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DO CIOs MATTER? ASSESSING THE VALUE OF CIO PRESENCE IN TOP MANAGEMENT TEAMS

Les DSI comptent-ils vraiment ? Evaluer la valeur liée à la présence des DSI dans les équipes de direction

Completed Research Paper

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Abstract

Though the importance of Chief Information Officers (CIOs) is well recognized in academic literature, concerns have often been expressed about the status of CIOs and their waning influence. In fact, not all firms choose to have Chief Information Officers (CIOs) as a part of their top management teams. This research investigates whether CIO presence/absence in top management teams affect firm performance. We assembled a multi-industry dataset of 205 firms that included CIOs in their TMTs and assessed their financial and market performance over a three year period (2002-2004). We found firms that included CIOs in their top management teams to have significantly better financial performance than their peer firms who did not. The results and their implications are discussed. This study provides an initial step towards understanding the empirical linkages between IT leadership and firm performance.

Keywords: Chief Information Officer, IT leadership, Firm performance, IT management

Résumé

Bien que l'importance des Directeurs des Systèmes d'Information (DSI) soit reconnue dans la littérature académique, des inquiétudes ont souvent été exprimées à propos du statut des DSI et le recul de leur influence. Toutes les entreprises ne choisissent pas d'avoir un DSI dans leur équipe dirigeante. Cette recherche étudie si la présence ou l'absence de DSI dans l'équipe de direction affecte la performance de la firme.

Introduction

Chief information officers (CIOs) have long been recognized as the principal architects of information systems strategy and major catalysts of IT-based organizational transformation. As information technology moved from back office data processing to the center stage of business operations, several organizations created the position of chief information officers in mid-1980s (Benjamin et al., 1985). As IT further permeated into organizations becoming an integral component of business strategy, a natural expectation was a rise in the status of CIOs. This signified an elevation in status of the CIO and their accession into top management teams.

Though the number of corporate CIOs has increased dramatically over the past two decades, the status of the CIOs still remains a significant concern (King, 2008). The status of the CIO is an important indication of the organizational recognition of the IT function's capabilities, credibility and value (Brown, 2005). Practitioner literature on CIOs frequently features discussion on the diminished status of the CIOs. For example, a study by the CIO magazine pointed out that the percentage of CIOs who report to CFOs, rather than CEOs, increased from 11% in 2002, to over 22% in 2003, suggesting a possible decline in the clout of CIOs. Another study by Society for

Information Management (Soat, 2008) confirmed that the number of CIOs reporting directly to CEOs has declined, suggesting that the “CIOs’ influence is waning”. Another study by Janet Associates reported a considerable decline in the compensation packages awarded to CIOs since 2001. Summing up the state of CIOs, Overby remarked: “Their budgets have been cut, their work’s been outsourced, their staff’s been downsized, and they’ve been pushed off the executive team. Their status within the enterprise has suffered.”

There are many reasons for the perceived low status and credibility of CIOs and IT function. First, the dramatic growth of IT services industry and increased corporate efforts to outsource and offshore IT activities have significantly changed the organizational expectations from CIOs (Ross and Feeny, 2000). Second, unlike 1980s, several line managers and functional executives have built considerable IT knowledge and assume responsibility for their own computing requirements, thus making some of the responsibilities of the CIOs redundant. Third, the difficulties in demonstrating the business value of information technology has also lowered the credibility of CIOs and IT function. Fourth, mere competency in information technology may not ensure them a seat in TMT, but their competence in business has become a necessity if they have to be accorded a higher status among the organizational executives.

While the MIS literature has long recognized the strategic nature of CIO role and status, recent studies have noted the perpetual problems CIOs face with their status and credibility (Brown, 2005; King, 2008; Maruca, 2000). MIS research has suggested several ways through which CIOs could elevate their role and status. Such mechanisms, for example, include building relationships with other senior executives, winning the confidence of CEO (Feeny et al., 1992), and making IT a key element of overall business strategy. Further, CIOs could use rational persuasion and personal appeal to generate peer commitment (Enns et al., 2003). By being a member of top management teams and interacting frequently with business executives, CIOs could enhance IT assimilation (Armstrong and Sambamurthy, 1999) and foster technology-based innovation in organizations (King, 2008).

