making and firm performance (Tang, Crossan, Rowe, 2011; Cao, Simsek, and Zhang, 2010). With more decision power, decisions are more variable—either decisions are very good or very bad (Sah and Stiglitz, 1991). Entrenched managers often limit information flow. These CEOs may impede corporate decision-making by adopting a centralized management approach in which operational decisions are made at the top of the organization with little or no authority delegated to its lower levels.

Also, firms with formidable CEOs can abuse power; often lessening governance provisions meant to monitor and evaluate their actions (Haleblian and Finkelstein, 1993; Hambrick and D'Aveni, 1992; Hermalin and Weisbach (1998) and Hellwig (2001). They have higher pay differentials between them and senior management, higher turnover among senior management, more risky business ventures, and higher executive compensation (Bebchuk, Fried, and Walker, 2002). These powerful CEOs are often overconfident, insensitive to others, view others as a pawn in their personal objectives, and are less inhibited by social restraints (Keltner, Gruenfeld, and Anderson, 2003).

While CEOs need greater power to influence critical decisions, prior research finds more risky decision-making and greater variability in firm performance ensues with powerful CEOs (Adams, Almeida, and Ferreira, 2005). Studies of powerful CEOs as those with more tenure find their actions result in more risk-taking (Simsek, 2007). When CEOs are entrenched having excessive power and

control, the impact on firm performance is noticeable with lower stock returns observed (Bebchuk, Cohen, and Ferrell, 2009).

Powerful CEOs Positively Impact Firm Performance

In contrast, other researchers contend that strong, decisive leaders are needed to get things done, especially in complex business environments. Without “power” to translate intentions into reality, a leader is not effective (Bennis and Nanus, 1985). Powerful CEOs are essential for firm success; executives can only impact firm outcomes when they have influence over crucial decisions. In firms with powerful CEOs, clear, direct, unity of communication and command are observed which leads some researchers to suggest that concerns about duality may be misdirected. Firms should seek a beneficial balance between strong CEOs versus strong boards to avoid CEO entrenchment (Finkelstein and D’Aveni, 1994; Daily and Dalton, 1997).

Dominant CEOs are driven to obtain results as compared to weak CEOs who may postpone tough decisions which jeopardize firms’ position and performance (Shen and Cannella, 2002; Zhang, 2006). Powerful CEOs pursue their objectives which can have a positive effect on corporate performance when influential CEOs are strongly positioned at the top. These strong CEOs contribute to stability and productivity in the organization and are able to coordinate activities that accomplish valuable ends (Adams, Almeida, and Ferreira, 2005).

Strong CEOs can facilitate or greatly influence team or group decision-making and can enhance firm performance and enrich shareholders, when external corporate governance curbs CEO power (Kisfalvi and Pitcher, 2003; Kim and Lu, 2011). Prior studies of group decision-making show when consensus is sought decision outcomes are less erratic (Sah and Stiglitz, 1991). Formidable CEOs in concert with other strong top executives produce beneficial results. Prior studies reveal that powerful CEOs who exert their will when managing with powerful boards have better firm performance (Finkelstein, 1992). For firms operating in competitive global environments, a highly skilled and agile management team is imperative.

Therefore, successful corporations need broad-based competent management teams that can quickly adapt to changing environments and can better position the firm for growth and expansion (Frame, 2002). Successful management teams are characterized by a small number of people with complementary skills who are committed to a common purpose; they achieve performance goals via a common approach permeated with a culture of shared responsibility and mutual accountability (Katzenbach, 1997). This study explores a simultaneous and interdependent (canonical) relationship between a set of firm management characteristics as independent variables to a set of dependent firm performance variables. The hypotheses evaluated are:

Hypothesis 1: There is no canonical relationship between a set of firm executive management characteristics and a set of firm performance variables.

Hypothesis 2: There is no linear relationship between firm executive management characteristics and dependent firm performance variables.

