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THE IMPACT ON FIRM VALUE OF ANNOUNCEMENTS OF THE APPOINTMENT OF AN INFORMATION TECHNOLOGY OFFICER (CXO) TO THE C-SUITE

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Abstract

Technology-enabled disruptions have created challenges for firms in all industries and often originate from firms outside a firm's known competitors. Senior technology executives are often charged with leading the firm's response to these competitive threats, leveraging technology to drive innovation and create value. In recent years, senior technology leaders have emerged in the Top Management Teams (TMT), including the traditional roles of Chief Information Officer and Chief Technology Officer, and the emerging roles of Chief Data Officer, Chief Digital Officer, and Chief Innovation Officer, collectively referred to as CxOs.

Researchers have begun examining the impact of CxOs using event study methodology and comparative studies of firm performance against peer groups. This research examines the impact of the presence of a CxO on firm outcomes with an event study, using, for the first time, the Fama-French 5 Factor model to examine announcements of CxO appointments, and finds that the firm announcements of CxO appointments result in significantly negative abnormal returns. This research adds to the growing research on how firms create value across both traditional and emerging CxO roles, identifying the role, firm, and industry factors that influence value judgments and the subsequent market reactions to a firm's announcement of the appointment of a CxO. The firm announcement of a CxO appointment appears to be perceived as a sign of potential instability, and therefore a risk to the important business/technology integration of these important roles.

Keywords

Event Study, Technology Leadership, TMT, Fama-French 5 Factor Model

1. INTRODUCTION

Advances in technology have enabled new capabilities that challenge stable business models and create rapid disruptions across many industries (Downes & Nunes, 2013). The alignment of technology investments to support strategic business initiatives is an essential business competency, however successful integration of technology throughout a business is not routine. Organizations have tried many strategies to take advantage of the capabilities available from technological innovations, most notably creating C-Suite management roles, which some argue are essential roles for today's business environment (Gartner, 2016). The role of the Chief Information Officer (CIO) was introduced and is widely used to handle technological innovations (Grover et al., 1993); the Chief Technology Officer (CTO) was preferred by firms in more technically intense industries (Adler & Ferdows, 1990). Recently, other less common roles have emerged, including the Chief Data Officer (CDatO), Chief Digital Officer (CDigO), Chief Innovation Officer (CINO), and for a brief time the Chief Web Officer (CWO). All of these roles are collectively referred to in this research as CxOs. The lack of consistency on how firms embed technology leadership suggests there is still much to learn regarding the value these roles bring to the organization.

Since the 1980's, many firms have been growing their C-Suite by incorporating necessary functional managers to the team (Guadalupe et al., 2014). These roles, such as the Chief Financial Officer (CFO), Chief Operating Officer (COO), and the Chief Marketing Officer (CMO) are responsible for increasing firm value in their functional areas, however there is little research evaluating the impact of these roles (Menz, 2012). The purpose of this research is to advance understanding of the impact of the functional role of the CxO in the C-Suite on firm value.

As technology has advanced, firms have quickly recognized the need to advance as well, but many identify challenges in figuring out how to stay competitive with technology (Columbus, 2014). Notably, the digital divide between organizations, those that are able to implement technology compared to those that are less-capable, is widening (McKinsey, 2019). As a result, some companies are being reactionary in creating transitional CxO roles to appear to fill gaps. The rapid pace of technological change is resulting in the creation of a myriad of CxO roles, with no agreed-upon approach for the structure of technology leadership (Gandomi & Haider, 2015). Because other C-Suite roles, such as the CFO, have seen less variability, this suggests firms need more guidance on how to approach this important functional position in their leadership team. This research uses an event study methodology to examine the market reaction to the appointment of CxO roles.

The appointment of a CxO is an indicator of a strategic decision regarding the role of technology in the firm. Extant research applying the event study methodology has focused primarily on the role of the CIO (i.e. (e.g.Banker et al., 2011b; Chatterjee et al., 2001; Hu et al., 2014; Khallaf & Skantz, 2007; Li & Ye, 1999; Ranganathan & Jha, 2008; Taylor & Vithayathil, 2018), and the CTO role (e.g.Medcof & Lee, 2017; Taylor et al., 2015). In this research, we expand on prior studies by including all CxO roles. Secondly, this research applies the Fama-French 5 factor model (Fama & French, 2015) in analyzing CxO appointment anouncements, which has never been done before in the extant literature.

Our results indicate the announcement of appointment of CxO roles has significant negative firm-value impact. Analysis of high vs. low dynamism industries, new vs. replacement roles, and earlier vs. more recent announcements shows no significant differences. Results by role are discussed, but show no significant differences. It appears that the risk of successfully integrating the role of the CxO into the executive management structure correlates with the negative stock price reaction.

2. LITERATURE REVIEW

The IT position within the firm has evolved from a functional staff position to a strategic management role as its competitive advantage grew more important for the success of the firm (see, for example, (Bean, 2019; Chen et al., 2012). Despite many of these roles moving into the C-Suite, (Menz, 2012) states that there is a lack of research on the impact of these roles on firm outcomes. To date, research has not considered the multitude of CxO roles simultaneously, instead focusing narrowly on the individual IT C-Suite positions, such as the CIO (e.g.Banker et al., 2011b; Chatterjee et al., 2001; Hu et al., 2014; Khallaf & Skantz, 2007; Li & Ye, 1999; Ranganathan & Jha, 2008; Taylor & Vithayathil, 2018), CTO (e.g.Medcof & Lee, 2017; Taylor et al., 2015), CINO (Wingender & Kirby, 2021), CDatO and CDigO roles (Chatterjee et al., 2001; Drechsler et al., 2019; Khallaf & Skantz, 2007; Zhan et al., 2020). In this research we do the first comprehensive examination of the impact on firm value of announcements of the appointment of the IT function into the C-Suite, regardless of the CxO title.

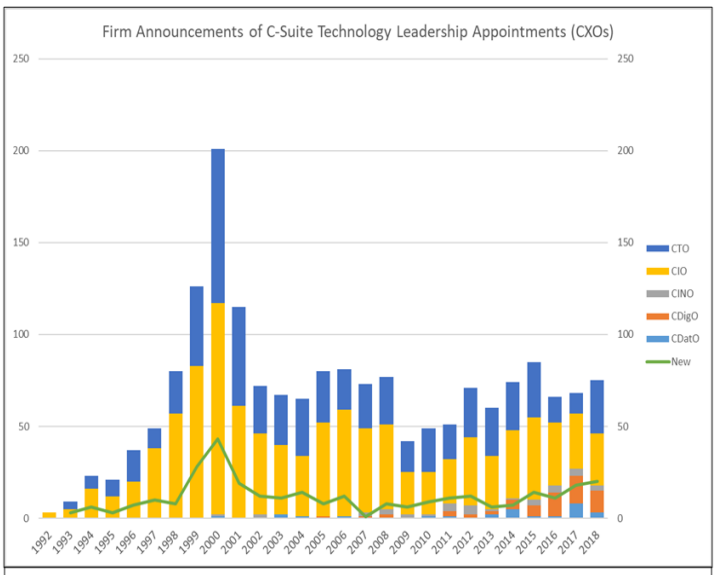

Figure 1 – Firm announcements of CXO appointments. Search results compiled from NexisUni database, using search terms of "appoint", "named", "announce", and "hired" for each of the specified titles.