Although prior studies have noted the importance of IT leadership and have argued for providing an elevated status for CIOs, there is no direct evidence linking IT leadership and firm performance. Calls have been made to better understanding of the value provided by IT leadership to the organizational outcomes (Karahanna and Watson, 2006). By virtue of their higher status and roles, CIOs could add value to their organizations by enriching IT management capabilities, enhancing the business value of IT, and contribute to overall improvements in firm performance. Despite the apparent centrality of IT leadership to the phenomenon of IT-enabled business value, however, research on this relationship is severely limited, and an empirical association between IT leadership and firm performance is yet to be established. The primary purpose of this paper, therefore, is to assess if firms that include CIOs in their top management teams (TMTs) exhibit better business outcomes in terms of both financial and market performance. The fundamental research questions addressed by this paper are: *What are the effects of IT leadership on firm performance? Does inclusion of CIO in the top management team make a difference to the organizational outcomes?*

The remainder of this paper unfolds as follows. The following section describes the theoretical foundation that links IT leadership and firm performance, and presents the research hypotheses. The methodology used to test the hypotheses, the dataset used and results are presented next. The subsequent section discusses the results, and presents the theoretical and practical implications that ensue.

Theoretical Development

Organizational theorists have demonstrated a long-standing interest in the issue of organizational leadership and performance linkages because of the potential impact of leadership on organizational strategy, change and operations (Thomas, 1988; Waldman et al. 2001). However, the focus has largely been centered on chief executive officers (CEOs). For instance, researchers have demonstrated the significance CEO-related factors including personal characteristics, leadership style, power (Combs et al. 2007) and CEO-board relationships and tenure (Simsek, 2007) as significant in affecting the organizational performance. Apart from examining individual CEOs, many scholars have focused their attention on the top management teams (TMT) - a relatively small group of most influential executives at the apex of the firm. TMT represents the group of top, C-level executives who have overall responsibility for running the enterprise. Several studies have argued that characteristics of TMTs influence the strategic decisions and resultant business outcomes (Finkelstein and Hambrick, 1996).

A central theory that has guided much of the research on TMT is the upper echelons theory (UET). According to UET, the top management team’s experiences, personalities, and values influence their interpretations of the

organizational situations they face, and in turn affect the strategic decisions and the ultimate firm performance (Hambrick and Mason, 1984; Hambrick, 2007). A core construct in UET is the heterogeneity of the senior executive team. Researchers have argued for both positive and negative effects of TMT heterogeneity on organizational outcomes. On the positive side, a heterogeneous TMT enhances the organizational knowledge base, cognitive abilities and the overall problem-solving capabilities of the group (Hambrick et al. 1996) thus leading to better decisions. Heterogeneous teams promote greater variance in creativity, ideas and capabilities enabling organizations to innovate and perform better. Dynamic, high velocity environments place considerable demands on information processing, learning and adaptation on TMT, making heterogeneity a desirable attribute (Harrison et al. 2002). Therefore, TMT heterogeneity assumes critical importance in firms that operate in fast-paced and dynamic environments. However, TMT heterogeneity could create tension that limits information exchange, thus adversely affecting firm performance (Ancona and Caldwell, 1992). Differences in thoughts, viewpoints and objectives that arise from team diversity could lead to strains in strategic decision process that could adversely affect organizational outcomes. O'Reilly et al (1993) argue that homogeneity among senior leaders promote cooperation and consensus that is critical to implementing strategic decisions.

