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The Structure and Effectiveness of
Internal Control

A Contingency Approach

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Annukka Jokipii

”Nousin aamulla, niin kuin olen aina noussut. Laitoin aamukahvin. Menin puotiin. Järjestelin kaikki valmiiksi asiakkaita varten. Niin se siitä sitten taas vaan lähti, päivä kerrallansa. Joka päivälle omat työnsä ja murheensa. Ja aina joskus ilonkin aihetta.”

“I got up one morning as I have always got up. I made my coffee. I went to the shop. I got everything ready for the customers. And so I got started once again, one day at a time. Each day has its own work and its own worries. And sometimes cause for joy.”

Sisko Istanmäki

English translation by Virginia Mattila

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LIST OF ABBREVIATIONS

AAA	American Accounting Association
AIC	Akaike Information Criterion
AICPA	American Institute of Certified Accountants
CEO	Chief Executive Officer
COCO	Guidance on Control
COSO	Committee of Sponsoring Organizations of the Treadway Commission's Internal Control – Integrated Framework
FEI	Financial Executives Institute
GAO	General Accounting Office
GFI	Goodness of Fit
ICAEW	The Institute of Chartered Accountants in England and Wales
ID	Unique Identifier
IIA	Institute of Internal Auditors
IMA	Institute of Management Accountants
LISREL	Linear Structural Relations
LSE	London Stock Exchange
MAS	Management Accounting System
MCS	Management Control Studies
MI	Modification Index
NFI	Normed Fit Index
PEU	Perceived Environmental Uncertainty
RMR	Root Mean Square Residual
RMSEA	Root Mean Square Error Approximation
SBU	Strategic Business Unit
SME	Small and Medium size Enterprises
SOX	Sarbanes-Oxley Act of 2002
SEM	Structural Equation Modeling
URL	Uniform Resource Locator

ABSTRACT

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In order to ensure the efficiency and effectiveness of activities, reliability of information and compliance with applicable laws and regulations organizations need adequate internal control. With this wide definition internal control is understood as an integral component of an organization's governance structure. However, the current state of internal control research is incoherent and most recent studies focus only on relatively narrow segments of internal controls.

In this study the objective is to examine research hypotheses focused on contingency characteristics that may affect internal control structure and its effectiveness. The research objective is based on contingency theory, where it is stated that the design of control depends on the organization's context and that an appropriate fit between the organization's context and control leads to better effectiveness. This statement concurs with those internal control frameworks that assume that the need for internal control varies by organizational characteristics. To attain a more holistic view on the issue, this study considers the internal control structure and its effectiveness not as single controls, but as a control package. Moreover, internal control structure and its effectiveness are operationalized as latent variables.

The data used in this study were gathered from Finnish firms using a web-based survey method. A total of 741 CEOs responded to the questionnaire (response rate 50.4%). The data were analyzed using structural equation modeling technique.

The results of this study show that in the mediation model prospector strategy and high perceived environmental uncertainty have a statistically significant effect on internal control structure. Internal control structure plays a mediating role between these contingency characteristics and internal control effectiveness. The results also reveal statistically significant differences between the mean values of the latent variables in alternative multi-groups. In moderation model no significant results were found which confirms the results given by mediation model. Thus, among the contingency characteristics examined, the prospector strategy and high perceived uncertainty were the most important characteristics affecting internal control structure and its effectiveness.

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Key words: internal control, contingency theory, structural equation modeling

1. INTRODUCTION

This research is motivated by the fact that the establishment and reporting of internal control has become a statutory requirement for companies. Many national corporate governance reports and reforms include recommendations for internal control (Maijoor 2000). For example, Section 404 of the Sarbanes-Oxley Act of 2002 (SOX) passed by the United States Congress makes it a requirement for public companies, mandating that management annually assesses and reports the effectiveness of the company's internal controls. As organizations adopt these requirements, they must make sure that internal control structure is designed in keeping with the new internal control requirements. Even the management in organizations not governed by SOX 2002 is typically required to provide their board of directors with assurances that controls are adequate.

Management has always actually been responsible for the design and maintenance of the company's internal control. Because of the increased requirements, organizations managements now have the added responsibility to annually evaluate, test and report on the company's internal controls. Moreover, the external auditors are also responsible for auditing management assertions as to the effectiveness of the internal control and they have to give their own, independent conclusion (Ramos 2004: 75). In addition, suppliers, customers, investors, the government and society as a whole are interested in internal controls since they may affect long term confidence in reporting, accountability and in the corporate form of organization (Rittenberg and Schwieger 2001: 172). As such, it is an integral component of an organization's governance structure. Thus, in the corporate governance literature, improved and stronger internal control is frequently suggested as an effective solution to corporate governance problems (Maijoor 2000: 108).

Despite this development, no study focused on internal control structures, its effectiveness and related contingency characteristics was found in the literature. Kinney (2000) noted that even if internal control is an essential element affecting reference groups, it is still relatively unexplored by researchers. Selto and Widener (2004)

analyzed published research and professional articles in management accounting and found that there were less internal control topics in research literature than in practical literature. The professional literature on internal control has made progress towards developing international control frameworks, but so far there is a limited amount of internal control research.

This study is conducted on the basis of this apparent gap in prior research. Due to increasing emphasis of the role played by internal control in business and the lack of existing research, an internal control approach offers new research opportunities. In this study the objective is to examine research questions focused on contingency characteristics that affect internal control structure and its effectiveness as assessed by management. The research objectives are based on the contingency theory that assumes that the design of control depends on the organization context and that an appropriate fit between the organization context and control structure leads to better effectiveness. This statement concurs with the internal control literature and frameworks, where it has been stated that the needs of internal control vary according to organizational characteristics. Thus, a contingency approach is in accord with practical frameworks and appears to afford a potential explanation for the variety of internal control structures observed in practice.

Based on the arguments in the contingency theory and the internal control literature, this study examines the impact of organization strategy, size, structure and environment on the internal control structure. These organizational characteristics are chosen because there is evidence in the previous studies that these factors may have some impact on the design of control structure (for example Chenhall 2003; Donaldson 2001; Hoque and James 2000; Kaplan and Atkinson 1998; Macintosh 1994; Simons 1987; Drazin and Van den Ven 1985; Otley 1980). This study also focuses on the important relationship between internal control structure and its effectiveness, which have been theorized in internal control frameworks. These relationships are examined using structural equation modeling technique and, specifically, mediation and moderation models are used.

1.1. Purpose of the study

The main purpose of this study is two-fold. The first purpose is to research the relationship between the contingency characteristics and the internal control structure. The second purpose of the study is to examine the relationship between internal control structure and the effectiveness of internal control from the organization managements' perspective. These relationships are examined using structural equation modeling technique and specifically, this research focuses on the mediation and moderation models.

In the first part the main question is how contextual aspects – internal and external – affect internal control structure. The theory of this part of study is grounded on the contingency approach, which proposes that control systems should be designed specifically to suit the special circumstances in which the organization operates (Evans, Lewis and Patton 1986: 483). The contextual aspects, i.e. the contingency characteristics used in this study, are found important in previous management control studies. The characteristics examined are strategy, organization structure, size, and perceived environmental uncertainty. The internal control structure examined is based on the existing frameworks which are used in practice. In the frameworks internal control structure has been described to contain five components: control environment, risk assessment, control activities, monitoring, and communication and information. Based on the frameworks a quantitative measurement model for internal control structure is developed, tested, and implemented in this study.

The detailed research model of the first part of the study is presented in Figure 1. On the left are the four contingency characteristics applied from contingency theory. On the right is the internal control structure with five components. Research questions 1–4 examine the relationships between the contingency characteristics and the internal control structure.

The second part of this study focuses on the relationship between internal control structure and internal control effectiveness from the management perspective. Based on

frameworks, the effectiveness of internal control includes three components: efficiency and effectiveness of activities, reliability and completeness of information, and compliance with laws and regulations. As in internal control structure, a quantitative measurement model for internal control effectiveness is developed, tested and implemented in this study. This part of the research is presented in Figure 2. On the left is the internal control structure with five components. On the right is the effectiveness of internal control with three components. Research question 5 examines the relationships between the internal control structure and its effectiveness.

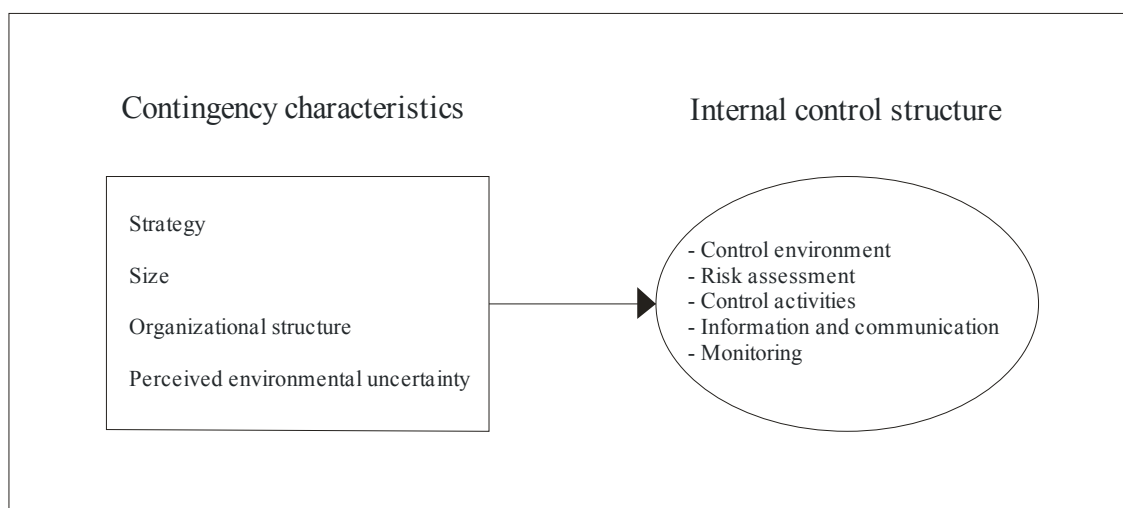


Figure 1. First part of the study.

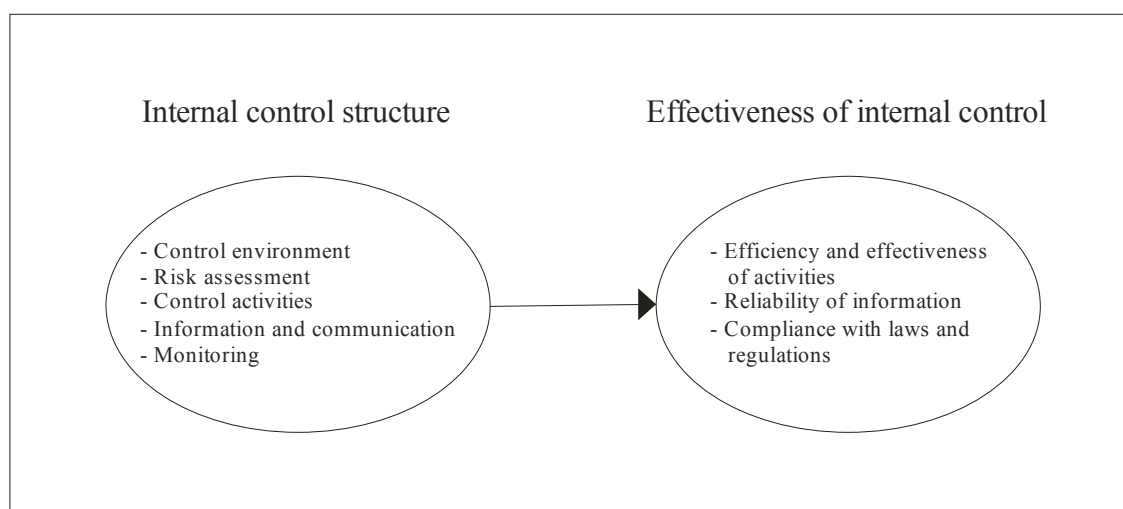


Figure 2. Second part of the study.

Thus, the relationships between the three sets of variables – the contingency characteristics, the internal control structure and the effectiveness of internal control – are the main focus of this research. Figure 3 presents the mediation model for the research. On the left are four contingency characteristics which are applied from contingency theory. In the centre is the internal control structure with five components. On the right is the effectiveness of internal control with three objectives. Research questions 1–4 (Q₁, Q₂, Q₃, Q₄) focus on the relationships between the contingency characteristics and the internal control structure. Research question 5 (Q₅) focuses on the relationship between internal control structure and the effectiveness of internal control. Hypothesized relationships are analyzed with structural equation modeling technique. The goal of the analysis is to ascertain which of the relationships are significant and, furthermore, if the internal control structure has a mediating role between contingency characteristics and internal control effectiveness. In addition, this research also examines if contingency characteristics have a moderating role between contingency characteristics and internal control effectiveness. Figure 4 presents the moderation model used to examine alternative effects of contingency characteristics and confirm the results given by the mediation model. Furthermore, to confirm the results given by the models, direct effects were also examined. All the relationships examined are presented in Figure 5.

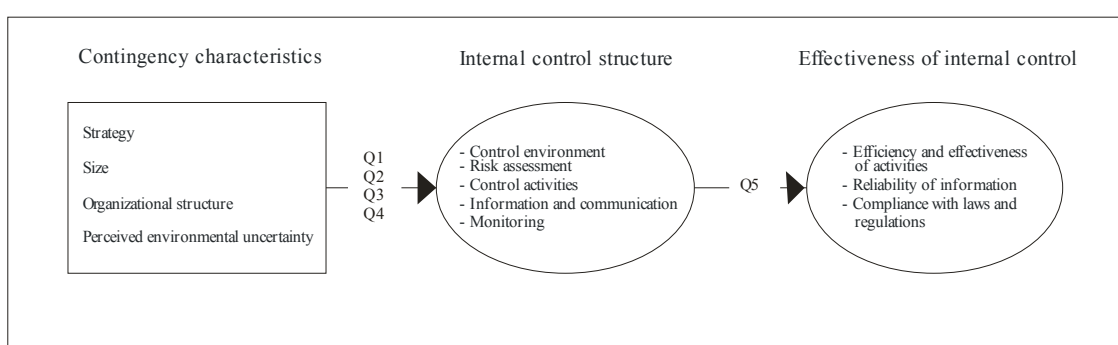


Figure 3. Mediation model for the study.

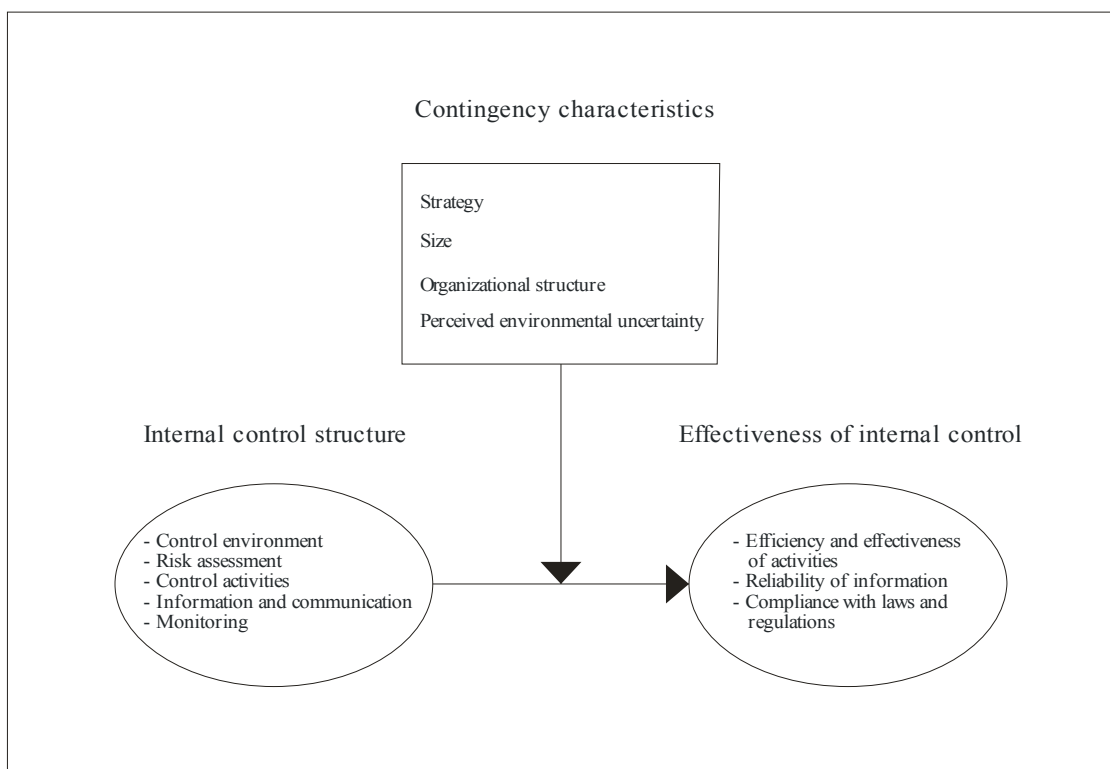


Figure 4. Moderation model for the study.

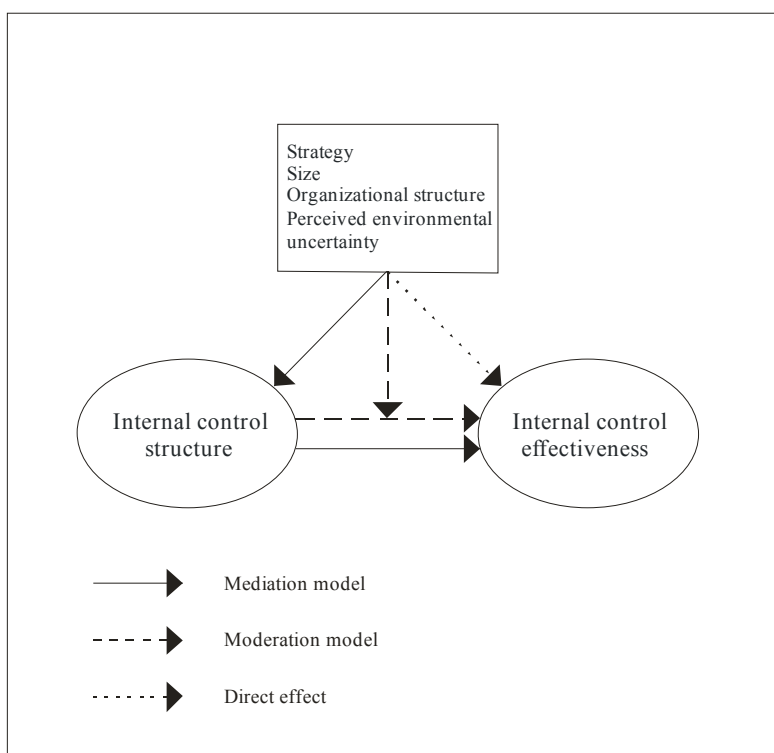


Figure 5. Examined theoretical relationships in the study.

The research questions of this study are presented below.

Research question 1: Is the internal control structure dependent on the type of business strategy of the organization?

Research question 2: Is the internal control structure dependent on the size of the organization?

Research question 3: Is the internal control structure dependent on the structure of the organization?

Research question 4: Is the internal control structure dependent on the perceived environmental uncertainty of the organization?

Research question 5: Is the internal control effectiveness dependent on the internal control structure?

To answer the research questions formulated more detailed research hypotheses are developed in Chapter 3. Several models are also produced. First, the internal control frameworks and contingency theory produce a theoretical model which is used to provide theoretical understanding. Next, several research models are specified for empirical examination. The constructs of the theoretical models need to be translated into observable variables and thus, previous contingency studies are used to identify corresponding contingency variables. Internal control structure and its effectiveness are drawn from theories of internal control frameworks. Relationships between theoretical constructs are tested based on contingency and internal control theories.

In general, there are some obstacles in the research of internal control (Kinney 2000: 88; Maijoor 2000: 102). The first barrier is the complexity of the internal control process. The definition of internal control is broad and it is operationalized in complex and dynamic organizations that differ across time and cultures. Due to their complexity it is difficult to measure internal controls. The second barrier is the lack of access to

organizations. Usually management does not want to publish information about the organization's internal control systems, thus researchers have problems with the availability of data. The third barrier is the generalizability of research results across countries, industries, organizations and cultures. Internal control may reflect all of these differences to some degree and research may reflect these differences rather than generalized behavior. The fourth barrier is the limited size of the body of relevant internal control research. Hence, internal control is not yet a separate category of research.

This study goes beyond these barriers in alternative ways. The first barrier, the complexity of internal control system, is solved with the common definition and with the frameworks of internal control used in practice. The definition of internal control is based on the frameworks approved in many official contexts and widely used in alternative kinds of organizations worldwide. These frameworks are used as a ground theory when defining internal control factors that should be included in effective internal control in organizations. These factors are used in this study, which means that this research does not concentrate on individual controls. On the contrary, the focus is more general and abstract.

The second barrier, data availability, is solved by theoretical and methodological choices. The statistical approach used in this study needs a large number of observations and furthermore, the results are interpreted on a general level to guarantee the anonymity of any individual organization. The third barrier, the problem with the generalization of the results, is avoided by the overall research approach. This research tends to find organizational factors affecting the internal control structure. The idea of the study is to find relationships between contingency characteristics, the internal control structure and the effectiveness of internal control. The research approach is chosen so that the results can be generalized in different organizations. This study also contributes to the growing body of internal control research.

1.2. Contribution of the study

This research provides some explanations for the contextual factors that influence internal control structure and its effectiveness. It contributes to the existing research in several respects. First, the research examines internal control structure. Several internal control structure frameworks have been published and these are used in current practices in organizations worldwide. At any rate, there is slight evidence about frameworks outside practice and thus, frameworks deserve more intensive research attention (COSO 1994; Selto et al. 2004). This study extends earlier studies focusing on internal control and gives more detailed insight into factors affecting internal control structure and effectiveness. For example Fisher (1995: 47) proposed that in the future accounting research on control studies should be addressed to the non-financial measures (see also Fisher 1992; McKinnon and Bruns 1992). Thus, this research offers a non-financial control system approach and examines situations pertaining in the organizations. Furthermore, the present study contributes to the internal control literature by adopting a more holistic approach than has typically been the case. Earlier studies (see for example D'Aquila 1998; Hooks, Kaplan and Schultz 1994; Mills 1997) have usually concentrated on particular control elements, such as control environment, communication or risk assessment. Apart from a few exceptions (see for example Stringer and Carey 2002), however, little attention has been paid to internal control as defined in frameworks.

Second, understanding the contingencies affecting the internal control structure is important when evaluating and restructuring the organization's control system. Modern management techniques have caused organizational downsizing, decentralization, fewer layers of middle management, delegation of responsibility and tendency to simplify processes in organizations. These changes mean that there are fewer people to implement traditional internal accounting controls and to perform traditional control activities (Stinger et al. 2002: 61). Thus, it is reasonable to have a comprehensive view of internal control structure in alternative contexts. In that way the special needs of different organizations can be identified and there an appropriate internal control structure for effective internal control can be found. Therefore, contingency theory

offers a useful approach to study internal control and its effectiveness in alternative contexts. Contingency theory is well known in organization and management control research but, it is not yet common in internal control research.

Third, there is a lack of knowledge about the effectiveness of existing internal control structures from managements' point of view. The earlier literature has concentrated on the external parties' view despite the fact that organizing internal control in the organization is management's responsibility (see for example Bierstaker 2003). Thus, this research examines how management perceives internal control structure and its effectiveness and how contingency characteristics affect it.

Fourth, the research provides an empirical analysis of internal control in the Finnish context, where formal regulation of internal control is more limited than, for example, in the United States, where the Sarbannes-Oxley Act 2002 stipulates that firms meet requirements of internal control.

Fifth, this study also contributes methodologically. In recent years there has been criticism not only of the use of inappropriate proxies to capture theoretical constructs, but also of the lack of consistency between the levels of theory, analysis and measurement (Ittner and Larcker 2001; Luft and Shields 2003; Abernethy, Bouwens and van Lent 2004). Consistent with the research question development, constructs are measured on organizational level. This study uses either prior established survey instruments or, when needed, these are constructed on the basis of theory. The measurement models constructed are internal control structure and its effectiveness. Earlier studies have usually limited their studies to one control system component, but in this research internal control and its effectiveness are represented as multi-dimensional latent variables.

Sixth, the relationships between contingency characteristics, internal control structure and its effectiveness are examined using structural equation modeling (SEM). In particular, this research examines both the mediation and moderation models which have been introduced in contingency research but only few studies have implemented

both models in the same study. In the mediation model both direct and indirect effects are tested. In the moderation model both concepts of fit, form and strength, are examined. In addition, mean analysis of latent variables is also performed. By using these complementary statistical techniques, the aim is to get a broader view of the situation. Understanding commonalities and differences in internal control structure and its effectiveness in alternative contexts makes a significant contribution to the internal control discussion. Therefore structural equation modeling technique offers a useful approach to the study of internal control structure and its effectiveness.

1.3. Structure of the study

The dissertation consists of seven chapters organized in the following way. The first chapter offers an introduction to the research, and in addition, the purpose and the contribution are presented. The second chapter briefly introduces four well-known internal control frameworks and defines the framework for internal control and its effectiveness used in this study. The chapter continues previewing earlier internal control research and contingency theory based control research. The theoretical choices made in contingency fit approach are also presented. In the third chapter the research hypotheses are formulated between contingency characteristic, internal control structure and its effectiveness based on the earlier contingency studies.

The fourth chapter describes the methodology and sources of information, methods of data collection and also discusses the validity and reliability of this research. The fifth chapter presents the results of the structural equation modeling. In the last chapter a discussion based on the empirical results can be found, likewise theoretical, methodological and practical contributions. Moreover, limitations for the study are noted and further research ideas are also evinced. The study ends with the conclusion.

2. THEORETICAL BACKGROUND

According to the wide view of internal control it covers all aspects of organization and there is a clear demand for a method of pulling together control concepts to form an integrated internal control framework. Thus, at the beginning of this chapter well-known frameworks are presented and an internal control framework for this research is developed. This research unites two fields in the literature, and therefore both internal control and contingency based management control research are presented in the second section. The third section continues with contingency fit theory and presents the choices which have been made in the contingency theory approach.

2.1. Internal control frameworks

The aim of this section is to present common issues of the internal control structures and objectives of the internal control. Internal control frameworks are chosen to explain internal control: through them important elements of control and its relationships can be understood. These commonly known frameworks include the definition of internal control and present components of internal control structure. At the end of this section the frameworks presented are summarized, and the used research structure of internal control and its effectiveness are explained.

In earlier studies researchers have offered different classifications or frameworks for control systems. Formal, system-based approach is used by Simons (1995). This well-known study seeks to understand how top management use formal control systems as levers in the implementation of strategy. Gordon and Narayanan (1984) focus on the balance between financial and non-financial information systems, and Ditillo (2004) includes informal and social forms of control in his framework. A broader view of control is introduced by Abernethy and Stoelwinder (1995). They include both formal and informal controls in their research design.

In this study internal control is defined in the broad sense, based on internal control frameworks used in practice. An internal control system can be designed by selecting control mechanisms from a portfolio which is presented in frameworks. The frameworks include both formal and informal controls. For example, formal internal controls are job descriptions, personal supervision, and performance measurement. Informal controls are personnel selection and training implemented to influence behavior and create desired cultural environment.

A control system can be understood as a package, since its components are internally consistent and are designed to achieve similar ends (Abernethy and Chua 1996: 573). Consequently, alternative internal control frameworks constitute a parallel control package which can be used to achieve reasonable assurance in organizations that the boards of directors and management have understood the extent to which the entity's operations objectives are being achieved, published financial statements are reliably prepared and the applicable laws and regulations are being complied with. However, the problem within defining internal control and its effectiveness has been addressed the earlier literature (Maijoor 2000). The definition of internal control is broad and encompasses all the organization's activities. Several parallel frameworks including definitions of internal control and its effectiveness have been evinced by professionals: some well known frameworks are presented in the following section.

2.1.1. Internal Control – Integrated Framework (COSO)

The most widely accepted model for internal control is the Committee of Sponsoring Organizations of the Treadway Commission's Internal Control – Integrated Framework (the COSO Report). The commission was created in 1985 with the joint sponsorship of the five prominent organizations (AICPA, AAA, IIA, IMA, and FEI). It established a common internal control framework for the use of business executives, legislators, regulators and researchers. The first draft was issued in 1991 and the final version in 1992.

The main objective in the COSO Report is to present a framework which enables common understanding of internal control. The report specifies control criteria and suggests tools to assist management in the business sector for evaluating the internal control system. It also provides guidelines for preparing reports on internal control to be used by external parties. The COSO Report emphasizes the importance of management's involvement in understanding internal control functions and establishing an adequate and effective control system.

The COSO Report defines internal control as a process affected by an organization's management, board of directors and other personnel. The process is designed to provide reasonable assurance regarding the achievement of objectives in the following categories:

- 1) Operational: Effectiveness and efficiency of operations
- 2) Financial Reporting: Reliability of financial reporting
- 3) Compliance: Compliance with applicable laws and regulations

With these objectives the COSO Report goes far beyond the narrow objectives of internal accounting control and covers three broad objectives: operational, financial reporting and compliance. *Operational objectives* pertain to the effectiveness and efficiency of operations including performance and profitability goals and safeguarding resources against loss. *Financial reporting objectives* cover the preparation of reliable financial statements, including the prevention of fraudulent financial reporting. *Compliance objectives* specify adherence to the laws and regulations the organization is subject to. This broad definition indicates that the COSO Report considers almost all organizational measures to be part of internal control. The problem is a lack of clear boundaries between internal control and non-internal control: it can be claimed that all an organization's measures contribute to internal control.

Furthermore, the COSO Report states that managements should take into consideration five essential components when planning an effective internal control system. These components are:

Control environment, which establishes the foundation for the internal control system by providing a fundamental discipline and structure.