The increased prominence of CxOs can be witnessed by examining firm announcements of CxO appointments. Figure 1 provides a summary of firm announcements across all CxO roles from 1992 through 2018. The stacked bar element presents the firm announcements by position while the line graph presents the number of these announcements that reflect newly created positions. A review of Figure 1 shows how the announcements reflect changes in the CxO roles with the introduction of new technologies and suggest that CxO announcements follow market trends. Announcements for traditional CIO and CTO roles dominate the announcements over the entire period, but one can see the growth in the emerging roles of CDatO, CDigO, and CINO roles beginning in 2008.

The graph suggests that announcements of intitial CxO appointments are sensitive to market factors, showing large reductions in firm announcements following the market corrections in 2000 and 2008. Thus, researchers are exploring the impact of CxOs on firms' financial performance outcomes.

Members of the C-Suite are recognized as individuals with the responsibility and power to shape the strategic direction of the firm (Finkelstein, 1992). Strategic decisions involve less certainty than operational decisions, so the composition of who is included in the TMT reflects an important consideration for firms (Finkelstein, 1992). Across many disciplines, researchers studying functional C-Suite members are examining

changes in domain-specific responsibilities, factors that influence a role's presence, and firm outcomes. Examples include studies of CFOs that explore their role expansion from operations to strategic planning (Geiger & North, 2006), as well as governance changes associated with a new CFO (Zorn, 2004). In a study of the COO role, researchers explored factors that influence the presence of a COO and questioned the need for this functional C-Suite role when results showed that CEOs with COOs posted a worse financial outcome than CEOs without COOs (Hambrick & Canella Jr, 2004). As presented in these examples, there is an increase in the number of studies that focus on functional C-Suite members and their impact on firm outcomes.

In his review of literature on the growth of functional TMT members, (Menz, 2012) notes the lack of research on firm outcomes of functional executive suite members and highlights the varied approaches taken by studies that originate from researchers across many domains; existing studies of CxOs reflect the absence of a guiding framework. Menz (2012) provides an organizing framework to examine factors that influence firm outcomes, including the functional TMT member role, the presene of other TMT members, environmental factors, and the organizational context; this framework guides this analysis of CxOs.

In previous research on the market impact of IT decisions on financial performance many accounting and market variables have been used to measure financial performance. Zahra and Pearce (1989) recount dozens of studies evaluating the financial performance of TMT with most of them using accounting data. In a more recent study, (Carpenter & Sanders, 2002) state that aligning TMT compensation with shareholders' interests is the missing link in measuring strategic decisions by the firm. This study uses event study analysis of the market reaction to examine how investors value the appointment of IT managers to the executive officer suite, similar to (Roztocki & Weistroffer, 2015) with the additional methodological enhancement of the Fama-French 5 Factor model to examine market reactions to announcements of CxO appointments.

Firm outcomes have been studied concerning the presence and individual characteristics of the CxO with varying results. Individuals with a STEM background have resulted in negative abnormal returns (Drechsler et al., 2019), while individuals with graduate degrees resulted in positive abnormal returns (Khallaf & Skantz, 2007), and whether the appointee comes from within the organization or from the outside produced insignificant results (Chatterjee et al., 2001).

Studies have looked at the relationship between the CxO, the CEO, and/or other functional C-Suite members with varying results. A comparison of the CIO versus CMO roles finds that a CIO in the C-Suite adds more value to firm outcomes than a CMO (Taylor & Vithayathil, 2018). With the addition of a CDigO or CDatO, the presence of a CIO within the firm results in significant negative abnormal returns (Zhan & Mu, 2016). A study of whether the CIO must report to the CEO or not shows that performance outcomes are enhanced when the CIO-CEO reporting structure is aligned with the firm's strategic positioning choices (Banker et al., 2011b), while another study suggests that CIO-CEO reporting distance is negatively related to firm performance (Li & Ye, 1999). A study of market reactions to the firm announcement of the appointment of a CINO results in negative abnormal returns, while the move of the CEO into the CINO position is a very significantly negative factor (Wingender & Kirby, 2021). In this study, all these roles are evaluated for their impact on firm value both collectively and individually.

Firms that have a CxO positioned in the TMT, as reported by compensation in the Execucomp database, experience significant and positive results versus their peers (Kirby et al., 2022; Medcof & Lee, 2017; Taylor et al., 2015). When the strategic positioning of the firm and CIO-CEO reporting is aligned, firms reported higher performance (Banker et al., 2011b), yet a CTO in the TMT as evidenced by the presence in the T5 is shown to influence firm outcomes (Kirby et al., 2022; Medcof & Lee, 2017). The appointment of the CxO from a first-mover in their industry group results in positive returns (Khallaf & Skantz, 2007). Firm size produces conflicting results, with size positively related to the appointment/presence of a CDatO (Nie et al., 2019), while the firm size is negatively related to abnormal returns for the announcement of a CIO and CINO appointments (Khallaf & Skantz, 2007; Wingender & Kirby, 2021). Thus, the overall impact from CxO appointment announcements is examined first. The impact of each individual CxO position is then subsequently examined.

Positive results have been found in studies that control for market dynamism (Hu et al., 2014; Li & Ye, 1999), for firms within industries experiencing IT transformations (Chatterjee et al., 2001), and for firms within a technology-centric industry (Medcof & Lee, 2017). Studies have also segmented results in different time periods to explore the potential market reactions or firm performance differences based on overall market factors (Drechsler et al., 2019; Hu et al., 2014).

Contradictory results in existing literature are not surprising within a growing body of research. Such results suggest more research is necessary and provide opportunities to shape future research. In this research, a much longer sample period is examined than previous studies. We expand a far larger set of CxO announcements than previous research. The number of distinct roles is examined using the lastest event models, such as the Fama-French 5 Factor model to examine announcements of CxO appointments, expand our examination the role of dynamism on the impact of the announcement of CxO appointments on firm value and compare our results to previous studies.

3. HYPOTHESES DEVELOPMENT

Several theories are used to inform research to understand the growth of the functional managers in the C-Suite and the impact of their presence on the value of the firm, including Signaling Theory (ST), Upper Echelons Theory (UET), and Contingency Theory (CT). ST is commonly investigated with event studies examining the market's evaluation of the firm's announcement of the appointment of a functional member to the C-Suite. A core element of ST involves the reduction of information asymmetries between the sender and receiver by providing non-public information to investors; the sender makes choices on what signals to communicate and the receiver interprets these signals and makes value decisions (Spence, 1978). When a firm announces a technology investment (Bharadwaj et al., 1999; Dos Santos et al., 1993) or the appointment of a CIO to the C-Suite (Chatterjee et al., 2001; Drechsler et al., 2019), they are sending a signal of the importance of the investment and their commitment to pursue technology initiatives with the expectation of enhanced market value. In an efficient market, the investment community is expected to evaluate the potential impact in terms of the future firm value resulting from this signal and to take actions that would increase or reduce firm value accordingly (Fama, 1970). It is reasonable to infer that firms announce their CxO appointments to signal a positive impact on firm value from the managent decision.

