Information Conveyed in Hiring Announcements of Senior Executives Overseeing Enterprise-Wide Risk Management Processes

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ABSTRACT

Enterprise risk management (ERM) is the process of analyzing the portfolio of risks facing the enterprise to ensure that the combined effect of such risks is within an acceptable tolerance. While more firms are adopting ERM, little academic research exists about the costs and benefits of ERM. Proponents of ERM claim that ERM is designed to enhance shareholder value; however, portfolio theory suggests that costly ERM implementation would be unwelcome by shareholders who can use less costly diversification to eliminate idiosyncratic risk. This study examines equity market reactions to announcements of appointments of senior executive officers overseeing the enterprise's risk management processes. Based on a sample of 120 announcements from 1992-2003, we find that the univariate average two-day market response is not significant, suggesting that a general definitive statement about the benefit or cost of implementing ERM is not possible. However, our multiple regression analysis reveals that there are significant relations between the magnitude of equity market returns and certain firm specific characteristics. For non-financial firms, announcement period returns are positively associated with firm size and the volatility of prior periods' reported earnings and negatively associated with leverage and the extent of cash on hand relative to liabilities. For financial firms, however, there are fewer statistical associations between announcement returns and firm characteristics. These results suggest that the costs and benefits of ERM are firm-specific.

Subject Areas: Enterprise risk management, chief risk officers (CROs), value creation

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1. INTRODUCTION

In this paper we examine the impact of the adoption of Enterprise Risk Management (ERM) on shareholder wealth. ERM differs from traditional risk management, where risks are managed individually, and instead, uses a holistic, top-down approach to manage risks across the enterprise (Kleffner et. al., 2003). ERM is designed to ensure that the entity's risk profile is within the stakeholders' risk tolerances (Beasley et. al., 2005), while protecting and enhancing shareholder value (COSO, 2004).

While there has been significant growth in the number of ERM implementations, we do not have a clear understanding of the impact of ERM on shareholder wealth. In fact, little research has sought to challenge the commonly held view that ERM provides a significant opportunity for competitive advantage (Stroh, 2005).[1] While there are theoretical reasons why ERM may increase or decrease shareholder value, these reasons depend upon the characteristics of the individual firm, suggesting that a definitive statement about the benefits or costs of ERM is not possible.

The view that ERM may be value destroying stems from modern portfolio theory, which assumes that shareholders, through portfolio diversification, can eliminate idiosyncratic risks in a virtually costless manner. Therefore, any expenditure by the firm on trying to reduce this

[1] For existing research on the stages of ERM deployments see: Tufano (1996), Colquitt et al. (1999), Liebenberg and Hoyt (2003) and Beasley et. al. (2005)

idiosyncratic risk represents a negative net present value project. This view relies on the assumption that capital markets work without frictions and imperfections.

When the possibility of such frictions and imperfections is introduced, a role for ERM in value creation emerges. Stulz (1996, 2003) argues that firms should engage in ERM to protect corporate assets from the risk of lower tail earnings outcomes where the result of these outcomes would be a real destruction in shareholder value. Stulz argues that the factors that determine whether a firm will benefit from ERM depend upon the likelihood of a lower tail earnings outcomes and the amount of firm value that might be lost in the resulting potential financial distress. Firms with high leverage, limited cash reserves and volatile earnings should benefit from ERM, as these firms are more likely to face financial distress. Firms that have growth options, high levels of R&D and opaque assets have significant amounts of firm value tied to yet unrealized cash flows. In the case of financial distress, these future investments may be unfunded, and substantial firm value may be forgone. Furthermore the value of these assets is likely to be understated in forced liquidations and asset sales. Firms with opaque assets and volatile earnings may also find it harder to access external capital markets to supplement cash flows.

We therefore expect firms with more leverage, lower cash reserves, more volatile earnings, more opaque assets, and greater growth options to benefit from ERM. We measure benefit to shareholders by examining the abnormal return surrounding the appointment of a CRO, an event that is frequently linked to ERM adoption.

Using a sample of 120 firms announcing the appointment of a senior executive overseeing the enterprise's risk management processes from 1992-2003, we find that the

univariate average two-day market response is not significant, suggesting that a general statement about the benefit or cost of implementing ERM across all types of entities is not possible. However, our multiple regression analysis finds significant relations between the magnitude of equity market returns and certain firm specific characteristics. For the non-financial firms in our sample, announcement period returns are positively associated with firm size and the volatility of prior periods' reported earnings and negatively associated with cash on hand relative to liabilities and leverage, while controlling for changes in beta that occur after ERM adoptions. These associations are consistent with ERM adding value for firms in which there are real costs to shareholders from idiosyncratic risks. For financial firms, however, there are fewer statistical associations between announcement returns and firm characteristics. This lack of a result may be due to these firms having been engaged in ERM prior to their appointment of a CRO, or it could also be a function of regulatory and rating agency demands for ERM for financial institutions (Basel, 2003; Standard & Poor's, 2005). Our results indicate that the benefits of ERM are not equal across firms, but are dependent on certain firm-specific characteristics.

The paper proceeds as follows: section 2 provides background on the evolution of ERM and develops our hypotheses, section 3 describes the data and methodology, section 4 presents the results, and section 5 concludes and suggests areas for future research.