Business Complexity and Firm Performance

Prior studies indicate that both executive characteristics and organizational factors influence firm performance (Adams, Almeida, and Ferreira, 2005). Researchers find a direct relationship between leadership style and firm performance which finds that effective leaders are needed in competitive environments to enhance firm performance (Cherian and Farouq, 2013). Today’s managers must cope with the challenges of business complexity. Sources of business complexity are defined as interdependence of internal and external factors; local versus global operations; diversity of people and cultures including employees, customers, stockholders, and other stakeholders; information ambiguity which requires decision-making with less clarity and more uncertainty; and a fast-flux, fast-paced and dynamically changing environment (Amann, Nedopil, and Steger, 2011).

Moreover, business complexity is found to impact firm performance. Firms operating in complex environments – multiple industries, national and international markets, diverse employees and demanding customers require greater focus from CEOs and greater resources which often negatively impacts firm performance. Firms with diversification across industry segments and geographical regions require higher levels of CEO attention and management talent (Bushman, Chen, Engel, and Smith, 2004). Multi-industry firms often allocate capital ineffectively which contributes to poor firm performance (Stein, 1997). Some researchers have found that firms with greater industry and geographic diversification have lower value than firms without such diversification (Lamont and Polk, 2002; Denis, Denis, and Yost, 2002). Similarly, multi-national firms face complex managerial decisions due to cultural and legal diversity across markets; MNCs must develop, coordinate, and maintain organizations that span international boundaries in which complexities arise due to geographic dispersion, multiple currencies, different legal systems, and cultural differences (Duru and Reeb, 2002; Denis, Denis, and Yost, 2002).

Business complexity is inevitable; so, successful managers in the 21st century must deal with operational complexities and seek methods to simplify operations with common goals and behaviors. When business complexity is not effectively managed firm value is reduced. When firms are able to reduce degrees of complexity derived from individuals, they are better able to focus their attention on aspects of institutional complexity (Heywood, Spungin, and Turnbull, 2007). Management teams that are successful with coping with complexity are found to have common goals and behaviors, clear focus, and shared leadership (Steger, Amann, and Maznevski, 2007; Ghosal, 2013). For complex business environments, distributed leadership with a hierarchy of managers with prescribed roles is essential for business success because one leader does not know everything and cannot effectively and simultaneously address a variety of stakeholder concerns (Seijts, Crossan, and Billou, 2010).

This paper also explores the impact of business complexity on a relationship between management characteristics and firm performance. We examine a link between management structure and firm performance in the context of executives coping with business complexity in the 21st century.

Hypothesis 3: There is no canonical relationship between a set of business complexity measures and a set of firm performance variables.

Hypothesis 4: There is no linear relationship between firm management characteristics and dependent firm performance variables when controlling for business complexity.

DATA

The data sample is comprised of firms named to the 100 Top Corporate Citizens list by the Corporate Responsibility Magazine. This magazine annually ranks firms in the Russell 1000 index based upon over 290 data elements in seven categories: environment, climate change, employee relations, human rights, governance, finance, and philanthropy. These firms were selected because of their reputed ability to effectively manage the triple bottom line of people, profit, and planet by satisfying demands of various stakeholder groups which are critical for effective management in complex business environments. An additional 100 firm competitors not named to the list were selected based on factors such as revenues, gross margin and net income. Data were collected on the management structure of the firms from 1995 to 2010 in five year intervals which were 1995, 2000, 2005, and 2010. This approach is used because replacement of CEOs or changes at CEO levels is infrequent (James and Soref, 1981).

Data on CEO duality, CEO insider and number of subsidiaries were obtained from firm proxy statements. Data on CEO ownership were obtained from ExecuComp and proxy statements. Data on CEO tenure, top management team tenure, top management team size, top management team span of control were obtained from the 10-Ks and through Internet searches. Data on firms designated as multinational corporations (MNC) were obtained by reviewing the 10-Ks and other statements filed with the Securities and Exchange Commission (SEC). We omit firms without proxy statements, 10-Ks and financial data

from COMPUSTAT in any period. With further deletion of records with negative market-to-book (MTB) ratios, our sample resulted in a total of 703 observations.