The central precept of UET is that an organization can be viewed as a "reflection of its top managers" (Hambrick & Mason, 1984, p. 193). UET posits that how and why firms make decisions can be explained by individual and organizational factors. The choice to add a functional TMT member introduces an executive with different experiences, adding to the diversity of knowledge and skills within the TMT (Harrison & Klein, 2007), which has been used as a proxy for increased C-Suite heterogeneity (Hambrick et al., 1996). Heterogeneity is an important construct of UET and has been shown to increase team cognition, promote healthy conflict, to leverage the differing perspectives of managers and to lead to more effective decision-making processes (Amason, 1996; Drucker, 1967; Hambrick, 2007; Hambrick & Finkelstein, 1987; Hambrick et al., 1996) and improved firm financial outcomes (Amason, 1996; Ranganathan & Jha, 2008). As a member of the TMT, the CxO is better positioned to directly influence IT investment decisions, yet this level of access and influence is not universally available to IT leaders (Jones et al., 2019). A CxO in the TMT is positioned to influence IT strategy and IT investment decisions, to remove roadblocks (Bennett, 2016), and to influence organization values and priorities to ensure the ongoing adherence to IT investment choices (Christensen & Overdorf, 2000). According to UET theory, a transition of a functional technology role to the C-Suite enhances the strategic nature of IT at the decision making level of TMT and would be very positive for the future financial performance of the firm. The purpose of this research is to examine the whether placing IT leaders to an executive officer increases firm value and whether these different executive officer roles in the C-Suite impact firm outcomes differently.

Firm announcements of CxO appointments provide investors with non-public information related to the firm's technology strategies. This signal reduces information asymmetries, which is shown to reduce risk and is expected to enhance firm value (Hughes et al., 2007). The announcement of the appointment of a CxO communicates the importance of this role to the firm, a commitment to pursue technology initiatives as a strategic priority, and a level of influence assigned to this role within the organization (McLean & Smits, 2014). Firms making this symbolic announcement of the appointment of a new CxO signal their commitment to leveraging technology and influencing firm outcomes through greater efficiencies, coordination, and improvements in decision-making.

These announcements represent strong positive signals from the firm of the importance of technology. Studies show positive market reactions to the firm announcement of the appointment of CIO, CDatO, and CDigO roles (Chatterjee et al., 2001; Drechsler et al., 2019; Khallaf & Skantz, 2007; Zhan et al., 2020), yet a comprehensive examination across all CxO positions does not exist. Therefore, the following hypothesis is tested:

$H1_0$: The firm announcement of a CxO will have no impact on firm value as measured by abnormal stock returns.
$H1_A$: The firm announcement of a CxO will increase firm value as measured by abnormal stock returns.

Prior studies have shown conflicting results between announcements of the appointment of a newly created CxO position versus the replacement of an existing CxO position. One early study examined the market reaction to firm announcements of newly created CIO positions, finding positive market value outcomes suggesting the moves are received as a signal of positive future firm performance, especially within IT-intense industries (Chatterjee et al., 2001). In a follow-up study with an expanded sample size of firm announcements for newly created and existing position replacement appointments, researchers find negative market reactions to firm announcements of new appointments and no difference between new or existing appointment announcements. (Khallaf & Skantz, 2007). The difference between these types of announcements remains an ongoing empirical question. Therefore, the following hypothesis is tested:

H20: There will be no difference in firm value outcomes as measured by abnormal stock returns for new versus existing CxO appointment announcements.

H2A: There will be a difference in firm value as measured by abnormal stock returns for new versus existing CxO appointment announcements.

CT provides another framework to understand how and why firms make strategic decisions regarding the size and structure of their functional TMT. CT argues that organizational and environmental factors create the set of conditions a firm faces, which influences their choices. Firm size, task demands of the TMT members, technology intensity, industry growth, and dynamism are all factors that influence how firms make strategic decisions regarding their TMT (Donaldson, 2001). Within the existing literature, studies that utilize CT tend to focus on the antecedents related to the presence of a given position; these studies examine specific environmental or organizational factors as predictors and also examine firm outcomes related to the presence of the role (Hambrick & Canella Jr, 2004; Medcof & Lee, 2017; Menz & Scheef, 2014; Nie et al., 2019; Xu et al., 2016). Thus, this study will examine the role of industry dynamism, the extant to which a firm faces an environment that is predictable and stable (Low Dynamiam) or changing and uncertain (High Dynamism). CT predicts High Dynamism firms will have a CxO and it will be a beneficial affect on firm value. This study will examine the role of industry dynamism, the extant to which a firm faces an environment that is predictable and stable (Low Dynamiam) or changing and uncertain (High Dynamism). CT predicts High Dynamism firms will have a CxO and it will be a beneficial affect on firm value. Therefore, the following hypothesis is tested:

$H3_0$: There will be no difference in firm results as measured between Low Dynamism firms versus High Dynamism firms.
$H3_A$: Firms in High Dynamism industries will high higher abnormal returns than firms in Low Dynamism industries.

4. DATA COLLECTION AND METHODS

Table 1 summarizes the data sources and collection methods for this research. A search of the Nexis-Uni database is conducted to identify firm announcements for technology roles. The search terms include: "new" or "created" or "announced" or "appointed" or "named" and positions of "Chief Information Officer," “CIO,” “Chief Technology Officer,” “CTO,” “Chief Data Officer,” “Chief Digital Officer,” “CDO,” “Chief Innovation Officer,” “Chief Web Officer,” and “CWO.” Firm announcements are reviewed and only firms listed on the New York Stock Exchange (NYSE) and NASDAQ between 1992 and 2018 are included. Announcements are coded as a new position if the announcement text reflected a newly created position by the firm. Announcements are coded individually by the role of CIO, CTO, CINO, CDatO, and CDigO. A total dataset of 1,715 firm announcements for CxO positions is retained; no firm announcements are found for the CWO.

Table 1 – Data Sources

Data	Source	Method
Firm Announcements	Nexis-Uni	Manual web-search
Daily Stock Prices, and Monthly Stock PERMNO, and CUSIP	Wharton Research Data Services (WRDS) using the Center for Research in Security Prices (CRSP) database	Download / R-Script for Processing
Firm Financial Data & NAICS Code	Compustat Annual Updates	R-Script Query

The firm announcements provide the firm ticker symbol at the time of the event; the ticker symbol can change over time and does not provide the most complete results when conducting event studies. Stock information is downloaded from The Center for Research in Security Prices (CRSP) database to gather each firm’s permanent issue identifier (PERMNO) and its unique identifier (CUSIP). Using R 3.5.0, code is executed to search the monthly CRSP data file and update the firm announcement records with the correct PERMNO and CUSIP for the event period. PERMNO and the announcement date provide input for the event study. Firm announcements for which daily returns are available are retained, resulting in 1,696 firm announcements. This sample of CxO announcements is the largest, most comprehensive ever investigated with an event study.