The empirical results from TMT heterogeneity and organizational outcomes have been mixed. TMTs with members from diverse backgrounds have been found to influence individual satisfaction and group cooperation (Barsade et al. 2000). TMT heterogeneity has been found to be associated with financial performance (Carpenter, 2004), competitive action (Hambrick et al. 1996) and propensity for strategic change (Wiersema and Bantel, 1992). However, some studies have found that heterogeneous teams cause less social integration and communication frequency and high turnover in TMTs (Wagner et al. 1984). Therefore, TMT heterogeneity could be viewed as a 'double-edged sword' (Finkelstein and Hambrick, 1996).

CIOs in Top Management Teams

MIS research has demonstrated several potential benefits for including CIOs in TMTs. As firms become increasingly reliant on information technology for several critical business initiatives, CIOs inclusion adds to the diversity of TMTs, thus enhancing the heterogeneity. This enhances the shared understanding of the role of IT and improves IT-business decision making. Wherever the CIOs are not a member of TMTs, they have to exert influence on the senior managers to appreciate the relevance of strategic IT projects (Enns et al., 2003). Further, CIO's inability to exert such an influence is likely to increase chances of these critical IT projects getting governed by less informed people (Enns et al., 2003). Not all firms have been able to convert their IT investments into tangible business results and sustainable IT-business capabilities and one of the primary reasons for this gap has been lack of competent IS leadership. Despite creating CIO positions, many organizations have not provided the necessary authority and decision making rights to the IS leadership. In many firms, CIOs do not have seat at the top-level executive table and often are left out of the top management teams. Despite creating the position of CIOs, many firms have not included them in the apex body of TMTs (King, 2008). Industry surveys (Soat, 2008) point to exclusion of CIOs in the top-most decision making body of the organization.

CIOs inclusion in TMT demonstrates top management's active support and commitment towards IT and further breed organizational commitment, in terms of garnering organization-wide executive involvement and support for IT. CIO's presence in TMT creates a direct rapport with the CEO and other which helps in speedy decision making and effective deployment of IT. This efficiency and effectiveness would get manifested in efficient business processes and thus, enhanced business performance. Hence, firms where CIOs are accorded a higher status, by means of their induction in the top-most level of organizational hierarchy are likely to perform better than others where CIOs are absent from the top-most bracket of business leadership.

Inclusion of CIOs in TMTs will enhance and enrich the communication between CIOs and CEOs thus enabling a shared vision about the role of information technology in organization (Johnson and Lederer, 2007). In addition, CIO inclusion in TMT will also promote a shared language between CIO and executive management, which creates a shared understanding between CIO and other executives that ultimately, provides stronger IT-business alignment (Preston et al. 2006). Higher levels of engagement between CIO and TMTs is likely to improve the CIOs' capabilities including their communication, political savvy, IT and business knowledge, which would improve their overall effectiveness (Smaltz et al. 2006). Better IT-business alignment and shared vision between business and IT have been shown to improve IT's contribution to the business, leading to better financial performance. Collectively, these results and upper echelon arguments suggest that organizations that have CIOs as a part of their TMTs will gain superior financial performance. Therefore,

Hypothesis 1: Firms that include CIOs in their top management teams will exhibit better financial performance than those who do not.

We now propose our arguments linking CIO status to a firm’s market value. Prior research suggests that firms creating new CIO positions signaled their seriousness about IT to their shareholders. Investors also view announcements of a new CIO positions positively as is evident from increased market value (Chatterjee et al., 2001). Investors have encouraged firms undertaking key IT initiatives such as implementing ERP systems (Ranganathan and Brown, 2006), e-commerce projects (Subramani and Walden, 2001), and IT outsourcing (Oh et al. 2006), in addition to IT governance efforts (Chatterjee et al. 2001). We therefore believe that CIOs presence in the TMTs would further encourage shareholders and their support would result in higher market value. Inclusion of CIOs in TMTs signals a firm’s strong commitment to IT, reflecting the organization’s resolve to manage IT effectively as a key organizational resource. Therefore, we expect firms that have CIOs as a part of their TMTs to have greater market value than their industry peers who do not. This leads us to the following hypothesis:

Hypothesis 2: Firms that include CIOs in their top management teams will exhibit better market value than those who do not.

