Assessing Employee Affective Commitment as a Mediator on the Relationship between Risk Assessment and Effective Enterprise Risk Management (ERM)

Irzan Ismail*, Nik Mutasim Nik Abd Rahman**, Mohamad Abdul Hamid** and Fazli Idris**

Researchers have been suggesting the need to integrate aspects of organizational behavior in the field of risk management. One of those aspects that have attracted much attention was commitment. However, most of the past literatures on commitment in risk management focus only on top management commitment. Not many seriously looked into the role of lower level employees’ commitment in the successful implementation of risk management program in enterprise risk management. While obligation to comply rest heavily on the employees for the success of the implementation, it remains to be seen as to how employees react or adapt based on their commitment to the requirement of the organization as well as how they perceive that the approach in ERM is beneficial in improving the organization’s performance. This study attempts to address the gap with respect to incorporating aspects of organizational behavior, specifically employees’ affective commitment, into the field of enterprise risk management. Data for the study was collected via a survey conducted through self-administered questionnaire. The respondents comprised of employees of different public listed companies within the construction industry. As for the data analysis, multiple regressions were employed to test all the hypotheses. The results obtained from the study confirmed employees’ affective commitment as a variable which partially mediates the relationship between all the risk assessment constructs and effective enterprise risk management.

Field of study: Enterprise risk management, organizational commitment, risk.

1. Introduction

The developing literature on risk management insufficiently addresses the impact of aspects of organizational behavior, specifically employee commitment, on risk management. This is due to the tendency to view risk management as tasks that require logical and rational decision making rather than as forums for addressing the issue of employee or public acceptability and participation (Burnaby and Hass 2009, Olsson 2007, Fraser and Henry 2007, McWorther, Matherly and Frizzelli 2006, Carey 2001, Hollman and Forrest 1991: and Pidgeon 1991). While risk management is an integral part of business and management, it is also part of an organization’s strategy to reduce potential losses and managing opportunities. The importance of risk management as an organizational approach in optimizing performance is explicit through reduction of possible losses. Risk management is essential for organization in balancing threats

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Smallman (1996) argued that there is a need to view risk management holistically by adding behavioral constructs in order to understand the behavioral aspects of risk management. The author’s observation is consistent with the argument offered earlier by Sitkin and Pablo (1992) on the importance of integrating behavioral constructs in risk management research to enable in-depth studies be conducted on the relationship between behavior and attitude toward risk among individuals or organizations. The respective balance between ecology and culture in how ordinary people think about risk posit a fundamental issue pertaining to the understanding of the behavioral or sociological aspect of risk study (Harb 2009, Marais and Saleh 2008, Knight 2007, Warrier and Chandrashekhar 2007: and Pidgeon 1991). While individual initiative is critical, it is the aspects of organizational behavior such as organizational culture, commitment, attitude towards risk and risk acceptance, which facilitate the process of risk management (Hagigi and Sivakumar 2009, Burnaby and Hass 2009, Knight 2007, Webster and Simon 2007, Abu-Khader 2004, Smallman 1996: and Pidgeon 1991).

Despite the discussions and recommendations on the importance of employee contribution in risk management, it remains unknown of the influence of employee affective commitment on the overall success of enterprise risk management. This study intends to focus on two major concerns. First, the uncertainty pertaining to the relationship between risk assessment, affective commitment and employee’s perceived effective risk management. As to date, the nature of relationships between the risk assessments constructs and affective commitment, as well as the link between affective commitment and employee’s perceived effective enterprise risk management has yet to be confidently recognized. Secondly, the ambiguity with regards to the mediating effect of employee affective commitment on the relationship between risk assessment and effective enterprise risk management. Theoretically, risk assessment is essential in ensuring the effectiveness of any risk management program. However, there is yet to be established any empirical evidence with regard to the nature of relationship between the risk assessment and effective enterprise risk management from the employee perspective. The mediating effect of affective commitment on the other hand is inconclusive since there has yet to be established any empirical evidence to support this proposition. While research has shown that top management commitment is essential for the success of risk management, the literature does not offer guidance on how employee organizational commitment can affect employee awareness or understanding of the risk management process and their perceived effective enterprise risk management.

The purpose of this study is to examine the significance of organizational commitment in influencing the relationship between stages of the risk management process and effective enterprise risk management. This study is geared towards answering the following research question i.e., does affective commitment mediates the relationship between risk assessment and effective enterprise risk management? This study therefore, seeks to examine the relationship between risk assessment and perceived effective enterprise risk management, and the mediating role of employee affective organizational commitment on the relationship between risk assessment and perceived
Ismail, Rahman, Hamid & Idris

effective enterprise risk management. Until this question is answered, organizations will remain uninformed of the significance of employee organizational commitment in enterprise risk management. Discussions in this paper begin with the introduction of the background of the study, followed by a review of past literatures, methodology of the study, and finally, some discussions on the findings.