Our management structure variables include CEO duality, CEO insider, CEO ownership, CEO tenure, top management team (TMT) size, and TMT span of control. Appendix A provides details about these variables. Financial performance data consist of a profitability measure, market-value measure, operating efficiency measure, and internal investment measure. The financial performance variables are:

- Return on Equity (ROE) is a profitability ratio which measures annual net income to total shareholders' equity.
- Market-to-Book (MTB) ratio is a market measure which captures a firm's market value in relation to its accounting value.
- Capital expenditures ratio (CAP_EXP) is used as a proxy for internal firm investment. It is a ratio of capital expenditures to total assets.
- Total Asset Turnover (TA_TURN) is an operating efficiency ratio which captures the amount of revenue generated per dollar of assets.

The business complexity variables chosen for this study reflect operational challenges for firms in terms of industry competition, operation of multiple subsidiaries, national versus international operations, and management of multiple stakeholder groups. Four business complexity variables are studied:

- MNC which is coded as "1" for firms with multinational operations and coded as "0", if not.
- SUBS is a count of the number of subsidiaries for a given firm where subsidiaries are plants, branches, divisions, or subordinate companies of a parent organization.
- INDUS_HHI is an industry Herfindahl-Hirschman Index which indicates industry competition based upon size. It is computed as the average value of the sum of the squares of firm sales in each industry segment divided by total firm sales. Higher values indicate more industry concentration (Bushman, Chen, Engel, and Smith, 2004).
- TOP_FIRM is a dummy variable set to "0" for firms not on the 2010 Top Corporate Citizen List and set to "1" for firms on the 2010 Top Corporate Citizen List.

METHODOLOGY

To address our research questions regarding the inter-relationship between groups of variables – (1) which management characteristics most impact firm performance and (2) which business complexity measures most impact firm performance, canonical correlation analysis is performed. Canonical correlation analysis is a multivariate statistical model that enables the study of inter-relationships among a group of independent variables and a group of dependent variables. Its correlation measures the strength of relationships between two sets of variables with one set considered the dependent variables and the other independent variables (Green, 1978; Hair, Anderson, Tatham, and Black, 2003). We analyze the canonical correlations between the group of management characteristics variables to the group of firm performance variables; and the group of business complexity variables to the group of firm performance variables using the results to further investigate multivariate relationships among these variables using linear regressions. Therefore, our focus is on significance and strength of canonical correlation functions, weights, and loading factors. Output in the form of canonical functions explains whether relationships exist between the sets of dependent and independent variables. Each canonical function developed is independent of other canonical functions; therefore, each canonical function represents a different relationship found among the sets of dependent and independent variables.

For statistically significant canonical functions, we analyze the magnitude of the canonical weight assigned to each variable in its group of multiple variables (canonical variates). Variables with relatively larger weights contribute more to the variates, and vice versa. Many researchers prefer to use canonical loading values which reflect the variance that the observed variable shares with the canonical variate and can be interpreted like a factor loading in assessing the relative contribution of each variable to each

canonical function. The larger the canonical loading coefficient, the more important it is in deriving the canonical variate. For this study, we consider canonical loading coefficients of 0.50 or greater for further analysis in multivariable regressions.

From the statistically significant canonical functions (p-value less than 0.05), we select those management characteristics and firm performance variables with higher canonical loading factor magnitudes to evaluate in subsequent multiple regression analysis. We use firm performance variables as a dependent variable to assess a linear relationship between firm performance measures and management characteristics. Then, we include in our study business complexity measures as control variables to examine sensitivity to firm performance measures.

ANALYSIS AND RESULTS

In this section, we present empirical results of the relationship between executive management, firm performance and business complexity measures. Table 1 highlights summary statistics for the full sample of 703 observations. For firm financial performance measures, the sample average has a ROE of 18%, market-to-book ratio of 3.86 times, total asset turnover of 1.01 times, and percentage of capital expenditures to total assets of 5%. As indicated by management characteristics, more firms have organizational structures with CEO duality, CEOs with stock ownership, and about half with CEOs as insiders. The average firm has multinational operations, low industry concentration, and the average number of subsidiaries for these firms is 110.

