

The effect of gender and ethnic diversity of audit committee on
internal control weaknesses

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Abstract

This thesis investigates the impact of gender and ethnic diversity on ICWs by utilizing four different proxies to measure them. I argue that the presence of female and non-Caucasian members on the audit committee reduces the likelihood of internal control weaknesses. To support my claim, I analyze a sample of 13,682 firm-year observations, representing 1,461 unique firms, from the years 2007 to 2022 in the United States. I conclude that having at least one female and non-Caucasian member on the audit committee is significantly associated with a lower occurrence of internal control weaknesses. However, when examining the proportion of female and non-Caucasian members, the results are not statistically significant. Interestingly, combining the proportion of female with non-Caucasian ethnicity into a single measure yields a significant negative correlation with internal control weaknesses. Furthermore, my findings do not provide significant evidence regarding the influence of financial expertise on the audit committee in relation to internal control weaknesses. Nonetheless, this research serves as a valuable reminder to policymakers, particularly in the context of gender-based quota regulations, as it highlights the importance of considering diversity in corporate governance.

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1. Introduction

The purpose of this thesis is to examine the relation between board diversity and internal control quality. More specifically, the thesis will investigate the relation between the role of gender and ethnic diversity of audit committee and weaknesses in companies' systems of internal control, and attempt to answer the following research question:

RQ: Does gender and ethnic diversity in the audit committee affect internal control weaknesses (ICWs)?

The Securities and Exchange Commission (SEC) requires CEOs and CFOs of public companies to verify the efficacy of company internal control on an annual and quarterly basis. In addition, the adoption of Section 404 of the Sarbanes-Oxley Act mandates that all annual financial reports consist of an internal control report, where the auditor of the respective publicly traded company must attest to, and report on, management's evaluation of internal controls (Chen et al., 2016). Researchers in the field of auditing have uncovered a wide variety of variables that influence the probability that an auditor may express an opinion about a material weakness. However, the consideration lacks a discussion of the diversity of the company's audit committee (Din et al., 2021). This is quite surprising as audit committee plays a pivotal role in overseeing a company's internal control. They are also primarily accountable for the external audit relation (Srinidhi et al., 2011). This is due to the fact that Section 301 of the Sarbanes-Oxley Act mandates that the audit committee be directly responsible for nominating, compensating, and supervising the external auditor. Conforming to PCAOB Auditing Standard 1301, the external auditor is obligated to discuss certain audit-related matters with the client's audit committee (Lee et al., 2019). In this instance, the audit committee is in charge of ensuring that the company's internal control systems are competent for providing quality audits. Thus, this research will shed light in exploring the effect of audit committee member diversity on internal control.

Following the Enron scandal, lawmakers attempted to integrate gender diversity into corporate governance guidelines to decrease groupthink created by all-male boards (Wahid, 2019). Various nations have imposed different gender restrictions. For instance, France, Spain, and Norway implement a 40% female-on-board quota principle, including sanctions, state contract penalties, and non-payment of board fees. In the context of the U.S., females have actively entered company committees over the last two decades. Lawmakers and others contend that gender-diverse boards will be scrutinized more carefully because female executives have higher ethical standards (Abbasi et al., 2020).

Although a great number of current publications and legislation emphasise the significance of females holding positions of authority, the vast majority of them fail to take into consideration the existence of ethnic diversity in their coverage. According to Bloomberg, roughly a dozen of the S&P 500 corporations with the biggest market capitalization do not have any representatives of the Black community serving on their boards of directors. In addition, Bloomberg reports that the number of African-American serving as corporate directors has stagnated or even decreased (Green, 2020). A survey by an executive recruiting firm Spencer

Stuart Inc., despite the fact that approximately 10% of directors at the 200 largest S&P 500 companies are Black, the proportion of Black executives entering boards in 2020 decreased from 13% to 11% (Posner, 2020). Nevertheless, an equal, if not greater, emphasis should be placed on enhancing racial and cultural diversity, which is seriously lacking (Asare, 2020). A 2020 survey of the 3,000 biggest publicly listed American corporations found that just 12.5% of board directors belonged to minority ethnic and racial backgrounds (Forbes, 2022). According to an article published in the Harvard Business Review, boards that have higher participation from racial and ethnic minority groups benefit from the presence of a wider variety of viewpoints that may assist influence board decisions. This finding suggests that a greater focus should be made on increasing the ethnic diversity of boards. Boards that include at least two directors from a minority ethnic group are more likely to respond positively to the question of whether or not they have an acceptable mix of individuals with a variety of opinions and experiences, and that diversity inside the firm is a key priority. This contrasts with boards that lack any ethnic diversity (Posner, 2020).

Existing research presents two explanatory theories to understand the phenomenon regarding diversity and how it can affect one's decision making. Firstly, gender socialization theory suggests that males and females develop distinct values due to their different socialization experiences. These diverse values result in unique behaviours and attitudes (Oradi et al., 2021). Secondly, resource dependence theory provides compelling theoretical justifications for the commercial rationale behind board diversity. According to Din et al. (2021), diversity enhances the board's information capabilities by bringing in directors with distinct expertise. Previous studies on audit committee diversity have shown that increased sense of responsibility, conservative nature, and risk aversion among audit committee members can lead to improved supervision and ultimately enhance business performance. Based on this, I argue that as the number of female and non-Caucasian members on audit committee increases, the occurrence of ICWs decreases. Hence, it is hypothesized that there is an inverse relationship between gender and ethnic diversity and ICWs. Expanding on this concept, the study also considers the gender composition of financial experts. It is observed that female financial experts on audit committees tend to establish more rigorous monitoring mechanisms, and the audit committee benefits from having a higher representation of female financial professionals who can provide better oversight. Consequently, a second hypothesis is formulated, proposing that the proportion of female financial experts on the audit committee has a more pronounced impact on ICWs compared to male financial experts.

To examine the proposed hypotheses, a sample comprising 13,682 firm-year observations, representing 1,461 unique firms, is constructed. In order to measure ICWs, three distinct proxies are employed: 1) material weakness under SOX Section 302, 2) material weakness under SOX Section 404, and 3) a combination of weaknesses under both SOX Section 302 and 404. Following the recommended approach of Chen et al. (2016) and Oradi et al. (2021), a dummy variable is utilized to measure these weaknesses. Two measures of gender and ethnicity are investigated: the proportion of females and the proportion of non-Caucasian members. In addition to that, this study also incorporates an indicator measure to evaluate whether there is at least one female or one non-Caucasian member on the audit committee.

Moreover, the study examines the influence of financial experts on internal control weaknesses. To ensure robustness, a further test is conducted using the count of weaknesses under SOX Section 404 as a proxy for ICWs. This analysis incorporates a combination of a female audit committee with non-Caucasian ethnicity.

The findings reveal that the presence of female and non-Caucasian members on the audit committee, as assessed through the use of dummy variables, exhibits a significant negative correlation with the occurrence of internal control weaknesses. This finding holds true even when employing the proportion of female and proportion of non-Caucasian measures, although the statistical significance is not observed in these cases. However, when combining gender and ethnicity into a single measure, specifically by considering the proportion of females with a non-Caucasian background, a negative and significant relationship emerges. On the other hand, the investigation into the presence of female or male financial experts on the audit committee does not yield statistically significant results concerning the occurrence of internal control weaknesses. This suggests that the impact of financial expertise, in terms of gender, on ICWs may not be as influential as the presence of female and non-Caucasian members on the audit committee. These findings highlight the unique contribution of gender and ethnicity diversity to the oversight and control mechanisms within organizations, emphasizing the importance of diverse perspectives in mitigating internal control weaknesses.

This thesis contributes to the growing body of literature examining the link between gender diversity on boards and internal controls. While previous studies have primarily focused on the impact of gender diversity, overlooking the significance of other forms of diversity in the workplace (Chen et al., 2016; Din et al., 2021; Oradi et al., 2021; Sultana et al., 2020), this research addresses the call by Chen et al. (2016) to explore the influence of different types of diversity on corporate board decisions. Specifically, this study investigates whether ethnic diversity exhibits distinct effects. Furthermore, this thesis extends the existing research on the role of gender in audit committee financial experts (Abbasi et al., 2020; Zalata et al., 2018) by highlighting the association between female financial experts on audit committee and internal controls. While Oradi et al. (2021) have explored the relationship between female and male financial experts on audit committee and internal control weaknesses, their investigations were limited to the context of Iran, a developing nation. In contrast, this thesis focuses on the U.S., which serves as an example of a developed economy. By considering the impact of ethnic diversity and emphasizing the contribution of female financial experts on audit committee in the U.S. context, this research expands the scope of knowledge on the relationship between board diversity and internal controls, providing valuable insights into the broader implications of diversity within corporate governance structures.

This study acknowledges several limitations that highlight potential avenues for future research. Firstly, the issue of endogeneity may affect the findings of this study, indicating a need for further exploration. Secondly, the non-disclosure of ICWs by certain firms introduces a potential source of bias. Thirdly, the generalizability of the study is limited to U.S. firms, suggesting the importance of conducting similar research in other contexts to assess cross-cultural variations. Lastly, unlike the study by Abbasi et al. (2020), this research does not

differentiate between accounting and non-accounting financial experts, which could potentially impact the insignificant results. These limitations underscore the need for future investigations to address these factors and deepen the understanding of the relationship between audit committee diversity and internal controls.

The subsequent sections of this paper are organized as follows. In Section 2, I reflect on the concept of earnings quality and provide a theoretical background on the relationship between gender and ethnic diversity and internal control weaknesses, building up to the development of my hypotheses. Section 3 describes the measurements of ICWs, gender, and ethnicity used, as well as the sample and research design employed. In Section 4, I present the descriptive statistics, results, and additional analysis conducted to examine the research hypotheses. Finally, in Section 5, I provide closing remarks, discuss the limitations of my study, and propose potential areas for future research in this field.

2. Literature Review and Hypothesis Development

This chapter's discussion will focus on the most significant concepts, theories, works of literature pertaining to the topic, and the hypothesis formulation. This chapter is divided into four sections. The first section provides a broad overview of earnings quality, before discussing ICWs in the second section. The third section covers gender and ethnic diversity, in which I will discuss the many ways that an organization may benefit from having a diverse board of directors. The fourth section discusses about the importance of gender and ethnic diversity on ICWs based on previous evidence, followed by the hypothesis to be tested in this study.

