Do Powerful Technology Leaders Make a Difference in Firm Performance?

Joseph Taylor  
Washington State University  
joseph.d.taylor@wsu.edu

Arvin Sahym  
Washington State University  
arvin@wsu.edu

Joseph Vithayathil  
Washington State University  
joseph.vithayathil@wsu.edu

Abstract

Technology is taking an increasingly prominent role in firm strategy and investments, yet there is a high degree of variability of returns in technology based expenditures. Fragmented technology investments can lead to reduced firm flexibility and higher operating costs over time. Coordinated technology planning and effective IT governance can manage tradeoffs between short term and long term benefits. Given that costs and benefits of IT are evaluated by the upper echelons of management, this study examines how does the inclusion of a technology leader (e.g., CIO or CTO) in the top management team influence firm performance. This paper uses upper echelon theory to examine the influence of a powerful technology officer on technology investments and subsequent performance. This paper finds that firms with a powerful senior technical leader perform better on forward oriented dimensions of value such as sales growth and Tobin’s q compared to firms without this executive.

1. Introduction

1.1 Introduction

The relationship between technology investments and firm performance has long been debated by both practitioners and scholars. Solow famously pointed out that the “computer age (was) everywhere but in the productivity statistics.” [1]and Carr [2] argued that there is no strategic advantage to technology investments. Others, such as Brynjolfsson [3]and Aral [4] have found excess returns to technology investment. However within the returns of technology investments they observed high levels of variability. Despite debates regarding their efficacy, investments in technology have become the single largest targets for capital expenditures [5]. However, despite the large investments that are being made, significant variation continues to exist in the benefits that accrue from technology investments [6]. Empirical and qualitative studies have found inconsistent results in firms achieving the expected benefits of technology projects [7]. The presence of technology leader in the upper echelon of firm management could be a key factor which affects this variability, however, research has yet to focus on this factor.

Powerful leaders can exercise broad authority in executing on their strategic vision. This paper explores the impact of placing a technology executive in one of a firm’s highest paid executive positions. It seeks to explore the questions, “Does the presence of a powerful technology executive make a difference in firm performance?” and “For which managerial key performance indicators is the inclusion of a technology leader in the upper echelon of management advantageous?”

1.2 Prior Literature

Prior research has examined the effects of CEO and the top management team characteristics on firm performance [8] [9] [10]; and similarly scholars have discussed the effect of relationships between senior technology leaders and the CEO [11] [12]. Preston et al demonstrated the varying levels of strategic authority of CIOs effects IT contributions to firm performance, although their analysis was based on self-reported perceptions of IT contributions, as opposed to analysis of standard firm performance metrics. [13] While many papers have addressed the interaction between senior technology leaders and the top management team, the literature has yet to focus on the effects of including the CIO/ CTO in the dominant coalition of firm. Their presence in the dominant coalition is important because it is associated with their managerial discretion and their ability to influence long-term performance [14].

De Haes and Van Grembergen have examined the role of top management teams and executive oversight as a mechanism of IT governance, highlighting the role of executive committees in providing effective oversight to IT investments. [15] Schwarz and Hirchheim examined the role of IT governance in managing a firms perceptions of IT performance, however success metrics across firms were not compared. [16] There are many scholarly and practitioner models that have been developed for evaluating the effectiveness of IT governance.
procedures and oversight, such as Ross and Weill, [17], however there has been limited quantitative analysis of the impact of specific IT governance actions on the performance of firms over time. Prior research has demonstrated that effective governance and oversight of IT investments is of value to firms. This research extends existing IT governance research by examining how one aspect of IT governance, the representation of a technology leader within the firms top management team, affects firm performance over time.

The findings of the analysis indicate that having a technology leader represented in the top management team is associated with higher levels of sales, and higher values of Tobin’s q. This paper will presented as follows. First, we will provide an overview of theoretical influence of managers represented within a firms top management team and develop our hypotheses. Next, we will present our analysis methodology and results. In conclusion we will present our results and discussion.