Methods

The fundamental purpose of this study was to test if firms that have CIOs in the TMTs differ from other peers (who do include CIOs in their TMT) in terms of their business performance. As is commonly done in leadership research, CIO’s inclusion in TMT can be assessed by examining their presence or absence as one of the ‘named executive officers’ of the organization. All publicly traded US firms disclose TMT information, including their names, compensation and other particulars in their filings to Securities and Exchange Commission (SEC). We assembled a database of US firms having CIOs in named the executive officers group through an extensive search of public disclosures made by firms in their SEC filings. We conducted detailed search on the EDGAR SEC filing database (available via the LexisNexis) and scanned the proxy statements of all the firms in the database to identify the disclosures pertaining to senior IT executives. Our search resulted in a final usable dataset of 205 firms that had CIOs in named executive officers group in the year 2002. It should be noted that our dataset contains all the publicly traded US firms that had CIO as a named executive officer for 2002 in the EDGAR database – Hence, our dataset represents a population of firms, rather than a limited sample. Table 1A and 1B shows the descriptive statistics and demographics of our dataset. As evident from the tables, our dataset had CIOs from diverse industries. These firms, for the purpose of our study, we call as ‘incident’ firms.

| | Mean (‘000 \$) | S.D |
|---------------------|-----------------|-----------|
| Sales | 3,697,125 | 8,543,609 |
| Number of Employees | 16089 | 39546 |

| Industry | No of Firms |
|---|-------------|
| Manufacturing Related | 37 |
| Transportation, Communication & Utilities | 18 |
| Wholesale and Retail | 56 |
| Finance & Insurance | 43 |
| Business, professional services & real estate | 51 |

We followed the procedure suggested by Santhanam and Hartono (2003) for comparing the performance of incident firms (firms that had included CIOs in their TMT) and those who did not (control group). Each firm in our dataset was benchmarked with all the other firms in that industry for comparison. We utilized four-digit Standard Industry

Classification (SIC) scheme to create industry as a benchmark for each incident firm. Four-digit SIC classification identifies firms based on their product lines and hence, is more specific classification. Consistent with our research goals, we also ensured that the matched industry group did not contain any firms that were present in our dataset. In essence, for each firm in our dataset (where CIO was a member of TMT), we had a matched peer-group from same industry (where firms did not list their CIOs as a part of TMT). We were interested in comparing the difference in performance of each incident firm with the average performance of all the other firms with the corresponding four-digit SIC code. Hence, for each incident firm, we collected all firms with the same SIC code. Then we removed the incident firm (and other incident firms with same SIC code) from this group of firms and computed average performance measures to compare with each incident firm.

Measures: Firm performance has two components: financial performance and firm market value. We employed seven accounting ratios for comparing financial performance. Firm value was assessed by Tobin's q, the ratio of the market value of firms to the replacement cost of its tangible assets. Data pertinent to each ratio was gathered from Compustat database.

Measures of Financial Performance:

- Profit ratios: Return on Sales (ROS), Return on Assets (ROA), Operating Income to Assets (OI/A), Operating Income to Sales (OI/S), and Operating Income to Employees (OI/E)
- Cost ratios: Cost of Goods Sold to Sales (COG/S), Selling and General Administration Expenses to Sales (SGA/S)

Market Value Measure: Tobin's q = (MVE + PS + DEBT)/ TA

Where MVE = (Closing price of share at the end of the financial year) * (Number of Common Shares Outstanding);

PS = Liquidating value of the firm's outstanding preferred stock;

DEBT = (Current Liabilities – Current Assets) + (Book Value of Inventories) + (Long Term Debt), and

TA = Book Value of Total Assets

Analysis: We employed matched sample comparison group methodology. First, we computed the above eight ratios for all incident firms and control group firms. Thereafter, we carried out parametric t-test and non-parametric Wilcoxon signed-rank test to statistically test the differences in firm performance and firm value between IS leader and control group firms.