TABLE 1
SUMMARY STATISTICS

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
<i>Firm Performance</i>					
ROE	703	0.1802	0.2785	-1.2435	4.3966
MTB	703	3.8624	4.3602	0.2513	42.0239
Cap_EXP	703	0.0534	0.0443	0.0000	0.4287
TA_TURN	703	1.0136	0.7032	0.0545	4.9276
<i>Management Characteristics</i>					
CEO Duality	703	0.7582	0.4285	0	1
CEO Insider	703	0.5334	0.4992	0	1
CEO Tenure Ratio	703	0.6676	0.7683	0.0000	6.1818
CEO Ownership	703	0.9545	0.2086	0	1
TMT Span of Control	703	1.414	0.7127	0	3
TMT Size	703	6.2902	3.0501	3	32
<i>Business Complexity</i>					
MNC	703	0.8193	0.3850	0	1
Subsidiaries	703	109.6031	226.9495	0	2298
Industry Competition	703	0.3595	0.4052	0.00	1.00
Top 100 Firm	703	0.5064	0.5003	0	1

As Table 2 shows there is a canonical relationship between the set of executive management characteristics and set of firm performance variables. Two of the four derived canonical functions are statistically significant with p-values of <.0001 and 0.0166, respectively. For canonical functions, successive pairs of canonical variates are based on residual variance with inter-relationships between variates becoming smaller as subsequent functions are extracted. So, the first pair of canonical variates exhibits the highest inter-correlation with the last pair exhibiting the least. Commonly, functions whose

canonical correlation coefficients are statistically significant beyond some level, typically p-value less than 0.05 are analyzed. We follow this approach for our study. Also shown in Table 2, our multivariate tests of significance, Wilk's Lambda, Pillai's trace, Hotelling's trace, and Roy's greatest root, are all statistically significant. The results indicate that there is a canonical relationship between sets of executive management variables and sets of firm performance variables. Therefore, we further analyze the output from the two statistically significant canonical functions.

TABLE 2
SIGNIFICANCE LEVELS FOR SETS OF CANONICAL CORRELATIONS FROM SETS OF
MANAGEMENT CHARACTERISTICS AND FIRM PERFORMANCE VARIABLES

Canonical Function	Canonical Correlation	Squared Correlation	F-ratio	P-value
<i>Function 1</i>	0.2745	0.0753	3.52	<.0001
<i>Function 2</i>	0.1657	0.0274	1.93	0.0166
<i>Function 3</i>	0.1160	0.0134	1.19	0.3004
<i>Function 4</i>	0.0113	0.0001	0.03	0.9930
	Statistics	Value	F-ratio	P-value
	Wilk's Lambda	0.8871	3.52	<.0001
	Pillai's Trace	0.1164	3.48	<.0001
	Hotelling-Lawley	0.1235	3.56	<.0001
	Roy's	0.0815	9.45	<.0001

Table 3 indicates the canonical weights and canonical loadings for each management characteristic and firm performance variables. Variables with canonical weights of 0.50 or higher in absolute value indicate greater contribution (Fornell and Larcker, 1980). Due to issues of instability with canonical weights due to multicollinearity, analysis of canonical loading is often performed using canonical loading values versus canonical weights. Canonical loadings measure the linear correlation between a variable in either set and that set's canonical variate. It is similar to factor loading in assessing the relative contribution of each variable set to the canonical function; the larger the coefficient, the more important is the variable set. So, we analyze variables with canonical loadings in absolute value of 0.50 or higher.