2.1. Earnings Quality

A significant number of scholars investigate the empirical metrics used in the academic study to evaluate the quality of earnings. Because of the multifaceted nature of the idea of earnings quality, there are a variety of alternative perspectives on how it should be understood. Dechow et al. (2010) defines earnings quality as "higher quality of earnings provides more information about the features of a firm's financial performance that are relevant to a specific decision made by a specific decision maker." There are a few different aspects to take into account while discussing the notion of earnings quality. First, earnings quality is discussed from the viewpoint of the decision-relevance of information. Because earnings quality can only be defined in the context of a certain decision model, Dechow et al. (2010) consider the definition to be useless since earnings quality can only be discussed in this context. Second, the quality of reported earnings is dependent on the degree to which a company can learn from its financial success. Due to the degree to which a company can learn from its financial performance, many aspects of earnings quality are often not apparent. Lastly, the significance of financial performance towards earnings quality has to be related with decision making and the capacity of accounting systems to monitor performance. This is necessary in order to ensure that earnings are of a high enough quality. In general, the definition of earnings quality says that quality must be consistent with decision making that depends on an informative representation of financial performance. The quality of earnings is an essential component of financial reporting since it determines the extent to which resources are used in an effective manner. Firms that have poor earnings quality often have higher capital costs, and firms that are subject to restatements or SEC enforcement actions generally suffer an economically substantial unfavorable market reaction to the knowledge that these events have occurred. This is due to the fact that investors and analysts utilize value models, and the most important input into these models is a company's earnings (Demerjian et al., 2013).

Because earnings quality is not directly measurable, there are several proxies that are used to measure its level. According to Dechow et al. (2010), there are three types of proxies to determine earnings quality: 1) properties of earnings, 2) investor responsiveness to earnings, and 3) external indicators of earnings misstatements. The first proxy of properties of earnings analyzes the degree to which a company uses its accounting system and quantifies the underlying business reality. The properties of earnings include persistence of earnings, smoothness of earnings, asymmetric timeliness and timely loss recognition, beating of targets, and accruals. Dechow et al. (2010) specifically employs abnormal accruals and accruals

models, as they are the most often employed approach to capture discretion. Accruals can be used to manipulate earnings, which impair financial reporting's informative content and dependability, resulting in a lower earnings quality. Dechow et al. (2010) describes the second proxy as investor responsiveness to earnings, that is the earnings response coefficient (ERC) to measure earnings quality as seen by outside stakeholders such as banks and investors. ERC stands for earnings relevant or value informativeness of unexpected earnings. Liu and Thomas (2000) contend that a larger correlation between unexpected earnings and stock returns may result from the perception of unexpected earnings as having a higher value significance. If the stated information more accurately reflects the underlying businesses' present performance and situation, a greater value relevance might be attained. The final proxy takes into account companies that have been subject to Accounting and Auditing Enforcement Releases (AAERs), restatement, or internal control material weaknesses that have been reported in accordance with the SOX regulations. Material deficiencies in internal controls may lead to incorrect financial reporting and, in extreme cases, require a restatement of financial statements, which can have a negative impact on earnings quality.

In order to prevent poor earnings quality, it is crucial to monitor the executive team of a company, specifically the CEOs and CFOs who have a significant influence on the determination of earnings quality (Nguyen et al., 2021). Since these individuals are responsible for making decisions that impact financial reporting, auditors need to interact with them more than with other top executives (Lee, 2019). To enhance the quality of earnings and financial reporting, Siagian and Tresnaningsih (2011) suggest that independent directors and audit committees should collaborate. Unlike management, independent directors and audit committee are not prone to conflicts of interest that could limit their oversight capabilities. As such, it falls upon audit committee to improve earnings quality by supervising the selection of auditors, ensuring high audit quality, monitoring internal controls, evaluating the internal audit division's activities, and assessing accounting disclosure and policy choices (Srinidhi et al., 2011).

The primary emphasis of this research is the third proxy of earnings quality defined by Dechow et al. (2010), which is internal control material weaknesses because Lin (2022) asserts that corporate governance and internal control are linked and mutually influence one another. Both anecdotal data and scholarly studies (Hoitash et al., 2009; Krishnan, 2005) point to the fact that audit committees play a pivotal role in corporate governance as they see internal control as their primary responsibility. The quality of an organization's internal controls is a result of the quality of the control environment, particularly the audit committee (Krishnan, 2005), which is the focus of this study. Dechow (2010) mentions that conclusions drawn from research that examine a correlation between audit committee quality and earnings quality have the best internal validity among all of the other governance systems, all other things being equal. These studies provide some preliminary justification for considering the internal control failures that are disclosed in line with SOX as an indication of the quality of earnings. Another previous study by Dechow et al. (2010) suggests that inadequate internal control may heighten the risk of material errors and incorrect financial disclosures. Inadequate internal control also

has the potential to raise the likelihood of a company restating its earnings because it creates greater opportunities for earnings management as well as estimation errors.

2.2. Internal Control Weaknesses

The Committee of Sponsoring Organizations of the Treadway Commission (COSO) issues what they term the "Internal Control – Integrated Framework" in an effort to define and unite a vast number of diverse concepts relating to internal control. COSO (2013) defines internal control as "a process, effected by an entity's board of directors, management, and other personnel, designed to provide reasonable assurance regarding the achievement of objectives relating to operations, reporting, and compliance." This activity is carried out by the board of directors, management, and many other persons associated with a company. An internal control system consists of a total of five different components, which are the internal environment, risk assessment, control activities, information and communication, and monitoring.

A company that has robust internal controls is better able to identify and prevent current instances of fraud committed by management and employees, which in turn reduces its exposure to the risk of fraud and improves its capacity to detect new instances of fraud. According to Tsai and Huang (2021), the Chief Accountant of the U.S. SEC places a strong emphasis on the significance of rigorous internal controls as the first line of defence in the process of finding and avoiding significant mistakes or fraud in financial reporting. When conducting an audit, auditors are required by the SEC to take into consideration a company's internal controls (SEC, 1941). In 1941, this legislation was put into effect for the very first time. However, auditors are required by Section 404 of the SOX to certify that their clients who use expedited filing have effective internal controls over financial reporting (ICFR). The report from the ICFR is intended to serve as a warning to the company's stakeholders about the probability that the company's accounting system is generating erroneous financial information (PCAOB, 2007). This information concerns the likelihood that the company's accounting system is creating erroneous financial information. ICFR is essential because firms use financial reporting as a tool for transparency in order to assist stakeholders like investors and creditors in evaluating investment risk and allocating resources, as well as evaluating the performance of top management (Chen et al., 2016).

According to Section 302, the management of the company is required to conduct an evaluation of the effectiveness of the firm's disclosure and control systems every three months, disclose the results of the evaluation, and state any significant changes in the controls that have occurred since the most recent 10-K or 10-Q report (Lin et al., 2022). Section 404 goes farther than Section 302 in that it requires the auditor to validate management's view of the effectiveness of internal control. Although the disclosure of the efficiency of an organization's internal controls is required by both Section 302 and Section 404, the requirements of Section 404 are more stringent than those of Section 302. When compared to the disclosure that is required by Section 302, Kim et al. (2011) state that an auditor-attested Section 404 report is a more accurate indication of the integrity of a company's financial reporting system. This is because the Section 404 report is subject to more stringent requirements. Only when more stringent criteria are used, such as those found in Section 404, does the connection between

corporate governance and the disclosure of substantial control weaknesses become evident (Hoitash et al., 2009).

The standards of SOX stipulate that a part of the responsibility for determining whether or not the company's internal control system can be relied upon rests with the audit committee. "The audit committee provides independent review and oversight of a company's financial reporting processes, internal controls, and independent auditors" (SEC, 2003). As a direct consequence of SOX, the individuals serving on audit committees have a much-increased danger of being subjected to legal action in respect to their duties, which include the monitoring of internal controls. According to Parker et al. (2017), possible legal consequences include both infractions of relevant securities laws and breaches of fiduciary obligations due to shareholders.

The implications of having insufficient internal controls have been investigated by researchers working in the discipline of accounting. Deficits in internal control are shown by the research that is presently available to be a contributing factor in poor quality of financial reporting (Ashbaugh-Skaife et al., 2008; Doyle et al., 2007), inefficient investments (Cheng et al., 2013), and more extreme cases of insider trading (Skaife et al., 2013). In light of these results, it is very necessary to have a comprehension on what causes that lead to poor internal controls. The investigation of the elements that influence whether or not a firm has acceptable internal controls by Ashbaugh-Skaife et al. (2007) and Doyle et al. (2007) indicates a number of client characteristics (i.e., size of the business, the complexity of the corporation, and the general financial health of the organization) that are linked to weak internal controls. Furthermore, companies that have auditors of a higher quality and those with higher degrees of institutional ownership are more likely to identify flaws in the quality of their internal control systems. Krishnan (2005) makes the discovery that audit committees that are independent of management, audit committees that have financial expertise, and audit committees that are larger are less likely to disclose problems with internal control. However, the current body of literature ignores the possibility that the diversity of a board of directors could affect the frequency with which internal controls are violated (Chen et al., 2016).

2.3. Gender and Ethnic Diversity

When discussing issues of corporate governance, the term "diversity" refers to the wide range of histories, experiences, points of view, and abilities that board members bring to the table during discussion and decision-making. There are many different types of diversity that can be represented in the boardroom, including diversity in terms of age, religion belief, gender, culture, ethnicity, professional background, knowledge, technical skills and competence, experience regarding commercial, industry, career, life, and so forth. Diversity is identical with "human capital" when discussing the composition and efficiency of a board of directors. Human capital is described as the collection of abilities, both broad and narrow, that a person acquires through education and experience (Van der Walt, 2003).

According to Ponomareva et al. (2022), the general consensus is that the board of directors is responsible for at least four significant functions. These functions include monitoring and controlling managers, providing information and counsel to managers,

monitoring compliance with applicable laws and regulations, and linking the corporation to the external environment. A major amount of the board theory literature discusses these functions in some capacity or another in several of its chapters. One of the most essential notions is that the composition of the board has an influence on the way in which it carries out its duties, and that these duties assist to define, at least in part, the level of success that the firm enjoys. This theory proposes the concept that the gender diversity and ethnic minority diversity of a board, which is a component of a board's composition, is connected with a company's level of profitability. In other words, the make-up of the board as a whole could be related to the success of the company. Although there is not a single theory that can directly anticipate the nature of the connection that exists between board diversity and financial success, several ideas from a variety of fields may shed light on the topic (Carter et al., 2010).