Adjusting for Prior Financial Performance: Researchers have stressed the importance of adjusting for the prior financial performance because of its strong influence on current performance (Fama and French, 2000; Santhanam & Hartono, 2003). Our intent was to examine if there were any differences in performance between incident firms and other peers in their industry (where CIO was not in the TMT). Accordingly, we first regressed each of the eight performance ratios for the following year on prior year's performance ratios (as shown in Model A below). Thereafter, as shown in the Model B, we introduced the binary variable in the first model (coded 1 for incident and 0 for the control group). The two models can be represented as:

$$PM_t = \beta_0 + \beta_1 PM_{(t-1)} \quad (\text{Model A})$$

$$PM_t = \alpha_0 + \alpha_1 PM_{(t-1)} + \alpha_2 B \quad (\text{Model B})$$

Where, PM is one of the nine performance measures, t is the time period in years; β_0 and α_0 are the intercepts; β_1 , α_1 , and α_2 are the regression coefficients; and B is the binary variable. The significance of the regression coefficient of the binary variable will indicate whether incident firms had a significantly different performance than the control group.

Results

We examined the financial and market performance of incident firms and corresponding control group for three years (2002-2004). Table 2 (a-c) shows the results of the matched sample analysis with four digit corresponding SIC codes as benchmarks and Table 3 (a-c) presents the results of the regression analyses. We report the t-statistic from the t-test and the Z-statistic from the Wilcoxon test in the Table 2(a-c). Following the conventions (as in Santhanam & Hartono, 2003) the test statistic is negative when the performance measure of the leader group is better than the

control group. Hence, a negative and significant profit ratio, and a positive and significant cost ratio would indicate firms with CIOs in the named executive officers group did better than the control firms.

As indicated in Table 2 (a-c), our analysis found the following: Incident firms significantly outperformed the control group in terms of both profit and cost ratios for the years 2002, 2003 and 2004 as indicated by the non-parametric test results. The results of t-tests also align mostly with those of the non-parametric tests. Most t-test results were consistent with the expectations as seen by the sign – a few were insignificant in 2003 and 2004. It should be noted that ROS was higher across all the years while other performance measures were insignificant, especially in 2003. Together, the results provide support for hypothesis H1. The market value (as measured by Tobin’s q) did not significantly differ between incident and control firms for 2002 and 2003, but was found to be significant for 2004. Therefore, hypothesis H2 did not find strong support.

The results of the analysis of the adjusting for the prior year performance effect are shown in the Table 3(a-c). Changes in R square value represents whether the model was significant or not and the regression coefficients show whether the prior year’s performance or the dummy variable (incident or the control firm) was found to be significant or not. The results were similar to the matched sample analysis as discussed above. We find that dummy variable had significant negative coefficient for most variables across the years, and insignificant for few variables. Therefore, after adjusting for prior performance, our incident firms outperformed their control group, especially in ROS (profit ratio) and COG/S (cost ratio) across all the three years.