As highlighted in Table 3, the management variables with the highest contribution are CEO insider, CEO ownership, and top management team span of control (TMT_Span). For function 1, CEO insider has a canonical loading absolute value of 0.6713 and TMT_Span has an absolute value of 0.5376; for function 2, CEO ownership has a canonical loading magnitude of 0.7255. Therefore, we use these three management structure variables – CEO Insider, CEO Ownership, and TMT Span in our regression analysis.

Interestingly, variables such as CEO duality and CEO tenure which have been found to influence firm performance often with conflicting results have less impact on firm performance measures as indicated by either canonical weight or canonical loading values (Adams, Almeida, and Ferreira, 2005; Blettner, Chaddad and Bettis, 2012). This finding supports a perspective that these CEO characteristics indirectly impact firm performance through direct influence on members of the top management team. Simsek (2007) highlights that CEO tenure indirectly influences firm performance via direct influence on actions of top management teams (TMTs), especially risk-taking and entrepreneurial efforts.

Furthermore, Table 3 highlights which firm performance measures have greater influence as indicated by higher canonical loading magnitudes. As shown in function 1 and function 2, all firm performance measures ROE, market-to-book, asset turnover, and capital expenditures have high canonical loading absolute values which are greater than 0.50. So, all these firm performance measures are included in subsequent regression analysis. As prior literature indicates, CEO characteristics and actions of powerful

CEOs can influence firm performance (Core, Holthausen, and Larker, 1999; Faleye, Kovacs, and Venkateswaran, 2013; and Veprauskaitė and Adams, 2013).

TABLE 3
CANONICAL CORRELATION ANALYSIS OF SIGNIFICANT CANONICAL FUNCTIONS
FOR MANAGEMENT CHARACTERISTICS AND FIRM PERFORMANCE VARIABLES

	Function 1		Function 2	
	Weight	Loading	Weight	Loading
<i>Management Characteristics</i>				
CEO Duality	-0.3367	-0.2408	0.2646	0.2233
CEO Insider	-0.6896	-0.6713	0.2867	0.2580
CEO Tenure Ratio	0.2532	0.3063	0.2291	0.1507
CEO Ownership	0.0692	0.1578	-0.7777	-0.7255
TMT Span of Control	0.5567	0.5376	0.3487	0.3167
TMT Size	0.2210	0.3089	0.3927	0.4020
<i>Firm Performance</i>				
ROE	-0.0251	0.0106	0.8219	0.9648
MTB	0.0402	0.0808	0.2121	0.7348
CAP_EXP	0.7384	0.8194	-0.1591	-0.1478
TA_TURN	0.5765	0.6798	0.1538	0.1801

Table 4 indicates there is a canonical relationship between the set of business complexity variables and set of firm performance variables. Three of the four derived canonical functions are statistically significant with p-values of <.0001, <.0001, and 0.0026, respectively. Also, all multivariate tests of significance (Wilk's Lambda, Pillai's trace, Hotelling's trace, and Roy's greatest root) are statistically significant. We conclude that there is a canonical relationship between sets of business complexity variables and sets of firm performance variables. Next, we analyze the output from the three statistically significant canonical functions.

TABLE 4
SIGNIFICANCE LEVELS FOR SETS OF CANONICAL CORRELATIONS FROM SETS OF
BUSINESS COMPLEXITY AND FIRM PERFORMANCE VARIABLES

Canonical Function	Canonical Correlation	Squared Correlation	F-ratio	P-value
<i>Function 1</i>	0.3332	0.1110	8.63	<.0001
<i>Function 2</i>	0.2239	0.0501	5.88	<.0001
<i>Function 3</i>	0.1424	0.0203	4.10	0.0026
<i>Function 4</i>	0.0537	0.0029	2.02	0.1555
Statistics		Value	F-ratio	P-value
Wilk's Lambda		0.8245	8.63	<.0001
Pillai's Trace		0.1843	8.43	<.0001
Hotelling-Lawley Trace		0.2012	8.73	<.0001
Roy's Greatest Root		0.1248	21.79	<.0001

As highlighted in Table 5, each business complexity variable has high canonical loading values for at least one of the three statistically significant canonical functions. For function 1, number of subsidiaries

has a canonical loading absolute value of 0.5737 and industry competition has a value of 0.7140. For function 2, the multinational corporation variable has an absolute canonical loading value of 0.7185; and for function 3, the top corporate citizen firm variable has a canonical loading value of 0.7138. One or more of each business complexity variable has a strong relationship to at least one type of firm performance variable (profitability, market-value, internal investment, and operating efficiency). For firm managers, this finding underscores the importance of addressing dimensions of business complexity to better influence firm performance outcomes.