The gender socialisation theory posits that males and females have distinct values because they have different socialisation. Diverse values give rise to distinctive ways of behaving and attitudes (Oradi et al., 2021). Females in leadership positions have a greater propensity to avoid taking risks, which often results in more conservative decision-making (Zalata et al., 2018). Females have a lower propensity than males to participate in fraudulent activities involving financial papers (Heminway, 2007). The viewpoints of typically male-dominated committees can benefit from the heightened awareness of financial hazards and increased attention to risk management that females bring to the table. The conservative worldview and trustworthy leadership of females may contribute to enhancement of internal control and financial reporting quality (Alhababsah & Yekini, 2021). According to Chen et al. (2016), female directors would be more concerned with the quality of internal control as an effort to avoid the negative effect that inadequate internal control may have and the damage that can be done to personal reputations. Being more risk adverse has a lot of benefits, one of which is that it pushes boards to demand for enhanced levels of monitoring to protect their reputation (Lai, 2017).

The resource dependence theory underpins some of the most convincing theoretical justifications for a commercial rationale for board diversity. According to Din et al. (2021), diversity has the capacity to enrich the information provided by the board to management due to the distinct expertise acquired by various directors. Gender and ethnic disparities are nearly guaranteed to provide various data sets that management may utilize to make better choices. Diverse boards of directors also provide access to crucial external stakeholders (Carter et al., 2010). Because women and ethnic minorities make up more than half of the firm's human resource pool, establishing this critical relationship is critical. As a result, diverse organizations now have more access to talent. Although Caucasian women directors send a different message to these markets than ethnic minorities, board diversity sends significant positive signals to labor and product markets. Furthermore, diverse directors may bring different perspectives and alternate approaches to difficulties, since they are less likely to be insiders or business experts (Van der Walt, 2003). Because ethnic minority groups are becoming more prevalent in countries such as the U.S., the ability of an ethnically diverse board to provide legitimacy for the business with both external and internal constituents is especially important.

Ethnically diverse boards foster a higher level of ethics through robust questioning, criticism, and advise. Two separate studies investigate whether or not there is a connection between a diversity index that takes into account both gender and ethnic diversity and a company's level of economic performance. According to the findings of study done by Erhardt et al. (2003), a positive correlation is found between the participation of women and persons of color on the board of directors of a sample of U.S. enterprises and their return on assets and return on equity. Second research is conducted to investigate whether or not the ethnicity of board members has any effect on the company's financial performance. According to the findings of study carried out by Carter et al. (2003), Tobin's Q has a positive correlation with the number of directors who come from underrepresented groups.

2.4. Diversity and Internal Control Weaknesses

While many studies have highlighted the positive impact of board diversity on a company's financial performance, it is important to recognize that diversity can also lead to improved internal controls. According to Tsai and Huang (2021), inadequate internal controls are associated with adverse market reactions, and weak controls may increase the investment risk for the firm and its directors (Cheng et al., 2013). Additionally, weak controls can cause reputational damage to the organization (Lai, 2017). However, diverse boards can avoid those negative risks through better position organizations to assess risks, discover opportunities, and make choices in their best interests. As Bernile et al. (2018) suggest, boards that include members from diverse backgrounds can draw on a greater variety of human capital, talent, ideas, and expertise. They do a more comprehensive and critical evaluation of the internal control system and are more likely to identify and report issues in the internal control system (Parker et al., 2017). Consequently, they bring positive impact on internal control that enhances corporate governance and accountability (Tee & Rassiah, 2019).

Previous research (Hoitash et al., 2009; Krishnan, 2005) investigate the connection between the quality of corporate governance and the efficiency of internal controls. Krishnan (2005) analyzes data collected before the implementation of SOX to demonstrate how audit committee with more independence and financial competence aid in the prevention of internal control issues. The relationship between corporate governance and the disclosure of ICWs under SOX Section 302 and Section 404 is investigated by Hoitash et al. (2009) using a larger sample of post-SOX enterprises. Companies with higher audit committee quality (i.e., more member who is equipped with financial expertise) and a stronger board of directors (i.e., smaller board, more independent, more reputable, longer director tenure, and more frequent board meetings) are less likely to disclose material ICWs.

Researchers have examined whether or not a correlation exists between gender diversity on boards and ICWs. Chen et al. (2016) showed, using data from the U.S., that there is a substantial and inverse correlation between the participation of women on boards and the possibility of ICWs. A prior study based their findings on research conducted on Iranian businesses concluded that companies with female representation in the audit committee are statistically less likely to have ICWs (Oradi et al., 2021). They conduct a study in Iran, a developing country that has inadequate corporate governance rules. In Iran, women's social

positions and engagement in top executive ranks are quite different from those in the U.S. As a consequence of this, their study contributes to the body of previously accumulated information by providing actual data on the connection between female representation on audit committee and ICWs in the context of a developing economy. Furthermore, Parker et al. (2017) discovered that women participating in audit committee were more likely to disclose ICWs. This is because women on audit committee conduct a more critical assessment of the internal control process compared to men; consequently, companies with female audit committee members are more inclined to uncover instances of ICWs. Regarding ethnic diversity, Felix et al. (2021) discovered that a culturally varied audit committee is related to a decreased chance of ICWs, which results in a greater quality of financial reporting.

Previous studies in the U.S. context (Chen et al., 2016; Felix et al., 2021; Parker and al., 2017) generally focus on material flaws under Section 404. What makes this analysis unique is that I investigate both ICWs based on SOX Section 302 and Section 404 to rule out the possibility that the omission of ICWs declared under SOX 302 influences the findings. This is because some ICWs may only be included in the quarterly Section 302 reports and not the annual Section 404 reports due to the difference in reporting frequency (Lin et al., 2022). The difference between Section 302 reports and Section 404 reports may be attributed to a great number of factors. To begin, the benchmark for severe defects under Section 404 may be set lower than the standard under Section 302 in certain cases. Second, the samples under investigation for Section 404 can only come from accelerated filers who have access to more comprehensive information environments. Third, there is a lack of clarity regarding whether or not Section 302 mandates the disclosure of serious deficiencies; as a direct result of this lack of clarity, material issues that are not as severe may not be disclosed (Doyle et al., 2007). Fourth, disclosures under Section 404 are required to be included in the annual report, but disclosures under Section 302 may be made on dates that do not interfere with the event window announcements (Dechow et al., 2010).

Additionally, despite the fact that the vast majority of earlier written works concentrate their attention primarily on gender diversity research, it is impossible to ignore the fact that ethnic diversity also contributes to the decision-making processes of boards, which may have an effect on ICWs. This research incorporates both gender and racial diversity into the discussion of the findings. In addition to this, the study gives further evidence of board diversity by taking into consideration a more recent sample spanning the years 2007 to 2022. Overall, studies on audit committee diversity show that their increased sense of responsibility, conservatism nature and risk aversion enable them to be better supervisors and, in the end, may enhance business performance. Accordingly, I express my hypothesis as follows:

H1: Female and non-Caucasian directors on the audit committee are negatively associated with ICWs.

The initial concept is developed further to include a consideration of the gender of audit committee financial experts. Based on agency theory, committees that have members who are experts in financial matters build an internal control system that is more effective and implement risk management processes that are more appropriate (Oradi et al., 2021). Experts

in the financial sector audit committee are helpful for a multitude of reasons, one of the most important of which is that they have a more in-depth grasp of financial accounts (Bilal et al., 2018). audit committee also have a greater understanding of how to use accounting software. Dhaliwal et al. (2010) have a similar point of view, and they argue that financial specialists are in a better position to determine whether or not financial reports correctly represent reality due to their competence in earnings forecasting and evaluating mergers and acquisitions. This is because financial experts have more experience than the average person has in both of these areas. This suggests that the incorporation of financial knowledge into audit committees by individuals who are not CPAs is likely to result in an improvement in the quality of audits. Nevertheless, only a few studies have looked at the potential effect of gender variations in the AC's financial competence on internal control. According to U.S. data, Zalata et al. (2018) discovered that female financial experts on audit committee have a substantial inverse relation with earnings management (EM), while male financial experts have no significant inverse relation with EM. Abbasi et al. (2020) finds that the involvement of female accounting experts in audit committee has a positive and significant link with audit quality. In contrast, the participation of male financial experts has no substantial impact on audit quality. Female financial experts on audit committee were found to put up more rigorous monitoring mechanisms, which might explain the study's findings. The audit committee would benefit from having more female financial professionals if they performed better oversight (Abbasi et al., 2020; Zalata et al., 2018). Because of this, I elaborate my hypotheses to:

H2: The proportion of female financial experts on the audit committee has a more pronounced impact on ICWs than that of male financial experts.

3. Research Design and Sample Selection

This chapter will address the research design and methodology that will be utilized. This chapter is split into four sections, the first of which will discuss the factors that may be considered the dependent variable. In the second section, I will discuss about the independent variables. Third, I will discuss about the set of control factors that I will use to minimize endogeneity and make the result more resilient. Lastly, I will describe the regression model that takes into account the dependent variable together with the independent variable and the control variable. The definitions, measurement and prior literatures of all variables that are discussed in this chapter may be found in Appendix on Table 1.

3.1. Dependent Variable

The company's external auditor must provide an opinion on whether or not the company has established and implemented a proper and effective internal control system within the internal controls framework specified by the regulations (Oradi et al., 2020). The data on ICWs are available through the Audit Analytics database. The first year that large U.S. companies were required to disclose the audit opinion on the assessment of ICWs start in 2004, so the sample in this study ranges from 2005 until 2022. For the dependent variable, my measure of *ICWs* consists of three proxies: 1) material weakness under SOX Section 302 (*SOX302_DUM*), 2) count weakness under SOX Section 404 (*SOX404_DUM*), and 3) combination of both weakness under SOX Section 302 and 404 (*SOX_COMBI*). For the main analysis using logistic regression model, I use a dummy variable that equals 1 if the company's auditor reports a material ICW and 0 otherwise (Chen et al., 2016; Felix et al., 2017; Parker et al., 2017; Oradi et al., 2021). In addition, I will conduct a robustness test that uses an OLS regression concerning a continuous output of ICW disclosed under SOX Section 404 (*SOX404_COUNT*).

3.2. Independent Variables

In attempts to answer the research question, the independent variables in Model (1) are audit committee gender diversity (*FEM*) and audit committee ethnic diversity (*ETH*). The data concerning gender and ethnicity of the audit committee is derived from Institutional Shareholder Services (ISS). Owing to data availability on ISS that is only accessible since 2007, I will use the observations that overlap with other datasets. I follow Oradi et al. (2021) and Sultana et al. (2020) to measure gender diversity on the audit committee in two different ways: (1) a continuous measure (*FEM_PRO*) and (2) a dichotomous measure (*FEM_DUM*). I will also use the same approach to measure ethnic diversity: (1) a continuous measure (*ETH_PRO*) and (2) a dichotomous measure (*ETH_DUM*). The independent variables in Model (2) are *FEMEX_PRO* and *MALEX_PRO*. *FEMEX_PRO* represents the proportion of female financial experts on the audit committee, and *MALEX_PRO* represents the proportion of males.