2. Literature Review

Risk management is a practical subject. It can be sophisticated and complicated but the starting point should always be a simple assessment of the problem (Tchankova 2002) and a possible solution. Hollman and Forrest (1991) believed that risk management process requires not only full dedication from the organization but also participation from all individuals in the organization. Participation from employees at all levels in the organization is essential in ensuring the success of enterprise risk management (Burnaby and Hass 2009, Fraser and Henry 2007, Khan 2006, O’Toole 2002: and Frosdick 1997). According to McWhorther et al. (2006), employees’ participation is important in risk management process. Khan (2006) also suggested that employee organizational commitment be incorporated in the study of risk management especially during the risk identification stage. The author, however, has yet to offer any empirical support for his conceptual proposition. Employee organizational commitment is indeed important considering the fact that in enterprise risk management the emphasis is on the total participation of organizations’ members and not only the board of directors or top management (COSO 2004). In other words, it is a process affected by people at every level of the organization. The involvement of employees at every level as ‘risk owner’ in managing their risk is essential and part of the enterprise risk management (ISO31000 2009).

Navare (2003) highlighted the importance of assessing the behavioral aspects of risk management by stressing that it is the behavior that constitutes risk rather than procedures. Abu-Khader (2004) in a study on the impact of human behavior on process safety management suggested that human factors and behaviors are essential parts of any successful risk assessment. He further suggested that future research should not only look into the relationship between risk assessment and effective risk management but also examine some of the relevant behaviors such as managerial commitment and employees’ contribution in risk management (Smallman 1996, O’Toole 2002: and Mearns and Yule 2008). Although management commitment is essential in supporting the implementation of risk management throughout all the levels in the organization, employees are equally responsible in complying with the principles or approaches outlined in the risk management program. While employee’s commitment is believed to be elementary in ensuring effective risk management (ISO31000 2009, Khan 2006: and COSO 2004), most of the studies investigating commitment in relation to risk management are being directed towards understanding the top management commitment (Mearns and Yule 2008, Abu-Khader 2004: and O’Toole 2002).

Olsson (2007) stated that risk management process itself cannot ensure effectiveness of risk management considering there are other factors such as suitability and acceptability of the risk management process to the organization and its members may limit the effectiveness of risk management. This implies that for risk management to be effectively implemented and practiced in an organization, the management needs to consider the appropriateness or practicality in the implementation of each of the stages in the risk management process and the need to ensure that every member of the
organization understands the principles of risk management and committed in carrying out the necessary strategies in its implementation. Schmidt, Lyytinen, Keil and Cule (2001) in the study of obstacles toward successful risk management ranked commitment as one of the major obstacles in risk management since lack of top management commitment in a project as the main threat to risk management and at the same time agreed that failure to gain user commitment is also crucial for successful risk management.

The role of employee commitment is therefore important in enterprise risk management. While top management commitment is necessary in ‘setting the tone’ for risk management and safety, employee organizational commitment is also essential in ensuring a successful implementation of risk management (O’Toole 2002). Consistent with the recommendations made by the COSO (2004) and ISO31000 (2009) that employees’ participation or contribution is vital for risk management; there is a need to examine the role of organizational commitment as a factor that contributes to employee’s participation in risk management process and perceived effective enterprise risk management. The discussion rests upon how organizational commitment could influence employee’s willingness towards put their effort in understanding and participating in the enterprise risk management.

The current enterprise risk management framework or guidelines highlight the significance of employees’ participation and contribution in risk management (ISO31000 2009: and COSO 2004), which directly justify the need to further study employee attitudes such as employee organizational commitment in the process. However, throughout the literature search there were only few discussions made by past researchers on the significance of employee commitment in enterprise risk management (Khan 2006; and O’Toole 2002) but there has yet to be established any empirical findings with regard to the significant of employee organizational commitment in enterprise risk management. Past researchers have agreed that organizational behavior aspect such as organizational commitment is significant in risk management (Mearns and Yule 2008, Khan 2006, O’Toole 2002: and Smallman 1996); nevertheless slight progress has been made in discussing the significant of organizational commitment in enterprise risk management. This allows ample space for future research to establish the importance and influence of organizational commitment on risk management.