To gather descriptive financial information about announcement firms, the Compustat Fundamentals Annual database (WRDS, 2020) is queried using R 3.5.0 to obtain financial measures for the year preceding the announcement event. The firm’s CUSIP provides a more complete dataset than queries using the firm’s ticker symbol.

4.1 Methodology

An event study methodology is used to measure the market reactions of firm announcements by calculating the abnormal stock returns on the day of the announcement of a CxO using daily stock returns (Brown & Warner, 1985; Fama, 1970). In an efficient market, Abnormal Returns (AR) experienced on the day of the firmannouncement are interpreted as a measure of the impact of the event. Figure 2 provides a conceptual model for the event study methodology. The estimation window trading-day returns for a firm are used as the dependent

variable with the simultaneous trading-day returns for a market index as the independent variable in an Ordinary Least Squares (OLS) regession to estimate the alpha and the beta of the model. These estimates are used in the event period to compute the expected daily returns for a stock with a market benchmark. The estimation window ends at a defined number of trading days before the event window to provide a degree of separation from the actual event period and calculates the expected return separate from events surrounding the event date that may influence a stock's pricing. On the event date, an abnormal return for a stock is calculated as the difference between the expected daily return of a stock and the actual return for the stock. Eventus 8.0 is used to perform the calculations as described above (Cowan, 2005; Halperin & Lusk, 2013).

Several benchmark models exist from which to calculate expected stock returns. The Capital Asset Pricing Model (CAPM) provides a calculation of the expected return based on the idea that a stock's price fluctuates with the market, as calculated by the individual stock's beta (β) coefficient times the market return (Sharpe, 1964). The Fama-French three-factor (FF3) model builds upon the CAPM by adding factors of firm size and market value (Fama & French, 1993). The Carhart four-factor model builds upon the FF3 model by adding a factor for momentum (Carhart, 1997). A more recent addition is the Fama-French five-factor (FF5) model, which builds upon the FF3 model by adding factors of firm profitability and level of firm investment (Fama & French, 2015). The FF5 model is shown to provide a better explanation of pricing variances and represents a better predictive model of expected returns, and thus is the selected benchmark for this event study (Chiah et al., 2016). The FF5 model is constructed as follows:

$$R_{it} - R_{Ft} = a_i + b_i(R_{mt} - R_{Ft}) + s_i\mathbf{SMB_t} + h_i\mathbf{HML_t} + \mathbf{r}_i\,\mathbf{RMW_t} + \mathbf{c}_i\,\mathbf{CMA_t} + e_{it}, \quad (1)$$

where R_{it} is the return for security i on day t., R_{mt} is the value-weighted market return, R_{Ft} is the risk-free return, $s_i\text{SMB}_t$ reflects the difference in return of a diversified portfolio of small versus large firms, $h_i\text{HML}_t$ reflects the difference in return of a diversified portfolio of high market value firms versus low market value firms, $r_i\text{RMW}_t$ reflects the difference in return of a diversified portfolio of firms with robust profitability versus weak profitability, and $c_i\text{CMA}_t$ reflects the difference in return of a diversified portfolio of firms with a highly conservative investment profile versus firms with an aggressive investment profile.

This study measures the abnormal return associated with a firm announcement of the appointment of a CxO, which is the difference between the actual return and the expected return for the firm on the day of the announcement. The expected return of an individual security is estimated using the following linear regression model:

$$R_{it} = a_i + b_iR_{FF5t} + e_{it}, \quad (2)$$

where R_{it} is the return for security i on day t., R_{FF5t} is the market return using the FF5 model benchmark, a_i is the intercept, and b_i is the coefficient of the security with the market return, and e_{it} is the error term. This regression model is applied to each security for each day in the estimation window to calculate the ordinary least squares coefficients $\hat{a}$ and $\hat{b}$, which are used to estimate the expected return for each security on the event date. The abnormal return (AR_{it}) for each security is calculated as the actual return on the event date minus the expected return for the event date, as expressed in the following formula:

$$AR_{it} = R_{it} - (\hat{a}_i + \hat{b}_i\,R_{FF5t}), \quad (3)$$

The abnormal return is calculated for each firm, and aggregated to calculate the average abnormal return (AAR), as expressed in the following formula:

$$AAR_t = \frac{1}{n}\sum_{i=1}^{N} AR_{it}, \quad (4)$$

which reflects the average abnormal return on the event date. Daily average returns are calculated for each date within the event window, from trading day -10 through trading day +10. The cumulative abnormal return (CAR) is calculated for various windows (T_1, T_2), as expressed in the following formula:

$$CAR = \sum_{t=T_1}^{T_2} AAR_t \quad (5)$$

Significance of the FF5 model results are tested using the Standardized Cross-Sectional parametric test (Boehmer et al., 1991) and the non-parametric Rank test (Corrado, 1989). For larger samples, standard statistical tests of normality may produce significant results even for minor violations of normality; a distribution should also be visually inspected to interpret normality (Field, 2018). R 3.5.0 provides an extension of the Shapiro-Wilk W test to examine normality for large sample sizes (Royston, 1982). As recommended by McWilliams and Siegel (1997), results from both parametric and non-parametric tests are reported. Interpretation of the normality of the distribution of abnormal returns involves a visual inspection of the distribution and performing the Shapiro Wilk W test in R 3.5.0. Parametric significance statistics are used for normally distributed results. Non-parametric significance statistics are used for non-normally distributed results. Although this study contains a large number of

firm announcements, outliers may influence normality and significance tests.

Mean comparison tests are conducted to compare abnormal returns across data subsets and to compare firm performance. As these are large samples, the determination of normality involves a visual review of the distribution and statistical testing. The parametric t-test and non-parametric Wilcoxon Signed-Rank (WSR) test are used to allow for interpretation of results for both normally and non-normally distributed results. Hu et al. (2014) note that both tests are common across events studies, and the WSR test is appropriate for non-normal distributions. Both test statistics will be presented and discussed.

5. RESULTS

The event study includes 1,695 firm announcements of CxOs from all industries. As shown in Table 2, the firm announcements originate from a relatively even split between firms listed on the NYSE and NASDAQ exchanges. The firms vary greatly in terms of size, profitability, and market capitalization, as evidenced by the large standard deviations found across all descriptive statistics. The announcements are made most frequently for the traditional roles of CIO and CTO, with a smaller number found in the emerging roles of CINO, CDatO, and CDigO. These announcements represent firms from across many industries.

