A Comprehensive Approach to Relationship between COSO ERM and Firm Performance in Construction Industry

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ABSTRACT: The construction industry is one of the most dynamic, risky, and challenging businesses. Due to construction projects' complexity and uniqueness, the number of risks present always goes beyond those found in other industries. Therefore, it seems to be rational that risk management to be applied as an integral part of activities in construction industry. Based on the reviewed literature scholars have reported a growth in the use of enterprise risk management among the organization. These scholars generally found that the adoption of an ERM program is positively associated with improved financial performance. Nevertheless, empirical studies conducted to date do not make a general statement about the effect of the program on firm performance. Therefore, the objective of the study is to examine the effect of COSO ERM adoption on firm performance. This study addressed the lack of the empirical studies by developing a comprehensive model to examine the relationship between COSO ERM adoption and firm performance. A quantitative methodology will be used to investigate the correlations paths. Using a cross-sectional survey method, data will be collected from 361 companies in the construction industry across the Iran. Hypothesized relationships will examine using structural equation modelling (SEM) based on Analysis of Moment Structures (AMOS). The indirect exploratory effect of the moderators will be conduct by examining using multi-group analysis (MGA) method. The results of this study can help organizations and academic bodies to expand their knowledge about Keywords: Enterprise risk management (ERM), Committee of Sponsoring Organizations of the Tread way Commission (COSO).

INTRODUCTION

The roots of construction industry can be traced back to the times when human beings tried to build their own shelters in the ancient times. The construction industry is regarded as a vivid indicator of the economy conditions in each country. The considerable impact of this industry on the overall health of the economy makes it an interesting and crucial area of interest for researchers, economists, and policy-makers alike. Construction industry can be extremely complex and fraught with uncertainty. The industry is one of the most dynamic, risky, and challenging businesses. Risk and uncertainty can potentially have damaging consequences for the construction projects (Mills, 2001). Therefore, to achieve the project objectives in this industry, it is necessary to systematically identify, analyze, manage and respond to the risk (Ashworth, 2013). Enterprise risk management (ERM) in business includes the methods and processes used by organizations to manage risks and seize opportunities related to the achievement of their objectives. ERM provides a framework for risk management with typically involves identifying particular events or circumstances relevant to the organization's objective, assessing them in term of likelihood and magnitude of impact, determining a response strategy and monitoring process (Land, 2013). There are many definitions of ERM, but the most widely accepted definition was published in 2004 by the Committee of Sponsoring Organizations of the Tread way Commission (COSO). COSO (2004) defines ERM as a process used in strategy formulating across the firm, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of
entity objectives. ERM provides a holistic approach to understanding, quantifying, and managing the risk of an organization (Board et al., 2012). What is different about ERM is that it abandons the traditional “silo” approach to risk management and aims to measure and manage risk on a portfolio basis (Crouhy et al., 2014). Harris and McCaffer (2013) asserts that enterprise risk management should be an essential element of modern risk management as it provides a strategic view of organizational threats and protects assets from the risk of lower-tail earnings outcomes that would result in real destruction of shareholder value. The assumed benefits of enterprise risk management are enhanced business performance, improved financial results, and risk mitigation (FLOURIS and YILMAZ, 2011). Scholars have reported a growth in the use of ERM among the organization. (MOELLER, 2011). These scholars generally found that the adoption of an ERM program is positively associated with improved financial performance (HOYT and LIEBENBERG, 2011). Nevertheless, empirical studies conducted to date do not make a general statement about the effect of the program on firm perform (MCShane et al., 2011). Therefore, the purpose of the study is to evaluate the relationship between COSOERM and firm performance.

**Literature review**

Risk management has been a widely debated topic from the early days of finance research where it was considered irrelevant (MODIGLIANI and MILLER, 1958) under perfect market conditions. The debate continues today as firms adopt ERM programs and accounting and finance academics begin to investigate their effectiveness. The following discussion covers the evolution of this topic and distinguishes between what we call "TRM" and "ERM".

**Traditional Risk Management (TRM)**

Some finance scholars responded to Modigliani and Miller (1958) risk management irrelevance principle by citing capital market imperfections and proposing theories that explain why risk management can increase firm value. In traditional risk management (TRM) research, scholars propose that the existence of these imperfections allows risks to impose real costs on firms and that risk management can increase firm value by reducing total risk, typically measured as some type of volatility. Researchers have identified various value-increasing benefits of risk management that can generally be classified as reduction in expected costs related to the following: tax payments, financial distress, underinvestment, asymmetric information, and diversifiable stakeholders. Such studies help in understanding the reasons that firms decide to hedge risk and provide a theoretical justification for the link between risk management and firm value. Alayannis et al.(2001) directly investigate the relation between risk management and firm value. Among their sample of large nonfinancial firms with foreign currency exposures, Alayannis et al. (2001) find that firms using foreign currency derivatives had on average, almost a five percent higher firm value than non-users. More studies followed showing a positive relation between risk management, specifically hedging using derivatives, and firm value.