TABLE 5
CANONICAL CORRELATION ANALYSIS OF SIGNIFICANT CANONICAL FUNCTIONS
FOR BUSINESS COMPLEXITY AND FIRM PERFORMANCE VARIABLES

	Function 1		Function 2		Function 3	
	Weight	Loading	Weight	Loading	Weight	Loading
<i>Business Complexity</i>						
MNC	0.5521	0.4563	-0.7488	-0.7185	0.3874	0.5209
Subsidiaries	-0.5199	-0.5737	-0.0053	-0.2299	0.5381	0.5559
Industry Competition	0.6302	0.7140	0.4758	0.3849	0.1865	-0.0832
Top 100 Firm	0.0755	-0.0017	0.6061	0.4581	0.7209	0.7138
<i>Firm Performance</i>						
ROE	-0.1991	0.0946	0.3207	0.2343	0.3276	0.7733
MTB	0.4282	0.3627	-0.0731	0.1156	0.7102	0.8986
CAP_EXP	0.4188	0.5389	0.8726	0.7866	-0.2897	-0.2989
TA_TURN	0.7612	0.8379	-0.5657	-0.4366	-0.1581	-0.1388

Table 6 shows multivariate regression output for the relationship among firm performance measures, management characteristics and business complexity measures with firm performance as a dependent variable. Four categories of firm performance measures are evaluated; they are profitability measured by return on equity (ROE) ratio, market-value measured by market-to-book (MTB) ratio, internal investment measured by ratio of capital expenditures to total assets (CAP_EXP), and operating efficiency measured by total asset turnover (TA-TURN). As indicated by the output of the canonical correlation analysis, some management characteristics variables are not significantly correlated with firm performance measures; therefore, the regression analysis includes only three management characteristic variables – CEO insider, CEO ownership, and top management team span of control. The results indicate that CEO Insider has a statistically significant negative correlation with capital investment and operating efficiency firm performance measures. This negative impact may be due to insider CEOs having greater autonomous decision-making power and being less likely to change course or other executives less likely to contradict these insider CEOs when poor decisions are made. Prior research finds insider CEOs are less likely to change course and reverse bad decisions as highlighted when CEOs are replaced. Greater improvements in firm performance are observed with outsider CEOs (Weisbach, 1995; Peng, 2004; Pan and Wang, 2012). Also, CEO ownership has a statistically significant negative relationship with ROE and market-to-book firm performance measures. This result is consistent with literature which finds in firms with weak governance, incentive pay contracts tied to stock performance cause CEOs to engage in self-serving actions which focus on short-term firm performance (Bhagat and Bolton, 2008). Also, this negative correlation between CEO ownership and firm market measures may reflect the market's inability to correctly price incentives based upon management ownership (Lilienfeld-Toal and Ruenzi, 2014). These authors find that CEO ownership can be value increasing with better firm operating efficiency (in our

study, this relationship is positive but not statistically significant), but market pricing is not consistent with a value-increasing proposition.

Furthermore, these findings indicate that CEOs that have more executives as part of their top management team have positive overall firm performance with statistically significant positive impact on capital investment and operating efficiency firm performance measures. These results are consistent with prior studies that find powerful, entrenched CEOs with self-serving interests have a negative impact on firm performance. We find that better firm performance correlates with management structures involving greater involvement of other managers. For results with an inverse, significant correlation between firm performance measures and management characteristics, the intuition is such results reflect areas where greater conflict of interest for resource usage ensues. These conflicts result in inefficient firm operations and decisions which result in less internal investment of capital. Powerful insider CEOs and CEOs with greater stock ownership may engage in actions that they believe will be beneficial to shareholders, but are not. When these powerful CEOs are left unchecked by strong boards or strong top management teams, firm performance may suffer.