2.1. Enterprise Risk Management

Basically, risk management is the sum of all proactive management-directed activities within a program that are intended to acceptably accommodate the possibility of failures in elements of the program. Vaughan (1997) defines risk management as a scientific approach to the problem of pure risk, and its objective is the reduction and elimination of pure risk facing the business firm. Risk management is a process that identifies loss exposures faced by an organization and selects the most appropriate techniques for treating such exposures (Rejda 2005). According to ISO31000 (2009), risk management is ‘a coordinated activity to direct and control an organization with regard to risk’. Enterprise risk management is a structured approach to managing uncertainty related to a threat, and a sequence of human activities which include risk assessment, strategies development in managing risk and mitigation of risk using managerial resources. Enterprise risk management refers to the integration of organization risk and risk management strategy (Lam 2003). Skipper and Kwon (2007) in their discussion of
enterprise risk management historical evolution stated that as risks evolve, the risk management strategies also evolve in order to accommodate and manage these risks leading to the integration all aspects of risk and hazard as well as the available approach for holistic risk management term as enterprise risk management.

2.2. Risk Assessment

Risk assessment normally comprise of risk identification, risk estimation and risk evaluation (Startiene and Remeikiene 2007, Chapman 2007; and White 1995). Some authors consider using the terms risk analysis interchangeably with risk assessment despite the fact that both terms refer to the same phase in risk management (Fraser and Henry 2007, Frosdick 1997, Tummala and Leung 1996; and Hollman and Forrest 1991). Tummala and Leung (1996) on the other hand suggest that risk assessment itself constitute the three phases of the risk management process that is risk identification, risk measurement and risk assessment.

The risk identification phase involves identifying all potential hazards or risk factors associated with the organization’s operation (Tummala and Leung 1996). Risk identification is the first stage of risk management and acts as a basis for the other steps available in risk management. (Tchankova 2002). White (1995) defines risk identification as a process of perceiving hazards, identifying failures and recognizing consequences. According to Tchankova (2002), risk identification is a process that reveals and determines the possible organizational risks as well as conditions, arising risks. Risk identification can be described by several elements namely sources of risks, hazard factors, perils, and exposures to risk.

Risk analysis or risk measurement is a process by which organization undertook in estimating the risk probabilities, describing risk and quantifying risk (White 1995). During this process, organization will focus their effort in assessing both risk and the opportunities to business in terms of their probability and their impact (Chapman 2007). Although risk management and risk analysis seem to be identical, it is important to understand that their similarities and differences. Risk analysis is part of risk management process that deals with examination of possible risk. Startiene and Remeikiene (2007) stated that the aim of risk management process is to reduced risk to an acceptable level while risk analysis provide base for risk control program.

Risk evaluation is the process whereby organization tries to understand the net effect of the identified threats and opportunities on an activity when aggregated together (Chapman 2007). According to White (1995), risk evaluation is the process of estimating significance of risk, judging the acceptability and comparing risk against benefits. Risk evaluation phase involves the critical examination of all action plans proposed in the risk measurement phase in terms of effectiveness of reduction in the overall hazard, the amount of resources required and the extend of changes needed, and the selection of the optimal course of action in meeting the organization’s risk objectives (Tummala and Leung 1996).

2.3. Organizational Commitment

Past studies have indicated that organizational commitment is an important factor for organizational development given the fact that high commitment organization could lead to a better performance (Shirbagi 2007; and Meyer, Stanley, Herscovitch and
It is also essential for organizational change and implementation of strategy or approach (Mowday 1998). Organizational commitment can be defined as employee psychological attachment to an organization (Meyer and Allen 1997, Mathieu and Zajac 1990). Organizational commitment is an important attitude in assessing overall contribution of the employee to the organization since it affects employee’s willingness and work-related behavior (Shirbagi 2007). According to Meyer and Herscovitch (2001), organizational commitment also represents commitment to the organizational goals. Employees who are committed to implementation of changes will be expected to adopt their behavior to be consistent with the changes (Benkhoff 1997).

In discussing the importance of organizational commitment, Meyer and Allen (1997) believed that committed employees would be an advantage to the organization because of their loyalty and willingness, and at the same time adhere to organization strategy (Nehmeh 2009, Parish, Cadwallader and Busch 2008, Shirbagi 2007, Currie and Dollery 2006, Meyer et al. 2002; and Mowday 1999). According to Foote, Seipel, Johnson and Duffy (2005), individual who have a better understanding of their role were more committed to the implementation of policy. This led to the fact that employee who understands the importance of risk management will exhibit better or higher commitment in ensuring the overall success of risk management that lead to its effectiveness. Nehmeh (2009) added that highly committed employees exhibit stronger identification with organization’s goals and objectives where they will display greater cooperation and participation. It was also found that individual whose level commitment is higher; demonstrate higher level of conscientiousness and civic virtue behavior (Foote et al. 2005). Theoretically, higher organizational commitment will lead to better employee participation due to the sense of obligation that the employee had towards the organization success (Gellatly, Meyer and Luchak 2006).