Risk assessment, which involves the identification and analysis of relevant risk in achieving predetermined objectives by management.

Control activities, which covers policies, procedures and practices which ensure that management objectives are achieved and risk mitigation strategies are carried out.

Information and communication, which supports all other control components by communicating control responsibilities to employees and providing information in a form and time frame that enables people carry out their duties.

Monitoring, which covers the external overview of internal controls by the management or other parties on the outside of the process. It may include the application by employees of independent methodologies, like customized procedures or standard checklists within a process.

Control environment consists of integrity and ethical values, management's philosophy and operating style, human resource policies and practices, competence of personnel and assignment of authority. It sets the tone of the organization and influences the control consciousness among personnel. The control environment serves as a foundation for the other components. *Risk assessment* requires identification and investigation of both internal and external risks. Management has to set objectives before they can identify risks to their achievement and take the necessary actions to manage the risks. Because of continuous change in operating conditions, risk assessment is needed to identify and deal with the special risks associated with the change. *Control activities* are the policies, procedures and rules that provide reasonable assurance that internal control objectives are being carried out properly and risks are being managed effectively. These control activities are divided into three categories: operating controls, financial information controls, and compliance controls. Operating control activities are directed towards managing and monitoring the organization's operations. Financial information

control activities are geared toward ensuring reliable financial reporting process and safeguarding organization's assets. Compliance control activities are aimed at ensuring compliance with the applicable laws and regulations as well as adherence to ethical guidelines and conduct. The *information and communication* component ensures that relevant information is identified, captured and communicated in a form and timeframe that enables people to carry out their responsibilities sufficiently. Information systems produce reports, containing operational, financial and compliance-related information that makes it possible to run and control the business. This component should be built into the organization's information system in the design phase, along with internal control safeguards. The *monitoring* component requires that internal control systems are monitored on both an ongoing and periodic basis in order to remain effective. Ongoing monitoring is a continuous assessment of various factors through proper training and evaluation of personnel and supervision and implementation of recommendations provided by auditors. Periodic evaluation can supplement ongoing monitoring and should be used on an ad hoc basis. The scope and frequency of separate evaluations will depend on the assessment of risks and the effectiveness of ongoing monitoring procedures.

The COSO Report stresses that these interrelated factors of internal control must be presented and function properly in order to have an adequate and effective internal control system. The COSO Report continues that depending on circumstances, these components can be linked together in any sequence. The COSO Report has been widely used in public and private corporations across the US and Europe, as well as in Finland. For example AICPA, IIA, and the General Accounting Office (GAO) incorporate the COSO Report into their auditing standards in the US (Ziegenfuss 2001: 313). In Finland, the professional association for internal auditors and the professional association for practicing auditors have also followed the COSO Report in their recommendations for internal control. Moreover there are public and private organizations which have based their internal control systems on the COSO Report.

2.1.2. Framework for internal control systems in banking organizations

The Basle Committee on Banking Supervision is a Committee of banking supervisory authorities. It was established by the central bank Governors of the Group of Ten countries in 1975. It consists of senior representatives of bank supervisory authorities and central banks from Belgium, Canada, France, Germany, Italy, Japan, Luxembourg, the Netherlands, Sweden, Switzerland, the United Kingdom and the United States. In January 1998 it issued among others drafts for the Framework for the Evaluation of Internal Control Systems. The final Framework for Internal Control systems in Banking organizations (hereafter the Basle Framework) was issued in December 1998. The Basle Framework is concerned especially with evaluating banks' internal control systems.

The Basle Framework (1998) emphasized that an effective internal control system can help to meet the goals and objectives of a banking organization, in achieving long-term profitability targets, and in maintaining reliable financial and managerial reporting. An internal control system can also help to ensure that the bank will comply with laws and regulations as well as policies, plans, internal rules and procedures, and decrease the risk of unexpected losses or damage to the bank's reputation.

As in the COSO Report the Basle Framework states that internal control is a process affected by all levels of personnel, management and board of directors. It categorizes the main objectives of internal control process as follows (Basle Framework 1998: 8–9):

- *Performance objectives*: Efficiency and effectiveness of activities
- *Information objectives*: Reliability, completeness and timeliness of financial and management information
- *Compliance objectives*: Compliance with applicable laws and regulations

Performance objectives refer to the effectiveness and efficiency of the bank in using its assets and other available resources and protecting the bank from loss. The internal control process seeks to ensure that the personnel throughout the organization is working to achieve the bank's objectives in a straightforward manner. *Information*

objectives refer to the preparation of the timely, reliable reports needed for decision-making within the bank. The term reliable means in this manner that the preparation of statements is presented fairly and is based on comprehensive and well-defined accounting principles and rules. *Compliance objectives* refer to compliance with the applicable laws and regulations, supervisory requirements, and internal policies and procedures.

The Basle Framework states that internal control consists of five interrelated elements, of which effective functioning is essential to achieve the three aforementioned objectives. These elements are:

- Management oversight and the control culture
- Risk recognition and assessment
- Control activities and segregation of duties
- Information and communication
- Monitoring activities and correcting deficiencies

Inside the elements, which are congruent with those of the COSO Report, thirteen principles are included. These principles contain more detailed information for the banking sector and are intended for general application regardless of the framework not focusing on specific areas or activities within banking organizations. It states that exact application depends on the nature, complexity and risks of the bank's operations. In summary, the Basle Committee recommends supervisory authorities to use the framework in assessing their own supervisory procedures for monitoring how banks construct their internal control systems.

2.1.3. Guidance on Control (CoCo)

The Canadian Institute of Chartered Accountants published Guidance on Control (CoCo) in November 1995. The CoCo (1995) was built on the concept introduced in the previously published COSO Report but emphasizes the importance of behavioral controls. The CoCo describes internal control as “those elements of an organization

(including its resources, systems, processes, culture, structure and tasks) that, taken together, support people in the achievement of the organization's objectives.”

The CoCo includes three categories of objectives:

- Effectiveness and efficiency of operations
- Reliability of internal and external reporting
- Compliance with applicable laws and regulations and internal policies

Effectiveness and efficiency of operations includes operational objectives, which are related to organizational goals. These goals may be customer service, the safeguarding and efficient use of resources, profitability and meeting social obligations. Safeguarding of the organization's resources from inappropriate use or loss can also be included in this objective. *Reliability of internal and external reporting* objectives are related to matters such as the maintenance of proper accounting records, the reliability of the information used within the organization, and the information produced for third parties. This objective includes the protection of records against two main types of fraud, such as the concealment of theft and the distortion of results. *Compliance with applicable laws and regulations and internal policies* is related to ensuring that the organization's affairs are conducted in accordance with legal and regulatory obligations and internal policies.

Instead of the five objectives that can be found for example in COSO Report and in the Basle Framework, CoCo describes twenty criteria in four areas which indicate whether internal control is effective. It states that effectiveness of internal control cannot be judged solely on the degree to which each criterion, taken separately, is met. The CoCo differs from the COSO Report in stating that the judgment of effectiveness is made in relation to a specific objective, such as customer service level, not in a category of objectives. It also states that the effectiveness of internal control in an organization is different from the sum of the effectiveness of the internal control within each unit because the organization includes the dynamic interaction in its various elements. The

CoCo states that inside the four control areas the twenty criteria are interrelated, as are the control elements in an organization. The four control areas in CoCo are:

- Purpose
- Commitment
- Capability
- Monitoring and learning

Purpose includes the criteria that provide a sense of the organization's direction. They address objectives, risks and opportunities, policies, planning, and performance targets and indicators. *Commitment* refers to criteria that provide a sense of the organization's identity and values, such as ethical values, human resource policies, authority, responsibility, accountability and reciprocal trust. *Capability* includes criteria that provide a sense of the organization's competence. They are knowledge, skills, tools, communication processes, information, coordination and control activities. *Monitoring and learning* includes criteria that present a sense of the organization's evolution. These include monitoring external and internal environments, monitoring performance, challenging assumptions, reassessing information needs and systems, follow-up procedures and assessing the effectiveness of control.

Because CoCo builds on the concept of the COSO Report, there can be found large areas of overlap and consistency between these two frameworks. For example, the four control areas presented in CoCo can be regrouped into the five component structure of COSO. The differences between these two frameworks are only minor. CoCo includes two criteria which are not explicitly addressed in COSO: reciprocal trust between people and the periodic challenging of assumptions. CoCo also includes some particular aspects of management that COSO excludes in the scope of control. These aspects are objective setting, strategic planning and risk management, as well as corrective actions.

2.1.4. The Combined Code and the Turnbull Guidance

The Principles of Good Governance and Code of Best Practices, known as the Combined Code, was published by the London Stock Exchange (LSE) in June 1998 and came into effect for companies reporting in 1999. The Combined Code followed the recommendations of the Hampel Committee's Report (1998), together with some additional recommendations from the Greenbury Committee's Report (1995), and the Cadbury Committee's Report (1992). It represents the regulation of corporate governance and internal control for the companies listed on the London Stock Exchange. The Combined Code was reissued on July 2003 in conjunction with, among others, the Internal Control: Guidance for Directors on the Combined Code (henceforth the Turnbull Guidance). The Turnbull Guidance was published by The Institute of Chartered Accountants in England & Wales (ICAEW) with the support of the LSE in 1999 and provides guidance on the implementation of the internal control recommendations set out in the Combined Code.

The Combined Code (2003) focuses on internal control in principle C.2 and in provisions C.2.1. and C.3.4. In the principle C.2. it has been stated that

“The board should maintain a sound system of internal control to safeguard shareholders' investment and the company's assets.”

Provision C.2.1. continues with

“The board should, at least annually, conduct a review of the effectiveness of the group's system of internal controls and should report to shareholders that they have done so. The review should cover all material controls, including financial, operational and compliance controls and risk management systems”.

Provision C.3.5. moreover states that

“The audit committee should monitor and review the effectiveness of the internal audit activities...”

The Turnbull Guidance was created on the foundations of statements on the Combined Code published in 1998. There are some differences between the Combined Codes published in 1998 and 2003: as stated in the Combined Code of 2003, the code references in the Turnbull Guidance should be read accordingly. The Turnbull Guidance (1998) in paragraphs 11 and 20 states that internal control:

- facilitates the effectiveness and efficiency of operations
- helps ensure the reliability of internal and external reporting
- assists compliance with laws and regulations

The system includes the following parts (paragraph 21):

- control activities
- information and communication processes
- processes for monitoring the continuing effectiveness of the internal control system

The Turnbull Guidance (1999) emphasizes that internal control has a key role in the management of risks that are significant to the fulfillment of its business objectives. It also contributes to the safeguarding of the shareholders' investments and company's assets (paragraph 10). The report also states that the board of directors is responsible for the company's system of internal control and has the responsibility to review its effectiveness. Management's role in this case is to implement board policies on risk and control. To fulfill its responsibilities management should identify and evaluate the risks faced by the company and design, operate and monitor a suitable system of internal control which implements the policies adopted by the board. Management is also accountable to the board for monitoring the internal control and providing assurance to the board that this has been done. Furthermore, the Turnbull guidance also states that all employees have some responsibility for internal control as part of their accountability for achieving objectives (paragraphs 16–19 and 25).

2.1.5. Framework for the study

In Finland, the Finnish Companies Act requires organizations' management to arrange adequate internal control in the organization but it does not stipulate any specific form of internal control system. The Corporate Governance Recommendations for Listed Companies (2003) also recommend that organizations shall define the operating principles of internal control. Thus, it should be noted that formal regulation and guidance regarding internal control is still very limited in Finland compared for example to the United States¹. Although the law does not give any details about internal control, the previous analysis of internal control frameworks shows that there are parallel themes across internal control frameworks. The following three internal control objectives can be found in the frameworks presented:

1. Efficiency and effectiveness of activities
2. Reliability, completeness and timeliness of financial and management information
3. Compliance with applicable laws and regulations

When these three objectives are properly achieved, internal control can be deemed effective. In this study internal control effectiveness is defined on the basis of how well these three objectives are achieved in the organizations examined.

It has been stated in the alternative frameworks that an internal control structure includes several components. These components are also described in different terms in the various frameworks and regulations, but as a summary, the following five components can be identified:

1. *The control environment* component defines the ethos of an organization and the way it operates. This component refers to the creation of an atmosphere in which people can conduct their activities and carry out their control responsibilities. Specifically, it consists of integrity and ethical values, management's philoso-

¹ More historical details about internal control in Heier, Dugan and Sayers (2005).

phy, operating and supervisory style, human resource policies and practices and the competence of personnel. This creates the overall control culture in the organization.

2. *The risk assessment* component refers to the processes of dealing with the risks that pose a threat to achieving the organization's objectives. It involves the identification, analysis and assessment of relevant risks.
3. *The control activities* component refers to policies, procedures and practices that assure management that the objectives are achieved and the risk mitigation strategies are carried out effectively.
4. *The information and communication* component ensures that relevant information is identified, captured and communicated in a form and time frame that allows personnel to carry out their duties and responsibilities effectively.
5. *The monitoring* component refers to a process of assessing the quality of control. It covers ongoing and periodical evaluations of the external supervision of internal controls by management or other parties outside the process.

In this research these five components define the internal control structure². Most of the research done in this field focuses on examining particular control elements, such as the control environment (D'Aquila 1998), communication (Hooks et al. 1994) or risk assessment (Mills 1997). Stringer et al. (2002) examined all five components. However, they used a qualitative approach in their study and examined components separately. In this study, internal control components are used as factors in latent variable.

² While this study uses the term internal control structure, some other researchers may prefer to use the term internal control system to study the same construct. In the earlier literature the terms internal control, internal control system and internal control structure are sometimes used interchangeably. In this study these terms are used as follows: internal control is the broadest term that encompasses other terms. Internal control system refers to the systematic use of internal control structure.

There are organizations worldwide which have used internal control frameworks as a foundation for conducting activities regardless of the fact that there has been a very limited amount of academic research examining internal control structures or its consequences. This research will fill that gap and provide some insight on internal control structure and its effectiveness. The objectives and components of internal control structure described in this section are used here as a theoretical model of internal control structure and its effectiveness. It should be noted that the level of analysis is theoretical and specific individual controls or judgments are not the main focus in this study (see for example Felix and Niles 1988; Gadh, Krisnan and Peters 1993). Furthermore, the level of analysis in the organizations is at the corporate control level as applied by the CEO and other corporate officers (Fisher 1998).

2.2. Internal control research

Internal control is traditionally understood as a part of accounting controls. However, the recent professional accounting literature has expanded the internal control concept (Heier et al. 2005). Now it is considered to be a complex, dynamic, and constantly evolving concept including a variety of interpretations and philosophies. The problem with this broad definition is that there are no clear boundaries in the internal control concept and it can be argued that all organization's measures contribute to internal control (Maijoor 2000: 105). In contrast, due to the broad definition, it is now closely involved with the concept of management control and corporate governance (see Spira and Page 2003: 640).

The unclear boundaries of the concept of internal control are also witnessed to some extent in the accounting literature. Maijoor (2000) found three areas of internal control research in this literature:

1. Internal control from an external auditing perspective
2. Internal control from an organization theory perspective
3. Internal control from an economics perspective

The first one, the external auditing perspective, is the most studied area (see for example Brown and Solomon 1990; Mayper, Doucet and Warren 1989; Ashton and Brown 1980; Pae and Yoo 2001). It focuses on traditional accounting controls in the context of decision-making by auditors. Most of the studies focus on problems related to lower level control and broad internal control concepts are hardly considered (Maijoor 2000: 105). Pioneering studies have been conducted by Ashton (1974) and Mock and Turner (1981). For example, Mock et al. (1981) examined auditors' consensus in decision-making utilizing a case study based on audit working papers. Two versions of the cases were developed. One of the cases showed substantial improvement in the strength of the internal control compared with the previous year while other case showed only moderate improvement. The respondents, two hundred auditors, were asked to decide what changes should be made to the planned audit hours in the case. The results showed that there was a considerable variation in the auditors' decision making (Gwilliam 1987: 233). Trotman, Yetton and Zimmer (1983) examined individual and group judgments of internal control. Respondents evaluated internal control system cases first individually and then in groups. It was found that group members' judgments reduced the variance in internal control evaluations and interacting groups acted as they merely averaged members' judgements to derive a group evaluation. This avenue of research was pursued later by O'Donnell, Arnold and Sutton (2000). They found that information sampling bias does exist, thus confirming that in an internal control evaluation task, groups may not make the best of information that is known to only one group member.

The second are of internal control research, the organization theory perspective (or management control perspective) used in this research uses a broader concept of internal control than the external auditing perspective. The research in this area mainly examines internal control on the level of departments and divisions. Controls are studied in the context of organizational effectiveness. This perspective also emphasizes that people, culture or social control can be important control mechanisms. Mautz, Kell, Maher, Merten, Reilly, Severance, and White (1980) used this perspective. They conducted a study to define internal control in corporations in the United States. They conducted interviews with senior executives in fifty companies and sent a questionnaire to financial executives where respondent were asked to evaluate the company's internal

control. As a result they found that internal control was viewed as a key management responsibility, that opportunities for improvement in internal control existed, and that most financial executives had minimal knowledge of internal control practices in other companies within their own industries (Noland 2000: 22). Etherington and Gordon (1985) examined internal control in Canadian companies. They sent a questionnaire to chief financial officers, internal audit managers and data processing managers. The findings of the research revealed that corporate managers perceived internal control as a significant factor in an organization. In some companies a more formal review of internal control risks was needed regardless of the fact that 80 percent of the firms studied had an internal audit function.

Wood (1989) analyzed the internal control system in public schools. As a result, he found that many schools had inadequate internal control systems. He did not find any relationship between the adequacy of internal control and the experience of administrators in implementing internal control. Duncan (1995) studied internal controls in churches. He found that larger churches had better internal controls than small ones and different denominations had different internal controls in place. The results were confirmed by Duncan, Flesher and Stocks (1999) who explain the difference by the fact that larger size means access to more advanced financial resources and more professional staff. Bowrin (2004) analyzed internal control systems in religious organizations and the results indicated that all the organizations had inadequate internal control systems. Noland (2000) examined the internal controls of newly chartered financial institutions and compared them with the controls of old ones. The results showed that new banks had more internal controls in place than old ones. Stringer et al. (2002) in their exploratory field study studied internal control re-design in Australian organizations. As a result it was found that all respondents (accountants and internal auditors) in the eight organizations studied had a view of a changing approach to internal control. Respondents emphasized the importance of creating an environment that would foster employee integrity and performance, which is far away from multiple layers of authorization, strict supervision and crosschecking.

The third perspective, internal controls from the economics perspective, is dominated by agency theory. The agency theory research focuses mostly on the control between outside capital suppliers and inside directors: the main focus is on top-level management. The difference from the second approach is that this approach emphasizes the effects of uncertainty, the cost of the monitoring mechanism and the rewards for the control systems. See for example Baiman (1990) for a review of the agency theory related to the control system.

To summarize, within the accounting literature, there is various conceptions of internal control. Three perspectives of internal control studies can be distinguished from the literature and these perspectives differ in the type of controls being the subject of study. The external auditing perspective mainly focuses on lower level of controls. The management control perspective, used in this study focuses on the controls in the context of the organizational effectiveness. The economics perspective focuses more on agency theory and the costs of the monitoring mechanism.

2.3. Contingency based research

The research issues that are relevant to control in organizations usually relate to the design of a control system that will ensure organizational performance. Studies focused on control in organizations are largely based on management control theory (Collier 2004: 321). Consequently, management control is a major control sub-system in organizations which have been subjected to contingency theory research. The research has focused on the influence of contextual variables on MAS design (for example Gordon and Miller 1976; Waterhouse and Tiessen 1978; Langfield-Smith 1997; Chenhall 2003).

The basic theme in contingency research is that organizational context and structure must fit together in order for an organization to perform well (Drazin et al. 1985). The original contingency approach in organizational theory contains three core elements that together form its paradigm (Donaldson 2001) applied here in internal control. First,

there is a connection between contingency characteristics and the internal control structure. Second, contingency characteristics determine the internal control structure: an organization that changes its contingency characteristics, in consequence, actually changes its internal control structure. Third, there is a fit of the level of the internal control structure to each level of contingency characteristics. Appropriate fit leads to higher internal control effectiveness, whereas misfit leads to lower internal control effectiveness.

The contingency statements concur with the internal control literature and frameworks. In the frameworks it has been stated that the needs of internal control vary by organizational characteristics: for example, the COSO (1994: 18) states that two organizations should not have similar internal control systems unless the organizations are completely identical. All organizations need internal control over their activities, but the control system may vary. Contingency theory provides a widely approved research approach to study internal control and its effectiveness. However, contingency theory is a novel approach to study internal control and thus, theoretical fundamentals are derived from the contingency-based management control literature. Internal control and management control system are congruent with some parts, but the commonalities and differences depend on the breadth of the definitions. Chenhall (2003) states that previous contingency-based management control research follows the conventional view that perceives the management control system as a passive tool designed to assist managers' decision-making. A management control system encompasses a management accounting system and also includes other controls such as personal or clan controls.

On the other hand, the broad definition of internal control covers all management functions except setting objectives, strategies, and follow-up of identified surprises. Internal control is contemporarily understood as part of corporate governance dealing with internal and external actors, whereas management control is directed towards internal agents. Thus the definitions of management control system and internal control have some aspects in common, but internal control can be understood more broadly and according to DePaula and Attwood (1982), it also includes management control.

A contingency variable can be said to be relevant to the degree that businesses that differ on that variable also exhibit major differences in how control attributes or actions are associated with performance (Fisher 1998). Using the contingency approach researchers have attempted to explain the effectiveness of accounting and management control systems by examining designs that suit the nature of the environment, size, structure, technology, strategy, task environment, national culture, international competition and societal differences (see Chapman 1997; Reid and Smith 2000; Chenhall 2003 for a review). These studies have focused on a variety of aspects of management control system, such as dimensions of budgeting (Bruns and Waterhouse 1975), ABC (Gosselin 1997), reliance on accounting performance measures (see the review by Hartmann 2000), non-financial performance measures (see Ittner and Larcker 1998), strategic interactive controls and diagnostic controls (Simons 1995). In addition, Chenhall (2003) proposed that other approaches based in economics should be included in the traditional contingency-based model.

There is a considerable amount of literature which has provided a basis for generalized propositions between elements of management control system and its context. Fisher (1995) classified previous contingency control research according to the level of complexity of the analysis. The control literature is divided into four categories depending on the contingency characteristic, control, and outcome variables included in the study. The research design becomes more complex as the analysis level increases. At the first and simplest level of contingent research category contingency characteristic may correlate with one control mechanism. This approach examines whether the occurrence of the contingent characteristic is related to a control mechanism. Linear additive models have therefore been used to provide separate arguments for each variable enacting in isolation. This level of analysis has been used by MacIntosh and Daft (1987), Merchant (1985), Simons (1990) and Rockness and Shields (1984). For example, Rockness et al. (1984) examined the relationship of control systems, technological uncertainty, measurability of outputs, task complexity and task dependence. A positive relationship between behavior control and knowledge of the transformation process was empirically supported. In this level there has not been any attempt to examine whether the contingency characteristic and the control mechanism

have an effect on firm outcome. In recent studies the effect of multiple contingencies on the control system has been examined. For example, Gerdin (2005) examined the combined effect of departmental interdependencies and organizational structures on management accounting systems. The findings provided some support for the notion that organizations adapt their management accounting system designs according to the control requirements.

The more developed second level of the analysis includes the combined effect of one contingency characteristic and one control interaction on an outcome variable. The typical outcome variable examined is organization performance. Interaction models may be used where the strength or the form of a relationship between control and outcome variable will depend on the effect of the contingency characteristic. Govindarajan and Gupta (1985), Ginzberg (1980), Simons (1987) and Fisher (1994) have used this level of analysis. Govindarajan et al. (1985) examined the relationship between strategic business unit, manager incentive compensation, strategy, and effectiveness. The results indicated that the strategic business unit (SBU) in the build stage of the product life cycle that used long-term criteria and subjective approaches for determining managers' remuneration were found to be more effective than those that used short-term criteria and objective approaches. Ginzberg (1980) suggested that the interaction of contingency characteristics with an organization's control system determines the organizational control system fit, which in turn affects organizational performance. He linked environmental stability and technology routines to control system design. Ginzberg (1980) proposed that organizations with a stable environment and routine technology tend to use a procedural control system for higher performance. He also noted that contingency characteristics may require conflicting control systems. However, on this level of analysis possible interactions of multiple control mechanisms and contingency characteristics have not been examined.

On the third level the studies attempt to examine combined linkage between multiple control mechanism, contingent characteristic and organization outcome. The major difference compared to the second level is that explicit consideration is devoted to the interrelationship between control mechanisms, and control is examined as a system

rather than as an independent control mechanism. This type of analysis can also show whether a control mechanism has an effect on outcome variables. Furthermore, the analysis is able to reveal whether some control mechanisms complement each other by having a greater total effect on the outcome variables. On this level structural equation models are used. Studies by Waterhouse et al. (1978), Merchant (1981), Govindarajan and Fisher (1990) can be classified to this third level. Waterhouse et al. (1978) focused on two contextual characteristics, environment and technology, that were hypothesized to have an affect on control system design. Contingency characteristics were suggested to have separate and independent effects, but this hypothesis was not tested. An underlying premise in the study was that organizations attempt to centralize authority and specify procedures to the greatest extent possible. If an organization's technology is well known and the environment is predictable, a formal, centralized control system is optimal. The study provides an example of a mechanistic control system, a standard costing system built on a tight budgeting process. Thus, subunits that face a particular environment or have a routine technology, adopt a formal centralized control system. However, under conditions of environmental uncertainty or high technology, direct control by specifying procedures and evaluating performance in relation to the standards is difficult to implement. As the characteristics become more uncertain, the organization will employ a more organic control system, which typically involves high management discretion, monitoring of outputs, and careful selection and socialization of employees. The study suggests that control mechanisms are used in a reinforcing way.

Merchant (1981) examined the effects of characteristics of the organization's internal environment on the use of budgeting system. The contingency characteristics size, diversity, and degree of decentralization were linked to an administrative or interpersonal control strategy. As a result it was found that as an organization's organizational context becomes more complex, the budgeting system tends to be used in an administrative way. The notion that a match between context and budgeting system results in a higher organizational performance was only weakly supported. Govindarajan et al. (1990) examined the interaction effect of control, resource sharing, and competitive strategy on strategic business unit effectiveness. The results suggested that a combination of high resource sharing and output control had a positive impact on

strategic business unit effectiveness with a low cost strategy. They also found that a combination of high resource sharing and behavior control had a positive influence on the organizations' effectiveness with a differentiation strategy.

The fourth level of analysis includes multiple contingent characteristics in determining an optimal control strategy. This level adopts a multiple contingency approach recognizing that a control system must be geared to multiple contingent characteristics. Techniques such as Euclidian distance and cluster analysis are used on this level. Fisher (1995) argued that studies that focus on a single contingent characteristic might fail to capture the complexities of the contingent control process. Therefore, designing the control system to address several contingencies at once may involve tradeoffs that preclude a fit to all contingencies simultaneously (Fisher and Govindarajan 1993; Gresov 1989; Gerwin 1979). If contingencies demand the same control system for optimal control, the designing of controls is straightforward. Problems arise when the demands of contingencies differ from each other. The existence of conflicting contingencies increases the probability that control system design will deviate from the demands of at least one of the contingencies, making optimal design difficult. This approach to analysis has been examined by Gresov (1989), Fisher et al. (1993), and Miller (1988). Fisher et al. (1993) used Porter's (1980) typology on strategy and product life cycle as contingent characteristics. Incentive compensation was used as a control system variable and SBU managers were the level of analysis. The results revealed that the control design requirements of the build and differentiation strategies were similar, as well as for the harvest and low cost strategies. It was found that contingency conflict arises when low cost strategy and a build mission are used in conjunction, or differentiation strategy is employed with a harvest mission. Thus the presence of conflicting contingencies increases the likelihood that control system design will deviate from the demands of at least one contingency, making optimal design difficult. To resolve such a conflict, Fisher (1995) proposed that companies can design a control system to be consistent with one contingency while ignoring the others. However, this may result a poorer organizational performance.

This study extends the earlier contingency based models presented in the previous accounting and management accounting literature. In this study, control mechanism is replaced by internal control structure and organizational performance by the effectiveness of internal control. In the analysis the contingency characteristics that may have an influence on internal control structure and its effectiveness are used: the selection of contingency characteristics is made on the basis of the previous literature. According to Fisher's (1995) categorization, the second level of analysis with one contingency characteristic is adopted in moderation model examination. Furthermore, the third level of analysis is used when the contingency characteristics studied are included in the mediation model to examine their effects on internal control structure and its effectiveness. The theoretical background of the models is presented in the next section.

2.4. Contingency fit approach

In this research the basic knowledge of the circumstances that have an effect on internal control structure and its effectiveness is based on the contingency approach. However, Gerdin and Greve (2004: 303) have stated that in contingency research attention should be focused on the way the concept of fit has been applied. They noted that many different forms of fit have been used and researchers have not always been aware of the implications of their choice for theory building and testing. They also showed that two approaches may yield very different results even if applied to the same empirical data. In this section, the research opportunities and the choices made in contingency approach for this study are discussed. The possible theoretical choices are presented as a summary in Figure 6.