2. BACKGROUND AND HYPOTHESES DEVELOPMENT

The rapid emergence of ERM is being driven by pressure from a range of sources. For example, the New York Stock Exchange's final corporate governance rules now require audit committees to "discuss guidelines and policies to govern the process by which risk assessment

and management is undertaken" (NYSE, 2004). Section 409 of the Sarbanes Oxley Act of 2002 requires public companies to disclose to the public "on a rapid and current basis such additional information concerning material changes in the financial condition or operations of the issuer, in plain English, which may include trend and qualitative information" (SOX, 2002). Some have interpreted this increased emphasis on transparency and completeness of disclosures of trend and other qualitative information as increasing the need for more robust enterprise-wide risk management processes to ensure there is a process in place to meet these expanding disclosure expectations. In addition, the emerging regulatory capital framework, known as Basel II, expands risk management requirements for financial institutions to include oversight of operational risks in addition to credit and market risks as part of their capital adequacy determinations (Basel, 2003). In response to these requirements, financial institutions are embracing ERM to manage risks across the entity. Rating agencies, such as Standard and Poor's and Moody's, are also examining how managers are controlling and tracking the risks facing their enterprises (Samanta et al., 2005; Standard & Poor's, 2005). These rating agencies have publicly reported their explicit focus on ERM activities in the financial services, insurance, and energy industries.

One of the challenges associated with ERM implementation is determining the appropriate leadership structure to manage the identification, assessment, measurement, and response to all types of risks that arise across the enterprise. For ERM to be successful, it is critical that the whole organization understand why ERM creates value (Necco and Stulz, 2006). There is a prevailing view that an ERM initiative cannot succeed, because of its scope and impact, without strong support in the organization at the senior management level with direct

reporting to the chief executive officer or chief financial officer (Walker, et. al. 2002). Without senior management leadership of the entity-wide risk management processes, cultural differences in risk management assessments and responses across business units lead to inconsistencies in risk management practices across the enterprise (COSO, 2004). Senior executive leadership over ERM helps communicate and integrate the entity's risk philosophy and strategy towards risk management consistently throughout the enterprise.

To respond to this challenge, many organizations are appointing a member of the senior executive team, often referred to as the chief risk officer or CRO, to oversee the enterprise's risk management process (The Economist Intelligence Unit, 2005). Indeed, some argue that the appointment of a chief risk officer is being used to signal both internally and externally that senior management and the board is serious about integrating all of its risk management activities under a more powerful senior-level executive (Lam, 2001). In fact, rating agencies, such as Standard and Poor's, explicitly evaluate organizational structure and authority of the risk management function as part of their assessment of strength and independence of the risk management function (Standard & Poor's, 2005).

Recent empirical research documents that the presence of a CRO is associated with a greater stage of ERM deployment within an enterprise, suggesting that the appointment of senior executive leadership affects the extent to which ERM is embraced within an enterprise (Beasley et. al., 2005). Despite the growth in the appointment of senior risk executives, little is known about factors that affect an organization's decision to appoint a CRO or equivalent, and whether these appointments create value.

Evidence from previous research examining a small sample of firms (n = 26) appointing chief risk officers and a matched control sample finds that firms with greater financial leverage are more likely to appoint a CRO (Liebenberg and Hoyt, 2003). This finding is argued to be consistent with the hypothesis that firms appoint CROs to reduce information asymmetry between managers and shareholders regarding the firm's current and expected risk profile, thus suggesting shareholders should value CRO appointments.

This study extends the work of Liebenberg and Hoyt (2003) by examining the equity market response to the firm's announcement of the hiring of a senior executive overseeing risk management. To our knowledge, previous research has not investigated explanations for the observed cross-sectional differences in the magnitude of the stock price response to the CRO hiring announcement. Because corporations disclose only minimal details of their risk management programs (Tufano, 1996), our focus on hiring announcements of senior risk officers attempts to measure the valuation impact of the firm's signaling of an enterprise risk management process.

The basic premise that ERM is a value creating activity actually runs counter to modern portfolio theory. Portfolio theory shows that under certain assumptions, investors can fully diversify away all firm (or idiosyncratic) risk (Markowitz, 1952).[2] This diversification can be achieved costlessly by randomly adding stocks to an investment portfolio. Because investors can diversify away firm-specific risk, they should not be compensated for bearing such risk (for example, risks associated with holding an undiversified portfolio). As a result, investors should not value costly attempts by firms to reduce firm-specific risk, given an investor's costless ability

[2] See Markowitz (1952) although the number of papers that have extended this early seminal work is extensive.

to eliminate this type of risk. Thus, under modern portfolio theory, any expenditure on risk management is value destroying and should be negatively perceived by investors.

While portfolio theory might suggest a lack of value associated with ERM implementation, markets do not always operate in the manner presented by Markowitz (1952). Stulz (1996, 2003) presents arguments under which risk management activities could be value increasing for shareholders in the presence of agency costs and market imperfections. The motivation behind Stulz's work is to reconcile the apparent conflict between current wide-spread corporate embrace of risk management practices and modern portfolio theory.

Stulz (1996, 2003) argues that any potential value creation role for risk management is in the reduction or elimination of "costly lower-tail outcomes." Lower tail outcomes are those events in which a decline in earnings or a large loss would result in severe negative consequences for the firm. Thus, when a firm is faced with the likelihood of lower tail outcomes, engaging in risk management that reduces the likelihood of real costs associated with such outcomes could represent a positive net present value project. Only firms facing an increased likelihood of these actual negative consequences associated with lower tail events will benefit from risk management, while other firms not facing such events will see no benefit at all (Stulz, 1996, 2003), and indeed could be destroying value by engaging in costly risk management.

Costs associated with lower tail events can be significant, calling for greater risk management activities as the likelihood of such occurrences increases. Events such as bankruptcy and financial distress involve direct cost outlays such as payments to lawyers and courts. These events involve indirect costs as well, such as an inability to pursue strategic

projects, loss of customer confidence, and inability to realize the full value of intangible assets. Costs to shareholders can also include a decline in debt ratings and the higher borrowing costs that result. Shareholders may also bear indirect costs associated with the impact of lower tail outcomes on other stakeholders. For example, managers and key employees of public firms have an undiversifiable stake in the firm, and will bear a greater proportion of the cost of a lower tail event. Assuming an efficient labor market, employees will demand higher compensation for their risk bearing, and this higher compensation cost will result in lower cash flows to equity holders.[3] Other stakeholders may be adversely affected by financial distress – for example, suppliers may be reluctant to enter into long term contracts with the firm if the potential for future payment is uncertain, and higher supplier costs will hurt shareholder value. As the likelihood of these occurrences increases, the potential benefit from enterprise risk management increases also.