TABLE 6
MULTIVARIATE REGRESSION ANALYSIS OF FIRM PERFORMANCE

	ROE	MTB	CAP_EXP	TA_TURN
Intercept	0.2168***	3.1133***	0.0368***	0.7452***
<i>Management Characteristics</i>				
CEO Insider	0.0222	0.4249	-0.0122***	-0.1147*
CEO Ownership	-0.1542**	-1.8236*	0.0103	-0.0697
TMT Span of Control	0.0222	0.2242	0.0086***	0.0756*
<i>Business Complexity</i>				
MNC	0.0206	1.1199**	-0.0073	0.3955***
Subsidiaries	0.0000	0.0003	-0.0000**	-0.0005***
Industry Competition	0.0381	1.4144***	0.0187***	0.1798**
Top 100 Firm	0.0662**	0.9541**	0.0055	-0.0878
N	703	703	703	703
Adjusted R ²	0.0247	0.0333	0.0952	0.0908

* p <.05; **p < .01; ***p <.001

Additionally, Table 6 highlights a statistically significant relationship between firm performance and business complexity measures. For each firm performance category, one or more business complexity variable has a statistically significant correlation. We find that firms with multinational operations have better firm performance, possibly because MNCs realize that collaborative top management teams are needed to effectively operate across borders with different cultures, laws, and customer demands. Literature on executive compensation finds that consistent compensation levels among top management team members correlates with better firm performance for multinational corporations (Carpenter and Sanders, 2004). We believe that similar results observed for firm performance in relationship to TMT span of control and MNC variables may reflect the findings of Carpenter and Sanders (2004).

We find an inverse relationship between firm performance and number of subsidiaries with firms having more subsidiaries experiencing negative impact on operating efficiencies and asset management measures. This result suggests that firms should seek to operate an optimum number of subsidiaries for beneficial usage and allocation of resources. Our results indicate that firm with greater industry concentration have better firm performance. This result may reflect greater efficiencies due to concentration, synergies, and similar focus, as well as, competitive advantages from greater market presence.

Also, consistent with prior research, we find that firms with good corporate social performance, top corporate citizen firms have better firm performance (Brammer, Brooks, and Pavelin, 2009), especially for profitability, market measures, and internal investment. These top corporate citizen firms tend to effectively balance various and often conflicting demands from multiple stakeholder groups while yielding good financial performance which our results confirm. Although not statistically significant, an inverse relationship between top corporate citizen firms and asset turnover is found; this finding may reflect differences in industry with more asset-intensive industries having lower turnover ratios.

DISCUSSION AND IMPLICATIONS

This paper revisits correlations between executive management characteristics and firm performance in the context of complex business environments because business complexity is a major challenge for corporate managers. Recent survey results from U.S. corporate executives list business complexity as their largest 21st century challenge. Common sources of complexity in business environments include international operations, diversity of stakeholders, information ambiguity, and dynamic settings. Consequently, CEOs have greater pressures to make effective decisions in fast-flux situations with little to no room for error.

As the top corporate manager, CEOs are accountable for firm performance. Therefore, CEOs need the power, authority, and dominance to resolve disputes, allocate resources, and make final decisions, especially when other executive may disagree. However, with concerns that powerful CEOs will exploit stakeholders for personal gains, strong top management teams or collaborative executive management are preferred organizational structures. We believe that in complex business environments, a “one size fits all” management structure is not suitable. Therefore, corporations must weigh costs and benefits associated with forms of executive leadership based upon present and future settings (Brickley, Coles, and Jarrell, 1997; Faleye, 2007).