TABLE 2 - Firm Announcement - Descriptive Statistics

	N	Mean	Median	SD
Day 0 CAR	1696	-0.20%	-0.170%	3.831%
Firm Descriptives				
Total Assets	1532	36,598	1,021	199,012
Intangible Assets	1201	2,584	209	10,256
EBITDA	1500	1,382	97	5,059
Market Value of Equity	1495	9,794	1,035	30,652
NASDAQ / NYSE	790 / 905			
- Total Assets for NASDAQ firms		2,777	263	11,238
- Total Assets for NYSE firms		65,964	3,342	268,458
CXO		% of Total		
- # of CIOs	971	57.3%		
- # of CTOs	603	35.6%		
- # of CINOs	37	2.2%		
- # of CDatOs	22	1.3%		
- # of CDigOs	63	3.7%		

Table 3 provides the abnormal market returns for all firm announcements of CxO appointments. This table provides the reporting structure used for subsequent event study results. The Days column provides various reporting windows within the event period, with the event date represented as (0). The remaining event windows report on the cumulative abnormal returns for the various periods beginning or ending on the event date and extending two weeks, one week, or one trading day before and after the event date. As an example, the window (-10,-1) provides the cumulative abnormal return for the two weeks of trading days beginning 10 trading days before the event and ending on the trading day before the event. The N column reflects the number of firms included in the event study. The Mean CAR column reports the cumulative abnormal return for each reported window; for Day 0, this reflects the single day abnormal return. The Pos:Neg column reports the number of firms with positive and negative abnormal returns for each window. The StdCsect Z column reports the significance test result for the Standardized Cross-Sectional parametric Z test statistic. The Rank Test Z column reports the significance test result for the Rank non-parametric Z test statistic.

TABLE 3 - The Event Study Results the Fama-French Five-Factor Model - All CXO Roles

Days	N	Mean CAR	Pos:Neg	StdCsect Z		Rank Test Z	
(0)	1696	-0.20%	775:921	-1.686	**	-2.437	**
(-10,-1)	1696	0.18%	824:872	0.198		-0.186	
(-5,-1)	1696	0.21%	819:877	0.245		-0.784	
(-1,0)	1696	-0.24%	804:892	-1.845	**	-1.980	**
(0,1)	1696	-0.16%	767:929	-1.302	*	-1.623	*
(1,5)	1696	0.05%	841:855	0.242		0.205	
(1,10)	1696	-0.09%	829:867	0.276		0.487	

Significance Symbols: * p<0.1; ** p<0.05; *** p<.01

Hypothesis 1_0 states the firm announcement of a CxO will have no impact on firm value as measured by abnormal returns, with an alternative hypothesis that the announcement will have a positive impact on firm value. As reported in Table 3, the results show a statistically significant negative effect to firm announcements across all CxO roles on

the day of the event (AR (0) = -0.20%, p<.01)[1], in the event window beginning the trading day before and ending the trading day of the event (CAR (-1,0) = -0.24%, p<.05), and in the event window beginning the trading day of the event and ending the trading day after the event (CAR (0,1) = -0.16%, p<.10). The significant tests are consistent across both parametric and non-parametric tests. This negative market reaction to firm announcements indicates that the null $H1_0$ is to be rejected. However, the prior literature and theory supported a positive market reaction as stated in alternative $H1_A$, which must also be rejected.

Hypothesis 2_0 states there will be no difference in firm value outcomes as measured by abnormal stock returns for new versus existing CxO appointment announcements. To test this hypothesis, the data are separated into subsets based on newly created position announcements and existing position announcements, and the event study methodology was applied separately to these subsets. Table 4 provides a summary of results, with newly created CxO announcements presented in Panel A and existing CxO announcements presented in Panel B. As reported in Panel A, the market reaction to newly created positions is negative on the day of the event (AR (0) = -0.25%), as well as across event windows except the week following the announcement. None of these results is significant.

Panel B reports on the market reactions to firm announcements for existing CxO positions, with significantly negative reactions on the day of the announcement (AR (0) = -0.19%, p<.05), and during the (-1,0) event window (CAR (-1,0) = -0.23%, p<.05), and during the (0,1) event window (CAR (0,1) = -0.12%, p<.10); the Rank Test Z statistic is used to determine significance due to the non-normally distributed results.

TABLE 4 - The Event Study Results the Fama-French Five-Factor Model - New vs Existing Positions

Panel A - Announcements of Newly Created Positions

Days	N	Mean CAR	Pos:Neg	StdCsect Z	Rank Test Z
(0)	291	-0.25%	128:163	-0.652	-1.268
(-10,-1)	291	-0.45%	134:157	-1.240	-1.271
(-5,-1)	291	-0.03%	140:151	-0.107	-0.596
(-1,0)	291	-0.29%	144:147	-0.734	-1.068
(0,1)	291	-0.38%	132:159	-0.448	-0.630
(1,5)	291	0.24%	147:144	0.503	0.124
(1,10)	291	-0.50%	140:151	-0.193	0.874

Panel B - Announcements of Existing Positions

Days	N	Mean CAR	Pos:Neg	StdCsect Z	Rank Test Z
(0)	1405	-0.19%	646:759	-1.542 *	-2.229 **
(-10,-1)	1405	0.31%	691:714	0.802	0.381
(-5,-1)	1405	0.25%	680:725	0.363	0.566
(-1,0)	1405	-0.23%	659:746	-1.679 **	-1.791 **
(0,1)	1405	-0.12%	635:770	-1.189	-1.561 *
(1,5)	1405	0.00%	693:712	0.005	-0.150
(1,10)	1405	-0.01%	690:715	0.408	0.127

Significance Symbols: * p<0.1; ** p<0.05; *** p<.01

Firm announcements of newly created and existing CxO announcements produce negative market reactions, with significant results only found for announcements of existing positions. To test Hypothesis 2 on the event date, it is necessary to test if the abnormal return of -0.25% (Table 4 Panel A) for newly created position announcements is significantly different than the abnormal return of -0.19% (Table 4 Panel B) for existing position announcements. Results from a WSR test (p-value = .59) and t-test (p-value = .84) produce non-significant results, indicating the two means are not significantly different, providing support for $H2_0$ that the results of the impact of new or replacement CxO appointments are similar.

The consistent negative market reactions to announcements of CxO appointments found within this large sample study are interesting. Consistent with extant research, further analysis is conducted across CxO positions, periods, and market segments as defined by industry dynamism to try to determine whether there is a particular characteristic associated with the negative return. To explore differences by position, the dataset is partitioned into subsets for announcements by role, and the event study methodology was applied separately to these subsets. Results for CIO, CTO, CINO, CData, and CDigO are presented in Tables 5, 6, 7, 8, and 9 respectively. To determine if the individual CxO abnormal returns are normally distributed, a histogram of abnormal returns is visually inspected and a Shapiro-Wilk W test is performed by role. Abnormal returns are normally distributed for the CINO role and not normally distributed for the CIO, CTO, CDatO, and CDigO roles.

The Standardized Cross-Section Z test statistic is used to test significance for the CINO role, while the Rank Test Z statistic is used to test significance for CIO, CTO, CDatO, and CDigO roles.

