ERASMUS UNIVERSITEIT ROTTERDAM

Accounting, Auditing and Control

Thesis

Does an association exist between the personal determinants of the CEO and CFO and corporate internal control quality?

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Abstract

This thesis examines the association between the determinants age, gender, ethnicity and internal control quality. Independently of each other a hypothesis is developed concerning each of the 3 determinants that will be tested using logistic regression. The study uses a sample of 5104 companies that during the period 2007 till 2015 reported 0 or more material weaknesses. The research shows a significant correlation between age and the internal control quality. This association was expected and is consistent with academic articles related to age. A significant association between gender and the internal control quality and between ethnicity and the internal control quality could not be demonstrated. This is consistent with related academic articles reporting the complexity of showing associations between gender and ethnicity and internal control. This study contributes to the limited existing literature regarding the influence of determinants on the internal control quality.

Keywords: CEO; CFO; age; gender; ethnicity; internal control quality.

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1 Introduction

1.1 Introduction

Recently several accounting scandals have occurred, which were partly caused by a failing system of internal control. Well known notorious examples of extensive fraud are Enron, Ahold, Parmalat, and Worldcom. Where internal control weaknesses exist, an important question that arise is whether these weaknesses can be traced to personal determinants of those within the company who are involved and who are linked with these internal control problems, more specific, audit department employees, members of the audit committee and members of the senior management.

Related to these internal control weaknesses an often heard statement is that especially white men of an average age are dominant in these cases. Are failures in the corporate internal control due to a population of a specific group of people? Does coherence exists between the internal control problems and a population of white men of an average age? Or, on the contrary, is the age of those who are involved with internal auditing positively associated with the quality of the internal audit as part of financial reporting? Or does female presence and ethnic diversity in management boards and in the audit committees contributes to the internal control quality?

Relevance of the problem

Research concerning the association between the internal control quality and the personal competencies of the personnel within the company who are responsible for the internal audit concentrates mainly on technical internal auditing issues such as audit committee size, independence issues, audit committee members expertise and firm size. Research on the association of the internal control quality and the personal determinants as age, gender and ethnic minority background is scarce.

To what extent do these determinants influence the weaknesses in the internal control area? This thesis aims to contribute to the limited prior research and literature regarding the association between the internal control quality, the internal audit skills and ethical behavior by emphases on the human determinants rather than on the technical determinants.

Similar research regarding this association concerns the audit committee characteristics in relation to the firm performance, the use of earnings management, the audit committee quality and pricing, (Krishnan 2005; Klein 2002; Aldamen et al. 2012; Peters et al. 2015). Limited research exists regarding age, gender and ethnic diversity of the responsible auditing members and most of this concentrates on the issue of women in corporate boards, (Adams 2009; Carter et al. 2007; Carter et al. 2010; Bernardi, 2001; Peterson et al. 2006). In spite of all the relevant studies, no studies are traceable regarding the association between specific human determinants of those who are responsible for internal control and the internal control quality.

1.2 Objectives

The objective of this thesis is to investigate the association between the quality of the corporate internal control and the determinants of those who are responsible for the corporate internal control. Because no data is available of employees who executes the operational internal controls, the focus of this thesis is on the members from whom enough data is available to execute this thesis, the members of the board of the companies, more specifically the Chief Executive Officers (CEO's) and the Chief Financial Officers (CFO's). The main determinants under consideration are age, gender and ethnicity.

Much research has been performed concerning the association between the audit quality and the performance of the audit committees, the executives, the CFO's and the CEO's, and the external auditors. While these studies mainly focus on external auditors and technical issues such as the audit committee size and the audit committee independence, in contrast less research is available of more specific personal characteristics such as age, gender and ethnic diversity in relation to the internal control quality and more specific the internal audit quality. This thesis concentrates primarily on the personal characteristics of the members of the board of directors. To what extent affect age, gender and ethnic diversity background the internal control quality of companies?

As responsible for the internal control are considered the members of the management board. Each year they will be accountable for the operation, monitoring and maintenance of a sound system of internal control and have to sign for executing these controls in the annual financial report. Concerning the Sarbanes Oxley Act (SOX) of 2002 and the Securities and Exchange Commission (SEC), CEO's and CFO's are as part of the board required to certify annually

and quarterly about the effectiveness of the corporate internal control. Because of this as proxy for the board of directors are considered the CEO and the CFO.

Concerning the subject 'age' this thesis investigate the effect on internal control quality executed by those who are accountable for the internal audit quality. A positive association is expected between the increase of the age and the increase of the internal control quality.

Concerning the subject 'gender', an association exist between female board presence and company firm performance. Particular these associations indicate that, because women generally exhibit more risk aversion behavior as men do, they perform well in monitoring functions as audit committees. This in addition should affect the internal control quality. A positive association is expected between the presence of woman in boards and the increase of the internal control quality.

Regarding ethnic diversity within boards, this thesis investigates the association between the internal control quality and ethnicity. Does a different ethnic and cultural background influence the internal audit quality in companies because of differences in perceptions of what can be qualified as ethical? Do people from different ethnic- and cultural backgrounds have different perceptions and standards towards achieving the company results? Are cultural and ethnic differences of employees affecting the company rules by following them literally or by interpreting the underlying intent? Is the personal belief of how an individual relate to a group, family or society from importance in creating internal control quality? Does this believe influences the behavior and the values? And has the ranking of a culture as more or less masculine its impact on company results? A positive association is expected between the presence of a CEO/CFO with no Caucasian ethnic background and the internal control quality.

1.3 Research question

The research question of the thesis is:

"Does an association exist between the personal determinants of the CEO and CFO and corporate internal control quality?"

Age, gender, and ethnic minority of the CEO and of the CFO are considered as main independent variables. As dependent variable and proxy for the internal control quality are considered published material weaknesses concerning the internal control.

Sub questions to help answering the research question are:
- What is internal control quality?
- Who are responsible for the internal control quality?
- How to measure the internal control quality?
- Are published material weaknesses appropriate proxies to measure the internal control quality?
- Are age, gender and ethnic minority determinants that can influence the internal control quality?
- Which control variables affect the internal control quality?

1.4 Methodology

Data:

To perform an up-to-date analysis, the thesis chooses to use the most recent data which is the 8-year period, from 01/01/2007 till 31/12/2014.

The test sample consists of companies that reported internal control problems. Companies which report material weaknesses in the internal control are selected by using the Wharton Research Data Services database (WRDS). Conform SOX, the company's management have to assess annually the entity's internal control and report internal control problems. In addition companies that are switching from external auditors are required to publish all the internal control problems which occurred during the auditor period through an 8-K form. This information is traceable through the WRDS database. Data regarding determinants of senior management members and audit committee members is available in WRDS, on company websites, Linkedin and annual reports.

With as input all found relevant variables, SPSS is used for testing an association between the determinants and the internal control quality.

1.5 Limitations

Out of the scope of the thesis is the quality of the staffing of the internal control departments. None or few data is available on personal determinants of operational staff of internal control departments. Because the quality of the internal auditors performing the internal control strongly affects the internal audit quality, this is a shortcoming.

Despite of the fact that companies are obliged to publish their internal control problems not all companies intentially do so. This is because publications of weaknesses could create negative firm value. Because discovery of not publicizing these internal control problems can have a much greater negative impact on the firm value, this is a relatively uncommon problem.

In addition a problem are the external auditors who discover but do not report the existing internal control problems. This in addition is a relatively uncommon problem because observation backwards cause reputational damage to both the external auditor and the company. Because of this, both parties will act to prevent this.

What is considered as a material weakness? Does a standard exist? By some, only fraud case are regarded as weakness. For others much lighter offenses are regarded as weaknesses.

1.6 Structure

The thesis is structured as follows:
In chapter 2 research related theories, internal control itself and responsibilities and measurement issues regarding the internal control quality will be explained.
In chapter 3 prior research is executed by a literature review concerning 3 the independent main variables age, gender and ethnicity all associated directly or indirectly with internal control quality.
In chapter 4 the realization of the 3 hypotheses will be presented
In chapter 5 the research design is elaborated. Research method, research models, variables, the validity framework and the data collection are discussed.
In chapter 6 the results of the research method will be presented. Before important conditions and checks are described which had to be performed before executing a regression analysis. After presenting the regression results these will be interpreted and discussed. The chapter ends with a sensivity test.

In chapter 7 the conclusion of the thesis, the limitations and some suggestions for further research in the field of determinants and internal control quality are presented.

2 Theoretical foundation

2.1 Introduction

Paragraph 2.2 elaborates on the thesis related theories which need to justify expected associations. Where people work together, their interests can be contrary to the interests of the organization. In this paragraph some governance-related theories are explained that are directly related to the internal control and the personal interests of employees in an organization. In addition to the elaborated governance related theories, hereafter also theories related to ethnicity are presented. Some studies indicate that diversity in teams creates better performance while other studies are less convinced of this assumption. For example the effect on the communication within diverse composite teams (O'Reilly et al. 1993; Smith et al. 1994; Zenger & Lawrence 1989). Other studies however report that heterogeneous composite groups perform better than homogeneous compound groups (Cox et al. 1991; Watson et al. 1993). An unambiguous conclusion about the effect of diversity on the outcomes of companies is not easy to communicate. Next to internal control and determinant related theories in paragraph 2.3 the concept of the term internal control will be explained. Internal control as being a separate department within the company which delivers a significant contribution to monitoring reporting quality. Paragraph 2.4 describes the people who are responsible in the company for a sound system of internal control. In paragraph 2.5 is described the way how to measure the quality of internal control. Chapter 2 ends with a summary

2.2 Internal control related theories

Policeman Theory

One of the oldest and most basic theories in auditing developed in the early 20th century is the Policeman Theory. This theory suggests that the main function of the auditor is to ensure the arithmetical accuracy in accounting and to detect fraud within organizations. Because nowadays the mission of the auditor is changed and shifted from detecting fraud towards provide reasonable assurance that the processes and the systems comply and the published financial statements are correct, this theory is obsolete.

Agency Theory

Concerning auditing and internal control, the Agency Theory is the most relevant theory. This theory points the difference in the interests of the agent and of the principal or, in another way, between the employee and the owner. In organizations in which the operational management is handed over by the owner to a manager, the manager is in a position that he in comparison with the owner has a knowledge advantage regarding the operational activities. This executive manager has the ability to exploit this knowledge advantage for personal gain that could be in disadvantage to the owner. Both these interests are opposite (Jensen et al. 1976). The interest such as achieving personal gain by the executive manager, for example by under reporting or false reporting, is not in the interest of the owner and the company who both will be properly informed and want to realize maximum results (Anderson & Emander 2005). Owners being at risk if managers pursue their personal interests. Because of this owners do not achieve the maximum result (Donaldson & Davis 1991). Because the agent is not acting in the interest of the principle, an agent risk or an agency problem concerning the principle arise. Because he is not fully able to control the manager or the agent, the owner has a knowledge gap.

The Agency Theory in addition can explain the extent of auditing activities executed by the internal control department and by the external auditor. Differences in branches may impose specific requirements on the control activities performed. This because research has shown that within complex composed organizations with multiple owners it is more difficult to exercise audit and control over management activities compared to single composed organizations whose only owners are stockholders. In particular, the degree of cohesion and heterogeneity in ownership is of influence (Mayers & Smith 1986). These control problems can be partly addressed by leave acting the internal control department as independent of the management with direct reporting lines to the board of directors and especially the audit committee as independent part of the organization. In addition, the information asymmetry can be encountered by affect the salary of the manager by auditing costs. In this way the manager is encouraged to show as much as possible transparency in his work to keep the ‘bonding cost' which affect his salary as low as possible (Scapens, 1985; Walance, 1980; Sherer & Kent 1983).

Concerning the agency theory linked to diversity aspects in a company, in the cognitive psychology an assumption exist that diversity aspects may play a role in leadership styles.

Particular women, and ethnic minorities can have a different scoop and a fresh perspective on organizational issues in comparison white middle aged men (Dewatripont et al. 1999; Westphal & Milton 2000). A CEO with a democratic leadership style will emphasize more on creativity and on entrepreneurship opposite to an autocratic leader who is more inclined to emphasize on technical and hard financial issues. The choice of who to appoint for the CEO or CFO position in such cases depends on the circumstances of the company at the moment. It is conceivable that in the event of a financial crisis, because of economic considerations, one rather opts for a leader with an autocratic leadership style over a more democratic leader which diversity aspects are less relevant at that specific moment (Rotem et al. 1993).

Stewardship Theory

Unlike the Agency Theory, that considered the discrepancies in personal interests as negative for an organization, the Stewardship Theory has a positive view on the managers' personal contributions and commitment on behalf of an organization. Managers are expected to realize a positive contribution regarding the firm that can be encouraged by rewarding them financially or by providing them equity. However, not only financial gain is a motivator for them. The theory in addition assumes that managers want to create satisfaction in their activities by trying to optimize their involvement and to be loyal to their employer. They set themselves goals, engage responsibilities and by acting in a way that contribute to good stewardship of corporate assets become visible in the organization (Mc Clelland 1961; Herzberg et al. 1959; Donaldson 1990; Barney 1990). In addition, this theory suggests such benefits are only feasible in organizations with clearly defined hierarchical relationships, responsibilities and powers, and in which the CEO has a strong position.

Regarding the before signaled theory that managers want to realize satisfaction in their work, a connection exist with diversity aspects whereby in particular women score positive on the before signaled motivations. Research has shown that for the quality of making the right choices in a rapidly changing business environment, the related skills such as knowledge, creativity, and judgment to a greater extent are more reflected in heterogeneous groups than in homogeneous groups. This connection between the stakeholder theory and in particular the gender diversity aspects has been noticed by several companies and is regarded as a reason for a positive discrimination policy regarding the recruitment of women in board positions. Pressure on companies to commit themselves to diversity management comes from a wide

range of stakeholders such as investors, shareholders, consumer groups and politicians (Dallas 2002; Fields & Keys 2003).

Theory of Inspired Confidence

This theory suggests that the demand for audit services is the result of the financial contribution of third party organizations which in turn for their investments reclaim accountability of the management. This accountability is provided through the provision of the periodic financial reports. The reliability of these reports will be reviewed by auditors. The auditor earns his existence to the demand from society for the independent assessment of these financial reports. This theory in addition is based on the fact that auditors should strive to meet the public expectations. Society has expectations concerning the effectiveness of the audit and of the auditors' opinion. Auditors need to be independent and are expected to act as trustees of the society. If this confidence is ashamed, the belief in the auditing sector is affected which kills the base and the usefulness of financial auditing (Limperg 1932). Separate from the fact that society trusts the auditor, the auditor needs to be able to recognize and to assess what society demands of him. Rules concerning this purpose hardly exist. This implies that auditors should arouse no greater expectations as they think they can live up to and oversees the consequences of their actions (Carmichael 2004).

Theory of Heterogeneity

This theory states that within heterogeneous groups regarding age, gender, ethnicity etc. another dynamic is active than in homogeneous composed groups. This dynamic affects organizational processes such as among other communication, collaboration and performance. Within culturally homogeneous groups, people communicate more easily and intensely than outside this group. The lack of cultural barriers within homogeneous groups, recognizing and sharing each other's views and perceptions and speaking the same language, stimulates having mutual contact (Earley & Mosakowski 2000). Belonging to a homogenous group provides a sense of comfort so consequently less conflicts will occur. As diversity increases, the process of social comparison and categorization increase which will enhance the development of in-groups and out-groups. Signaled developments have a negative impact on the performance of the organization. These negative developments within a heterogeneous group will reach an optimum for a specific group size. As heterogeneity increase, the negative developments decrease due to an increased population which will spread across multiple groups which result in a decrease of in-group/out-group (Alexander et al. 1995). Summarized, in groups with high

numbers of diversity categories, communication and mutual contact will be stimulated which will boost the pressure on in-group members to maintain social contacts with out-group members (Blau 1977; Tajfel & Turner 1985; Tsui et al. 1992; Smith et al. 1994; Alexander et al. 1995; Murnighan & Lau 1998; Earley & Mosakowski 2000).

The Upper Echelon Theory

This theory claims that the performance of an organization depends on demographic characteristics such as age, gender and ethnicity of the members of the management team. For this reason strategic choices are the result of these demographic characteristics of top managers instead of profit maximization calculations. The theory is particularly focused on the higher positions in the organization and appoints a wide range of visible characteristics that influence the behavior of managers. The theory establishes a link between these characteristics, strategic choices and company performances. Other to this theory linked relations are the connection between the diversity in the top management and the internationalization of the company, the age, the tenure and the organizational innovation, the gender diversity and the growth orientation. In addition linked to this theory is the link between the members' diversity and the diversity related activities within the company such as initiatives to combat discrimination and efforts to give minority groups within the organization a stage. Such initiatives find their breeding ground in organizations where diversity is reflected in the composition of the senior management which offer space for diversity in the workplace (Hambrick & Mason 1984; Finkelstein & Mambrick 1996). Research does not presents an unambiguously picture regarding the association between demographic diversity aspects and company performances. Some studies indicate that additional costs exist associated with the coordination of heterogeneous management teams. These costs are pressing down the company performances, (Murray 1989; Ancona & Caldwell 1992). Other studies show that diversity in the MT has a positive impact on company performance because these teams deliver broader insights and knowledge and possess bigger problem solving capacity (Bantel & Jackson 1989; Smith et al. 1994; Hambrick et al. 1996).