Our results shed light on conflicting literature about whether top executives’ characteristics directly impact firm operations – do CEOs matter (Hambrick and Mason, 1984; Finkelstein and Hambrick, 1996). We find that insider CEOs and CEO ownership strongly influence firm performance; whereas, CEO characteristics such as CEO tenure and CEO duality do not directly influence firm performance, but rather may have an indirect impact on firm performance via influence on top managers and board directors. Our study highlights that top management team span of control has a direct impact on firm performance which suggests that shared management is beneficial. When firms have dedicated managers for regional, functional, product, or global operations, firm performance measures are better, especially operating efficiency and asset management measures.

We find strong evidence that measures of business complexity greatly impact firm performance and conclude that business complexity is an important challenge for managers. For this study proxies for business complexity captured national versus international operations, diversity in size and operations, industry concentration, and management of various stakeholder groups. Our results indicate that each measure of business complexity has a direct, significant impact on firm performance. Firms with more subsidiaries had worse firm performance. So, firms should limit diversification and vertical expansion beyond numbers which become value-decreasing. However, we find that firms with multinational operations, greater industry concentration, and good reputations for effectively balancing diverse stakeholder groups have better firm performance and that firms with greater top management team span of control have better overall performance.

This study contributes to literature on the impact of executive power and firm performance by highlighting that “one size fits” all management structures are not effective in today’s business environment. This study highlights that CEO duality and CEO tenure do not directly impact firm performance, but rather may have indirect impact on board members and top executives. Furthermore, powerful CEOs working collectively with strong top management teams are beneficial with the role of these top managers being more important than mere numbers of managers. Business complexity seems to

dictate team management approaches. In complex business environments, collaboration between strong CEOs and strong top management teams working in concert can yield beneficial results for corporations.

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APPENDIX – VARIABLE DEFINITIONS

Management Characteristics

CEO Duality	Coded as 1 if CEO is also the chair of the board, otherwise 0.
CEO Insider	Coded 1 if the CEO is the only insider on the board, otherwise 0.
CEO Tenure ratio	Ratio of the CEO tenure to the average tenure of the top management team where average tenure of the top management team is measured as the mean number of years in the firm of top executives in a given year and CEO tenure is zero, if less than one year.
CEO Ownership	Coded as 1 if CEO owns stock, otherwise 0.
TMT Size	The number of executives in the two highest levels of a firm's management structure.
TMT Span	Coded as 0 to 4, based upon the quantity of top executives with distinct responsibility roles. The responsibility roles include functional manager, regional manager, product manager, or global operations manager. They are defined as: <ul style="list-style-type: none"> • Functional Manager is a president or vice president who heads a functional area such as head of marketing, research, or manufacturing. • Regional Manager is president or vice president with geographical responsibility within the U.S. such as head of southwest region or head of tri-state area. • Product Manager is a president or vice president which heads a product line or subsidiary such as head of Chevy division or head of Pizza Hut. • Global Operations Manager is a president or vice president which heads non-U.S. territories such as Asian Division.

Performance Measures

ROE	Return on equity is a profitability ratio which divides net income by total shareholder's equity.
TATURN	Total asset turnover is an asset management ratio indicates the efficiency with which a company is deploying its assets.

MTB	Market-to-book ratio is a market measure which reflects the market value of a company in comparison to its book value or accounting value.
CAP_EXP	Capital Expenditure ratio is an operating efficiency ratio which measures total capital expenses divided by firm's total assets.
<i>Business Complexity Measures</i>	
MNC	Coded as 1 if the firm is a multinational corporation (it operates in international markets), otherwise 0.
Subsidiaries	Number of subsidiaries where a subsidiary is defined as branch plant, division, a company controlled by a holding company.
Top firm	Coded as 1 if the firm is on the list of 2010 list of 100 Top Corporate Citizens, otherwise 0.
IndyHHI	An industry concentration measure defined as the sum of the square of firm sales in each industry segment divided by total firm sales. Approach used by Bushman, Chen, Engel, and Smith (2004) with an upper bound of 1.0.