We assume that the hiring of a chief risk officer implies that the firm is implementing an ERM program and will expend some effort, and more importantly, corporate resources, on methods of reducing the likelihood of these lower-tailed events. The idea that ERM is not costless is important to our study. A costless ERM program that reduces earnings variability but not the mean level of earnings is likely to be viewed by shareholders as harmless at worse and perhaps beneficial. A costly ERM program may actually be harmful if the value benefits of the risk reductions do not offset the costs of securing the risk reductions.

The assumption that CRO appointments signal adoption of ERM is fundamental to our study, and it is worth exploring the reasons why a firm might appoint a CRO. First, the

[3] Although we do not specifically address managerial characteristics in our tests, we discuss their potential impact in section 5.

appointment may by due to the position being created for the first time, and in this case it would seem reasonable to assume that the firm has started paying more attention to ERM. Second, it could be that the CRO appointment is a replacement of an existing CRO. In this case it is not clear whether ERM adoption has already taken place or is currently underway. Finally, a CRO appointment may be little more than a title change that more accurately reflects a manager's responsibility, where the manager has already been heavily engaged in ERM. Out of these three possibilities, it is only the first that could reasonably be relied upon as a signal of first-time ERM adoption. To the extent that CRO appointments may be due to all three of these reasons, tests that use CRO appointments will be biased towards the null of finding no effect because of the noise introduced by the second and third reasons.

Our study of equity market responses to announcements of appointments of CROs builds upon Stulz (1996, 2003) to examine firm-specific variables that reflect the firm's likelihood of experiencing a lower-tailed event. These variables reflect firm-specific factors that finance theory suggests should explain the value effects of corporate risk management. These variables are described more fully below, and include several factors that may impact earnings volatility such as the extent of the firm's growth options, intangible assets, cash reserves, earnings volatility, leverage, and firm size, while also controlling for possible revisions in the firm's beta.

While the focus of our paper is on firm characteristics and their influence on the market reaction to ERM adoption, we have specifically not included managerial characteristics in our analysis. The effect of managerial characteristics is a potentially very interesting area of future research, but beyond the scope of the current paper. We discuss the potential impact of managerial characteristics in section 5 of the paper.

***Growth Options*.** Firms with extensive growth options require consistent capital investment and may face greater asymmetric information regarding their future earnings (Myers, 1984; Myers and Majluf, 1984). When in financial distress, growth options are likely to be undervalued and that distress may lead to underinvestment in profitable growth opportunities. When growth firms have limited access to financial markets, they may face higher costs in raising external capital, perhaps due to the asymmetric information surrounding these growth options, in a period of time when steadier streams of cash flows are desired (see Froot, Scharfstein, and Stein, 1993; Gay and Nam, 1998). We hypothesize that the firms with greater growth options will have a positive abnormal return around hiring announcements of CROs.

Hypothesis 1: *Ceteris paribus, the market reaction to firm announcements of appointments of CROs will be positively associated with the firm's growth options.*

Intangible Assets. Firms that have more opaque assets, such as goodwill, are more likely to benefit from an ERM program because these assets are likely to be undervalued in times of financial distress (Smith and Stulz, 1985). Although this benefit directly accrues to debtholders, stockholders should benefit through lower interest expense charged by the debtholders. Nance, Smith and Smithson (1993), Geczy, Minton and Schrand (1997) and Dolde (1995) find that firms with high levels of research and development expense (often correlated with creation of intangible assets) are more likely to use derivatives to hedge risk. Conversely, Mian (1996) finds no relation between market-to-book (a common proxy for intangibles) and derivative use. We hypothesize that the firms with a large amount of intangible assets will have a positive abnormal return around hiring announcements of CROs:

Hypothesis 2: *Ceteris paribus, the market reaction to firm announcements of appointments of CROs will be positively associated with the firm's amount of intangible assets.*

Cash Ratio Firms with greater amounts of cash on hand (as defined as cash/total liabilities) are less likely to benefit from a enterprise risk management program, as these firms can protect themselves against a liquidity crisis that might result from some lower tail outcomes. Froot, Scharfstein and Stein (1993) show that a firm's hedging activity can be value creating if it ensures that the firm has sufficient cash flow to invest in positive NPV projects. However, Tufano (1996) argues that cash flow hedging can create agency conflicts if managers are able to pursue projects without the discipline of external capital markets. In addition, less cash on hand can increase the likelihood of financial distress for levered firms (Smith and Stulz, 1985). We hypothesize that firms with greater amounts of cash will have a negative abnormal return around announcements of CRO appointments.

> ***Hypothesis 3:*** *Ceteris paribus, the market reaction to firm announcements of appointments of CROs will be negatively associated with the firm's cash ratio.*

Earnings Volatility. Firms with a history of greater earnings volatility are more likely to benefit from ERM. Firms that have large amounts of earnings volatility have a greater likelihood of seeing a lower tail earnings outcome, missing analysts' earnings forecasts, and violating accounting based debt covenants (Bartov, 1993). In addition, managers may smooth earnings to increase firm's share prices by reducing the potential loss shareholders may suffer when they trade for liquidity reasons (Goel and Thakor, 2003). In an earnings smoothing model, shareholders reduce the price they pay for companies with high earnings volatility. Thus, managers have an incentive to smooth earnings in order to ensure that long-term share price performance is not lower than its true value. We hypothesize that firms experiencing a high

variance of earnings per share (EPS) will have a positive abnormal return around hiring announcements of CROs:

> ***Hypothesis 4:*** *Ceteris paribus, the market reaction to firm announcements of appointments of CROs will be positively associated with the firm's variance in earnings per share (EPS).*

Leverage. Greater financial leverage increases the likelihood of financial distress. Under financial distress, firms are likely to face reductions in debt ratings and consequently higher borrowing costs. Furthermore, many of the rating agencies, such as Moody's and Standard & Poor's, incorporate ERM into their rating methodology (Aabo et. al., 2005; Standard & Poor's, 2005). More robust ERM practices may lead to lower financing costs. We hypothesize that the firms with high leverage will have a positive abnormal return around hiring announcements of CROs:

> ***Hypothesis 5:*** *Ceteris paribus, the market reaction to firm announcements of appointments of CROs will be positively associated with the extent of the firm's leverage.*

Size. Research examining the use of financial derivatives finds that large companies make greater use of derivatives than smaller companies. Such findings confirm the experience of risk management practitioners that the corporate use of derivatives requires considerable upfront investment in personnel, training, and computer hardware and software, which might discourage smaller firms from engaging in their use (Stulz, 2003). Recent calls for ERM adoption in the financial services industry emphasize that ERM adoptions should depend on the size and level of complexity of the institution, with smaller firms applying ERM in less formal and less structured ways (Bies, 2007). Therefore, all else equal, ERM will be less costly for large firms compared to small firms because of economies of scale. We hypothesize that larger firms will have a positive abnormal return around hiring announcements of CROs:

Hypothesis 6: *Ceteris paribus, the market reaction to firm announcements of appointments of CROs will be positively associated with firm size.*

Beta or market risk. If ERM introduction reduces the market risk of the firm (in addition to the idiosyncratic risk), rational stock investors will re-price the stock using a lower cost of capital. This re-pricing will result in an upward revision of the stock price. We therefore control for the possibility that observed price reactions to ERM adoption merely represent the market anticipating reductions in the firm's beta. We hypothesize that a decline in beta around the introduction of ERM will be associated with a positive stock price reaction.[4]

Hypothesis 7: *Ceteris paribus, the market reaction to firm announcements of appointments of CROs will be negatively associated with the change in the firm's beta.*

4. DATA AND METHOD

Our study method examines the impact of firm-specific characteristics on the equity market response to announcements of appointments of CROs within the enterprise. To obtain a sample of such appointments, we conduct a search of hiring announcements of senior risk management executives made during the period 1992-2003. Announcements are obtained by searching the business library of LEXIS-NEXIS for announcements containing the words "announced", "named", or "appointed" in conjunction with position descriptions of "chief risk officer" or "risk management" (consistent with the approach used by Liebenberg and Hoyt (2003)). We searched the period of 1992 through 2003 and identified 348 observations. Each observation is unique to a firm, in that it represents a firm's first announcement during the period searched, subsequent announcements by a firm are excluded. By starting our search in 1992, we hope to capture the initial creation of a CRO position, as the presence of CRO positions became

[4] We thank the referee for suggesting this hypothesis.

more prevalent in the later 1990s. However, as we discussed earlier, if some of these appointments are merely changes in personnel we will not be capturing unique or initial appointments. Contamination of our data set by these noisy observations will serve to bias our results towards finding no effect of CRO appointments.

From this list of 348 observations, we exclude 100 announcements made by private corporations, given the lack of observable financial and operational data needed to test our hypotheses. We exclude an additional 36 announcements made by foreign companies and 46 firms that did not have the required security market data necessary for our analysis. Finally, 46 observations of public companies are dropped for not having the required financial statement data needed for analysis. The final sample includes 120 observations.

Table 1 provides information about our final sample of 120 observations. The data in Table 1 documents the increase in CRO announcements over time. In addition, the sample is concentrated in three industries, financial services (39.2%), insurance (12.5%) and energy services (20.0%). These industries are often cited as being in the forefront of implementation of enterprise risk management (Beasley et. al., 2005). This industry distribution is consistent with other survey data finding that highly regulated industries, such as financial services and insurance, are among the early adopters of enterprise risk management due to growing regulatory calls for ERM (such as Basel, 2003), while manufacturing companies consistently lag more regulated industry sectors (PwC, 2004). Fallout from the Enron debacle has placed greater expectations on energy sector firms to embrace enterprise-wide risk management, as evidenced by energy industry's subsequent formation of the Committee of Chief Risk Officers (CCRO), which is a consortium of chief risk officers formed after the fall of Enron to focus on furthering

ERM best practices in the energy sector. The same three industries are also the focus of rating agencies, such as Standard & Poor's, Moody's, and Fitch that now formally evaluate ERM practices of firms in these industries as part of the credit rating process.

[Insert Table 1 About Here]

Table 2 provides descriptive statistics for the sample. The mean (median) market value of equity, assets and sales, in millions of dollars, are $8,242.1 ($3,008.5), $39,002.1 ($7,347.4) and $8,709.0 ($3,032.3), respectively. Firms in our sample are on average quite large; however, there is a large amount of variance in these size metrics. Each of these variables is measured as of the end of the most recent fiscal year prior to the hiring announcement.

[Insert Table 2 About Here]

Table 2 also contains information about the cumulative abnormal return (CAR) for the event period. We measure the announcement period as the day of the hiring announcement plus the following day. The abnormal return is computed using a three factor market model estimated over the -255 to -46 day window prior to the announcement. The market return is proxied for by the CRSP equally weighted index. The other factors are book-to-market and size as developed by Fama and French (1993).[5] The announcement period return for the entire sample of announcements is -0.001 and is not statistically different from zero. The average CAR indicates that we cannot make a general statement across all types of firms about the benefit (or cost) of implementing ERM, as on average, there is no value effect; however, there is substantial cross sectional variation. For this reason, our study focuses on the cross-sectional firm characteristics that we hypothesize may determine the value of effects of risk management.