3.3. Control Variables

In this study, I will use numerous control factors to minimize endogeneity, which has been addressed by previous scholars. There are several control variables that may be employed. However, after conducting a substantial amount of research, I come to the conclusion that the best way to control for the effects of gender and ethnic diversity on ICWs is to use nine variables that have been used in previous research.

I account for board monitoring characteristics, which begins by audit committee characteristics, such as audit committee independence (*AC_IND*), which is obtained from ISS. I anticipate that companies with more independent audit committees will have better corporate governance and, as a result, a reduced risk of internal control issues (Chen et al., 2016). A number of control variables concern the financial characteristics of the firm. Based on previous research conducted by Ashbaugh-Skaife et al. (2007), Krishnan (2005), and Parker et al. (2017), I expect that companies experiencing negative profitability (*LOSS*), high levels of leverage (*LEV*), and a significant portion of debt (*DEBT*) are more likely to receive adverse SOX reports. According to prior research, bigger auditing firms conduct higher-quality audits, and as a result, they may be in a better position to identify and report instances of ICWs (Chen et al., 2016; Oradi et al., 2021). As a result, auditor type (*BIG4*) is included into the model. Following prior research, I control for other firm characteristics including inventory (*INVT*). Firms that have larger amounts of inventory may face various challenges when it comes to accurately assessing their inventory levels, preventing employee theft, and ensuring timely adjustments for inventory depreciation (Ashbaugh-Skaife et al., 2007; Oradi et al., 2021). In addition, I take into account the effects of ownership structure, which includes institutional ownership (*INSTOWN*) derived from Thomson/Refinitiv because previous study documents that there is a significant correlation between ICWs and ownership structure (Oradi et al., 2021). The remaining control variables are obtained from Compustat.

Table 1. Variable definitions, measurements, and sources

Panel A: Independent variables			
Variable	Variable Operationalization	Prior Literature	Source
<i>FEM_PRO</i>	Proportion of female audit committee members.	Abbasi et al. (2020); Oradi et al. (2021); Parker et al. (2017); Sultana et al. (2020)	ISS
<i>FEM_DUM</i>	Indicator variable, equals 1 if there is a female member on the audit committee, and 0 otherwise.	Oradi et al. (2021); Sultana et al. (2020)	ISS
<i>ETH_PRO</i>	Proportion of non-Caucasian audit committee members.	Harjoto et al. (2015)	ISS
<i>ETH_DUM</i>	Indicator variable, equals 1 if there is a non-Caucasian member on the audit committee, and 0 otherwise.	Harjoto et al. (2015)	ISS
<i>FEMEX_PRO</i>	Proportion of female financial experts on the audit committee to the total number of audit committee members.	Abbasi et al. (2020); Oradi et al. (2021); Zalata et al. (2018)	ISS

<i>MALEX_PRO</i>	Proportion of male financial experts on the audit committee to the total number of audit committee members.	Abbasi et al. (2020); Oradi et al. (2021); Zalata et al. (2018)	ISS
<i>FEMETH_PRO</i>	Proportion of female with non-Caucasian ethnicity on the audit committee to the total number of audit committee members.	-	ISS

Panel B: Dependent variable

Variable	Variable Operationalization	Prior Literature	Source
<i>SOX302_DUM</i>	Indicator variable, equals 1 if the firm's auditor reports an internal control weakness under SOX Section 302, and 0 otherwise.	-	Audit Analytics
<i>SOX404_DUM</i>	Indicator variable, equals 1 if the firm's auditor reports an internal control weakness under SOX Section 404, and 0 otherwise.	Chen et al. (2016); Felix et al. (2017); Parker et al. (2017)	Audit Analytics
<i>SOX_COMBI</i>	Indicator variable, equals 1 if the firm's auditor reports an internal control weakness either under SOX Section 302 or 404, and 0 otherwise.	-	Audit Analytics
<i>SOX404_COUNT</i>	Count weakness in internal control under SOX Section 404.	-	Audit Analytics

Panel C: Control variables

Variable	Variable Operationalization	Prior Literature	Source
<i>AC_IND</i>	Proportion of independent audit committee members.	Abbasi et al. (2020); Parker et al. (2017); Sultana et al. (2020)	ISS
<i>LOSS</i>	Indicator variable, equals 1 if the firm reports a negative net income, and 0 otherwise.	Chen et al. (2016); Krishnan (2005); Oradi et al. (2021); Sultana et al. (2020)	Compustat
<i>LEV</i>	Total liabilities scaled by total assets.	Abbasi et al. (2020); Din et al. (2021); Parker et al. (2017)	Compustat
<i>BIG4</i>	Indicator variable, equals 1 if the auditor is a Big 4, and 0 otherwise.	Chen et al. (2016); Din et al. (2021); Oradi et al. (2021)	Compustat
<i>INVT</i>	Inventory scaled by total assets.	Chen et al. (2016); Oradi et al. (2021); Parker et al. (2017)	Compustat
<i>DEBT</i>	Receivables scaled by total assets.	Abbasi et al. (2020); Parker et al. (2017)	Compustat
<i>INSTOWN</i>	Percentage of shares held by institutional investors.	Chen et al. (2016); Oradi et al. (2021)	Thomson/ Refinitiv

3.4. Regression Models

The questions are probed using a pair of logistic regression models. Model (1) investigates whether the presence of females and non-Caucasian on audit committee is related to the presence of ICWs, whereas Model (2) compares the presence of females and males who are financial experts on audit committee for any significant relation with the presence of ICWs.

$$ICWs = \alpha + \beta_0 + \beta_1 FEM + \beta_2 ETH + Controls + \varepsilon \quad (1)$$

$$ICWs = \alpha + \beta_0 + \beta_1 FEMEX_PRO + \beta_2 MALEX_PRO + Controls + \varepsilon \quad (2)$$

3.5. Sample Selection

Audit Analytics

The data collection process begins with obtaining information from Audit Analytics on SOX 302 Disclosure Controls, resulting in an initial dataset of 583,406 firm-year observations from 12,831 distinct firms. To ensure data accuracy and reliability, the dataset undergoes a thorough cleaning process where any duplicate observations or missing data are eliminated, which is reduced to 447,800 firm-year observations and 12,830 distinct firms. Proceeding to the collection of data related to SOX 404 Internal Controls, a dataset of 199,385 firm-year observations is obtained from Audit Analytics. Like the previous dataset, this dataset is also subjected to a cleaning process to remove any duplicates or missing data, resulting to a reduced dataset to 106,443 firm-year observations, representing 11,812 unique firms.

After removing the missing values, the datasets are merged based on common identifiers, such as the CUSIP number and the fiscal year end period. This merging process combines the relevant information from both datasets into a single dataset. To ensure data consistency, zero-values are imputed for firm-years that are not present in either the SOX 302 or 404 datasets. This step allows for a comprehensive analysis by incorporating all available data points. Next, duplicate observations are identified and removed from the merged dataset. As a result, the dataset is further refined, reducing it to 104,608 firm-year observations, while maintaining the same 11,812 unique firms.

ISS

Starting with an initial dataset of 225,429 firm-year observations and 3,229 firms, data cleaning procedures are then implemented by removing any duplicate observations, missing values, unknown or undisclosed ethnicities, and excluding individuals who are not part of the audit committee, resulting in a refined dataset containing 77,117 firm-year-director observations and 3,166 firms. The proportion of female, non-Caucasian, and financial experts are calculated from this dataset where new variables of *FEM_PRO*, *FEM_DUM*, *ETH_PRO*, *ETH_DUM*, *FEMEX_PRO*, *MALEX_PRO*, *AC_IND* are generated. These variables are then combined to create a single, comprehensive collection of independent and control variables,

which consists of 23,446 firm-year observations and represents 3,166 unique firms, enabling a comprehensive analysis of the correlations between the variables.

Compustat

I utilise Compustat data to construct control variables, where I obtain 224,626 firm-year observations and 24,480 firms. Due to their unique characteristics and regulatory constraints, it is impossible to compare observations with lacking CUSIP, financial data, and companies in the financial industry, missing values. Therefore, a final sample is reduced to 94,202 firm-year observations and 11,934 distinct firms.

Thomson/Refinitiv

The data retrieval process begins with a collection of 801,405 firm-year observations and 50,448 unique firms. To ensure data completeness, observations with missing CUSIP values are removed. Given the availability of year, month, and day information, the dataset is further filtered to focus on observations specifically at the end of each year. To enhance data quality, any remaining observations with missing values are also removed. This filtering process narrows down the dataset to 168,944 firm-year observations and 33,665 unique firms.

Final dataset

After combining the three datasets of independent, dependent, and control variables, the final sample consists of 13,685 firm-year observations, representing 1,461 unique firms. To ensure the reliability of the data for the regression analysis, observations with missing values are further removed, resulting in a slightly reduced sample size of 13,682 firm-year observations while maintaining the 1,461 unique firms. Furthermore, to minimize the impact of outliers on the regression results, a winsorization technique is applied to the variables. This involves adjusting extreme values at the 1st and 99th percentiles, thereby bringing them within a more reasonable range while preserving the integrity of the dataset. For a clear presentation of the sample selection procedure, please refer to Table 2, which provides a detailed overview of the process.