2.3 Internal control

"Internal control is a process, effected by an entity's board of directors, management and other personnel, designed to provide reasonable assurance regarding the achievement of objectives in the following categories: effectiveness and efficiency of operations, reliability of

financial reporting, compliance with applicable laws and regulations, and safeguarding of assets against unauthorized acquisition, use or disposition." (Hayes et al. 1999).

In managing an organization, the internal control is essential. The ultimate aim of an efficient internal control is to assess and to control the risks of material misstatements in the annual financial statements. Both internal and external stakeholders of listed companies require of the entity's management at year end to provide a public statement about the effectiveness of the entity's internal control. Although management needs to evaluate annually the effectiveness of the company's internal control over the financial reporting, it need to remember that no matter how effective internal control in the organization is, management can only offer *reasonable assurance* that the entity's objectives will be achieved. A guarantee that the company is 100% in control cannot be given. Limitations of assurance are partly due to poor working internal control systems and due to procedures, fraud, and human judgment constraint such as inadequate oversight by directors over management, breakdown risks, and collusion and override procedures by the management.

COSO

To create as much as possible grip on the internal control of companies, the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in 1992 published a report titled "Internal Control-Integrated Framework" with recommendations and guidelines in which way to manage the internal control within companies. This report was created after since 1977 in the USA a debate arose initiated by the accounting profession about independent auditor reports on management's assertions regarding the effectiveness of the internal control over financial reporting. By that time Moxey (1979) observed a trend that the responsibility of the internal control was shifted from the management to an independent function within the organizations that reports directly to the board of directors or the audit committee. In the 1992 COSO report, a control framework was presented in which way to assess and in which way to evaluate the entity's internal control systems. In addition, relevant terms regarding the internal control were defined. This report is considered as a milestone in the evolution of the internal control. From that moment on internal and external stakeholders raised awareness of the importance of the public reporting of the entity's internal control. The COSO report in addition had an enormous impact on the independent auditor's considerations regarding the auditing and the internal control structures. In 2002, in accordance with the Sarbanes Oxley (SOX) legislation, requirements with respect to the internal control over

financial reporting received a formal character. The framework in the proposed report helps the internal- and the external auditor to evaluate the management assessment of the entity's internal control and consists of five internal control components which are: control environment, the entity's risk assessment process, information and communication systems and processes, control procedures, and monitoring or controls. The signaled 5 components are divided into 3 categories of controls that are: operating controls, financial information controls, and compliance controls. Finally, these three controls are processed at multiple layers in the company, such as an activity, a process, and a unit.

SOX

SOX legislation is essential as guidance in nowadays auditing and reporting over internal control issues. The SOX Act of 2002 became effective shortly before the big accounting scandals of Enron and WorldCom and confronted the US listed companies and audit firms with strict laws regarding reporting, control activities and related audit services and forced listed organizations to execute solid corporate governance. With regard to specific internal control issues, especially the SOX articles 302 and 404 are of interest. Article 302 focuses on disclosures with the specific requirement that the managing board of the company needs to report on the effectiveness of the controls related to the financial reporting. Article 404 focuses on the accountability of the Chief Executive Officer (CEO) and the Chief Financial Officer (CFO) regarding the internal control issues. Both need to declare in the annual financial report that the design and the operational effectiveness of the internal controls within the company are in control. In addition, article 404 requires an external auditor to verify and to endorse the accuracy of the statement published by the CEO and by the CFO. Regarding this, both the CEO and CFO are personally liable for the quality of the financial reporting (Wei Huang et al 2012).

If the focus is at the consequences for auditing aspects of the entity's internal control, SOX article 404 requires annually an "internal control report" which contains:

1. a statement that management is responsible for establishing and maintaining an adequate internal control structure and procedures concerning the financial reporting;
2. a description of the review by management at the end of the fiscal year of the effectiveness of the internal control structure and procedures concerning the financial reporting;

3. an attestation by an independent external auditor of the test performed by the management regarding the effectiveness of the internal control structure and the procedures concerning the financial reporting;
4. the attestation by an independent external auditor about the differences between the management's assertions and the required audit evidence on internal controls.

2.4 Responsibilities regarding the quality of the internal control

In addition to SOX articles 302 and 404, which focuses on the CEO- and CFO responsibilities for ensuring the integrity of the entity's internal control, SOX article 301 focuses on the independency of the members of the audit committee by pointing out that an audit committee member itself will not been paid by the organization for consulting and advisory activities. An audit committee member consequently is an unaffiliated person of the firm or its subsidiaries. SOX article 407 indicates that the firm periodically needs to disclose if a member of the audit committee is a financial expert. In addition to the CEO, the CFO and the audit committee members are responsible towards the internal control audit by the external auditor. The auditor is expected to have knowledge and insight on the performance of the company including the entity's internal control and the environment in which this is located.

Separate from inside directors as CEO and CFO, outside directors (members of the audit committee) are more objective and often possess greater expertise. Because of their greater expertise, outside directors are as members of the audit committee involved in the monitoring process. By acting as independent experts, outside directors are less concerned about their reputation in the labor market (Fama et al. 1983; Braiotta 1999). Furthermore the structure of the management board can affect monitoring the internal controls. In the case of CEO duality, the CEO act as CEO and in addition act as chairman of the board. This may create a conflict of interest in performing the assessment of the internal controls. This because the task of the chairman of the board is monitoring the CEO (Jensen 1993). In addition, also the existence of more specialized subcommittees with all its own expertise as audit committee, a compensation committee and a nominating committee can influence the effectiveness of monitoring (Vafeas, 1999). Finally, in addition the size of the management board can have an effect on monitoring the internal controls. Opinions regarding this subject are diverse. Smaller streamlined management boards require less communication which enables faster performing decisions and effectively acting. A larger management board pushes the costs upwards which lower the benefits of the increased occupancy (Jensen 1993; Yermack 1996). Contrary is the

belief that small management boards do not have the ability to monitor effectively the management due to the lack of occupation and the relevant financial expertise (First et al. 1994; Beasley & Salterio 2001). SOX itself does not require board size conditions.

2.5 Measurement of the internal control quality

Concerning measuring the internal control quality a need for quality indicators exists. Which key indicators are acceptable and applicable to measure the internal control quality? Because the quality of internal control is not directly visible, this is a difficult issue. Which output of internal control is suitable to serve as a standard for the valuation of internal control quality? Concerning this purpose a first step is the determination that primary a material misstatement needs be discovered and should be reported (DeAngelo, 1981). DeAngelo describes the concept of audit quality as follows:

"The quality of audit services is defined to be the market-assessed joint probability that a given auditor will both (a) discover a breach in the client's accounting system, and (b) report the breach." (DeAngelo, 1981).

In other words: auditing quality and more specific, internal audit quality is present when a material misstatement is found and when this material misstatement is reported. Derived from this statement is the assumption and theorem in this thesis that the determination of material misstatements, which affect the reporting quality, is considered as negative and indirectly damaging the quality of the internal control. Consequently, a material misstatement or a material weakness can be regarded as a pure and direct proxy concerning the internal control quality.

Next to material weaknesses, as other indicators concerning the quality of the internal control can be classified; accruals, lawsuits, restatements, audit costs and audit opinions. The main findings related to measurement indicators of the internal control quality will be summarized below.

Material weaknesses

J.T. Doyle et al. (2007) investigated the association between internal control and accrual quality whereby a material weakness was a proxy for accrual quality. This research confirms a link between material weaknesses and the not correct estimated or proposed accruals. Because

of these incorrect accruals, the determination of a final correct cash flow could not be achieved. Because material weaknesses need to be disclosed in accordance with SOX and consequently is measurable, a material weakness is an interesting and, -regarding this thesis-, a useful proxy concerning the quality of the internal audit and internal control.

Besides the two sections 302 and 404, as signaled before that require the company to report the material weaknesses, SOX in addition requires to report the internal control problems that have been discovered by a predecessor external auditor in case an auditor change exists. More specific, SOX requires companies to report the internal control issues if the company changes the external auditor. This due to auditor rotation and in addition due to the auditor-client disputes. SAS No. 60 (AICPA 1988b) requires the auditor when "reportable conditions" are discovered in the internal control of the company, to report this in writing or orally to the Audit Committee or to someone within the organization with the same authority. These communications are not public but when a company changed the auditor it have to disclose any 'reportable event' that occurred during the previous two years of the auditor change. Reportable conditions are specific internal control issues and are part of reportable events.

With regard to material weaknesses a distinction exists between;

1. accounting specific weaknesses, which are often the results of improper accrual estimate issues owing to not qualified personnel, and
2. company level weaknesses which are intentially biased accruals through the use of earnings management that result from not properly organized internal control processes.

Rating agencies such as Fitch and Moody's classifies material weaknesses as type A and as type B categories in which A implies the account/transaction category of material weaknesses and B implies systematic internal control process related weaknesses. Transaction-related weaknesses are by auditors, investors and other financial stakeholders assessed as less serious than systematic related weaknesses. Accounting-related weaknesses can easily been identified during an audit by substantive testing of controls and can subsequently be eliminated. Because of this they are less associated with lower accrual quality as opposed to systematic weaknesses in internal control which can seriously affect and lower the accrual quality (Hogan & Wilkins 2006).

Because never can be guaranteed that all misstatements are detected regarding material weaknesses, always should be remembered that the quality of an audit and the quality of the internal control is difficult to assess because some misstatements remain undetected.

Accruals

In several studies accrual quality is linked to audit quality and indirectly to the internal control quality. Jones (1991) and Kothari et al. (2005) established a link between accruals quality and the use of earnings management. Accruals with a large abnormal discretionary component are considered as indirect evidence that the use of earnings management exists and may impact the audit. The underlying reason for earnings management behavior is to achieve results or benchmark targets that are realistically impossible. By 'meeting and beating' benchmarks, the required result are forced to become visible. The published earnings that are not yet realized are supposed to be just higher than in the reality. Consequently the conclusion could be that the published earnings which do *not* reach the desired targets are of a higher quality. Consequently, realizing benchmark targets could be an indicator that the audit quality and, by extension, the internal control quality, can be of a lower quality (Burgstahler & Dichev 1997; Degeorge et al. 1999).

Because BIG 4 audit firms have advanced opportunities to be selective in accepting clients, less abnormal accruals of lower quality by clients are found. This implies that BIG4 clients use less earnings management so the audit quality at these clients is of higher quality (Jones, 1991; Becker et al. 1998; Francis et al. 1999). Reynolds & Francis (2000) discovered an association between the size of the audited companies and the abnormal accruals/earnings management. They identified the association; the larger the customer, the less abnormal accruals. Becker et al. (1998) used the cross-sectional version of the Jones model (Jones, 1991) for the purpose of estimating the amount of discretional accruals and concluded that discretional accruals are of higher quality for smaller audit firms clients as for larger audit firms clients.

Research in addition has demonstrated that an association exist between the level of paid non-audit fees to audit firms and the increase of the abnormal accruals. Linked to this observation is the conclusion that an increase of abnormal accruals has an association with high levels of non-audit services and subsequently to the reduction of the audit quality (Frankel et al. 2002;

Canning & Gwilliam 2003; Beattie & Fearnley 2002), and supposed the quality of the internal control.

Audit failures / lawsuits

A direct link exist between audit failures and the audit quality and supposed the quality of the internal control. Audit quality is the inverse of audit failures. The more audit failures, the less audit quality. In addition a direct link exist between the audit failures and lawsuits. A survey concerning the period 1960-1995 showed that the number of lawsuits arising out of audit failures over a 35 year period was around 1000 which equivalent is approximately 28 per year. Set against a 10.000 US-listened companies during the same period, the number is relatively low. However it should be remembered not in all cases a business failure occurred because of an audit failure (Palmrose 2000; Krishnan et al. 2000).

Earnings restatements

Another measurement indicator which can be linked to the audit quality and supposed to the quality of the internal control are restatements. Restatements relate to corrections in annual audit reports as a result of the detection of omissions in these reports. US companies are obliged to notify these restatements to the Security and Exchange Commission (SEC) which subsequently shall be disclosed by the Government Accounting Office (GAO, 2003). The majority of these restatements are attributed to changes in the accounting estimations and are not related to audit failures. One must be aware a large number of failures remain undetected during an audit and cause no bankruptcy or other financial stress.

Audit costs

Audit costs are a proxy for the audit quality and supposed for the quality of the internal control because audit fees tend to be higher as audit failures occur less frequently. To avoid audits failures, auditing will require more time which results in higher auditing costs. The assumption that low audit costs correspond to low audit quality is incorrect (Francis 2004).

2.6 Summary

There are several theories that support this thesis. In paragraph 2.2 some of the most relevant governance related theories and diversity related theories are presented. The most relevant theory concerning the internal control quality is the Agency Theory. This theory affects the thesis regarding the responsibility of the CEO and CFO for the internal control quality. If

officers are appointed as agents by the owner to lead the organization, the possibility exist that they put their own interests above the interests of the owner and the company. This non ethical behavior affects directly the quality of the internal control and the internal audit which the CEO and the CFO are responsible for. In contrast the Stewardship Theory focuses on positive attitudes from managers regarding company activities. This theory assumes that managers want to realize satisfaction in their work which can be guaranteed by hierarchical structured organizations were the CEO has a strong position. The Theory of Inspired Confidence suggest that demand for audit services is the result of the financial contribution of third parties who reclaim management accountability which must be controlled and guaranteed by the audit profession. Regarding the diversity related theories concerning the behavior of demographic divers groups in the organization, it is difficult to proof that diversity aspects have positive consequences on the companies' performances. Studies show varying results. Regarding the Theory of Heterogeneity the focus is on differences in dynamic between homogeneous groups and heterogeneous groups and on how processes as communication and collaboration are stimulated. Regarding the Upper Echelon Theory the focus is on top management competences in relation to diversity aspects and company performances. What can be the impact on company performances by appointing not white middle aged CEO's or CFO's.

Paragraph 2.3 focuses on the internal control itself. Described are related issues as COSO and SOX. For professionals who work in the field of internal control and auditing, COSO is important as guidance how to operationalize and manage the internal control in companies. SOX is relevant for professionals as guidance in internal control and auditing related financial reporting legislation.

Paragraph 2.4 describes who are responsible for monitoring the entities internal control and zooms in on the specific responsibilities which are related to SOX. Compliant with SOX, relevant responsibilities are reserved for the CEO, CFO, audit committee members and the external auditor.

In paragraph 2.5 relevant issues are presented concerning the measurement of internal control quality. Because internal control is a not directly visualized concept, in the thesis some standards must be analyzed and selected how internal control can be measured. In this paragraph some types of internal control quality indicators and considerations are described. This result in the selection for material weaknesses as internal control quality standard in the thesis. Chapter 2 ends with the summary in paragraph 2.6.

In the next chapter prior research will be executed.

3 Prior research

3.1 Introduction

This chapter provides an overview of the literature which serves as basis for answering the research question. In paragraph 3.2 by means of 8 academic articles the association is examined between the personal determinants age, gender and ethnic background and internal control quality. As much as possible there is searched for a connection between these determinants and specific internal control quality. Because research for this association is limited available, the presented articles which are summarized have a similar connection with internal control quality such as for example reporting quality or audit quality. The articles are separately analyzed. 3 Articles are age related, 3 articles are gender related and 2 articles are ethnicity related. The analysis zooms in per article on the research, samples and conclusions. Each article is preceded by a brief introduction in which the article is summarized. By doing so an attempt was made to understand to what extent there is an association between the 3 determinants and internal control quality. In paragraph 3.3 a critical analysis is presented concerning the 8 articles signaled in the previous paragraph. The section concludes with the summary. Appendix 1 present the summary of all the presented articles.

3.2 Articles

AGE

1. CEO Age and financial reporting quality -(Wei et al., 2012)

Wei et al. investigated the association between the age of the CEO and the company's financial reporting quality. Research was performed regarding the forced meeting and beating analyst earnings forecasts and the delivery of financial restatements. The expected outcome of the study was that because of the increasing age, the CEO will show more ethical and conservative behavior so the CEO will be less engaged in aggressive earnings management. The sample consist of 3.413 firms which were examined during the period 2005 to 2008. Wei et al. proved a positive association between the age of the CEO and financial reporting quality. The researchers found a significant negative association between the CEO age and both meeting and beating analyst earnings forecasts and restatements.

