Risk Management, Ethical Environment, Internal Audit Activity and Accounting Control Procedural Quality: A Structural Equation Model

by

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Abstract
This study examines the impact of three organisational factors, namely, the ethical environment, scope of risk management and internal audit activities on accounting control procedural quality. Based on a questionnaire survey of a 64 Australian firms, data are analysed using a structural equation model. The results of the study support (1) a direct and positive relationship between ethical environment and accounting control procedural quality, and (2) an indirect relationship between the scope of risk management and accounting control procedural quality mediated by the extent of internal audit activity within the organisation. Our findings suggest that accounting control procedural quality may be enhanced by fostering a more ethical environment, and by undertaking more extensive internal audit activities as the scope of risk management increases. This study provides empirical evidence in an area where such evidence is scant and highlights the significant inter-relationships that exists within a network of internal controls comprising ethical environment, risk management, internal audit and accounting-based controls.
1.0 Introduction

Recent corporate governance initiatives have placed significant emphasis on the role of internal control. The Committee of Sponsoring Organizations (COSO) defines internal control as “a process, effected by an entity’s board of directors, management and other personnel, designed to provide reasonable assurance regarding the achievement of objectives in (1) the effectiveness and efficiency of operations, (2) the reliability of financial reporting, and (3) the compliance of applicable laws and regulations” (COSO, 1992). The term ‘process’ is used in a broad sense where it goes beyond procedures to include the corporate culture and related organisational policies. COSO’s Internal Control – Integrated Framework conceptualises an internal control system to comprise of several components, including the control environment, risk assessment, monitoring of controls, information and communication, and control activities (COSO, 1992). The first component, control environment, includes the ethical environment, which comprises factors involving ethical values and management’s philosophy and operating style. Conceptually, these five components of internal control represent a set of inter-related factors of an internal control system. While past research (e.g. Brief, Dukerich, Brown and Brett, 1996; Cohen, Krishnamoorthy and Wright, 2002; Liebenberg and Hoyt, 2003) may have examined some of these components separately, there appears to be no empirical studies that have investigated the inter-relationships of these components. As such, research into these factors, therefore, appears warranted because a better understanding of internal control design may lead to more effective and efficient systems of internal controls.

1 COSO was originally formed in 1985 as a private sector initiative by five major professional associations in the United States, the American Accounting Association, the American Institute of Certified Public Accountants, Financial Executives International, The Institute of Internal Auditors, and the National Association of Accountants (now the Institute of Management Accountants). Its key objective was to sponsor the National Commission on Fraudulent Financial Reporting, which studied the causal factors related to fraudulent financial reporting.
The primary focus of this study is on the quality of the internal accounting control procedures (hereon simply referred as accounting control procedural quality), which forms a key aspect of the control activities. The accounting control procedural quality entails not only the quality of the design of the internal accounting controls but also the extent to which internal accounting control policies and procedures are adhered to within an organisation (Marshall, 1995). The objective of this study is to examine the effect of three specific organisational factors on accounting control procedural quality. More specifically, we investigate the direct effects of ethical environment, risk management and internal audit activities on accounting control procedural quality. We also examine the indirect effects of ethical environment and risk management on accounting control procedural quality by considering the extent of internal audit activities as an intervening variable.

**Motivation for study**

The motivation for the present study is largely derived from the lack of empirical evidence on the relationships between key organisational-related factors within an organisation, and the increasing costs of installing and implementing internal controls. In the wake of the recent corporate collapses, regulators have intensified their attention on internal controls. For example, the Sarbanes-Oxley (SOX) Act passed by the U.S. Congress in 2002 mandates that management ought to assess and report on the effectiveness of its internal controls over financial reporting (Agami, 2006). It also stipulates that the independent auditor should report on management's assessment of the effectiveness of the company's internal controls over financial reporting. Although, traditionally, the review of the internal control system has always been a key part of an external audit, the formal reports by both management and the auditor are new requirements.

In addition to such regulatory requirements, there are various corporate governance guidelines. These include the Cadbury Code, the Australian Stock Exchange’s corporate governance guidelines, and professional institutions’ guidelines. For example, The Institute
of Internal Auditors’ (IIA) professional guidelines highlight the importance of management leadership (i.e. ‘tone at the top’) and an organisation’s risk management strategy for the design of internal controls (ASX, 2003). Further, these various guidelines have also placed significant emphasis on the risk management philosophy of an entity as a key component for designing more effective and efficient internal controls. Organisations have been encouraged to undertake an enterprise risk management (ERM) approach, which involves a process “designed to identify potential events that may affect the entity, manage risks within its risk appetite, and to provide reasonable assurance regarding the achievement of entity objectives” (COSO, 2003, p.3). In addition, the internal audit function has been acclaimed to be integral to a good internal control system. For example, in 2004, the New York Stock Exchange mandated that all listed firms establish an internal audit function. The primary role of an internal audit function is seen to be related to the monitoring of internal controls, whereby regular reviews of the internal controls and recommendations for their improvements are required. Interestingly, no study has been located to date that has undertaken a systematic examination of the inter-relationships among the five components of internal control systems espoused by COSO’s *Internal Control – Integrated Framework*.