Chowdhry and Howe (1999) argue that derivatives are used to mitigate short-term currency exposures, whereas operational hedges are better suited for handling long-run currency exposures. Later studies examine whether financial and operational hedging are substitutes or complements, and most find evidence of a complementary relationship. Another strand of the finance literature argues that firms should not engage in any effort to manage idiosyncratic risk. Markowitz (1952) work on diversification and portfolio theory, developed the capital asset pricing model (CAPM). In this model, investors are compensated only for bearing systematic (non-diversifiable) risk but not for bearing idiosyncratic (diversifiable) risk. In other words, a firm’s cost of capital should depend only on the firm’s systemic risk, not the total risk of the firm, because investors can eliminate the diversifiable risks of individual firms by holding a well-diversified portfolio. An implication of CAPM is that firms should not use risk management to reduce firm specific risks because investors can eliminate firm idiosyncratic risks through diversification. However, several researchers countered with asset pricing models in which idiosyncratic risk does matter, for example, because investors may hold undiversified portfolios. Froot and Stein (1998) develop a capital allocation/structure model for financial institutions in which information-intensive assets cannot be frictionless hedged. He builds on this model to include customer aversion to insolvency risk, which is an important consideration for financial institutions because their customers typically have a greater concern about solvency risk than do investors. Overall, an implication is that in deciding whether to allocate capital for an investment, the decision should reflect the covariation of the investment’s risk with the firm’s existing portfolio of risks.

**Enterprise Risk Management (ERM)**

Traditionally, risk management has been categorized and uncoordinated within a firm. Risk had been managed in silos with corporate risk managers concentrating on pure risks while the treasury department used derivatives to reduce financial risks, such as interest rate, credit, market, and foreign exchange risk. ERM tries to
handle additional risks such as operational or strategic risks. The goal of ERM is the synchronized management of all risks confronted by a firm, whether it is risk associated to corporate governance, auditing, supply chains, distribution systems, IT, or human resources. Unlike TRM’s silo-based risk management, the motivation behind ERM is to addition a methodical understanding of the interdependencies and connections among risks. A basic idea of ERM is the collecting of risks into portfolios, then hedging the residual risk, which is more proficient and worth boosting than managing each one danger autonomously Applying ideas of portfolio theory, ERM can build firm esteem in light of the fact that the risk of a total portfolio ought to be below than what the whole of the individual risks if the risks are not 100% related, particularly if regular hedges exist. In a call for risk management research that emphasizes on the coordination and strategic allocation of risk, Stulz (1996) proposes that academic theory expand beyond considering that the goal of risk management is variance minimization. In other words, the goal of risk management should not be to reduce total risk, but to allocate risks to play on a firm’s strengths. A basic concept of ERM is that a firm should reduce exposure to risk in areas where it has no comparative information advantage and exploit risks in areas where it has an advantage, meaning that total risk can possibly increase under ERM risk allocation. Schrand and Unal (1998) posit that corporate managers should coordinate risk management activities by hedging exposure to activities in which they are likely to earn zero economic rents (homogeneous risks), such as investments in efficient markets, while increasing exposure to core-business activities (Barney, 1992), in which they enjoy comparative information advantages. Such a coordinated approach can generate a decreasing, neutral, or increasing effect on total firm risk. Since Schrand and Unal (1998), there has been very little work related to coordinated risk management in the Finance literature. Recently, McShane et al. (2011) use insurance industry data to investigate the coordination of risks across completely different functions of the enterprise while controlling for other factors that affect hedging decisions. They consider investments to be a homogenous risk for insurers and underwriting to be a core-business risk and find evidence that insurers are coordinating risk management by hedging investment risk in order to take on more underwriting risk.