2. Theoretical Background

2.1 Upper Echelon Theory

Upper echelon theory (UET) proposes that the knowledge, experience and characteristics of senior management correspond with firm performance. [9] The theory asserts that composition, relationships and backgrounds of top management teams can influence firm performance. The background of the upper echelons of management have been found to influence firm strategies and subsequent performance. [18] [14] As previous experience, education and influence have been demonstrated to influence firm behavior in international growth and alliances, the experience of top management teams with technology may also influence the ways in which technology strategies are adopted and adhered to. Having an influential member of the top management team provide accurate interpretations of the key tenants of the technology strategy in evolving technical domains could enable faithful adherence to the strategies intent.

Upper Echelon theory associates compensation with the propensity to undertake strategic change. [19] Compensation has been identified as key moderator in understanding upper echelon behavior. [8] Given the high degree of variation seen in technology investments, major change initiatives in technology are inherently risky and wide variation in performance has been reported. [7] The inclusion of a technology leader as one of the highest compensated members of the top management team may provide impetus for greater engagement in strategic decision making. While the importance of compensation is generally recognized as key indicator in shaping strategies, the interaction of compensation with the individual executive’s personal attributes has also been shown to influence a firm’s strategic choices. [20] Having a senior technology leader ranked among the highest paid executives in the firm may allow for the leader to exercise greater discretionary control over strategic technology change thereby reducing variation in results. Upper Echelon theory proposes that these effects of senior leaders will be strongest in circumstances where senior leadership operates with the most discretion, [21] given the high degree of interpretation in technology projects [22] the application of UET within the technology domain can provide additional insights into the contexts, and constraints, appropriate to the theory.

2.2. Technology related conceptualization of UET

A defined information technology strategy can enable a firm to better provide flexibility within its environment to adapt to new technologies. [23] However, faithfully adhering to a technology strategy can require significant influence on the part of senior technology executives with other leaders in the firm. [24] While some practitioners and scholars, such as Ross and Weill, have argued that business leaders should take more responsibility for technology decision making [25], the rapid evolution of new technology platforms may require the contextual evaluation of experienced technology talent. For transformational investments utilizing emerging technology platforms, some firms make poor decisions implementing systems. Implementing technology tools that are poorly understood and not suited to challenges that the firm is facing can have negative consequences to the firm. If business units inconsistently implement new technologies without central planning and coordination the total cost of ownership of the underlying technology can exceed the business value created. If not guided by competent evaluation of new technology, business leaders may be prone to, as Swanson and Ramiller describe [26], “me too” technology investments that do not generate firm value. Business unit leaders making technology investments often have limited awareness of the risks of poor technology lifecycle planning, and little short term incentive to make decisions that maximize long term flexibility. However, centralized, coordinated planning can
allow for better control of expenses and flexibility through technology transitions. [27] Technology decision making is complex. In addition to decisions around price, performance and availability of technology tools, decisions must be made about many other aspects of the technical implementation, such as hardware, software integrations, development platforms and building versus buying capabilities. [28] Within the complexity of decision making significant management discretion is introduced. Even if business leaders across a firm share a high degree of alignment on the overarching goals of a technology investment, the prioritization of required capabilities, and the implications of competing technology platforms may require the evaluation of experienced technical leadership. This relatively large degree of management discretion makes technology leadership decision making particularly suited to the constructs of upper echelon theory.

3. Hypotheses

The number of senior technology executives represented in the highest compensated executives at a firm has greatly increased over the 21 year time period included in the analysis. (See figure 1) The number of firms with a senior technology leaders represented in the highest paid executives reached a high of 293 out of a total firm count of 1,436 in 2007 (20.4%) before dropping down to 201 companies with senior technology executives among 1,102 companies (18.2%). Given the rise in representation of technology leaders in the upper echelons of firm management, greater research is required to understand the expected benefits that can be achieved through strong technology leaders.

![Figure 1: Percentage of Firms with Technology Leader with Highest Compensated Executives](image)

Merely having a senior technology leader named within a firm would not necessarily indicate that this leader had sufficient organizational power to optimize decision making in times of uncertainty and strategic change. Without the financial compensation to justify an executive title or a reporting relationship the influence of the technology leader may be minimized. Other studies have demonstrated that compensation is associated with influence. [8] The relatively abstract nature of technology work can allow significant latitude for interpretation between system developers and system users. [22] As technology executives are faced with these high levels of interpretation and discretion, significant influence may be required to maintain adherence to the central vision. The existence of an influential senior technology leader may allow a firm to better adhere to the underlying intentions of its defined technology strategies.