Assuming that risk management is one of the organizational goals, it is obvious that organizational commitment would be essential in determining the level of participation in the implementation of risk management. Highly committed employee will adhere to the needs of the organization for risk management by understanding its importance resulting in positive perception of the benefits it may brings to the organization. Employee will also exhibit higher obligation towards each of the stages in the risk management process. As for this study, it will focus more on affective commitment which is consider to be more significant in predicting employee performance. However, Meyer and Allen (1997) suggest that affective commitment has been the focal of study and discussion by past researcher due to the facts that only recently commitment was being viewed as multidimensional and it is the most desirable form of commitment that an organization want to instills in their employees. Meyer and Allen (1997) stated that if an employee possessed stronger affective commitment, he/she is emotionally attached with the organization that indirectly motivates him/her with the desire to contribute meaningfully to the organization. In other word, the sense of belonging to the organization will actually enhance their effort and compliance for the well-being of their organization and may lead their agreement to the organization policies or strategy.

2.4. Effective Enterprise Risk Management

There are several issues with regards to the definition for effective enterprise risk management. According to COSO (2004), an organization is considered to have achieved effective enterprise risk management if they fulfilled all the eight components of the ERM Framework respectively internal environment, objective settings, event
identification, risk assessment, risk response, control activities, information and communication, and risk monitoring, corresponding to the organization’s capability and suitability. The success of embedding enterprise risk management relies heavily on the ability to respond to changing conditions where it requires the involvement from the employees (Carey 2001). Further discussions by Hagigi and Sivakumar (2009) indicated that effective risk management is not only concerned with the ability of organizations to reduce risk or avoid risk but also the ability to develop suitable risk strategy to the organization’s goals and risk preference.

It is currently essential to incorporate the behavioral considerations in the risk management process in order to provide a better understanding of individual’s perceptions of risk and risk taking behavior so that organization can attain effective risk management (Hagigi and Sivakumar 2009; and Knight 2007). One of the important qualities required in ensuring effective enterprise risk management is to incorporate human and cultural factors into risk management particularly on skills, capabilities, perceptions and intentions (Harb 2009, ISO31000 2009, Knight 2007; and Warrier and Chandrashekhar 2007). Burnaby and Hass (2009) believed that employees need to understand and participate in risk management for organization to achieve effective enterprise risk management. Effective risk management demands commitment from all parties due to the fact that that effective risk management requires not only process and tools but other essence such as culture and commitment (Webster and Simon 2007). Marais and Saleh (2008) acknowledged the importance of understanding organizational behavior as one of the requirement in developing a successful strategy for risk management. Obviously there is still a gap in the study of risk management and organizational behavior due to the fact it remains disconnect between putting risk management in action and organizational practice because the model of project success (e.g. implementation of ERM) requires culture, communication and commitment (Webster and Simon 2007; and Taylor 2005).

2.5. Organizational Commitment in Enterprise Risk Management

The importance of organizational commitment in enterprise risk management is clearly stated under the Malaysian Code of Corporate Governance (Securities Commission 2007) where it is necessary for commitment to be one of the influencing factors for enterprise risk management. The ability to gauge commitment level will enable the management of the organization to determine the level of involvement in risk management activities among members of the organization. In his conceptual argument, Khan (2006) suggested that commitment should be added in risk management study in order to examine the employee participation with the application of general model of commitment to the risk management dimension. The reason of incorporating the commitment model to the study of risk management is due to the fact that each of different commitment influences different level of employee participation and behavior where this will enable examination on employee participation in risk management. Further discussion by Tchankova (2002) also revealed that human factors is a risk and at the same time influence the risk management process. Organization can achieve effective enterprise risk management if all the members of the organization participate during the risk management process in order to ensure that all risks are known and properly managed (Burnaby and Hass 2009).

A study on the implementation of enterprise risk management by Warrier and Chandrashekhar (2007) revealed that one of the key elements contributing towards a
successful implementation of risk management is all employees or members of the organization must be aware of the key drivers, features and benefits of risk management. This implies that for enterprise risk management to properly take place, employee participation and understanding is vital in ensuring that all the stages can be applied effectively. According to Warrier and Chandrashekhar (2007), a thorough understanding of the organization with respect to risk is essential in enterprise risk management especially in relation to the cultural aspects of the organization (Harb 2009, Burnaby and Hass 2009; and Knight 2007). The overall implementation of the risk management process will not be successful if there is a lack of participation among the organizations’ employees. All employees are responsible for the success of risk management program even if the consent for risk management normally comes from the top management (Burnaby and Hass 2009). For this reason, the study on the relationship between organizational commitment and the implementation of risk management is crucial in providing the necessary inputs with regards to the behavioral impact on risk management.