[1] The sample trimmed with the 1.5 x IRQ method netted 1,502 events and a Day 0 result of (AR= -0.20%, p<.01). As they are very similar to the full sample, the full sample results are reported here and throughout this research.

Results for the firm announcement of a CIO are shown in Table 5 and reflect a significantly negative abnormal return on the event date (AR (0) = -0.15%, p<.05), a significant negative return in the (-1,0) event window (CAR (-1,0) = -.26%, p<.05), and a significant negative return in the (0,1) event window (CAR (0,1) = -.26%, p<.05).

TABLE 5 - The Event Study Results the Fama-French Five-Factor Model - CIO Announcements

Days	N	Mean CAR	Pos:Neg	StdCsect Z		Rank Test Z	
(0)	971	-0.15%	442:529	-1.036		-2.107	**
(-10,-1)	971	0.12%	481:490	1.011		0.672	
(-5,-1)	971	0.08%	468:503	0.509		-0.287	
(-1,0)	971	-0.26%	455:516	-1.566	*	-1.880	**
(0,1)	971	-0.26%	432:539	-1.496	*	-1.966	**
(1,5)	971	-0.35%	481:490	-1.117		-0.734	
(1,10)	971	-0.53%	470:501	-1.097		-0.470	
Significance Symbols: * p<0.1; ** p<0.05; *** p<.01							

Results for the firm announcement of a CTO are shown in Table 6, and reflect a marginally significant negative abnormal return on the event date (AR (0) = -0.31%, p=.109). The abnormal returns for all remaining event windows report a combination of positive and negative CARs, with no significant Rank Z results.

TABLE 6 - The Event Study Results the Fama-French Five-Factor Model - CTO Announcements

Days	N	Mean CAR	Pos:Neg	StdCsect Z		Rank Test Z
(0)	603	-0.31%	274:329	-1.181		-1.234
(-10,-1)	603	0.34%	293:310	0.004		-0.232
(-5,-1)	603	0.50%	293:310	0.552		-0.180
(-1,0)	603	0.20%	292:311	-0.571		-0.562
(0,1)	603	0.02%	277:326	0.271		0.117
(1,5)	603	0.62%	295:308	1.560	*	1.120
(1,10)	603	0.58%	297:306	1.699	*	0.956
Significance Symbols: * p<0.1; ** p<0.05; *** p<.01						

Results for the firm announcement of a CINO are shown in Table 7, and reflect a non-significant negative abnormal return on the event date (AR= -0.10%, p>.10), significant negative results in the (-5,-1) event window (CAR (-5,-1) = -0.82%, p<.10) and the (-1,0) event window (CAR (-1,0) = -0.72%, p<.10). The abnormal returns for all remaining event windows report a combination of positive and negative CARs, with no significant results.

TABLE 7 - The Event Study Results the Fama-French Five-Factor Model - CINO Announcements

Days	N	Mean CAR	Pos:Neg	StdCsect Z		Rank Test Z	
(0)	37	-0.10%	18:19	-0.488		-0.223	
(-10,-1)	37	0.07%	13:24	-0.796		-1.333	*
(-5,-1)	37	-0.82%	17:20	-1.305	*	-1.923	*
(-1,0)	37	-0.72%	18:19	-1.308	*	-1.015	
(0,1)	37	-0.11%	20:17	-0.668		-0.968	
(1,5)	37	1.01%	23:14	0.662		0.407	
(1,10)	37	0.79%	20:17	0.862		0.341	
Significance Symbols: * p<0.1; ** p<0.05; *** p<.01							

Results for the firm announcement of a CDatO are shown in Table 8 and reflect a significant negative abnormal return on the event date (AR(0) = -0.44%, p<.05), and a significant negative result in the (-1,0) event window (CAR (-1,0) = -0.64%, p<.10). The abnormal returns for all remaining event windows report generally negative, non-significant CARs.

TABLE 8 - The Event Study Results the Fama-French Five-Factor Model - CDatO Announcements

Days	N	Mean CAR	Pos:Neg	StdCsect Z		Rank Test Z	
(0)	23	-0.44%	8:15	-2.106	**	-2.080	**
(-10,-1)	23	-0.93%	11:12	-0.192		-0.499	
(-5,-1)	23	0.16%	13:10	0.667		-0.992	
(-1,0)	23	-0.64%	8:15	-1.445	*	-1.698	**
(0,1)	23	-0.51%	9:14	-0.770		-1.234	
(1,5)	23	-0.77%	10:13	-0.090		-0.387	
(1,10)	23	-0.72%	13:10	0.497		0.385	
Significance Symbols: * p<0.1; ** p<0.05; *** p<.01							

Results for the firm announcement of a CDigO are shown in Table 9, and reflect a non-significant positive abnormal return on the event date (AR= 0.02%, p>.10), significant negative results in the (-1,0) event window (CAR (-1,0) = -0.05%, p<.10) and the (-5,-1) event window (CAR (-5,-1) = 0.15%, p<.10). The abnormal returns for all remaining event windows report a mixture of non-significant positive and negative CARs.

TABLE 9 - The Event Study Results the Fama-French Five-Factor Model - CDigO Announcements

Days	N	Mean CAR	Pos:Neg	StdCsect Z		Rank Test Z	
(0)	63	0.02%	33:30	0.142		0.241	
(-10,-1)	63	-0.05%	28:35	-1.439	*	-1.335	*
(-5,-1)	63	0.15%	30:33	-1.022		-1.305	*
(-1,0)	63	0.25%	31:32	0.404		0.177	
(0,1)	63	-0.33%	29:34	-0.976		-0.291	
(1,5)	63	0.29%	31:32	-0.429		-0.261	
(1,10)	63	-0.10%	30:33	-0.409		0.665	

Significance Symbols: * p<0.1; ** p<0.05; *** p<.01

To test the mean differences by position, a pairwise t-test and non-parametric Kruskal Wallis (KW) tests are performed to compare the Day 0 abnormal returns between groups. The pairwise t-test model results in a p-value of .93 and the KW test results in a p-value of .64. The non-significant results using parametric and non-parametric tests indicate that no significant difference in abnormal returns exists by role. Thus, the negative impact from a CxO announcement is across all these types of positions. This finding is different from the studies investigating one role at a time, such as (Chatterjee et al., 2001; Drechsler et al., 2019; Khallaf & Skantz, 2007).

To explore market reactions by period, the dataset is partitioned into subsets for before and after 2009, a year that corresponds to the noticeable increase in prominence of the CxO roles within the T5. Results are presented in Table 10, with announcements through 2008 presented in Panel A and announcements in 2009 or after presented in Panel B. To determine if the abnormal returns by period are normally distributed, a histogram of abnormal returns is visually inspected and a Shapiro-Wilk test is performed by data subset. Abnormal returns are normally distributed for both periods, so the Standardized Cross-Section Z (StdCsectZ) test statistic is used to test for significance.