Given the relative size of technology investments, the variable success rate of technology projects and the complexity of the rapidly changing technology landscape, adhering to a centrally planned technology strategy can be politically and managerially challenging. Effectively managing the political and managerial implications of technology strategy adherence requires a leader with the influence, and the access, to engage in major decision making within the firm. The representation of a technology leader within the dominant coalition of the firm is hypothesized to enable greater influence on other powerful leaders in the organization, providing greater benefits than interactions that are focused only between the firm’s technology leader and the CEO.

Studies have examined the role of CIO reporting structure on performance and found strategic benefits to CIO visibility with senior management teams, [29] however mere inclusion in the reporting structure may not necessarily indicate decision making discretion on the part of the technology leader. Executives in organizations with the highest compensation can have greater decision making authority, and greater influence with peers. [30]

A defined information technology strategy can enable a firm to better provide flexibility within its environment to adapt to new technologies. [23] Representation of a senior technology executive as one of the highest compensated leaders within the organization should provide the technology leader with greater latitude in influencing the organization to adopt the changes required to make systems implementations successful. The ability to drive complex decision making in the organization requires significant organizational influence. [31] Technology leaders in companies may be found in a variety of reporting structures. [29] However the existence of a titled technology leader in the firm may not be indicative of that leader have the organizational influence necessary to support decision making optimized for long term needs.
According to the precepts of UET, high levels of compensation relative to peers should allow a technology leader greater latitude in pursuing strategic change. [19]

While the financial costs of near term technology investments are relatively easy to quantify, the potential benefits that a firm achieves by investing in technology flexibility are harder to measure. Technology flexibility also may allow firms to be more agile in adopting new technology platforms as existing technology investments become legacy. [32] If managers represented in the upper echelon operate with additional discretion due to the complexity of technology based decision making, Upper Echelon theory would suggest having technology expertise represented in senior management should be associated with better firm performance as the magnitude of firm technology investments increase.

Although technology lifecycle management is critical to ongoing expense control, technology lifecycle management requires making technology investments that often provide minimal tangible short term benefits to business functions. Often lifecycle investments compete for resources technology projects requested by line business leaders. Ineffective technology lifecycle management can lead to escalation of sales and general administration costs. [33] If informed technology decision makers guide management decisions, over time it is hypothesized that the firm would demonstrate better performance in expense management. UET would predict that influential technology leaders who are highly compensated members of the top management team would be more successful in having the latitude necessary to pursue technology lifecycle projects.

If senior technology leaders have the latitude to pursue transformational projects, the influence with their peers to encourage technology adoption, and the authority to pursue cost reducing technology lifecycle projects lower selling, general and administrative (SG&A) costs should result.

Technology investments may take a year or more to deliver, and often benefits to the business will not be full achieved until sometime thereafter. Additionally the benefits that are achieved through technology investments that provide firm flexibility may take even longer to materialize. [34] In order to capture the time lag between the technology investments and firm performance, in this analysis a lag of 3 years or 5 years is considered from the year a technology leader is included in the upper echelons of management.

Hypothesis 1: Firms that have technology leaders represented in upper echelons of management will see decreased SG&A spending as a percentage of sales than firms that do not 3-5 years in the future

An influential technology leader could also enable a firm to more rapidly identify and exploit new technology opportunities. [32] New technology developments can create opportunities for a firm that are consistent with their overarching technology vision. However, the “sensing” and “seizing” of the new opportunities afforded by emerging technologies may be enhanced by executives with technology background. [35] If a technology leader is included as a member of the upper echelon greater opportunities for technology exploitation may be identified and implemented.

According the UET, managers with greater levels of discretion will have a greater level of impact on firm performance. [21] According to the theory, technology leaders operating within the upper echelons of management with greater compensation should be afforded the latitude to pursue strategic initiatives. [19] The engagement of the technology leader with peers in the top management team should be positively associated with the business value created by technology investments. As the senior technology leader exercises greater influence in the organization, the firm may be positioned to better capitalize on emerging technology trends. [23] If a firm is better able to adjust to new technologies and bring better products and services to market improved sales should result.