2.6. Hypotheses Development

In order to address the research question, the study will incorporate the dimensions of risk assessment provided under the enterprise risk management (ISO31000 2009, AS/NZ4360 2004: and Tummala and Leung 1996), affective organizational commitment (Meyer and Allen 1991) and perceived effective enterprise risk management (ISO31000 2009: and AS/NZ4360 2004) as the key research variables. Corresponding to the suggestion made earlier in the paper, organizational commitment is expected to mediate the relationship between the constructs of risk assessment and perceived effective enterprise risk management. Risk assessment constructs are expected to have a significant relationship with effective enterprise risk management in an organization. The expected relationships shown in the proposed framework are set forth in the following section.

Consistent with the recommendation made by the international standards (ISO31000 2009), that requires risk management process to be in placed in order to achieve effective enterprise risk management (Khan 2006: and COSO 2004), it is expected that there is a positive correlation between the risk assessment and effective enterprise risk management. Therefore, the followings are hypothesized:

H1: Risk identification is significantly related to effective enterprise risk management.

H2: Risk measurement is significantly related to effective enterprise risk management.

H3: Risk evaluation is significantly related to effective enterprise risk management.

In respect of risk assessment and affective organizational commitment, a positive relationship is expected given the importance of the latter in the implementation of risk management process (Faser and Henry 2007, Webster and Simon 2007, Warrier and Chandrashekhar 2007, McWhorter et al. 2006, Taylor 2005, Carey 2001; and Hollman and Forrest 1991). Consequently, the followings are hypothesized:
H4: There is a significant relationship between employee’s awareness and understanding of risk identification and employee organizational commitment.

H5: There is a significant relationship between employee’s awareness and understanding of risk measurement and employee organizational commitment.

H6: There is a significant relationship between employee’s awareness and understanding of risk evaluation and employee organizational commitment.

Past studies have acknowledged the significance of organizational commitment in predicting successful enterprise risk management (Khan 2006; and O’Toole 2002). Highly committed employees will make an effort to understand the importance of risk management to the organization and will perceive enterprise risk management as effective (Foote et al. 2005). Thus, it is hypothesized that:

H7: There is a significant relationship between employee affective organizational commitment and effective enterprise risk management.

This study posits employee organizational commitment as the mediating variable between employee’s awareness and understanding of risk management process and employee’s perceived effective enterprise risk management for two reasons. First, risk management is an approach adopted by the top management and passed down to the organization members for implementation of its process (Mearns and Yule 2008, Parker et al. 2006, Khan 2006, Beasley et al. 2005, Abu-Khader 2004, COSO 2004: and O’Toole 2002). According to Norlida, Isahak and Rasid (2007), employee is not the driver for organizations and companies to adopt enterprise risk management. Given this finding, it is obvious that employee is one of the factors that facilitate enterprise risk management. Second, employee’s attitude and behavior are the factors that support the implementation of risk management and its effectiveness (Marais and Saleh 2008, Webster and Simon 2007, Navare 2003: and Tchankova 2002). Drawing on the above discussion, this study posits organizational commitment as a mediating factor between risk management process and effective enterprise risk management. Therefore, it is hypothesized that:

H8: Employees’ affective commitment mediates the relationship between employee’s awareness and understanding of risk identification and perceived effective enterprise risk management.

H9: Employees’ affective commitment mediates the relationship between employee’s awareness and understanding of risk assessment and perceived effective enterprise risk management.

H10: Employees’ affective commitment mediates the relationship between employee’s awareness and understanding of risk evaluation and perceived effective enterprise risk management.

Consistent with the hypotheses posted above, the proposed theoretical framework of the study is as illustrated in Figure 1.
The proposed theoretical framework was derived from the current practiced of risk assessment towards effective enterprise risk management proposed by the ISO31000 (2009). The three independent variables, namely risk identification, risk measurement and risk evaluation were believed to contribute towards effective ERM if properly applied (ISO31000 2009, Chapman 2007, Khan 2006, COSO 2004, Tchankova 2002). Therefore, positive significant relationships between the independent variables and the dependent variable are expected. The current framework also introduce new variable in enterprise risk management practice with respect to the inclusion of affective commitment as the mediating variable based on the findings made by Norlida et al (2007) which suggest that employee is not the determinant but more as intermediary in the success of enterprise risk management.

3. The Methodology

This study will adopt a quantitative approach and is designed to be cross-sectional in a non-contrived setting. Data will be gathered via a survey using self-administered questionnaire. The study population for this research consisted of managers and executives of construction companies listed on the main board of Bursa Malaysia. The selection of construction companies is based on the findings made by Hlaing, Singh, Tiong end Ehrlich (2008) which proved that construction companies are highly exposed to risks and seriously practice risk management in their operation. Managers and executives were selected as the respondents based on feedback from pilot study conducted prior to the actual study which suggests that this group of respondents is more appropriate in capturing the much needed information due to the high technicality in content and phrases of the research instrument. Using convenience sampling, a total of 500 questionnaires were distributed to the selected respondents among the selected companies. A response rate between 15 to 20 percent is expected. This expectation is consistent with past studies that employ such method of data collection (Bashkaran and Sukumaran 2007).