In addition, the researchers examined the association between the reporting quality and the age of the CFO. A significant association was not found. In addition Wei et al. examined to

what extent the variable ‘gender’ affected the reporting quality. The researchers found no significant association.

2. The influence of executive age, career horizon and incentives on pre-turnover earnings management – (Davidson et al, 2007)

The research conducted by Davidson et al. proved that when CEO’s are approaching their retirement they are more interested in a short-term company performance instead of the long-term performance. By executing revenue-generating transactions which are linked to profit-based incentive schemes, they secure shortly before their retirement their financial future. This way of the use of earnings management is called the ‘horizon problem’ (Fukutomi & Hambrick 1991). The study in addition proved that older CEO’s have less resistance to takeover attempts by other companies. This because the positive effects are still taken but the negative effects will be faced in the future by the new CEO. The study covers the years 1992-1998. The total sample consists of 597 CEO retirement related turnovers. Davidson et al. proved a positive association between the ages of the almost retired CEO’s and the presence of large discretionary accruals in the two years prior to their retirement. In addition, the study shows that in companies where the CEO is nearing retirement a positive association exists between the profit-based bonus plans and the discretionary compensation accruals. (Lott 1990; Dechow & Sloan 1991). Despite the correlation between the bonus plans and the discretionary accruals, the study shows that specific control variables in the regression analysis can neutralize the correlation.

3. Ethical beliefs of business professionals: A study of gender, age and external factors – (Peterson et al, 2001)

Peterson et al. investigated the influence of external factors on the ethical beliefs of female business professionals and business professionals of a certain age. The study proved that the development of ethical beliefs is linked to age and gender. Where age is concerned, it appears that ethical beliefs develop with an increasing age, (Trevino, 1986). As age increases, the influence of the external factors decreases. External factors have less impact on the women’s ethical beliefs which implies that they are more stable in their ethical beliefs. This because for women more than for men cognitive moral development is earlier completed. The research includes a literature study in which questionnaires where used. Answers were analyzed and displayed in tables. Although the outcome of this study and other studies proved that women maintain a higher standard of ethical beliefs, (Akaah 1989; Betz et al. 1989; Chonko & Hunt

1985; Harris, 1989), other studies proved no difference exist with regard to the level of ethical beliefs between men and women (Dubinsky & Levy 1985; Fritzche 1988; Kidwell et al. 1987; Singhapakdi & Vitell 1990). Consequently the presumption that as a result of increasing age of the CEO the development of ethical beliefs has a positive impact on financial reporting quality is not conclusively proved.

GENDER

4. Women in the boardroom and their impact on governance and performance – (Adams., Ferreira, 2009)

The research focuses on demonstrating a link between the presence of women in board positions and their impact on the governance. Regarding governance, the research concentrates on attendance behavior and at the presence of woman in governance related committees. When it comes to committee assignment, it shows that female directors take more part of monitoring committees than male directors. The sample consists of 86.714 directorships, 8,253 firm-years and 1,939 firms. The study focuses on the period 1996-2003. The investigation proved a not robust association between women and the firm performance. Where women are part of committees, they have a significant impact on the board governance. In addition, women are over-represented in monitoring related committees. The study proved that women are tougher and more stubborn auditors or monitors than male directors. Their presence in boards has an impact on the board behavior that can lead to better governance. In addition, female board presence may have a positive effect on companies with weak governance. Despite these positive results, the influence of women in the board on firm performance is difficult to prove. Because female board members are proved tougher monitors and over-represented in monitoring committees it is possible that overmonitoring affect the shareholder value of the firm (Almazan & Suarez 2003). All summarized, the study shows an association between gender diversity and the firm related performances such as governance and shareholder value. The association can be either positive or negative.

5. Ethics, Diversity Management and Financial Reporting Quality – (Labelle et al, 2010)

Through this study Labelle et al. tried to prove an association between business ethics and the financial reporting quality. The study used diversity management as a proxy for business ethics and the size of the use of earnings management as a proxy for the financial reporting quality. The study covered companies which diversity management and corporate governance scores were available for the period 2004-2006. Diversity is qualified as a component that can

have an effect on limiting executives' discretionary behavior, (Carter et al. 2003). In addition, diversity is qualified as a factor that has a positive influence on the decision-making processes of managers, the culture within organizations and the quality of informal social networks (Gilbert et al. 1999; Dallas 2002). Regarding gender related issues, female directors have the same impact on the governance integrity as the independent directors, (Adams 2008), boards with female members prove to have a better control over earnings management behavior, (Gul et al. 2007), show women more democratic leadership, (Cohen et al. 1998; Klenke 2003; Trinidad & Normore 2005), are women more risk averse in making financial decisions (Hinz et al. 1997; Powell & Ansic 1997; Riley & Chow 1992; Sunden & Surette 1998), and show women higher ethical values in decision-making processes than men, (Betz et al. 1989; Mason & Mudrack 1996; Clikeman et al. 2001). Labelle et al. concluded and proved a significant negative association between diversity management as a proxy for corporate moral development and the use of earnings management as a proxy for quality reporting.

6. Women and racial minorities in the boardroom: How do directors differ? – (Hillman et al, 2002)

Hillman et al. investigated in which way competencies of female directors and ethnic minority directors differ from the competences of white male directors with respect to training and obtaining leading positions within companies. From the Fortune 1000 index a sample was drawn of company boards consisting of approximately the same number of white men-, white women-, and African-American directors during the period 1993-1997. The sample ended up with 275 directors. The study proved that female directors and managers with a minority background to acquire an executive function are particularly bathed by owing a high education degree. In addition the study proved that female directors and managers with a minority background on average are higher educated than white male candidates. These groups often acquire a position as being external candidate and not as internally grown candidate. In addition the study proved that female directors and ethnic minority directors entering more quickly a 2nd or 3rd board position than white male board members do. Compared to white male candidates to qualify for directors' positions, both groups need to have more competences (Kanter, 1989). Because, they will after once having acquired a position as director, qualified as more than average competent (Foddy & Smithson, 1989). Because for this research directors of Fortune 1000 companies were selected, presumably the results of the study will differ from reality.

ETHNICITY

7. The diversity of corporate board committees and firm financial performance – (Carter et al, 2007)

The research concerns the association between the board diversity with regard to gender and ethnic minority and firm performance. The idea is that both groups complement the company management with skills and competences which results in better company performance and creates value for the shareholders (Van der Walt & Ingley 2003; Stephenson 2004; Robinson & Dechant 1997; Catalyst 2004). Additional competencies provide innovative and creative new insights for strategic decision-making processes (Brancato & Patterson 1999), a broad and new focus on the organization that prevent stagnant thinking (Stephenson 2004) and the ability to approach and solve problems at a higher level (Stephenson 2004; Robinson & Dechant 1997). In addition is assumed that women and ethnic minority members, because they move in different external environments and consumer markets, have another additional view at consumers (Stephenson 2004). Board diversity in addition present a positive signal to the external environment of the company and consequently creates external legitimacy. The study covers the period 1998 to 2002. The sample was taken from the Fortune 500 index. The study proved a positive association between the board diversity and the firm performance. When it comes to board *committee* diversity, the association with firm performance is more complex. The study proved a significant positive association between the minority board members in compensation committees and the firm performance but a significant negative association between the minority board members in nomination committees and the firm performance. Although this study shows positive associations between board diversity and firm performance, other studies exist that prove otherwise. A study by Farrell & Hersch (2005) shows no link between the presence of the female board members and the market returns to the shareholders. In addition Shrader et al. (1997) examined the link between women in board positions and the return on assets (ROA), and found no association.

8. The gender and ethnic diversity of US boards and board committees and firm financial performance – (Carter et al, 2010)

Carter et al. investigated the association between the female board members and the board members with an ethnic minority background and the financial performance. Regarding board members with a diversity ethnic background, the opinion exist that they affect the performance of the board regarding governance issues and the firm performance. This opinion is based on the fact that ethnic minority directors compete not only on the basis of talent with

traditional corporate directors but they in addition have unique characteristics. Early conducted research proved that diversity regarding ethnic background does not create positive results to any organization (Fiedler et al. 1967). In addition, social psychological processes, and many other complex effects have an impact on the board performance (Milliken & Forbes 1999). The research refers to the period 1998-2002. The sample consist of 641 firms and 2563 firm years. Carter et al. found no clear positive association between the number of board members with an ethnic minority background and the firm financial performance. Concerning the study some effects appear which exclude positive associations. Innovation and creativity in decision making by ethnical minority board members can been neutralized by social conflicts within the board. The influence of the ethnic minority board members may depend on time-dependent conditions. In contrast, no evidence exist from the investigation that ethnic minority board members have a negative impact on the firm financial performance. Research conducted by Westphal & Milton (2000) shows that the demographic minority directors can have negative impacts on social cohesion within a group and consequently on the decision-making processes within the board. In addition conflicts and costs can neutralize the positive effects of ethnicity on boards such as creativity and innovation (Williams & O'Reilly 1998).

3.3 Critical analyses

All cited 8 articles summarized, what are the main findings? Regarding age, Wei et al. (2012) proved an association between the financial reporting quality and the CEO age, however, this association is not significant. Related to age a significant association exist between the financial reporting quality and the restatements and forced meeting earnings forecast. Both associations are attributable to the internal control reporting quality because the reporting quality is directly related to the internal control quality. Results of the investigation will depend on the selection of the control variables. It is conceivable that different control variables that affect the material misstatements or the material weaknesses scores different from results associated with restatements and meeting earnings forecast. Another association between age and ethical beliefs is realized by the research executed by Peterson et al. (2001) showing that ethical beliefs especially develop by men during increasing age. The study does not present during which age period this development occurs, however the study shows that ethical beliefs are more developed by men of advanced age. Taking into account that the position of the CEO and the CFO particularly are exercised by officials of middle age, this could be a relevant research result related to governance. In addition, the study proved no association between the ethical beliefs and the specific internal control quality. It is

conceivable that the ethical beliefs evolve with increasing age, but the sharpness with respect to monitoring internal controls decreases as result of anility. In these situations neutralizing effects appear. A negative correlation between age and the internal control quality is proved by the research performed by Davidson et al. (2007) showing that retirement approaching CFO's and CEO's become more susceptible to earnings management which conflicts with the monitoring of the internal control quality. This correlation is proved by a positive association between profit bonus plans and companies where the CEO is approaching the retirement age. However, the research does not prove an association between the internal control quality or the reporting quality and the presence of profit bonus plans. Both associations probably not conflict with each other. It is conceivable that this issue can have particular impact on the performance issues and not on the governance issues such as the internal control quality. The before signaled issues summarized, the expectation remains that a positive correlation between age and the internal control quality exist, however several studies revealed that this association is complex to prove. Particular, results are dependent on the selection of the control variables.

Regarding gender the cited articles provide less input for a solid association between gender and the internal control quality. Although the research conducted by Adams & Ferreira (2008) proved that women are more strongly represented in monitoring related committees and by doing so have impact on board governance, several studies are ambiguous in the effects on firm performance. As negative effect can be considered the over-representation of woman in monitoring committees which can result in over-monitoring and which negatively impact the shareholder value of the firm. Excluding this final issue the conclusion is justifiable that facts as monitoring behavior by women and the fact that women are perceived as tougher monitors as men should be regarded as supporting an association between gender and the internal control quality. In addition, this association is supported by the research conducted by Labelle et al. (2010) who proved that boards with female members have a better control over the use of earnings management, are more likely than men are risk averse and have higher ethical values in decision making processes. All three arguments are traced to the presence of women on boards and support an association between gender and the internal control quality. Research conducted by Hillman et al. (2002) shows that female directors compared to Caucasian male candidates have a higher education and are more competent than average to be eligible for directors positions. This is because female directors often come from outside the organization as opposed to male candidates who often internally grow due to their

network. It can be concluded that female directors score higher than men on competences as development of ethical values, better monitoring, and to have impact on the governance issues, all related to the internal control quality. The study in addition showed that women change faster than men of position and opt for a 2nd or 3rd director position. Because research showed earlier that it is more difficult for women than for men to qualify for such positions, this is a remarkable study result. In addition such a career stimulating behavior has an adversely effect on the internal control quality whereby consistency of monitoring policy is necessary. Consequently this effect does not contribute to the support of a gender – internal control quality association.

The before signaled research findings from articles regarding gender in addition largely apply to ethnicity. Both determinants have similarities related to diversity effects on the firm performance. The two studies performed by Carter, D'Souza, Simkins and Simpson from 2007 and 2010 are focused on board members with a different ethnic background from which is expected that because of their unique characteristics these affect the firm performance. Both studies show no significant correlation between the number of board members with an ethnic background and the financial performance. One study reported neutralizing effects that over a period of time are off less influence so possible a link could be detected in the future. For example, due to higher costs and social conflicts such as exposed in the theory of heterogeneity, these issues nullifying ethnics related positive competences like creativity and innovation force. The study does not show to which extent social conflicts arise. It is conceivable that social conflicts do less occur within larger boards where several members have an ethnic background. Since a correlation exist between the size of the companies and the existence of the internal control departments, this negative finding would have less impact in this thesis. Several studies regarding board members with ethnic background and firm performance do not prove an explicit association. Through the selection of specific control variables which are associated with the internal control quality, the results in chapter 6 of the thesis shall show whether an association exist between ethnicity and the internal control quality.

3.4 Summary

Paragraph 3.2 focuses on academic articles that studied the association between the determinants age, gender, ethnicity and governance, firm performance, the use of earnings management, the reporting quality all indirectly linked with the internal control quality and the internal auditing quality. Paragraph 3.3 present a critical analysis regarding the articles and their conclusions.

Regarding the information from previous articles on the association between age and governance issues a positive association has been proved between the CEO age and the financial reporting quality by Wei et al. (2012). Linked with this result a negative correlation exist between age and the CEO meeting and beating earnings forecasts and restatements. The before signaled association in addition can be related to the research executed by Peterson et al, (2001) who demonstrate that ethical beliefs are strongly linked to the development of an individual and to gender. Contrary to the positive association before signaled, the increase of the CEO age in addition can have negative effects on the firm-related results. Davidson et al, (2007) investigated the association between the almost retiring CEO's and the large discretionary accruals and found a significant positive association between these variables. Because discretionary accruals are direct related with the use of earnings management this study demonstrated implicit a correlation between the increase in the CEO-age and the use of earnings management.

The connection between gender and governance issues is less clear as the link between age and governance. Labelle et al. (2010) found a significant negative association between diversity management as being a proxy for corporate moral development and the use of earnings management as a proxy for the financial reporting quality. Adams & Ferreira (2008) proved in a similar study that the association between the gender diversity and the firm performance can be both positive and negative. By contrast, Gul et al. (2007) demonstrate that boards with female members have better control over the use of earnings management. Other research suggests that women are more risk averse than men when it comes to performing financial decisions, (Hinz et al. 1997; Powell & Ansic 1997; Riley & Chow 1992; Sunden & Surette 1998), and that women handling higher ethical values in decision making processes than men do, (Betz et al. 1989; Mason & Mudrack 1996; Clikeman et al., 2001). Where women are part of monitoring committees they have a significant impact on board governance. These associations catch the subject of this thesis and as such are interesting. The fact that women are often over-represented in monitoring related committees that results in over monitoring has a negative impact on the shareholder and on the firm performance.

Several other studies in addition deny an association between gender and the before signaled governance related performances.
The association between the board members with an ethnic background and governance issues exhibited similarity to the association between gender and governance issues.
Regarding performance it is complex to convincingly prove a positive association between the ethnic minority board members and the firm financial performance (Carter et al. 2010). An earlier 2007 study by Carter et al. demonstrate a significant positive association between the board diversity and the firm performance. Contrary this 2007 study from Carter et al. most similar studies related to diversity management and firm performance struggled to establish an association between the ethnicity and the firm performance (Fiedler et al. 1967; Shrader et al. 1997; Williams & O'Reilly 1998; Westphal & Milton 2000; Farrell & Hersch 2005).
In the next chapter the hyphoteses will be formulated.

4 Hypotheses development

4.1 Introduction

By testing 3 hypotheses, possible causal links are sought between the personal determinants of the person responsible for the internal control quality and the quality of the internal control. This chapter describes the realization of the 3 hypotheses. Each of the 3 hypotheses presented below focuses on a specific determinant of the CEO and of the CFO. Hypothesis 1 focuses on age, hypothesis 2 on gender and hypothesis 3 focuses on ethnicity.