Hypothesis 2: Firms that have technology leaders represented in upper echelons of management will see increased ROA performance compared to firms do not 3-5 years in the future

As new technologies enter a firm’s ecosystem the existing technology platforms within a firm are often not flexible enough to operate in the new, more efficient, technology environment. Outdated technologies upon which a firm is required to rely are often labeled “legacy.” [27] Effective technology leaders must plan for, and effectively lifecycle technology or legacy technologies can result in compounding operational expenditures, and limited firm flexibility. [36] It is hypothesized that having a senior technology executive represented within the top management team could allow the firm to develop more flexible technology platforms, enabling
the firm to better adapt to changes in the business environment over time.

Similarly, technology leader representation in the top management team could enable better leverage of technology investments, and improve market assessment of firm performance over time. Utilization of both the tangible and intangible technology investments and resources would be reflected in the long-term returns which is hypothesized to be reflected in the market evaluation of the firm. Tobin’s q captures how an effective upper echelon can create superior economic value from a given quantity of tangible and intangible assets. This is a forward-looking measure that captures the “value of a firm as a whole rather than as the sum of its parts and implicitly includes the expected value of a firm’s future cash flows, which are capitalized in the market value of a firm’s assets (i.e., the combined market value of a firm’s debt and equity).” [37]

This is a particularly appropriate measure in our context as the investors, who ultimately determine the market value of a firm in the calculation of Tobin’s Q, are increasingly focused on top management structure and characteristics as the drivers of long-term value. Tobin’s q has been used as a measurement for evaluating firm performance in the adoption of new technology. [38]

Hypothesis 4: The representation of a technology leader in the upper echelons of management will be positively correlated with a firm’s Tobin’s q 3-5 years in the future

4. Methodology

The time horizon of the analysis for this study is from 1992-2013. Data from all industries is included and captured by fiscal year. If a firm did not have all data fields available for the year the firm was dropped from the analysis. Data has been analyzed using hierarchical regression. In total just under 250,000 company-year combinations are included in the analysis.

4.1. Independent variables

Technology leader inclusion in the management upper echelon. Data from 1992-2013 was collected from the COMPUSTAT EXECOMP database. All executives whose title included the word “information” or “technology” were classified as senior technology executives. While distinctions do exist between Chief Information Officer and Chief Technology Officer roles, for the purposes of this evaluation both roles were considered technology leaders and were consolidated together. Chief Digital Officers were also considered, however in the data no Chief Digital Officer had been in represented in the EXECOMP database the minimum of 3 years necessary to be included in the analysis. This variable was coded as “0” if there were no executives listed who included the word “information” or “technology” in their title, or “1” if either term were used in the executive’s title. For comparison purposes data was also collected on the representation of other functional leaders from the same data set. Leaders whose titles included the word “marketing” or “sales” were coded as marketing leaders, and leaders whose titles included the word “operations” were coded as operations leaders. Executive compensation is typically only reported for the CEO, CFO and additional three highest compensated executives of the company. [39] For the purposes of this analysis only those technology leaders whose compensation met the SEC guidelines that are outlined in the regulatory filing procedures were included. This method of analysis does not include many technology leaders who participate in top management teams, only technology executives who are among the highest compensated leaders within their organizations. UET would predict that such technology leaders would have the greatest amount of influence based on the moderating impact of compensation. [8] Companies were flagged as either having a technology leader represented in the upper echelon of management, or not having a technology leader represented in the upper echelon of management for each fiscal year included in the study.

4.2. Dependent Variables

Selling, General and Administrative Expenses post 3 years, post 5 years. Selling, general and administrative expenses were collected from COMPUSTAT North America database. Financial results from 1992-2013 were collected from all firms included in the database. Data were normalized across companies by dividing expenses by revenue.
From the COMPUSTAT North America data set the variable for total SG&A, or “xsga” was utilized, and divided by the variable for revenue, or “sales” in the COMPUSTAT data set. The formula used for the normalization was (xsga / sales). SG&A performance for firms without a senior technology leaders represented in the EXECUCOMP data set 3 years prior and 5 years prior to the financial years under consideration were compared to the mean normalized SG&A performance with senior technology leaders represented in the EXECUCOMP data set in the relevant years prior to the financial year under consideration. In other words, if a senior technology executive for firm “A” was in place in 1992, the 3 year financial results analyzed data on SG&A performance in 1995 for firm “A”. For the “SG&A performance over 5 years” the financial results analyzed data on SG&A performance in 1997 for firm “A”.