Table 2. Sample selection procedure

Panel A: Sample selection for Audit Analytics						
	SOX 302		SOX 404		Merge	
	Firm-year obs.	Firms	Firm-year obs.	Firms	Firm-year obs.	Firms
Beginning of the sample	583,406	12,831	199,385	11,813		
<i>Less: Duplicates</i>	(5,148)	(0)	(70,419)	(0)		
<i>Less: Missing CUSIP</i>	(130,458)	(1)	(22,523)	(1)		
Final sample	447,800	12,830	106,443	11,812	107,711	11,812
<i>Less: Duplicates</i>					(3,103)	(0)
Final sample					104,608	11,812
Panel B: Sample selection for Institutional Shareholder Services						
	Firm-year-director obs.		Firms		Firm-year obs.	
Beginning of the sample	225,429		3,229			

<i>Less: Duplicates</i>	(34)	(0)		
<i>Less: Missing CUSIP</i>	(0)	(0)		
<i>Less: Unknown ethnicity</i>	(25,807)	(13)		
<i>Less: Non-audit committee</i>	(122,471)	(50)		
Final sample	77,117	3,166	23,446	3,166

Panel C: Sample selection for Compustat

	Firm-year obs.	Firms
Beginning of the sample	224,626	24,480
<i>Less: Missing CUSIP</i>	(160)	(1)
<i>Less: Missing financial data</i>	(675)	(6,358)
<i>Less: Financial firms</i>	(51,732)	(3,191)
<i>Less: Missing values</i>	(77,857)	(2,996)
Final sample	94,202	11,934

Panel D: Sample selection for Thomson/Refinitiv

	Firm-year obs.	Firms
Beginning of the sample	801,405	50,448
<i>Less: Missing CUSIP</i>	(5)	(1)
<i>Less: Quarterly data</i>	(606,657)	(9,282)
<i>Less: Missing values</i>	(25,799)	(7,500)
Final sample	168,944	33,665

Panel E: Final sample

	Firm-year obs.	Firms
Final sample after merging	13,685	1,461
<i>Less: Missing values</i>	(3)	(0)
Final sample	13,682	1,461

4. Empirical Results

4.1. Descriptive Information

The data shown in Table 3 presents information related to the percentage of non-Caucasians and females who served on audit committees during the sample period. The percentage of women serving on audit committees has increased dramatically over the years, in which almost two-thirds of audit committees, specifically 62.36 percent, are made up of female members by 2022. On the other hand, the percentage of non-Caucasians serving on audit committees is slowly increasing within the sample; currently, only about one-third of audit committees of 31.09 percent are comprised of members who are not of Caucasian descent. This evidence is consistent with Forbes' (2022) conclusions that ethnic minorities are underrepresented in the boardroom, implying that a greater focus should be made on improving racial and cultural diversity, which is inadequate (Asare, 2020).

Meanwhile, there is no clear trend to be seen within the sample regarding the occurrence of material weaknesses. In the early years, both SOX Section 302 and 404 witnessed considerable increases, with the proportion of ICW almost doubling. Section 302 rose from 8.68 percent to 13.97 percent in 2007, while Section 404 rose from 9.71 percent to 16.86 percent. Following then, the percentages varied throughout time but typically showed a constant or slightly dropping tendency. Both figures showed a rising trend beginning in 2005 and reaching a high in 2014. Since then, the trend has remained largely stable in the sample's following years, with around 19 percent of firms currently reporting a material weakness based on the Audit Analytics dataset. More material weaknesses reported under Section 404 means that it puts a greater focus on the effectiveness of ICFR and requires more detailed examination and reporting. The larger breadth, extensive analyses, and external attestation of Section 404 contribute to its reputation as a more stringent regulatory component compared to Section 302.

Table 3. Female, non-Caucasian and ICW proportion over time

Year	%Female AC	%Non-Caucasian AC	%SOX302 (ICW = 1)	%SOX404 (ICW = 1)
2005	-	-	10.36	12.11
2006	-	-	8.68	9.71
2007	17.53	11.62	13.97	16.86
2008	18.10	11.33	16.62	19.36
2009	17.46	11.17	18.53	20.97
2010	17.32	11.44	18.92	21.33
2011	17.65	11.82	19.06	21.57
2012	18.43	11.97	19.79	22.32
2013	19.96	12.31	20.90	23.76
2014	21.44	12.83	21.13	24.03
2015	22.86	13.52	20.78	23.13
2016	23.88	13.43	20.91	23.10
2017	26.19	14.34	20.61	22.20
2018	30.41	15.78	20.74	22.53
2019	35.95	16.50	20.87	21.21
2020	51.33	19.25	19.01	19.95

2021	57.75	23.49	19.34	19.90
2022	62.36	31.09	18.39	19.07

Table 4 shows the descriptive statistics of the variables that are employed in this study. According to the results presented by *SOX302_DUM*, the material weakness that is reported under Section 302 indicates that just 3 percent of the firms have internal control deficiency. Fewer firms also revealed weaknesses in accordance with Section 404, as shown by *SOX404_DUM*, which found that only an average of 3 percent of businesses had inadequacies in their internal control system. In other words, many firms do not have any substantial weaknesses for any of the sample years. The average value of *FEM_PRO* is 0.20, which indicates that females occupy an average of one-fifth of the seats on audit committee within the sample. It is in line with the findings of Chen et al. (2016), in which they discovered a value of 19.4 percent in the U.S. However, it is somewhat different from what Oradi et al. (2021) observed in Iran, which was 4 percent, and it is slightly lower than what Abbasi et al. (2020) discovered in the United Kingdom, which was 22 percent. Given that the mean value of *FEM_DUM* is 0.52, it can be deduced that fifty percent of the firm-year data included within the sample had at least one female serving on the audit committee. Similarly, the mean value of *ETH_PRO* is 0.12, which indicates that non-Caucasians hold an average of 12 percent of the seats on audit committee within the sample. This statistic is consistent with the findings of a poll that was performed by Forbes (2022), which found that racial minorities only make up 12.5 percent of boardroom representation. The fact that *ETH_DUM* has a mean value of 0.34 indicates that about one-third of the firm-year observations included within the sample have at least one member who is not of Caucasian descent. The descriptive data also highlight the fact that 11 percent of the sample is comprised of female finance experts serving on audit committees, as revealed by *FEMEX_PRO*. In addition, I have discovered that 45 percent of the male members of the audit committee who have experience in finance are represented by *MALEX_PRO*. In keeping with the findings of previous research (Abbasi et al., 2020; Oradi et al., 2021; Zalata et al., 2018), these descriptive data point to a larger presence of male financial experts than female financial experts.

Table 4. Descriptive statistics

Statistic	N	Mean	St. Dev.	Min	Max
<i>SOX302_DUM</i>	13,682	0.03	0.18	0	1
<i>SOX404_DUM</i>	13,682	0.03	0.18	0	1
<i>SOX404_COUNT</i>	13,682	0.06	0.44	0	17
<i>SOX_COMBI</i>	13,682	0.03	0.18	0	1
<i>FEM_PRO</i>	13,682	0.20	0.23	0.00	1.00
<i>FEM_DUM</i>	13,682	0.52	0.50	0	1
<i>ETH_PRO</i>	13,682	0.12	0.19	0.00	1.00
<i>ETH_DUM</i>	13,682	0.34	0.47	0	1
<i>FEMEX_PRO</i>	13,682	0.11	0.19	0.00	1.00
<i>MALEX_PRO</i>	13,682	0.45	0.31	0.00	1.00
<i>FEMETH_PRO</i>	13,682	0.04	0.11	0.00	1.00
<i>AC_IND</i>	13,682	0.79	0.41	0.00	1.00
<i>LOSS</i>	13,682	0.14	0.35	0	1
<i>LEV</i>	13,682	0.54	0.20	0.12	0.96
<i>BIG4</i>	13,682	0.92	0.27	0	1

<i>INVT</i>	13,682	0.10	0.09	0.00	0.29
<i>DEBT</i>	13,682	0.12	0.08	0.00	0.27
<i>INSTOWN</i>	13,682	0.85	0.13	0.60	1.13

Table 5 exhibits the Pearson correlation matrix of each variable in the model. The majority of the variables show significant positive or negative correlations with one another at the 1 percent, 5 percent, or 10 percent significance level. It demonstrates that there is a strong negative correlation between female and non-Caucasian representation on audit committees and deficiencies in internal control. In addition, there is a negative association between the presence of finance experts on audit committees and the existence of internal control weakness, although the correlation is not significant. Nevertheless, this approach does not adjust for other factors in the models; for this reason, the regression analysis that will be provided below is a more suitable technique for resolving the problems posed by this study. Further, it is doubtful that there will be issues resulting from multicollinearity since the variance inflation factors (VIF) values are much below 10 in the major models, with the highest VIF value being 1.25 (Bose et al., 2017).

Table 5. Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) <i>SOX302_DUM</i>	1.00								
(2) <i>SOX404_DUM</i>	0.94***	1.00							
(3) <i>SOX404_COUNT</i>	0.73***	0.77***	1.00						
(4) <i>SOX_COMBI</i>	0.98***	0.96***	0.74***	1.00					
(5) <i>FEM_PRO</i>	-0.02*	-0.02	-0.01	-0.02*	1.00				
(6) <i>FEM_DUM</i>	-0.02*	-0.02*	-0.01	-0.02*	0.82***	1.00			
(7) <i>ETH_PRO</i>	-0.02*	-0.02*	-0.02*	-0.02*	0.18***	0.20***	1.00		
(8) <i>ETH_DUM</i>	-0.03**	-0.02**	-0.02*	-0.03**	0.17***	0.24***	0.87***	1.00	
(9) <i>FEMEX_PRO</i>	-0.01	-0.00	-0.00	-0.01	0.69***	0.54***	0.15***	0.12***	1.00
(10) <i>MALEX_PRO</i>	-0.01	-0.01	0.00	-0.01	-0.35***	-0.27***	-0.07***	-0.07***	-0.18***
(11) <i>FEMETH_PRO</i>	-0.03***	-0.03***	-0.03***	-0.04***	0.40***	0.33***	0.56***	0.48***	0.28***
(12) <i>AC_IND</i>	0.00	0.01	-0.00	0.00	-0.28***	-0.21***	-0.13***	-0.10***	-0.22***
(13) <i>LOSS</i>	0.07***	0.07***	0.06***	0.07***	-0.02**	-0.03***	-0.04***	-0.05***	-0.03***
(14) <i>LEV</i>	0.01	0.01	0.01	0.01	0.19***	0.23***	0.14***	0.18***	0.16***
(15) <i>BIG4</i>	-0.03***	-0.03***	-0.02	-0.03***	0.10***	0.13***	0.07***	0.09***	0.09***
(16) <i>INVT</i>	0.01	0.01	0.02*	0.01	-0.02**	-0.02*	-0.07***	-0.05***	-0.01
(17) <i>DEBT</i>	0.03***	0.03**	0.03***	0.03***	-0.09***	-0.07***	-0.07***	-0.06***	-0.05***
(18) <i>INSTOWN</i>	0.03**	0.02*	0.02*	0.03**	-0.01	-0.01	-0.05***	-0.06***	0.01

Variables	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(10) <i>MALEX_PRO</i>	1.00								
(11) <i>FEMETH_PRO</i>	-0.12***	1.00							
(12) <i>AC_IND</i>	0.02*	-0.14***	1.00						
(13) <i>LOSS</i>	0.03***	-0.02*	-0.07***	1.00					
(14) <i>LEV</i>	0.03**	0.11***	-0.12***	0.05***	1.00				
(15) <i>BIG4</i>	0.01	0.06***	0.03**	-0.05***	0.23***	1.00			
(16) <i>INVT</i>	-0.00	-0.04***	0.06***	-0.02*	-0.07***	-0.07***	1.00		
(17) <i>DEBT</i>	0.03***	-0.05***	0.07***	-0.04***	-0.05***	-0.06***	0.13***	1.00	
(18) <i>INSTOWN</i>	0.04***	-0.04***	-0.06***	0.04***	-0.04***	0.02*	0.04***	0.02**	1.00