[5] Our results are quantitatively unchanged if we use a single factor model to estimate the abnormal returns.

We proxy for the hypotheses of interest using the following independent variables:

Market/Book	=	market to book ratio serves as our proxy for growth options and is computed as the market value of the firm divided by its book value of equity, with both variables measured at the end of the fiscal year prior to the announcement.
Intangibles	=	book value of intangible assets divided by total assets measured at the end of the fiscal year prior to the announcement.
Cash Ratio	=	the amount of cash as reported at the end of the fiscal year-end prior to the announcement divided by total liabilities measured at the end of the fiscal year prior to the announcement.
EPS Vol	=	standard deviation of the change in earnings per share over the eight quarters prior to the announcement.
Leverage	=	total liabilities divided by market value of equity measured at the end of the fiscal year prior to the announcement.
Size	=	the natural logarithm of the firm's market value of equity as measured at the end of the most recent fiscal quarter prior to the announcement.
BetaDiff	=	the beta estimated over the 250 trading days after the appointment less the beta estimated over the 250 trading days prior to the appointment, where the CRSP value weighted return is used as the market proxy.

Due to the large number of financial service firms in our sample we disaggregate our sample into financial service industry firms and non-financial service industry firms. Descriptive information about these two sub-samples is reported in Table 3. The sample of financial service firms is significantly larger in terms of assets and is, not surprisingly, more highly leveraged than the non-financial service firms. Finally, the financial service firms have, on average, reported fewer intangibles as a percentage of total assets and have less variable earnings per share than the sample of non-financial service firms.

[Insert Table 3 About Here]

Table 4 presents correlations of our main variables. We observe a significant negative correlation between the cash ratio and the announcement return, CAR. This relation is consistent with our hypothesis that the market will view ERM for firms that can buffer risky outcomes with cash as wealth destroying. We also observe a positive relation between Size and CAR, suggesting the ERM implementation is valued more at larger firms. A few other correlations are worth noting. First, the positive correlation between EPS Vol and Market to book value is consistent with high growth firms being more risky. EPS Vol is also greater for firms with more leverage. The negative relation between Intangibles and Leverage is consistent with debt frequently being secured against tangible assets. In general these correlations conform to our expectations.

[Insert Table 4 About Here]

To examine whether there are cross sectional differences in our hypothesized associations between firm-specific characteristics and the equity market reaction to announcements of CRO appointments, we use multiple regression analysis. Specifically, the general form of the model is the following (firm subscripts are omitted):

$$\begin{aligned} CAR(0,+1) = {} & a_0 + a_1 \text{Market/Book} + a_2 \text{Intangibles} + a_3 \text{Cash Ratio} + a_4 \text{EPS Vol} + \\ & a_5 \text{Leverage} + a_6 \text{Size} + a_7 \text{BetaDiff} + e \end{aligned} \quad (1)$$

We expect to observe a positive association between the event period abnormal return and the market to book value ratio, the level of intangible ("opaque") assets, earnings volatility, leverage, and firm size. We expect to observe a negative association between the event period abnormal return and the firms' cash ratio. We are agnostic about the significance of BetaDiff,

but if this variable is significant, we expect it to be negatively related to returns. The next section presents the results of our multiple regression analysis as defined by equation (1).

4. RESULTS

Table 5 presents the results based on multiple regression analysis where the dependent variable represents the cumulative abnormal return for the announcement period regressed on our seven variables of interest for the full sample of 120 observations. The F-Value of model is 3.11, which is significant at the 0.005 level and the Adjusted R^2 is 0.111.

[Insert Table 5 about here]

Consistent with our second hypothesis, we find a significantly negative relationship between the event period cumulative abnormal return and the cash ratio. The primary inference from the regression results is that investors view negatively the implementation of ERM programs for firms with large amounts of cash on hand. This result is consistent with financial theory that suggests firms that have large cash reserves are less likely to suffer financial distress and thus have less need to manage risks related to future financial problems. Thus, our results support Hypothesis 2.

In contrast, we do not observe statistically significant associations between the event period cumulative abnormal return and our measures for Market to book, Intangibles, EPS Vol and Leverage. These results suggest that the extent of growth opportunities, holdings of intangible assets, recent earnings volatility and capital structure do not impact the information content of senior executive hiring announcements. Thus, Hypotheses 1, 3, 4 and 5 are not supported by our full sample.

We find a positive association between the event period cumulative abnormal return and the firm's Size. This finding is consistent with our expectation as stated in Hypothesis 6 that larger firms are more likely to benefit from risk management activities than smaller firms. Finally we find no significant relation between BetaDiff and returns.

As indicated by Table 1, a large portion (39.1%) of our sample is in the financial services industries. Due to the nature of risks facing financial services firms, such as credit and market risks, such institutions have incorporated risk management practices as part of their day-to-day management processes. Regulatory expectations that financial services firms effectively manage credit and market risk have been in place for decades. In recent years, there have been greater calls for financial institutions to expand their risk oversight activities to include broader categories of risks threatening operations (Basel, 2003; Bies, 2004; Samanta et al., 2005). New regulations issued by the Bank of International Settlements, a global association of banking regulators, require that financial services firms adopt broader enterprise wide risk management processes to determine capital reserve requirements (Basel, 2003). Additionally, many of the rating agencies, such as Moody's and Standard & Poor's, have recently launched programs for incorporating information about ERM practices in their overall rating assessments by first focusing on entities in the financial services industry (Standard & Poor's, 2005). Calls for expanding traditional credit and trading risk management practices in financial services firms to broader enterprise-wide risk management approaches to risk oversight continue (Bies, 2007). As a result, financial services firms may have already begun engaging in ERM before the CRO appointment, which may bias against findings related to our seven hypotheses for these firms.