Return on assets, post 3 years, post 5 years. Asset and profitability data were collected from COMPUSTAT North America database. Financial results from 1992-2013 were collected from all firms included in the database. ROA was calculated by dividing the operating income of the firm for the fiscal year, labeled NI within COMPUSTAT by the total assets of the firm, labeled AT within COMPUSTAT. The same 3 or 5 year lag on reported results utilized for SG&A was used to define the sale data.

Sales post 3 years, post 5 years. Sales data were collected from COMPUSTAT North America database. Financial results from 1992-2013 were collected from all firms included in the database. The same 3 or 5 year lag on reported results utilized for SG&A was used to define the sale data.

Tobin’s q post 3 years, post 5 years. Market valuation and total asset value data were collected from COMPUSTAT North America database. Tobin’s q calculation was completed by dividing market valuation (mkvalt) by the total asset valuation (at) (mkvalt/at). Financial results from 1992-2012 were collected from all firms included in the database. The same 3 or 5 year lag on reported results utilized for SG&A was used to define the sale data.

4.3. Control Variables

Industry. Industry has been found to be a significant predictor of firm performance. This research controls for industry by utilizing Fama-French’s industry classification system. [40]

Competitive intensity. The concept of competitive intensity has been developed in the research, examining the degree to which firms in a given industry practice aggressive competitive activities. [41] For this analysis I have utilized the measure of competitiveness developed by textual analysis of 10k submissions. [42] The competitive intensity framework utilized provides a level of competitive intensity based on Fama-French industry classifications. For firms in industries with a high degree of competitive intensity the ability to rapidly adjust to market conditions provides enhanced benefits. [43] However, even in competitive industries some technical domains are better managed through standard technology solutions. [44]

Assets, Employees. In order to isolate variation that may be the result of firm size total assets and total number of employees are also controlled for. The COMPUSTAT value of AT was used to represent total assets, and the value of EMP was used to represent employees.

Year. Significant variation in firm performance can be attributed to economic cycles. In order to isolate the effects of technology leaders a fixed effect of year is included.

Firm. Significant variation in performance can be attributed to firm specific attributes. In order to isolate the effects of technology leaders a fixed effect of firm is included based off of the gvkey provided to each firm within COMPUSTAT.

5. Results

A linear regression model was used to examine the hypothesized effects. The 3 year and the 5 year effects for each of the four dependent variables were considered separately, while controlling for year, firm, assets, employees, industry and competitive intensity. Figure 1 summaries the variable coefficients, standard error and significance. Given the size of the data set, listwise deletion was utilized in the event of missing data points for firm and year combinations.

Hypothesis 1 proposed that firms with a technology leader in upper echelons of management would have lower SG&A as a percentage of revenue that firms that did not have a technology leader represented in it upper echelons of management. No significant association was found between technology leader representation in the top management team and SG&A performance, and in the 3 year or the 5 year time horizon. Hypothesis 1 is not supported.
Hypothesis 2 proposed that firms with a technology leader in the upper echelons of management would have a higher ROA than firms that did not have a technology leader represented in the upper echelons of management. Hypothesis 2 is not supported, as firms with a technology leader represented within its highest paid executives did not have significantly higher ROA than firms that did not have a technology leader represented in the same management group.

Hypotheses 1 and 2 both relate to better management of a firm’s costs or asset base. The non-significant results may indicate that the higher levels of strategic influence afforded a technology leader through participation in the top management team does not meaningfully contribute to the delivery of cost reduction strategies.

Hypothesis 3 proposed that firms with a technology leader in the upper echelons of management would have greater sales than firms that did not have a technology leader represented in the upper echelons of management. Hypothesis 3 is supported, as firms with a technology leader represented within its highest paid executives had significantly higher sales growth than firms that did not have a technology leader represented in the same management group.

Hypothesis 4 proposed firms with a technology leader in the upper echelons of management would have a greater impact on firm performance as measured by Tobin’s q than firms that did not have a technology leader represented in the upper echelons of management. Hypotheses 4 is not supported over a 3 year period, however over a 5 year period Tobin’s q was significantly higher for firms that had a technology leader represented within the firm’s highest paid executives. Hypothesis 3 and 4 both relate to future growth of a firm. The significant results may indicate that when technology is used as a strategic asset to enhance future firm value, the higher levels of strategic influence afforded a technology leader through participation in the top management team does meaningfully contribute to the delivery of the technology strategy.