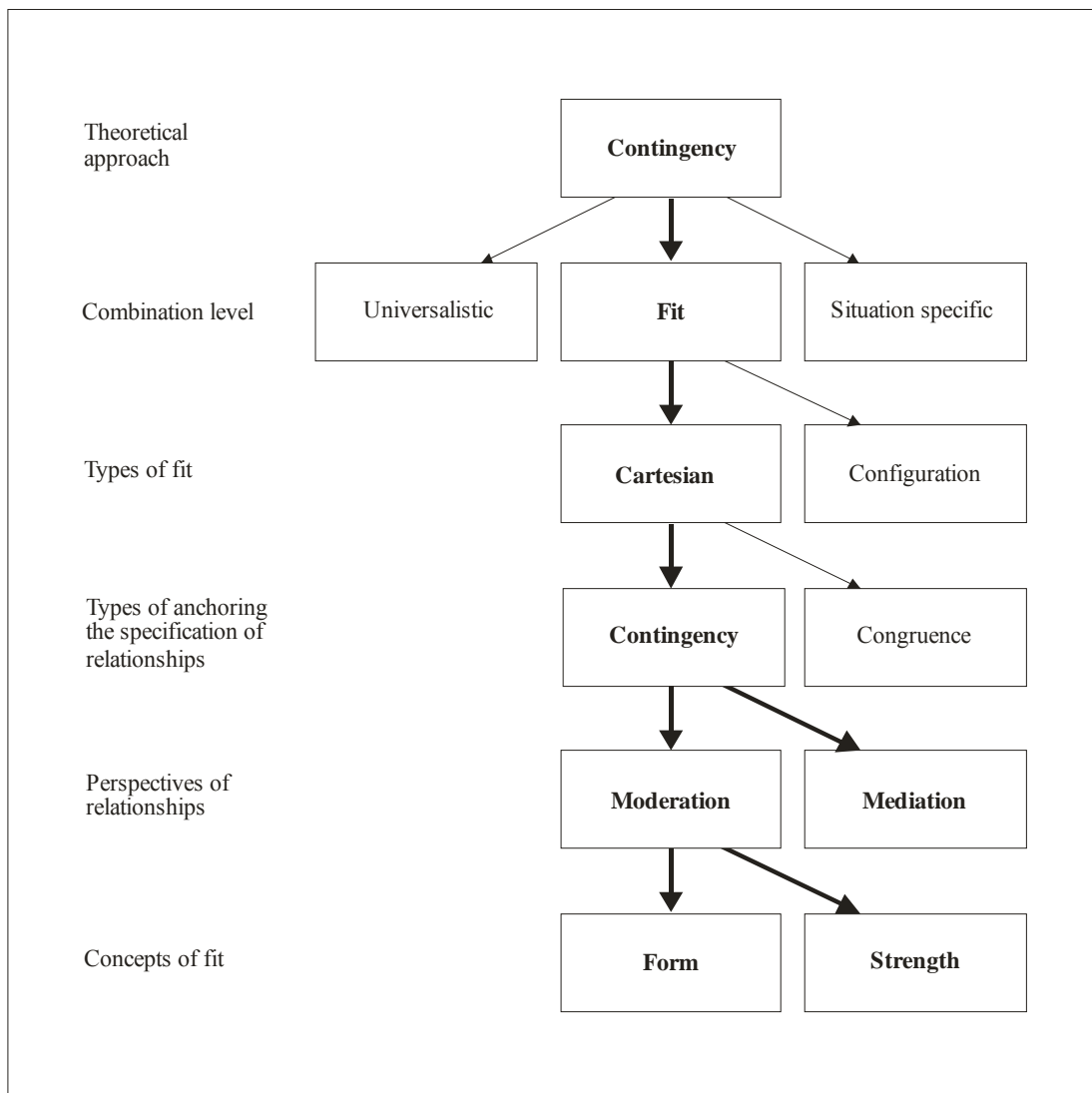


Figure 6. Summary of theoretical choices. Modified from Gerdin et al. (2004: 304)
(**bold** = approach applied).

The first theoretical choice is made between combination levels. The three types of combination levels are: universalistic, fit and situation-specific (Hambrick and Lei 1985: 764). The universalistic approach implies that there is only one contingency setting. It argues that optimal control system design holds, to some degree, in all settings and organizations. Many of the portfolio models of strategy formulation and implementation are based on this universalistic view (Fisher 1995: 29). The rationale of the situation-specific approach is that the factors affecting each control system decision are unique, thus general rules and models cannot be applied. On this level each

organization must be studied individually, usually using case studies: the generalization of the results to other organizations is problematic. The fit approach is situated between these two extremes (see Figure 7). The fit theory differs from the universalistic approach in stating that more than one contingent component can influence the existing control system. In contrast to the situation-specific model, the control system generalizations can be made for classes of business settings in the fit approach.

The approaches presented offer opportunities to study internal control. This study focuses on the generalization of the effects of alternative characteristics of the organization on internal control. The situation-specific level has a number of unique combinations and it is usually applied in case studies. The universalistic approach emphasizes only one optimal control combination and it is not usable with the idea of flexible internal control system. For this study, the fit approach is chosen: the main theme (applied here to internal control) is that all components of an organization must “fit” well with each other or the organization will not perform optimally (Dent 1990; Selto, Renner and Young 1995: 667; Luft et al. 2003). Moreover, the contingency fit perspective allows researchers to use a variety of methodologies and to reach an answer that is compromise between the two extreme views.

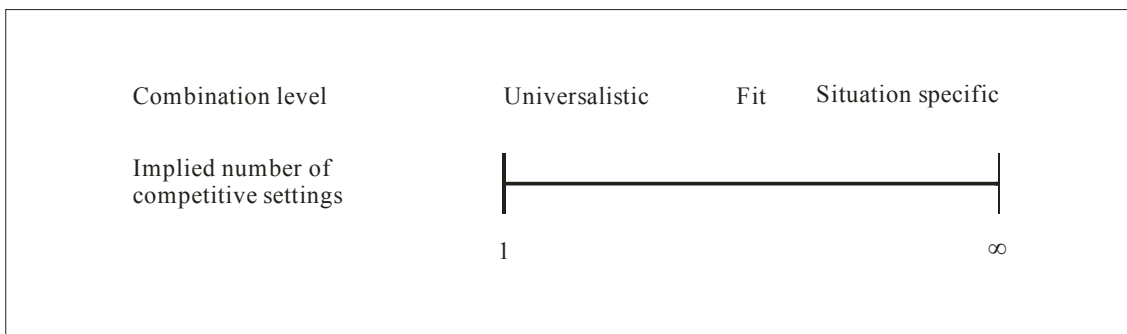


Figure 7. Number of competitive settings implied by various views in the contingency approach (Hambrick et al. 1985: 764).

Two approaches can be found in the fit theory chosen (Gerdin et al. 2004: 304–305): Cartesian and Configuration. With the Cartesian approach, which is characterized by

reductionism, the focus is on how single contextual factors affect single structural attributes and how these context-structure pairs affect performance (Drazin et al. 1985). The fit between context and structure is understood as a continuum that allows frequent, small movements of organizations from one state to another. It has been argued that most empirical data support the idea that organizations make incremental changes so that they gradually move along a continuous line between contingency and structure. All points are equally effective: there is a structure that fits each level of contingency (Donaldson 2001). On the other hand, the Configuration approach, which is a more holistic view, opposes partial analyses of context and structure variables. In Configuration approach the relationships can only be understood if many contextual and structural variables are analyzed simultaneously. It can be stated that there are only few states of fit between context and structure: organizations have to make “quantum leaps” from one state to another. Intermediary positions between the states are seen as internally inconsistent. Therefore they are claim to be ineffective and not workable (Drazin et al. 1985). In this research the Cartesian approach is selected as a main approach to examine continuous and incremental relations across contexts.

Two major concepts underlying the phenomenon of the Cartesian approach are Congruence and Contingency (Gerdin et al. 2004: 304). These concepts focus on the choice of anchoring the specification of fit based relationships. Congruence is a criterion-free specification of fit and Contingency entails criterion-specific anchoring of fit (Umanath 2003: 552). The congruency proposition hypothesizes a simple, unconditional association among the variables. It assumes that structure depends on context without any examination of whether this relationship affects performance: it is implicitly assumed that fit is the result of a natural selection process that ensures that only the best-performing organizations survive to be observed at a given point of time. The research task is to identify contextual variables that affect structure and to explore the nature of these context-structure relationships (Gerdin et al. 2004: 307). In contrast, the Contingency proposition is more complex. It connotes a conditional association of two or more independent variables with a dependent outcome (Drazin et al. 1985: 515). The fit is understood as a positive impact on performance due to certain combinations of context and structure. The research task is then to explain variations in performance

in terms of interaction effects between context and structure (Gerdin et al. 2004: 307). The latter, Contingency approach is chosen in this study because the main proposition in Contingency theory is that the structure and process of an organization must fit its context in order to be effective (Drazin et al. 1985: 515). Accordingly, the Contingency type of fit includes the assessment of a relationship between variable pairs on the basis of the impact on an explicit criterion variable.

The contingency approach has several types of relationships between variables (see Venkatraman 1989; Bergeron, Raymond and Rivard 2001: 126–127) but in management research the two common types used are mediation and moderation³ (Gerdin et al. 2004). The mediation approach includes a transitive effect (if $X \rightarrow Y$ and $Y \rightarrow Z$, then $X \rightarrow Z$ transitively). The mediation assumption (see Figure 8) is, for example, that the more uncertain the environment is, the higher is the level of internal control. Higher level of internal control leads to better internal control effectiveness. This approach also allows some variables, apart from being contributors, to be dependent on other variables (Bergeron et al. 2001: 127). In path analysis, which is used for testing mediation forms, fit is described as a statistically significant indirect effect.

The moderation approach explains variation in a criterion (dependent) variable in terms of co-variation between two independent (predictor and moderator) variables (see for example Hartmann and Moers 2003; Dunk 2003; Umanath 2003; Bisbe and Otley 2004; Luft et al. 2003). It is assumed that the impact of an independent variable on the dependent variable is contingent on the level of a third variable (see Figure 7). For example, the moderation assumption is that internal control structures (predictor) and organization size (moderator) are independent of each other and their interaction influences internal control effectiveness (dependent). The important statement underpinning the moderation assumption is that the moderator has non-significant, bivariate relationships with both independent and dependent variable (Shields and Shields 1998; Gerdin et al. 2004).

³ See the review of moderator and mediator variables by Baron and Kenny (1986).

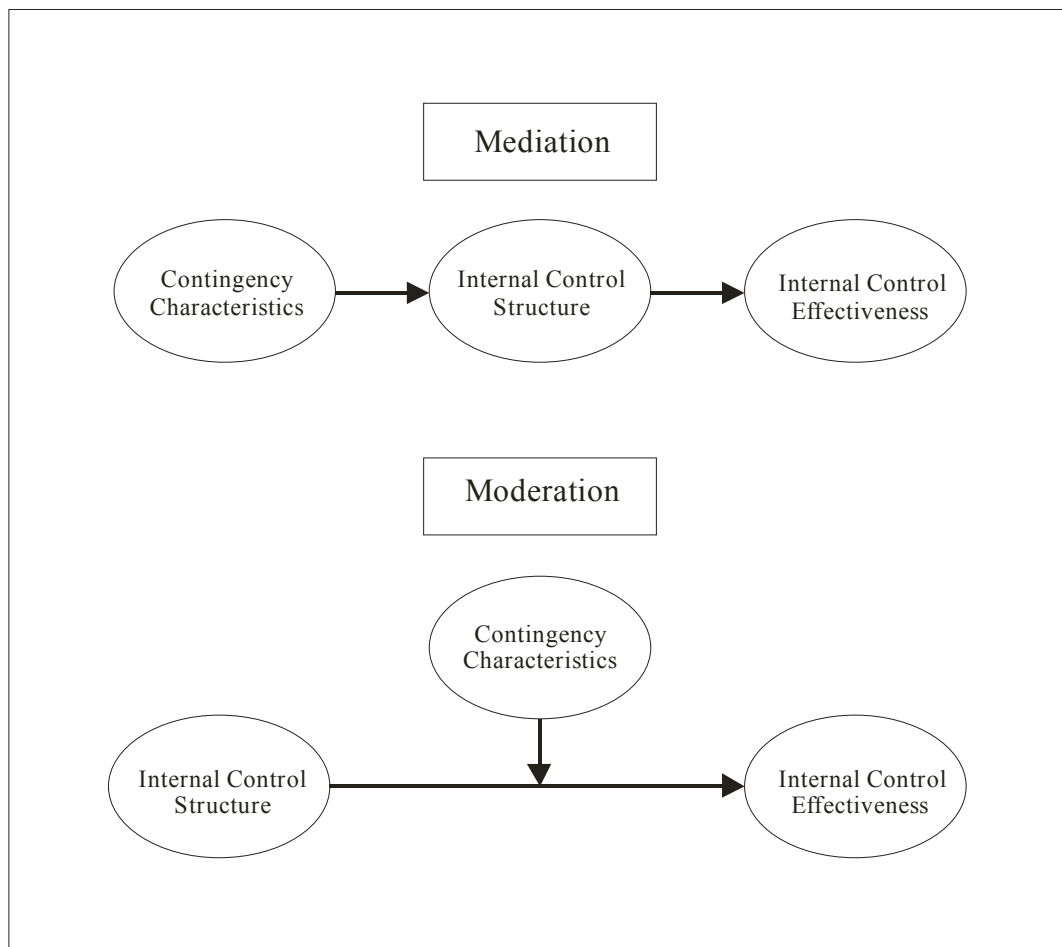


Figure 8. Functional forms of fit.

In this study the relationship between contingency characteristics, internal control structure and its effectiveness are assessed with both relationship types to determine the nature of that relationship. Only few previous studies (Abernethy and Lillis 1995; Bouwens and Abernethy 2000; Chong and Chong 1997; Perera, Harrison and Poole 1997) have made comparisons between the moderation and mediation form of fit. However, it should be noted that theoretically in a particular situation only the moderator or mediation model can give an exact description of the relationship. The moderation and mediation forms of fit have fundamentally different theoretical meanings: internal control structure cannot concurrently play the role of mediating variable (and be dependent on size) and role moderator (and be independent of size). If both models give significant results, this should be interpreted as a contradictory result (Gerdin et al. 2004: 322).

In addition, in the moderation approach, relationships have been analyzed in terms of their strength and form (Hartman and Moers 1999, Hartman et al. 2003; Dunk 2003; Gerdin et al. 2004). For example, Abernethy and Guthrie (1994) and Abernethy et al. (1995) have compared both strength and form in the same study. Strength and form refer to different statistical methods, and they also represent different theoretical meanings of moderation. The form of moderation is in focus when the impact of internal control on its effectiveness is examined in contingency based multi-groups. On the other hand, the strength is on the focus when the predictive ability of internal control on its effectiveness is researched in contingency based multi-groups. The theoretical implications are very different and there is no reason to expect that results based on the two forms of fit will concur (Gerdin et al. 2004): both forms of fit, the strength and the form, are examined in this research.

3. THE RELATIONSHIP BETWEEN CONTINGENCY CHARACTERISTICS, INTERNAL CONTROL STRUCTURE AND INTERNAL CONTROL EFFECTIVENESS

This chapter presents theoretical research questions and develops detailed research hypotheses for empirical testing. The section begins with research hypotheses regarding the contingency elements and the internal control structure. After that, a research hypothesis regarding the relationship between internal control structure and internal control effectiveness from the management perspective is presented. All the hypotheses presented are reviewed in the light of the current literature.

3.1. Contingency characteristics and internal control structure

Control systems are designed to assist managers to achieve firm goals and desired outcomes (Chenhall 2003). In the COSO framework (1994: 18) it is stated that two organizations should not have similar internal control system unless the organizations are identical. The needs of internal control systems may vary in organizational contexts: all organizations need internal control over their activities, but the control system may vary. The internal control framework statement is analogous to the contingency theory that implies that the applicability of control mechanism is contingent on the circumstances of the organizations.

The contingency characteristics examined in this study are taken from previous management accounting and accounting control studies. If this study were to focus on only one contingency characteristic, it would fail to capture the complexities of internal control structure design. For example, it would fail to take account of the fact that internal control structures in organizations evolve in response to a diverse set of contingency requirements. Many contingency characteristics may have little correlation, giving rise to the possibility of conflicting contingencies (Fisher 1998). When testing several contingency characteristics at once in the mediation model, a more holistic view can be adopted. However, if the demands placed on the internal control by contingency

characteristics conflict, simultaneous tailoring of the internal control to all contingency characteristics in a straightforward design is not possible. Thus, trade-offs between the conflicting contingency characteristics should be considered in designing the internal control.

The contingency characteristics examined in this study can be divided into internal and external characteristics. Internal characteristics are strategy, size, and organization structure and the external characteristic is the perceived environmental uncertainty. The selection of characteristics is not the only set of variables that might have an effect on internal control structure. Researchers have listed numerous contingency characteristics that may affect control design. For example, Fisher (1998) classified contingency characteristics examined in prior management control studies in five categories. The first category consists of variables related to uncertainty, which sources are task and external environment uncertainty. The second category consists of firm technology and interdependence. The third contingency characteristics category includes industry, firm and business unit variables, such as size, diversification and structure. The fourth category consists of competitive strategy and mission. The last category examined in the control literature includes observability characteristics. Observability of behavior or outcomes implies that control can only be exercised over variables that are observable by the evaluator.

According to Fisher's (1998) classification, the characteristics examined in this research can be classified into first (perceived environmental uncertainty), third (organizational structure and size) and fourth (strategy) categories. Based on earlier research, the characteristics are considered relevant: in the contingency literature the researchers have suggested that the chosen characteristics might be important elements in control research. For example, Macintosh (1994) has stated that there are important links between environment, strategy, organization structure, and control and that a congruent matching of these variables is essential to performance. Donaldson (2001), Drazin et al. (1985), Lawrence and Lorsch (1967), Burns and Stalker (1961) have stated that environment, organizational size, and business strategy are important contingencies when adapting structures if the organization is to perform well. Furthermore, there is a

lack of knowledge of how contingency characteristics affect internal control framework, thus this research focuses on characteristics that have been examined widely in the management control literature. The research questions are:

Research question 1: Is the internal control structure dependent on the type of business strategy of the organization?

Research question 2: Is the internal control structure dependent on the size of the organization?

Research question 3: Is the internal control structure dependent on the structure of the organization?

Research question 4: Is the internal control structure dependent on the perceived environmental uncertainty of the organization?

Research question 5: Is the internal control effectiveness dependent on the internal control structure?

In the light of these research questions detailed hypotheses are developed with current literature in the following section.

Is the internal control structure dependent on the type of business strategy of the organization? The term strategy has been employed in the literature in various ways. The common theme is that the strategy is thought to constitute a logic underlying an organization's interactions with its environment, and this in turn guides its deployment of resources (Dent 1990: 5). Chenhall (2003: 150) suggested that strategy differs from other contingency variables because is not an element of content but rather the means whereby managers can influence the nature of the external environment, the technologies of the organization and structural arrangements on the control culture. Otley (1980) and Dermer (1977) have stated that the business strategy should be one of the main characteristics in accounting control system design. Furthermore, the strategy

researchers Miller and Friesen (1978), Miles and Snow (1978) and Porter (1980) proposed that depending on the firm's strategy the control systems are used in different ways. For example, Simons (1990) found evidence that organizations with different strategies employ accounting control systems in dissimilar ways⁴. If earlier studies suggest that different types of organizational strategies tend to cause different control system configurations, they may also cause some differences in internal control. However, empirical studies conducted to date have not yielded any firm conclusions about the nature of the most appropriate connections between strategies and controls (Otley 1999). Smith and Langfield-Smith (2002) proposed that the research should examine the associations of strategy with other control system variables and study the effect of control system choices on organizational effectiveness in the future.

Strategy can be classified in various ways. One of the most widely used and tested strategy typologies is the introduced by Miles and Snow (1978). They identified the strategy types prospector, defender, reactor and analyzer. Other well-known typologies according to Simons (1990) and Chenhall (2003) are innovators and dominant firms (Miller et al. 1978), performance maximizing and cost minimizing (Utterback and Abernathy 1975), entrepreneurial and planning mode (Mintzberg 1973), build-hold-harvest (Gupta & Govindarajan 1984), and product differentiation-cost leadership (Porter 1980). The scope and focus is different in each typology: for example, the prospector and defender –typologies have a broad scope, while the scope in the product differentiation and cost leadership typology is quite narrow. The entrepreneurial classification is focused on product innovation, while build-hold-harvest is focused on market share and short-term profit tradeoffs (see Kald, Nilsson and Rapp 2000).

In this study, the Miles and Snow (1978) typology was adopted: their research states that the organization's control system should be congruent with the strategy. The Miles and Snow (1978) typology was tested in subsequent studies and found to be useful for classifying generic strategies across diverse industries (Simons 1990: 299). In the study by Miles and Snow (1978) strategic types were identified according to the rate at which

⁴ For more on the role of strategy as a specific contingent variable see Simons (1995) and Langfield-Smith (1997).

they changed their products or markets. *Prospector* competes through new products and market development. It typically offers a large array of products targeted at a variety of market segments. *Prospector* is flexible and proactive in its usually uncertain environmental interactions. *Defender* operates in stable product areas and competes through cost leadership, customer services and quality. Most of its research and development efforts are related to process improvements rather than product innovation. Usually defender's environment is stable. *Analyzer* combines part of both defender and prospector. It operates like prospector in rapidly evolving domains while in the stable segments they use a defender approach. *Reactor* is seen as a dysfunctional organizational type because it does not follow a conscious strategy. It perceives change in the environment but seldom responds to it until it is forced to. Most control research has focused only on the differences between prospector and defender (Fisher 1995: 31).

Simons (1987, 1990) used the Miles and Snow (1978) typology in his study. He found that when focusing on cost efficiency, a defender requires a sophisticated control system that relies heavily on formal accounting procedures, cost control and trend monitoring. Furthermore, defender used control systems less intensively and had little change in the control systems. This could imply that defender does not use its control systems as actively as prospector. According to Simons (1990) prospector searches for the new market opportunities, requires flexible structures and utilizes uniform control systems which are changed frequently, accumulates information on forecasts and monitors outputs closely. In fact, Miles et al. (1978) found that prospectors' control systems may focus more on problem finding and flexible structures and processes may assist the organization to respond rapidly to environmental change. Control in prospector organizations may be decentralized and results oriented (Langfield-Smith 1997: 217). This means that prospector requires a strong control environment, which can ensure strong control consciousness. Simons (1987) found that prospector emphasizes monitoring deviations from budget through exception reports and monthly reports. Simons (1991) later reanalyzed the data used in earlier studies and concluded that the uncharacteristic use of tight budgets by prospector was simply a tool to gather information and stimulate discussion. Prospector needs a wide range of information related to future during the search of market opportunities. In summary, prospectors are more likely to have flexible

controls to enable quick adaptation to fast changing environments while defenders are more likely to focus on reducing uncertainty and maximizing efficiency. Compared to defenders, prospectors are more flexible in modifying their management systems according to the user needs. Based on the previous discussion the following hypothesis is presented:

Hypothesis 1 (H1): Organizations with prospector strategy rely to a greater extent on internal control than do organizations with other strategies.

Is the internal control structure dependent on the size of the organization? The early contingency research suggests that an organization's size may affect the organization's method of designing and using management systems (Hoque et al. 2000). This view of the contingency theory is used by Merchant (1981, 1984), who argued that organizational growth increases communication and control problems. This is due to the inappropriateness of the behavioral oriented management control, which is useful in small organizations but not suitable for larger organizations. Earlier contingency studies also propose that when an organization's size increases, control processes become more specialised and sophisticated (Bruns et al. 1975; Ezzamel 1990; Libby and Waterhouse 1996; Hoque et al. 2000). In larger organizations the need for effective information flow becomes more obvious. Merchant (1981) found in his study that in a large organization communication is more formal. Bruns et al. (1975) found that control in large organizations was more administrative, whereas control in small organizations tends to be more informal and personal. Control in small organizations was exercised by the entrepreneur who could see what was happening on a regular basis and make personal interventions. Accordingly, organizations were less reliant on the formal use of budget when using interpersonal control strategy. Duncan et al. (1999) found that internal control evaluations are not similar in different size non-profit organizations: the larger the organization is, the better the internal control system is. The size of an organization is related to the availability of resources and internal differentiation. Size is also related to the need for managers to handle greater quantities of information. In large organiza-

tions there is a greater need to have controls such as rules, documentation, and specialization of roles and functions.

Studies in management control theory have examined relatively large organizations and reasoned that large organizations tend to adopt more formal control systems. It seems likely that the role of controls varies depending on size, but in fact, there is only a limited amount of studies focusing especially on small and medium sized organization controls in contingency based literature (Chenhall 2003: 149). In addition, no research has been conducted specifically on internal controls in small organizations. It has been a secondary or tertiary issue in some audit studies (for example Wallace and Kreuzfeld 1995) and in these studies it has been found that smaller organizations have weaker control systems than larger organizations. Furthermore, in small organizations management has expressed concerns that internal control frameworks are not appropriately tailored to the small business control environment. Internal control is as important in small organizations as it is in larger ones, although has been noted that the control may differ substantially. Direct involvement by top management has been considered adequate compensation for a less sophisticated control system. The current literature creates a particular need for the research of internal control. The following hypothesis is conducted:

Hypothesis 2 (H2): Large size organizations rely to a greater extent on internal control than do smaller size organizations.

Is the internal control structure dependent on the structure of the organization?

Organizational structure refers to an internal pattern of roles, communication, authority and relationship. The structure adopted by an organization itself is an important control device. Adopting particular structures, certain kinds of contacts and relationships are encouraged and others discouraged (Emmanuel, Otley and Merchant 1993: 52). Structural arrangements influence the efficiency of work, the motivation of individuals, information flows and control systems (Chenhall 2003: 145). Otley (1980) suggested that different forms of organization structure would require different types of ac-

counting information to be provided to enable them to operate effectively. Jensen (1983) argued that differences in requirements for organizational coordination and control across organizations are likely to result in differences in accounting systems as indicated by such contingencies as organizational context and structure (Nicolaou 2000: 92). In addition, Chenhall (2003) suggested that organizational structure remains an important characteristic in understanding control design. Several dimensions of structure have been discussed in the literature: centralization, formalization, complexity, functional differentiation and specialization (Gupta, Chen and Chiang 1997: 512; Damanpour 1991: 558; Gosselin 1997: 111). Based on the alternative dimensions of structure, Burns et al. (1961) developed a widely used theory of mechanistic and organic organization form. This form includes aspects of centralization, vertical differentiation and formalization. Mechanistic organization is more centralized, vertically differentiated and formalized than organic organization. Pugh, Hickson, Hinings and Turner (1968) and Pugh, Hickson and Hinings (1969) developed the theory proposed by Burns et al. (1961) with empirical identification of structural mechanisms. Mechanisms have been commonly used as a dimension in structure in contingency based research (Chenhall 2003: 145). Based on earlier studies the mechanistic and organic form was used to define organizational structure in this research. Three aspects of this form are presented and discussed in relation to control in the following sections.

Centralization is the most researched aspect of organization structures (Chow, Heaver and Henriksson 1995: 287). It refers to the concentration of decision-making authority in the organization (Gupta et al. 1997: 513; Gosselin 1997: 111). It is measured by identifying the level on which decisions are made (Palmer and Dunford 2001: 55). Centralization has an effect on monitoring and control activities: the lower the level of decision-making is the more monitoring and control is required. Management can thereby have a certain assurance that the organization is working toward its declared objectives. For example, Khandwalla (1977) found that large decentralized companies employed sophisticated controls but also utilized high levels of participation: the less centralized the organization, the more control is needed.

Differentiation describes the depth of the organizations' structure. Usually a vertically differentiated organization has problems with communication because information has to flow through different levels of the organization (Gosselin 1997, Hull and Hage 1982). This has a negative effect on the information and communication component (see Gresov 1989: 433). There is also an increased need for monitoring and controlling in vertically differentiated organization.

Formalization refers to the degree to which tasks within an organization are standardized by formal rules, policies and procedures. Another view of formalization is the extent to which appropriate behavior is prescribed in writing (Gosselin 1997, Hull et al. 1982). Formalization is often implicitly contrasted with direct personal control over work activities and reliance on personnel. A highly formalized organization has strong control activities in the internal control structure: low reliance on formal rules and procedures implies greater personal discretion and a tendency to take more features into account in monitoring and evaluating (Whitley 1999: 509–510). Formal rules should exist in control activities and monitoring but the idiosyncrasies of people involved and the particular situation are seen as being important elements of the control environment.

In sum, mechanistic structure may facilitate internal control by reducing the variability and increasing the predictability of work behavior. However, mechanistic structure may also reduce internal control effectiveness by the problem of control loss in multiple hierarchies (Evans 1975) or by the problems of alienation induced by centralization (Morris, Steers, and Kock 1979). From this perspective, the third hypothesis is:

Hypothesis 3 (H3): Organizations with a mechanistic structure rely to a greater extent on internal control than do organizations with organic structure.

Is the internal control structure dependent on the perceived environmental uncertainty of the organization? Perceived environmental uncertainty has been widely studied in the contingency literature (Young, Parker and Charns 2001: 74). The definition of uncertainty is usually understood as an organization's inability to predict

accurately the effects of various sources of uncertainty such as competition, production technologies, customers' tastes and preferences, deregulation and globalisation, government regulation and industrial relations (Hoque 2001: 5). Environmental uncertainty should be distinguished from risk, which is usually focused on situations in which probabilities can be attached to particular events occurring: environmental uncertainty defines situations in which probabilities cannot be attached and even the elements of the environment may not be predictable. However, uncertainty does not provide a comprehensive description of the environment, it is merely part of it. Khandwalla (1977) presented a comprehensive description of environmental elements which includes several variables; complexity (rapidly developing technologies), diversity (variety in products, inputs and customers), hostility (stressful, dominating, restrictive), and turbulence (risky, unpredictable, fluctuating, ambiguous). Hartmann (2000) and Chapman (1997) have stressed the importance of uncertainty as a fundamental variable in management control in contingency based research (Chenhall 2003: 137). Thus, in this study the focus is on perceived environmental uncertainty.