The remainder of the paper is organised as follows. The next section provides an overview of the background of the concept of internal control, and the relevance of accounting control procedural quality. Subsequent sections provide the development of several testable hypotheses and a delineation of the research method. The final two sections discuss, respectively, the results and the conclusions of the study.

### 2.0 Background

The benefits of having adequate internal controls are abundantly clear with corporate collapses highlighting the association between poor internal controls and substandard financial reporting and managerial fraud (Tipgos, 2002). An effective internal control system not only minimises mistakes and fraud, but also potentially enhances
operational efficiency (Buckhoff, 2002). Such a system is also expected to improve the quality of accounting control procedures. The following discussion describes both internal control system and quality of accounting control procedures.

**Internal Control System**

The COSO definition of internal control incorporates "effectiveness" into its definition, which was an important addition to its dimensions. Through the inclusion of "effectiveness" (the achievement of objectives) into the ambit of internal control, COSO recognises the existence of business objectives and assists in aligning the definition with business risk approaches to audit (Spira and Page, 2002). COSO’s *Internal Control – Integrated Framework* models internal control as comprising of five interrelated components, which are derived from the way management, runs a business. The components are:

- **Control environment**: this sets the tone for the organisation by providing the foundation for all other components of internal control and influencing the control consciousness of its people. It includes integrity, ethical values and the competence of the entity’s people as well as management's philosophy and operating style.

- **Risk assessment**: this is the identification and analysis of relevant risks, internal and external, to the achievement of the objectives, forming a basis for determining how the risks should be managed.

- **Control activities**: these help ensure that the necessary actions are taken to address risks relating to the achievement of the entities objectives. Control activities occur throughout the organisation, at all levels and in all functions.

- **Information and communication**: internal and external information must be identified, captured and communicated in a form and timeframe that enable people to carry out their responsibilities. Effective communication also must occur in a broader sense, flowing down, across and up the organisation.

- **Monitoring**: internal control systems need to be monitored, a process that assesses the quality of the system’s performance over time. This is accomplished through ongoing monitoring activities, separate evaluations, or a combination of the two.
COSO argues that there is a synergy and linkage among these components, forming an integrated system that reacts dynamically to changing conditions. The internal control system is seen to be intertwined with the entity’s operating activities and to exist for fundamental business reasons.

**Accounting Control Procedural Quality**

Accounting control procedures aim to prevent the possibility of errors and omissions in transaction processing. Such controls also operate to detect transaction errors and omissions, and to correct such errors and omissions, where possible. Accounting control procedures include authorisation of transactions, record keeping custody, and segregation of duties. In general, there are two dimensions to accounting control procedural quality. The first refers to the quality of the design of the internal accounting controls e.g. the format of authorisation procedures relating to a given transaction. The second relates to the extent to which various employees within the organisation adhere to internal control policies and procedures (Marshall, 1995). The higher the accounting control procedural quality, the better the quality of the internal control design and the higher the probability of employee adherence to the set procedures. Consequently, the higher the accounting control procedural quality, the greater the probability that errors and misappropriations are detected.

Not surprisingly, breakdown in accounting control procedures have been associated with organisational fraud and errors. For instance, the recent CPA Australia’s survey on small business indicates that while about two-thirds of small businesses claim to have internal accounting controls in place in most transaction areas e.g. sales, purchases, accounts receivable, etc. (Hartcher, 2003), the dominant factor associated with fraud occurrence is the breakdown of such controls. A number of prior studies have also
associated accounting control procedures with waste control and overall organisational
decision-making and planning (Hoque and Rossingh, 2006; Jenkins et al., 1978).

In the following section, hypotheses for the present study are developed. The first
three hypotheses relate to the direct relationships between three independent organisational
factors, namely the scope of risk management, ethical environment and extent of internal
audit activities on accounting control procedural quality. The fourth and fifth hypotheses
predict relationships between the scope of risk management and ethical environment on
internal audit activities, and finally the sixth hypotheses-set proposes indirect relationships
between risk management and accounting control procedural quality as well as ethical
environment and accounting control procedural quality, with internal audit activities as an
intervening variable.

3.0 Hypothesis Development

Risk Management Scope - Accounting control procedural quality

Management has the responsibility to identify business risks, assess the significance
and likelihood of risk occurrence, and decide how to manage such risks. For example, the
IIA’s Practice advisory statement on Assessing the Adequacy of Risk Management
Processes notes that management need to install sound risk management processes and
periodically communicate such risk strategies to all stakeholders in the organisation. These
requirements extend beyond the purely financial to embrace the broad range of risks
experienced by companies, with internal control now being explicitly linked to risk
management (Lindow & Race, 2002). This indicates a change in the relationship between
risk and accountability, where recent developments in audit have seen risk management
become adopted as an accountability process.