As reported in Panel A, the market reaction to announcements through 2008 is significantly negative on the day of the event (AR (0) = -0.29%, p<.10), and during the (-1,0) event window (CAR (-1,0) = -0.35%, p<.10). The abnormal returns for all remaining event windows report a mixture of non-significant positive and negative CARs.

TABLE 10 - The Event Study Results the Fama-French Five-Factor Model - Before & After 2009

Panel A - Firm Announcements Before 2009							
Days	N	Mean CAR	Pos:Neg	StdCsect Z		Rank Test Z	
(0)	1089	-0.29%	487:602	-1.302	*	-1.607	**
(-10,-1)	1089	-0.01%	534:555	0.533		-0.203	
(-5,-1)	1089	0.35%	533:556	1.038		-0.114	
(-1,0)	1089	-0.35%	513:576	-1.464	*	-1.607	*
(0,1)	1089	-0.21%	500:589	-0.576		-1.147	
(1,5)	1089	0.12%	543:546	0.737		0.237	
(1,10)	1089	-0.23%	531:558	-0.240		-0.176	
Panel B - Firm Announcements in 2009 and After							
Days	N	Mean CAR	Pos:Neg	StdCsect Z		Rank Test Z	
(0)	607	-0.04%	287:320	-1.036		-1.124	
(-10,-1)	607	0.52%	291:316	-0.398		-0.052	
(-5,-1)	607	-0.04%	287:320	-0.873		-1.387	*
(-1,0)	607	-0.04%	290:317	-1.073		-1.167	
(0,1)	607	-0.07%	267:340	-1.307	*	-1.151	
(1,5)	607	-0.10%	297:310	-0.717		-0.052	
(1,10)	607	0.16%	299:308	0.765		1.024	

Significance Symbols: * p<0.1; ** p<0.05; *** p<.01

Panel B reports on the market reactions to firm announcements during and after 2009, with a non-significant and negative reaction on the day of the announcement (AR (0) = -0.04%, p>.10), and a significant and negative reaction during the (0,1) event window (CAR (0,1) = -0.07%, p<.10). The abnormal returns for all remaining event windows report mostly a mixture of non-significant positive and negative CARs. A paired t-test is performed to

compare the Day 0 abnormal returns between announcements before and after 2009, resulting in a p-value of .49, indicating no significant difference in the Day 0 abnormal returns between the two periods.

Thus, there is no difference between earlier movers and later entrants to the CxO appointment, which is a different finding than Drechsler et al. (2019).

To explore market reactions by the degree of industry dynamism, a calculation of the ratio of total R&D expense as a percentage of total sales is calculated collectively for all firms, by year, within two-digit NAICS code groups. Industries are segmented into categories of high and low dynamism if the calculated dynamism ratio is either below or above the median value of all firms. The dataset is partitioned into subsets for high and low dynamism. Results are presented in Table 11, with announcements for firms in high dynamism industries presented in Panel A and announcements for firms in low dynamism industries presented in Panel B. To determine if the abnormal returns by industry dynamism are normally distributed, a histogram of abnormal returns is visually inspected and a Shapiro-Wilk test is performed upon data subsets. Abnormal returns are normally distributed for both datasets, so the Standardized Cross-Section Z test statistic is used to test for significance in each subsample.

TABLE 11 - The Event Study Results the Fama-French Five-Factor Model - Low vs High Dynamism

Panel A - Firm Announcements within High Dynamism Industries

Days	N	Mean CAR	Pos:Neg	StdCsect Z		Rank Test Z	
(0)	773	-0.43%	332:441	-2.956	***	-2.887	***
(-10,-1)	773	-0.11%	372:401	-0.875		-0.958	
(-5,-1)	773	0.02%	352:421	-0.601		-1.220	
(-1,0)	773	-0.37%	352:421	-2.153	**	-1.951	**
(0,1)	773	-0.27%	347:426	-1.280	*	-1.294	*
(1,5)	773	0.44%	392:381	1.704	**	1.518	*
(1,10)	773	0.50%	390:383	1.935	**	1.628	*

Panel B - Firm Announcements within Low Dynamism Industries

Days	N	Mean CAR	Pos:Neg	StdCsect Z		Rank Test Z	
(0)	761	-0.08%	363:398	-0.212		-0.806	
(-10,-1)	761	-0.45%	363:398	-0.087		-0.060	
(-5,-1)	761	-0.19%	381:380	-0.240		-0.751	
(-1,0)	761	-0.21%	371:390	-0.897		-0.808	
(0,1)	761	-0.19%	346:415	-1.367	*	-1.212	
(1,5)	761	-0.48%	364:397	-1.679	**	-1.412	*
(1,10)	761	-0.54%	367:394	-0.964		-0.598	

Significance Symbols: * p<0.1; ** p<0.05; *** p<.01

As reported in Panel A, the market reaction to announcements for firms in industries identified as high dynamism is significantly negative on the day of the event (AR (0) = -0.43%, p<.01), during the (-1,0) event window (CAR (-1,0) = -0.37%, p<.05), and during the (0,1) event window (CAR (0,1) = -.27%, p<.10), while significant positive market reactions are reported during the (1,5) event window (CAR (1,5) = 0.44%, p<.05), and during the (1,10) event window (CAR (1,10) = 0.50%, p<.05). The remaining abnormal returns reflect non-significant negative CARs.

Panel B reports on the market reaction to announcements for firms in industries identified as low dynamism, with a non-significant and negative reaction on the day of the announcement (AR (0) = -0.08%, p>.10), and a significantly negative reaction during the (0,1) event window (CAR (0,1) = -0.19%, p<.10), and during the (1,5) event window (CAR (1,5) = -0.48%, p<.05). The remaining abnormal returns reflect non-significant negative CARs. A paired t-test is performed to compare the Day 0 abnormal returns between announcements for firms in low and high dynamism industries, (p=.07), indicating a marginally significant difference in the Day 0 abnormal returns between low and high dynamism industries. The non-parametric WSR test is also run, (p=.05), further supporting the difference between low and high dynamism means. These findings reject Hypothesis 3_0 that there is no difference in firm results as measured between Low Dynamism firms versus High Dynamism firms. The high dynamism industry impact is more negative, which also rejects Hypothesis 3A that firms in high dynamism will outperform firms in low dynamism industried when announcing appointments of CxO, which is a different finding than (Chatterjee et al., 2001; Hu et al., 2014).

The above-partitioned event study results examine the Day 0 abnormal returns by position, period, and industry dynamism, individually. To examine the Day 0 abnormal returns using a more robust cross-sectional analysis, an ordinary least squares (OLS) regression analysis is performed using the following model:

$$AR = \beta 0 + \beta 1 * Period + \beta 2 * Role + \beta 3 * IndIntensity + \beta 4 * logta + \beta 5 * MktBook + \beta 6 * ebitda + Controls + E \quad (6)$$

where *AR* is the Day 0 abnormal return; Period is dummy coded for before or after 2009, with years before 2009 as the reference; Role is dummy coded by position with CDigO as the reference; IndIntensity is dummy coded for low or high Industry Intensity, with low intensity as the reference; logta (Log of Total Assets) is the natural logarithm of total assets; Market to Book Ratio(s) is the standardized ratio of the firm's market value to book value; EBITDA(s) is the standardized firms reported earnings before interest, depreciation, and amortization, and Controls are present for the firm's standardized R&D expense as a percentage of total assets and ROA(s) is the standardized Return on Assets. A trimming technique is applied to Day 0 abnormal returns to replace values greater than the ninety-fifth percentile with the ninety-fifth percentile and replace values less than the fifth percentile with the fifth percentile (Ghosh & Vogt, 2012). All non-dummy coded data are centered.