Burns et al. (1961) and Lawrence et al. (1967) were the first researchers to examine whether environmental uncertainty has an influence on organizational design. They suggested that organizations which are subjected to a high level of environmental uncertainty would be more likely to achieve optimal performance if they adopted a less formal organization structure. Galbraith (1973) explored this field further and presented information processing requirements as the central mediating mechanism between uncertainty and organizational design. Galbraith (1973) states that higher level of uncertainty creates greater information processing requirements for the organization (Young et al. 2001: 74). Ezzamel (1990) also reported that high level of uncertainty was associated with high level of participation and interpersonal interactions between superiors and subordinates but also with emphasis on budgets for evaluation and the explanation of variances required. Gordon et al. (1976) predict that increased environmental dynamism would lead to a higher quality of control system: the control system becomes more important when uncertainty is greater. Further, Evans et al. (1986) found supporting evidence for this: organization would modify internal systems frequently to adapt to the changing circumstances. Chenhall (2003) also notes that the

more hostile and turbulent the external environment is, the greater is the reliance on formal controls and emphasis on traditional budgets. He also proposed that there are rich research opportunities to examine appropriate control design for an uncertain environment.

Research has yielded contradictory results in relationships between perceived environmental uncertainty and management accounting system (MAS) design in small and medium size enterprises (SMEs). Gul (1991) found that under environmental uncertainty, high MAS sophistication contributes to better performance. In contrast Matthews and Scott (1995) found that the sophistication of strategic and operational planning decreases with increasing perceived environmental uncertainty. These contradictory results are explained by Freel (2000): organizations operating in very uncertain environments need a flexible, organic structure to adapt to environmental changes. On the other hand, high environmental uncertainty may lead firms to adopt structures that seek to reduce uncertainty, and hence, formal control systems represent a rational response. According to Freel (2000) the latter interpretation applies to small firms because on a whole the uncertainty they faced is considerably greater than that faced by large firms (Storey and Sykes 1996). In the light of earlier studies it can be stated that environmental uncertainty highlights the importance of control. The fourth hypothesis is:

Hypothesis 4 (H4): Organizations with high perceived environmental uncertainty rely to a greater extent on internal control than do organizations with low perceived environmental uncertainty.

3.2. Effectiveness of internal control

Is internal control effectiveness dependent on internal control structure? Effectiveness has been presented as a necessary dependent variable in contingency research as it provides the means to determine the appropriate fit between control and organizational variables (Langfield-Smith 1997; Otley 1980). The second purpose of

this study is to examine the relationship between internal control structure and the effectiveness of internal control from the organization management perspective. The perspective of management is chosen for two reasons: first, establishing, evaluating and supervising internal control is the responsibility of management (Krishnan 2005: 650). Second, management has immediate and detailed insight into the operation of internal control system (Changchit, Holsapple and Madden 2001: 439; COSO 1994). The internal control effectiveness is in the focus of this part, because legislative actions have highlighted the importance of public reporting of organizations' assessments of the quality of their internal control systems (Vanasco, Skousen and Verschoor 1995). The Committee of Sponsoring Organizations of the Treadway Commission (1992), the Cadbury Committee (1992), the Hampel Committee (1998) and Turnbull Committee (1999) have also emphasized management's responsibilities for internal control and recommended that management report on their responsibilities in the annual report. The Cadbury Committee also recommended that management report on the effectiveness of the organization's internal control system (see Hermanson 2000: 326). In addition, SOX 2002 requires enterprises to assess internal control using suitable frameworks and report the results in the annual report. Consequently, management's internal control reporting has received much attention outside the internal audit profession and it is therefore worthwhile to know how management reports and evaluates internal control.

Raghunandan and Rama (1994) examined the reporting of internal control effectiveness in the annual reports of the Fortune 100 companies. They found that 80 percent of the annual reports had a management report on internal control. However, only six companies provided any information on the effectiveness of internal control. The other companies focused on the existence of internal control but not on its effectiveness. McMullen, Raghunandan and Rama (1996) explored companies issuing voluntary management reports on internal control. They found that some companies are disclosing information about their controls, but only few discuss effectiveness in the reports. As a result, they concluded that smaller organizations with financial reporting problems were less likely to have management reports on internal control. Hermanson (2000) examined nine financial statement user groups to analyze their demands for reporting internal controls. The results indicated that all user groups feel that internal control reporting is

important. User groups feel that voluntary management reports improve control and provide additional information beyond the audited financial statements. On the other hand, O'Reilly-Allen and McMullen (2002) found in their study using MBA students as informants that user's perceptions do not appear to be affected by the inclusion of management or auditors' reports on internal control.

In this part of the study the interest is in the relationship between internal control structure and management's assessment of internal control effectiveness and whether the contingency characteristics have an effect on this relationship. The basic premise in contingency theory is that a proper fit will result in superior performance (effectiveness). In the earlier literature Venkatraman (1989) identified the strategic fit of the Miles et al. (1978) elements as an important predictor of effective performance. Simons (1987) found that differences in the attributes of formal control systems existed between the defender and prospector organizations and that these attributes had significant effects on company performance depending on the strategy type. In this research, the contingency premise is regenerated to the internal control approach. This research aims to determine whether the internal control structure will result in a more favorable assessment of the effectiveness of internal control in alternative contexts.

However, Fisher (1995) has noted that in the contingency approach only a narrow stream of research has been done on outcome variables other than performance. For example, Simons (1987) defined effectiveness as financial performance, Miller et al. (1982) as innovation, whereas Fisher (1990) used several dimensions which respondents weighted to reflect the relative importance to their business. Fisher (1998) stated that in addition to traditional financial goals, firms may have other goals and these should be included as performance variables, and that other outcome variables beyond performance should also be addressed in the research. In this study, the focus is on internal control effectiveness instead of performance. Internal control effectiveness is used as a dependent variable in the models. The definition of the effective internal control system was taken from the internal control frameworks. For example COSO (1994: 20) states that internal control can be judged to be effective when the board of directors and management have reasonable assurance that *they understand the extent to*

which the entity's operations objectives are being achieved, published financial statements are being prepared reliably, and the applicable laws and regulations are being complied with. Thus, the effectiveness of internal control was defined in terms of managements' perceptions of how well the internal control objectives are achieved.

The following hypothesis was designed to test whether internal control structure has an effect on the management's assessment:

Hypothesis 5 (H5): There is a positive relationship between internal control structure and internal control effectiveness.

The relationships between three sets of variables – the contingency characteristics, the internal control structure and the effectiveness of internal control – are in the focus of this research. Hypotheses 1–4 examine the relationships between the contingency characteristics and the internal control structure. Hypothesis 5 focuses on the relationship between internal control structure and the effectiveness of internal control. Relationships are analyzed with structural equation modeling technique. The objective of the analysis is to examine which of the relationships are significant and, furthermore, if the internal control structure has a mediating role between contingency characteristics and internal control effectiveness. In addition, this research examines whether contingency characteristics have a moderating role between contingency characteristics and internal control effectiveness.

4. METHODOLOGY

In the earlier part of the study the aim is to develop the research hypotheses based on the literature. The objective of this part is to describe the methodological choices for collecting data and to test the hypotheses empirically. This chapter comprises the survey design, a description of the sample, reliability and validity analyses, construct operationalization and statistical methods.

4.1. Survey design

The survey research method, used in this study can be used for two purposes. Firstly, it can be used for a descriptive study designed to discover the characteristics of a given population, not to test theory. Secondly, it can be used for an explanation to test a theory that states the expected causal relationships among a set of variables (Sapsford 1999; Van der Stede, Young and Chen 2005). In this study the aim is to examine relationships between contingency characteristics, internal control structure and its effectiveness; the data of the survey research will be used to test the theory and the relationships between variables. A cross-sectional design, which is the most common survey design in management accounting studies, is used. Longitudinal design was not used because the research agenda of this research does not require that type of data.

A survey instrument using e-mail and a Web site is employed to collect the data for the research. E-mail and Web site surveys (i.e. electronic surveys) are similar to conventional mail surveys. The main difference between traditional and electronic surveys is the medium by which the surveys are distributed, completed and returned (Herron and Young 2000: 268). The electronic survey method has some advantages compared to the conventional mail method: an electronic survey offered the opportunity to reduce the close correspondence between the sample size and survey costs. The time required for survey implementation could also be reduced from weeks to days. On the other hand, a disadvantage of electronic survey method is that email has a limited and biased population of users in terms of age, income and gender. It is also virtually

impossible to ensure the respondents' anonymity (Dillman 2000: 534–538, Selwyn and Robson 1998). However, Griffis, Goldsby and Cooper (2003: 254) found evidence that there is no difference in the characteristics of the data collected by mail and Web surveys. Schonlau, Fricker and Elliot (2001: 29) found that sampling error issues with electronic surveys were generally the same as those with conventional surveys. Thus, quality of the data collected by traditional mail and web are comparable. Moreover, Cobanoglu, Warde and Moreo (2001) found that electronic surveys outperform conventional surveys on both response time and response rate. Thus, the electronic survey approach is chosen to include a large number of organizations in research, reduce the time of the data collection procedure and obtain a higher response rate.

The electronic survey design used in this study is mainly based on Dillman's Tailored (or Total) Design Method (1978 and 2000). This method is chosen to provide a sufficient response rate and adequate level of construct reliability. To meet these objectives, Dillman (2000) proposed some improvements to the implementation procedure and to the questionnaire (see also Schonlau et al. 2002). The proposed aspects are taken into account in the survey design: for example, respondents are contacted through their personal email addresses, e-mail is designed to be attractive and the questionnaire made easy to complete. The survey design is subjected to various revisions before it is considered to be in adequate form to be sent out. Furthermore, respondents are encouraged to respond by offering compensation, such as a copy of the research report and the option to participate in a book raffle.

During the survey the author provides a uniform resource locator (URL) to the participants in the e-mail message. The URL includes a unique identifier (ID). When a respondent follows the URL she or he is automatically directed to a Web site hosting the survey where it can be completed. This method enabled restricted access to the survey for the individuals selected to participate and allows the author to monitor who has responded for follow-up purposes. This procedure serves to address sampling and coverage error. Furthermore, when participants submit the data, it is automatically captured and coded in the ASCII format.

The research questionnaire consists of three individual parts. Variables are adapted from earlier studies, where possible, to enhance the validity and reliability of measures. The first part includes questions on the control variables and contingency characteristics, namely strategy, size, organizational structure and environmental uncertainty. The second part focuses on the internal control structure and includes questions on internal control components: control environment, risks, control activities, information and communication, and monitoring. The third part examines management's evaluations of internal control effectiveness and includes questions on the efficiency and effectiveness of activities, reliability and timelines of financial and management information, and compliance with applicable laws and regulations. The first part of the questionnaire is first developed in English and then translated to Finnish. These versions are compared and some minor changes are made. The second and third parts are developed in Finnish. To check the relevance and the construct of the questionnaire (Diamond 2000, Dillman 2000), it is pre-tested with a small group of academics and CEOs. As a result, some modifications in the wording and in the presentation of the questionnaire are made. The questionnaire is presented in Appendix 3.

The first e-mail (see Appendix 1) is sent to participants in October 2004. It includes a short letter containing information about the study. The main objective of the letter is to motivate recipients to participate. The e-mail includes the URL and the ID. The recipients are asked to respond to the questionnaire within two weeks (see timetable from Table 1). Earlier studies have shown that follow-ups effectively improve response rates (Van der Stede et al. 2005): after two weeks the second contact (similar to that in Appendix 1) is made to those who have not answered. The recipients are asked again to answer the questionnaire within two weeks. Again, after two weeks the third (Appendix 2) contact is made to those who have not answered. This is done as before by using e-mail with the URL and the ID. The recipients are now asked to answer the questionnaire within one week. A PDF format of the questionnaire is also offered to those who are experiencing difficulties in using the Web-based questionnaire. Four recipients used this option and returned the questionnaire by fax.

Table 1. Timetable for the survey.

<i>Contact n:o</i>	<i>Description</i>	<i>Response option</i>	<i>Days</i>
1.	E-mail with link to questionnaire	Web	0
2.	E-mail follow-up	Web	14
3.	E-mail follow-up	Web and fax	28
	Closing day of the survey		35

4.2. Sample

The population is drawn from the MicroMedia database. The database contains information on over 160 000 Finnish organizations and as a special characteristic, it also contains CEOs' e-mail addresses. The selection criteria of the sample are the following: the number of employees in the organization should be over 14 and the annual turnover of the company over 3 million euros. The aim is to ensure that the sample consists of relatively medium and large size companies in Finland. This is done because in small organizations direct involvement by the top management compensates for less sophisticated control systems, thus, existence of internal control structure is not so obvious. Moreover, the aim is to cover organizations with at least one middle level manager to ensure the existence of internal control system. All industries are included, except financing and insurance services, and public administration. These are excluded because they are more regulated in internal controls compared to other industries (see for example Carcello, Hermanson and Raghunandan 2005: 73). Due to the Web based survey method the last important selection criterion is an existing e-mail address directly to the CEO. The e-mail address to the CEO is intended to ensure the engagement of the target population and a large enough number of responses. As a result, 1469 companies are found to meet these selection criteria. Van der Stede et al. (2005: 671) found that response rates to surveys have declined and the lowest response rates have been found in studies involved with top management. To ensure the enough

large number of responses required for statistical analysis, the survey includes all 1469 companies in the survey sample.

A total of 762 responses out of 1469 companies received. Ten responses are unusable due to too small organization size (<14 employees). Eleven responses are unusable due to over 20 percent of missing data. The survey results in 741 usable responses, a response rate of 50.4 %, which is fairly high compared to usual survey response rates. Table 2 presents the response pattern of the study.

Table 2. Response pattern of the study.

	<i>Number of the companies</i>	<i>%</i>
Total number of the companies in the population	1469	100
Companies that explicitly refused to respond	70	4.8
Companies that returned completed questionnaires	762	51.9
Companies that did not return questionnaire	637	43.3
The companies excluded from the sample after receiving their responses because		
The companies were too small	10	0.7
The questionnaire was not fully completed	11	0.7
Number of usable responses	741	50.4

Overall, 70 CEOs explicitly refused to respond to questionnaire. The CEOs gave the following reasons for refusing to respond: too busy (n = 32), language problems (n = 11), organization policy does not allow participate (n = 9), methodology or topic (n =

14), and no explanation (n = 4). As expected, CEOs are very busy and the first reason is very understandable. The second reason, language problem, emerges because the questionnaire is written only in Finnish. English version is not provided to respondents because it would compromise the consistency of the questionnaire. Third reason, policy, is connected to the first reason. These CEOs wrote that they had received too many surveys and thus a collective decision not to participate in any voluntary surveys had been made. The fourth reason, methodology or topic used in the study, gives cause for some concern, as other non-respondents may have had a similar view. These CEOs replied that topic of the study is too sensitive for their organization. There were also of the opinion that the methodology of the research is too accurate, or coverseely too inaccurate. Finally, four CEOs did not give any reason for not responding. The summary statistics of survey response rate⁵ are provided in Table 3.

Table 3. Survey response rate.

<i>Contact n:o</i>	<i>All responses % (Cumulative %)</i>	<i>Usable responses % (Cumulative %)</i>	<i>Usable responses per mailed surveys % (Cumulative %)</i>
1.	24.6 (24.6)	23.6 (23.6)	24.6 (24.6)
2.	16.9 (41.5)	16.6 (40.2)	22.6 (47.2)
3.	10.4 (51.9)	10.2 (50.4)	17.7 (64.9)

Diamond (2000: 239) suggests that potential nonresponse bias should be scrutinized carefully when the response rate is between 50–75 percent. Thus, in this study tests for nonresponse bias are conducted using Oppenheim's (1966) early-late hypothesis: late return responses are more closely related to the data that would have been received from nonrespondents than early return responses. However, comparison of early and late

⁵ As shown, the number of all responses was higher than that of usable responses, because 21 questionnaires out of 762 were excluded.

responses requires that at least one follow-up is administered. Each wave of follow-ups potentially brings in different respondents based on the variables studied, which creates a need for non-response bias analysis between waves (Moore and Tarnai 2002: Van der Stede et al. 2005: 18) and makes non-respondent analysis an important issue. In this research two follow-ups are administered: immediate replies without follow-up can be compared with those received after the first and second follow-ups. Neither of these late return response groups differs significantly from the early responses which, according to Oppenheim (1966), suggests that CEOs who did not respond would have answered in a similar manner to the subjects who did respond (see summary of respondents from Appendix 4).

In addition, possible missing data i.e. item non-response reduces sample size and potentially introduces bias. A missing value in multivariate analysis results in a lost observation for the whole analysis. The total number of observations in a multivariate analysis will be less than the total number of observations in the sample. This can cause biased results even if there is no evidence of non-response bias in the sample (see Van der Stede et al. 2005: 20). In this research, the total number of missing values is reasonably low and all missing values are randomly placed in the data. The number of internal missing values is low, no variable has more than 3.5 % (CEN 7) of internal missing value. Perhaps the best method for dealing with incomplete data would be to avoid the problem by careful planning and data collection. However, it is still common to have some level of missing data (Olinsky, Chen and Harlow 2003: 56). The most common methods to address item non-response is the imputation of missing values (Mason, Lesser and Traugott 2002) for which a number of techniques have been developed. In this research, to optimize the number of cases the missing values expectation maximization (EM) algorithm available in SPSS 10.0 statistical package is used. The EM, which has recently gained much popularity, iterates through a process of estimating missing data and then estimating parameters (Olinsky et al. 2003). This technique has been shown to be superior to the other missing data strategies such as listwise deletion, pairwise deletion, single regression imputation, or mean substitution (Arbuckle 1996). Through the application of EM, the maximum sample size ($n = 741$) equals the effective sample size.

4.3. Reliability and validity

The important aspects of the accuracy of the results are reliability and validity. Reliability refers to the possibility of replicating the results obtained using the same method and is a methodological issue. In comparison, validity refers to the agreement between the value of a measurement and its true value (Bollen 1989) and therefore it is a more theoretically oriented issue. Reliability focuses on a particular property of empirical indicators, namely the extent to which they provide consistent results across repeated measures, while validity focuses on the crucial relationships between the concept and indicators.

To examine reliability, the study would need to be repeated several times and the consistency between the repetitions would also need to be established. Regarding particular measures, high reliability is assessed in contingency characteristics. These indicators are drawn from earlier studies and have been tested in several earlier researches. However, measures for internal control structure and its effectiveness are developed for this particular research, and thus the reliability of these measures must be ensured in a different manner. In the questionnaire attention is first paid to the wording and standardized presentation (see for example Fowler 1991, 2002; Dillman 2000). Furthermore, to ensure reliability, the questionnaire is self-administered and all respondents receive similar questions which are tested for wording to make sure that they are understandable. Closed questions are used: it is assumed that differences in the responses are due to differences among respondents rather than from differences in the stimuli. In addition, a Likert scale is used as often as possible to ensure easiness of replying. The statistical method used in reliability estimation focuses on the unidimensionality of the measures and thus factor analysis is applied. Moreover, when the questionnaire is assessed qualitatively, high response percent and non-systematic missing values are positive sign for reliability.

Validity is concerned with whether a variable measures what it supposed to measure. In the earlier literature several types of validity can be found but in its basic form, validity can be classified into two different categories: content and construct validity. The first,

content validity refers to the sampling adequacy of a measuring instrument. For content validity each dimension of a concept should have one or more measures. To attain content validity, several steps are needed: First, a thorough review of the literature of how the construct has been used before; second, the contents are stratified into most important facets; third, the questionnaire is pre-tested. In addition, multiple-item measures are used as often as possible. These steps ensure adequate content validity in the study. The second type of validity, construct validity, assesses whether a measure relates to other observed variables in a way that is consistent with theoretically derived predictions (Bollen 1989: 187). Cambell and Fiske (1959) propose two criteria for construct validation: convergent validity and discriminant validity. Convergent validity refers to the extent to which multiple measures of a construct agree with each other. If two or more measures are true indicators of a concept they should be highly correlated. Discriminant validity, on the other hand, is the degree to which measures of different constructs are distinct from one another. Thus, measures of different constructs should share little common variance. To attain construct validity, two issues need to be determined: First, the unidimensionality of measures should be tested and second, it must be ascertain whether these measures conduct with each other as expected. The construct validity occurs during the statistical analysis and is therefore, reported with the statistical analysis of the empirical data.

4.4. Construct operationalization

When attempting to extend the empirical research in any area, it is important to keep variables constant over time (Gerdin 2005). Therefore, the constructs of the contingency characteristics (strategy, size, organizational structure and perceived environmental uncertainty) are made with the existing instruments applied in earlier studies. The contingency characteristic items are measured with manifest variables or a five-point Likert scale. Contingency characteristics' strategy and size are measured with the manifest variables whereas organizational structure and perceived environmental uncertainty are measured with several Likert scale based questions. Organizational structure and perceived uncertainty are used as Likert scale mean variables in further

analysis. Internal control structure and its effectiveness are theoretical constructs and are measured with seven-point Likert scale based questions recommended by Schumacker and Lomax (1996: 19). They suggest that numerical scales should have a sufficient range of values to introduce variance. A Likert scale may use various types of scales. The most used is a classical scale (see Metsämuuronen 2003: 71–72) which can also be called a negative-positive scale (1, 2, 3 = disagree, 4 = no opinion, 5, 6, 7 = agree). It is usually interpreted as an interval scale although it is actually an ordinal scale. It measures two dimensions at the same time; does the respondent have an opinion (1, 2, 3, 5, 6, and 7) or not (4), and does the respondent disagree (1, 2, and 3) or agree (5, 6, and 7). The other scale used is called a positive-positive scale (1 = totally disagree, 2 = almost totally disagree, 3 = a slightly inclined to agree, 4 = agree to an extent, 5 = almost agree, 6 = almost totally agree, 7 = totally agree) which is actually an interval scale. In this research a positive-positive scale is chosen. This enables this research to avoid the possible interpretation problems in the middle of the scale (3 = no opinion) and measure only one dimension at one time. It is also in line with the operationalization of perceived environmental uncertainty (PEU) and formalization (FOR) .

Both contingency and latent variable Likert scale constructs are assessed by looking at single item reliability and validated by using confirmatory factor analysis⁶ in the SPSS statistical package with methods of item-total correlation and Cronbach's alpha. Nunnally (1978) has suggested that Cronbach's alpha coefficient values that are equal to or greater than 0.70 are acceptable, whereas Cortina (1993) has stated that in scales with a reduced number of items (e.g. six or less) Cronbach's alpha coefficient values of 0.60 and above may also be acceptable. Given that the alpha values in this study ranged from 0.65 to 0.86 and the number of items ranged from two to eleven, it is concluded that selected scales are reliable. For the contingency characteristics the analysis proceeds with confirmatory factor analysis, since the earlier studies confirm dimensions within these constructs. However, despite the use of confirmatory factor analysis for the internal control structure and its effectiveness, the procedure remains more exploratory in nature. The principal factors extraction method with Varimax rotation is employed to

⁶ In SEM, confirmatory factor analysis is used as the identification of the factors is specified by the theory (Baines and Langfield-Smith 2003; Hair, Anderson, Tatham and Black 1998)

maximize the relationships between the variables and evaluate the factor structures. Variables that have factor loadings 0.60 or higher on a primary dimension and 0.40 or lower on some other dimension are accepted. One aim of this study is to develop measurement model for these constructs: the measurement model for internal control and effectiveness constructs are modified until satisfactory models are achieved. In the beginning the construction starts by testing the dimensions proposed in the theoretical part. In the following section the research constructs are presented in detail.

Strategy has been operationalized and measured in the literature using several approaches. Hambrick (1980) proposed four different approaches to operationalizing strategy: textual description, partial measurement, multivariate measurement and typologies. The first one, textual description, is too weak for theory testing because descriptions cannot be generated in large numbers to produce generalizable results. Also, replication of studies is difficult. For case study research and theory building this is an appropriate approach. The second approach, partial measurement of strategy, considers variables such as market share or particular manufacturing strategy. The problem using this approach is that it does not capture the full breadth of an organization's strategy. The third proposed approach, multidimensional measurement involves measuring a series of variables and conducting large-scale statistical analyses of associations. Because of the complex outcome of these studies it is difficult to detect the internal logic of a particular strategy. The fourth approach to operationalize strategies uses typologies: they provide comprehensive profiles of different strategy types and have the advantage of emphasizing the integrative components of each strategy. There is also strong support for the development and use of strategic typologies in empirical research (Langfied-Smith 1997: 211). Thus, in this study the well-known Miles and Snow (1978) typology is used.

Several methods for studying Miles and Snow (1978) typology can be found in the literature. These are self-typing, objective indicators, external assessment, and investigator inference. These approaches are seldom used in conjunction in a single study. However, Conant, Mokwa and Varandarajan (1990) reported an empirical study in which two self-typing scales were used in the same study (Woodside, Sullivan and

Trappey 1999: 136). In addition, Gosselin (1997) used self-typing and investigator inference methods. Croteau and Bergeron (2001) used the Segev's (1987) instrument where 28 items were rated on a Likert-type scale varying from 1 to 7 (highly disagree to highly agree). Although Miles and Snow (1978) typology was used in Croteau et al. (2001), the organizations could not be clearly classified as one type or the other based on the data set. To keep the questionnaire short enough, the measurement approach used in this study is adapted from the studies by Guilding (1999) and Shortell and Zajac (1990).

A brief description of the strategies is presented to the respondents and they are asked to select the one which best characterized their organization. Despite the limitations of the paragraph method presented in Conant et al. (1990) it has been widely accepted in strategy research (Snow and Hrebiniak 1980). The qualitative variables are created with three values corresponding to each strategic type. The descriptive statistics can be seen in Table 4. The frequencies of analyzer and prospector strategy types are quite equal, but the frequency of the defender strategy type is low compared to the others. Miles et al. (1978) suggested that defenders, analyzers, and prospectors are distributed about equally in given industry. However, these results have been contradicted by empirical research results, and, for example, Zahra and Pearce (1990) found that different researchers reported different distributions of the strategic types. Thus, there could be three reasons for low frequency of defender strategy type. The first reason could be that the number of different industries is not distributed equally (see the table of respondent industries in Appendix 4). The second reason could be the inadequate operationalization of the definition used: in this study defender is defined as organization focusing on narrow and limited product-market domain, trying to protect its stable market share. The definition is unattractive and respondents may want to perceive their organizations more like the analyzer type, which is defined as organization that acts defensively or prospectively depending on their environmental settings and the efficiency-innovation balance they require. However, Shortell et al. (1990) have stated that manager's perceptions are very close to the strategic reality of the firm. The third reason could perhaps be the effects of the globalization of business and the increase in technical advancements: organizations with defender strategy are less able to sustain development

in this environment of change. According to Hambrick (1983) defenders tend to thrive in stable, mature, and non-innovative industries whereas prospectors capitalize on growth opportunities in innovative and dynamic environments.

Table 4. Descriptive statistics for the strategy.

Strategy	Frequency	%	Cumulative %
Defender	48	6.5	6.5
Analyzer	324	43.7	50.2
Prospector	369	49.8	100.0
Total	741	100.0	

The size of the organization has been measured by alternative surrogates like the number of employees, the number of subunits, the number of clients served, sales, assets, profits, and production volume. Even though several surrogates have been applied in earlier studies, the number of employees is the most common one (Haveman 1993: 33–34; Chenhall 2003: 149; Libby et al. 1996, Ezzamel 1990 etc.) and is found to be largely interchangeable with other measures (e.g. total assets) (Agarwal 1979). In the context of internal control it is useful to use the number of employees as a measure: internal control is defined as a process affected by the personnel. Thus, in this study the size of an organization is measured by number of full-time employees. The numbers are transformed logarithmically to adjust for expected nonlinear impacts. The descriptive statistics can be seen in Table 5.

Table 5. Descriptive statistics of the company size

Variables description	Min	Max	Mean	SD
Number of employees	14	30000	628	2294
Logarithm of employees	2.639	10.309	5.127	1.368

Organizational structure is measured by organic and mechanistic structures, operationalized using centralization, vertical differentiation and formalization. Mechanistic organization is classified as more centralized, vertically differentiated and more formalized than organic organization. Using the three determinants it ensures a more precise organic-mechanic continuum (Gosselin 1997: 111). All three variables can be found, for example, in the research of Gosselin (1997) and there are several studies in which some of these three determinants have been measured (for example Damanpour 1991, Hull et al. 1982). However, Macintosh (1994) has stated that organic-mechanic structure may vary within organizations depending on the tasks of the departments. In this study the focus is more general and the structure is considered on the organizational level.

Centralization represents the concentration of decision-making authority at a specific level of a hierarchy. The instrument employed to measure the centralization in this study is taken from Miller and Dröge (1986). Centralization is measured using a series of eleven standard decisions and identifying the level of organization where the decisions are made using five possible levels, ranging from the line (scored as 5) to the CEO (scored as 1). Unidimensionality and reliability of measures is tested with item-total correlation and Cronbach's alpha. A further test of dimensionality of the constructs is confirmatory factor analysis with Varimax rotation. The factor analysis for centralization indicates two factors. Five of the variables load into one factor (CENA) whilst the other six variables load to another factor (CENB). These constructs indicates that the higher the value of variable, the more the company is moving towards a mechanistic structure. CENA is associated with decisions connected to employees, whereas CENB reflects more process and working practices. In the structural model the factors are used as Likert scale mean-variables⁷. The construct and descriptive statistics for the centralization appear in Appendix 5, Table 1.

The vertical differentiation refers to the depth of the organization structure. It reflects the number of hierarchical levels below the CEO. To measure vertical differentiation the approach used by Gosselin (1997) and Hull et al. (1982) is applied. They measured

⁷ There was high correlation between factor scores and mean-variables, 0.998 in 0.01 significance.

vertical differentiation as the total number of hierarchical levels between a CEO and frontline supervisors. The total number of levels is converted to a scale 1–5. The descriptive statistics for the differentiation are presented in Appendix 5, Table 2.