Measures. The instruments with respect to risk management and ERM are adapted from the instruments of Risk Management Standards AS/NZS4360 (2004) developed by the Audit Office of New South Wales. Affective organizational commitment will be measured using the revised Organizational Commitment Scale (Meyer and Allen 1997). All items will be measured using seven point Likert's scale ranging from ‘1=strongly disagree’ to ‘7=strongly agree’.
Statistical analysis. In attempting to achieve the objectives of the study, several statistical analysis techniques will be used in the data analysis namely descriptive statistic, reliability analysis, correlation analysis, multicollinearity analysis and multiple regression analysis. Sequence of regression equations will be applied for testing a hypothesized mediator effect of affective commitment on the relationship between risk assessment and effective enterprise risk management. The analysis will be carried out using SPSS 18.0.

4. Findings

The study was conducted in 2011 where data for this study was collected during the first quarter. Out of 500 questionnaires distributed, 89 were returned, thus recording a response rate of 19.7 percent. After further scrutiny, 10 were identified as outliers. Finally, only 79 were usable for analysis. Although the samples obtained is small, it is still acceptable as long as it is bare the minimum required number of at least five time more cases than the independent variables (Tabachnik and Fidell (1989). Therefore, it is sufficient for the recommended statistical analysis to be conducted.

Sample characteristics. A profile of the sample is important in the interpretation of the statistical analyses. The percentage of males in the sample is 54.4 percent. The majority of the respondents are of age between 26 to 45 years old (74.7 percent). While 17.7 percent are of age less than 26 years old, only 7.6 percent 45 years old and above. In terms of educational background, slightly more than 5.1 percent possess a masters degree or higher. As for their position in the organization, about 48 percent are assistant managers, managers and senior managers while the remaining 52 percent are at executive levels. With respect to the nature of business, 58.2 percent (46 companies) comes from the engineering and construction sector, 17.7 percent from operations and maintenance, 10.1 percent, from infrastructure development while the others, from various sectors namely utilities'' infrastructure, building services and township or property development.

Reliability analysis. Reliability refers to the degree of accuracy or consistency of a measure. Statistically, it is indicated by the Cronbach's alpha coefficient. As far as the interpretation of the coefficient is concerned, a minimum alpha level of 0.60 is deemed acceptable. Table 1 shows alpha coefficients for each of the key research variables. All variables as demonstrated, are reasonably reliable.

Table 1: Reliability Analysis of Variables

<table>
<thead>
<tr>
<th>Measurement scale</th>
<th>Items/scale type</th>
<th>Cronbach’s (α)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk identification</td>
<td>7 items/Likert</td>
<td>.820</td>
</tr>
<tr>
<td>Risk measurement</td>
<td>7 items/Likert</td>
<td>.826</td>
</tr>
<tr>
<td>Risk evaluation</td>
<td>8 items/Likert</td>
<td>.748</td>
</tr>
<tr>
<td>Affective organizational commitment</td>
<td>6 items/Likert</td>
<td>.782</td>
</tr>
<tr>
<td>Effective enterprise risk management</td>
<td>11 items/Likert</td>
<td>.956</td>
</tr>
</tbody>
</table>

Correlation analysis. Table 2 presents Pearson’s correlation coefficients between the key research variables. The values of the correlation coefficients measure the strength of association as well as the direction of the relationships between each of these variables.
### Table 2: Correlations Analysis between Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Risk identification</th>
<th>Risk measurement</th>
<th>Risk evaluation</th>
<th>Affective commitment</th>
<th>Effective ERM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk identification</td>
<td>1</td>
<td>0.465**</td>
<td>0.590**</td>
<td>0.192*</td>
<td>0.737**</td>
</tr>
<tr>
<td>Risk measurement</td>
<td>0.465**</td>
<td>1</td>
<td>0.635**</td>
<td>0.136</td>
<td>0.305**</td>
</tr>
<tr>
<td>Risk evaluation</td>
<td>0.590**</td>
<td>0.635**</td>
<td>1</td>
<td>0.191*</td>
<td>0.507**</td>
</tr>
<tr>
<td>Affective commitment</td>
<td>0.192*</td>
<td>0.136</td>
<td>0.191*</td>
<td>1</td>
<td>0.283*</td>
</tr>
<tr>
<td>Effective ERM</td>
<td>0.737**</td>
<td>0.305**</td>
<td>0.507**</td>
<td>0.283*</td>
<td>1</td>
</tr>
</tbody>
</table>

*Correlation is significant at the 0.05 level
**Correlation is significant at the 0.01 level

Coefficients of ± 0.5 and above reflect strong correlations between the variables. As can be seen from the table, significant and positive correlations were registered for all the variables. All the correlations recorded moderate strength of relationships except for the relationships between risk identification and effective ERM (r=0.737, p=0.000) and another, involving risk monitoring and employee organizational commitment (r=0.136, p=0.116).