**COSO ERM Framework**

The most popular and widely accepted ERM framework was published by COSO in 2004 (Soileau, 2010). The COSO ERM framework defines essential components, suggests a common language, and provides clear direction and guidance for enterprise risk management. The model considers organization objectives in four categories; strategic, operations, reporting and compliance. Moreover, ERM considers organization’s activities in all level including enterprise-level, division, business unit and processes. Furthermore, enterprise risk management requires an organization to take a portfolio and interrelate view to individual risk. In addition, the model provides a guideline on how manager develops a portfolio and holistic view to identify and management of risk in both business unit levels and organizational level. The COSO ERM framework consists of eight core components: 1) Internal environment – The internal environment encompasses the tone of an organization, and sets the basis for how risk is viewed and addressed by an entity’s People, including risk management philosophy and risk appetite, integrity and ethical values, and the environment in which they operate. 2) Objective setting – Objectives must exist before management can identify potential events affecting their achievement. ERM ensures that management has in place a process to set objectives and that the chosen objectives support and align with the organization’s mission and are consistent with its risk appetite.3) Event identification – Internal and external events affecting achievement of an entity’s objectives must be identified, distinguishing between risks and opportunities.4) Risk assessment – Risks are analyzed, considering likelihood and impact, as a basis for determining how they should be managed.5) Risk response – Management selects risk responses – avoiding, accepting, reducing, or sharing risk – developing a set of actions to align risks with the organization’s risk tolerances and risk appetite.6) Control activities – Policies and procedures are established and implemented to help ensure the risk responses are effectively carried out.6) Information and communication – Relevant information is identified, captured, and communicated in a form and timeframe that enable people to carry out their responsibilities.7) Monitoring – The entirety of ERM is monitored and modifications made as necessary. Monitoring is accomplished through ongoing management activities, separate evaluations, or both. According to COSO (2004), ERM is not a serial process, where one of these eight components affects only the next. Almost any component can influence another in a multidirectional and iterative process. This multidirectional process and interaction of components is highlighted in the COSO Cube ERM Framework (see Figure 2.2).
Firm performance

Firm performance is the ultimate dependent variable of interest for researchers concerned with just about any area of management. This broad construct is essential in allowing researchers and managers to evaluate firms over time and compare them to rivals. In short, firm performance is the most important criterion in evaluating organizations, their actions, and environments (Richard et al., 2009). The classical approach to performance measurement, as described by the Sink et al. (1989) model claims that the performance of an organizational is complex interrelationship between six performance criteria: effectiveness, efficiency, quality, productivity, innovation and profitability (Van Aartsengel and Kurtoglu, 2013). In this study firm performance will be measured in the two dimensions; namely financial performance and non-financial performance.

Underline Theory of the Study

The center of this study is overseeing risk of construction projects and asserting that due to unique nature of the projects there is no one best way to manage them. Therefore, choosing contingency theory can be considered as an appropriate theoretical framework for this thesis because the main concept of this theory is in common with the focus of this thesis; the theory rejects the idea that there is one best way for managing. The fact that management situations are not similar clarifies the reason why specific management practices work in some cases but not in others. Much in management and organizational life is situational and these realities of organizational life are what contingency theory has been grown from (Longenecker and Pringle, 1978). Discussing contingency theory within the context of organizational studies, Kast and Rosenzweig (1973) have pointed out that the theory represents a middle ground between: 1) Existence of universal principles for management and organizations 2) Uniqueness of each organization and therefore analyzing each situation separately. This suits the objective of this research where the theory recognizes the complexity involved in managing risk of construction projects but uses patterns of relationship of risks in order to facilitate risk management. Although the contingency approach refuses the existence of “one best way” for managing risk, it proposes that there is one most “appropriate” approach for each specific situation (Contingencies). The word “contingency” indicates how the environment (external source of risk) relates with the system, and determines the activities and construction of an organizational system (Longenecker and Pringle, 1978). Therefore, “one best way” to manage all the construction projects cannot be defined and for this thesis, the most appropriate way in risk management depends on the nature of the environment (Iran) in which the projects are taking place. Improvement in organizational effectiveness is what contingency theory aims at in order to respond to uncertainty in performance. Contingency is mainly generated for removing or decreasing the negative outcomes of unforeseen events. The novelty of contingency theory, as recognized by Steiner (1979), is adaption of a new way to be identified for specific structures and activities which are the most appropriate for the current requirement of the organization. This illustrates that it is no longer suitable to utilize all-purpose theories or one-size-fit-all integrative frameworks in management and studies. So, contingency theory is used in this thesis in order to describe an approach in managing risk of construction projects that best suits the Iran’s current situation. The aim of the contingency theory has been identified as twofold by Ritchie and Marshall (1993): a) Determining the probability of existence of relationships between specific elements in the environment of organizations b) Identification of various organizations’ responses to these elements in order to provide guidelines for other organizations with similar environmental influences (these influences should not be necessarily identical).
The Theoretical Framework in the Study

Thus, the purpose of the study is to examine the effect of enterprise risk management (ERM) on firm performance. Based on Figure 2.3, firm performance, COSO ERM adoption and firm performance respectively are considered as an independent and dependent variable. The COSO’s enterprise risk management - integrated framework adapted to measure the extent to which organizations have adopted ERM processes. This framework was selected because it is the most popular and widely accepted ERM framework (Soileau, 2010). Contingency theory has been utilized to provide a convincing and logic explanation on the relationship between ERM COSO adoption, and firm performance in the construction context. Therefore, according to this explanation, the theoretical framework of research is represented in figure 2.8 as follows:

Hypothesis development
The Relationship between ERM Maturity and Firm Performance

The increasing complexity and range of risks force organizations to recognize their importance in order to achieve the established objectives. The implementation of an enterprise risk management (ERM) framework supports and improves the risk awareness at every level, from strategic to operative, and from top management to employees. ERM cannot be seen as a static one-time process, but it must be embedded in the organization and dynamically adapted to the changing internal and external environment. By adopting a new mindset for governance, organizations can move to applying a risk-based process framework of identify, assess, evaluate, mitigate and monitor within each business process. The risk maturity model assesses the degree to which these activities are pervasive inside business processes. Many executives misinterpret these processes as unique to ERM, when in fact the steps are iterative, constantly reoccurring within organizations but without any defined process or standardizations. In the recent years, Enterprise Risk Management (ERM) has emerged as a new risk management technique aimed to manage the portfolio of risks that faces an organization in an integrated, enterprise-wide manner (Woods, 2012). Unlike traditional risk management, where individual risk categories are managed from a silo-based perspective, ERM involves a holistic view of risks allowing taking into account correlations across all risk classes (Monda and Giorgino, 2013). The academic literature on ERM is focused on two main aspects: the analysis of the factors that influence ERM adoption and its effects on firms’ performances. Scholars have generally failed to address studies to propose robust and rigorous models to evaluate the quality, or maturity, of ERM programs implemented by firms (Monda and Giorgino, 2013). For a deeper understanding and as well as providing scholarly explanation on the relationship between ERM Maturity and Firm Performance the following hypothesis is formulated.

H3: There is a positive relationship between ERM maturity and firm performance.

METHODOLOGY

A quantitative survey methodology using self-administered questionnaires has been adopted to collect data for the constructs proposed in the theoretical model. COSO ERM adoption, firm performance are the constructs of the study. These constructs were operationalized by multi-item measures using 5-point Likert scale, and the items used to measure them were adopted and adapted from previously tested scales. An English version questionnaire
was developed in this study. Since the native language of respondents is not English, the survey tool will be translated to Persian by one bilingual expert.

To ensure that the wording of this questionnaire is clear and understandable and the equivalence of the instrument is met, a pilot study will conduct prior to conducting the final survey. The pilot study is considered necessary to discover any problems in the instrument, and to determine face validity of the measures. Following the pilot study procedures, the final survey will be conducted. In total, 361 questionnaires will be distributed among companies active in the construction industry across Iran. The respondents of the study are project managers. To analyze the data, two statistical techniques will be adopted. The Statistical Package for the Social Sciences (SPSS) version 21 will use to analyze the preliminary data and provide descriptive analyses about the study sample such as means, standard deviations, and frequencies. Structural Equation Modeling (SEM using AMOS 21) using Confirmatory Factor Analysis (CFA) will use to test the measurement model. SEM was conducted using the two steps. The first step includes the assessment of the measurement model, while the second step includes assessment of the structural model. The measurement model stage in this thesis will be conducted in two steps. This involves the assessment of the unidimensionality, followed by the assessment of reliability and validity of the underlying constructs. Reliability will investigate using both the internal consistency measures of Cronbach’s alpha, construct reliability and AVE. Validity criterion construct, including convergent, discriminant and construct validity will also be assessed. Once the scale is developed in stage one, the hypotheses developed in chapter two will be tested in stage two (the structural model).

**Data collection**

This study relies on a self-administered questionnaire that is a set of questions for gathering data from individuals. This method has some advantages in obtaining data in terms of more efficient, time, cost and maintaining participants’ privacy. The target population of this study consists construction industry in IRAN. According to the statistics of President Deputy Strategic Planning and Control Regulations of Iran there are 5,700 eligible companies in construction industries that have been ranked in three levels. The respondents of the study are the project manager of the respondents companies.

**CONCLUSION**

The financial crisis of, which is widely considered the greatest global economic crisis since the great depression of 1929 – 1933, has led to the widespread adoption of ERM. While there has been significant growth in the number of ERM implementations, there still fails to be a clear understanding of the association between ERM and firm performance. This study expands upon previous studies into the financial benefits of ERM Adoption by empirically testing the relationship between ERM adoption, as defined by the COSO ERM framework, and firm performance. The results of this study will be important to the growing research on ERM as previous research has not investigated the relationship between ERM adoption, as defined by the COSO ERM framework, and firm performance. The findings of this study provide new insights to organizations and business leaders as they determine the most effective ways to manage enterprise risks in the future.

**REFERENCES**