To examine whether the predicted associations described by our hypotheses are supported for firms in the financial services firms, we conducted our same multiple regression analysis for the sub-set of firms (n = 47) that are in the financial services industry. We also conducted the same analysis for the remaining subset of firms not in the financial services industry (n = 73). The results of this analysis are reported separately in Table 6.

[Insert Table 6 about here]

We find that the cash ratio, leverage and BetaDiff variables are found to be significantly associated with the market reaction to announcements of appointments of CROs for the financial services firms in our sample, while the overall model is not significant (F-Value of 1.32, p = 0.266). These results indicate that firms with less cash and more leverage are likely to see benefits from ERM. Additionally, the negative coefficient on Beta Diff indicates that a reduction in beta is associated with a positive price reaction.

The results shown in Table 6 for the sub-sample of firms in industries other than financial services indicate that, in the absence of regulatory expectations, several of the firm's financial characteristics may explain the firm's value enhancement due to ERM adoption. Our overall model is significant (p = 0.001), with an F-Value of 5.66 and R^2 of 0.279.

For our non-financial firms (n = 73), we find that announcement period market returns are positively associated with the firm's prior earnings volatility and size, while negatively associated with the extent of cash on hand and leverage. There is no statistical association between the announcement period returns and the firm's growth, extent of intangible assets, or change in beta.

While the results for earnings volatility, size and cash on hand are consistent with our expectations, the findings for leverage are opposite our expectations. One explanation for this result is that shareholders of highly leveraged firms may not want risk reduction as it reduces the value of the option written to them by debtholders. In this case, the option value outweighs the dead weight costs of bankruptcy that increase with leverage. Our finding is consistent with Hoyt and Liebenberg (2006) who find the extent of ERM usage is negatively associated with the extent of leverage.

The results for our two sub-samples suggest that results for the full sample of announcement firms examined in Table 5 are driven mostly by the non-financial services firms, suggesting that key financial characteristics drive stockholder value of ERM related processes for firms outside financial services, while regulatory or other demands for risk management affect those processes in the financial services sector.

5. CONCLUSION AND LIMITATIONS

This study provides evidence on how the perceived value of enterprise risk management processes varies across companies. While ERM practices are being widely embraced within the corporate sector, not all organizations are embracing those practices and little academic research exists about the benefits and costs of ERM. On average, we find no aggregate significant market reaction to the hiring of CROs for either the financial service or non-financial service firms. This result suggests that we cannot make any broad claims about ERM benefits or costs to shareholders across a wide range of firms.

The absence of an average market reaction for our entire sample does not mean that the market is not reacting. In cross section analysis, we find that a firm's shareholders respond

largely in accordance with our expectations and value ERM where the program can enhance value by overcoming market distortions or agency costs. Specifically, we find that shareholders of large firms that have little cash on hand value ERM. Furthermore, shareholders of large non-financial firms, with volatile earnings, low amounts of leverage and low amounts of cash on hand also react favorably to the implementation of ERM. These findings are consistent with the idea that a well implemented ERM program can create value when it reduces the likelihood of costly lower tail outcomes, such as financial distress.

Despite providing some insights into the value of ERM adoption, there are limitations to our study. First, while we are able to observe announcements of appointments of senior executives overseeing risk management practices, we are unable to directly observe the extent to which the related firms actually embrace ERM. Further study of more specific announcements about ERM activities is therefore warranted. Second, we are only able to measure short-term reactions to these CRO announcements and cannot provide insight into the long term value of ERM. For example, ERM adoption may have an impact on longer-term future cash flows by affecting the rigor of the evaluation process related to the nature and types of investment projects selected in the future. We believe long-term benefits, such as the impact on future cash flows, provides an interesting opportunity for further empirical research. Third, we only measure equity market reactions and as a result, we do not provide any evidence of ERM's value to other stakeholders, such as creditors, employees, suppliers, among others. Fourth, we do not know whether ERM processes lead to greater transparency about risks to stakeholders. For a subset of our sample firms, we reviewed their financial statement disclosures in public filings and saw no increase in risk-related disclosures before and after the CRO announcements. We believe,

however, that determination of how ERM impacts risk reporting to stakeholders represents an avenue of future research.

Finally, we have not addressed the issue of managerial characteristics on ERM adoption. Managers hold an undiversified stake in their company as all of their labor capital is tied up in the firm. In addition many managers receive equity based compensation resulting in his/her personal portfolio being over weighted in the firm's stock, and thus undiversified. Managerial preferences for ERM may depend on the manager's compensation. For example, a manager that only receives salary based compensation may favor smoother earnings over a higher stock value, if the latter is associated with more volatility. In this case the manager would favor ERM adoption.

The issue is less clear for managers with stock based compensation or share ownership in the firm. In this case the manager may hold an undiversified portfolio and would favor ERM as a means to reduce his overall portfolio risk. However, for levered firms, equity can be viewed as a call option on the firm's assets, and this option value is increasing in the volatility of the value of the firm's assets. Therefore, the impact of managerial stock ownership is unclear as managers could either favor or eschew ERM. For managers with option grants, the value of these options will be increasing in the volatility of the firm's equity, and managers who seek to increase the value of their options would also avoid ERM. However, if managers view in the money options as equity substitutes, and wish to reduce their portfolio risk, they would favor ERM.

The role of managerial compensation is further complicated by board structure and the endogenous relation between firm characteristics such as leverage, industry and managerial

compensation. We therefore leave the subject of ERM adoption and managerial characteristics as an important topic for future research.

