

The Influence of Audit Risk and Materiality Guidelines on Auditor's Planning Materiality Assessment

Julia Baldauf¹, Rudolf Steckel¹ & Marcel Steller¹

¹ School of Management, University of Innsbruck, Innsbruck, Austria

Correspondence: Julia Baldauf, School of Management, University of Innsbruck, Innsbruck, Austria, Universitaetsstraße 15, A- 6020 Innsbruck. Tel: 43-512-71203. E-mail: julia.baldauf@uibk.ac.at

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Abstract

At present, methods to improve audit quality and auditing decisions are being debated by standard setters and researchers worldwide. Materiality has been and continues to be a topic of importance for auditors.

Audit quality is primarily influenced by two factors: the requirements of standard setters and the professional judgment of auditors. Materiality judgment is primarily determined by the subjective judgment of the auditor because there is a lack of clear, standardized guidelines for such judgments. Thus, the same materiality issue could be judged differently by different auditors. Auditors' materiality judgments are important because they significantly influence what information is recorded in the accounts, disclosed in financial statements and made available to external parties for decision-making.

The objective of this study is to examine the influence that audit risk and quantitative guidelines have on the assessment of planning materiality and on the adjustment of material misstatements. We use a case study and conduct an experiment. The study results provide evidence that the standardization and implementation of quantitative materiality guidelines result in a smaller range of planning materiality judgments. This paper discusses the implications of those findings.

JEL Classification: C12, C91, M42

Keywords: Accounting, Auditing, Audit practice, Experimental study, International standards on auditing, Materiality

1. Introduction

Materiality has been and continues to be a topic of importance for auditors. Financial statements should provide interested investors with relevant information and reduce the information asymmetries between a company's management and stakeholders. In this context, the function of an audit is to assure the integrity of the information provided by the firm's management, specifically the financial statements. The issue of materiality arises during the preparation and the auditing of the financial statements. Auditors are due to the risk based audit approach are interested in audit materiality when planning and performing the audit, as well as when reporting the audit issues. Generally, audit literature states materiality as the problem of determining the accuracy of a material misstatement. The concept of materiality that is currently used by accounting and auditing standard setters is based on determining what information an average investor would need to know before purchasing a stock. (Note 1) The audited financial statements may contain failures (misstatements) that are not relevant to influencing the economic decisions of investors. It is widely recognized that when making materiality judgments, quantitative thresholds and qualitative factors must be taken into account.

Although there is a large body of research concerning materiality, relatively little is known about how auditors assess materiality (Tuttle et al., 2002) or about the lack of consensus among preparers, other auditors and users regarding the materiality threshold (Turley & Cooper, 1991; Chong, 1992; Iselin & Iskandar, 1999). Moreover, the aforementioned research accentuates that there is considerable disagreement regarding the appropriate materiality threshold level. Two reasons for the lack of consensus were identified by previous studies. The first reason is the lack of clear materiality guidelines from professional accounting bodies and standard setters. In this regard, previous research on audit firms' audit manuals and working papers have identified significant differences in the way audit firms establish and handle materiality (Steinbart, 1987; Martinov & Roebuck, 1998; Edler & Allen, 1998). The

second reason for the lack of consensus is that qualitative variables may also affect the materiality thresholds (Iselin & Iskandar, 2000). This lack of consensus can cause the same materiality issue to be judged differently by different auditors. Additionally, it is possible that financial statement auditors and users (investors) have different understandings of materiality due to their differing personal interests. These considerations demonstrate the importance of the auditors' materiality judgments in financial reporting. The materiality judgments of financial statement preparers significantly influence what information is recorded in the accounts and disclosed in the financial statements.

The importance of materiality judgments and the lack of uniformity in determining and handling materiality form the basis for this study. The lack of consensus regarding thresholds raises questions regarding the standardization of quantitative thresholds and the procedures used to establish thresholds. A uniform, standardized materiality system has long been rejected within audit literature and audit practices, which yield to the professional judgment of the auditors. Since 2009, two International Federation of Accountants (IFAC) standards have dealt with materiality (IFAC, 2013a; IFAC, 2013b). Nevertheless, the materiality assessments of auditors remain highly subjective. Auditors must consider many factors when making their judgments. For instance, characteristics that are specific to a certain industry or company are variables that could affect materiality decisions. To date, the effects of multiple qualitative variables on materiality judgments have not been studied in a thorough and systematic manner. Only Iselin & Iskandar (2000) have analysed in detail the effects that specific industries have on materiality thresholds.

The purpose of this research is to examine the influence of risk and standard setting on materiality judgments and the adjustment of material misstatements. In this context, we view the effects of business risk as a qualitative variable on judgment. The central question of this research is the following: What are the impacts of the implementation of materiality guidelines on assessment of the materiality threshold? Can the effects of standardization always be assessed positive? We conduct an experimental study to answer this research question.