As the scope of enterprise risk management (ERM) evolves into a more widely
practiced phenomenon, increasingly sophisticated shareholders demand that management
become more involved in incorporating risk management principles into a strengthened corporate governance structure (Nielsen, Kleffner and Lee, 2005). ERM enables firms to use an integrated approach to managing risk, shifting the scope of the risk management function from its traditionally defensive role to one that is increasingly offensive and strategic (Liebenberg and Hoyt, 2003). These researchers used a matched pairs sample, based on firms choosing to appoint or not appoint a Chief Risk Officer (CRO). They found that firms with greater financial leverage, and thus risk, are more likely to appoint a CRO. This is consistent with the hypothesis that firms increase risk management to reduce information asymmetry between the firm’s current and expected risk profile. Therefore, as organizations are embracing change in this area in different ways, the scope of risk management activities may vary from narrow to wide in terms of the number of business functions within each organisation that adopt risk management activities. For example, risk management activities may involve only sales or a particular section of the business in some companies, while in others there may be a more enterprise-wide approach undertaken. We predict that the greater the scope of risk management activities, the higher the accounting control procedural quality. This is because as the scope of risk management widens, more staff from different areas become aware of, and involved in risk management activities, leading to higher levels of relevant knowledge and strategies to identify and manage risks. Such staff should be more able to identify weaknesses in the internal controls as they become more aware of the risks facing an organisation, and in turn, are more likely to offer valuable suggestions to improve internal control design. Further, from an individual psychological perspective, staff are also likely to be more motivated to adhere to internal controls when they better understand the potential consequences to the organisation of failing to follow proper internal controls. Based on the above discussion, the following hypothesis is suggested:
**H1: There is a direct and positive relationship between the scope of risk management and accounting control procedural quality.**

**Internal Audit Activity - Accounting control procedural quality**

Traditionally, the internal audit function’s role has been to assess the effectiveness of organisational internal controls, and to report to management where and how internal controls could be strengthened (Van Peursem, 2004). The internal audit function also encompasses processes designed to improve the quality of public corporate financial information, and to engage in risk management (Verschoor and Farrell, 1996). More recently, in addition to auditing financial transactions, internal audit activities may also cover non-financial areas such as business unit processes, operational efficiencies and compliance with laws and regulations.

In June 1999, the Institute of Internal Auditors (IIA) officially adopted a new definition of the internal auditing function. The internal audit function is defined as:

“an independent, objective assurance and consulting activity designed to add value and improve an organization's operations. It helps an organization accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control, and governance processes (IIA, 2000)”.

This new definition expands the focus of the internal audit function from one of assurance to one providing a value added approach, which is likely to drive the profession more toward a ‘standards-based’ approach with a greater public identity (Bou-Raad, 2000; Krogstad et al, 1999). In creating a broader definition of the role of the internal audit function, it is expected to improve the quality of risk management, internal control and corporate governance, leading to an overall more effective design of the internal control procedures.

Due to this broader role of the internal audit function, internal audit programmes may vary in their nature and scope. For example, internal auditors may undertake compliance type audits, performance reviews and various operational audits. Additionally,
the internal audit function plays a key internal monitoring role, with the effect that the greater the nature and scope of the internal audit activities, the higher the probability of detecting errors and fraud. For example, internal audit test results can be used by fraud investigators to reveal evidence of fraud, resulting in further investigation being undertaken (Colbert and Alderman, 1998). As such, we predict the larger the extent of internal audit activities, the higher the accounting control procedural quality. Regular checking and monitoring of the numerous internal control features across a variety of business sections of a firm with increasing internal audit activities will invariably increase the probability of finding weaknesses in the internal accounting controls and improve their design. Thus, the second hypothesis for the study is as follows:

**H2: There is a direct and positive relationship between internal audit activity and accounting control procedural quality.**

**Ethical Environment - Accounting control procedural quality**

While internal control procedures can be easily written down as formal organisational policies, getting individuals or employees to adhere to such policies is more difficult. Carelessness, laziness and even disobedience are plausible reasons for ignoring internal control procedures. However, it is argued that in a more ethical environment, employees will tend to follow company rules and regulations because it would be the morally acceptable behaviour. According to COSO (1992) and Australian auditing standard AUS 402.43, the ethical environment of an organisation encompasses aspects of upper management’s tone in achieving organisational objectives, their value judgments and management styles.

Victor and Cullen (1987) introduced the concept of ethical climate to explain and predict organisational ethical behaviour. They suggested that when morally acceptable behaviours based on honesty and integrity are actively promoted and become part of the organisational culture, a more highly ethical environment is created. In an empirical study
by Valentine, Godkin and Lucero (2002), the impact of ethical environment on employee organisational commitment was examined. Using a sample of 304 young working adults, the authors found that ethical environment was positively and significantly associated with the degree of organisational commitment from employees. Organisational commitment is an indication that employees experience feeling connected with the company’s values and way of doing things (Schwepker, 1999). Therefore, we predict that in a more ethical corporate environment, employees will be more willing to adhere to the organisation’s internal control procedures.

Thus, the ethical environment within the firm is likely to influence employee behaviours in two ways. First, through organisational socialisation processes employee will learn to behave according to the level of ethical climate, and the higher the ethical values, the greater the ethical outcomes (Ardts, Jansen & Van der Velde, 2001). Second, senior management themselves are more likely to focus and invest in designing and developing better internal control procedures and systems. Prior studies have shown that management’s attitude to corporate ethical environment, exampled by ethical leadership, impacts overall employee behaviour. Kizirian (2004), in a recent study of the audit papers of 60 information systems audit engagements, found that the client’s management tone has a significant impact on the strength of the client’s security controls. Therefore, it is expected that the greater the ethical environment, the higher the accounting control procedural quality.