5.1. Robustness Checks

In order to evaluate the robustness of the model we applied the same analysis to evaluating the performance of firms with other functional leaders represented in the top management team. The same model was used to evaluate the significance of a technology leader on each of the dependent variables, as well as the significance of the effect of a marketing or operations leader. Leaders with the term “marketing” or “sales” in their job titles were coded as having a marketing leader represented in the top management team, leaders with the term “operations” in their job titles were coded as “operations” leaders. Table 1 provides a comparison of the regression coefficients. The results demonstrate that the model can be applied to other functional domains.

Future work will include enhanced analysis of statistical robustness.

Table 1: Comparison of Regression Coefficients for Technology, Operations and Marketing Roles with the Highest Compensated Firm Executives

<table>
<thead>
<tr>
<th></th>
<th>Tech</th>
<th>Ops</th>
<th>Marketing</th>
</tr>
</thead>
<tbody>
<tr>
<td>3ySGA</td>
<td>.000</td>
<td>.025</td>
<td>0.070**</td>
</tr>
<tr>
<td>5ySGA</td>
<td>.016</td>
<td>.018</td>
<td>0.095**</td>
</tr>
<tr>
<td>3yROA</td>
<td>-.001</td>
<td>-.021***</td>
<td>-.023</td>
</tr>
<tr>
<td>5yROA</td>
<td>.002</td>
<td>-.034***</td>
<td>.004</td>
</tr>
<tr>
<td>3ySales</td>
<td>769.362**</td>
<td>-355.601*</td>
<td>771.630***</td>
</tr>
<tr>
<td>5ySales</td>
<td>1053.678**</td>
<td>-397.954</td>
<td>741.236**</td>
</tr>
<tr>
<td>3yTobinsq</td>
<td>.033</td>
<td>.079**</td>
<td>.237***</td>
</tr>
<tr>
<td>5yTobinsq</td>
<td>.086*</td>
<td>.153***</td>
<td>.325***</td>
</tr>
</tbody>
</table>

*<p<.05  **<p<.01  ***<p<.001
When applying the model of hypothesis 2 firms that included an Operations leader within its highest paid executives there were significantly lower ROA over both the 3 year and 5 year evaluation periods. This contrasts with the impact of technology leaders on ROA was effectively flat, although non-significant. Marketing representation within the highest paid executives in a firm also did not have a significant impact on ROA over either the 3 year, or 5 year period.

When applying the model of hypothesis 3 firms that included an Operations leader within its highest paid executives and comparing against firms that did not have an operations leader included among the firm’s highest paid executives. Firm’s with operations leaders did have significantly higher sales over 3 years, but did not over 5 years both the 3 year and 5 year evaluation periods. However, the amount of sales growth delivered was somewhat smaller than the effect provided by having a technology leader in place. The inclusion of a marketing leader within the firm’s highest compensated executives was positively associated with sales growth over both 3 and 5 years.

When applying the model of hypothesis 4, firms that included an Operations leader within its highest paid executives there were significantly higher values for Tobin’s q over both the 3 year and 5 year evaluation periods. Marketing representation within the highest paid executives in a firm was also associated with a significantly higher values of Tobin’s q over both 3 and 5 years.

6. Discussion

As the amount of investment in technology continues to grow, the question of “Does a powerful technology leader make a difference?” becomes increasingly relevant.

Brynjolfsson’s work questioning the strategic value of IT highlights the commodization of technical capabilities, and the downward pressure on technology prices as reasons to avoid investments in technology leadership. [2] The results of this analysis could lend support to the assertion that for firms that invest in technology to reduce costs, or to improve asset management the inclusion of a powerful technology leader is not likely to improve results. Much attention has been paid to the evolving role of the CIO within firms. [45] [46] While some firms looks to technology as a means of controlling costs, other firms look to technology as a potential source of new business value. The results of this analysis would support the elevation of a firm’s technology leader to a place among the firm’s highest compensated executives if technology were viewed as a means of delivering sales growth and enhanced shareholder evaluation to the firm. The data in this analysis demonstrated that positive effect of a technology leader on sales was roughly equivalent to the positive effect of including a marketing leader within the firm’s highest compensated leadership team. However, if firm viewed technology as a means to better control costs, representation of a technology leader within the firm’s highest paid executives may not “matter.”