4.2 Hypothesis 1

Through hypothesis 1 an attempt is made to show a link between the increase in age of the CEO and of the CFO and the internal control quality. The idea is that as the age of the persons responsible for the internal control increases, the quality of the internal control in addition increase. A linear link is suspected on the basis of research conducted by Wei et al. (2012). This study shows a positive association between the CEO age and the financial reporting quality. This thesis tries to show a similar relationship with as independent variable the internal control quality instead of the financial reporting quality which are strongly related. In addition research performed by Peterson et al. (2001) offers reasons to suspect that a positive association exist between the increase in the CEO and in the CFO age and the internal control quality. This research shows that an increasing age of staff in the company went parallel to the development of moral and ethical belief. Because of this, the intention to apply earnings management will be reduced which has a positive impact on the internal control quality.
As a proxy for the internal control quality in this thesis the variable material weakness (*MW*) is used. In a similar study performed by Doyle et al. (2007) the variable material weakness is used as a proxy for the accrual quality whereby the accruals quality can be considered as a derivative concerning the internal control quality. In addition as before signaled the variable material weakness is well documented by companies and as such available and operable in this thesis. Data is well accessible. This because since 2002 companies are due to the SOX act required to report identified material weaknesses in the annual report. Based on the before signaled studies, the determination of the reported material weaknesses is regarded as an immediate and measurable standard regarding the internal control quality.

In summary, it is assumed that a negative association exists between the increase in age of a CEO and/or CFO and the number of material weaknesses which create the following hypothesis:

(H1)
A positive association exists between the increase of the age of the CEO and/or of the CFO and the internal control quality.

4.3 Hypothesis 2

Gender is the 2nd determinant of which is assumed in this thesis that it has an association with the internal control quality. More specific, a negative association is suspected between the number of women in the position of CEO and/or of CFO and the number of material weaknesses that are reported by companies in which women execute this position. Research has shown that women in board positions have a strong impact on the board governance. This is evident from the attendance behavior of women in board meetings in which women show a significantly higher present score than men do. By doing so they are better informed and because of this have more influence on governance related issues. In addition, it has been shown that women more as men are part of the company committees such as monitoring, nominating- and monitoring committees. Particularly in monitoring committees, women are strongly represented and present themselves as tougher and more stubborn auditors as men (Adams et al. 2008). The assumption that women have a positive impact on the financial reporting quality in addition is confirmed by research by Labelle et al. (2010) who proved a significant positive association between the corporate moral development, which is more developed by women, and the financial reporting quality. The before signaled issues create the following hypothesis:

(H2)
A positive association exists between the presence of members of female gender as CEO and CFO and the internal control quality.

4.4 Hypothesis 3

The 3rd determinant of which is assumed in this thesis that it affects the internal control quality is the ethnic background of the CEO and/or of the CFO. According to Carter et al.

(2007) a positive association exist between the board diversity and the firm performance. Positive effects linked to the ethnic minority members in the board are; they provide the organization with a renew focus that prevent stagnant thinking, they offer the organization a higher level of problems solving, they create value for the shareholders and within the organization they improve the productivity and the performance (Van der Walt et al. 2003; Stephenson 2004; Robinson et al. 1997; Catalyst 2004; Brancato et al. 1999). Despite the before signaled effects, these have no direct link with the internal control quality. On the other hand these positive creativity and intelligence-based results have a positive effect on the governance related issues and by doing so in addition indirect on the internal control quality. The before signaled effects create the following hypothesis:

(H3)
A positive association exists between the presence of members with a minority ethnic background as CEO and or CFO and the internal control quality.

4.5 Summary

After a brief introduction in section 4.1, in section 4.2 an explanation is presented of the realization of the three hypotheses that in the thesis will be tested in chapter 6. From all 3 hypotheses is suspected they carry a positive association between the personal determinants of the CEO and/or of the CFO and the internal control quality. Hypotheses are not formulated as null H consequently alternative hypotheses are not formulated.
The next chapter contains the research design.

5 Research design

5.1 Introduction

Paragraph 5.2 describes which research method is chosen and explains the reasons concerning this choice.
In paragraph 5.3 the regression model is explained. The model will be used to test the 3 hypotheses. Paragraph 5.4 presents the description of the variables that are used in the logistic regression. They are divided in dependent variables, main variables and control variables. Concerning each variable is explained for what reason the variable is selected and how it affects the regression model. In paragraph 5.5 the study is explained through a 'Predictive Validity Framework'. By using 'Libby Boxes', the research is visualized and clarified. Paragraph 5.6 describes the data which is used in the thesis. Regarding the data, the focus is on the period to which the data relates, and the sources from which the data originates. Paragraph 5.7 contains the summary.

5.2 Research method

In this thesis empirical research is executed based on the quantitative method. This because the required and the available data is numeric, based on counts and numbers, and large in size. Quantitative research, in contrast to a study based on a qualitative method, makes it possible to prove cause-effect associations for a large amount of data by using statistical methods. In the thesis the pre-formulated research question and the hypotheses are analyzed based on tests by means of logistic regression.

5.3 Regression models

All in chapter 4 signaled 3 hypotheses are tested by using logistic regression. The 3 hypotheses differ particular in the selection of the main variable. By using 4 models is tested to what extent a link exist between de dependent variable and the main variables and the control variables. In the 4^{th} model all the 3 diversity aspects are combined. The results of the 4 regression models are presented in chapter 6. Below presented the 4 regression models used.

(H1) $MW\ i,t = \beta_0 + \beta_1 AGE + \beta_2 FSIZE + \beta_3 FPROFIT + \beta_4 FLOSS + \beta_5 FOPTION + \beta_6 BIG4 + \beta_7 SD + \beta_8 FEMAUDIT + \beta_9 FEMGOV + \beta_{10} FEMCOMP + \beta_{11} SIZEAUDIT + \beta_{12} FINAUDIT + \beta_{13} ICEFFECTIVE + \beta_{14} RESTADV + \beta_{15} RESTACC + \beta_{16} RESTFRAUD + \beta_{17} RESTSEC + \beta_{18} RESTOTHER + \beta_{19} RESTIMPR + \beta_{20} VOTPOW + \beta_{21} EXEMPTION + \beta_{22} NOTEFFACC + \beta_{23} NOTEFFFINFRAUD + \beta_{24} NOTEFFOTH + \beta_{25} NOTEFFERROR + \varepsilon\ i,t$ (Model 1)

Where:

MW = presence of material weaknesses

AGE = age CEO/CFO

FSIZE = firm size

FPROFIT = firm profit

FLOSS = firm loss

FOPTION = presence of option benefit plans

BIG4 = firm audited by BIG4 audit firm

SD = presence of significant deficiencies

FEMAUDIT = female member in audit committee

FEMGOV = female member in governance committee

FEMCOMP = female member in compensation committee

SIZEAUDIT = size audit committee

FINAUDIT = presence of an audit committee member with financial expertise

ICEFFECTIVE = effective evaluated IC by management

RESTACC = restatement due to disapproval accounting rules

RESTFRAUD = restatement due to fraud

RESTSEC = restatement initialized by the SEC

RESTOTHER = restatement not fraud and accounting rules related

RESTIMPR = restatement show improvement

VOTPOW = percentage voting power director

EXEMPTION = exemption notation in SOX 404

NOTEFFACC = disclosed not effective accounting rules

NOTEFFFINFRAUD = disclosed not efficient financial fraud indicators

NOTEFFERROR = disclosed not efficient other indicators

(H2) MW $i,t = \beta_0 + \beta_1$GEN $+ \beta_2 FSIZE + \beta_3 FPROFIT + \beta_4 FLOSS + \beta_5 FOPTION + \beta_6 BIG4 + \beta_7 SD + \beta_8 FEMAUDIT + \beta_9 FEMGOV + \beta_{10} FEMCOMP + \beta_{11} SIZEAUDIT + \beta_{12} FINAUDIT + \beta_{13} ICEFFECTIVE + \beta_{14} RESTADV + \beta_{15} RESTACC + \beta_{16} RESTFRAUD + \beta_{17} RESTSEC + \beta_{18} RESTOTHER + \beta_{19} RESTIMPR + \beta_{20} VOTPOW + \beta_{21} EXEMPTION + \beta_{22} NOTEFFACC + \beta_{23} NOTEFFFINFRAUD + \beta_{24} NOTEFFOTH + \beta_{25} NOTEFFERROR + \varepsilon\ i,t$ (Model 2)

Where:
GEN = CEO and/or CFO is female

(H3) MW $i,t = \beta_0 + \beta_1$ETHN $+ \beta_2 FSIZE + \beta_3 FPROFIT + \beta_4 FLOSS + \beta_5 FOPTION + \beta_6 BIG4 + \beta_7 SD + \beta_8 FEMAUDIT + \beta_9 FEMGOV + \beta_{10} FEMCOMP + \beta_{11} SIZEAUDIT + \beta_{12} FINAUDIT + \beta_{13} ICEFFECTIVE + \beta_{14} RESTADV + \beta_{15} RESTACC + \beta_{16} RESTFRAUD + \beta_{17} RESTSEC + \beta_{18} RESTOTHER + \beta_{19} RESTIMPR + \beta_{20} VOTPOW + \beta_{21} EXEMPTION + \beta_{22} NOTEFFACC + \beta_{23} NOTEFFFINFRAUD + \beta_{24} NOTEFFOTH + \beta_{25} NOTEFFERROR + \varepsilon\ i,t$ (Model 3)

Where:
ETHN = CEO and/or CFO has an ethnic minority background

(H1 t/m H3) MW $i,t = \beta_0 + \beta_1$AGE $+ \beta_2$GEN $+ \beta_3$ETHN $+ \beta_4 FSIZE + \beta_5 FPROFIT + \beta_6 FLOSS + \beta_7 FOPTION + \beta_8 BIG4 + \beta_9 SD + \beta_{10} FEMAUDIT + \beta_{11} FEMGOV + \beta_{12} FEMCOMP + \beta_{13} SIZEAUDIT + \beta_{14} FINAUDIT + \beta_{15} ICEFFECTIVE + \beta_{16} RESTADV + \beta_{17} RESTACC + \beta_{18} RESTFRAUD + \beta_{19} RESTSEC + \beta_{20} RESTOTHER + \beta_{21} RESTIMPR + \beta_{22} VOTPOW + \beta_{23} EXEMPTION + \beta_{24} NOTEFFACC + \beta_{25} NOTEFFFINFRAUD + \beta_{26} NOTEFFOTH + \beta_{27} NOTEFFERROR + \varepsilon\ i,t$ (Model 4)

5.4 Variables

Dependent variable

The dependent variable in the thesis is material weakness *MW* which is detected by the internal control department or the external auditor and which are published in the financial statements. It has previously been indicated that this variable is considered to be a pure and direct standard for the measurement of the audit quality and by doing so concerning the quality of the internal control. This in addition because of the definition of the concept of auditing quality by DeAngelo (1981) which states that the audit quality is present when a

material misstatement was found and when this material misstatement is reported. Because the internal control quality is indirect linked to the auditing quality, DeAngelo with this definition established an indirect association between the internal control quality and the material misstatement. Regarding this thesis *MW* = 1 if a company published in the financial statements a material weakness during the period 2007-2014 and 0 otherwise.

Independent main variables

To answer the three hypotheses three main variables are used. These are the variables *AGE*, *GEN* and *ETHN*.

CEO/CFO age (AGE) is considered to be decisive for the number of determined *MW*. Related to hypothesis 1, a negative association is suspected between *AGE* and *MW*. The higher the age of the CEO and/or of the CFO, the less material weaknesses are identified within the company and the better the level of the internal control quality is considered (Davidson et al. 2007; Wei et al. 2012). Per company where *MW* are detected the ages of the CEOs and CFOs are summed and averaged.

Regarding female involvement the variable CEO/CFO gender *(GEN)* is assumed to have a positive effect on the internal control quality. This should be reflected in the detection of less *MW*. A negative association is suspected between the number of women in CEO/CFO positions and *MW* (Labelle et al. 2010). In addition female members of the audit committee, as being an intermediary between the management and the external auditors, have a strong influence on the quality of the internal control. An audit committee with relatively many women is considered more influential concerning the internal control quality as an audit committee with few women (Adams et al. 2008). Per company which reported *MW*, the total number of women in a CEO and CFO position are totaled. *GEN* = 1 if a CEO and/or CFO is a female during the period 2007-2014 and 0 otherwise.

Regarding board members with an ethnic minority background *(ETHN)* is assumed through hypothesis 3 that they have a positive impact on the company results. This because these members are more as average talented, carry out their work properly, are more creative in decision-making processes and are more capable to resolve problems within the company at a higher level (Carter et al. 2007; Carter et al. 2010). Based on these characteristics it is assumed that CEO's and CFO's with an ethnic minority background have a positive impact on the internal control quality. A negative association is expected between *ETHN* and *MW*. The number of CEO's and CFO's with a minority background are totaled. As ethnic minority members are considered CEO's and CFO's of African-American, Asian, Black/African

American, Hispanic, Hispanic/Latin American, Indian, Middle-Eastern, and Native American/Alaskan-Native origin. Not ethnic minority members are CEO's and CFO's with a Caucasian Background. *ETHN* = 1 if a CEO or CFO has an ethnic minority background during the period 2007-2014 and 0 otherwise.

Control variables

Larger companies more as small businesses have the ability to maintain a large and competent finance and control department that ensures the management the execution of adequate and appropriate financial reporting processes and procedures. Consequently, larger companies in terms of their finance and reporting activities are more in control than smaller companies and consequently in larger companies material misstatements are less present. For these reasons a negative association is assumed between the firm size (*FSIZE)* and *MW*. (Kinney et al. 1989; Defond et al. 1991; Ge et al. 2005; Labelle et al. 2010; Wei et al. 2012). As a proxy for firm size applies the market value (price x shares outstanding) of the company.

The quality of the internal control is linked to the profitability (*FPROFIT)* of a company. If the financial condition of a company is problematic, because adequate internal control requires investments in time and money, this has bad consequences for the internal control department. As a result of reorganization, cuts in the internal control budgets can exist that affect the quality of the internal control (Krishnan, 2005; Ge et al. 2005). For this reason a negative relationship is assumed between *FPROFIT* and *MW*. As a proxy for firm profitability is considered return on assets (ROA).

An association is assumed between losses *(FLOSS)* incurred by financially ailing companies and the use of earnings management (Wei et al. 2012). Because of this reason an association is conceivable between ailing companies and the internal control quality. A positive association is assumed between *FLOSS* and *MW*. Firm loss is a dummy variable which is 1 if the company reported a loss during the period 2007-2014 and 0 otherwise.

According to research performed by Davidson et al. (2007) concerning CEO's who nearing their retirement an association exist between the profit-based bonus plans and the discretionary accruals and consequently the internal control quality. Through revenue-generating transactions CEO's can positively influence the bonus plans in order to secure their financial future after their retirement. In this context in addition Option Benefit Plans *(FOPTION)* are characterized as a financial opportunity. A positive association is expected between the presence of the benefit option plans within the company and *MW*. The variable

FOPTION is a dummy variable-which is 1 if the company reported the existence of benefit option plans and 0 otherwise.

An association is assumed between the size of an external audit firm *(BIG4)* and the internal audit quality. This because large audit firms, more as small audit firms, have large companies as client where material misstatements are less present. Larger audit firms count larger customers to their clientele due to the higher rates which are charged and the fear by large audit firms to loose reputation which makes them more selective in accepting customers, (Lennox 1999; Ge et al. 2005; Wei et al. 2012). BIG4 auditors in addition are less flexible in accepting the use of earnings management within companies, (Defond et al. 1994; Frankel et al. 2002). The sort of association between the executed audits by *BIG4* audit firms and *MW* is not presented. This can be positive if auditors detect few material misstatements. This can be negative because auditors select customers with a good reputation. As BIG4 companies are considered, Deloitte, E&Y, KPMG and PWC. As a proxy for the size of the external auditor is considered the dummy variable *BIG4* Company. *BIG4* is a dummy variable which scores 1 if a company has a BIG4 firm as previous and current auditor during the period 2007-2014 and 0 otherwise.

A less severe type of material weakness is a significant deficiency *(SD).* A significant deficiency is related to the possibility that a misstatement in the future is not discovered. A direct link exists between material weaknesses and significant deficiencies. A positive association is assumed between the *SD* and *MW*. Significant deficiency is a dummy variable which is 1 if a company report during the period 2007-2014 at least one significant deficiency and 0 otherwise.

The internal control quality is related to the quality of the corporate governance and the quality of the audit committee (Wei et al. 2012). Within audit committees especially female members *(FEMAUDIT)* have a strong influence. (Carter et al. 2007; Adams et al. 2008). Consequently, a negative relationship is assumed between the presence of women in the audit committees and *MW*. The variable *FEMAUDIT* is a dummy variable which is 1 in case of the presence of at least one woman in the audit committee during the period 2007-2014 and 0 otherwise.