Formalization represents the standardization degree of jobs within the organization. Formalization is operationalized by using the approach of Schminke, Cropanzano and Rupp (2002): it measures formalization a five-point Likert scale with five statements about the extent to which rules, procedures and policies are standardized on. The construct and descriptive statistics for the formalization are reported in Appendix 5, Table 3. The factor analysis with Varimax rotation indicated one factor and the alpha value is also well above the generally accepted criterion level. Thus, a single scale variable is constructed by taking the average of the respondents' scores for each item of the factor. As a result, organizational structure measured in three dimensions (centralization, vertical differentiation and formalization) resulted in four factors. These dimensions are used in a construct in the study: organizational structure (MECH) was constructed by first taking the average from each factor and then taking the average of the factors (see for example Gordon et al. 1984).

The only external organizational characteristic included in this study is the **perceived environmental uncertainty**. The recent literature contains extensive discussion focusing the environment and its measurement (Chenhall 2003, Hamel and Prahalad 1994, Cooper 1995). The main challenge in measuring the external environment is that different measures have been used to measure the same environmental constructs. This causes problems when comparing the results. The application of a single valid and reliable measure would assist in comparing the results (Chenhall 2003: 138). Thus in this research the same instrument is used as in Hoque (2001). The environmental uncertainty is assessed by using eight items:

- 1) suppliers' actions
- 2) customer demands and tastes
- 3) deregulation and globalization
- 4) market activities of competitors

- 5) production technologies
- 6) government regulations and policies
- 7) economic environment
- 8) industrial relations.

Hoque (2001) included these items from widely used instruments developed by Govindarajan (1984) and Gordon et al. (1984). In the questionnaire the respondents are asked to indicate their perceptions of the relative predictability of the eight items focusing on external environment on a five-point scale (1 – very unpredictable to 5 – very predictable). The construct and descriptive statistics for PEU are reported in Appendix 5, Table 4. Table 4 also presents a summary of the outcome of confirmatory factor analysis with Varimax rotation and Cronbach's alpha coefficient. A single scale variable was constructed by taking the average of the respondents' scores for each item of the factor.

Internal control structure. In this part of the research the main challenge is to transform the theoretical components of the internal control structure into a quantitative form. Following the procedures described in Bollen (1989) internal control structure measurements are operationalized by 1) providing a theoretical definition, 2) identifying the dimensions, 3) forming appropriate measures and 4) specifying the relations between the measures and the constructs. The theoretical definition of the internal control structure (CONTROL) includes five factors and is measured with the following indicators: control environment (COEN), risk assessment (RISK), control activities (COAC), information and communication (INFO) and monitoring (MONI). The measurement is based on the control self-assessment (CSA) method, which is an application used in practice (see for example Adamec, Rexroad, Leinicke and Ostrosky 2002). In the CSA questionnaire method respondents are asked to give their opinions about the functionality of the internal controls in their unit, for example on a scale from 1 to 4 (1 – strongly agree to 4 – strongly disagree). This idea is revised and the respondents are asked to evaluate the situation in their company and answer the questions on five internal control components using a scale from one to seven (1 – totally disagree to 7 – totally agree). Appendix 6 Table 1 presents the construct and

descriptive statistics for internal control structure. The Table 1 contains a summary of the outcome of the factor analysis with Varimax rotation and Cronbach's alpha coefficient. Tables 2–6 present the factor analysis and Cronbach's alpha coefficient for each component individually. The Likert scale mean variables of these constructs are used as a reflective measurement characteristic for latent variable CONTROL in the further analysis.

Internal control effectiveness. The measurement of internal control effectiveness encounters the same challenges as the internal control structure, and at the end, both of these are measured in a similar way. In this study the structure of internal control effectiveness (EFFE) is defined by the following indicators: efficiency and effectiveness of activities (EFFI), reliability, completeness and timeliness of financial and management information (RELI), and compliance with applicable laws and regulations (LAW). However, one must separate the effectiveness of internal control from the efficiency of internal control. Efficiency of internal control system means the quality of controls yielding an optimum measure of resource inputs to productive outputs. Effectiveness focuses on the quality of controls over the achievement of specific management objectives (Applegate and Willis 1999: 62).

The effectiveness of internal control is measured on the basis of the subjective judgments of management. Management is asked to assess how reasonable assurance they have about the three objectives of internal control (i.e. how well the organization met the three objectives of internal control). It should be noted that according to the theoretical frameworks, internal control system is an ongoing process, and judgements concerning effectiveness occur at a specific point of time. The survey is conducted as above for internal control structure. Confirmatory factor analysis with Varimax rotation and Cronbach's alpha coefficient value for all questions are presented in Appendix 7, Table 1. The values for each component are reported individually in Table 2, 3 and 4. In further analysis Likert scale mean variables of these constructs are used as a reflective measurement characteristic for latent variable EFFE. Appendix 8 includes correlation matrix of the observed variables and the variances of the variables are given on the diagonal.

4.5. Structural equation modeling

4.5.1. General overview

Structural equation modeling (SEM) is an approach which integrates various portions of the research process in a holistic fashion. It allows the simultaneous analysis of multiple relationships, provides measures of overall model fit, and explains the significance of each of the relationships between the variables (Baines et al. 2003: 686; Kline 1998; Bollen 1989). Shields (1997) and Shields and Shields (1998) encouraged management control researchers to use SEM to provide simultaneous tests of measurement reliability and structural relations. In addition, Smith and Langfield-Smith (2004) suggested that there is a potential for the use of SEM in the examination of relations between strategy, control system variables, and organizational effectiveness: SEM enables the development of a comprehensive model to test these relations.

SEM can be seen as a combination of factor analysis and regression or path analysis. It is particularly useful when a dependent variable in one equation becomes an independent variable in another equation. In addition, it can handle both direct and indirect effects through a mediating variable. In SEM the focus is on the theoretical constructs represented by the latent variables: it is also referred to as latent variable analysis or linear structural relationships.

SEM has several advantages when compared to multiple regression and path analysis. First, compared to multiple regression analysis SEM allows a range of relationships between variables to be included in the analysis: all the models may be recursive or non-recursive. SEM enables a more holistic approach to be adapted to the construction of a theoretical model. Second, SEM has the ability to account for the effects of measurement error of observed variables, whereas path analysis and multiple regression analysis cannot. In this study multi-item measures are used to measure constructs: as concluded earlier, internal control structure and its effectiveness are theoretical constructs that cannot be subjects of direct measurement. In addition, data is obtained using a web-based survey which may include noise caused by the very act of collecting

the data. Interaction terms in multiple regressions may encompass measurement error, particularly when multi-item variables are used. This situation may cause bias in the estimation of the coefficients of interaction terms, and can undermine significance tests (Smith et al. 2002: 13). Third, other analyses provide no overall indices on how well a structural model fits the data. Fit information is important: even if the proposed paths between latent variables are statistically significant, the theoretical model may still have a poor fit to the data and lack validity. In addition, path analysis yields no information about the viability of direct paths between latent variables excluded from the model. Therefore, SEM provides a way of overcoming some of the problems and limitations of path analysis and multiple regression analysis and is therefore used in this study.

4.5.2. Single sample analysis

A two-step SEM approach is applied as recommended by Schumacker et al. (1996: 72–73). In the first stage of the two-step SEM method, the measurement model specifies how the hypothetical constructs are measured in terms of observable variables. For example, in this research internal control structure and its effectiveness approximated by survey instrument are latent variables. These variables cannot be measured directly: they are measured indirectly through scaled responses to a series of items. Confirmatory factor analysis is usually used to confirm the measured constructs and establish the reliability of the latent variable. In the second stage of the two-step SEM method, a structural part of the modeling specifies the hypothesized causal relations between the constructs. Alongside various directly measured manifest variables can also be included in a structural model. Due to the existence of alternative variables the model actually becomes a hybrid model combining measurement models and structural components. The hybrid model has been argued to be the most typical model of SEM.

The SEM procedure can be conducted using three alternative modeling strategies (Jöreskog 1993). In *strictly confirmatory strategy* the researcher formulates one model, obtains empirical data to test it and supports or rejects the model. In *alternative models strategy* the researcher specifies several alternative models derived from prior theory and after analyzing a single set of empirical data, selects one of the models. In *model*

generating strategy the researcher specifies a theoretical or conceptual model. If the model does not fit the data, the model is modified and tested using the same data: several models may be tested using this process. Modifications to models may be driven by theory or data. The main goal is to specify a model that fits the data well from a statistical point of view and also so that parameters of the model can be given a meaningful interpretation (Smith et al. 2002: 23–24). In this research, the third modeling strategy is used.

The SEM involves three primary components: indicators (observed or manifest variables), latent variables (construct, concept or factor), and path relationships (correlational, one-way paths or two-way paths). The SEM models are presented in a variety of notations, but in this research the Lisrel model and LISREL 8.72. statistical package are used. Furthermore, the Generalized Least Square (GLS) estimation method in Lisrel 8.72 is used, which yields an approximate chi-square test under less restrictive assumptions of multivariate normality than some the alternative procedures (Loehlin 1987: 52–55). The model used this research includes two latent variables, namely the internal control structure (CONTROL) and effectiveness of internal control (EFFE). In the figures, a circle is used to represent latent variables, while boxes represent associated manifest variables or indicator variables. The relationships between the latent variables and their indicators are referred to as a measurement model. It represents an assumed process in which an underlying construct determines or causes behavior that is reflected in measured indicator variables. Each factor serves as an independent variable in the measurement model. The indicator variables serve as the dependent variables and the paths are referred to as factor loadings. Indicator is also potentially influenced by a second independent variable in the form of measurement error, and its influence is represented as a cause of the indicator variable through the use of a second arrow leads to each of the indicators.

4.5.3. Multi-group analysis

Multi-group analysis is a way to study theoretical models simultaneously with more than one sample. It provides an opportunity to extend the research to examine how the

measurement⁸ and structural equation models fit alternative samples and also to analyze whether model differences exist between groups (Schumacker et al. 1996: 204–205). In statistical analysis it is usually assumed that relationships between variables are equivalent for different groups: with multi-group analysis such an assumption can be evaluated. For example, Smith et al. (2004: 76) have stated that the use of multi-group analysis improves modeling in management accounting research. Smith et al. (2004) also proposed that multi-group analysis could play an important role in promoting theory development in future research. Consequently, the volume of data gathered during this research provides an opportunity to use multi-group analysis.

The procedure for multi-group analysis is the same as in single sample analysis. Multi-group formatting is based on contingency characteristics (strategy, size, structure, and perceived environmental uncertainty). The comparison of models in each contingency based group is carried out simultaneously. No reference group is used except in mean analysis. Like the two-step single sample SEM approach, the multi-group analysis consists of two stages: Multi-group confirmatory factor analysis and multi-group structural equation modeling. Multi-group confirmatory factor analysis focuses on invariance in factor loadings (factorial invariance) and is widely used in management research to examine measurement equivalence across cultures, in different industries, and in experimental versus control groups (Cheung and Rensvold 1999). The multi-group structural equation modeling is focused with the invariance of relationships between latent variables.

In the multi-group confirmatory factor analysis, the equivalence of factor loadings is most frequently of interest: it is a necessary condition for comparisons across groups (Bollen 1989). In fact, equivalence can be tested at several different levels (see for example Meredith 1993; Cheung et al. 1999; Loehlin 2004). The first, strict factorial invariance requires equivalence of all the elements of the measurement model (factor loadings, specific means for each manifest variables, and specific variances). The second, strong factorial invariance requires equivalence for the factor loadings and the specific means for each manifest variable, allowing the possibility of measurement

⁸ See Vandenberg and Lance (2000) and Williams, Edwards and Vandenberg (2003) for a review.

errors differing between groups. The third, weak factorial invariance (i.e. metric invariance), requires that manifest variables load on the same constructs and factor loadings are equivalent. Metric invariance indicates that members of different groups interpret and respond to measures in an equivalent manner. In this study, the result of multi-group confirmatory factor analysis is limited to metric invariance, which indicates that the alternative groups have identical factor constructs and loadings.

The general procedure in multi-group analysis is first to test the fit of theoretically derived baseline models by using appropriate fit indices. If the fit is adequate, then unconstrained models can be compared to models where certain parameters are constrained to be equal between the groups. The difference between models can be tested by the chi-square difference test.

Metric equivalence of factor loadings is a necessary condition for comparing means between latent variables. The difference of this analysis compared for other covariance based analyses is that it uses information from the means of the indicators and includes parameters representing the means of the latent variable. During the analysis, one latent variable mean had to be constrained a reference value to make identification possible. The means of the latent variables for the other groups are estimated as deviations from the reference group. The advantage of mean analysis is that the scores of organizations are aggregated within each multi-group, which tends to produce a score which is more reliable than in the score of the individual organization (Donaldson 2001). This analysis also shows that the fit to low levels of the context may produce the same effectiveness as the fit to higher levels, i.e. different contingency fits between context and structure are equally effective. However, mean analysis reveals nothing about the form or shape of the relationship.

Multi-group analyses can also be use to examine whether different model structures are invariant between groups. In this study, the multi-group approach is used for testing moderation models. The form of the moderation is examined with the following procedure: multi-group strategy is based on a moderator variable (strategy, size, structure, and perceived environmental uncertainty) and the tests of moderation focus on

the equality of structural parameters linking latent variables. Differences in these parameters across groups constitute evidence for the form of the moderation (Ridgon, Schumacker and Wothke 1998). The strength of the moderation is examined by testing the invariance of the squared multiple correlations.

4.5.4. Fit indices and other model validation values

In SEM the overall fit between the theoretical model and the empirical data is measured by using several fit indices. Hair et al. (1998: 580) defined goodness of fit as the “degree to which the actual/observed input matrix is predicted by the estimated model”. Series of indices that can be used in combination to assess the fit and the simplicity of the model have been developed. Six fit indices (Schumacker et al. 1996: 121) are used and reported in this study:

- 1) Chi-square test (χ^2)
- 2) Root Mean Square Error of Approximation (RMSEA)
- 3) Akaike Information Criterion (AIC)
- 4) Normed fit index (NFI)
- 5) Goodness of Fit (GFI)
- 6) Root Mean Square Residual (RMR)

The first, the χ^2 test is conventional and the most commonly-used fit index. χ^2 test provides useful basis for decision making: it tests the overall goodness of fit of the entire model. A non-significant ($p > 0.05$) value indicates that the model fits the data. Unfortunately, χ^2 test is sensitive to large sample size. For example, if sample size exceeds 500, the test has a tendency to indicate a significant probability level ($p < 0.05$). With large samples practically trivial lacks of fit tend to become significant. This is noted when assessing models in this research ($N = 741$). The second, Root Mean Square Error of Approximation (RMSEA) index is based on the model approximation and indicates if the model is too simple. An RMSEA index below 0.05 indicates very good fit to the data and values less than 0.08 are good (Hair et al. 1998: 660). The third index, Akaike’s Information Criterion (AIC) (Akaike 1987) indicates the simplicity of the

model in the comparison of models. The smaller the AIC index, the better the model (Hair et al. 1998: 661). The AIC index is very useful when two models tested using the same data are compared to each other. The fourth, Normed Fit Index (NFI) indicates the influence of a large sample size on the χ^2 test. It adjusts for complexity of the model. The model reflects a good fit when NFI is close to 0.90 or over (range 0–1) (Schumacker et al. 1996: 121). The fifth, Goodness of Fit Index (GFI) indicates the compatibility of the model with the empirical data. The model is sufficient if the value of GFI is close to 0.90 or over (range 0–1). The sixth, Root Mean Square Residual (RMR), is the square root of the mean squared amount by which the sample variances and covariances differ from the corresponding estimated variances and covariances, estimated on the assumption that the model is correct. The smaller the RMR, the better the model fit. Usually the researcher defines the required level: in this research a cutoff point 0.05 indicates good fit. All these goodness-of-fit values for models are reported in text or in figures.

These six indices are used to evaluate overall fit for measurement models and structural models. However, even the fit indices indicate an acceptable model; individual value in the model may be meaningless. It is also important to examine individual variables and parameters in the model. The values examined during the analyses in this research consists of factor loadings and variances, error variances, t-values for parameters, and the square multiple correlation of an observed variable. First, all factor loadings are examined as to whether they have a correct sign (plus or minus) and reasonable range of values. Measurement error is defined as the portion of an observed variable measuring something other than what the latent variable is hypothesized to measure. Thus the higher the factor loading and lower the error variance, the better. In addition, if the t-value for a parameter is greater than two, the parameter is statistically significant. Square multiple correlations (R^2) are interpreted in the measurement models as the reliability of an indicator variable. Square multiple correlations of structure equations indicate the proportion of variance which the independent factors explain of the dependent factors. In the present study standardized factor loadings and error variances, t-values, and square multiple correlations are reported in figures. Fit indices are listed in the tables following the figures.

Once these issues are taken into consideration, the interpretation of the modification indices of constrained parameters can be used to modify the models. The modification index (MI) provides information on the improvement in the overall χ^2 test of a model fit that would be achieved if that specific parameter is set free. Estimated large MI value indicated that if the corresponding parameter is introduced to the model the fit will improve significantly. However, all modifications made to an original model in this research are substantively meaningful and justifiable.

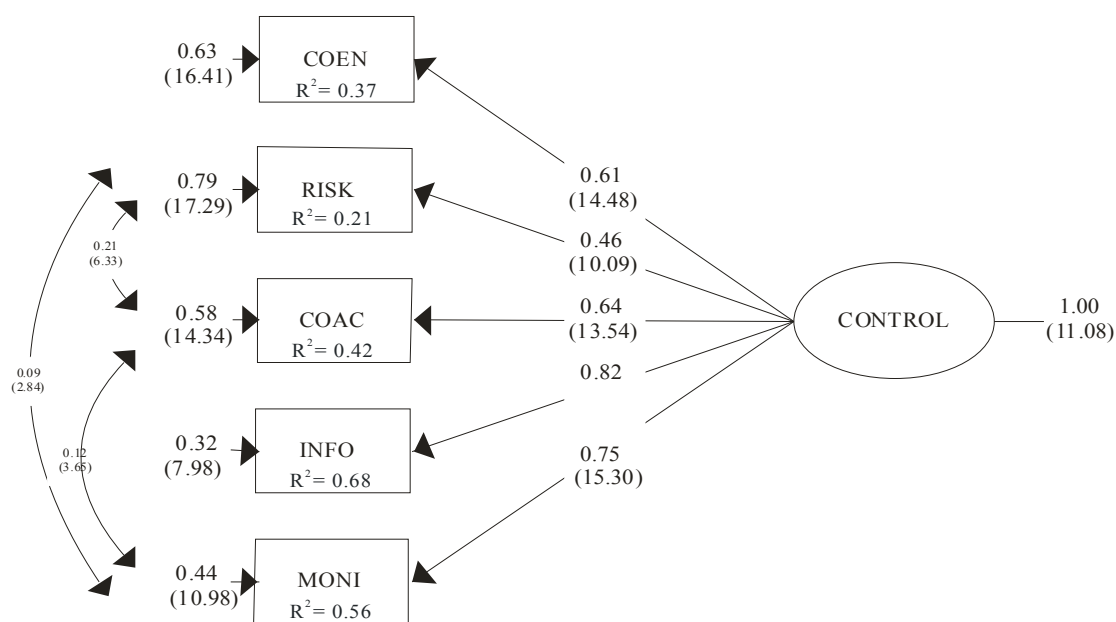
5. RESULTS

In this chapter the hypotheses developed earlier in the study are tested with the statistical approaches presented in the preceding section. This chapter has seven sections. The first section reports measurement models in the data as whole and in multi-groups data. The second section analyses means for latent variables in multi-groups. In the third section the analysis continues with a structural model which is first tested in multi-groups and then in single sample. After that, the mediation role of internal control structure is tested and the analysis continues to the moderation model, where both the strength and form of moderation are examined. In the last section a summary of the results is presented.

5.1. Measurement models

Internal control structure (CONTROL) is theoretically defined in Section 2.1.5. using five components: control environment (COEN), risk assessment (RISK), control activities (COAC), information and communication (INFO) and monitoring (MONI). In this section the measurement model for CONTROL is tested on the data as a whole (N = 741). In the first model tested, the modification indices suggest that allowing the errors of RISK and COAC, COAC and MONI, and MONI and RISK to correlate would improve the fit of the model. Thus, these covariances are included between error terms⁹. Furthermore, the variable that has highest estimate of factor loadings is scaled as a reference variable by fixing its estimate at one. Thus, the variable INFO is chosen as a reference in the factor CONTROL since its loading estimate is highest. The fit for the modified CONTROL model is good ($\chi^2(2) = 3.85$; (p = 0.146); RMSEA = 0.035 (p = 0.590); AIC = 29.85; NFI = 0.99; GFI = 1.00; RMR = 0.009) and the model is presented in Figure 9.

⁹ Covariances between error terms have been used in management accounting research if semantic or theoretical relationships exist between items (see for example Baines and Langfield-Smith 2003; Shields, Deng and Kato 2000)

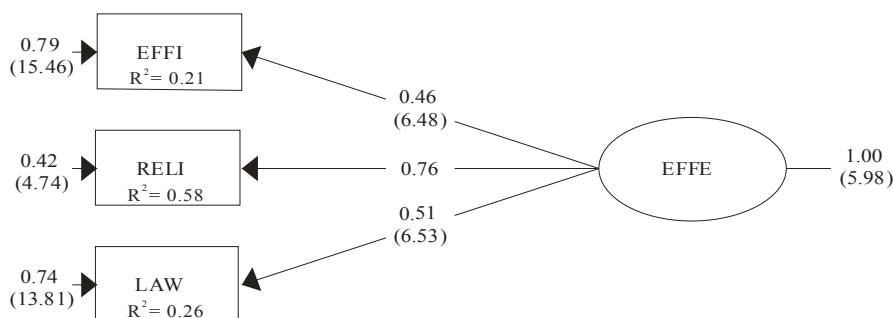


$\chi^2(2) = 3.85$; $P = 0.14594$; $RMSEA = 0.035$ ($P = 0.59$); $AIC = 29.85$; $NFI = 0.99$; $GFI = 1.00$; $RMR = 0.0088$

The construct for internal control structure CONTROL consists of five factors. COEN, RISK, COAC, INFO, and MONI stand respectively for control environment, risk assessment, control activities, information and communication, and monitoring. The reported numbers are standardized solutions and t-values are presented in parentheses.

Figure 9. Estimation and testing results for CONTROL -factor model, $N = 741$.

Internal control effectiveness (EFFE) is likewise theoretically defined in Section 2.1.5 using three components: efficiency and effectiveness of activities (EFFI), reliability completeness and timeliness of financial and management information (RELI), and compliance with applicable laws and regulations (LAW). In this section the measurement model for EFFE is tested on the data as a whole ($N = 741$). The variable RELI has the highest loading estimate and thus is scaled as a reference variable by fixing its estimate at one. The EFFE model is saturated, thus no fit indices are available. The model is presented in Figure 10.



The construct for internal control effectiveness EFFE consists of three factors. EFFI, RELI, and LAW stand respectively for efficiency and effectiveness, reliability of financial information, and compliance with law and regulations. The reported numbers are standardized solutions and t-values are presented in parentheses.

Figure 10. Estimation and testing results for EFFE -factor model, N = 741.

5.2. Measurement models in multi-groups

Multi-group analysis relates to the extent to which a model that is assumed to hold for general population also holds in sub-groups (Ullman 2001: 717). Thus, the factor models for CONTROL and EFFE are tested to see if the models examined with pooled data are invariant across multi-groups. Thus the whole data is split into multi-groups. Multi-groups may be any set of mutually exclusive groups of individuals that are clearly defined (Jöreskog, Sörbom, du Toit & du Toit 2000: 9). In management control studies the sample is typically divided into groups based on the value on the context variable (see for example Abernethy et al. 1995). In this research, groups are defined on the basis of the contingency characteristics. First, strategy (PROS) is measured by nominal scale with three groups (defender, analyzer, and prospector). Second, the size (SIZE) of the personnel is measured as a numerical value and is divided into three groups: small (<50 employees) medium (50–250 employees) and large (>250 employees). Third, organizational structure is measured by an organic-mechanic continuum (MECH) and it is split into two groups (high MECH and low MECH) according to the median (3.050) of the distribution of the variable. Fourth, perceived environmental uncertainty (PEU) is

split into two groups (high PEU and low PEU) according to the median (3.625) of the distribution of perceived environmental uncertainty variable.

Strategy groups. The first multi-group analysis is made between three strategy groups. The tested groups are defender (n = 48), analyzer (n = 324) and prospector (n = 369). The unconstrained model for CONTROL yield a poor fit to the data (χ^2 (6) = 13.40 (p = 0.037); RMSEA = 0.071 (p = 0.210); AIC = 91.40; NFI = 0.97; GFI = 0.96; RMR = 0.079). However, the estimation of parameters in multi-group analysis groups are weighted by sample size, so high-sample groups carry more weight in the analysis. This becomes an important issue when constraints across groups are imposed. When group sizes are compared, the group defender is notably smaller (n = 48) than analyzer (n = 324) or prospector (n = 369). Theoretically, defender is closer to analyzer than prospector, and thus, it is included in the group analyzer to avoid problems during multi-group statistical analyses.

The new strategy multi-groups are prospector (n = 369) and other strategies (n = 372). These two new groups are quite equal measured by size. The latent variable CONTROL is tested and the unconstrained model yields a good fit to the data (χ^2 (4) = 4.67 (p = 0.323); RMSEA = 0.021 (p = 0.70); AIC = 56.67; NFI = 0.99; GFI = 1.00; RMR = 0.013). To check whether the factorial invariance can be found across all groups the result of the chi-square difference is examined. The test is non-significant (χ^2 (4) = 3.39, p = 0.495). Thus, the metric invariance assumption of CONTROL model is supported in these multi-groups.

Next, the unconstrained model for EFFE is estimated with prospector and other strategies. The EFFE model is saturated, thus no fit indices are available. The result of the chi-square difference test of the EFFE model for the unconstrained model compared to the constrained model is not significant (χ^2 (2) = 1.39, p = 0.499). Thus metric invariance assumption of the factor structures is supported.

Size groups. The second multi-group analysis is made between three groups of sizes (SIZE). The tested groups are small (n = 135), medium (n = 352) and large (n = 254)

organizations. The analysis is made as above with strategies. The unconstrained CONTROL model yields a reasonable fit to the data ($\chi^2 (6) = 8.07$ ($p = 0.234$; RMSEA = 0.037 ($p = 0.560$); AIC = 86.07; NFI = 0.98; GFI = 1.00; RMR = 0.012). The result of the chi-square difference test of CONTROL model for the unconstrained model compared to the constrained model is significant ($\chi^2 (8) = 9.98$, $p = 0.266$). Thus, the metric invariance assumption of the CONTROL model is supported.

Next, the unconstrained model for EFFE is estimated with small, medium and large groups. The result of the chi-square difference test of the EFFE model for the unconstrained model compared to the constrained model is not significant ($\chi^2 (4) = 1.18$, $p = 0.881$). Thus the metric invariance assumption of the factor structures is supported.

Organizational structure groups. The third multi-group analysis is made between two groups of organizational structure (MECH). The unconstrained CONTROL model yields a good fit to the data ($\chi^2 (4) = 4.76$ ($p = 0.313$); RMSEA = 0.023 ($p = 0.690$); AIC = 56.76; NFI = 0.98; GFI = 1.00; RMR = 0.012). The result of the chi-square difference test of the internal control structure is insignificant ($\chi^2 (4) = 5.37$, $p = 0.251$). As the results of the difference tests turned out to be non-significant with respect to the unconstrained model, the metric invariance assumption of CONTROL-model is supported.

Next, the unconstrained model for EFFE is estimated. The result of the chi-square difference test of the EFFE model for the unconstrained model compared to the constrained model is not significant ($\chi^2 (2) = 1.26$, $p = 0.533$). Thus the metric invariance assumption of the factor structures is supported.

Environmental uncertainty groups. The fourth multi-group analysis is made between two groups of perceived environmental uncertainty (PEU). The unconstrained CONTROL model yields a reasonable fit to the data ($\chi^2 (4) = 6.78$ ($p = 0.148$); RMSEA = 0.043 ($p = 0.500$); AIC = 58.78; NFI = 0.98; GFI = 1.00; RMR = 0.013). The result of the chi-square difference test of internal control structure is ($\chi^2 (4) = 9.39$, $p = 0.052$). As the results of the difference tests turned out to be non-significant with respect to the

unconstrained model, the metric invariance assumption of CONTROL model is supported.

Next, the unconstrained model for EFFE is estimated. The result of the chi-square difference test of the EFFE model for the unconstrained model compared to the constrained model is not significant ($\chi^2(2) = 0.09, p = 0.956$). Thus the metric invariance assumption of the EFFE factor structures is supported.

5.3. Mean analysis of factors between groups

Given that invariance of factor structures was established in the last section, it is appropriate to examine mean differences in latent variables across groups. In the two-group analysis for strategy, the reference value of the mean of other strategies is fixed at zero. As can be seen from Table 6 prospector has a positive (0.17, t-value = 2.11) and a statistically significant higher mean value for CONTROL. In addition, the mean value for EFFE (0.06, t-value = 0.64) is also higher than the reference value (= 0.0), but the difference is statistically non-significant.

The second multi-group tested is size (SIZE). The reference group in this analysis is the group small. Compared to the values for the reference group, the mean of CONTROL for the group medium is slightly negative (-0.02, t-value = -0.20), and for the group large it is positive (0.09, t-value = 1.07). Even if the results are not statistically significant, the values for CONTROL indicate that the CEOs in medium size (50–250 persons) organizations give lower values for internal control structure than CEOs in small or large organizations. However, comparing the mean values of EFFE it is found that both groups, medium (0.22, t-value = 1.55) and large (0.25, t-value = 1.68) have higher values than the group small. Thus, in medium and large organizations the CEOs assess internal control effectiveness higher than in small organizations.