**Multicollinearity analysis.** In order to fulfill the assumptions of multivariate analysis, a multicollinearity test was performed by regressing the independent variables against the outcome variable. Two statistical indicators were used to assess the existence of multicollinearity namely the tolerance factor (>0), and variance inflation factor (VIF<10). As shown in Table 3, both indicators suggest an absence of any issues of multicollinearity in the data.

### Table 3: Collinearity Analysis

<table>
<thead>
<tr>
<th>Variables</th>
<th>Tolerance factor</th>
<th>VIF</th>
<th>Std. Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk identification</td>
<td>0.632</td>
<td>1.582</td>
<td>0.125</td>
</tr>
<tr>
<td>Risk measurement</td>
<td>0.584</td>
<td>1.713</td>
<td>0.108</td>
</tr>
<tr>
<td>Risk evaluation</td>
<td>0.482</td>
<td>2.074</td>
<td>0.149</td>
</tr>
<tr>
<td>Affective commitment</td>
<td>0.954</td>
<td>1.048</td>
<td>0.069</td>
</tr>
</tbody>
</table>

*Regression analysis.** This statistical technique was conducted to assess the relationship between the independent variables and the dependent variable as well as to test the various hypotheses proposed in the study. Given the need to test the role of the mediating variable, a test of mediation was conducted using the procedures suggested by Baron and Kenny (1986). The test of mediation involves three regression
equations: regression of the mediator on the independent variables, regression of the independent variables on the dependent variables and regression of both the independent variables on the mediator variables. The decision whether to accept or reject the hypotheses is based on the standardized coefficient beta (β) and R-square (R²).

In the first equation, the independent variables namely risk identification; risk measurement and risk evaluation were regressed against affective commitment (the mediating variable). Results from the analysis (see Table 4) indicated that there are positive relationships between the independent variables and the mediating variable. As shown, the explanatory power of the variables is low but significant. Therefore hypothesis 4, 5 and 6 are supported.

Table 4: The Influence of Risk Assessment Variables on Affective Commitment

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Standardized Beta</th>
<th>R²</th>
<th>Sig. (p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk identification</td>
<td>0.192</td>
<td>0.037</td>
<td>.091</td>
</tr>
<tr>
<td>Risk measurement</td>
<td>0.136</td>
<td>0.019</td>
<td>.231</td>
</tr>
<tr>
<td>Risk evaluation</td>
<td>0.191</td>
<td>0.024</td>
<td>.091</td>
</tr>
</tbody>
</table>

In the second equation, the effective enterprise risk management (dependent variable) was regressed on all the independent variables (risk identification, risk measurement and risk evaluation) and the mediating variable (affective commitment). The regression results are as displayed in Table 5, below.

Table 5: Influence of Risk Assessment Variables and Mediating Variable on Effective ERM

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Standardized Beta</th>
<th>R²</th>
<th>Sig. (p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk identification</td>
<td>0.737</td>
<td>0.543</td>
<td>.000</td>
</tr>
<tr>
<td>Risk measurement</td>
<td>0.305</td>
<td>0.093</td>
<td>.006</td>
</tr>
<tr>
<td>Risk evaluation</td>
<td>0.507</td>
<td>0.248</td>
<td>.000</td>
</tr>
<tr>
<td>Affective commitment</td>
<td>0.238</td>
<td>0.057</td>
<td>.034</td>
</tr>
</tbody>
</table>

The regression results showed that while the explanatory powers of the independent variables varies between all the variables, significant relationships prevailed between the independent variables, the mediating variable and the dependent variable. Therefore hypothesis 1, 2, 3 and 7 are supported. The most significant influence on the dependent variable was with respect to Risk identification with the result indicating the independent variables explaining about 73.7% of the variations in the dependent variable. The significant F value is < .01, which indicates that the model has 99% confidence in the ability to explain the dependent variable.
Ismail, Rahman, Hamid & Idris

Table 6: Summarizes the Statistics Indicating the Mediating Effects of Affective Organizational Commitment

<table>
<thead>
<tr>
<th>Significant Variable</th>
<th>Beta Coefficients in Regression Equation II (DV on IV)</th>
<th>Beta Coefficients in Regression Equation III (DV on IV and MV)</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk Identification</td>
<td>0.737</td>
<td>0.718</td>
<td>Partial Mediation</td>
</tr>
<tr>
<td>Risk measurement</td>
<td>0.305</td>
<td>0.278</td>
<td>Partial Mediation</td>
</tr>
<tr>
<td>Risk evaluation</td>
<td>0.507</td>
<td>0.479</td>
<td>Partial Mediation</td>
</tr>
</tbody>
</table>