Like female membership in the audit committees, in addition female membership in other committees is expected to have an impact on the company quality and on the company results including the internal control quality. Adams et al. (2008) confirmed that generally more woman then men appear in monitoring-related committees. Next to audit committees in addition a negative association is expected between female membership in governance-

(FEMGOV) and compensation- *(FEMCOMP)* committees and *MW*. The variables *FEMGOV* and *FEMCOMP* are dummies that are 1 in case of the presence of at least one woman in one of these committees during the period 2007-2014 and 0 otherwise.

Besides gender in addition the size of the audit committee *(SIZEAUDIT)* affects the quality of the financial reporting and hence the quality of the internal control (Wei et al. 2012). As a proxy for the size of the audit committee is considered the number of audit committee members. A negative association is assumed between the number of the audit committee members and *MW*.

Financial expertise *(FINAUDIT)* is a competence that is considered to be important for audit committee members and will affect the financial reporting quality and hence the quality of the internal control, (Wei et al. 2012). A negative association is assumed between the presence of the audit committee members with financial expertise and *MW*. The variable *FINAUDIT* is a dummy that is 1 in case the company includes audit committee members with financial expertise during the period 2007-2014 and 0 otherwise.

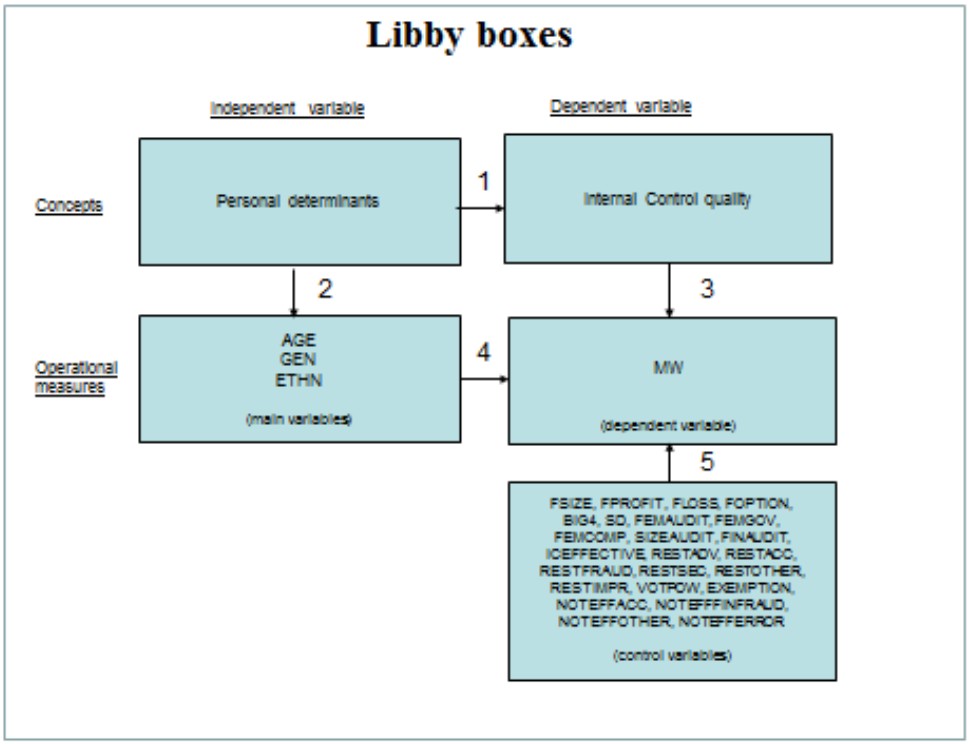
The variable *(ICEFFECTIVE)* indicates that the IC is effectively evaluated by the management. This variable is expected to correlate highly with *MW*. An estimation regarding the predicted sign is not presented. A negative association may indicate a highly qualified IC department which avoid material misstatements. A positive association may indicate a highly qualified IC department that detect regularly material misstatements. *ICEFFECTTIVE* is a dummy variable which is 1 if the CEO and the CFO evaluated the IC as effective and 0 otherwise.

Confirmed by research performed by Wei et al. (2012) an association exist between the obligation to produce restatements and the age of the CEO. Because the delivery of a restatement is due to a low quality internal control, a positive correlation is suspected between restatements and the internal control quality. An exemption and negative correlation is suspected for *RESTIMPR*. The relations are examined by the following 6 types of restatements: Restatements due to an adverse opinion from the external auditor *(RESTADV),* restatements as a result of the auditor disapproval of accounting rules *(RESTACC),* restatements arising from fraud cases *(RESTFRAUD),* restatements initialized by the SEC *(RESTSEC),* restatements concerning other issues due to fraud and accounting rules and SEC *(RESTOTHER),* and restatements showing an improvement over the previous financial statements *(RESTIMPR).* All these 6 types of restatements are dummy variables and have a value 1 if those situations exists and 0 otherwise.

An association is suspected between the director voting power *(VOTPOW)* and *MW*. The variable voting power represents the percentage of the company's voting power controlled by the director. A negative correlation is suspected because a strong control of the director of the company voting power parallels the influence of the CEO/CFO at the company results and the governance quality-including the internal control quality.
An association is suspected between the obligation with SOX 404 to capture the notation exemption *(EXEMP)* and *MW*. An exemption notation in SOX 404 represents an incomplete or delayed record 404, disagreement between the management and the auditor, acquisition issues and equity method issues. A negative association is suspected between *EXEMP* and *MW*. This because they create mitigatory circumstances that give less cause for a MW assessment. EXEMP is a dummy variable which scores 1 if an exemption is made during the period 2007-2014 and 0 otherwise.
A strong association is expected between the assessments of disclosure controls regarding the internal control procedures and *MW*. Regarding disclosure controls 4 indicators have been investigated. These are identified not efficient accounting rules *(NOTEFFACC)*, detected not efficient financial fraud indicators *(NOTEFFFINRAUD)*, detected indicators related to errors *(NOTEFFERROR)* and detected no efficient other indicators *(NOTEFFOTH)*. All indicators are expected to have a positive association with *MW*. All indicators are dummy variables and have value 1 in case they are identified at least once during the period 2007-2014 and have value 0 otherwise.

5.5 Validity framework

To visualize the associations between the independent and the dependent variables, the by Libby (1981) designed Predictive Validity Framework is used. In the below presented predictive validity framework the numbered arrows between the various 'Libby boxes' correspond to the following associations:



Association 1 visualizes the casual relationship between the personal determinants of the CEO and/or of the CFO and the internal control quality. This association concerns the factual research question asked in the thesis "Does an association exist between the personal determinants of the CEO and/or of the CFO and the corporate internal control quality? "
Association 2 & 3 visualizes in which way the research question can be operationalized. Both the conceptual independent variable and conceptual dependent variable are translated into operational measures.
Association 4 visualizes the associations between the main independent variables and the dependent variable. These associations will be tested. Tested are the effects of the personal determinants age, gender and ethnicity on the internal control quality.
Association 5 visualizes the influence of other (control) variables on the dependent variable. Examined is the significance of associations 4 and 5.

By involving a large number of variables an attempt is made to create the construct validity as high as possible. Using in the regression many and relevant variables prevents the research for relying too heavily on a few variables that prove to be inadequate proxies for testing which does not satisfy the measurement method. The degree of the external validity, to what extent the sample and the independent variables fit to test the effect on the dependent variable, is considered acceptable. This because the sample is large and is derived from a trusted source

(WRDS). In addition the independent variables are used for a large part in relevant studies that are presented in paragraph 3.2. The degree of the internal validity, which represents the degree of influence of the independent variables at the dependent variable should be reflected in the test results.

5.6 Data collection

All data used for the purposes of the regression models is derived from Wharton Research Data Services (WRDS). The data from WRDS relates to the 8 year period 2007-2014. By opting for this period results are based on the most recent data consequently the thesis is as actual as possible. The most recent year which WRDS has complete data available is 2014. The year 2007 is selected because of availability reasons of different sort of data. The initial a-select chosen sample consists of 5104 companies which are controlled for a material weakness. Ultimately 1439 companies published at least one material weakness during the period 2007-2014. All data is checked for outliers. If present, these are removed.

companies that published 0 or more material weaknesses	5104
companies that published 0 material weaknesses	3665
companies that published at least 1 material weakness	1439

The study intend to show the associations between the internal control quality and diversity related issues relating to the period after the introduction of SOX regulations in 2002. For this reason the results are suspected to differ from similar surveys executed before 2002.

5.7 Summary

This chapter provide insight into the creation and the selection of the regression models, the variables and the data. After an introduction in paragraph 5.1 the research method in paragraph 5.2 is explained. Explained is why is decided to do research based on a quantitative method and what are the properties of this method. Paragraph 5.3 present the 3 regression models and a combination model. In paragraph 5.4 all the variables used in the thesis are explained. For each variable is explained what is the predicted positive or negative association with the internal control quality represented as *MW*. Variables are grouped in 1 dependent variable, 3 main variables and 24 control variables. Some control variables are previously signaled in the relevant articles. Other variables are added because of the suspected effect on

the association between the main variable and the dependent variable. Besides the variables are classified as continuous variable or as categorical variable. In paragraph 5.5 Libby boxes are presented. These boxes create the possibility to visualize the research and associations between all variables which are tested in the thesis. Paragraph 5.6 described in which way the data is collected and the reason for selecting the research period. Chapter 5 ends with the summary.

The next chapter presents the results.

6 Results

6.1 Introduction

In paragraph 6.2 the conditions are detailed and checked to realize that the variables are satisfy in order to perform a proper logistic regression. Paragraph 6.3 presents additional checks. The continuous variables are checked for linearity, normality and homoscedasticity. Paragraph 6.4 present an adjusted regression model. Because not all conditions signaled in paragraph 6.2 are met, some adjustments had to be perform in the regression model. In paragraph 6.5 the regression results are presented. For each hypothesis the results of the logistic regression are presented. Paragraph 6.6 explains the results regarding the associations between the variables that match and that does not match with the expectations signaled in chapter 5. Paragraph 6.7 describes additional sensivity tests. To test the robustness of the results signaled in paragraph 6.5 in the additional tests a logistic regression is executed with as dependent variable material weaknesses and significant deficiencies totaled. Chapter 6 ends in paragraph 6.8 with the summary.

6.2 Presuppositions

The conditions a logistic regression need to meet are the following:

1. The dependent variable *MW* is a categorical variable;
2. The independent variables are continuous variables and/or categorical variables;
3. A causal link needs to exist between the dependent variable and the independent variables;
4. No multicollinearity exist;
5. Data is reliable.

Next the check of the 5 conditions.

Condition 1 en 2: Categorical and continuous variables

The dependent variable *MW* is a categorical variable. Consequently the thesis will use logistic regression to test the hypotheses. The research question transformed into a question that can be answered by using logistic regression is: Create CEO/CFO determinants age, gender and ethnicity less chance for the presence of *MW*? By means of logistic regression is the association determined between the dependent and the independent variables. The

independent categorical variables are: *GEN, ETHN, FLOSS, FOPTION, BIG4, SD, FEMAUDIT, FEMGOV, FEMCOMP, FINAUDIT, ICEFFECTIVE, RESTADV, RESTACC, RESTFRAUD, RESTSEC, RESTIMPR, EXEMPTION, NOTEFFACC, NOTEFFFINFRAUD, NOTEFFOTH, and NOTEFFERROR.* The independent continuous variables are: *AGE, FSIZE, FPROFIT, SIZEAUDIT and VOTPOW.*

Condition 3: Causal link

Regarding a causal association translated to hypothesis 1 implies that a decrease of material weaknesses is the consequence of an increase in the age of a CEO/CFO. Regarding hypothesis 2 and 3 similar associations exists. In this thesis it is assumed that these causal links exist.

Condition 4: Check on multicollinearity

Because as two explanatory variables have a strong influence on each other and these strengthen each other, they in addition affect the associations with other variables. Doing so they affect the reliability of the logistic regression model. Concerning this reason the check on multicollinearity between continuous variables is essential. Regarding a multicollinearity check, the following VIF scores are of interest. If the score is less than 3, no multicollinearity exists. Above a score of 5 it is likely that multicollinearity exists. A value higher than 10 indicates multicollinearity without argue. In addition, the tolerance statistics should have a value > 0.1. Next, the output of the multicollinearity check on the variables in the thesis is presented.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.096	.056		1.702	.089		
	AGE	-.002	.001	-.024	-1.674	.095	.938	1.066
	GEN	-.018	.016	-.016	-1.125	.261	.922	1.084
	ETHN	.012	.012	.015	1.000	.318	.825	1.212
	FSIZE	-4.007E-6	.000	-.019	-1.286	.199	.891	1.122
	FPROFIT	.000	.001	.008	.532	.595	.841	1.189
	FLOSS	.009	.011	.012	.803	.422	.852	1.173
	FOPTION	-.001	.011	-.001	-.065	.948	.843	1.187
	BIG4	-.003	.013	-.003	-.246	.806	.962	1.040
	SD	-.201	.035	-.256	-5.697	.000	.092	10.915
	FEMAUDIT	.008	.018	.008	.432	.666	.517	1.935
	FEMGOV	.017	.014	.022	1.223	.222	.556	1.800
	FEMCOMP	-.029	.014	-.038	-2.108	.035	.576	1.737
	SIZEAUDIT	-.001	.001	-.011	-.675	.500	.698	1.433
	FINAUDIT	.014	.011	-.018	-1.302	.193	.980	1.020
	ICEFFECTIVE	.477	.022	.426	21.558	.000	.474	2.107
	RESTADV	-.061	.031	-.077	-1.976	.046	.124	8.082
	RESTACC	.081	.032	.104	2.559	.011	.112	8.967
	RESTFRAUD	-.037	.121	-.004	-.306	.760	.899	1.112
	RESTSEC	-.041	.047	-.013	-.885	.377	.868	1.153
	RESTOTHER	.114	.029	.061	3.950	.000	.776	1.288
	RESTIMPR	-.046	.029	-.032	-1.575	.116	.441	2.268
	VOTPOW	.000	.000	-.008	-.567	.571	.927	1.079
	EXEMPTION	-.004	.012	-.005	-.345	.730	.763	1.311
	NOTEFFACC	.442	.019	.490	23.252	.000	.418	2.393
	NOTEFFFINFRAUD	.094	.052	.026	1.812	.070	.895	1.117
	NOTEFFOTH	.202	.037	.254	5.467	.000	.086	11.653
	NOTEFFERROR	.023	.068	.005	.346	.730	.963	1.039

a. Dependent Variable: MW

Tabel 1

Condition 5: Check on Reliability

In research need to be assured that in favor of the regression analysis, the selected variables have to be reliable and contain correct values. All variables used in this thesis are originating from the Wharton Research Data Services (WRDS) database. This database can be designated as a reliable source that is a combined database of previously in academic research used separate databases such as Compustat, IRRS, and Audit Analytics etc. In addition in the articles described and used variables are derived from these databases. Since all variables used in the thesis are derived from WRDS, these are assumed to be trustworthy.

6.3 Additional checks

In addition to the before signaled assumptions, the continuous variables are checked for the following properties:

1. Linearity.
2. Normality.
3. Homoscedasticity.

1. Check on linearity

Regarding the thesis the assumption is that all independent variables have a linear effect on the dependent variable *MW*. This assumption is based on the study of the articles signaled in chapter 3 in which most variables are used. All associations between the independent variables and the dependent variable *MW* are signaled in chapter 5. It is suspected that linearity is particularly evident in the association between the age and the internal control quality as evidenced by the article by Wei et al. (2012). The articles in chapter 3 showed that the associations between the diversity determinants gender and the ethnicity and the internal control quality are more complex to determine. Because some variables are dummy variables it is complex to verify these variables for linearity. The check for linearity for the continuous variables is presented in Appendix 2.

2. Check on normality

The continuous variables are controlled for normality. Normally distributed variables help associations better to understand. A normal distribution shown that variables concentrate around a mean and shows that the deviations of the mean occur less frequently as deviations increase, both + and -. Preferably, the data is free of outliers that may obscure associations. To neutralize outliers by independent variables, all outliers are removed from the sample. The results of the normality check are presented in Appendix 3.

3. Check on homoscedasticity

The condition homogeneity of variance implies that the variation in the deviations relative to the mean of an independent variable have to be approximately the same for all the independent variables. This can be checked for the continuous variables. Small differences are hardly affect the significance test. Major differences, however, can create serious distortion of the results. This condition implies that the smallest estimated standard deviation is not more than twice as small as the largest. Appendix 4 present the results of this check.