This paper is divided into four main sections. In section two, materiality in the auditing context is described normatively. This is followed by a brief summary of previous materiality studies and a synopsis of our hypotheses development. In section three, we discuss our study design and describe the variables. Section four presents substantial findings, and the final section contains our concluding comments.

2. Related Research and Hypothesis Development

2.1 Materiality in the Context of Auditing

The concept of materiality is central to the external audit process of a company's annual financial statements. This tenet has been especially true since the adoption of the risk-based audit approach. Materiality influences the planning, nature, extent and timing of the audit process and also helps to determine the relevance of any identified differences or deviations. The auditor reports on material differences and/or deviations and decides whether an item (representation, fact or amount) is material (cp., Botha & Gloeck, 1998). To describe materiality normatively, it is important to first establish that materiality is indeed an auditing concept. To pursue a scientifically accountable approach, the materiality concept must be evaluated within the postulates of auditing and consequently defined as a concept thereof (e.g., Mautz & Sharaf, 1961; Schandl, 1978 support this approach). There exist a large number of definitions used to describe materiality. The FASB's definition is of particular importance because of its widespread use as the formal definition of materiality in auditing textbooks (e.g., Kell et al., 1986; Ricchiute 1992; Kiger & Scheiner, 1994; Arens & Loebbecke, 1997). An analysis of the various definitions reveals a sufficient number of common elements that define materiality in the context of financial statement auditing; an issue will be deemed material if that issue, based on its scope or nature, will likely influence the decisions or actions of a reasonable addressee of the annual financial statements. This definition formalizes materiality as an auditing concept and therefore can be used as a basis for normatively describing how materiality is determined during a company's annual financial statements audit (cp., Botha & Gloeck, 1998).

A standardized system of materiality in Europe has long been rejected; instead, the professional judgment of the auditors is relied upon. In many European countries, the IFAC's International Standards on Auditing (ISA) are adopted or accepted. Since the clarity project of the IFAC's IAASB (International Auditing and Assurance Standard Board) was completed in 2009, two standards have been used to determine materiality, with the goal of achieving high-quality audits. These standards only provide general guidance, and making materiality decisions still remains an ill-defined task. The International Standard on Auditing (ISA) 320 guideline, "Materiality in Planning and Performing an Audit," establishes the auditor's responsibility for applying the concept of materiality in planning and performing an audit of financial statements. ISA 450, "Evaluation of Misstatements Identified During the Audit," explains how materiality is applied to evaluate the effect of identified misstatements on the audit and the effect of

uncorrected misstatements, if any, on the financial statements. In the U.S., the Statement of Auditing Standard (SAS) Number 107 AU Section 312 addresses audit materiality. In December 2010, the Public Company Accounting Oversight Board (PCAOB) established Auditing Standard (AS) Number 11, which addresses audit risk and materiality in the context of an audit. Both regulations establish standards and provide guidance on the concept of materiality and its relationship with audit risk. As defined in ISA 320, the SAS 107 states that the assessment of materiality is a matter of professional judgment (AU §312.03). The SAS 107 does not contain any quantitative guidelines for handling materiality. Two example thresholds are provided in the application material of ISA 320. Item A7 states that the auditor may consider five percent of profit from continuing operations before tax to be an appropriate threshold for a profit-based entity, whereas the auditor may consider one percent of total revenue or total expenses to be appropriate for a “non-profit-entity”.

Hence, both standards require a definition of materiality at both the overall financial statement level and in relation to particular account balances, classes of transactions and disclosures (AU §312.19, ISA 320.10). In general, these standards recommend that a percentage of a chosen benchmark be used as a starting point for determining the materiality threshold, thereby underlining the importance of an auditor’s professional judgment.

Beyond arguing for the threshold with common practice and the standard setting theoretically the derivative of a materiality threshold can be gained by a logical deductive way by focusing on the decision situation of financial statements users. Such a method is for example a cost benefit model of auditing weighting the benefits of a user with the corresponding audit fees.

The Financial Reporting Council (FRC), published in 2013 a thematic review paper on audit quality and materiality. This thematic review reports on the findings from the FRC’s inspection reviews of the six largest audit firms in Great Britain, which were undertaken to examine the auditors’ consideration and application of materiality. The report shows that most of the six firms provided detailed guidance as to which benchmark (for example, profit before tax or revenues) should be used in certain circumstances, whilst other firms had less prescriptive guidance for selecting benchmarks to allow for judgment to be exercised by audit partners. In most of the audits reviewed, the benchmark profit before tax was used. Whilst the FRC noted improvements in the qualitative materiality guidance provided by audit firms, it also identified a general trend for audit firms to make changes to their guidelines to permit materiality to be set at a higher level, or to allow lower sample sizes to be used (perhaps to cope with downward pressure on audit fees). (Note 2)

Financial statement reviewers are sometimes confused by materiality assessments because of the large number of quantitative and qualitative factors that auditors must consider when making their judgments. Third parties cannot replicate these factors due to the lack of standardization.