The third hypothesis for this study is as follows:

**H3: There is a direct and positive relationship between ethical environment and accounting control procedural quality.**

**Risk Management - Internal Audit Activity**

In organisations where the scope of risk management activities is wide, employees are likely to be more actively involved in risk management activities. The awareness among employees about the various types of risks faced by their organisation, (and how such risks
may be interconnected) and the risk mitigation strategies put in place by management, is expected to be greater in firms with a wide risk management agenda than those firms with narrow risk management plans. Consequently, with greater risk management exposure, employees are likely to find value in internal audit activities, because such activities help to identify breakdowns in both the design of, and adherence to procedures designed to manage risk.

Also, the internal audit function is well placed to aid in improving risk management strategies (Lindow & Race, 2002). These researchers argue that as a firm widens its risk management activities, there will be greater demand for the internal audit function to assist in administrating and monitoring many of these risk management activities. Similarly, Spira and Page (2003) observe that, in view of the Turnbull report, some companies have expanded their internal audit function to include specialists such as engineers and marketers to broaden their operational risk perspective. Senior management can engage internal auditors to not only audit control activities, but also help to monitor a company's risk profile and play a key role in identifying areas that improve risk management processes.

Based on the above discussion, the following hypothesis is proposed:

**H4: There is a positive relationship between the scope of risk management and the extent of internal audit activities.**

**Ethical Environment - Internal Audit Activity**

In this study, we also predict that in organisations with higher ethical environment, senior management will be motivated to ensure that unethical behaviour is detected and corrected. For an organization to be ethical, it must have an organizational culture that promotes and values ethical decision-making, which occurs when organizational culture is conveyed and perpetuated through communication (Bowen, 2004). Ethical values may be communicated by example through leadership, and management’s strict adherence to
admonishing those who violate the ethical standards or code. Management’s conduct is likely to convey what is acceptable and unacceptable behaviour in the organisation. Given the monitoring role of internal audit, a management committed to fostering a high ethical climate, would thus seek more internal audit activities to improve financial integrity. For example, an ethical management may install a greater extent of internal controls that provide internal auditors with an enhanced ability to discover fraud indicators when the outcomes of their audit tests are considered collectively (Colbert and Alderman, 1998).

Therefore, based on the above discussion, we hypothesise:

**H5: There is a direct and positive relationship between ethical environment and the extent of internal audit activities.**

**Intervening Effect of the Extent of Internal Audit Activity**

In the preceding discussion, it was proposed that there is a significant relationship between the scope of risk management activity and the extent of internal audit activity (H4). It was further predicted in the discussion of H2 that there is a significant relationship between the extent of internal audit activity and accounting control procedural quality. When viewed together, internal audit activity can be expected to have an intervening effect on the relationship between scope of risk management activity and accounting control procedural quality. In other words, we hypothesise the following indirect relationship:

**H6(a): There is a significant intervening effect by the extent of internal audit activity on the relationship between risk management and the quality of internal control procedures.**

Similarly, the discussion on the significant proposed relationship between ethical environment and extent of internal audit activities (H5) may be considered simultaneously with the significant proposed relationship for H2 discussed earlier; between the extent of internal audit activities and accounting control procedural quality. This collective view of these relationships leads to the following final hypothesis for this study:

**H6(b): There is a significant intervening effect by the extent of internal audit activity on the relationship between ethical environment and the quality of internal control procedures.**
4.0 Research Method

To examine the proposed relationships, a questionnaire survey was distributed to financial controllers or chief accountants of medium to large Australian firms. The development of the questionnaire instrument is discussed in the following section.

Sample

The sample population involved firms from a cross-section of industries such as manufacturing, retail, automotive dealerships, information technology, wineries and fisheries, and hotels. The database comprised two major sources. The first data set accessed the BRW list of 1000 largest Australian firms (September, 2003) (www.brw.com.au). One hundred and sixty (160) firms whose revenues ranged from $20 million to $110 million per annum were selected randomly from the database for this study with the aim of accessing medium to large-sized firms. The second database comprises one hundred and sixty (160) four and five star hotels in Australian capital cities derived from the Dawson’s (2003) hotel directory.

Questionnaire Development

A questionnaire was developed based a literature review of prior studies, and the research instrument was pre-tested using six participants: the financial controllers of two large locally based firms, three academics who had significant industry experience and one forensic accountant, whose firm specialised in forensic consulting. Face-to-face interviews were conducted, leading to minor changes to wordings in several questions.

The questionnaire instrument included distinct sections for each of the four variables and a section capturing participants’ demographic information.
Questionnaire Administration

The questionnaire was mailed to the financial controller (or chief accountant) of each firm. Financial controllers were chosen as survey participants for two key reasons. Firstly, they are in a senior position and thus, are expected to have a very good understanding of the quality of internal control procedures. Secondly, financial controllers are often actively involved in the oversight of any system reviews and changes, and thus would be aware of any control weaknesses or malfunctions of internal control procedures. The questionnaire was accompanied by a letter to introduce the purpose of the study along with a reply paid envelope for their responses. Follow up calls were made approximately two weeks after the questionnaires were sent out².