6.4 Adjusted regression model

The multicollinearity check indicates that the variables *SD*, *RESTADV*, *RESTACC* and *NOTEFFOTH* score multicollinearity. Analysis prove that the set of variables *SD* and *NOTEFFOTH* and the set variables *RESTADV* and *RESTACC* reinforce each other in such a way that it affects the reliability of the results in the model. By removing one variable from each set the multicollinearity in the model will be eliminated. It is decided to remove *NOTEFFOTH* and *RESTADV*. Because *NOTEFFOTH* provides no clear information about this variable, is less informative as the variable *SD* and scores Tolerance < 0,1, consequently is chosen for these variables. Because the variable *RESTACC* is more specific than *RESTADV* is decided to remove *RESTADV*. After the elimination of both variables below presented VIF and Tolerance scores remain. All VIF scores < 3 and Tolerance scores are > 0.1 consequently the model is cleared from multicollinearity.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.099	.057		1.727	.085		
	AGE	-.001	.001	-.023	-1.608	.108	.939	1.065
	GEN	-.022	.016	-.020	-1.408	.159	.925	1.082
	ETHN	.012	.012	.016	1.061	.289	.825	1.212
	FSIZE	-4.049E-6	.000	-.019	-1.280	.201	.894	1.119
	FPROFIT	.000	.001	.008	.523	.601	.860	1.163
	FLOSS	.011	.011	.015	.999	.318	.861	1.161
	FOPTION	.001	.012	.002	.115	.909	.844	1.185
	BIG4	-.006	.013	-.007	-.503	.615	.964	1.038
	SD	-.022	.013	-.028	-1.671	.095	.702	1.425
	FEMAUDIT	.012	.018	.012	.639	.523	.518	1.931
	FEMGOV	.019	.014	.025	1.330	.184	.556	1.798
	FEMCOMP	-.034	.014	-.044	-2.411	.016	.578	1.730
	SIZEAUDIT	-.001	.001	-.011	-.645	.519	.700	1.429
	FINAUDIT	-.013	.011	-.017	-1.228	.220	.980	1.020
	ICEFFECTIVE	.490	.022	.438	21.938	.000	.480	2.081
	RESTACC	.021	.012	.027	1.732	.084	.761	1.314
	RESTFRAUD	-.062	.123	-.007	-.507	.613	.901	1.110
	RESTSEC	-.023	.047	-.007	-.487	.626	.873	1.146
	RESTOTHER	.115	.029	.061	3.905	.000	.781	1.281
	RESTIMPR	7.919E-5	.022	.000	.004	.997	.853	1.173
	VOTPOW	.000	.000	-.008	-.591	.555	.928	1.077
	EXEMPTION	.002	.012	.003	.186	.852	.769	1.300
	NOTEFFACC	.456	.019	.505	24.026	.000	.434	2.307
	NOTEFFFINFRAUD	.079	.053	.022	1.498	.135	.898	1.113
	NOTEFFERROR	.018	.069	.004	.259	.796	.966	1.035

a. Dependent Variable: MW

Tabel 2

6.5 Regression results

Model 1: AGE

Results regarding the dependent variable *MW* are presented in the model below. The overall model is highly statistically significant with p = ,000 and a Chi-square of 787,221 indicating that that the type of portfolio has a significant effect on the direction of the independent variable *AGE*. The R^2 (Nagelkerke) of ,916 indicates a strong correlation between the dependent variable *MW* and the independent variables. Appendix 4 presents the model coefficients and the values of R^2. The variable of interest *AGE* is significant (p = ,045) and negative at conventional level (p < ,05). The coefficient indicates that as CEO's and CFO's become older the chance of the presence of material weaknesses reduces and consequently the internal control quality increase. Because of this result H1 is not rejected.

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	AGE	-.086	.043	4.005	1	.045	.917
	FSIZE	.000	.000	.699	1	.403	1.000
	FPROFIT	.034	.039	.732	1	.392	1.034
	FLOSS	.173	.613	.080	1	.778	1.189
	FOPTION	.064	.529	.015	1	.903	1.066
	BIG4	.772	.593	1.693	1	.193	2.164
	SD	-17.655	1496.995	.000	1	.991	.000
	FEMAUDIT	.590	.886	.444	1	.505	1.804
	FEMGOV	1.493	.762	3.841	1	.050	4.451
	FEMCOMP	-1.912	.769	6.174	1	.013	.148
	SIZEAUDIT	-.076	.068	1.273	1	.259	.926
	FINAUDIT	.159	.532	.089	1	.765	1.172
	ICEFFECTIVE	5.065	.903	31.467	1	.000	158.421
	RESTACC	.593	.548	1.172	1	.279	1.810
	RESTFRAUD	14.665	27283.836	.000	1	1.000	2338487.156
	RESTSEC	-.754	1.628	.215	1	.643	.470
	RESTOTHER	2.506	1.087	5.314	1	.021	12.260
	RESTIMPR	-.417	.803	.270	1	.604	.659
	VOTPOW	-.024	.026	.882	1	.348	.976
	EXEMPTION	.472	.533	.785	1	.376	1.603
	NOTEFFACC	37.538	1921.870	.000	1	.984	2.006E+16
	NOTEFFFINFRAUD	.910	1.105	.678	1	.410	2.484
	NOTEFFERROR	-1.224	1.607	.580	1	.446	.294
	Constant	-15.782	1205.237	.000	1	.990	.000

a. Variable(s) entered on step 1: AGE, FSIZE, FPROFIT, FLOSS, FOPTION, BIG4, SD, FEMAUDIT, FEMGOV, FEMCOMP, SIZEAUDIT, FINAUDIT, ICEFFECTIVE, RESTACC, RESTFRAUD, RESTSEC, RESTOTHER, RESTIMPR, VOTPOW, EXEMPTION, NOTEFFACC, NOTEFFFINFRAUD, NOTEFFERROR.

Dependent Variable: MW

Main Variable: AGE

Tabel 3

It appears from the model that the coefficients of the variables *ICEFFECTIVE, RESTOTHER* and *FEMCOMP* are significant, (p < ,05). A value p = ,000 for *ICEEFFECTIVE* indicates that companies whose internal control by management is assessed as effective have a greater

chance of detecting material weaknesses. A positive value p = ,021 for *RESTOTHER* implies a higher probability of the existence of material weaknesses in companies that have produced a restatement due to issues different from accounting rules and fraud. This corresponds with the expectation. A negative p = ,013 for *FEMCOMP* indicates that a decrease in women who have seats in compensation committees result in an increase of *MW*. This is consistent with the expectation that women in committees have an impact on governance issues within the company. Concerning this result the positive p = ,050 for *FEMGOV* at significant level (p < ,10) is inexplicable. All other independent variables are insignificant at conventional level (p < ,10).

Model 2: GEN

Below are presented the results of the association between gender and material weaknesses. The *GEN*-related model is highly significant with p = ,000 and a Chi-square value 786,845. The R^2 = ,913 (Nagelkerke) which indicates that the associations between the dependent variable *MW* and the independent variables are strong. The main variable *GEN* with a positive p = ,913 is not significant at conventional level (p < ,10). Because of this result H2 is rejected.

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	GEN	.079	.724	.012	1	.913	1.082
	FSIZE	.000	.000	.813	1	.367	1.000
	FPROFIT	.036	.038	.907	1	.341	1.037
	FLOSS	.475	.591	.646	1	.422	1.607
	FOPTION	-.095	.522	.033	1	.856	.910
	BIG4	.459	.553	.689	1	.407	1.583
	SD	-17.281	1520.679	.000	1	.991	.000
	FEMAUDIT	.789	.871	.821	1	.365	2.202
	FEMGOV	1.210	.732	2.735	1	.098	3.353
	FEMCOMP	-1.572	.735	4.572	1	.032	.208
	SIZEAUDIT	-.070	.069	1.025	1	.311	.933
	FINAUDIT	.051	.524	.010	1	.922	1.053
	ICEFFECTIVE	4.718	.844	31.224	1	.000	111.971
	RESTACC	.840	.536	2.458	1	.117	2.316
	RESTFRAUD	15.295	26795.488	.000	1	1.000	4390674.707
	RESTSEC	-.710	1.551	.210	1	.647	.492
	RESTOTHER	2.357	1.076	4.799	1	.028	10.562
	RESTIMPR	-.554	.811	.466	1	.495	.575
	VOTPOW	-.024	.025	.958	1	.328	.976
	EXEMPTION	.414	.535	.599	1	.439	1.512
	NOTEFFACC	36.958	1960.796	.000	1	.985	1.123E+16
	NOTEFFFINFRAUD	1.164	1.083	1.155	1	.283	3.202
	NOTEFFERROR	-.966	1.480	.426	1	.514	.381
	Constant	-20.842	1237.843	.000	1	.987	.000

a. Variable(s) entered on step 1: GEN, FSIZE, FPROFIT, FLOSS, FOPTION, BIG4, SD, FEMAUDIT, FEMGOV, FEMCOMP, SIZEAUDIT, FINAUDIT, ICEFFECTIVE, RESTACC, RESTFRAUD, RESTSEC, RESTOTHER, RESTIMPR, VOTPOW, EXEMPTION, NOTEFFACC, NOTEFFFINFRAUD, NOTEFFERROR.

Dependent Variable: MW

Main Variable: GEN

Tabel 4

Regarding the independent variables, the coefficients of *FEMCOMP*, *ICEEFFECTIVE* and *RESTOTHER* have explainable directions and are significant at a level p < ,050. The variable *FEMGOV* with a p-value = ,098 is significant at level p < ,10. No explanation exists concerning the direction of this variable. All other independent variables are insignificant.

Model 3: ETHN

The regression results regarding the association between the dependent variable *MW* and the main independent variable *ETHN* are presented in the schedule below. Like the before signaled main variables *AGE* and *GEN*, the model is highly significant with p = ,000 and a Chi-square of 786,905. In addition the R^2 is with p = ,913 statistical significant which indicates a strong association between *MW* and the independent variables. The postive p = ,789 regarding the variable *ETHN* is not significant at conventional levels. Because of this result H3 is rejected.

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	ETHN	.145	.544	.072	1	.789	1.157
	FSIZE	.000	.000	.847	1	.358	1.000
	FPROFIT	.036	.038	.814	1	.367	1.035
	FLOSS	.466	.586	.634	1	.426	1.594
	FOPTION	-.119	.517	.053	1	.817	.887
	BIG4	.476	.558	.726	1	.394	1.609
	SD	-17.293	1528.147	.000	1	.991	.000
	FEMAUDIT	.734	.898	.668	1	.414	2.084
	FEMGOV	1.193	.733	2.647	1	.104	3.298
	FEMCOMP	-1.534	.747	4.220	1	.040	.216
	SIZEAUDIT	-.069	.068	1.033	1	.309	.933
	FINAUDIT	.022	.533	.002	1	.967	1.022
	ICEFFECTIVE	4.721	.845	31.226	1	.000	112.251
	RESTACC	.831	.533	2.435	1	.119	2.296
	RESTFRAUD	15.275	26806.597	.000	1	1.000	4302576.218
	RESTSEC	-.627	1.591	.155	1	.693	.534
	RESTOTHER	2.308	1.052	4.811	1	.028	10.058
	RESTIMPR	-.527	.784	.453	1	.501	.590
	VOTPOW	-.024	.024	.990	1	.320	.976
	EXEMPTION	.410	.524	.613	1	.434	1.507
	NOTEFFACC	36.930	1971.811	.000	1	.985	1.092E+16
	NOTEFFFINFRAUD	1.206	1.084	1.238	1	.266	3.340
	NOTEFFERROR	-.999	1.481	.455	1	.500	.368
	Constant	-20.816	1246.117	.000	1	.987	.000

a. Variable(s) entered on step 1: ETHN, FSIZE, FPROFIT, FLOSS, FOPTION, BIG4, SD, FEMAUDIT, FEMGOV, FEMCOMP, SIZEAUDIT, FINAUDIT, ICEFFECTIVE, RESTACC, RESTFRAUD, RESTSEC, RESTOTHER, RESTIMPR, VOTPOW, EXEMPTION, NOTEFFACC, NOTEFFFINFRAUD, NOTEFFERROR.

Dependent Variable: MW

Main Variable: ETHN

Tabel 5

Regarding the independent variables, the coefficients of *FEMCOMP*, *ICEFFECTIVE* and *RESTOTHER* are significant at p < 0,05. Like *AGE* and *GEN*, all the 3 variables have explainable directions. All other independent variables are insignificant at conventional level (p < ,10).

Model 4: AGE, GEN, ETHN

As confirmation of the previous regression results, next is presented the test result regarding the association between *MW* and the combination of main variables *AGE, GEN* and *ETHN*. This model is like the 3 previous tested models highly significant with p = ,000 and a Chi-square value 787,466. The R^2 = ,916 (Nagelkerke) which indicates the associations between the dependent variable *MW* and the independent variables are strong. The main variable *AGE* with a negative p = ,042 is like the H1 model significant at conventional level (p < ,05). The

main variable *GEN* is with a positive p = ,685 like the H2 model insignificant. The main variable *ETHN* is with a positive p = 0,809 like the H3 model insignificant. Like previous models the variables *FEMCOMP*, *ICEFFECTIVE* and *RESTOTHER* are significant at conventional level (p < ,05), and variable *FEMGOV* is significant at conventional level (p < 0,10). All other independent variables are insignificant.

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	AGE	-.089	.044	4.148	1	.042	.915
	GEN	.307	.758	.164	1	.685	1.360
	ETHN	.137	.566	.058	1	.809	1.146
	FSIZE	.000	.000	.774	1	.379	1.000
	FPROFIT	.032	.040	.653	1	.419	1.033
	FLOSS	.100	.630	.025	1	.873	1.106
	FOPTION	.084	.544	.024	1	.877	1.088
	BIG4	.809	.601	1.813	1	.178	2.245
	SD	-17.790	1482.193	.000	1	.990	.000
	FEMAUDIT	.498	.926	.289	1	.591	1.645
	FEMGOV	1.500	.765	3.847	1	.050	4.482
	FEMCOMP	-1.903	.785	5.883	1	.015	.149
	SIZEAUDIT	-.083	.070	1.418	1	.234	.920
	FINAUDIT	.143	.547	.068	1	.794	1.154
	ICEFFECTIVE	5.104	.910	31.432	1	.000	164.648
	RESTACC	.607	.552	1.209	1	.271	1.834
	RESTFRAUD	14.623	27363.732	.000	1	1.000	2242730.661
	RESTSEC	-.695	1.696	.168	1	.682	.499
	RESTOTHER	2.595	1.129	5.287	1	.021	13.400
	RESTIMPR	-.504	.836	.363	1	.547	.604
	VOTPOW	-.027	.026	1.087	1	.297	.974
	EXEMPTION	.531	.547	.941	1	.332	1.701
	NOTEFFACC	37.662	1902.455	.000	1	.984	2.272E+16
	NOTEFFFINFRAUD	.904	1.115	.657	1	.418	2.468
	NOTEFFERROR	-1.288	1.634	.621	1	.431	.276
	Constant	-15.557	1192.664	.000	1	.990	.000

a. Variable(s) entered on step 1: AGE, GEN, ETHN, FSIZE, FPROFIT, FLOSS, FOPTION, BIG4, SD, FEMAUDIT, FEMGOV, FEMCOMP, SIZEAUDIT, FINAUDIT, ICEFFECTIVE, RESTACC, RESTFRAUD, RESTSEC, RESTOTHER, RESTIMPR, VOTPOW, EXEMPTION, NOTEFFACC, NOTEFFFINFRAUD, NOTEFFERROR.

Dependent Variable: MW

Main Variable: AGE, GEN, ETHN

Tabel 6

6.6 Interpretations of results

Model 1: H1

The regression results of H1 are consistent with the results of the research performed by Wei et al. (2012). The study performed by Wei et al. (2012), which examined the association

between the age of the CEO and the financial reporting quality, showed that as CEO's get older they are less likely to forced achieve analysts' earnings forecast. Wei et al. in addition found that companies with older CEO's are less likely to have financial restatements. Despite the choice of both studies for different dependent variables, the coefficients and directions of the variable age in the study by Wei et al. with values p = 0.003 and p = 0.046 corresponds substantially in accordance with the results of this thesis, p = 0.045. This may be a consequence of the choice in both studies for identical independent variables as *FSIZE, FPROFIT, FLOSS, BIG4, SIZE, AUDIT*, and *FINAUDIT*. Another explanation for similar outcome is likely that the 2-year period between the two surveys is short on the assumption that Wei et al. (2012) have been working using the latest identical data. This because used data in both studies partly come from the same databases Compustat and WRDS. An equally important precondition for convincing evidence of H1 is the availability of sufficient data. This was available particular for the variable *AGE*. A sample of 1487 companies whose CEO / CFO age was published covers approximately 30% of the final sample of 5104 companies who published the presence or non-presence of a material weakness (*MW*).