Note: *p<0.1; **p<0.05; ***p<0.01

4.2. Multivariate Regression Analyses

Table 6 presents the logistic regression results for hypothesis 1, which investigates the relationship between the presence of female and non-Caucasian members on audit committees and the occurrence of internal control weaknesses. Panel A focuses on the variables of interest,

namely the proportion of female audit committee members and the proportion of non-Caucasian audit committee members. To support hypothesis 1, these variables should exhibit a significant negative coefficient. The findings align with hypothesis 1 for non-Caucasian members of the audit committee in relation to ICW reported under Section 302 and the combined Sections 302 and 404. In these instances, the variable *ETH_PRO* demonstrates significance at the 10 percent level and displays coefficient values of -0.486 and -0.518, respectively. To further assess the economic magnitude of these relationships, I also employ the use of marginal effects. A one-unit increase in the proportion of non-Caucasian audit committee members is associated with a 1.53 percent reduction in the predicted probability of reporting material weakness under Section 302. Similarly, a one-unit increase in the proportion of non-Caucasian members on the audit committee is linked to a 1.69 percent decrease in the predicted probability of reporting material weakness under both sections combined. However, the same pattern is not observed when examining the percentage of females on the audit committee. In this case, the variable of interest is not significant, indicating insufficient evidence to support the first hypothesis. It is worth noting that some previous publications have argued that there must be a certain percentage of females on the board for them to have a significant influence on the company performance. For instance, Joecks et al. (2013) found that gender diversity of the board is positively linked with company performance only until the board is made of around 30 percent female members. In this sample, the mean values for *FEM_PRO* and *ETH_PRO* are, respectively, 20 percent and 12 percent. With regards to Section 404, this threshold criterion may be applicable. Since the initial result is not statistically significant, I will perform a robustness test by taking into account the combined proportion of female with non-Caucasian ethnicity on the audit committee.

Several additional control factors and internal control deficiencies are shown to have substantial connections with each other. The coefficients on the control variables are, for the most part, in accordance with the expectations. Firms that are more financially stressed, as assessed by a negative net income (*LOSS*) and higher debt levels (*DEBT*) is shown to have a positive and significant association with internal control weakness, which is supported by prior literatures (Krishnan, 2005; Parker et al. 2017). From an economic standpoint through employing marginal effects, firms that undergo financial loss face a 2.55 percent higher likelihood of encountering difficulties with their internal control systems, as reported under Section 302. Similarly, highly indebted firms have a 6.81 percent higher likelihood of experiencing such challenges. When examining the impact of Section 404, loss firms see a 2.67 percent increase in the likelihood of weaknesses, while highly indebted firms experience a 5.56 percent increase. Considering both Section 302 and 404 together, these percentages rise to 2.82 percent for loss firms and 6.79 percent for highly indebted firms. These findings highlight the significant role that financial performance and debt levels play in the occurrence of internal control weaknesses. However, the coefficient on *AC_IND* is not significant, which demonstrates that there is no substantial influence exerted by independent audit committee on ICWs in the sample. In addition, I discover that firms which are audited by the Big 4 accounting firms (*BIG4*) have a reduced risk of having difficulties with their internal controls. The regression results in the first column reveal a significant finding, companies audited by a Big 4 accounting firm have a lower likelihood, approximately 1.13 percent, of experiencing

material weaknesses reported under Section 302. This suggests that the presence of a Big 4 auditor is associated with a reduced risk of ICWs in that specific section. Similarly, under Section 404, the likelihood is 1.25 percent lower, indicating a consistent trend. When both sections are combined, the lower likelihood increases to 1.19 percent, further highlighting the potential benefits of engaging a Big 4 auditor in terms of enhancing internal control reliability. This is owing to the fact that Big 4 auditors have higher criteria for internal controls (Parker et al., 2017).

Panel B of Table 6 presents the key empirical findings when examining the presence of female and non-Caucasian members on audit committees using dummy variables. To assess the economic magnitude, I perform calculations for odds ratios, similar to a previous study conducted by Parker et al. (2017). In their study, they employed a logistic regression model that included a dummy variable for both the independent and dependent variables, which is also applied in the current analysis. The first column presents a negative and significant coefficient of -0.213 for the variable *FEM_DUM*. This indicates that firms with at least one female member on the audit committee have a 19 percent lower likelihood (odds ratio of 0.81 from $e^{-0.213}$) of reporting material weakness under Section 302, compared to firms without female representation. Similarly, the negative and significant coefficient of -0.260 for the variable *ETH_DUM* suggests that firms with at least one non-Caucasian member on the audit committee have approximately 23 percent lower odds (odds ratio of 0.77 from $e^{-0.260}$) of experiencing material weakness. These findings support the acceptance of the first hypothesis, indicating that the presence of female and non-Caucasian members on the audit committee is associated with a reduced likelihood of material weakness. The results remain consistent when examining material weakness reported under Section 404 or a combination of both sections. Thus, the first hypothesis can be accepted when using dichotomous measures for the predictor variables. Contrary to the critical mass hypothesis proposed by Torchia et al. (2011), which suggests that a critical mass of female directors enhances corporate innovation, the findings indicate that even having just one female director is associated with a lower probability of internal control problems. This discrepancy may be attributed to the unique context of ICFR, where CEOs and CFOs are required to provide judgments on the quality of ICFR, and auditors must attest to its quality. In such a highly regulated and litigious market like the U.S., audit committees exercise greater caution in assessing internal control issues related to ICFR quality (Abbott et al., 2012; Srinidhi et al., 2011).

Table 6. Regression result of hypothesis 1

Panel A: Continuous measure of female and non-Caucasian audit committee members			
	Dependent variable		
	<i>SOX302_DUM</i>	<i>SOX404_DUM</i>	<i>SOX_COMBI</i>
	Logistic regression	Logistic regression	Logistic regression
	(1)	(2)	(3)
Independent variable			
<i>FEM_PRO</i>	-0.332 (0.239)	-0.249 (0.241)	-0.319 (0.234)
<i>ETH_PRO</i>	-0.486* (0.295)	-0.417 (0.298)	-0.518* (0.292)
Control variable			

<i>AC_IND</i>	0.127 (0.672)	-0.289 (0.734)	0.170 (0.665)
<i>LOSS</i>	0.809*** (0.112)	0.887*** (0.112)	0.867*** (0.109)
<i>LEV</i>	0.269 (0.247)	0.322 (0.251)	0.298 (0.243)
<i>BIG4</i>	-0.360** (0.157)	-0.441*** (0.157)	-0.367** (0.155)
<i>INVT</i>	0.478 (0.516)	0.612 (0.523)	0.514 (0.507)
<i>DEBT</i>	2.159*** (0.624)	1.831*** (0.639)	2.083*** (0.615)
<i>INSTOWN</i>	0.613* (0.362)	0.462 (0.366)	0.584 (0.355)
Constant	-3.950*** (0.787)	-3.486*** (0.841)	-3.897*** (0.776)
Year fixed effects	Yes	Yes	Yes
Observations	13,682	13,682	13,682
Log Likelihood	-1,908.356	-1,856.817	-1,959.985
Akaike Inf. Crit.	3,864.712	3,761.635	3,967.970

Panel B: Dichotomous measure of female and non-Caucasian audit committee members

	Dependent variable		
	<i>SOX302_DUM</i>	<i>SOX404_DUM</i>	<i>SOX_COMBI</i>
	Logistic regression (1)	Logistic regression (2)	Logistic regression (3)
Independent variable			
<i>FEM_DUM</i>	-0.213** (0.104)	-0.206* (0.106)	-0.221** (0.102)
<i>ETH_DUM</i>	-0.260** (0.112)	-0.224** (0.114)	-0.258** (0.111)
Control variable			
<i>AC_IND</i>	0.148 (0.671)	-0.266 (0.734)	0.192 (0.664)
<i>LOSS</i>	0.800*** (0.112)	0.877*** (0.112)	0.858*** (0.109)
<i>LEV</i>	0.339 (0.248)	0.397 (0.252)	0.370 (0.244)
<i>BIG4</i>	-0.333** (0.157)	-0.411*** (0.157)	-0.338** (0.155)
<i>INVT</i>	0.481 (0.515)	0.617 (0.522)	0.521 (0.506)
<i>DEBT</i>	2.165*** (0.624)	1.827*** (0.638)	2.089*** (0.614)
<i>INSTOWN</i>	0.599* (0.361)	0.450 (0.365)	0.572 (0.354)
Constant	-3.985*** (0.786)	-3.521*** (0.841)	-3.935*** (0.775)
Year fixed effects	Yes	Yes	Yes
Observations	13,682	13,682	13,682
Log Likelihood	-1,905.191	-1,853.876	-1,956.712
Akaike Inf. Crit.	3,858.383	3,755.752	3,961.425

Note: *p<0.1; **p<0.05; ***p<0.01

Table 7 displays the logistic regression analysis examining the relationship between having female and male financial experts on the audit committee and the occurrence of internal control weakness. The variables of interest, namely the presence of female or male financial experts, demonstrate a negative association, but the results do not reach statistical significance. Therefore, hypothesis 2 cannot be accepted. This finding aligns with Bédard and Gendron's (2010) research, which indicates that 57 percent of studies suggest a positive impact of audit committee financial competence on corporate outcomes, 10 percent report a negative effect, and 33 percent find no significant effect. Therefore, these findings shed some light on the contradictory results observed in the literature regarding the impact of audit committee financial expertise on corporate outcomes.