Of the 320 questionnaires sent out to the organisations selected for participation, a total of 67 responses were received (approximately 21% response rate), of which 64 were useable (18.8% usable responses). Three of the returned questionnaires were discarded due to incomplete responses. As shown in Table 1, nearly half the respondents were from large firms i.e. 100 employees and above and about 28% from less than 49 employees.

A range of industries were represented in this study. These were categorized into Manufacturing, Retail, Hotel and Other Services.

5.0 Variable Measurement Model

Accounting control procedural quality was assessed based on a seven-item scale, whereby the items were adapted from the ‘Small Business Sample’ Section of CPA Australia’s Small Business survey (CPA Australia, 2003). Each participant was required to rate the firm’s internal control strength, using a 7-point Likert-type scale anchored at both

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² Ethical clearance for this research was obtained from Griffith University’s Social Sciences, Business, and Arts Ethics Sub Committee. A letter was forwarded to each firm, with a declaration that the questionnaire was given ethical clearance by the University’s sub committee, along with the researcher and supervisor’s contact details. Each letter sought respondent’s participation in fully completing the questionnaire, allowing the opportunity for each participant to remain anonymous.
ends with 1=very poor to 7=very good, in seven key areas. These include ‘cash management’, ‘bank accounts’, ‘physical assets’, ‘purchasing and accounts payable’, ‘sales’, ‘employee recruitment’ and ‘payroll’. Data analyses were based on the Z-score of a factor analysis for the seven-item (KMO = .841; Sig = 0.000). A confirmatory factor analysis produced goodness of fit indices that support this measurement model (see Table 3). The internal reliability of the measure for these seven-items for each participant was also strong with the Cronbach Alpha being 0.875.

The questionnaire also asked an additional question on the perceived quality of the internal controls overall so as to gain an assessment of the respondent’s overall judgement of the strength of the internal controls. A bivariate correlation analysis between the average score of the 7-item measure and the overall rating suggests indicates a significant and strong correlation to exist. The extent of internal audit activities was measured by asking each respondent “To what extent did your organisation, in the last financial year undertake internal audit activities?” An eight-point scale was also provided with 0 being ‘none’, 1 representing to ‘a very small extent’ and 7 signifying ‘a very large extent’.

Ethical environment was measured using a five item, five-point Likert-type scale as developed by Hunt, Wood and Chonko (1989). Ethical environment was evaluated using the ethical tone at the senior management level because COSO (1992) asserts that the overall ethical tone in an organisation is developed from the top down, and must be exampled to the lower staff levels of the organisation before an ethical environment will be assimilated by the whole organisation. The measure consisted of statements such as, “Top management in my organisation has let it be known that unethical behaviour will not be tolerated”, and “If a manager in my organisation is discovered to have engaged in unethical behaviour that results primarily in the entity’s gain (rather than personal gain) he or she will be promptly reprimanded. The Cronbach Alpha evaluating the internal reliability of the

3 The confirmatory factor analysis was conducted using structural equation modelling within the AMOS statistical software programme.
Ethical scale is 0.807. Further, a factor analysis revealed a unidimensional scale for the five-item ethical environment scale (KMO = .766; Sig = 0.000) and provided a Z-score, which was supported by the confirmatory factor analysis shown in Table 3.

Scope of risk management was measured by asking each respondent to rate the extent to which four items of risk management have been adopted by a firm. These four items relate to four specific areas that are likely to be covered as part of a firm’s risk management activities. The four items include the management of financial, environmental, technological, and operational risks. A factor analysis produced a significant result (KMO = .752; Sig = 0.000) while a high Cronbach Alpha (α = 0.846) supported a strong internal reliability for the risk management scale. Indices in Table 3 from a confirmatory factor analysis support a four-item risk management factor. Therefore the Z-score for the four-item has been used in the analysis.

6.0 Statistical analyses

Structural equation modelling (SEM) was used to test these six hypotheses. For this study, SEM was the preferred method of analysis because it allows the analysis of multiple relationships simultaneously, provides measures of overall model fit, and explains the significance of relationships between variables (Kline, 1998; Baines & Langfield-Smith, 2003). These functions as well as accounting for the effects of measurement error in multi-item variables are considered to be advantages of SEM over path analysis (Viator, 2001). Figure 2 is a SEM constructed to illustrate the relationships hypothesised in H1 to H6.

This study adopted the two-stage process recommended by Schumaker and Lomax (1996). The first stage of process was to conduct separate measurement models for each latent variable. The results of these confirmatory factor analyses are summarised in Table 3 and reported earlier in this paper under section 5.0 (Variable Measurement). The structural
model is constructed as the second stage of the process and the results are reported under the following section.

7.0 Results and Discussion

Results of Hypotheses

The descriptive statistics for the four variables are presented in Table 2. Figure 3 provides details of the initial (full) SEM for all the relationships hypothesised in H₁ to H₆. The regression coefficients for each path are summarised in Table 4. There are three significant SEM (full) Model structural paths.