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Table 1
Sample Statistics for Industry and Year

Year of Announcement	Financial Industry	Insurance Industry	Energy Industry	Miscellaneous	Totals
1992	5	0	0	3	8
1993	2	0	1	4	7
1994	1	1	1	3	6
1995	3	1	2	4	10
1996	4	2	3	2	11
1997	3	0	2	0	5
1998	3	1	1	3	8
1999	3	2	1	3	9
2000	2	2	2	4	10
2001	10	1	5	3	19
2002	3	3	3	3	12
2003	8	2	3	2	15
TOTAL	**47**	**15**	**24**	**34**	**120**

Table 2
Descriptive Statistics – Full Sample

Variable	N	Mean	Median	Standard Deviation	Minimum	Maximum
Size Metrics:						
Assets	120	39,002.1	7,347.4	82,624.0	18.2	616,064.1
Liabilities	120	35,339.5	5,300.5	78,712.0	0.2	594,494.6
MVE	120	8,242.1	3,008.5	14,609.0	8.0	93,259.6
BVE	120	3,662.7	1,816.3	5,383.0	7.6	33,705.1
Sales	120	8,709.0	3,032.3	19,743.0	19.3	162.558.0
Independent Variable:						
CAR	120	-0.001	-0.002	0.032	-0.100	0.111
Hypothesized Variables of Interest:						
Market/Book	120	2.291	1.824	3.013	0.256	27.540
Intangibles	120	0.058	0.014	0.104	0.000	0.564
Cash Ratio	120	40.136	0.060	0.242	0.001	1.710
EPS Vol	120	9.414	1.421	38.719	0.022	288.35
Leverage	120	6.084	2.197	10.642	0.002	74.867
Size	120	8.765	8.902	2.223	2.901	13.331
BetaDiff	120	0.044	0.021	0.436	-1.061	1.203

Where; Assets = the amount of total assets as reported at the end of the fiscal year-end prior to the announcement, in million of dollars. Liabilities = the amount of total liabilities as reported at the end of the fiscal year-end prior to the announcement, in million of dollars. MVE = the market value of equity at the end of the most recent fiscal quarter prior to the announcement, in million of dollars. BVE = the book value of equity at the end of the fiscal year-end prior to the announcement, in million of dollars. Sales = the amount of sales in the year prior to the announcement, in millions of dollars. CAR = the cumulative abnormal return for the event period, the announcement day plus the following day, computed using the Fama-French three factor model. Market/Book = the market value of the firm divided by its book value of equity reported at the end of the fiscal year-end prior to the announcement. Intangibles = book value of intangible assets divided by total assets reported at the end of the fiscal year-end prior to the announcement. Cash Ratio = the amount of cash as reported at the end of the fiscal year-end prior to the announcement divided by total liabilities. EPSVol = the standard deviation of the change in earnings per share over the eight quarters prior to the announcement. Leverage = total liabilities divided by market value of equity reported at the end of the fiscal year-end prior to the announcement. Size = the natural logarithm of MVE at the end of the fiscal year-end prior to the announcement. BetaDiff = the beta after the announcement less beta before the CRO announcement.

Table 3
Descriptive Statistics - Sub-samples of Financial and Non-Financial Firms

Panel A: Financial Firms

	N	Mean	Median	Standard Deviation	Minimum	Maximum
Size Metrics:						
Assets	47	75,888.6	33,703.8	115,458.0	18.2	616,064.1
Liabilities	47	71,424.3	30.774.8	110.674.0	4.7	594,494.6
MVE	47	10,633.2	3,736.8	15,860.0	10.0	72,847.1
BVE	47	4,464.3	2,166.6	5,357.0	13.5	21,569.5
Sales	47	7,587.7	2,996.2	11,878.0	19.3	66,070.2
Independent Variable:						
CAR	47	0.003	0.001	0.031	-0.052	0.111
Hypothesized Variables of Interest:						
Market/Book	47	2.067	1.806	1.540	0.333	9.295
Intangibles	47	0.023	0.010	0.050	0.000	0.259
Cash Ratio	47	0.163	0.096	0.231	0.007	1.347
EPSVol	47	7.261	0.597	39.515	0.022	272.020
Leverage	47	11.157	6.602	14.178	0.134	74.867
Size	47	9.681	10.425	2.363	2.900	13.331
BetaDiff	47	0.038	0.019	0.337	-0.554	0.784

Continued on next page.

Table 3
Continued.

Panel B: Non-Financial Firms

	N	Mean	Median	Standard Deviation	Minimum	Maximum
Size Metrics:						
Assets	73	15,253.3	4,017.5	36,145.0	29.0	276,229.0
Liabilities	73	12,106.8	3,308.8	31,893.0	0.2	248,692.0
MVE	73	6,702.6	2,137.6	13,634.0	8.0	93,259.6
BVE	73	3,146.5	1,494.92	5,373.0	7.6	33,705.1
Sales	73	9,431.0	3,307.3	23,510.0	22.3	162,558.0
Independent Variable:						
CAR	73	-0.003	-0.003	0.033	-0.100	0.069
Hypothesized Variables of Interest:						
Market/Book	73	2.436	1.852	3.665	0.256	27.540
Intangibles	73	0.080	0.023	0.122	0.000	0.564
Cash Ratio	73	0.119	0.047	0.249	0.001	1.710
EPSVol	73	10.800	1.972	38.409	0.054	288.335
Leverage	73	2.817	1.315	5.582	0.002	37.440
Size	73	8.175	8.298	1.923	3.367	12.529
BetaDiff	73	0.048	0.040	0.491	-1.061	1.203

Where; Assets = the amount of total assets as reported at the end of the fiscal year-end prior to the announcement, in million of dollars. Liabilities = the amount of total liabilities as reported at the end of the fiscal year-end prior to the announcement, in million of dollars. MVE = the market value of equity at the end of the most recent fiscal quarter prior to the announcement, in million of dollars. BVE = the book value of equity at the end of the fiscal year-end prior to the announcement, in million of dollars. Sales = the amount of sales in the year prior to the announcement, in millions of dollars. CAR = the cumulative abnormal return for the event period, the announcement day plus the following day, computed using the Fama-French three factor model. Market/Book = the market value of the firm divided by its book value of equity reported at the end of the fiscal year-end prior to the announcement. Intangibles = book value of intangible assets divided by total assets reported at the end of the fiscal year-end prior to the announcement. Cash Ratio = the amount of cash as reported at the end of the fiscal year-end prior to the announcement divided by total liabilities. EPSVol = the standard deviation of the change in earnings per share over the eight quarters prior to the announcement. Leverage = total liabilities divided by market value of equity reported at the end of the fiscal year-end prior to the announcement. Size = the natural logarithm of MVE at the end of the fiscal year-end prior to the announcement. BetaDiff = the beta after the announcement less beta before the CRO announcement..