The mediator is said to have a mediating effect on the relationship between the IVs and the DV when the effect (β) of the IVs on the DV shrinks upon addition of the mediator (MV) to the regression equation (Baron and Kenny, 1986). As shown in the table, the mediation test on the dimensions of risk assessment and the effective ERM is significant. In other words affective commitment does partially mediate the relationship between the risk assessment constructs and effective ERM. Therefore, hypotheses 8, 9 and 10 are well supported. The results of the study suggest that affective commitment conclusively influence the relationship between process of risk assessment and effective enterprise risk management. The more complex the situation or condition of risk that need consideration, the more interaction with individuals or organizations is needed in clarifying the situation. Table 7 presents a summary of the results of the hypotheses testing.

Table 7: Summary of Hypotheses and Findings

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Hypothesized Relationship</th>
<th>Finding (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affective commitment → Effective risk management (ERM)</td>
<td>+</td>
<td>supported</td>
</tr>
<tr>
<td>Risk identification (RI) → Affective commitment</td>
<td>+</td>
<td>supported</td>
</tr>
<tr>
<td>Risk measurement (RM) → Affective commitment</td>
<td>+</td>
<td>supported</td>
</tr>
<tr>
<td>Risk evaluation (RE) → Affective commitment</td>
<td>+</td>
<td>supported</td>
</tr>
<tr>
<td>Risk identification (RI) → Effective risk management (ERM)</td>
<td>+</td>
<td>supported</td>
</tr>
<tr>
<td>Risk measurement (RM) → Effective risk management (ERM)</td>
<td>+</td>
<td>supported</td>
</tr>
<tr>
<td>Risk evaluation (RE) → Effective risk management (ERM)</td>
<td>+</td>
<td>supported</td>
</tr>
<tr>
<td>Risk identification (RI) → Effective risk management (ERM)</td>
<td>Mediates**</td>
<td>supported</td>
</tr>
<tr>
<td>Risk measurement (RM) → Effective risk management (ERM)</td>
<td>Mediates**</td>
<td>supported</td>
</tr>
<tr>
<td>Risk evaluation (RE) → Effective risk management (ERM)</td>
<td>Mediates**</td>
<td>supported</td>
</tr>
</tbody>
</table>

+ denotes positive relationship significant at < .01
** denotes the mediating effect of affective commitment on IV and DV
The first hypothesis deals with the relative importance of affective commitment on effective enterprise risk management (ERM). The next three hypotheses focuses on the evaluation of the associations between the different constructs of risk assessment, namely risk identification (RI), risk measurement (RM) and risk evaluation (RE); and effective ERM. Another three hypotheses are directed in determining the relationship between the independent variables and the mediating variable. The final three hypotheses are tailored towards assessing the mediating role of affective commitment on the relationship between the risk assessment variables and effective ERM. As shown, all the hypotheses of the study are supported.

5. Discussion and Conclusion

This study confirms the significance of employees' affective commitment as the mediator on the relationship between risk assessment and effective enterprise risk management (ERM) even if the results suggest a partial mediation. Although the mediation is small, it still carries some significant influence on the overall success in enterprise risk management.

Based on the findings of the study, it can be concluded that managers need to concur with the suggestions made earlier by researchers in the field that in the implementation of enterprise risk management organizations should seriously take into consideration aspects of organizational behavior, specifically employees' affective commitment. Indeed, employees' feelings of attachment and belongingness to their organizations would be very much relevant in enhancing the effectiveness in the conduct and practice of enterprise risk management. Developing commitment as a culture within organizations, though time consuming and not easy to achieve should be one of the important agendas in an organization’s human resource management and development.

Based on the findings of this study, further research that could explore the role and significance of other aspects of organizational behavior such as job satisfaction, organizational citizenship behaviors, intention to remain in organizations, etc. should be interesting to conduct. These aspects of organizational behavior may directly or indirectly influence the implementation or practice of risk management.

The outcome of this study, if appropriately considered, would obviously contribute towards complementing the implementation of effective enterprise risk management. In other words, this is not to deny the importance of implementing the 'hard system of ERM, i.e., which involves a systematic approach of the overall risk management process as represented by the various ISOs namely, ISO31000 2009, COSO 2004, AS/NZS4360 2004. The extent to which the present findings effectively contribute to the body of knowledge as well as its practical applications are, however, limited by the nature and size of the sample obtained. Other possible limitations often found in data using survey methodology is also exposed to the potential issue of common method variance. However, given the perceptual nature of this research, survey methodology was deemed most appropriate.
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