The critical ratio (CR) and non-significant regression coefficient (CR = 0.268; P = .788) have been found for the path representing the relationship between the degree of risk management and the strength of accounting control procedures. These statistics do not support a significant direct relationship between these factors. Consequently, these results do not provide support for Hypothesis One (H₁). Conversely, the SEM results show an acceptable CR and significant regression coefficient (CR = 2.568; P = .010) for the positive relationship between the strength of internal control procedures and the strength of accounting control procedures; thus supporting Hypothesis Two (H₂). Similarly, the positive relationship between ethical environment and the strength of internal control procedures is shown to be significant (CR = 2.810; P = .005). Therefore these results support Hypothesis Three (H₃).

Table 4 also shows significant statistics (CR = 2.626; P = .009) for the direct positive effect of the degree of risk management on the extent of internal audit activities, which support Hypothesis Four (H₄). However, an unacceptable CR and non-significant
regression coefficient (CR = -0.936; P = .349) results are reported for the relationship between ethical environment and the extent of the internal audit activities. These statistics do not support the relationship proposed in Hypothesis Five (H5).

Also, from the results in Table 4, the acceptable and significant statistics for two significant paths hypothesised in H2 and H4 provide support for the intervening effect the extent of internal control procedure on the relationship between the extent of risk management and the strength of accounting control procedures. These statistics therefore support Hypothesis Six a (H6a). However, the statistics for the relationship between ethical environment and the extent of the internal audit activities were unacceptable and non-significant, respectively. Therefore, these findings do not reveal internal audit activity to have a significant role in the relationship between the ethical environment and accounting control procedural quality. Consequently, Hypothesis Six b (H6b) is not supported.

Both insignificant paths of the initial (full) SEM were eliminated when a further model was constructed to achieve a ‘best fit’ SEM. Table 5 summarises the regression coefficients, CR and significance for each of the remaining three significant SEM structural paths that are hypothesised in H2, H3, and H4. Significant findings achieved for the ‘best fit’ SEM are similar to the initial (full) SEM results that supported H2, H3, and H4. The significant statistics for the two SEM structural paths hypothesised in H2 and H4 again provide support for the intervening effect the extent of internal control procedure on the relationship between the extent of risk management and the strength of accounting control procedures hypothesised in H6a. These significant SEM structural paths are illustrated in Figure 4. The ‘goodness of fit’ indices are reported in Table 6 for the ‘best fit’ SEM. These significant indices (SRMR = 0.0352; GFI = 0.9930; AGFI = 0.9640; NFI = 0.9740;
Discussion of the Results

The findings of this study suggest that the strength of accounting control procedures is directly related to two factors: the ethical environment and the extent of internal audit activities. First, a significant and positive relationship between ethical environment and accounting control procedures is revealed. This association indicates that the higher the standard of ethics of the corporate culture, the more likely employees will adhere to organisational policies and procedures and support each other in conforming to ‘doing the right thing’, including adhering to accounting control procedures. Furthermore, in a highly ethical environment, there will be greater social norm pressure on following organisational procedures as it would mean enhancing the well-being of the organisation as a whole. Consequently breaches of accounting control procedures would be minimal as ethical behaviour becomes more valued and fostered within the organisation. This finding indicates the importance of evaluating a firm’s ‘tone at the top’ when auditing organisational internal controls. That is, firms with a highly ethical senior management are expected to exhibit better quality accounting controls, whereas firms with a less ethical management philosophy are expected to have less effective accounting controls.

Further, the positive relationship between internal audit activities and accounting control procedures supports the traditional role played by internal audit as a key monitoring mechanism whereby the more extensive the internal audit activities, the greater the likelihood of detecting errors and shortcomings of the accounting control procedures. It is a widely held view that part of the primary function of internal audit is to review the

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4 Smith and Langfield-Smith (2004) recognised that while $\chi^2$, GFI, NFI, AGFI are the most commonly used fit indices for accounting research, they acknowledged some structural equation model (SEM) experts consider these to be inappropriate measures (e.g., Hu & Bentler, 1999; Byrne, 2001). Consequently, Table 7 incorporates additional indices considered to be more appropriate by these SEM experts (e.g., CFI, RMSEA and Standardised RMR). Further, the appropriateness of the $\chi^2$ statistic to as an indicator of fit has been questioned due to its potential bias (Byrne, 2001; Arbuckle, 2005).
soundness, effectiveness and compliance of internal control systems (Cai, 1997; Fadzil, Haron and Janten, 2005).

Interestingly, the findings of this study do not support a direct relationship between the scope of risk management activities and the strength of accounting control procedures. However, the impact of the scope of risk management activities on accounting control procedures strength is seen to occur indirectly through the extent of internal audit activities. The results indicate that greater the scope of risk management, the greater the extent of internal audit activities conducted by the firm. This finding suggests that in organisations with a wider scope of risk management, employees tend to become more aware of areas in which the organisation is exposed to risks including area with high probability of errors and omissions occurring. In turn, with increasing risk identification and assessment processes, employees are more likely to involve the internal audit section for investigation and review of the various risks. Subsequently, as the internal audit activities increase, the strength of the accounting control procedures will increase. In summary, staff who have had a greater degree of experience in risk management activities are more likely to be aware of the relevant risks associated with internal control breakdowns. They also are more likely to follow-up and report on such risks to the internal audit, which in turn will have a positive impact on the strength of the accounting controls.