The third group tested is the mechanistic continuum (MECH) and the low mechanistic group is used as a reference. The mean of CONTROL for the high mechanistic group is

statistically significantly higher (0.18, t-value = 2.18) than for the reference group. In addition, the mean of EFFE for the high mechanistic group is also positive (0.07, t-value = 0.72) but the difference is not statistically significant.

The fourth group tested is perceived environmental uncertainty (PEU), where the reference group is the low PEU. The compared mean of CONTROL for high PEU is positive (0.40, t-value = 6.80) and the difference is highly statistically significant. Moreover, the mean of EFFE for high PEU is also positive and statistically highly significant (0.24, t-value = 4.02) compared to the reference value.

Table 6. Mean analysis of latent variables CONTROL and EFFE in multi-groups.

The latent variables are internal control structure (CONTROL) and internal control effectiveness (EFFE). Multi-groups are based on contingency characteristics, namely strategy (PROS), organization's size (SIZE), organizational structure (MECH), and perceived environmental uncertainty (PEU). The reference value, which is fixed at zero, is marked by 0* and t-values are reported in parentheses. Statistically significant results are given in bold face.

		CONTROL	EFFE
PROS	Other strategies	0*	0*
	Prospector	0.17 (2.11)	0.06 (0.64)
SIZE	Small	0*	0*
	Medium	-0.02 (-0.20)	0.22 (1.55)
	Large	0.09 (1.07)	0.25 (1.68)
MECH	Low Mech	0*	0*
	High Mech	0.18 (2.18)	0.07 (0.72)
PEU	Low PEU	0*	0*
	High PEU	0.40 (6.80)	0.24 (4.02)

Thus, mean analysis in multi-groups based on strategies and organizational structure confirms that the fit to the low levels of the contingency characteristics may produce the same effectiveness as the fit to the higher levels, i.e. different contingency fits between

context and structure are equally effective. However, the mean analysis in the multi-group perceived environmental uncertainty (PEU) shows that the fit to the low level of this particular contingency characteristic does not produce the same effectiveness as the fit for higher levels.

5.4. The relationship between CONTROL and EFFE in multi-groups

The next analysis is designed to test whether a theoretical causal relationship between the CONTROL model and the EFFE model exists in multi-groups. Throughout the tests, factor loadings are set to be invariant between groups. Furthermore, during the analysis the modification indices suggest that allowing the errors of RELI and LAW in the latent variable EFFE model to correlate will increase the fit of the model. The form of the tested model is presented in Figure 10.

Strategy groups. First, the two strategy groups (PROS) are tested. The model fit is good (χ^2 (36) = 46.19 (p = 0.119); RMSEA = 0.028 (p = 0.980); AIC = 118.19; NFI = 0.91; GFI = 0.98; RMR = 0.041). The gamma value (standardized solution) for prospector is 0.87 (t-value = 9.93) and for other strategies 0.88 (t-value = 10.14). The squared multiple correlations for the structural equation of EFFE are 0.73 for prospector and 0.78 for other strategies.

Size groups. The second groups tested (SIZE) are small (n = 135), medium (n = 352) and large (n = 254). The fit is moderate (χ^2 (57) = 74.03 (p = 0.064); RMSEA = 0.035 (p = 0.88); AIC = 176.03; NFI = 0.87; GFI = 0.98; RMR = 0.040). However, the NFI value is low and the p-value moderate. Thus, further analysis is needed. First, the structural model fit is tested only for the group small and the fit is low (χ^2 (15) = 29.66 (p = 0.013); RMSEA = 0.085 (p = 0.096); AIC = 71.66; NFI = 0.79; GFI = 0.96; RMR = 0.076). Low p-value indicates a poor fit for the model. Thus the group small is excluded and the multi-group analysis continues with the groups medium and large. The fit is good (χ^2 (36) = 38.14 (p = 0.372); RMSEA = 0.014 (p = 0.980); AIC = 110.14; NFI = 0.90; GFI = 0.98; RMR = 0.041). The gamma value for medium is 0.85 (t-value

= 10.01) and large 0.97 (t-value = 9.93). The squared multiple correlations for the structural equation of EFFE are 0.87 for medium organizations and 0.80 for large organizations.

Organizational structure groups. The unconstrained structural equation model mechanic continuum (MECH) groups yield in reasonable fit (χ^2 (36) = 36.86. (p = 0.429); RMSEA = 0.008 (p = 1.00); AIC = 108.86; NFI = 0.92; GFI = 0.99; RMR = 0.035). The standardized gamma value for low mechanistic continuum is 0.83 (t-value = 10.07) and for high mechanistic continuum 0.93 (t-value = 9.88). Squared multiple correlations for the structural equations of EFFE for low mechanistic organizations is 0.73 and for high mechanistic organizations 0.82.

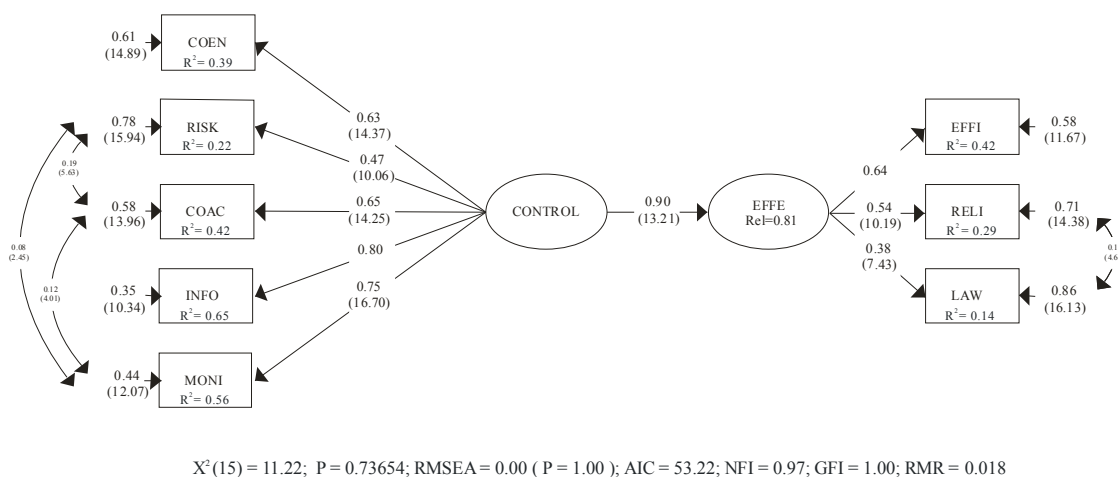
Environmental uncertainty groups. The unconstrained structural equation model of perceived environmental uncertainty (PEU) groups yield in reasonable fit (χ^2 (36) = 47.65 (p = 0.093); RMSEA = 0.030 (p = 0.950); AIC = 119.65; NFI = 0.91; GFI = 0.98; RMR = 0.040). The gamma value for low environmental uncertainty is 0.88 (t-value = 9.02) and for high environmental uncertainty 0.85 (t-value = 9.83). The squared multiple correlations for the structural equations of EFFE are 0.80 for low environmental uncertainty and 0.70 for high environmental uncertainty.

Next, the applicability of the CONTROL – EFFE model is tested on the data as whole. The advantage of this analysis is that it examines global fit and relationships. The previous results confirmed the metric invariance for the CONTROL model and the EFFE model and also the causal relationships between these models except when organization size is small. In small organizations the causal relationship cannot be confirmed. Thus due to model fit problems in small organizations (n = 135) they are excluded from the data. To examine how models fit the rest of the data (n = 606) first the CONTROL model and the EFFE model are tested again, and second, the causal relationship between these models is examined.

First, the fit of the measurement model is tested with the smaller data (n = 606) and the fit for CONTROL is good (χ^2 (2) = 2.15 (p = 0.342); RMSEA = 0.011 (p = 0.73); AIC =

28.15; NFI = 0.99; GFI = 1.00; RMR = 0.008). The standardized factor loadings are all statistically significant (COEN = 0.63 (t-value = 13.43); RISK = 0.47 (t-value = 9.11); COAC = 0.66 (t-value = 12.30); INFO = 0.79; MONI = 0.76 (t-value = 13.75). The squared multiple correlations for variables show satisfactory reliability for the parameters (COEN = 0.39; RISK = 0.22; COAC = 0.44; INFO = 0.63; MONI = 0.57). The latent variable for EFFE is saturated, thus no fit indices are available. The standardized factor loadings on parameters (EFFI = 0.45; RELI = 0.77 (t-value = 5.70); LAW = 0.49 (t-value = 7.17) are all statistically significant. The squared multiple correlations show satisfactory reliability for the parameters (EFFI = 0.21; RELI = 0.59; LAW = 0.24).

Next, the measurement models of CONTROL and EFFE are combined in the same model yielding good fit (χ^2 (15) = 11.22; (p = 0.737); RMSEA = 0.000 (p = 1.00); AIC = 53.22; NFI = 0.97; GFI = 1.00; RMR = 0.018). Detailed results are presented in Figure 11.



The construct for internal control structure CONTROL consists of five factors. COEN, RISK, COAC, INFO, and MONI stand respectively for control environment, risk assessment, control activities, information and communication, and monitoring, respectively. The constructs for internal control effectiveness EFFE consist of three factors. EFFI, RELI, and LAW stand respectively for efficiency and effectiveness, reliability of financial information, and compliance with laws and regulations. The numbers reported are standardized solution and t-values are presented in parentheses.

Figure 11. Relationship between CONTROL and EFFE for (n = 606) data.

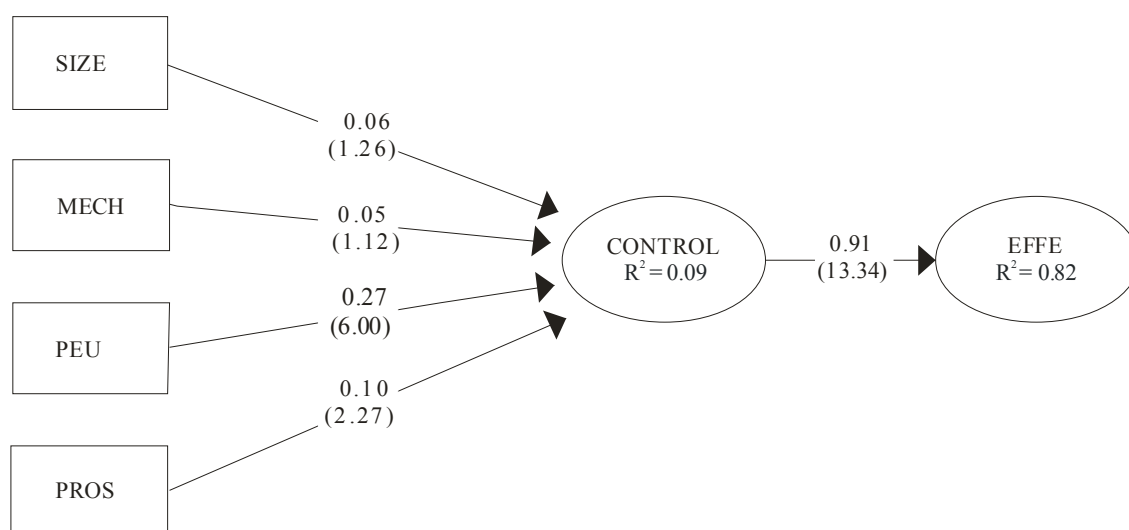
5.5. Mediation model

Next, the structural model analysis involves constructing the mediation model by specifying the relationships between contingency characteristics, CONTROL and EFFE. The mediation model is presented in Figure 12. The model contains four contingency characteristics¹⁰; strategy (PROS), size (SIZE), organizational structure (MECH) and perceived environmental uncertainty (PEU). The goodness-of-fit indices of the mediating model ($\chi^2(43) = 56.87$; ($p = 0.076$); RMSEA = 0.023 ($p = 1.00$); AIC = 131.07; NFI = 0.88; GFI: 0.99; RMR = 0.026) show that the model had acceptable values. The squared multiple correlation for CONTROL is low (0.09) and for EFFE moderate (0.82). A statistically significant direct effect on CONTROL is seen in contingency characteristics PEU (0.27, t -value = 6.00) and strategy (0.10, t -value = 2.27). Statistically non-significant direct effects on CONTROL are seen for SIZE (0.06, t -value = 1.26), and MECH (0.05, t -value = 1.12).

In addition, contingency characteristics do not have any statistically significant direct effect on EFFE. The greatest direct effect on EFFE is that of PEU (0.05, t -value = 1.02) and the smallest MECH (-0.01, t -value = -0.19). Focusing on the mediation role of CONTROL, it is found that the statistically significant indirect effects of contingency factors on EFFE have PEU (0.24, t -value = 5.66) and strategy (0.09, t -value = 2.23). Statistically non-significant indirect effects have SIZE (0.05 t -value = 1.25) and MECH (0.04, t -value = 1.10). The correlations between contingency variables are strongest between SIZE and PROS (0.14, t -value = 3.26) and lowest between PROS and PEU (0.02, t -value 0.58).

Next, contingency characteristics are separately included in the model to find out if they have an individual statistical significant effect. This is done to find out if multicollinearity between variables can decrease the effect. MECH did not had any statistically significant effect (0.08, t -value = 1.81) separately whereas PEU (0.30, t -value = 6.60), PROS (0.11, t -value = 2.54) and SIZE (0.09, t -value = 2.08) had.

¹⁰ PROS: 0=other strategy, 1=prospector; SIZE: lnemployee; MECH: average of the respondents' scores
PEU: average of the respondents' scores.



$\chi^2(43) = 56.87$; $P = 0.07633$; $RMSEA = 0.023$ ($P = 1.00$); $AIC = 131.07$; $NFI = 0.88$; $GFI = 0.99$; $RMR = 0.026$

Contingency characteristics SIZE, MECH, PEU and PROS stand respectively for organizations size, organizational structure, perceived environmental uncertainty, and strategy. The contingency characteristics are allowed to correlate [values not reported]. The model for CONTROL and EFFE is reported in Figure 11. CONTROL denotes the construct for internal control structure and consists of five factors: control environment, risk assessment, control activities, information and communication, and monitoring. EFFE denotes the construct for internal control effectiveness and consists of three factors: efficiency and effectiveness, reliability of financial information, and compliance with law and regulations. The numbers reported are standardized solutions and t-values are presented in parentheses.

Figure 12. Mediation model for whole data ($n = 606$).

5.6. Moderation model

In the last chapter the mediation role of CONTROL was confirmed with contingency characteristics PEU, STRA, and when separately examined, also for SIZE. However, no statistically significant results for contingency characteristic MECH are found. Also, no statistically significant direct relationship between contingency characteristics and EFFE is found. To confirm the results and gain a more holistic view of the research questions, further analysis is needed.

The next analysis is designed to test whether the contingency characteristics moderate the relationship between CONTROL and EFFE. Earlier in this chapter the fit for the

relationship between CONTROL and EFFE was assessed in multi-groups. This analysis continues to examine that relationship. First, the form of the moderation is tested with the invariance analysis of the gamma parameter between CONTROL and EFFE in multi-groups. Next, the strength of the moderation is examined by testing the equality of the squared multiple correlations. However, in Lisrel 8.72 statistical package this test is not directly possible. Thus invariance of the squared multiple correlations for structural equation is tested by comparison of the unconstrained model and the constrained model in which the variance of latent variable CONTROL and the variance of the residual term of structural equation are invariant across multi-groups.

Strategy groups. The first multi-groups tested are strategies (PROS) (n = 741). The test invariance of structural path from CONTROL to EFFE the unconstrained structural model is compared with the constrained model in which gamma values are fixed to be invariant across groups. The gamma value for prospector is 0.87 and for other strategies 0.88. The chi-square difference is insignificant ($\chi^2 (1) = 0.03, p = 0.863$). The squared multiple correlations are 0.73 for prospector and 0.78 for other strategies. The testing invariance of the squared multiple correlations for structural equation across groups, the chi-square difference is insignificant ($\chi^2 (2) = 0.28, p = 0.870$).

The second groups tested are medium and large (SIZE) organizations (N = 606). The group small is not tested, because the relationship between CONTROL and EFFE could not be confirmed in the previous test. The gamma value for medium organizations is 0.85 and for large organizations 0.97. The chi-square difference is non-significant ($\chi^2 (1) = 2.71, p = 0.100$). The squared multiple correlations for the structural equation of EFFE are 0.87 for medium size organizations and 0.80 for large size organizations. The chi-square difference for the test of the invariance of the squared multiple correlations for structural equation is insignificant ($\chi^2 (2) = 5.14, p = 0.077$). Thus invariance of squared multiple correlations for structural equation is supported.

For the mechanic continuum (MECH) (n = 741) the gamma value for low mechanistic continuum is 0.83 and for high mechanistic continuum 0.93. The chi-square difference between unconstrained and constrained structural models is insignificant ($\chi^2 (1) = 1.26,$

$p = 0.262$). Squared multiple correlations for structural equations of EFFE for low mechanistic organizations is 0.73 and for high mechanistic organizations 0.82. The chi-square difference for the test of the invariance of the squared multiple correlations for structural equation is insignificant ($\chi^2 (2) = 1.5$, $p = 0.472$). Thus invariance is supported.

For the perceived environmental uncertainty groups (PEU) ($n = 741$) the gamma value for low environmental uncertainty is 0.88 and for high environmental uncertainty 0.85. The chi-square difference between the unconstrained and constrained structural models is insignificant ($\chi^2 (1) = 0.08$, $p = 0.777$). The squared multiple correlations for the structural equations of EFFE for low environmental uncertainty is 0.80 and for high environmental uncertainty 0.70. The chi-square difference for the test of the invariance of the squared multiple correlations for the structural equation is insignificant ($\chi^2 (2) = 1.3$, $p = 0.522$) and thus invariance is supported.

5.7. Summary of the results

The objective of this research is to empirically examine the relationships between contingency characteristics, internal control structure and internal control effectiveness. In the literature there is a lack of measurement tools for internal control structure and its effectiveness. In this research the measurement models for internal control structure (CONTROL) and its effectiveness (EFFE) are developed on the basis of theory in internal control frameworks.

In the first part of the analysis, the confirmatory factor analysis is used to test the factorial validity of the five-factor CONTROL model and the three-factor EFFE model using all the data. Based on the modification indices the CONTROL model is re-specified and after the modifications the model yielded a good fit to the data. The results for the CONTROL model are presented in Figure 9 and for the EFFE model in Figure 10. In the second part, the multi-group confirmatory analysis is used to test the equivalence of CONTROL model and EFFE model across multi-groups. The multi-

groups are based on contingency characteristics. The findings confirm the metric invariance for latent variable structures in all groups. Thus the measurement models for CONTROL and EFFE are confirmed.

In the third part, given that the metric invariance is established, the mean differences in latent variables across groups are examined to gain a wider understanding of the research problem. Statistically significant differences in latent mean values are found in multi-groups based on strategy, organizational structure and perceived environmental uncertainty. Table 6 shows the group prospector has a statistically significant higher positive mean value in the CONTROL variable than the other strategies. This means that the management in organizations which use prospector strategy gives higher values to internal control structure compared to the others. However, between strategy groups there is no significant difference in the mean value of EFFE. This implies that different strategy requires different internal control structure if the organization is to survive. The results are similar with multi-groups based on organizational structures. A statistically significant difference is found in the CONTROL variable, but no statistically significant difference is found in the EFFE variable. Therefore, in these organizations the management gives higher values to internal control structure than in the reference groups. There is no indication of higher level of internal control effectiveness compared to the reference groups. As before, this implies that different organizational structures require different internal control structure if the organization is to survive. These situations indicates so-called iso-performance which means that the fit to low levels of the contingency characteristic produces the same performance (i.e. effectiveness) as the fit to high levels of the contingency characteristic (Donaldson 2001). In contrast to this, in the multi-group based on perceived environmental uncertainty, both the CONTROL and the EFFE variables have higher mean values in the group high perceived environmental uncertainty compared to the reference value. This means that in the organizations with high perceived environmental uncertainty management gives higher values to the internal control structure and its effectiveness than in the organizations with low perceived environmental uncertainty. The results do not imply iso-performance with regard to the mean analyses of latent variables based on perceived environmental uncertainty.

One of the research interests is in the theoretical causal relationship between the latent variables CONTROL and EFFE. This relationship is examined by using multi-group structural equation modeling. The fit of the structural model is good in all multi-groups, except in multi-groups based on size. In the organizations with less than 50 employees no statistically significant relationship is found between internal control structure and its effectiveness. Based on the results, the group small ($n = 135$) is excluded from the data in further analysis. Next, the model for CONTROL and EFFE is tested on the data as whole. The detailed results are presented in Figure 11.

Next, the four contingency characteristics are added into the model tested above and the mediating nature of CONTROL is examined. The results are presented in Figure 12. As a result it is found that strategy (PROS) and perceived environmental uncertainty (PEU) have statistically significant effects on CONTROL. Organizational structure (MECH) and size (SIZE) have statistically non-significant effects on CONTROL. From this it can be concluded that prospector strategy and high perceived environmental uncertainty have an effect on internal control structure.

The analysis continues by including contingency characteristics into the model one by one. As a result, it is found that separately analyzed size, strategy and perceived environmental uncertainty have a statistically significant effect on internal control structure. The results diverge from the model examined above: contingency characteristic size also has a statistically significant positive effect on internal control structure and a statistically significant positive indirect effect on internal control effectiveness. However, Jorissen, Laveren, Martens, and Reheul (2005) claim that studies using bivariate settings can not find “real” differences between firms but differences can be found using multivariate analyses. In the previously examined mediation model including all four contingency characteristics, the correlations between contingency characteristics are set free. The highest correlation is found between size and strategy. Situation gives some indication that there may be multicollinearity between size and strategy. However, the relationship between size and internal control structure becomes insignificant in the presence of the other characteristics.

In the mediation model, including all four contingency characteristics, the strategy and the perceived environmental uncertainty characteristics have statistically significant indirect effects on EFFE. Organizational structure and size characteristics have statistically non-significant indirect effects on EFFE. In addition, contingency characteristics do not have any statistical significant direct effects on EFFE. The effect of strategy and perceived environmental uncertainty characteristics on internal control effectiveness is therefore fully mediated by internal control structure. In addition, in the mediation model the relationship between CONTROL and EFFE is statistically significant and the value is relatively high.

The analysis continues with the moderation model. The moderation model is used to confirm the results from the previous analysis because in the earlier studies it is stated that in a particular situation only the moderating or mediating model can achieve the exact description of the relationship: significant results from both analyses should be interpreted as a contradictory result. Furthermore, in the previous mediation model no statistically significant results for the organizational structure are found. Using the moderation model the alternative effects of organizational structure are examined. In the multi-group structural analysis the relationship between latent variables is confirmed except in the group small. This analysis is used as a basis for the moderation analysis, where the relationships between CONTROL and EFFE are examined in multi-groups. First, the form of the moderation is tested by the analyzing the invariance of structural paths. It is found that there are no statistically significant differences in the form of structural path from CONTROL to EFFE in multi-groups: the structural paths in these contingency based groups are invariant. Second, the strength of the moderation is tested using the invariance test of variance of latent variables. No significant differences are found. Statistically insignificant results indicate that the relationship between internal control structure and internal control effectiveness do not vary across different levels of contingency characteristics. This result confirms the results given in the mediation model.

6. DISCUSSION AND CONCLUSION OF THE RESEARCH

Having examined the outcomes of the testing of the data and the hypotheses in the last chapter, this chapter provides a more detailed discussion of the findings of this research. The first section provides further insights into the results of the research questions and hypotheses examined in this study. The second section discusses theoretical, methodological, and empirical contributions. Thirdly, the limitations of the study and suggestions for the future research are presented. The chapter ends with a conclusion.

6.1. Discussion

The purpose of this research is to contribute to the study of internal control by examining the internal control structure and internal control effectiveness through the contingency characteristics that describe the organizational context. Earlier contingency studies have not taken into account internal control and there is a very limited body of knowledge about the effects of organizational aspects on internal control structure and its effectiveness. The purpose of the study can be divided into two parts: the first part examines the relationship between the contingency characteristics and the internal control structure. The second part analyzes the relationship between internal control structure and its effectiveness from the perspective of the organization management. The theoretical approach is contingency theory. The internal control structure and its effectiveness are conducted from practical frameworks such as COSO, Basle, CoCo, the Combined Code and the Turnbull Guidance. Based on the frameworks the internal control structure consists of five components: control environment, risk assessment, control activities, information and communication, and monitoring. Internal control effectiveness is defined through three objectives: efficiency and effectiveness of activities; reliability, completeness and timeliness of financial and management information; compliance with applicable laws and regulations. When these three objectives are achieved, internal control can be evaluated as effective.

The used original contingency approach contains three core elements that together form its paradigm. This study applies all the core elements. First, the theory assumes that contingency characteristics and internal control structure are interrelated. Second, contingency characteristics determine the internal control structure. Third, there is a fit of the level of the internal control structure to each level of contingency characteristics, which leads to better internal control effectiveness, whereas misfit leads to poorer effectiveness.

The research questions for the study are following:

RQ 1: Is the internal control structure dependent on the type of business strategy of the organization?

RQ 2: Is the internal control structure dependent on the size of the organization?

RQ 3: Is the internal control structure dependent on the structure of the organization?

RQ 4: Is the internal control structure dependent on the perceived environmental uncertainty of the organization?

RQ 5: Is the internal control effectiveness dependent on the internal control structure?

For these research questions more detailed hypotheses are developed based on the literature. The hypotheses are as follow:

H1: Organizations with prospector strategy rely to a greater extent on internal control than do organizations with other strategies.

H2: Large size organizations rely to a greater extent on internal control than do smaller size organizations.

H3: Organizations with a mechanistic structure rely to a greater extent on internal control than do organizations with organic structure.

H4: Organizations with high perceived environmental uncertainty rely to a greater extent on the internal control than do organizations with low perceived environmental uncertainty.

H5: There is a positive relationship between internal control structure and internal control effectiveness.

These hypotheses are examined through mediation and moderation research models to gain a holistic view of the situation. The structural equation modeling (SEM) approach is used to examine the research models. The evidence upheld some of the hypotheses but also rejected some hypotheses.

In this study the measurement models for internal control structure and its effectiveness are conducted from theoretical frameworks. In the frameworks internal control structure is defined using five components: the measurement model for internal control structure also consists of five factors (Figure 9). Internal control effectiveness is defined using three objectives: the measurement model for internal control effectiveness likewise consists of three factors (Figure 10). These models are tested by using single sample analysis on the data as a whole. The results confirm the theory based structure of the latent variables for internal control structure and its effectiveness.

The analysis continues with data split into multi-groups. Multi-groups are based on the contingency characteristics: strategy characteristic includes prospector and other strategies; the size characteristic includes small, medium and large organizations; organizational structure characteristic includes high mechanistic and low mechanistic organizations; perceived environmental uncertainty contains high and low perceived environmental uncertainty organizations. Multi-group analysis is used to examine theoretical structures and model with more than one sample at once. This analysis focuses first on metric equivalence: the equivalence of factor structures is a requisite precondition for latent variables mean comparison and for model comparisons across groups. The findings of the multi-group confirmatory factor analysis confirm the measurement models for internal control structure and its effectiveness. Thus the theory based and multi-group tested models for internal control structure and its effectiveness are similar in all groups examined.

Is the internal control structure dependent on the type of business strategy of the organization? The mean analysis of latent variables results in statistically significant differences between the multi-groups in the study. In the multi-groups based on strategies it is found that the management in the prospector type of organizations give

higher values to internal control structure than in other strategy types of organizations (Table 6). This result can be construed such that the prospector type of organizations has stronger internal control structure than the other strategy types. This can be a result of the different market conditions in which these strategy types operate. The prospector type of organization searches for new market opportunities and accumulates information and monitors outputs carefully, whereas the defender's control system, for example, relies heavily on formal accounting procedures and cost control (Simons 1987, 1990, 1991). Having a stronger internal control structure than other strategies, the prospector type of organization can decrease uncertainty associated with the strategy. However, the comparison of the means of the effectiveness of internal control did not reveal statistically significant differences: in prospector and other strategy based multi-groups the CEOs give the same values the internal control effectiveness. This result suggests that prospector type of organizations have stronger internal control structure than other strategy types but the strength of internal control effectiveness is the same. Simons (1990) argued that the advantage of flexible controls for prospector strategy organizations is that they enable quick adaptation to fast changing environments. Thus, the prospector type creates internal control structure according to its changing needs.

Within the structural mediation model (Figure 12), the relationship between strategy and internal control structure is statistically significant (0.10, t-value = 2.27) reflecting that prospector strategy relies to a greater extent on internal control. This result supports Hypothesis 1. Thus, according to hypothesis, *organizations with prospector strategy rely to a greater extent on internal control than do organizations with other strategies*. Moreover, strategy also has indirect effect on internal control effectiveness (0.09, t-value = 2.23). Strategy does not have a direct relationship to internal control effectiveness and in addition, the moderation model does not fit in the data at hand. This result confirms the mediation role of internal control structure between strategy and internal control effectiveness.

Is the internal control structure dependent on the size of the organization? The multi-groups without any statistically significant differences in variable means are groups according to size (Table 6). The earlier studies suggest that the role of control is

dependent on the size of the organization. The mean analysis shows indications, but no statistically significant differences, that the mean for medium organizations (50–250 employees) is negative whereas the mean for large organizations is positive compared to reference value. Perhaps medium sizes of organizations suffer from the problems caused by organizational growth as proposed by Merchant (1981, 1984). He claims that organizational growth increases communication and control problems. This is due to the behavioral oriented still in use in larger organizations even if it is only suitable for small organizations.