| Table 2a. Comparison of Financial Performance (2002) | | | | | | |
|---|----------|-----|-------|--------|----------|-----------|
| | | N | Mean | Median | T | Z |
| ROS | Incident | 205 | -0.07 | 0.02 | -4.04*** | -9.64*** |
| | Control | 205 | -2.35 | -0.10 | | |
| ROA | Incident | 205 | -0.05 | 0.01 | -6.32*** | -10.08*** |
| | Control | 205 | -1.26 | -0.23 | | |
| OI/A | Incident | 204 | 0.07 | 0.08 | -6.29*** | -10.26*** |
| | Control | 204 | -0.98 | 0.0014 | | |
| OI/S | Incident | 204 | 0.11 | 0.09 | -4.14*** | -9.10*** |
| | Control | 204 | -1.67 | 0.01 | | |
| OI/E | Incident | 204 | 31.96 | 19.07 | 1.58 | -5.55*** |
| | Control | 204 | 17.81 | 6.59 | | |
| COG/S | Incident | 205 | 0.64 | 0.66 | 3.27*** | 5.99*** |
| | Control | 205 | 1.67 | 0.76 | | |
| SGA/S | Incident | 175 | 0.29 | 0.26 | 5.31*** | 8.41*** |
| | Control | 175 | 1.18 | 0.30 | | |
| Tobin’s q | Incident | 162 | 1.24 | 0.87 | 4.29*** | 5.10*** |
| | Control | 162 | 2.38 | 2.38 | | |

| Table 2b. Comparison of Financial Performance (2003) | | | | | | |
|---|----------|-----|-------|---------|----------|----------|
| | | N | Mean | Median | T | Z |
| ROS | Incident | 205 | 0.007 | 0.02 | -5.36*** | -8.71*** |
| | Control | 205 | -2.18 | -0.0481 | | |

| | | | | | | |
|-----------|----------|-----|-------|--------|----------|----------|
| ROA | Incident | 205 | -0.01 | 0.012 | -1.11 | -9.01*** |
| | Control | 205 | -4.36 | -0.08 | | |
| OI/A | Incident | 205 | 0.08 | 0.08 | -1.59 | -9.19*** |
| | Control | 205 | -0.96 | 0.01 | | |
| OI/S | Incident | 202 | 0.13 | 0.09 | -5.32*** | -8.86*** |
| | Control | 202 | -1.73 | -0.003 | | |
| OI/E | Incident | 201 | 37.58 | 21.61 | -1.66* | -5.01*** |
| | Control | 201 | 27.31 | 9.54 | | |
| COG/S | Incident | 205 | 0.62 | 0.65 | 4.33*** | 4.49*** |
| | Control | 205 | 1.96 | 0.723 | | |
| SGA/S | Incident | 176 | 0.29 | 0.25 | 3.36*** | 8.47*** |
| | Control | 176 | 1.13 | 0.34 | | |
| Tobin's q | Incident | 141 | 1.74 | 1.27 | 0.18 | 2.60 |
| | Control | 141 | 1.99 | 1.56 | | |

Table 2c. Comparison of Financial Performance (2004)

| | | N | Mean | Median | t | Z |
|-----------|----------|-----|--------|--------|----------|----------|
| ROS | Incident | 191 | 0.20 | 0.04 | -1.89* | -6.78*** |
| | Control | 191 | -0.99 | 0.008 | | |
| ROA | Incident | 192 | 0.01 | 0.04 | -2.47** | -6.62*** |
| | Control | 192 | -0.03 | 0.007 | | |
| OI/A | Incident | 192 | 0.09 | 0.11 | -3.66*** | -6.06*** |
| | Control | 192 | 0.05 | 0.07 | | |
| OI/S | Incident | 191 | 0.12 | 0.12 | -1.41 | -6.15*** |
| | Control | 191 | -0.69 | 0.07 | | |
| OI/E | Incident | 188 | 301.26 | 29.37 | -0.99 | -2.11** |
| | Control | 188 | 46.12 | 17.99 | | |
| COG/S | Incident | 191 | 0.60 | 0.65 | 1.32 | 2.41** |
| | Control | 191 | 0.95 | 0.64 | | |
| SGA/S | Incident | 167 | 0.32 | 0.24 | 1.29 | 4.88*** |
| | Control | 167 | 0.87 | 0.31 | | |
| Tobin's q | Incident | 192 | 1.56 | 0.97 | 3.93*** | 3.42*** |
| | Control | 192 | 1.09 | 1.12 | | |

Note:

ROS: Return on Sales; ROA: Return on Assets; OI/A: Operating Income to assets; OI/S: Operating Income to Sales; OI/E: Operating Income to Employees; COG/S: Cost of Good Sold to Sales; SGA/S: Selling & General Administrative Expenses to Sales

Significant at the 10%; ** 5% and *** 1% level.

| (Year 2002) | Model | N | R-Square Change | 2001 Financial Performance | Dummy ^a |
|-------------|-------|-----|-----------------|----------------------------|--------------------|
| ROS | 1 | 414 | 0.04*** | 0.21*** | |
| | 2 | 414 | 0.02*** | 0.17*** | 0.16*** |
| ROA | 1 | 414 | 0.15*** | 0.39*** | |
| | 2 | 414 | 0.05*** | 0.35*** | 0.23*** |
| OI/A | 1 | 408 | 0.12*** | 0.35*** | |
| | 2 | 408 | 0.05*** | 0.31*** | 0.24*** |
| OI/S | 1 | 408 | 0.03*** | 0.16*** | |
| | 2 | 408 | 0.03*** | 0.12** | 0.178*** |
| OI/E | 1 | 402 | 0.49*** | 0.70*** | |
| | 2 | 402 | 0.00 | 0.70*** | -0.004 |
| COG/S | 1 | 414 | 0.02*** | 0.13*** | |
| | 2 | 414 | 0.02*** | 0.09** | -0.14*** |
| SGA/S | 1 | 342 | 0.02*** | 0.15*** | |
| | 2 | 342 | 0.06*** | 0.10** | -0.26*** |
| Tobin's q | 1 | 322 | 0.51*** | 0.72*** | |
| | 2 | 322 | 0.007** | 0.69*** | -0.08** |

| (Year 2003) | Model | N | R-Square Change | 2002 Financial Performance | Dummy ^a |
|-------------|-------|-----|-----------------|----------------------------|--------------------|
| ROS | 1 | 414 | 0.050*** | 0.224*** | |
| | 2 | 414 | 0.047*** | 0.181*** | 0.22*** |
| ROA | 1 | 414 | 0.001 | 0.030 | |
| | 2 | 414 | 0.002 | 0.015 | 0.05 |
| OI/A | 1 | 408 | 0.003 | 0.057 | |
| | 2 | 408 | 0.004 | 0.037 | 0.07 |
| OI/S | 1 | 408 | 0.048*** | 0.219*** | |
| | 2 | 408 | 0.047*** | 0.174*** | 0.22*** |
| OI/E | 1 | 402 | 0.693*** | 0.832*** | |
| | 2 | 402 | 0.000 | 0.831*** | 0.01 |
| COG/S | 1 | 414 | 0.033*** | 0.181*** | |
| | 2 | 414 | 0.034*** | 0.151*** | -0.18*** |
| SGA/S | 1 | 348 | 0.055*** | 0.235*** | |
| | 2 | 348 | 0.014** | 0.202*** | -0.12** |
| Tobin's q | 1 | 280 | 0.385*** | 0.620*** | |
| | 2 | 280 | 0.001 | 0.627*** | 0.03 |

| Table 3c. Regression Analysis (Dependant Variables are for Year 2004) | | | | | |
|---|-------|-----|-----------------|----------------------------|--------------------|
| (Year 2004) | Model | N | R-Square Change | 2003 Financial Performance | Dummy ^a |
| ROS | 1 | 334 | 0.05*** | 0.21*** | |
| | 2 | 334 | 0.01** | 0.20*** | 0.12** |
| ROA | 1 | 334 | 0.35*** | 0.59*** | |
| | 2 | 334 | 0.005 | 0.58*** | 0.07 |
| OI/A | 1 | 334 | 0.43*** | 0.66*** | |
| | 2 | 334 | 0.001 | 0.65*** | 0.03 |
| OI/S | 1 | 332 | 0.003 | 0.05 | |
| | 2 | 332 | 0.001 | 0.05 | 0.03 |
| OI/E | 1 | 327 | 0.47*** | 0.68*** | |
| | 2 | 327 | 0.003 | 0.68 | 0.06 |
| COG/S | 1 | 333 | 0.001 | 0.03 | |
| | 2 | 333 | 0.02 | 0.01 | -0.15*** |
| SGA/S | 1 | 306 | 0.01 | 0.09 | |
| | 2 | 306 | 0.000 | 0.09 | 0.01 |
| Tobin's q | 1 | 333 | 0.59*** | 0.77*** | |
| | 2 | 333 | 0.001 | 0.78*** | -0.02 |