In summary, the findings of this study suggest that accounting control procedures can be strengthened in at least three ways. First, organisations may strengthen accounting control procedures by fostering a highly ethical organisational environment or culture. Supporting an active, independent internal audit function with adequate funds for a wide variety of internal audit activities is the second suggested way to strengthen such procedures. The promotion of a risk management culture, which is supported by a broad scope risk management programme, is suggested as the third way to strengthen such procedures.
8.0 Conclusion and Limitations

This study provides evidence to suggest the extent of internal audit activities plays a critical role in strengthening accounting control procedures. Also, organisations placing a greater focus on risk management will participate more actively in internal audit activities, and this has implications for improving the quality of the accounting control procedures. Finally, the ethical environment within a firm will have a direct positive effect on the quality of the accounting control procedures.

Nevertheless, the results of this study need to be interpreted in light of several limitations. First, a limitation of this study relates to the measurement of accounting control procedural quality, which was also based on the financial controllers’ assessment. Perhaps, a more objective measure of the design of the ‘accounting control procedural quality’ construct may be gained by evaluating the resources and sophistication of the various policies and procedures. Further, future studies may adopt a weighted measure of accounting control procedural quality, whereby the assessment of multiple parties including financial controllers, internal and external auditors may be used for a more holistic assessment. Also, the usual caveats of survey research are applicable to this study. Finally, the small sample size may be seen as a limitation. However, the Hoelter’s (1983) critical N (414 @ .05; 636 @ .01) suggests the sample size is adequate (Byrne, 2001; Arbuckle, 2005).5

5 The reported Hoelter critical N for the ‘best fit’ SEM indicated that the hypothesis that model is correct should be accepted for these large sample sizes (i.e., between 414 and 636 respondents), which are much larger than the accepted critical N of 200 argued by Hoelter (1983).
References


IIA, 2000


Figure 1:
The Five Components of Internal Control (AUS 402.43 and COSO, 1992)

![Internal Control System Diagram]

Figure 2
The relationships hypothesised in $H_1$ to $H_6$

![Relationships Diagram]

Indirect Relationship (Mediation Effect) Hypothesis

$H_{6a} = H_2 \ H_5$ path
$H_{6b} = H_2 \ H_4$ path
Table 1: Sample Respondents by Number of Employees

<table>
<thead>
<tr>
<th>Number of Employees</th>
<th>Number of Respondents</th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 49</td>
<td>18</td>
<td>28%</td>
</tr>
<tr>
<td>50-100</td>
<td>15</td>
<td>23%</td>
</tr>
<tr>
<td>More than 100</td>
<td>31</td>
<td>49%</td>
</tr>
<tr>
<td>Total</td>
<td>64</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 2 – Model 2 - Descriptive Statistics and Correlation Matrix (n=64)

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>MEAN</th>
<th>S. D.</th>
<th>THEO. RANGE</th>
<th>ACTUAL RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethical Environment (E. Env)</td>
<td>4.19</td>
<td>0.648</td>
<td>1 - 5</td>
<td>2.2 – 5.0</td>
</tr>
<tr>
<td>Risk Management (RM)</td>
<td>3.41</td>
<td>1.875</td>
<td>1 - 7</td>
<td>1.0 – 7.0</td>
</tr>
<tr>
<td>Extent of Internal Audit Activities (IA)</td>
<td>3.85</td>
<td>2.160</td>
<td>0 - 7</td>
<td>0.0 – 7.0</td>
</tr>
<tr>
<td>Accounting Control Procedural Quality (ACPQ)</td>
<td>5.35</td>
<td>1.08</td>
<td>1 - 7</td>
<td>2.0 – 7.0</td>
</tr>
</tbody>
</table>

Table 3: Confirmatory Factor Analysis for Three Measurement Models

<table>
<thead>
<tr>
<th>Goodness of fit indices</th>
<th>ACPQ</th>
<th>E. Env</th>
<th>RM</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMIN (Minimum Discrepancy) (χ²)</td>
<td>5.040</td>
<td>3.4350</td>
<td>0.116</td>
</tr>
<tr>
<td>P (Probability)*</td>
<td>.8880</td>
<td>.3290</td>
<td>.7330</td>
</tr>
<tr>
<td>CMIN/DF **</td>
<td>0.504</td>
<td>1.1450</td>
<td>0.116</td>
</tr>
<tr>
<td>SRMR (Standardised Root Mean Squared Residual)***</td>
<td>0.0273</td>
<td>0.0316</td>
<td>0.0068</td>
</tr>
<tr>
<td>GFI (Goodness-of-Fit Index)#</td>
<td>0.9790</td>
<td>0.9800</td>
<td>0.9990</td>
</tr>
<tr>
<td>AGFI (Adjusted Goodness-of-Fit Index)#</td>
<td>0.9400</td>
<td>0.9010</td>
<td>0.9910</td>
</tr>
<tr>
<td>NFI (Normal Fit Index)##</td>
<td>0.9780</td>
<td>0.9690</td>
<td>0.9990</td>
</tr>
<tr>
<td>CFI (Comparative Fit Index)###</td>
<td>1.0000</td>
<td>0.9960</td>
<td>1.0000</td>
</tr>
<tr>
<td>RMSEA (Root Mean Square Error of Approximation)###</td>
<td>0.0000</td>
<td>0.0470</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