When causal relationship between internal control structure and its effectiveness is tested in multi-groups (Figure 11), it is found that in the group of small organizations (less than fifty employees) the model fit is low. In this group no statistically acceptable relationship can be found between internal control structure and its effectiveness. This result indicates that this relationship is unformed in small organizations. It has been claimed that the internal control frameworks are not appropriately tailored to the small business control environment. Internal control is as important in small organizations as it is in larger ones. However, it should be noted that the nature of the control may differ substantially: control in a small organization is exercised by the entrepreneur and the larger the organization is, the more formal the control system is. Some authors have assumed that the direct involvement of top management is adequate compensation for a less sophisticated control system. Thus, smaller companies may have greater transparency. However, it can be recommended that small organizations have a more appropriate internal control framework than that used in this study. The framework is suitable for larger organizations, as can be seen from the fact that the relationship between the internal control structure and its effectiveness get the highest values in the large multi-group. Furthermore, in the contingency based literature only few studies have examined small and medium sized organization controls (Chenhall 2003). In the light of this study there is a need for future studies to examine in greater detail the relationship between internal control structure and its effectiveness in small organizations. The structural mediation model (Figure 12) also shows a statistically insignificant effect of medium and large size of organization on internal control structure (0.06, t -value = 1.26), also statistically insignificant indirect effect to its

effectiveness (0.05 t-value = 1.25) is likewise found. Moreover, in the moderation model no statistically significant result was obtained. According to the results, Hypothesis 2 is rejected. Thus, *there is no statistically significant evidence that large organizations would rely to a greater extent on internal control than do smaller size organizations.*

In explaining the statistically insignificant results further analysis is conducted. When contingency characteristic size is added separately to the mediation model, size has a statistically significant relationship to internal control structure (0.09, t-value = 2.08). When examined alone, a statistically significant indirect effect on internal control effectiveness is also found: the results indicate that when the effect of size of the organization is examined alone, the internal control structure has a mediation role between size and internal control effectiveness. However, Fisher (1995) argued that studies that focus on a single contingent characteristic might fail to capture the complexities of the contingent control process. Also Jorissen et al. (2005) claim that no real differences can be found in studies using bivariate settings: the differences can be found using more sophisticated analyses. The relationship between size and internal control structure and its effectiveness is not significant in the structural model when all other contingency characteristics – strategy, organizational structure, and perceived environmental uncertainty – are added to the model. This result supports the claims by Jorissen et al. (2005), that when the situation is viewed more widely, the role of some characteristics changes. To resolve the presence of conflicting contingencies Fisher (1995) proposed that companies may design a control system to be consistent with one contingency characteristic while ignoring the others. However, management in the organizations has to deal with several characteristics and it can therefore be stated that the mediation model with four characteristics give more usable information than the mediation model with one characteristic.

Chenhall (2003) noted that studies in management control theory have examined relatively large organizations and reasoned that large organizations tend to adopt more formal control systems. According to Bruns et al. (1975) control in small organizations tends to be more informal. In this study internal control structure includes both formal

and informal controls, and this may cause that internal control structure is not very sensitive for the effect of organizational size. Moreover, organization size is measured using number of employees. This is found to be largely interchangeable with other measures (Agarwal 1979), but as the results indicate insignificance, it is possible that some other size surrogate could be more appropriate for studying internal control.

Is the internal control structure dependent on the structure of the organization? In multi-groups based on organizational structure statistically significant results were obtained in the mean analysis of the study (Table 6). The CEOs give statistically significant higher values for high mechanistic organization compared to low mechanistic (organic) organizations. No statistically significant differences in the given values for internal control effectiveness are found in the study. This indicates that fit to low levels of the structure of the organizations produces the same effectiveness as fit to higher levels (iso-performance). In contrast, the structural mediation model (Figure 12) indicates no significant relationship between organizational structure and internal control structure (0.05, t-value = 1.12), reflecting that organization structure is not a driver for internal control structure. Furthermore, organizational structure does not have a statistically significant direct or indirect relationship to internal control effectiveness. Neither does the moderation model fit show any statistically significant differences. Thus, using simple mean analysis for latent variables some differences can be found, but when the analysis is more holistic, i.e. when other characteristics are taken in account in the same model, no effects of this particular characteristic can be found. Based on this, Hypothesis 3 is rejected because when a more holistic analysis is performed *no statistical evidence is found that organizations with a mechanistic structure rely to a greater extent on internal control than do organizations with organic structure.*

In explaining the statically insignificant results, there may be some conflicting affects on the mechanistic-organic continuum. High mechanistic organization is defined using three determinants: it is classified as more centralized, vertically differentiated and more formalized than a low mechanistic organization. In a centralized organization the decision-making authority is on high level of structure: the need for monitoring the

decision-making process is reduced. A vertically differentiated organization needs more monitoring and controlling. Vertical differentiation also requires for communication in the organization whereas formalization strengthens the internal control structure. However, these three dimensions may cause conflicting effects on internal control structure and its effectiveness. Centralization decreases control activities and monitoring: the higher the level of decision-making is the less controlling and monitoring is needed. On the other hand, when an organization is vertically differentiated, it creates particular needs for an information and communication component. Formalization strengthens the control environment and control activities by standardizing functions. It can therefore be stated that the dimensions along the mechanic-organic continuum may have different requirements.

The existence of conflicting dimensions increases the probability of the deviation of the control system design from the requirement of at least one of the dimensions, making optimal control design difficult (Fisher 1995). Thus, the organizational structure is measured using three probably conflicting dimensions. The measure is developed by averaging the responses to the questions. Important further question concerning on the relationship between organizational structure and internal control is the following: Can organizational structure be understood as part of the internal control structure? Organizational structure and internal control structure may share some dimensions, for instance formalization. Formalization standardizes functions, which is also referred to control activities in internal control structure. Thus, internal control structure may subsume some part of organizational structure. In the earlier literature organizational structure has been operationalized separately, but the relationship between organizational structure and internal control structure should be examined in future research to obtain more detailed results. It is also important to note that organization may include both forms of organizational structure. Some parts of the same organization may have organic structure and other parts mechanistic structure (see e.g. Macintosh 1994: 52–55). The approach applied in this study measured the overall structure of the organization. This may also be one explanation for statistically insignificant results.

Is the internal control structure dependent on the perceived environmental uncertainty of the organization? In the multi-groups based on perceived environmental uncertainty statistically significant differences are found in the means of internal control structure and its effectiveness (Table 6). It is observed that high environmental uncertainty leads to stronger internal control structure. The CEOs in organizations with high environmental uncertainty give statistically significant higher values for the internal control structure and its effectiveness than in the low environmental uncertainty organizations. These results are in line with Gul's (1991) suggestion: under environmental uncertainty high control sophistication contributes to higher performance. Within the structural mediation model (Figure 12), the relationship between perceived environmental uncertainty and internal control structure is statistically significant (0.27, t-value = 6.00) showing that organizations with high perceived uncertainty rely to a greater extent on internal control. The reason could be that the control system is more important when the uncertainty is greater. Gordon et al. (1976) and Waterhouse et al. (1978) reports similar results. As the environment become more uncertain, the organization will employ high management discretion, higher monitoring of outputs, and careful selection and socialization of employees. Waterhouse et al. (1978) suggests that control mechanisms are used in a reinforcing way. Thus, the results from this study confirm the earlier findings and supports Hypothesis 4: *Organizations with high perceived environmental uncertainty rely to a greater extent on internal control than do organizations with low perceived environmental uncertainty.*

Moreover, perceived environmental uncertainty also has an indirect effect on internal control effectiveness (0.24, t-value = 5.66). Furthermore, perceived environmental uncertainty does not have a direct relationship to internal control effectiveness. The moderation model does not fit the data. This confirms the mediation role of internal control structure between perceived environmental uncertainty and internal control effectiveness. Many studies (Chenhall 2003; Ezzamel 1990; Gordon et al. 1976; Young et al. 2001) have proposed that environmental uncertainty leads to better quality control systems. The results of the present study confirm that view in internal control. This study shows that the more uncertain the perceived environment is, the stronger is the internal control structure. Among the examined contingency characteristics, perceived

environmental uncertainty has the greatest effect on internal control structure and its effectiveness in the mediation model.

Is the internal control effectiveness dependent on the internal control structure? The final issue was whether internal control structure has any impact on internal control effectiveness. The multi-group analysis is first used to examine this relationship and it is found that the relationship between internal control structure and its effectiveness is relatively strong and positive in multi-groups. The highest value is found in the large organizations and the lowest in low mechanistic organizations. According to observations, the model fit was good in all groups except in the multi-groups based on size specifically in small organizations. This result shows that this relationship is unformed in small organizations. The good model fits for model (Figure 11) indicate that when management assesses the effectiveness of internal control, the results are heavily dependent on internal control structure. The structural mediation model (Figure 12) also shows a statistically significant relationship between internal control structure and its effectiveness (0.91, t -value = 13.34) which partially confirms Hypothesis 5. Thus, *there is a positive relationship between internal control structure and internal control effectiveness except in the group small (less than 50 employees)*. In addition, the significant indirect relationship between contingency characteristics and internal control effectiveness implies that changes in internal control effectiveness are primarily driven by changes in context, although this effect operates through an appropriate internal control structure. This means that low level of context, i.e. other strategy than prospector or low perceived environmental uncertainty, leads to a low level of internal control structure which, in turn, leads to low internal control effectiveness. High level of context, i.e. prospector strategy or high perceived environmental uncertainty, is associated with high internal control structure level and high internal control effectiveness.

To summarize, the findings in the mean analysis indicate that the factor structures in the latent variables may be similar, but the mean scores on constructs can differ. These findings imply that there is a variation in opinions about internal control and its effectiveness in alternative multi-groups based on contingency characteristics. In

addition, the relationship between contingency characteristics, internal control structure and its effectiveness is confirmed for strategy and perceived environmental uncertainty. Contingency characteristic size also has a statistically significant effect on internal control structure when added separately to the mediation model. However, no significant results are found in the mediation or moderation model for the effects of organizational structure.

The results show that contingency characteristics examined do not have a moderating role between internal control structure and its effectiveness. This role is examined in terms of the form and strength. The non-significant results in both analyses confirm the previous results that are evidenced in the case of mediation model.

The results of this study show the effect of four contingency characteristics on internal control structure and its effectiveness. The mediation model is able to predict nine percent of internal control structure and 82 percent of internal control effectiveness. The research model is still miss-specified in the sense that there are missing characteristics and underestimated constructs in the model. However, if potential characteristics and constructs presented in the contingency and control literature were included in the model, the information that the model would generate would be too complex to be useful. According to the results of this study, it can be stated that prospector strategy and high perceived environmental uncertainty do matter more in internal control than the other contingency characteristics examined. So far, this study is one of the very few to empirically examine the concept of internal control structure and its effectiveness. Additional empirical evidence is required to fully understand the effects of contingency characteristics to internal control structure and its effectiveness.

6.2. Theoretical, methodological, and empirical contributions

Theoretical contributions

A major theoretical contribution of this research is that it extends the research on contingency characteristics – accounting and management control – performance relationship into the internal control area. In this study control mechanism is replaced by internal control structure, and performance by internal control effectiveness. A unique emphasis of this study is on how internal control structure relates to internal control effectiveness. This study also contributes to the existing literature by examining first the mediating effect of internal control structure, and second, the moderating effects of contingency characteristics on internal control effectiveness. The relationship between the contingency characteristics, internal control structure and its effectiveness has not been examined in earlier empirical research, despite its importance to professionals in the field. The results of this study demonstrate the need for a thorough examination of the effect of multiple contingencies on internal control structure and its effectiveness.

Methodological contributions

This study makes several significant contributions to internal control research methodology. First, it provides an understanding of the nature of internal control structure and its effectiveness as latent variables. Recently, several authors have criticized the use of inappropriate proxies in order to capture theoretical constructs. This study answers this call by developing measures for internal control structure and its effectiveness and furthermore, demonstrating a technique that allows a researcher to simultaneously validate factor structures and to examine possible contingency effects. Second, it demonstrates the mean analysis of latent variables that can detect possible contingency influences on the internal control construct underlying assessment across multi-groups. It was observed that these analyses – factorial invariance and mean analyses – are useful for multi-group comparisons of internal control constructs because they simultaneously validate factor structures across multi-groups and can test the

systematic effects due to contingency. Third, the moderation model and direct effects are used to confirm the results extracted in the mediation model. This study therefore shows that several complimentary statistical techniques can be used in one and the same study.

Empirical contributions

In addition to its theoretical contribution, this study also offers empirical applications. Here the internal control structure and its effectiveness are tested empirically in alternative organizational contexts. The results can provide guidance for the assessment or reorganization of an organization's internal control structure. Organizations can benefit from understanding the significance of the contingency characteristics examined on internal control structure and its effectiveness. According to the results, when perceived environmental uncertainty is high or an organization employs prospector strategy, the internal control structure is stronger and this situation affects the efficiency and effectiveness of activities, reliability of financial information, and compliance with applicable laws. The results also show that in small organizations (less than 50 employees) the relationship between internal control structure and its effectiveness is not linear. This indicates that in small organizations the internal control framework should be amended. The results highlight the key contingency characteristics that have an effect on internal control structure and its effectiveness: the model identifies the characteristics that organizations need to be deal with during internal control reorganizing.

6.3. Limitations and suggestions for future research

This study also has its limitations and the findings of the research should be considered critically. First, the only way to validate the findings of this exploratory study is by process of replication. This research is conducted within a particular national context. To assess the external validity of the present results, it is essential that replication studies be performed in other countries. Such studies would help to identify potential

differences in internal control structure and its effectiveness in varying economic frameworks.

Second, there are limitations related to the methodology employed. Significant problems revolved around operationalising the internal control structure and its effectiveness that lie at the heart of the study. The constructs are developed on the basis of the existing literature, but the measures are relatively crude and may not achieve the depth and intensity of internal control and its effectiveness. Internal control structure and its effectiveness may be more complex than seen in this study and may be better determined in other ways. From a measurement perspective, the scale for the initiation of structures is slightly modified by dropping some items, which is noted in the methodology chapter. It follows that the strategy characteristics has only one measure and the control environment factor has two measures in the measurement construct.

Third, it is assumed in this research that there is a causal order from contingency characteristics to internal control structure and to its effectiveness. Although this sequence is applied from the theory, other causal ordering is not implausible: the model is tested using cross-sectional data. For example, if assessed effectiveness of internal control is low, this will cause some effects on internal control structure in the future. Without longitudinal data this possibility cannot be conclusively ruled out and thus, this study does lend promise to the fruitfulness of longitudinal studies undertaken specifically for the examination of causal linkages between internal control structure and its effectiveness. Moreover, in structural equation modeling technique it is not considered that the relationships between variables may not be linear or that the relationships exhibit linearity only within a limited relevant range. Therefore, a case study approach could be useful to evaluate these types of relationships in future studies.

Fourth, the e-mail survey approach used enhanced external validity. The survey was administrated via the Internet and it is not possible to verify that the participants are actually the ones to complete the questionnaire. However, the purpose of the study is to ascertain the opinions of the management, there are no incentives to provide false ratings. Also, the e-mail used is personal and included a unique identifier: it is possible to restrict access to the survey to those individuals who received e-mail and monitor

who responded. In addition, even if tests are performed to look for evidence of non-response bias, there is no way to directly test whether the non-respondents are systematically different from the respondents. Moreover, the use of summated responses to questionnaire items that appear on the same instrument always entails some risks.

However, these limitations indicate significant challenges for future research. Future studies can add to our understanding of the research problem by considering the role of additional relevant, and perhaps conflicting, contingency characteristics. There is a lack of knowledge about the contingency characteristics in internal control studies and further studies would be of immense value to theory development. In addition, the measurement of internal control structure and its effectiveness needs to be refined and further developed. For example, this study has relied on self-assessed internal control effectiveness. While management's perception of the effectiveness of internal control is an important outcome variable, more objective measures should be used to avoid measurement error. Measurement error affects the consistency of the parameter estimation of structural model. The use of multi-item scales mitigates some of the measurement error concerns, but the CEO's self-assessment of internal control structure and its effectiveness should perhaps be confirmed with an observer's assessment. Future research should also examine the effects of internal control on quantifiable measures on firm performance, such as operational measures of performance as well as profitability measures. The internal control reports in the annual reports could also be used as a measure of internal control effectiveness. A potential theory to use in future internal control studies is an institutional theory. It postulates that organizations respond to external pressures by adopting externally-driven internal control practices without any evidence of improvements in effectiveness. Moreover, a potential research avenue that builds on the current study could employ several other statistical methods, for example discriminant analysis in one study or use other research approaches, for instance a case study design. Close relationship to organizations could be an appropriate way to increase further understanding of the variety of internal control structure and its effectiveness.

6.4. Conclusion

This study contributes to the understanding of internal control structure and its effectiveness in alternative organizational contexts. It adds to the results of former studies by examining the relationships between contingency characteristics, internal control structure and its effectiveness. In particular, this study demonstrates how contingency approach and structural equation modeling technique may be applied to internal control research.

The study focuses on four contingency characteristics: strategy, size, organizational structure and perceived environmental uncertainty. These characteristics are chosen on the basis of the earlier results in contingency based control studies. Earlier control studies have also examined several other contingency characteristics, like technology, national culture, international competition and societal differences (Chapman 1997; Reid et al. 2000; Chenhall 2003). However, these characteristics are omitted from the focus of the present research. Instruments to measure chosen contingency characteristics are drawn from earlier management control studies to keep variables constant over time. In addition, internal control structure and its effectiveness measurements are developed from the existing internal control frameworks. Based on theory, internal control structure includes five factors and internal control effectiveness three factors. A measurement model for these variables is constructed. The results are based on empirical data that is gathered from 741 Finnish organizations (response rate 50.4%) using e-mail and web site survey.

This study demonstrates the use of a two-step approach to structural equation modeling. Confirmatory factor analysis is used to test whether the observed measures adequately reflect the underlying constructs. The structural model of the relationships between variables is estimated by using structural equation modeling technique. The use of structural equation modeling provides several advantages. First, it allows several relationships to be considered in a single analysis. Second, structural equation modeling allows incorporate error variances associated with constructs into model. Third, it allows measures of model fit to be determined, and finally, it can be used in the

examination of several theoretical models. Mediation and moderation models are examined.

The results show that the theory-based mediation model of internal control fits the data. High perceived environmental uncertainty has the strongest effect on internal control structure. The prospector strategy also has a statistically significant effect on internal control structure. These characteristics have statistically significant indirect effects on internal control effectiveness. In addition, size has a statistically significant effect on internal control structure only when tested alone in the mediation model. No direct effects on internal control effectiveness are found. In the moderation model no statistically significant results are found and thereby confirming the results given by mediation model.

As the results showed, a statistically non-significant result is obtained in the mediation or moderation models for organizational structure. However, statistically significant results for organizational structure are found in the mean analysis of latent variables: the higher the mechanistic structure of the organization is, the higher values are given for internal control structure by management. No statistically significant differences in the given values for internal control effectiveness are found in the study. This indicates that fit to low levels of the structure of the organizations produces the same effectiveness as fit to higher levels. The mean analysis reveals similar results for contingency characteristic strategy. In contrast to this, in the multi-group based on perceived environmental uncertainty, both the internal control structure and its effectiveness have higher mean values in the group high perceived environmental uncertainty compared to low perceived environmental uncertainty.

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APPENDIX 1. The cover letter of an e-mail sent to the respondents.

Arvoisa Vastaanottaja

Yrityksissä tehdään jatkuvasti suuria investointeja erilaisiin johtamisen ja valvonnan apuvälineisiin. Yrityksen johtamiseen ja valvontaan kohdistuu ulkoapäin yhä uusia odotuksia, joihin ei voida vastata ilman ajantasaista, objektiivista tutkimustietoa.

Väitöskirjani pyrkii nyt tuottamaan tutkimustietoa, jota voitaisiin käyttää hyväksi yrityksen johtamisen ja valvonnan kehittämisessä. Tämän tutkimustiedon tuottamiseen Teidän, yritysmaailman asiantuntijan, näkemykset ovat ensiarvoisen tärkeitä.

Pyydänkin nyt apuun väitöskirjani eteenpäin viemisessä. Oheisesta linkistä pääsette kyselyyn, johon toivon Teidän vastaavan mahdollisimman pian, kuitenkin 2.11.2004 mennessä. Vastaaminen vie noin 5–10 minuuttia.

http://www.uwasa.fi/~ajo/kysely/index.php3?sess=**

Vastanneiden kesken arvotaan viisi uutuskirjaa, professori Erkki K. Laitisen ja ohjaajani professori Teija Laitisen *Yrityksen rahoituskriisin ennustaminen*, johon tekijät ovat luvanneet signeerauksen haluamallanne omistuskirjoituksella. Lisäksi kaikki vastanneet saavat halutessaan tiivistelmän tutkimustuloksista niiden valmistuttua.

Vastauksenne käsitellään erittäin luottamuksellisesti ja missään yhteydessä ei esitetä yksittäisten yritysten tunnistettavia tietoja.

Vastaan erittäin mielelläni kaikkiin asiaa koskeviin tiedusteluihin ja kysymyksiin, joten älkää epäröikö ottaa yhteyttä.

Tutkimusterveisin

Annukka Jokipii

Tutkija
Laskentatoimen ja rahoituksen laitos
Vaasan yliopisto

Puh. 06–3248 911
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Kotisivu <http://www.uwasa.fi/~ajo>

The cover letter of an e-mail sent to the respondents in English.

Dear recipient,

Companies are constantly making large investments in various tools for management and control. New expectations are made on management and control form outside and these cannot be responded to without up-to-date objective research data.

My forthcoming doctoral dissertation endeavours to generate research knowledge to be utilised in the further development of company management and control. As a representative of business life your views are of paramount importance in the generation of such research knowledge.

I would therefore request your assistance for my doctoral dissertation. The enclosed links will take you to a questionnaire to which you are kindly requested to respond as soon as possible, and not later than 2 November 2004. Responding will take approximately 5–10 minutes.

http://www.uwasa.fi/~ajo/kysely/index.php3?sess=**

Among respondents there will be a lottery of five new books, *Yrityksen rahoituskriisin ennustaminen* by Professor Erkki K. Laitinen and my supervisor, Professor Teija Laitinen, which the authors have kindly agreed to autograph according to your preference. All respondents will also receive if desired a summary of the research findings once the work is complete.

Your response will be treated in strictest confidence and nothing to identify any individual company will be presented anywhere at all.

I shall be pleased to answer all enquiries pertaining to the questions, so please have no hesitation in contacting me.

Best regards

Annukka Jokipii

Researcher
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APPENDIX 2. The cover letter of a remainder e-mail sent to the respondents.

Arvoisa Vastaanottaja

Jokin aika sitten pyysin apuanne koskien yritysten johtamista ja valvontaa käsittelevää väitöskirjatutkimustani. Lähetin Teille sähköpostia ja linkin kyselyyn, jonka toivoin Teidän täyttävän omaa yritystänne silmällä pitäen. Yritystoimintaan liittyvien kiireiden vuoksi ette ehkä ole vielä ehtinyt vastaamaan.

Lähestyn Teitä nyt vielä kerran, koska jokainen täytetty kyselylomake on erittäin tärkeä tutkimuksen onnistumiseksi. Kyselyyn pääsette oheisesta linkistä

http://www.uwasa.fi/~ajo/kysely/index.php3?sess=**

Jos linkin toiminnassa on ongelmia, ystävällisesti pyydän Teitä ilmoittamaan siitä minulle, niin voin lähettää Teille sähköpostin liitetiedostona kyselylomakkeen. Toivon, että vastaisitte mahdollisimman pian, kuitenkin keskiviikkoon 24.11.2004 mennessä. Vastaaminen vie vain noin 5–10 minuuttia.

Muistattehan, että vastanneet yritykset saavat halutessaan koosteen tutkimustuloksista sekä mahdollisuuden osallistua kirja-arvontaan, jossa on palkintoina viisi kappaletta professori Erkki K. Laitisen ja ohjaajani professori Teija Laitisen kirjoittamaa uutuuskirjaa *Yrityksen rahoituskriisin ennustaminen* omistuskirjoituksella ja tekijöiden signeerauksella. Kirjat arvotaan torstaina 25.11.2004.

Toivon aktiivista osallistumista väitöskirjatutkimukseeni!

Vastaan mielelläni asiaa koskeviin tiedusteluihin ja kysymyksiin.

Ystävällisin terveisin

Annukka Jokipii

Tutkija
Laskentatoimen ja rahoituksen laitos
Vaasan yliopisto

Puh. 06–3248 911
E-mail: ajo@uwasa.fi
Kotisivu <http://www.uwasa.fi/~ajo>

Ps. Mikäli olette jo vastannut kyselyyn, kiitän vastauksestanne ja osallistumisestanne ajankohtaiseen tutkimukseen.

The cover letter of a remainder e-mail sent to the respondents in English.

Dear recipient,

Some time ago I requested your assistance for my forthcoming doctoral dissertation on the management and control of companies. I sent you an e-mail message with a link to a questionnaire, to which I hope you would kindly complete with regard to your company. Perhaps due to the pressure of work you have not yet found time to respond.

I now approach you for a second time as every completed questionnaire is extremely important for the success of my research. You will find the questionnaire at the following link

http://www.uwasa.fi/~ajo/kysely/index.php3?sess=**

In the event of problems with the link I would request you to notify me, and I can send you the questionnaire as an attached file to your e-mail. Your prompt response would be greatly appreciated, not later than Wednesday 24 November 2004. Responding will take approximately 5–10 minutes.

You will recall that respondents can, if desired, be supplied with a summary of the research findings and that your name will go forward when five copies of a book will be raffled, namely *Yrityksen rahoituskriisin ennustaminen* by Professor Erkki K. Laitinen and my supervisor, Professor Teija Laitinen, to be autographed and dedicated by the authors. The raffle will take place on 25 November 2004.

I look forward to your active participation in my doctoral research.

I shall be please to respond to any enquiries of questions.

Kind regards,

Annukka Jokipii

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P.S. If you have indeed already responded to the questionnaire, please accept my thanks for your responses and participation in topical research

APPENDIX 3. The research questionnaire.**Tehtävänimike:**

- Toimitusjohtaja
 Muu (mikä _____)

Ikä:

- alle 30 vuotta
 30-39 vuotta
 40-49 vuotta
 50-59 vuotta
 60- vuotta

Kauanko olette toimineet nykyisessä tehtävässä: _____ vuotta

Yrityksen päätoimiala

(jos tiedossanne on toimialakoodi TOL 2002, voitte merkitä myös sen): _____

Kuinka monta johtajatasoa löytyy yrityksestänne?

(Esimerkiksi toimitusjohtaja ja työnjohtaja = 2): _____ tasoa

Yrityksen nykyinen työntekijöiden määrä täysipäiväiseksi muunnettuna: _____ henkilöä

1. Yrityksenne strategia? Rengastakaa se strategia, joka lähinnä vastaa yrityksenne strategiaa kuluneen vuoden aikana.

A) Tarjoamme vakiintuneita palveluja tai tuotteita. Emme etsi valikoimiimme uutuuksia, vaan toimimme tehokkaasti nykyisillä tuotteilla ja markkinoilla.

B) Tarjoamme melko vakiintuneita palveluja tai tuotteita. Emme ole ensimmäisenä tarjoamassa uutuuksia, mutta pyrimme kuitenkin kustannustehokkaasti seuraamaan markkinoiden kehitystä.

C) Palvelumme tai tuotteemme muuttuvat jatkuvasti. Pyrimme vastaamaan markkinoiden tarpeisiin nopeasti ja tarjoamaan uutuuksia ensimmäisenä.

2. Kuinka paljon toimintoihin liittyvää päätöksentekoa tapahtuu eri tasoilla? Seuraavassa on lueteltu erilaisia päätöksiä. Rengastakaa sen henkilön numero, joka tekee kyseiset päätökset yrityksessänne.¹¹

Henkilöt on numeroitu seuraavasti:

1-toimitusjohtaja, 2-tuotanto- tai myyntijohtaja, 3-osastojohtaja, 4-linjan esimies, 5-työntekijä
Päätökset koskien:

Työntekijöiden määrä	1	2	3	4	5
Työntekijän palkkaamispäätös	1	2	3	4	5
Sisäiset työkiistat	1	2	3	4	5
Ylityöt työntekijätasolla	1	2	3	4	5
Toimituspäivät ja kiireellisyysjärjestys	1	2	3	4	5

¹¹ Hinged questions

Tuotantosuunnitelmien toteutus	1	2	3	4	5
Työsuhteen purkaminen	1	2	3	4	5
Työntekijöiden valitseminen	1	2	3	4	5
Työmenetelmien valinta	1	2	3	4	5
Työvälineiden käyttö	1	2	3	4	5
Töiden jakaminen työntekijöille	1	2	3	4	5

3. Onko yrityksenne dokumentoinut toimintatavat ja työtehtävät?

Rengastakaa yritystänne koskeva numero.

	eri mieltä					samaa mieltä				
Yrityksessämme on runsaasti dokumentoituja sääntöjä ja määräyksiä	1	2	3	4	5					
Yrityksemme kirjalliset säännöt on työntekijöiden saatavilla	1	2	3	4	5					
Työnkuvaukset on kirjoitettu kaikille työtehtäville	1	2	3	4	5					
Työntekijöiden työtuloksista pidetään kirjallisia muistioita	1	2	3	4	5					
Uudet työntekijät perehdytetään muodollisen ohjelman mukaisesti	1	2	3	4	5					

4. Kuinka hyvin pystytte ennakoimaan yrityksenne ympäristöön liittyviä tekijöitä?

Rengastakaa yritystänne koskeva numero.