Table 7. Regression result of hypothesis 2

	Dependent variable		
	SOX302_DUM	SOX404_DUM	SOX_COMBI
	Logistic regression (1)	Logistic regression (2)	Logistic regression (3)
Independent variable			
<i>FEMEX_PRO</i>	-0.131 (0.290)	-0.094 (0.292)	-0.179 (0.287)
<i>MALEX_PRO</i>	-0.238 (0.170)	-0.276 (0.173)	-0.234 (0.167)
Control variable			
<i>AC_IND</i>	0.113 (0.669)	-0.294 (0.730)	0.154 (0.662)
<i>LOSS</i>	0.832*** (0.112)	0.908*** (0.112)	0.888*** (0.109)
<i>LEV</i>	0.199 (0.246)	0.267 (0.250)	0.231 (0.242)
<i>BIG4</i>	-0.390** (0.157)	-0.465*** (0.157)	-0.393** (0.155)
<i>INVT</i>	0.508 (0.514)	0.631 (0.521)	0.546 (0.505)
<i>DEBT</i>	2.273*** (0.622)	1.936*** (0.636)	2.196*** (0.613)
<i>INSTOWN</i>	0.664* (0.362)	0.511 (0.366)	0.635* (0.355)
Constant	-4.019*** (0.786)	-3.557*** (0.839)	-3.970*** (0.775)
Year fixed effects	Yes	Yes	Yes
Observations	13,682	13,682	13,682
Log Likelihood	-1,910.087	-1,857.301	-1,961.902
Akaike Inf. Crit.	3,868.174	3,762.602	3,971.804

Note: *p<0.1; **p<0.05; ***p<0.01

4.3. Robustness Test

Table 8 presents the results of the first model in which the predictor variable is a combination of female representation and ethnicity on the audit committee. The coefficient value for the proportion of female with non-Caucasian ethnicity in the audit committee is negative and significant at 1 percent level. These findings are consistent across all proxies

related to internal control weaknesses, indicating their economic validity. In terms of the magnitude of the effect by analysing the marginal effects, having a female with non-Caucasian ethnicity on the audit committee reduces the likelihood of experiencing ICW reported under Section 302 by 8.38 percent. Similarly, having a female with non-Caucasian ethnicity on the audit committee decreases the likelihood of ICW reported under Section 404 by 7.09 percent. When both sections are considered together, a company with a female member of non-Caucasian ethnicity on the audit committee is typically 8.55 percent less likely to encounter material weaknesses compared to a company without such a member on the audit committee. In line with the findings of the main analysis, the coefficients for control variables, including *LOSS*, *BIG4*, and *DEBT*, are similarly statistically significant. This suggests that the state of a company's finances as well as the selection of auditors are important factors to consider when determining the effectiveness of its internal control system.

The robustness test includes an alternative measure of internal control weaknesses, which is based on the count of reported weaknesses under Section 404. In the fourth column, the coefficient remains negative and significant at a 1 percent level, suggesting that companies with a female audit committee member of non-Caucasian ethnicity are associated with a 10.7 percent lower likelihood of reporting material weaknesses under Section 404. This finding stands out as a key distinction from the main analysis. Another notable difference is that the proportion of inventory (*INVT*) and leverage (*LEV*) variables are significant at a 10 percent level in this context. A one percent increase in *LEV* and *INVT* is associated with a 3.3 and 7.2 percent increase in material weakness reported under Section 404, respectively. Based on the findings of Ashbaugh-Skaife et al. (2007), companies that have a higher level of inventory tend to face difficulties in accurately measuring inventory, experiencing employee theft, and timely write-downs of inventory. These issues are closely linked to challenges in maintaining effective internal control. Additionally, firms with a higher debt-to-assets ratio are found to be more prone to having deficiencies in their internal control system, which aligns with previous research conducted by Din et al. (2021).

Table 8. Regression result of robustness test

	Dependent variable			
	<i>SOX302_DUM</i>	<i>SOX404_DUM</i>	<i>SOX_COMBI</i>	<i>SOX404_COUNT</i>
	Logistic regression	Logistic regression	Logistic regression	OLS regression
	(1)	(2)	(3)	(4)
Independent variable				
<i>FEMETH_PRO</i>	-2.657*** (0.696)	-2.330*** (0.679)	-2.624*** (0.681)	-0.107*** (0.035)
Control variable				
<i>AC_IND</i>	0.171 (0.673)	-0.248 (0.736)	0.213 (0.666)	-0.069 (0.055)
<i>LOSS</i>	0.814*** (0.112)	0.890*** (0.112)	0.0872*** (0.109)	0.081*** (0.011)
<i>LEV</i>	0.257 (0.245)	0.320 (0.249)	0.284 (0.241)	0.033* (0.019)
<i>BIG4</i>	-0.366** (0.156)	-0.442*** (0.156)	-0.372** (0.154)	-0.016 (0.015)

<i>INVT</i>	0.470 (0.515)	0.604 (0.522)	0.508 (0.506)	0.072* (0.041)
<i>DEBT</i>	2.216*** (0.624)	1.874*** (0.638)	2.142*** (0.615)	0.187*** (0.050)
<i>INSTOWN</i>	0.581 (0.363)	0.431 (0.367)	0.555 (0.356)	0.025 (0.028)
Constant	-3.999*** (0.788)	-3.529*** (0.843)	-3.948*** (0.777)	0.060 (0.064)
Year fixed effects	Yes	Yes	Yes	Yes
Observations	13,682	13,682	13,682	13,682
Log Likelihood	-1,901.482	-1,851.065	-1,953.180	
Akaike Inf. Crit.	3,848.964	3,748.130	3,952.361	
R2				0.010
Adjusted R2				0.008
Residual Std. Error (df = 13,659)				0.442
F Statistic (df = 22; 13,659)				6.284***

Note: *p<0.1; **p<0.05; ***p<0.01

5. Conclusion

5.1. Summary of Results

The first section of this thesis, which focuses on the participation of females and non-Caucasian members on the audit committee, indicated that having at least one female or non-Caucasian member is highly connected to a reduced occurrence of internal control weaknesses. This means that just having a minority member on the audit committee may help strengthen its ability to detect and resolve these concerns. However, when the proportion or percentage of females and non-Caucasian individuals is used as the metric, the results are inconclusive. This shows that the link between variety and internal control deficiencies may not be linear, and that a threshold must be reached for the effect to be significant. The lack of significance for the proportion or percentage variables indicates that simply increasing the number of female members alone may not be enough to detect a significant relationship with ICWs in this particular sample. It is worth noting that previous research has also identified a threshold effect for gender diversity in relation to company performance. Some studies have suggested that a certain percentage of women on the board is necessary to observe their significant influence. In this case, the relatively low mean percentage of female members on the audit committee (20 percent) could explain the lack of significance. In conclusion, the difference in significance between the dummy variable and the proportion or percentage variable suggests that the presence of at least one female member on the audit committee has a stronger influence in reducing the likelihood of ICWs compared to the overall proportion or percentage of female members.

The second section of this study looked at the association between the presence of female or male financial experts on the audit committee and the incidence of internal control issues. Surprisingly, the analyses found that there was no significant association between these characteristics. In other words, whether the audit committee included female or male financial experts had no significant influence on the incidence of internal control deficiencies. This conclusion is consistent with the inconsistent results found in earlier research on the impact of audit committee financial ability on business performance. The current amount of research on this issue has shown conflicting and inconclusive findings, making it impossible to establish a clear and consistent link between audit committee members' financial knowledge and overall business success. These results imply that the mere presence of female or male financial professionals on the audit committee does not ensure that internal control deficiencies are reduced. Other elements and behaviours within the audit committee and the larger corporate environment may be more important in determining internal control effectiveness.

When the existence of female audit committee members and non-Caucasian audit committee members is investigated jointly in the robustness test, a notable finding emerges. The existence of a female member of non-Caucasian ethnicity is statistically significant and is connected with the prevalence of internal control weaknesses. This indicates that organizations with this precise representation on their audit committees are far less likely to suffer substantial deficiencies. The coefficient for the percentage of female audit committee members of non-Caucasian ethnicity regularly demonstrates a negative and substantial link with several

indicators used to gauge internal control problems. This means that the greater the presence of female audit committee members of non-Caucasian ethnicity, the lower the chance of having internal control problems in various areas. The importance of this connection emphasizes the need of having both gender and racial diversity on the audit committee. The addition of a female member of non-Caucasian ethnicity gives a variety of viewpoints, experiences, and insights that contribute to more effective internal control monitoring and decision-making. Companies may reap the advantages of various aspects of diversity within their audit committees by integrating gender and ethnic diversity.

To conclude, having at least one female member on the audit committee helps to reduce internal control problems. Furthermore, when its presence is paired with non-Caucasian ethnicity, it becomes statistically significant, enhancing the efficiency of internal controls even further. This research emphasizes the significance of encouraging diversity and inclusion in audit committees, as it leads to better control environments, lowers the likelihood of internal control failures, and ultimately safeguards the integrity of financial reporting and operations.

5.2. Limitations and Suggestions for Future Research

This thesis is subject to several limitations that affect the validity of the obtained results. Although efforts were made to reduce endogeneity bias, it is important to acknowledge that the issue of endogeneity may not have been fully addressed. Consequently, the findings of this study should be interpreted with caution. Another limitation is that certain firms may have ICWs that go undetected or undisclosed by their auditors, making them unobservable in the study. It is important to note that the absence of disclosed ICWs does not necessarily imply the absence of deficiencies in a firm's internal controls. Additionally, this study is limited to U.S. firms, and the generalizability of the findings to other research settings with different cultural and institutional contexts may be limited. Furthermore, the lack of significant association found between female finance experts may be attributed to the fact that the study did not differentiate between accounting and non-accounting experts. Future research could explore the specific characteristics and contributions of female non-accounting experts on audit committees.

One future research suggestion, as mentioned earlier, is to test the data in other countries. Given the variations in female leadership and representation in executive positions across different countries, it is possible that results may differ. However, obtaining data in certain countries could pose challenges. While this study's findings suggest that gender and ethnic diversity are associated with a reduced likelihood of material weaknesses in internal controls, it is important to note that internal control quality is just one aspect to consider when selecting audit committee members. It would be interesting to investigate whether male audit committee members have advantages in specific areas and whether there exists an optimal mix of male and female members. Finally, in addition to focusing on audit committees, another research idea is to examine the role of the audit engagement partner and the full audit team. While the former is addressed in this thesis, the latter remains an underdeveloped area of research. Gathering internal information from accounting firms can be challenging, and exploring the impact of other types of diversity, such as age diversity and industry-specific

expertise, on corporate board decisions also warrants further investigation. These considerations can be explored in future research endeavours.