Regarding H 1 the results of this thesis are partly consistent with the results of the research executed by Davidson et al. (2007). Referred to the Davidson et al. (2007) study, in which an association was found between older CEO's and their stock option plans and between older CEO's and increasing the use of earnings management, the results found are opposite of the results in the thesis. In both the Davidson et al. studies, these associations have a negative influence on the internal control quality, consequently in these studies an increase of CEO age result in an increase of *MW*. Through the results of the Davidson et al. study, the in the thesis unpredictable positive directions of the independent variables *FSIZE* and *FPROFIT* can be explained. Concerning these variables was assumed they had a negative association with *MW*. The study of Davidson et al. on the other hand found as result that older CEO's strive to increase the profits at the end of their career and strive to expand the firm size through acquisition. This in order to secure a financial future that causes an increase of *MW*. Regarding the for the thesis relevant variable *FOPTION* the direction of the variable is consistent with the predicted sign.

The results of the thesis regarding H1 are consistent with the results arising from the research performed by Peterson et al. (2001). The Peterson et al. study established a connection between the ethical beliefs and the elder business professionals and shows that the

development of the ethical beliefs is linked to gender and age. This research result is according the results of this thesis. Increase of age parallels the increase of the ethical beliefs by CEO's and by CFO's. This finding has a positive influence on the internal control quality with as result a decrease of *MW* within companies.

Model 2: H2

Regarding H2 the results from the thesis are partly consistent with the results from the studies performed by Adams et al. (2008), Labelle et al. (2010) and Hillman et al. (2002). The research of Adams et al. (2008) shows a mixed, complex and not robust association between women in monitoring committees and the firm performance. This research has similarities to the gender-related research in the thesis. The results of the thesis are partly consistent with the results in the Adams et al. study. Adams et al. proved that results regarding research on diversity aspects in relation to the firm performance are not always clear. As a result of reverse causality a clear link is difficult to establish. Adams et al. formulated different explanations for these findings. An important finding is the overrepresentation of women in monitoring committees resulting in excessive focused boards with over monitoring effects. Other factors include the limited social networks of women, and communication problems within the board as a result of too much different characters and different views. All of these factors may have impact on a decrease of the firm performance, (Almazan et al. 2003; Bohren et al. 2007; Milliken et al. 1996). Consequently negative firm performance would adversely affect the internal control quality by restrictions of IC budgets with as a consequence the increase of *MW*. This finding is contrary to the findings in this thesis predicted a negative H2 - association between gender and the internal control quality.

The study by Labelle et al. proved a significant association between the business ethics and the financial reporting quality. The study uses earnings management as proxy for the financial reporting quality and gender as proxy for ethics. Although the dependent variable and the main variable match in both studies, the results in the thesis are not consistent with the demonstrated connection in the Labelle et al. study. An explanations can be the fact that the dependent variable 'discretionary accruals' as a proxy for earnings management create other scores as the dependent variable in the thesis *MW*. Because discretional accruals is a continuous variable and the variable *MW* a categorical variable, other scores are probably. In addition, in the investigation of Labelle et al. less (4) and other independent variables are used as in the thesis (20).

The results in the thesis are not consistent with the results of the research executed by Hillman et al. (2002). In the Hillman et al. study the focus was on requirements for diversity directors to compete with white male directors. To compete these directors have to score higher on competences like integrity, responsibility and ethical and moral thinking. These competences create the expectation they contribute to the governance related issues as the internal control quality and by doing so reduce the presence of *MW*. This is not confirmed in the thesis. An explanation can be that the investigation of Hillman et al. was based on data from the Fortune 1000 index. The average US firm however has a less high profile as a Fortune 1000 company were work relatively more white men and more high qualified diversity directors. Within not Fortune 1000 companies, the requirements related to ethical competences are lower which may adversely affect the internal control quality.

Model 3: H3

The results of the ethnicity-related tests are not consistent with the results in the study by Carter et al. (2007) and are consistent with the study by Carter et al. (2010). The study by Carter et al. 2007 confirmed a positive association between the board diversity and the company performance. The association between the committee diversity and the company performance was mixed. A significant negative association between the minority board members in the nomination committees and the firm performance is consistent with the result in the thesis. A significant positive association between the minority board members of compensation committees however is not consistent with the results in this thesis. One explanation for the deviating results may be the difference in the period for which research has been performed. The study by Carter et al. relates to the period 1998 - 2002. A difference of 12 years in sort of data can yield other results. In addition, Carter used a sample of Fortune 500 firms. This is a significant smaller sample than the sample of 5104 firms used in the thesis. In addition the data is colored because Fortune 500 companies are of a higher segment and consequently these companies do not correspond with the average US companies used in the thesis. Another explanation could be the use of another dependent variable, and the use of a limited number of independent variables. Statements delivered by Carter et al. regarding differences in study results between the Carter et al. study and the thesis are: Conflicts within the company because of the social cohesion processes, psychological processes, and time dependent conditions in which the ethnic minority members may or may not be appreciated.

The results of the thesis is consistent with the results in the study by Carter et al in 2010. This study cannot prove an association between the number of the ethnic several board members and the firm financial performance. Explanations are found in the existence of endogeneity because of measurement errors, social- and psychological patterns within the board such as exclusion or conflicts, circumstances related to periods in time amongst others, differences per country in the level of integration, the cultural environments, the language and the religion.

Other ethnicity-related studies in addition show that no convincing or no link exists between minority directors and firm performance (Farrell et al 2005; Westphal et al 2000; Milleken et al 1999; Shrader et al 1997; Fiedler 1967; Lawrence et al. 1967).

Model 4

Next the results of the combination *AGE-GEN-ETHN* tests are presented. Regression results regarding variable *AGE* are consistent with H1. Regression results regarding variables *GEN* and *ETHN* are not consistent with H2 and H3. Because for these combination regression no hypothesis is formulated, the results will not be specified. Besides, results are consistent with the results analyzed as described by model 1, 2 and 3.

6.7 Additional sensivity tests

To control for data errors which affect the test results a test is performed in which the dependent variable material weaknesses (*MW*) is expand with significant deficiencies, (*SD*) which create a new and more large sized dependent variable *MWSD*. A significant deficiency is a less severe type of material weakness and is related to the possibility that a *misstatement* in the future is not discovered. A material weakness is related to the possibility that a *material misstatement* is not discovered in the future. Unlike material weaknesses, significant deficiencies are not required to be disclosed based on SOX section 302 and section 404.

With this additional test is attempted to realize more weight concerning the relatively small samples regarding the number of CEO's and/or CFO's in the variables *GEN* and *ETHN*. By executing this adjustment after all, in addition it includes the CEO's and the CFO's in the analysis who are linked to the presence of an *SD* during the period 2007-2014. Next the results are presented.

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	AGE	-.007	..015	.188	1	.665	.993
	GEN	-.156	.264	.348	1	.555	.856
	ETHN	.181	.193	.876	1	.349	1.198
	FSIZE	.000	.000	.414	1	.520	1.000
	FPROFIT	.014	.015	.857	1	.355	1.014
	FLOSS	.207	.185	1.258	1	.262	1.230
	FOPTION	.113	.187	.361	1	.548	1.119
	BIG4	-.345	.220	2.460	1	.117	.708
	FEMAUDIT	-.018	.307	.003	1	.953	.982
	FEMGOV	.200	.238	.707	1	.400	1.221
	FEMCOMP	-.165	.233	.500	1	.479	.848
	SIZEAUDIT	.043	.023	3.549	1	.060	1.044
	FINAUDIT	-.125	.177	.505	1	.477	.882
	ICEFFECTIVE	-1.482	1.475	1.009	1	.315	.227
	RESTACC	.340	.207	2.715	1	.099	1.405
	RESTFRAUD	15.405	28064.700	.000	1	1.000	4901492.807
	RESTSEC	-29.753	2559.390	.000	1	.991	.000
	RESTOTHER	12.841	1663.228	.000	1	.994	377529.629
	RESTIMPR	-.139	.422	.108	1	.742	.871
	VOTPOW	.003	.008	.160	1	.689	1.003
	EXEMPTION	2.384	.187	162.600	1	.000	10.849
	NOTEFFACC	47.652	3155.701	.000	1	.988	4.953E+20
	NOTEFFFINFRAUD	-25.978	12179.059	.000	1	.998	.000
	NOTEFFERROR	17.233	12491.510	.000	1	.999	30504127.480
	Constant	-1.302	.935	1.938	1	.164	.272

a. Variable(s) entered on step 1: AGE, GEN, ETHN, FSIZE, FPROFIT, FLOSS, FOPTION, BIG4, FEMAUDIT, FEMGOV, FEMCOMP, SIZEAUDIT, FINAUDIT, ICEFFECTIVE, RESTACC, RESTFRAUD, RESTSEC, RESTOTHER, RESTIMPR, VOTPOW, EXEMPTION, NOTEFFACC, NOTEFFFINFRAUD, NOTEFFERROR.

Dependent Variable: MWSD

Main Variable: AGE, GEN, ETHN

Tabel 7

The results of this test regarding the variables *AGE* and *GEN* in the combination model are consistent with the results presented in the relevant articles but all main variables are not significant. Noteworthy, the test demonstrate a negative correlation between *GEN* and *MWSD*, however, this link is not significant. Although the model is highly significant with p = ,000, the R^2 of ,517 indicates a less strong correlation as in the model with only *MW* as dependent variable. Coefficients of the single *AGE*, *GEN* and *ETHN* models are comparable with the coefficients in the presented combination model.

6.8 Summary

In this chapter the conditions for the logistic regressions are checked. After this the tests are executed and the results are analyzed. Starting with the presentation of the conditions that are required to execute logistic regression these conditions are checked in paragraph 6.2.

Variables are checked on kind of variable, categorical or continuous, and a check is performed concerning the causality, the multicollinearity and the reliability of the variables. Subsequently, in paragraph 6.3 additional checks are performed regarding linearity, normality and homoscedasticity. The results of these 3 controls are presented in Appendixes 2-4. In paragraph 6.4 an adjusted regression model is presented. Because the checks detected multicollinearity, the initial model requires an adjustment. Consequently, two variables in the model are deleted after which all VIF statistics < 3 and all Tolerance statistics > 0.1.

Paragraph 6.5 presents the regression results. H1 is not rejected and H2 and H3 are rejected. Model 4 presents a test regarding the associations between the variables *MW* and *AGE, GEN* and *ETHN*. The articles presented in chapter 3 showed the difficulty to confirm H2 and H3. The explanations from the regression results regarding H2 and H3 are described in paragraph 6.6. Regarding hypothesis 2 explanations are presented that are related to overmonitoring due to overrepresentation of women in monitoring committees, limited networks by women, communication problems with women in the board, difference in samples and the use of less independent variables in the thesis. Regarding H3 the explanations for rejecting the hypothesis are differences in the period between studies, the difference in used data, sample and variables, and circumstances regarding psychological and social dynamics, periods of time, level of integration, culture, language and religion.
In paragraph 6.7 a sensivity test is assessed to test the robustness of the three models. In this test the dependent variable *MW* is extended with significant deficiencies (*SD)*. In addition with this sensitivity test, the limited sized variables *AGE* and *GEN* are expanded what improves the final regression. The results of this sensivity test does not differ from the earlier tests which only tested the association between *MW* and the independent variables. This chapter concludes with the summary.
The next chapter contains the conclusion and the limitations.

7 Conclusion

7.1 Introduction

This chapter presents the final conclusion of the thesis, the limitations and the suggestions for further research. In paragraph 7.2 the conclusion of the thesis is presented. In order to show the realization of the conclusion the paragraph is divided in subsections. In paragraph 7.3 some limitations are presented which the thesis had to deal with. This chapter ends with paragraph 7.4 that include some recommendations for further research.

7.2 Conclusion

Motivation

The thesis investigates the association between the internal control quality and the CEO's and CFO's personal determinants age, gender and ethnicity. Although the internal control quality is of major importance in the light of the former accounting scandals previous to the introduction of SOX, research performed specific regarding internal control related issues is limited available. Most determinants related research refers to reporting quality, firm performance, the quality of the audit committee, and the use of earnings management. Most similar research has been performed concerning CEO/CFO determinants age and gender in relation to the reporting quality. Research concerning specific the association CEO/CFO determinants and specific the internal control quality is scarce.

Case

Since the SOX Act in 2002 became effective, in accordance with article 302 and 404 CEO's and CFO's need to report on the effectiveness of the controls related to financial reporting. In addition SOX 404 requires annually an "internal control report" with a statement from the management they establish and maintain an adequate internal control system. SOX in addition requires companies to report internal control problems discovered by a predecessor auditor if the company change the external auditor. In addition SOX requires to disclose and to report the existence of a material weakness. A material weakness is a material misstatement that DeAngelo (1981) noted as that the audit quality is present when a material misstatement was found and when this material misstatement is reported. Supposed material misstatements are directly linked with material weaknesses that in this thesis is assumed as indicator for internal control quality.

Approach

To demonstrate a link between the CEO and the CFO determinants and the internal control quality the following research question is formulated:

"Does an association exists between the personal determinants of the CEO and the CFO and the corporate internal control quality?"

To answer this research question, the following three hypotheses are developed:

H1

A positive association exist between the increase of age of the CEO and CFO and the internal control quality;

H2

A positive association exist between the presence of female members as CEO and CFO and the internal control quality;

H3

A positive association exist between the presence of members with a minority ethnic background as CEO and CFO and internal control quality.

Results

The regression results supported hypothesis 1. Regarding the main variable *AGE,* significant evidence was found that as CEO's and CFO's get older the corporate internal control quality increases. This is consistent with studies performed by Wei et al. (2012), Davidson et al. (2007) and Peterson et al. (2001). A negative coefficient indicates a negative association between CEO's and CFO's age and the presence of material weaknesses. In other words the elder the average age of the CEO and of the CFO is, the less material weaknesses will be detected. For this reason H1 is not rejected. Significant evidence was found that CEO & CFO age and the internal control quality is associated with the effectiveness of the internal control *(ICEFFECTIVE*), publicized restatements not related to fraud and accounting issues (*RESTOTHER),* and female presence in compensation committees (FEMCOMP). The results reveals that older CEO's and CFO's are more conservative than younger business professionals and are associated with higher ethical beliefs.

Regarding hypothesis 2 the results of the regression are partly consistent with the results from studies performed by Adams et al. (2008), Labelle et al (2010) and Hillman et al. (2012). As confirmed by these gender related studies it is complex to prove an association between female CEO's and CFO's and the internal control quality. In the thesis no significant evidence was found for this association. The thesis did not prove if a CEO and/or CFO is female that the internal control quality increase by the presence of less material weaknesses.

Consequently, H2 is rejected. Factors which make it complex to prove an association and affect the results are overrepresentation of women in monitoring committees, communication problems in boards because of differences in characters and views and limited sized social networks for women.

Regression results regarding H3 are partly consistent with 2 studies executed in 2007 and in 2010 by Carter et al. Like gender related research in addition the association between ethnic minority CEO's & CFO's and internal control quality is complex to prove. Carter et al. proved an association in the 2007 study between the board diversity and the company performance but could not prove a clear association between the committee diversity and the company performance. In addition not in the 2010 study. In this thesis no significance was found for the association between the CEO and the CFO ethnicity and the internal control quality. In other words, the thesis found no evidence that if the CEO and/or CFO has an ethnic minority background, this result in less presence of material weaknesses. Because no significance for the association is found, H3 is rejected. Except specific research dependent differences in sample and in data this is due to conflicts related to social cohesion processes, psychological processes and time dependent conditions that affect the appreciation and the acceptance of ethnic minority members. In addition differences per country in level of integration, cultural environments, language and religion are due to make it complex to prove an association between ethnicity and the internal control quality. Beside in addition measurement errors because of endogeneity issues affect the regression results.

Implications

The implications are particularly in the area of company human resource management and recruiting activities where awareness need to be created that particular older managers and executives can play a positive and reliable role in the internal control environment. In this type of work after all competences as responsibility, ethical beliefs and integrity are decisive. Findings do not aim to support only older CEO's and CFO's but in addition executives within internal control departments and audit-related officials where issues like experience and integrity are of most importance.

7.3 Limitations

The thesis has some limitations which could affect the regression results. The 4 most obvious limitations are:

1. - To communicate a statement about the quality of the internal control of a company alongside the CEO and CFO in the study in addition have to be included the IC-executives

who perform the day to day internal controls. These executives have an equally great influence on the quality of the internal control. To test this issue should be opted for a different research methodology. Regarding executives, attention should focus more on experience and tenure instead of integrity and ethical beliefs. The thesis lacked this additional research because of no availability of executive's specific data. Qualitative research can tackle this problem by using interviews and case studies.