Table 4
Pearson Rank Correlations Between Variables

	Market/ Book	Intangibles	Cash Ratio	EPS Vol	Leverage	Size	BetaDiff
CAR	0.051 (0.58)	-0.005 (0.96)	-0.339 (0.00)	-0.039 (0.67)	0.019 (0.84)	0.265 (0.00)	-0.049 (0.59)
Market/Book		0.134 (0.15)	-0.029 (0.75)	0.199 (0.03)	-0.095 (0.30)	0.058 (0.53)	-0.089 (0.34)
Intangibles			0.147 (0.11)	-0.051 (0.58)	-0.198 (0.030)	-0.230 (<0.01)	0.029 (0.75)
Cash Ratio				-0.044 (0.63)	-0.026 (0.78)	-0.270 (<0.01)	-0.139 (0.13)
EPS Volatility					0.314 (0.00)	-0.115 (0.21)	0.242 (0.01)
Leverage						0.178 (0.05)	0.226 (0.01)
Size							-0.023 (0.81)

Where; CAR = the cumulative abnormal return for the event period, the announcement day plus the following day, computed using the Fama-French three factor model. Market/Book = the market value of the firm divided by its book value of equity reported at the end of the fiscal year-end prior to the announcement. Intangibles = book value of intangible assets divided by total assets reported at the end of the fiscal year-end prior to the announcement. Cash Ratio = the amount of cash as reported at the end of the fiscal year-end prior to the announcement divided by total liabilities. EPSVol = the standard deviation of the change in earnings per share over the eight quarters prior to the announcement. Leverage = total liabilities divided by market value of equity reported at the end of the fiscal year-end prior to the announcement. Size = the natural logarithm of MVE at the end of the fiscal year-end prior to the announcement. BetaDiff = the beta after the announcement less beta before the CRO announcement. Two-tailed probability values are in parentheses.

Table 5
Regression of Firm Specific Variables on Cumulative Abnormal Returns

Variable	Predicted Sign	Parameter Estimate	White T-Stat
Intercept		-0.0216	-1.44
Market/Book	+	0.0002	0.28
Intangibles	+	0.0276	1.03
Cash Ratio	-	-0.0414	-4.62***
EPS Vol	+	0.0000	0.28
Leverage	+	0.0001	0.25
Size	+	0.0028	1.85*
BetaDiff	-	-0.0067	-1.14
N		120	
Adj. R-Squared		11.1%	
F-Value		3.11	
Model Significance		0.005	

Where the dependent variable is CAR, the cumulative abnormal return for the event period, the announcement day plus the following day, computed using the Fama-French three factor model. Market/Book = the market value of the firm divided by its book value of equity reported at the end of the fiscal year-end prior to the announcement. Intangibles = book value of intangible assets divided by total assets reported at the end of the fiscal year-end prior to the announcement. Cash Ratio = the amount of cash as reported at the end of the fiscal year-end prior to the announcement divided by total liabilities. EPSVol = the standard deviation of the change in earnings per share over the eight quarters prior to the announcement. Leverage = total liabilities divided by market value of equity reported at the end of the fiscal year-end prior to the announcement. Size = the natural logarithm of MVE at the end of the fiscal year-end prior to the announcement. BetaDiff = the beta after the announcement less beta before the CRO announcement. ***, **, *, indicates significance at the 1%, 5% and 10% levels

Table 6
Regression of Firm Specific Variables on Cumulative Abnormal Returns: Sub-samples of Financial and Non-Financial Firms

		Financial Firms sub sample		Non-Financial firms sub sample	
Variable	**Predicted Sign**	**Parameter Estimate**	**White T-stat**	**Parameter Estimate**	**White T-stat**
Intercept		-0.0023	-0.08	-0.0322	-1.89*
Market/Book	+	0.0032	2.37	-0.0004	-0.84
Intangibles	+	0.1058	1.07	0.0302	1.36
Cash Ratio	-	-0.0525	-2.82***	-0.0391	-4.02***
EPS Vol	+	0.0000	-1.07	0.0004	3.55***
Leverage	+	0.0006	2.22**	-0.0040	-3.83***
Size	+	-0.0001	-0.03	0.0047	2.55**
BetaDiff	-	-0.0233	-1.85*	0.0036	0.48
N		47		73	
Adj. R-Squared		4.6%		27.1%	
F-Value		1.32		4.81	
Model Significance		0.266		0.001	

Where the dependent variable is CAR, the cumulative abnormal return for the event period, the announcement day plus the following day, computed using the Fama-French three factor model. Market/Book = the market value of the firm divided by its book value of equity reported at the end of the fiscal year-end prior to the announcement. Intangibles = book value of intangible assets divided by total assets reported at the end of the fiscal year-end prior to the announcement. Cash Ratio = the amount of cash as reported at the end of the fiscal year-end prior to the announcement divided by total liabilities. EPSVol = the standard deviation of the change in earnings per share over the eight quarters prior to the announcement. Leverage = total liabilities divided by market value of equity reported at the end of the fiscal year-end prior to the announcement. Size = the natural logarithm of MVE at the end of the fiscal year-end prior to the announcement. BetaDiff = the beta after the announcement less beta before the CRO announcement. ***, **, *, indicates significance at the 1%, 5% and 10% levels