	Hyvin ennakoitavissa					Ei lainkaan ennakoitavissa				
Toimittajien ja alihankkijoiden toiminta	1	2	3	4	5					
Asiakkaiden vaatimukset ja maku	1	2	3	4	5					
Markkinoiden vapautuminen ja kansainvälistyminen	1	2	3	4	5					
Kilpailijoiden toiminta	1	2	3	4	5					
Tuotantoteknologian muutokset	1	2	3	4	5					
Toimintaan vaikuttavat lait ja asetukset	1	2	3	4	5					
Taloudellisen toimintaympäristön muutokset	1	2	3	4	5					
Työntekijöiden työsuhteasioiden muutokset	1	2	3	4	5					

5. Yrityksen valvontaan liittyvät asiat.

Vastatkaa seuraaviin kysymyksiin ympyröimällä mielestänne oikea numero koskien yrityksenne viimeisen kuluneen vuoden tapahtumia ja toimintoja. Huomioi, että oikeita vastauksia ei ole, vaan kysymyksillä kartoitetaan yleistä, yrityksissä aidosti olemassa olevaa valvontarakennetta.

- Vaihtoehdot:
- 1- täysin eri mieltä
 - 2- lähes täysin eri mieltä
 - 3- vain hieman samaa mieltä
 - 4- jonkin verran samaa mieltä
 - 5- melko samaa mieltä
 - 6- lähes täysin samaa mieltä
 - 7- täysin samaa mieltä

	Täysin eri mieltä				Täysin samaa mieltä		
Johtokunta/hallitus aidosti kyseenalaisti johdon päätöksiä ja esitti niille toteuttamiskelpoisia vaihtoehtoja. (COEN1)	1	2	3	4	5	6	7
Esimiehet ja johto eivät ole olleet ylityöllistettyjä. (COEN2)	1	2	3	4	5	6	7
Valvonta- ja johtotehtävissä on ollut paljon vaihtuvuutta. (COEN3) ¹²	1	2	3	4	5	6	7
Henkilöstö on ongelmitta ymmärtänyt tehtäviensä sisällöt ja vastuut. (COEN4)	1	2	3	4	5	6	7
Henkilöstö on osoittanut käytöksellään olevansa sitoutunut rehellisyyteen ja yrityksen eettisiin arvoihin. (COEN5)	1	2	3	4	5	6	7
Yrityksen toiminnan tavoitteille oli todennettavat ja mielestäni järkevät mittarit. (RISK1)	1	2	3	4	5	6	7
Johto arvioi aktiivisesti tavoitteiden saavuttamista estäviä sekä ulkoisia että sisäisiä riskejä. (RISK2)	1	2	3	4	5	6	7
Koko yrityksen kattava riskianalyysi suoritettiin kuluneen vuoden aikana. (RISK3)	1	2	3	4	5	6	7
Esimiestehtävissä toimivat tiedostivat oman vastualueensa riskit ja tiesivät, kuinka riskienhallinta oli toteutettu. (RISK4)	1	2	3	4	5	6	7
Yrityksen riskien analysointi ja niiltä suojautuminen olisi voinut olla mielestäni tehokkaampaa. (RISK5)	1	2	3	4	5	6	7
Yrityksen prosesseissa oli toimivat kontrollit, jotka hälyttivät aina, kun ei-toivottuja poikkeamia ilmeni. (COAC1)	1	2	3	4	5	6	7
Havaittuihin ei-toivottuihin poikkeamiin puututtiin asianmukaisesti ja välittömästi. (COAC2)	1	2	3	4	5	6	7
Työtehtäviä määriteltäessä oli kiinnitetty erityisesti huomiota valtuutuksiin ja tehtävien eriyttämisvaatimuksiin. (COAC3)	1	2	3	4	5	6	7
Yrityksen sisäisiä valvontatoimenpiteitä olisi pitänyt mielestäni vielä tehostaa. (COAC4)	1	2	3	4	5	6	7
Koko henkilöstöllä oli päivitetyt toimenkuvat. (COAC5)	1	2	3	4	5	6	7
Henkilökunnalla ei ollut ongelmia omaan työtehtävään liittyvien tietojen saamisessa. (INFO1)	1	2	3	4	5	6	7
Johdolle tulevat raportit olivat riittävän selkeitä ja sisälsivät olennaisia tietoja johtamisen kannalta. (INFO2)	1	2	3	4	5	6	7
Yrityksen eri osastojen välillä liikkui riittävästi tietoa, jotta toiminnan katkottomuus ja sujuvuus voitiin varmistaa (esim. myynnistä valmistukseen). (INFO3)	1	2	3	4	5	6	7

¹² Hinged questions: COEN3, RISK5, COAC4, INFO4, MONI5, EFFI1–LAW4

Yrityksemme informaatio – ja viestintäjärjestelmä ei ollut aivan ajan tasalla toimintojen suhteen. (<i>INFO4</i>)	1	2	3	4	5	6	7
Työt oli koordinoitu tehokkaasti toimintojen sisällä että muiden toimintojen kanssa. (<i>INFO5</i>)	1	2	3	4	5	6	7
Johtamisessa käytettävä operatiivinen tieto oli täsmäytetty taloushallinnon järjestelmätietoihin. (<i>MONI1</i>)	1	2	3	4	5	6	7
Esimiehet hoitavat päivittäisvalvonnan erinomaisesti. (<i>MONI2</i>)	1	2	3	4	5	6	7
Henkilökunnalle annettujen toimintaohjeiden noudattamista seurataan aktiivisesti. (<i>MONI3</i>)	1	2	3	4	5	6	7
Teimme analyyseihin (asiakastyytyväisyys, työtyytyväisyys, tehokkuus) perustuvia muutoksia kuluneen vuoden aikana. (<i>MONI4</i>)	1	2	3	4	5	6	7
Johto ei ole kuluneen vuoden aikana pyytänyt selvityksiä valvontatoimenpiteiden suorittamisesta. (<i>MONI5</i>)	1	2	3	4	5	6	7
Yrityksen toimintojen tehokkuutta olisi voitu vielä kohtuullisin panostuksin lisätä. (<i>EFFI1</i>)	1	2	3	4	5	6	7
Toiminnoissa on mahdollisesti sellaisia ongelmia, jotka poistamalla olisi saatu suurempi panostuotos –suhde (<i>EFFI2</i>)	1	2	3	4	5	6	7
Prosesseissa oli vaiheita, joiden tehokkuudesta en ollut aivan vakuuttunut. (<i>EFFI3</i>)	1	2	3	4	5	6	7
Joissain toiminnoissa resursseja olisi voitu käyttää tehokkaammin. (<i>EFFI4</i>)	1	2	3	4	5	6	7
En luottanut täydellisesti taloushallinnon tekemiin raportteihin ja jouduin joskus tarkistamaan saamiani tietoja. (<i>RELI1</i>)	1	2	3	4	5	6	7
Raporteissa oli joskus sellaisia virheitä, jotka jouduttiin korjaamaan jälkepäin kun tiedot varmistuvat. (<i>RELI2</i>)	1	2	3	4	5	6	7
Yrityksen ulkopuolelle menevistä raporteista saatiin joskus palautetta niiden virheellisyyksistä. (<i>RELI3</i>)	1	2	3	4	5	6	7
Taloushallinnon käyttämissä laskentaohjelmissa on ollut ongelmia. (<i>RELI4</i>)	1	2	3	4	5	6	7
Yritystämme koskevia säädöksiä oli vaikea soveltaa käytännössä. (<i>LAW1</i>)	1	2	3	4	5	6	7
Lakimuutokset tulivat yritykselle usein yllätyksenä. (<i>LAW2</i>)	1	2	3	4	5	6	7
Olen havainnut, että henkilökunnalla oli ongelmia voimassa olevien lakien ja säädösten suhteen. (<i>LAW3</i>)	1	2	3	4	5	6	7
Yrityksessämme ei ole henkilöä, jonka vastuualueena on seurata tulevia lakimuutoksia ja uusia säädöksiä. (<i>LAW4</i>)	1	2	3	4	5	6	7

The research questionnaire in English.

Present job title:

- CEO
 Other (please specify _____)

Age:

- under 30 years
 30-39 years
 40-49 years
 50-59 years
 60- years

How long have you been in your current position: _____ years

Main business of your organization

(if you know your organization's standard industrial classification TOL 2002 you can mark that):

What is the total number of hierarchical levels between a CEO and frontline supervisors?

(For example CEO and frontline supervisor = 2): _____ level

Number of full-time employees in your organization: _____ persons

1. What is the business strategy of your organization? The following three statements describe different types of businesses. Please indicate which of the statements best describes your firm during the last year.

A) We offer regular services or products. We are not looking for anything new for our product range, but operate efficiently with our present products and markets.

B) We offer fairly standardized services or products. We are not the first to offer novelties, but we still try to follow the market development in a cost-efficient way.

C) Our services or products are constantly changing. We endeavour to respond to market needs rapidly and to be the first to offer novelties

2. Which level in your organization has the authority to make the following decisions? Circle the appropriate level.¹³

1-CEO, 2-production or sales manager, 3-sub-department head, 4-first -level supervisor, 5-worker

Number of workers required	1	2	3	4	5
Whether to employ a worker	1	2	3	4	5
Internal labor disputes	1	2	3	4	5
Overtime to be worked at shop level	1	2	3	4	5
Delivery dates and priority of orders	1	2	3	4	5

¹³ Hinged questions

Production plans to be worked on	1	2	3	4	5
Dismissal of worker	1	2	3	4	5
Methods of personnel selection	1	2	3	4	5
Method of work to be used	1	2	3	4	5
Machinery or equipment to be used	1	2	3	4	5
Allocation of work among available workers	1	2	3	4	5

3. Has the organization documented policies and procedures?

Please indicate the correct number for your organization.

	Disagree			Agree	
The organization has a large number of written policies and procedures	1	2	3	4	5
Written policies are available for employees within this organization	1	2	3	4	5
There is a complete written job description for jobs in this organization	1	2	3	4	5
The organization keeps a written record of nearly everyone's job performance	1	2	3	4	5
There is a formal orientation program for most new members of the organization	1	2	3	4	5

4. How well can you predict the changes in the environment of your organization?

Please indicate the correct number for your organization.

	Foreseeable			Not foreseeable	
Suppliers' action	1	2	3	4	5
Customer demands, tastes and preferences	1	2	3	4	5
Deregulation and globalization	1	2	3	4	5
Market activities of competitors	1	2	3	4	5
Production technologies	1	2	3	4	5
Government regulation and policies	1	2	3	4	5
Economic environment	1	2	3	4	5
Industrial (workplace) relations	1	2	3	4	5

5. Matters pertaining to control in the enterprise.

Please answer the following questions by circling what you consider the right number for events and measures in your company *in the past year*. Please note that there are no correct answers; the questions are intended to survey the general control structure which is really in place in the company.

- Alternatives:
- 1- totally disagree
 - 2- almost totally disagree
 - 3- slightly inclined to agree
 - 4- agree to an extent
 - 5- almost agree
 - 6- almost totally agree
 - 7- totally agree

	Totally disagree						Totally agree
The governing body/board genuinely called management's decisions into question and evinced reliable alternatives. (<i>COEN1</i>)	1	2	3	4	5	6	7
Managers and management have not been overworked. (<i>COEN2</i>)	1	2	3	4	5	6	7
There has been a great deal of variation in control and management tasks. (<i>COEN3</i>) ¹⁴	1	2	3	4	5	6	7
The personnel has understood the content and responsibilities of their tasks. (<i>COEN4</i>)	1	2	3	4	5	6	7
The conduct of the personnel has demonstrated commitment to honesty and the ethical values of the company. (<i>COEN5</i>)	1	2	3	4	5	6	7
The goals for the company's operations had credible and in my opinion reasonable measures. (<i>RISK1</i>)	1	2	3	4	5	6	7
Management actively evaluated both internal and external risks preventing the achievement of goals. (<i>RISK2</i>)	1	2	3	4	5	6	7
A risk analysis covering the entire company was carried out during the last year. (<i>RISK3</i>)	1	2	3	4	5	6	7
Those in managerial functions were aware of the risks of their areas of responsibility and knew how risk management was implemented. (<i>RISK4</i>)	1	2	3	4	5	6	7
In my opinion the company's risk analysis and means of protection could have been more efficient. (<i>RISK5</i>)	1	2	3	4	5	6	7
There were functioning controls in the company's processes which gave warning whenever something exceptional occurred. (<i>COAC1</i>)	1	2	3	4	5	6	7
As soon as something exceptional and undesired was noticed it was promptly and appropriately dealt with. (<i>COAC2</i>)	1	2	3	4	5	6	7
In the definition of tasks special attention was paid to authorisation and the special demands of tasks. (<i>COAC3</i>)	1	2	3	4	5	6	7
In my opinion the internal control measures should have been stepped up still further. (<i>COAC4</i>)	1	2	3	4	5	6	7
The entire personnel had updated job descriptions. (<i>COAC5</i>)	1	2	3	4	5	6	7
The personnel had no problems in obtaining information pertaining to their own work tasks. (<i>INFO1</i>)	1	2	3	4	5	6	7
The reports forwarded to management were sufficiently clear and contained information relevant from the management perspective. (<i>INFO2</i>)	1	2	3	4	5	6	7
Sufficient information moved between the different divisions of the company so that the smooth uninterrupted running of operation could be ensured							

¹⁴ Hinged questions: COEN3, RISK5, COAC4, INFO4, MONI5, EFFI1–LAW4

(e.g. from sales to manufacture). (<i>INFO3</i>)	1	2	3	4	5	6	7
Our company's information and communications system was not quite up to date with respect to functions. (<i>INFO4</i>)	1	2	3	4	5	6	7
The work was efficiently coordinated within the function and also with other functions. (<i>INFO5</i>)	1	2	3	4	5	6	7
The operative information used in management was specified to the systems information of financial management. (<i>MON11</i>)	1	2	3	4	5	6	7
Line managers take excellent care of day-to-day control. (<i>MON12</i>)	1	2	3	4	5	6	7
There is active control of how the personnel obey the operating instructions issued. (<i>MON13</i>)	1	2	3	4	5	6	7
We conducted analyses based (customer satisfaction, job satisfaction, efficiency) changes during the last year. (<i>MON14</i>)	1	2	3	4	5	6	7
Management has not in the last year requested accounts of the accomplishment of control measures. (<i>MON15</i>)	1	2	3	4	5	6	7
With a reasonable effort the efficiency of operations could have been further improved. (<i>EFF11</i>)	1	2	3	4	5	6	7
There are possibly in operations problems which, if removed, would have resulted in a better input - output ratio (<i>EFF12</i>)	1	2	3	4	5	6	7
There are no stages in the processes of whose efficiency I have any doubts. (<i>EFF13</i>)	1	2	3	4	5	6	7
In some functions resources might have been more efficiently deployed. (<i>EFF14</i>)	1	2	3	4	5	6	7
I did not completely trust the reports by financial management and sometimes had to check the information I received. (<i>RELI1</i>)	1	2	3	4	5	6	7
There were sometimes errors in the reports which had to be corrected later when the information had been confirmed. (<i>RELI2</i>)	1	2	3	4	5	6	7
We sometimes received information about error in reports sent out for external use. (<i>RELI3</i>)	1	2	3	4	5	6	7
There have been problems with the accounting programs used by financial management. (<i>RELI4</i>)	1	2	3	4	5	6	7
It was difficult in practice to apply the regulations governing our company. (<i>LAW1</i>)	1	2	3	4	5	6	7
Changes in the legislation frequently came as a surprise to the company. (<i>LAW2</i>)	1	2	3	4	5	6	7
I have observed that the personnel had problems with the laws and regulations in force. (<i>LAW3</i>)	1	2	3	4	5	6	7
There is no individual in our company whose area of responsibility it is to monitor forthcoming legislative changes and new regulations. (<i>LAW4</i>)	1	2	3	4	5	6	7

APPENDIX 4. Summary of the respondents.

Organizations SIC -code	Frequency	Percent
Agriculture, Forestry and Fishing	3	0.4
Mining	3	0.4
Construction	45	6.1
Manufacturing	326	44
Transportation, Communications, Electric	95	12.8
Wholesale and Retail Trade	231	31.2
Services	9	1.2
Other	29	3.9
Respondent's Title	Frequency	Percent
CEO	684	92.3
CFO	22	3
Business Development Manager	9	1.2
Other (Factory Manager etc.)	26	3.5
Respondents Age	Frequency	Percent
under 30 years	5	0.7
30-39 years	72	9.7
40-49 years	274	37
50-59 years	340	45.9
over 59 years	50	6.7
Respondent's experience in occupation	Frequency	Percent
1 year or less	81	10.9
2-3 years	168	22.7
4-5 years	123	16.6
6-7 years	61	8.2
8-9 years	45	6.1
over 10 years	263	35.5

APPENDIX 5. Constructs and descriptive statistics for CEN, DIF, FOR and PEU.**Table 1.** Construct and descriptive statistics for centralization (CEN).

CENA							
Variable	N	Mean	SD	Theoretical range	Actual range	Corrected item-total correlation	Alpha if deleted
CEN1	741	1.672	0.851	1 - 5	1 - 5	0.5598392	0.735
CEN2	738	2.322	0.836	1 - 5	1 - 5	0.5306418	0.745
CEN3	739	1.886	0.911	1 - 5	1 - 5	0.6299139	0.710
CEN4	738	2.287	0.919	1 - 5	1 - 5	0.4166528	0.783
CEN8	738	1.890	0.911	1 - 5	1 - 5	0.6345692	0.708

Factor analysis construct

No. of items	Alpha	Variance explained
5	0.778	54 %

CENB

Variable	N	Mean	SD	Theoretical range	Actual range	Corrected item-total correlation	Alpha if deleted
CEN5	739	3.180	0.901	1 - 5	1 - 5	0.527	0.815
CEN6	719	2.922	0.903	1 - 5	1 - 5	0.585	0.804
CEN7	715	3.001	0.885	1 - 5	1 - 5	0.593	0.802
CEN9	736	3.117	0.984	1 - 5	1 - 5	0.597	0.802
CEN10	734	3.747	1.037	1 - 5	1 - 5	0.659	0.788
CEN11	734	3.574	0.762	1 - 5	1 - 5	0.651	0.794

Factor analysis construct

No. of items	Alpha	Variance explained
6	0.828	54 %

Table 2. Descriptive statistics for differentiation (DIF).

Variable description	Range	Mean	SD
Differentiation (actual)	1 - 15	3.583	2.115
Differentiation (converted)	1 - 5	2.000	0.795

Table 3. Construct and descriptive statistics for formalization (FOR).

Variable	N	Mean	SD	Theoretical range	Actual range	Corrected item-total correlation	Alpha if deleted
FOR1	741	3.416	1.211	1 - 5	1 - 5	0.683	0.751
FOR2	741	3.816	1.339	1 - 5	1 - 5	0.679	0.750
FOR3	741	3.268	1.257	1 - 5	1 - 5	0.643	0.762
FOR4	741	2.949	1.213	1 - 5	1 - 5	0.400	0.832
FOR5	740	3.729	1.181	1 - 5	1 - 5	0.610	0.773

Factor analysis construct

No. of items	Alpha	Variance explained
5	0.812	58 %

Table 4. Descriptive statistics for perceived environmental uncertainty (PEU).

Variable	N	Mean	SD	Theoretical range	Actual range	Corrected item-total correlation	Alpha if deleted
PEU1	741	3.252	0.737	1 - 5	1 - 5	0.500	0.745
PEU2	741	3.838	0.688	1 - 5	1 - 5	0.503	0.746
PEU3	741	3.660	0.853	1 - 5	1 - 5	0.510	0.743
PEU4	741	3.293	0.833	1 - 5	1 - 5	0.405	0.761
PEU5	740	3.777	0.813	1 - 5	1 - 5	0.436	0.755
PEU6	740	3.635	0.923	1 - 5	1 - 5	0.442	0.756
PEU7	741	3.414	0.825	1 - 5	1 - 5	0.505	0.744
PEU8	738	3.362	0.764	1 - 5	1 - 5	0.514	0.743

Factor analysis construct

No. of items	Alpha	Variance explained
8	0.77	39 %

APPENDIX 6. Constructs and descriptive statistics for CONTROL, COEN, RISK, COAC, INFO and MONI.

Table 1. Construct and descriptive statistics for internal control structure (CONTROL).

Variable	N	Mean	SD	Theoretical range	Actual range	Corrected item-total correlation	Alpha if deleted
COEN1	737	2.729	1.778	1 - 7	1 - 7	-0.140 ¹	0.854
COEN2	734	4.014	1.697	1 - 7	1 - 7	0.082 ¹	0.844
COEN3	728	5.162	1.692	1 - 7	1 - 7	0.033 ¹	0.845
COEN4	729	5.350	1.059	1 - 7	1 - 7	0.518	0.827
COEN5	738	5.304	1.100	1 - 7	1 - 7	0.466	0.828
RISK1	735	5.693	1.444	1 - 7	1 - 7	0.347 ²	0.832
RISK2	732	5.557	1.262	1 - 7	1 - 7	0.427	0.829
RISK3	738	3.973	2.180	1 - 7	1 - 7	0.310	0.836
RISK4	738	4.615	1.408	1 - 7	1 - 7	0.519	0.825
RISK5	737	4.752	1.314	1 - 7	1 - 7	0.575	0.824
COAC1	739	4.483	1.451	1 - 7	1 - 7	0.522	0.825
COAC2	738	5.294	1.187	1 - 7	1 - 7	0.586	0.824
COAC3	735	4.378	1.453	1 - 7	1 - 7	0.361	0.831
COAC4	734	3.971	1.664	1 - 7	1 - 7	0.340 ¹	0.832
COAC5	736	5.016	1.437	1 - 7	1 - 7	0.440	0.828
INFO1	738	5.238	1.232	1 - 7	1 - 7	0.455	0.828
INFO2	737	5.332	1.333	1 - 7	1 - 7	0.566	0.824
INFO3	738	4.728	1.244	1 - 7	1 - 7	0.480	0.827
INFO4	741	4.499	1.525	1 - 7	1 - 7	0.374	0.831
INFO5	736	4.701	1.151	1 - 7	1 - 7	0.567	0.825
MONI1	735	5.245	1.310	1 - 7	1 - 7	0.553	0.824
MONI2	740	4.820	1.108	1 - 7	1 - 7	0.615	0.824
MONI3	736	4.486	1.209	1 - 7	1 - 7	0.524	0.826
MONI4	739	5.471	1.265	1 - 7	1 - 7	0.384 ²	0.830
MONI5	734	4.823	1.628	1 - 7	1 - 7	0.265 ¹	0.835

¹Item deleted due to low corrected item-total correlation

²Item deleted due to low loadings in factor analysis

Factor analysis construct

No. of items	Alpha	Variance explained
18	0.862	55 %

Table 2. Construct and descriptive statistics for control environment component (COEN).

Variable	N	Mean	SD	Theoretical range	Actual range	Corrected item-total correlation	Alpha if deleted
COEN4	729	5.350	1.059	1 - 7	1 - 7	0.545	Not available
COEN5	738	5.304	1.100	1 - 7	1 - 7	0.545	Not available

Factor analysis construct

No. of items	Alpha	Variance explained
2	0.705	77 %

Table 3. Construct and descriptive statistics for risk component (RISK).

Variable	N	Mean	SD	Theoretical range	Actual range	Corrected item-total correlation	Alpha if deleted
RISK2	732	5.557	1.262	1 - 7	1 - 7	0.402	0.712
RISK3	738	3.973	2.180	1 - 7	1 - 7	0.530	0.689
RISK4	738	4.615	1.408	1 - 7	1 - 7	0.581	0.618
RISK5	737	4.752	1.314	1 - 7	1 - 7	0.621	0.606

Factor analysis construct

No. of items	Alpha	Variance explained
4	0.718	57 %

Table 4. Construct and descriptive statistics for control component (COAC).

Variable	N	Mean	SD	Theoretical range	Actual range	Corrected item-total correlation	Alpha if deleted
COAC1	739	4.483	1.451	1 - 7	1 - 7	0.500	0.530
COAC2	738	5.294	1.187	1 - 7	1 - 7	0.497	0.548
COAC3	735	4.378	1.453	1 - 7	1 - 7	0.374	0.623
COAC5	734	3.971	1.664	1 - 7	1 - 7	0.372	0.624

Factor analysis construct

No. of items	Alpha	Variance explained
4	0.65	50 %

Table 5. Construct and descriptive statistics for information and communication component (INFO).

Variable	N	Mean	SD	Theoretical range	Actual range	Corrected item-total correlation	Alpha if deleted
INFO1	738	5.238	1.232	1 - 7	1 - 7	0.458	0.678
INFO2	737	5.332	1.333	1 - 7	1 - 7	0.503	0.660
INFO3	738	4.728	1.244	1 - 7	1 - 7	0.511	0.658
INFO4	741	4.499	1.525	1 - 7	1 - 7	0.410	0.707
INFO5	736	4.701	1.151	1 - 7	1 - 7	0.529	0.654

Factor analysis construct

No. of items	Alpha	Variance explained
5	0.718	48 %

Table 6. Construct and descriptive statistics for monitoring component (MONI).

Variable	N	Mean	SD	Theoretical range	Actual range	Corrected item-total correlation	Alpha if deleted
MONI1	735	5.245	1.310	1 - 7	1 - 7	0.435	0.686
MONI2	740	4.820	1.108	1 - 7	1 - 7	0.572	0.512
MONI3	736	4.486	1.209	1 - 7	1 - 7	0.506	0.584

Factor analysis construct

No. of items	Alpha	Variance explained
3	0.686	62 %

APPENDIX 7. Constructs and descriptive statistics for EFFE, EFFI, RELI and LAW.

Table 1. Construct and descriptive statistics for internal control effectiveness (EFFE).

Variable	N	Mean	SD	Theoretical range	Actual range	Corrected item-total correlation	Alpha if deleted
EFFI1	739	3.353	1.765	1 - 7	1 - 7	0.322	0.793
EFFI2	730	4.263	1.726	1 - 7	1 - 7	0.466	0.778
EFFI3	738	5.835	1.669	1 - 7	1 - 7	0.377	0.786
EFFI4	733	4.930	1.528	1 - 7	1 - 7	0.491	0.776
RELI1	740	5.230	1.823	1 - 7	1 - 7	0.588	0.764
RELI2	739	4.782	1.878	1 - 7	1 - 7	0.552	0.768
RELI3	740	6.095	1.390	1 - 7	1 - 7	0.494	0.777
RELI4	735	5.331	1.739	1 - 7	1 - 7	0.515	0.773
LAW1	737	5.668	1.345	1 - 7	1 - 7	0.451	0.780
LAW2	731	5.922	1.287	1 - 7	1 - 7	0.327	0.790
LAW3	733	5.618	1.378	1 - 7	1 - 7	0.405	0.784
LAW4	735	4.800	2.066	1 - 7	1 - 7	0.322 ²	0.796

²Item deleted due to low loadings in factor analysis

Factor analysis construct

No. of items	Alpha	Variance explained
11	0.794	61 %

Table 2. Construct and descriptive statistics for efficiency and effectiveness component (EFFI).

Variable	N	Mean	SD	Theoretical range	Actual range	Corrected item-total correlation	Alpha if deleted
EFFI1	739	3.354	1.779	1 - 7	1 - 7	0.433	0.686
EFFI2	730	4.276	1.727	1 - 7	1 - 7	0.577	0.593
EFFI3	738	5.829	1.684	1 - 7	1 - 7	0.413	0.695
EFFI4	733	4.923	1.534	1 - 7	1 - 7	0.574	0.603

Factor analysis construct

No. of items	Alpha	Variance explained
4	0.709	54 %

Table 3. Construct and descriptive statistics for reliability of information component (RELI).

Variable	N	Mean	SD	Theoretical range	Actual range	Corrected item-total correlation	Alpha if deleted
RELI1	739	3.354	1.779	1 - 7	1 - 7	0.725	0.722
RELI2	730	4.276	1.727	1 - 7	1 - 7	0.703	0.734
RELI3	738	5.829	1.684	1 - 7	1 - 7	0.541	0.811
RELI4	733	4.923	1.534	1 - 7	1 - 7	0.593	0.788

Factor analysis construct

No. of items	Alpha	Variance explained
4	0.815	65 %

Table 4. Construct and descriptive statistics for law and regulations component (LAW).

Variable	N	Mean	SD	Theoretical range	Actual range	Corrected item-total correlation	Alpha if deleted
LAW1	739	3.354	1.779	1 - 7	1 - 7	0.520	0.667
LAW2	730	4.276	1.727	1 - 7	1 - 7	0.562	0.618
LAW3	738	5.829	1.684	1 - 7	1 - 7	0.555	0.625

Factor analysis construct

No. of items	Alpha	Variance explained
3	0.724	65 %

APPENDIX 8. Correlation matrix of the observed variables, the variances of the variables are given on the diagonal (N = 741).

	stra	emp	dif	cena	cenb	for	peu	coen	risk	coac	info
stra	0.432										
emp	0.119	1.870									
dif	0.087	0.419	0.632								
cena	-0.054	-0.536	-0.273	0.412							
cenb	0.006	-0.250	-0.224	0.433	0.432						
for	0.080	0.158	0.114	-0.114	0.006	0.871					
peu	0.010	0.126	0.043	-0.148	-0.014	0.195	0.250				
coen	0.025	0.012	-0.068	0.027	-0.009	0.125	0.210	0.890			
risk	0.153	0.137	0.124	-0.095	-0.028	0.206	0.296	0.286	1.333		
coac	0.098	0.079	0.040	-0.039	-0.069	0.356	0.227	0.418	0.505	0.932	
info	0.082	0.067	-0.007	-0.005	0.015	0.101	0.250	0.497	0.374	0.519	0.791
moni	0.062	0.083	0.011	-0.050	0.031	0.191	0.216	0.438	0.431	0.599	0.624
effi	0.030	0.108	0.012	-0.016	-0.022	0.057	0.184	0.384	0.269	0.361	0.466
reli	0.009	0.044	0.041	-0.017	-0.017	0.064	0.090	0.262	0.206	0.278	0.402
law	0.038	0.024	-0.030	0.043	0.028	0.084	0.203	0.244	0.115	0.160	0.263

	moni	effi	reli	law
moni	0.890			
effi	0.428	1.480		
reli	0.337	0.349	1.886	
law	0.210	0.231	0.387	1.136