References

- Abbasi, K., Alam, A., & Bhuiyan, B. B. (2020). Audit committees, female directors and the types of female and male financial experts: Further evidence. *Journal of Business Research*, 114(9), 186–197. doi: 10.1016/j.jbusres.2020.04.013
- Alhababsah, S. & Yekini, S. (2021). Audit committee and audit quality: An empirical analysis considering industry expertise, legal expertise and gender diversity. *Journal of International Accounting, Auditing and Taxation*, 42. doi: 10.1016/j.intaccudtax.2021.100377.
- Asare, G. J. (2020). Goldman Sachs announces at least one diverse board member needed for companies to go public-what are they missing? *Forbes*. Retrieved from <https://www.forbes.com/sites/janicegassam/2020/01/26/goldman-sachs-announces-at-least-one-diverse-board-member-needed-for-companies-to-go-publicwhat-are-they-missing/#7c02f53408f7>
- Ashbaugh-Skaife, H., Collins, D., Kinney, W., & LaFond, R. (2008). The effect of SOX internal control deficiencies and their remediation on accrual quality. *The Accounting Review*, 83, 217–250. doi: 10.1111/j.1475-679X.2008.00315.x
- Bédard, J. and Gendron, Y. (2010), Strengthening the financial reporting system: Can audit committees deliver? *International Journal of Auditing*, 14, 174210. doi: 10.1111/j.1099-1123.2009.00413.x
- Bernile, G., Bhagwat, V., & Yonker, S. (2018). Board diversity, firm risk, and corporate policies. *Journal of Financial Economics*, 127(3), 588–612. doi: 10.1016/j.jfineco.2017.12.009
- Bilal, Chen, S., & Komal, B. (2018). Audit committee financial expertise and earnings quality: A meta-analysis. *Journal of Business Research*, 84, 253–270. doi: 10.1016/j.jbusres.2017.11.048
- Bose, S., Podder, J., & Biswas, K. (2017). Philanthropic giving, market-based performance and institutional ownership: Evidence from an emerging economy. *British Accounting Review*, 49(4), 429–444. doi: 10.1016/j.bar.2016.11.001
- Carter, D. A., Simkins, B. J., & Simpson, W. G. (2003). Corporate governance, board diversity, and firm value. *Financial Review*, 38(1), 33–53. doi: 10.1111/1540-6288.00034
- Carter, D. A., D'Souza, F., Simkins, B. J., & Simpson, W. G. (2010). The gender and ethnic diversity of US boards and board committees and firm financial performance. *Corporate Governance: An International Review*, 18(5), 396–414. doi: 10.1111/j.1467-8683.2010.00809.x
- Chen, Y., Eshleman, J. D., & Soileau, J. S. (2016). Board gender diversity and internal control weaknesses. *Advances in Accounting*, 33(2), 11–19. doi: 10.1016/j.adiac.2016.04.005
- Cheng, M., Dhaliwal, D., & Zhang, Y. (2013). Does investment efficiency improve after the disclosure of material weaknesses in internal control over financial reporting? *Journal of Accounting and Economics*, 56(1), 1–18. doi: 10.1016/j.jacceco.2013.03.001

- COSO. (2013, May). Internal Control – Integrated Framework. Retrieved from <https://www.coso.org/Shared%20Documents/Framework-Executive-Summary.pdf>
- Dechow, P., Ge, W., & Schrand, C. (2010). Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of Accounting and Economics*, 50, 344–401. doi: 10.1016/j.jacceco.2010.09.001
- Demerjian, P. R., Lev, B., Lewis, M. F., & McVay, S. E. (2013). Managerial ability and earnings quality. *The Accounting Review*, 88(2), 463–498. doi: 10.2308/accr-50318
- Dhaliwal, D., Naiker, V., & Navissi, F. (2010). The association between accruals quality and the characteristics of accounting experts and mix of expertise on audit committees. *Contemporary Accounting Research*, 27(3), 787–827. doi: 10.1111/j.1911-3846.2010.01027.x
- Din, N. U., Cheng, X., Ahmad, B., Sheikh, M. F., Adedigba, O. G., Zhao, Y., & Nazneen, S. (2021). Gender diversity in the audit committee and the efficiency of internal control and financial reporting quality. *Economic Research-Ekonomska Istraživanja*, 34(1), 1170-1189, doi: 10.1080/1331677X.2020.1820357
- Doyle, J., Ge, W., McVay, S. (2007). Accruals quality and internal control over financial reporting. *The Accounting Review*, 82, 1141–1170. doi: 10.2308/accr.2007.82.5.1141
- Erhardt, N. L., Werbel, J. D., & Shrader, C. B. (2003). Board of director diversity and firm financial performance. *Corporate Governance*, 11(2), 102–111. doi: 10.1111/1467-8683.00011
- Felix, R., Pevzner, M., & Zhao, M. (2021). Cultural diversity of audit committees and firms' financial reporting quality. *Accounting Horizons*, 35(3), 143–159. doi: 10.2308/HORIZONS-2020-038
- Forbes. (2022, September 2). Why do struggling firms sacrifice board diversity? *Imperial Business Insights*. Retrieved from <https://www.forbes.com/sites/imperialinsights/2022/09/02/why-do-struggling-firms-sacrifice-board-diversity/?sh=3fdd0411565b>
- Green, J. (2020, August 19). After adding more women to boards, companies pivot to race. *Bloomberg*. Retrieved from <https://www.bloomberg.com/news/articles/2020-08-19/companies-seek-more-black-directors-after-adding-women?srnd=premium&leadSource=verify%20wall>
- Harjoto, M., Laksmana I., & Lee, R. (2015). Board diversity and corporate social responsibility. *Journal of Business Ethics*. doi: 10.1007/s10551-014-2343-0
- Heminway, J. M. (2007). Sex, trust, and corporate boards. *Hastings Women's Law Journal*, 18, 173–185.
- Hoitash, U., Hoitash, R., & Bedard, J. (2009). Corporate governance and internal control over financial reporting: A comparison of regulatory regimes. *The Accounting Review*, 84, 839–867. doi: 10.2308/accr.2009.84.3.839
- Kim, J. B., Song, B. Y., & Zhang, L. (2011). Internal control weakness and bank loan contracting: Evidence from SOX section 404 disclosures. *The Accounting Review*, 86(4), 1157–1188. doi: 10.2308/accr-10036
- Lai, K. M. Y., Srinidhi, B., & Gui, F. A. (2017). Board gender diversity, auditor fees, and auditor choice. *Contemporary Accounting Research*, 34(3), 1681–1714. doi: 10.1111/1911-3846.12313

- Lee, H. S., Nagy, A. L., & Zimmerman, A. B. (2019). Audit partner assignments and audit quality in the United States. *The Accounting Review*, *94*(2), 297–323. doi: 10.2308/accr-52218
- Lin, Z., Song, B. Y., & Tian, Z. (2022). Reputable inside directors and internal control effectiveness. *European Accounting Review*. doi: 10.1080/09638180.2022.2156573
- Liu, J. & Thomas, J. (2000). Stock returns and accounting earnings. *Journal of Accounting Research*, *38*, 71–101. doi: 10.2307/2672923
- Joecks, J., Pull, K., & Vetter, K. (2013). Gender diversity in the boardroom and firm performance: What exactly constitutes a “critical mass?”. *Journal of Business Ethics*, *118*(1), 61–72. doi: 10.1007/s10551-012-1553-6
- Nguyen, T. T., Duong, C. M. & Narendran, S. (2021). CEO profile and earnings quality. *Review of Quantitative Finance and Accounting*, *56*, 987–1025. doi : 10.1007/s11156-020-00916-7
- Oradi, J. & E-Vahdati, S. (2021): Female directors on audit committees, the gender of financial experts, and internal control weaknesses: Evidence from Iran. *Accounting Forum*, doi: 10.1080/01559982.2021.1920127
- Parker, R. J., Dao, M., Huang, H., & Yan, Y. (2017). Disclosing material weakness in internal controls: Does the gender of audit committee members matter? *Asia-Pacific Journal of Accounting & Economics*, *24*(3), 407–420. doi: 10.1080/16081625.2015.1057190
- PCAOB. (2007). Auditing standard no. 5: An audit of internal control over financial reporting that is integrated with an audit of financial statements. *PCAOB Release No. 2007-005 A*. Washington, DC.
- Ponomareva, Y., Federo, R., Aguilera, R. V., & Collin, S. (2022). The cost of conformity to good governance: Board design and compensation. *Corporate Governance: An International Review*, *30*(4), 399–420. doi: 10.1111/corg.12408
- Posner, C. (2020, September 8). Addressing the challenge of board racial diversity. *Harvard Law School Forum on Corporate Governance*. Retrieved from <https://corpgov.law.harvard.edu/2020/09/08/addressing-the-challenge-of-board-racial-diversity/>
- SEC. (1941). Amendment of rules 2–02 and 3–07 of regulation S-X. *Accounting Series Release No. 21*. Washington, DC: Government Printing Office.
- SEC. (2003). Final rule: Standards relating to listed company audit committees. Retrieved from <http://www.sec.gov/rules/final/33-8220.htm>.
- Siagian, F. T. & Tresnaningsih, E. (2011). *Asian Review of Accounting*, *19*(3), 192–207. doi: 10.1108/13217341111185128
- Skaife, H. A., Veenman, D., & Wangerin, D. (2013). Internal control over financial reporting and managerial rent extraction: Evidence from the profitability of insider trading. *Journal of Accounting and Economics*, *55*(1), 91–110. doi: 10.1016/j.jacceco.2012.07.005
- Srinidhi, B., Gul, F. A., & Tsui, J. (2011). Female directors and earnings quality. *Contemporary Accounting Research*, *28*(5), 1610–1644. doi: 10.1111/j.1911-3846.2011.01071.x

- Sultana, N., Cahan, S. F., & Rahman, A. (2020). Do gender diversity recommendations in corporate governance codes matter? Evidence from audit committees. *Auditing: A Journal of Practice & Theory*, *39*(1), 173–197. doi: 10.2308/ajpt-52560
- Tee, C. M., & Rassiah, P. (2019). Ethnic board diversity, earnings quality and institutional investors: Evidence from Malaysian corporate boards. *Accounting & Finance*, *60*(4), 4257–4290. doi: 10.1111/acfi.12485
- Tsai, Y. C. & Huang, H. W. (2021). Internal control material weakness opinions and the market's reaction to securities fraud litigation announcements. *Finance Research Letters*, *41*. doi: 10.1016/j.frl.2020.101833
- Van der Walt, N., & Ingley, C. (2003). Board dynamics and the influence of professional background, gender and ethnic diversity of directors. *Corporate Governance: An International Review*, *11*(3). 218–234. doi: doi.org/10.1111/1467-8683.00320
- Wahid, A. S. (2019). The effects and the mechanisms of board gender diversity: Evidence from financial manipulation. *Journal of Business Ethics*, *159*(3), 705–725. doi: 10.1007/s10551-018-3785-6
- Zalata, A. M., Tauringana, V., & Tingbani, I. (2018). Audit committee financial expertise, gender, and earnings management: Does gender of the financial expert matter? *International Review of Financial Analysis*, *55*, 170-183. doi: doi.org/10.1016/j.irfa.2017.11.002

Appendix

Figure 1. Libby boxes