2. - In the thesis is assumed that all variables are linear. The continuous variables are tested for this condition. To test the linearity for categorical (binary) variables on the other hand is difficult. This limitation could cause interference in the regression results.

3. - The data regarding the CEO and the CFO gender and the CEO and the CFO ethnicity related to individual companies was limited available. With the next amount of observations, CEO and/or CFO female: 201. CEO and/or CFO ethnic diverse: 901. Total companies *MW* yes or no: 5104, the samples for these two variables were relatively small compared with the amount of data concerning the presence of material weaknesses per company. A larger sample for both variables would make the regression results more robust and increases the external validity. To overcome this limitation a sensivity analysis is executed. This test however did not produce remarkable and distinguish results.

4. - It is conceivable that some associations are affected by endogeneity issues. This is due to correlations in which the study has no visibility or due to relevant variables that are not include in the study. Because they are not visible, a check on omitted variables is complex. Endogeneity is countered by the inclusion of relatively a large number of variables in the study.

7.4 Further research

Age-related research is limited available so further research can complement existing diversity related research. Regarding age, additional research should focus on the age structure of executives within the internal control department and its impact on the internal control quality. Taking into account the results in this thesis can be expected that if issues like tenure and experience are taken into account these benefit the internal control quality.

In addition, further research regarding the influence of gender and ethnicity on reporting quality and hence on the internal control quality is desirable. While extensive research in this field has been performed, based on this thesis it is complex to demonstrate significant associations. Several studies have shown that no clear and convincing evidence exists that diversity aspects have a positive or negative impact on the firm performance and on the

reporting quality and hence on the internal control quality. Because in the future the labor market shall be home for more people with diverse gender and diverse ethnic background and the internal control quality shall be of importance as long as accounting scandals are present, further research in this field is important.

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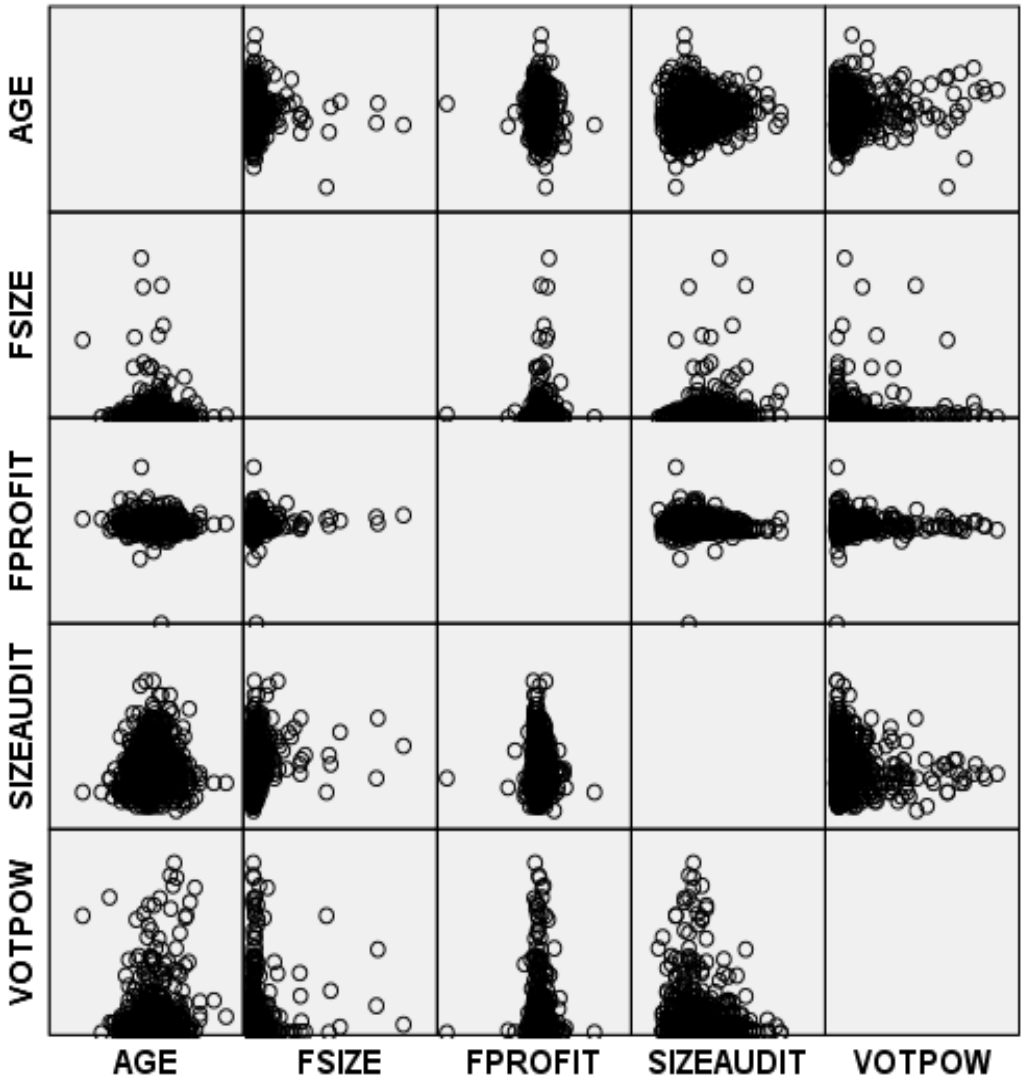
Appendix 1 Summary of articles

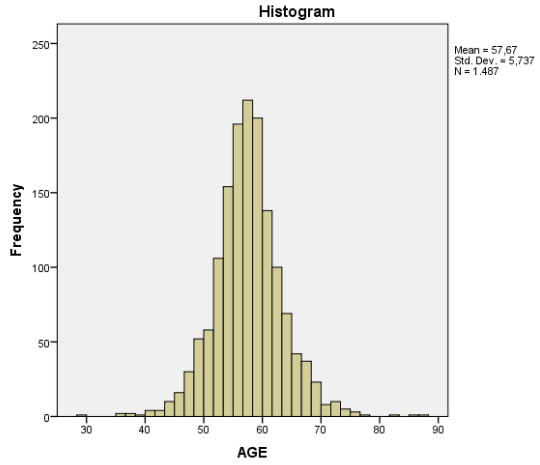
Year	Author(s)	Object of study	Sample	Methodology	Outcome
2012	Huang et al.	Wether firms with older CEO's are less likely meet and beat earnings forecasts and have less likely restatements, where both activities are proxies for reporting quality.	3.413 firms during period 2005-2008. Data from Compustat.	regression analysis.	A positive association exist between CEO age and financial reporting quality. No significant association exist between CFO age and reporting quality.
2007	Davidson et al.	Wether CEO's who reach retirement are interested in short term performance to score profit based bonus plans and so secure their own future.	597 CEO retirement related turnovers. Period 1992-1998. Data from Compustat.	regression analysis.	A positive association exist between almost retired CEO's and the presence of large discretionary accruals. Regarding almost retired CEO's a positive association exist between profit based bonus plans and discretionary compensation accruals.
2001	Peterson et al.	The influence of external factors on ethical values of female business professionals and business professionals of a certain age.	837 undergraduate business majors in senior policy and MBA students. Both randomly slected.	Literature study in which questionnaires are used.	Ethical beliefs among younger business professionals are less developed than among woman at a younger age and among men of an advanced age.
2008	Adams & Ferreira	Wether women in boards positions and company committees have impact on governance.	86.714 directorships, 8.253 firm years and 1.939 firms during the period 1996-2003.	regression analysis.	Women in committees have a significant impact on board governance. An association between gender diversity and firm performance can be positive or negative.
2010	Labelle et al.	Wether moral or ethical development affect the quality of financial reporting.	78 companies were diversity management and corporate governance is available during period 2004-2006.	regression analysis.	A significant negative association exist between corporate moral development and reporting quality.
2002	Hillman et al.	Do competencies of female directors and ethnic minority directors differ from competencies from white male directors with respect to training and obtaining leading positions?	275 directors from Fortune 1000 index companies with approximately the same numbers of white men, white woman and African American directors in board room during the period 1993-1997.	Chi-square analyses of differences across groups and event history analyses.	Female directors and directors with a ethnic minority background must have more competences compared to white male candidates to qualify for directors positions.
2007	Carter et al.	Wether there is an association between board diversity with regard to gender and ethnic minority and firm performance.	All selected companies with diverse boards were Fortune 500 listened at least one year in the five year period 1998-2002.	regression analysis.	A positive association exist between board diversity and firm performance. A significant positive association exist between minority board members in compensation committees and firm performance. A significant negative association exist between minority board members in nomination committees and firm performance.
2010	Carter et al.	Do female board members and board members with a ethnic minority background affect firm performance?	641 firms selected out of the S&P 500 index during the period 1998-2002	regression analysis.	No significant association exist between the number of board members with an ethnic minority background and firm performance.

Appendix 2 Linearity



Appendix 3 Normality

AGE



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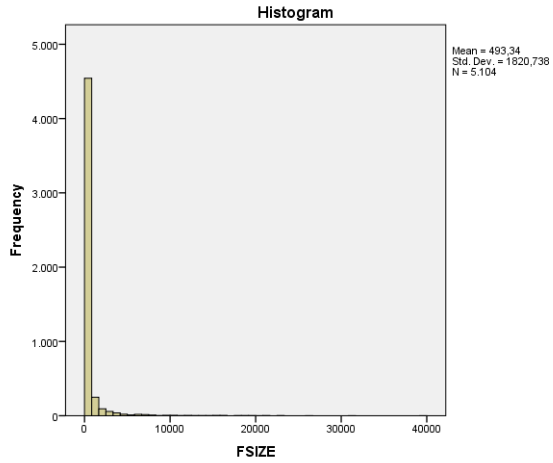

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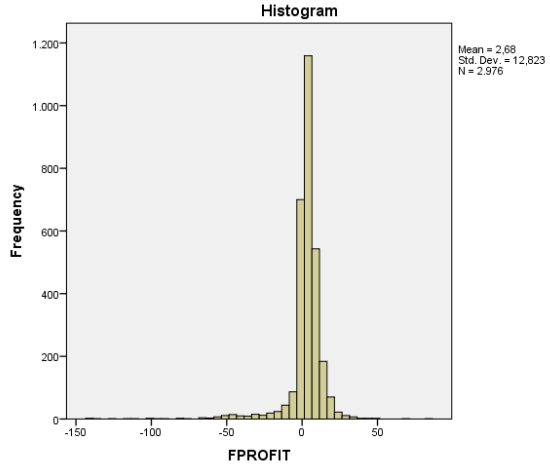
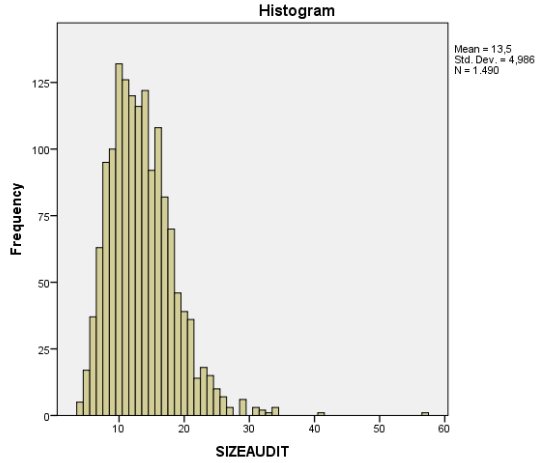
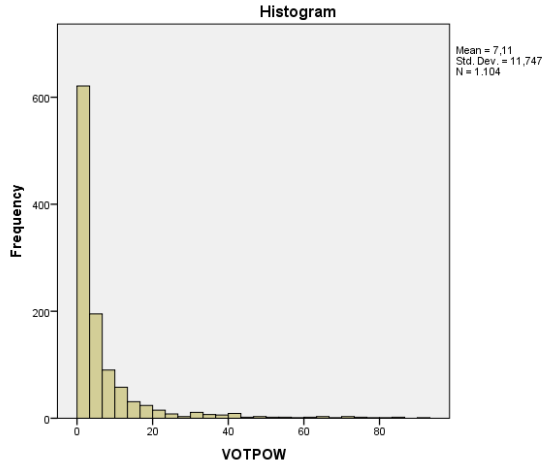


SIZEAUDIT

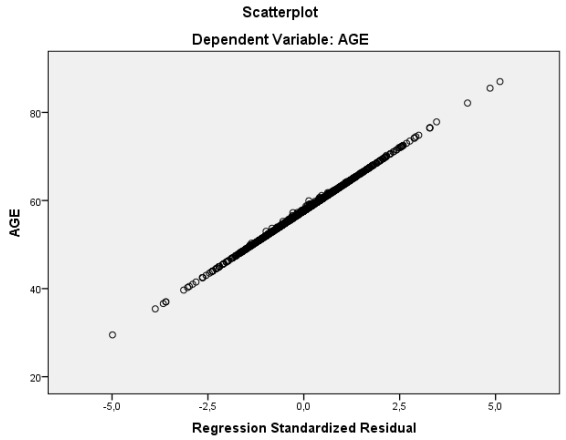


VOTPOW



Appendix 4 Homoscedasticity

AGE – FSIZE



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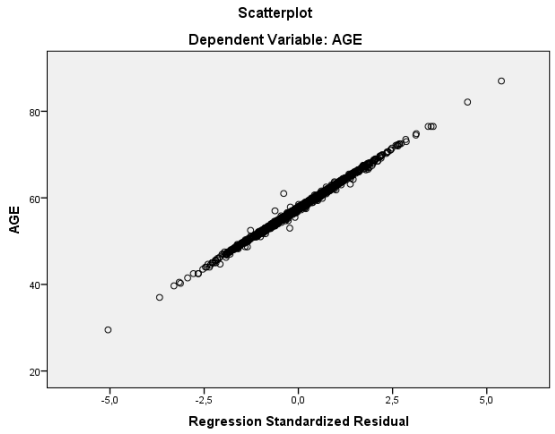
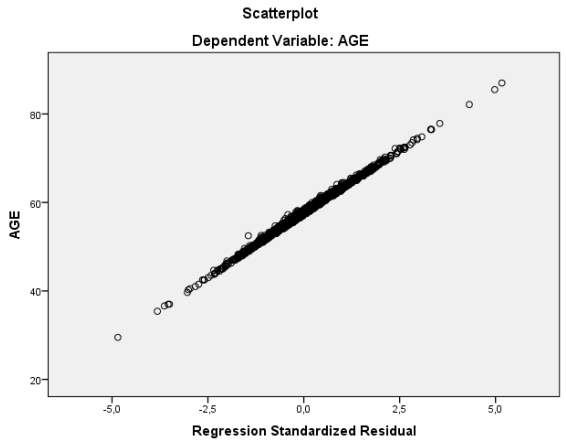
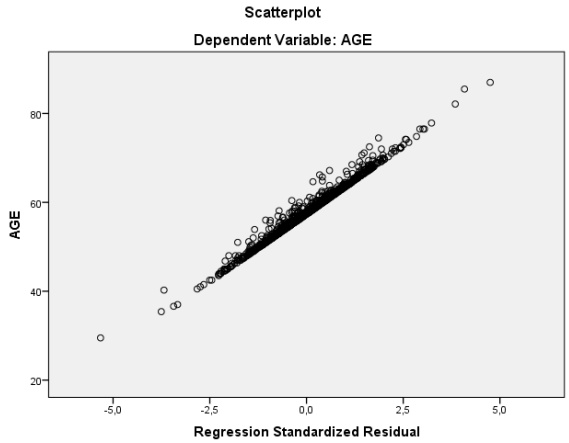


AGE – SIZEAUDIT



AGE – VOTPOW


Scatterplot
Dependent Variable: AGE
AGE
80
60
40
20
-5,0
-2,5
0,0
2,5
5,0
Regression Standardized Residual

Appendix 5 Model coefficients and R^2 values

AGE, dependent variable MW

Omnibus Test of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	787.221	23	.000
	Block	787.221	23	.000
	Model	787.221	23	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	117.821	.554	.916

GEN, dependent variable MW

Omnibus Test of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	786.845	23	.000
	Block	786.845	23	.000
	Model	786.845	23	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	122.060	.553	.913

ETHN, dependent variable MW

Omnibus Test of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	786.905	23	.000
	Block	786.905	23	.000
	Model	786.905	23	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	122.000	.553	.913

AGE, GEN, ETHN, dependent variable MW

Omnibus Test of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	787.466	25	.000
	Block	787.466	25	.000
	Model	787.466	25	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	117.576	.554	.916

AGE, GEN, ETHN dependent variable MWSD

Omnibus Test of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	459.620	24	.000
	Block	459.620	24	.000
	Model	459.620	24	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	805.401	.376	.517