While cutting costs and increasing technology asset use can largely be accomplished through changes within a firm’s technology division, growing sales and shareholder value may require a technology leader to exert influence outside the traditional boundaries of IT. In circumstances where a firm looks to technology to deliver sales growth and enhance shareholder returns, representation of a technology leader among the firm’s highest paid executives may be an effective governance mechanism to enhance the likelihood of successful delivery of the firm’s technology strategy.

Between budgeting, approval, development, implementation and system usage there can be a long delay between time that strategic technology leader is put in place, and the time when a firm begins to see the benefits of technology investments in the firm’s financial reports. The larger coefficients on including a technology leader predicting sales in year 5 versus year 3, and the significantly higher values of Tobin’s q in year 5 versus year 3 may indicate that time horizons of greater than three years could be of value in evaluating technology performance.

6.1. Limitations and Future Research

The structure of this analysis greatly limits the number of senior technology leaders that are considered. The research model employed in this study does not include technology leaders who are not among the five highest paid executives within the firm, even though such executives may wield substantial influence in their respective organizations even without being among their firms five highest paid executives. Further analysis based on broader measures of technology leader’s influence may provide greater perspective of technology leaders’ contributions to firm performance.

The model assumes that having a senior technology leader represented within the upper echelons of management implies that a deliberate technology strategy exists. Although it is argued that it may be reasonably assumed that having a
technology leader among the five highest compensated executives at a firm would necessitate a technology strategy to exist, that assumption is not empirically demonstrated in this paper and could be a source of future research.

The model deployed in the approach is purely binary and provides no measurement of technology leader competency and motivations, which could contribute significantly to the firm performance measures included in the analysis. Further measures that evaluated the competency for technology leader performance explain additional variation of the variables considered. While this research identifies that the inclusion of a senior technology leader among the firms upper echelon of management is positively associated with firm success, it does identify the specific action that are associated with that success.

Further analysis into which aspects of the technology strategy are most closely associated with improving firm performance could provide greater insight into explaining variation among the value that firms achieve through the utilization of technology. Further analysis could also be completed to examine the attributes of technology leader competency. Broader understanding of the behaviors and attributes associated with technology leader success in the organization would be of value as firms continue to grow technology investments as a percentage of overall capital expenditures. The maturing of IT Governance within a firm may also moderate the relationship between technology leadership and firm performance. The relationship may also be moderated by the degree of globalization exhibited by a firm.

6.2. Contributions

Technology strategy is increasingly important as firms place greater emphasis on the strategic use of IT. However, despite the growth in technology spending, empirical testing of benefits of technology strategy are still poorly understood. This research provides another variable that can be predictive of variation in firm performance from technology investments described by Brynjolfsson, Aral and others. The research also could contribute to our understanding of the value of IT Governance as provided by technology leadership representation in the top management team. The development of an empirical predictor for measuring benefits to the firm through technology provides a foundation for future empirical model development.

The analysis of whether the concepts outlined by upper echelon theory extends to domain specific work activities contributes to the overall body of knowledge within upper echelon theory, as differing business domains may allow for differing levels of management discretion. UET is demonstrated to have some explanatory capability below the total firm level. For practitioners, this research indicates that if a firm intends to emphasize technology as a means to grow company output that the inclusion of a technology leader in the top management team could contribute to output growth.

7. Conclusions

Execution of a technology strategy requires, discipline, patience, governance and credibility. This research demonstrates that the inclusion of the technology leader in the top management team can enable better execution and governance of the firm’s technology strategy. Effective governance of technology investments is becoming an increasingly critical need for managing firm performance as the level of technology investments continues to increase. Understanding the enhanced role of leadership in achieving technology investment success represents a significant contribution to strategy development and implementation effectiveness. Upper echelon theory can provide a framework through which to better understand how leadership can positively affect the long term benefits available through technology investments. For firms looking for ways to grow sales, and improve company valuations, having a powerful technology leader does make a difference.

9. References