* Non-significant probability cannot reject the goodness-of-fit of the hypothesised model [Byrne, 2001]

** Ratio of < 2 indicates a good-fitting model [Tabachnick & Fidell, 2001]

*** SRMR < .05 represents a well-fitting model [Byrne, 2001]

# Required value of >.9 for each of these indices [Page & Meyer, 2000] ;Tabachnick & Fidell, 2001]

## Required value of between >.9 [Tabachnick & Fidell, 2001]and ≥.95 [Hu & Bentler, 1999] for each of these indices

### RMSEA is one of the most informative criteria with ≤ .08 as the desired value of RMSEA [Hu & Bentler, 1999; Tabachnick & Fidell, 2001]
Figure 3
The Full Structural Equation Model: Testing Hypotheses H1 to H6

![Diagram of the Full Structural Equation Model]

\* = < .05; \** = < .01

Table 4: Maximum Likelihood Estimates: Full SEM Model Structural Paths

<table>
<thead>
<tr>
<th>Regression Weights</th>
<th>Estimate</th>
<th>S.E.</th>
<th>C.R</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent of IA  &lt;-------- Risk Management</td>
<td>.753</td>
<td>.287</td>
<td>2.626</td>
<td>.009</td>
</tr>
<tr>
<td>Extent of IA  &lt;-------- Ethical Environment</td>
<td>-.268</td>
<td>.287</td>
<td>-.936</td>
<td>.349</td>
</tr>
<tr>
<td>Accounting Control Procedural Quality  &lt;---- Ethical Environment</td>
<td>.313</td>
<td>.122</td>
<td>2.568</td>
<td>.010</td>
</tr>
<tr>
<td>Accounting Control Procedural Quality  &lt;---- Extent of IA</td>
<td>.147</td>
<td>.052</td>
<td>2.810</td>
<td>.005</td>
</tr>
<tr>
<td>Accounting Control Procedural Quality  &lt;---- Risk Management</td>
<td>.034</td>
<td>.127</td>
<td>.268</td>
<td>.788</td>
</tr>
</tbody>
</table>

Table 5: Maximum Likelihood Estimates: Best Fit SEM Model Structural Paths

<table>
<thead>
<tr>
<th>Regression Weights</th>
<th>Estimate</th>
<th>S.E.</th>
<th>C.R</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent of IA  &lt;-------- Risk Management</td>
<td>.637</td>
<td>.260</td>
<td>2.447</td>
<td>.014</td>
</tr>
<tr>
<td>Accounting Control Procedural Quality  &lt;---- Ethical Environment</td>
<td>.327</td>
<td>.109</td>
<td>2.992</td>
<td>.003</td>
</tr>
<tr>
<td>Accounting Control Procedural Quality  &lt;---- Extent of IA</td>
<td>.152</td>
<td>.050</td>
<td>3.041</td>
<td>.002</td>
</tr>
</tbody>
</table>
Figure 4
Best Fit Structural Equation Model: Testing Hypotheses H₁ to H₆

![Diagram showing the relationships between Risk Management, Extent of IA, and Accounting Control Procedural Quality with coefficients 0.64 *, 0.15 **, and 0.33 **.]

* = < .05; ** = < .01

Table 6: Indices for Full and Best Fit Structural Equation Models:
Testing Hypotheses H₁ to H₆

<table>
<thead>
<tr>
<th>Goodness of fit indices</th>
<th>Full SEM</th>
<th>Best Fit SEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMIN (Minimum Discrepancy) (χ²)</td>
<td>0.0000</td>
<td>0.9430</td>
</tr>
<tr>
<td>P (Probability)* see Table 3 for reference</td>
<td>Not Produced</td>
<td>.6240</td>
</tr>
<tr>
<td>CMIN/DF ** see Table 3 for reference</td>
<td>Not Produced</td>
<td>0.471</td>
</tr>
<tr>
<td>SRMR (Standardised Root Mean Squared Residual)*** see Table 3 for reference</td>
<td>Did not Fit</td>
<td>0.0352</td>
</tr>
<tr>
<td>GFI (Goodness-of-Fit Index) # see Table 3 for reference</td>
<td>1.0000</td>
<td>0.9930</td>
</tr>
<tr>
<td>AGFI (Adjusted Goodness-of-Fit Index) # see Table 3 for reference</td>
<td>Not Produced</td>
<td>0.9640</td>
</tr>
<tr>
<td>NFI (Normal Fit Index) ## see Table 3 for reference</td>
<td>0.9780</td>
<td>0.9740</td>
</tr>
<tr>
<td>CFI (Comparative Fit Index) ## see Table 3 for reference</td>
<td>1.0000</td>
<td>1.0000</td>
</tr>
<tr>
<td>RMSEA (Root Mean Square Error of Approximation) ### see Table 3 for reference</td>
<td>0.2790</td>
<td>0.0000</td>
</tr>
</tbody>
</table>