The regression results are presented in Table 12, with a total of 785 observations for announcements of CxO appointments by firms with financial data available within Compustat. The results indicate that the Market to Book Ratio(s) is positive and significant in explaining Day 0 abnormal returns (β=0..084, p<.05), and firm size, as measured by Log of Total Assets, is also positive and significant in explaining Day 0 abnormal returns (β=0.1180, p<.05). The period of firm announcements is not a significant predictor of abnormal returns, as announcements occurring during or after 2009 are not significantly different from firm announcements before 2009. The CxO role is not a significant predictor of abnormal returns, and when compared against the reference role of CDigO, announcements for CINO, CIO, CTO, and CDatO do not produce significantly different results. R&D spending as a percent of Total Assets is also not a significant predictor of abnormal returns, and no difference is found between low and high R&D Dynamism industry groups or between high and low Firm Dynamism. The statistically significant predictors of a positive, beneficial impact of adding a CxO to the TMT are size and market to book value. Both variables indicate the the larger the company with more market value added, the the bigger the benefits.

TABLE 12 - OLS Regression Model - Abnormal Returns Across All CXO Roles

	Dependent Variable - Day 0 AR		
Predictor	Estimate	p	Sig.
Intercept	0.1690	0.4500	
Period - After 2009	0.0910	0.2630	
Role - CINO	-0.3140	0.3320	
Role CIO	-0.1910	0.3850	
Role CTO	-0.0750	0.7380	
Role CDatO	-0.0540	0.9090	
Industry Dynamism - High	-0.1110	0.3570	
Firm Dynamism - High	-0.0250	0.8340	
Log of Total Assets	0.1180	0.0430	**
Market to Book Ratio(s)	0.0840	0.0150	**
EBITDA(s)	-0.0480	0.4400	
R&D Spent / Total Assets(s)	0.0180	0.7100	
ROA(s)	-0.0360	0.3460	
Observations	785		
R2 / R2 adjusted	0.019 / 0.003		
F-statistic: 1.228 on 12 and 772 DF, p-value: 0.259			
Significance Symbols: * p<0.1; ** p<0.05			

6. Discussion and Conclusion

The purpose of this study is to examine the impact of traditional and emerging senior technology leaders as viewed through a firm's symbolic value-enhancing strategies. Studying all CxO roles simultaneously allows for analysis and comparison of results for the traditional roles of CIO and CTO and the emerging roles of CINO, CDatO, and CDigO to better understand the impact each role as measured by market reactions to firm announcements.

A new event study methodology, the Fama-French 5 Factor Model, is used to examine the symbolic value of a firm announcement of the appointment of a CxO and finds significantly negative abnormal returns resulting in the rejection of both null and alternative hypotheses H1. No difference was found between new and existing announcements, supporting H2. Although previous research has suggested there is a difference between firms in High and Low Dynamism industry with CxOs, no statistically significant results are found testing Hypothesis 3. The results suggest the market interprets the symbolic firm announcement of a CxO appointment as a sign of uncertainty.

According to ST, the firm announcement of an appointment of a CxO represents a firm choice to send a signal to investors of the importance of technology-related initiatives to the firm and the strategic decision regarding the role charged with driving these initiatives; investors interpret this signal and make value judgments that will be quickly reflected in the stock price (Fama, 1970). It seems reasonable that if the announcement is perceived as a positive strategic move to enhance firm performance, the market is expected to react positively. If the announcement is perceived as a negative strategic move, or a sign of instability, risk, or an internal problem, the market is expected to react negatively. The significant negative abnormal returns in this study strongly suggest that investors interpret the announcement of the appointment of a CxO with skepticism and not as a value-enhancing decision. In financial market parlance, it is a "risk-on" event. Assuming the market is efficient, the negative results provide evidence that achieving competitive advantage and improved firm performance through technology-related strategies involves more than the technology itself. These negative results conflict with prior research that finds generally positive results (i.e.Banker et al., 2011a; Chatterjee et al., 2001; Drechsler et al., 2019; Zhan et al., 2020) from firm announcements of initiating specific CxO positions. These results are further confirmed when examining individual CxO roles.

Why do firms select a specific CxO role to place in their TMT? The literature suggests firms may do so as a result of lack of desired progress in advancing technology initiatives (Weill & Woerner, 2013), or perhaps these moves reflect a herd mentality and the firm following broader industry trends (Gartner, 2016). The growing number of CxO titles is an interesting trend and examining the impact across all the CxOs roles is an important empirical experiment to better understand which of these roles contribute to a firm's value-enhancing strategies.

The results by individual CxO title yield interesting findings that largely conflict with prior research. Results in this study show that the market differentiates among firm announcements by CxO title. The market reacts negatively to firm announcements for the CIO and CTO roles. The firm announcement of a CxO appointment appears to be perceived as a sign of potential instability, and therefore a risk to the important business/technology integration influenced by these important roles.

The market reactions conflict with generally positive market reactions to CIO announcements in previous, smaller sample studies (Banker et al., 2011a; Chatterjee et al., 2001; Khallaf & Skantz, 2007). The CDigO and CDatO roles are smaller in number and relatively new among the CxOs, and neither role is shown to enhance firm performance. The market showed no reaction to the firm announcement of a CDigO but showed significantly negative reactions to the firm announcement of a CDatO. The market seems to acknowledge the importance of a business/systems integration in firms that successfully leverage technology as a competitive advantage and the technology-focused role of CDatO is negatively perceived by investors. Prior studies reported positive market reactions for the announcement of a CDigO in the early years (Drechsler et al., 2019), but negative market reactions when a CIO also existed (Zhan et al., 2020) or the appointed individual possessed a STEM background (Drechsler et al., 2019).

The mixed results when comparing market reactions or firm performance differences to prior studies may be due to the larger large sample size used in this research compared to others, and to the use of the more sophisticated FF5 model which has been found to yield a more accurate reflection of the market reaction to the announcement events.

The results strongly support the notion that deriving value from IT investments involves more than technology. To develop IT as a competitive advantage, a successful CxO must develop IT assets, ensure a strong business/systems integration by aligning IT investments with business strategies, and become a strategic business partner with the members of the TMT. The negative abnormal returns from this study suggest the market is efficient and recognizes these challenges and views the firm announcement as a signal of possible instability in the role of critical IT leadership in the TMT of the firm.

Works Citation

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