Model 1: (Year t Performance) = f(Year (t-1) Performance)

Model 2: (Year t Performance) = f(Year (t-1) Performance), dummy variable: 1 = Incident firm, 0 = control firm)

^aModel 1 has no dummy variable and hence has no coefficient

* Significant at the 10%; ** 5% and *** 1% level.

Discussion

The aim of this study was to examine the association between IS leadership and firm performance. We identified all the firms that had placed their CIOs in the exclusive top management team ('named executive officers') in the year 2002 and assessed if these firms that included CIOs in their TMTs differed in business performance from the other firms that had not accorded a similar status to their CIOs.. We measured firm performance through cost and profit ratios (financial performance) and Tobin's q (firm value).

Resource-based view and dynamic capability perspectives suggest leadership capability to be key determinant of firm performance. Upper echelons theory places TMT heterogeneity to be a key ingredient in organizational success, and we argue that CIO inclusion in TMT greatly enhances the heterogeneity, thus contributing to firm performance. Consistent with these views, we found incident firms with CIOs in the TMT to perform better than the control group firms with respect to certain profit and cost ratios. This was found to be true even after adjusting for the prior performance. The empirical results support our arguments for significant association between high CIO status and financial performance. Our results clearly indicate that firms according higher status to their CIOs and including them in the TMT exhibit better financial performance than others who do not. However, we did not find strong support for Hypothesis 2 across all the years. Incident firms did not have significantly more market value compared to average market value of firms in control group for years 2002 and 2004 but they had superior market value in year 2003. One possible explanation for the lack of support for market value comparison could be partly attributed to turbulent stock market in the years of examination. Further, inclusion of CIOs in senior executive team may not necessarily increase market value as market to book value is sensitive to changes in market value as well as how assets are appreciated to book value.

Implications, Limitations and Future Research

This study has a few important implications for practitioners. Our study clearly demonstrates the importance of IT leadership to firm performance. Inclusion of CIOs in the TMT and according them a higher status in the organizational hierarchy are likely to result in higher financial performance. Our results indicate firms with high-status CIOs to significantly outperform others. Senior executives need to recognize the importance of including CIOs in the TMT so that the IS voice is heard at the upper-most echelons of the organization. Moreover, inclusion of CIOs would create a more heterogeneous and diverse leadership team to run the organization.

This study examined the relationship between IT leadership and firm performance by assessing the performance differences between firms that included CIOs in their TMT and others who did not. We inferred CIO status through their inclusion in the 'named executive officer' group. Although we have attempted to analyze firm performance using a variety of metrics, this study is based on just one-year (2002) data of CIOs and three years of performance. A fruitful extension of our work could undertake a more longitudinal analysis. Apart from using accounting-metrics, we also used market measures (Tobin's q). There are several other alternate measures of firm performance and future studies could employ them as well. In addition, we have not examined how IT leadership affects a host of organizational variables, ultimately affecting firm performance. This is another future research area to explore.

Though the importance of IT leadership has been recognized, there is very limited effort to link IT leadership with firm performance. Our study bridges this important gap and provides a stepping stone for further investigation between IT leadership and organizational performance. This study is one of the first studies investigating this important topic. More research is required to understand how IS leadership contributes to IT-business capabilities and further firm performance. Hence, a cumulative body of research in this area will go a long way in establishing the importance of CIOs and IT leadership.

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