2.2 Previous Research on Materiality

A significant amount of research has explored the subject of materiality. To date, the focus has been on factors used to determine materiality thresholds, aspects of materiality judgments and decision models. Botha & Gloeck (1998) provide an early meta-analysis concerning materiality by examining 27 previous materiality studies. The objectives and research methods varied among the studies, but despite those differences, the results of the studies generally indicated the following:

- Materiality decision making is influenced by a combination of appropriate quantitative and qualitative factors.
- The measure of materiality is a relative concept determined by the entity size, its nature and other characteristics.
- An even or sliding percentage scale should be applied to the appropriate quantitative bases to calculate a materiality limit.

In addition, Iselin & Iskandar (2000) evaluated past materiality research and discovered three important trends:

- Early research focused on quantitative factors, but later research considered both quantitative and qualitative factors.
- Early research methodology focused on survey and archival studies using experimental designs, but more recent research used multi-method studies.
- Early studies neglected the context of materiality judgments, but later experimental designs tried to contextualize environmental differences.

Concerning the results of empirical materiality research, Messier et al. (2005) have come to the conclusion that research conducted prior to 1982 does not provide any definite comprehensive implications for audit practice or for policy formulation. Since then, there have been several significant changes in both the regulatory and professional auditing environments. According to Messier et al. (2005), renewed interest in materiality arose in the late 1980s, most likely due to the incorporation of the audit risk model into auditing standards and the integration of the model into public accounting firms' audit methodologies.

With regard to the factors that influence materiality judgments, the results of past research are consistent in finding that an item's percentage of net profit is the primary factor influencing the judgment (Iselin & Iskandar, 1999; Messier et al., 2005). Moreover, research has also shown that other facts (Ward, 1976) and non-financial information can affect materiality judgments. Although the results have not been uniform, some studies show that industry type, personal characteristics and experience (e.g., industry experience) can affect materiality judgments. Other studies found that audit-firm structure can significantly influence materiality judgments (Morris & Nichols, 1988). An experimental study shows that authoritative guidance can have an effect on the materiality judgment of auditors (e.g., DeZoort et al., 2003; DeZoort et al., 2006).

An evaluation of several studies led Iselin & Iskandar (2000) to the conclusion that there is a lack of consensus between accountants and auditors regarding the threshold. They found a wide range of thresholds between 2-7% and 20%; this disparity, which seemed to be at least partly caused by the absence of clear materiality guidelines, demonstrated the importance of further research.

Standard setters still refused to introduce more specific materiality guidelines, preferring to use the professional judgment criterion. The analysis of Messier et al. 2005 has revealed a large area of future research in materiality (e.g., on issues such as establishing planning materiality, evaluating materiality decisions or the nature of the items examined). In this context, the implementation of new audit guidelines creates the need for further analysis and rationally gives rise to our study. Next we detail our hypotheses development.

2.3 Hypotheses Development

Based on theoretical considerations and previous literature on planning materiality (Note 3) assessments, we developed three hypotheses (in null form).

The first hypothesis examines the impact of risk on the materiality threshold. The second and the third hypotheses refer to the effects expected from the introduction of quantitative materiality guidelines.

2.3.1 Development of Hypothesis I

Previous research indicates that risk assessment (e.g., Wolz, 2003) and expertise (e.g., Iselin & Iskandar, 2000) have a strong influence on materiality threshold determination (e.g., Whittington & Margheim, 1993; Braun, 2001). In addition, some studies have revealed that the materiality thresholds determination depends on the experience of the auditor (e.g., Krogstad et al., 1984) and on pressure (e.g., DeZoort et al., 2006) to justify the assessed threshold.

According the risk-based audit approach, auditors must take risk assessment into account when defining materiality. If an audit engagement is estimated to be high-risk, a lower materiality threshold should be chosen. With a low-risk audit engagement, a higher materiality should be used. We suspect that such differentiation is actually performed, even if cost considerations require otherwise, and suggest that the materiality assessment is different in different risk environments. This leads to the following first hypothesis (in alternative form):

H I: The risk assessment does not affect the materiality threshold.

2.3.2 Development of Hypothesis II

According to prior research, the materiality judgment is primarily influenced by the individual assessment of the responsible auditor (e.g., Wolz, 2003). Moreover, the great influence of that individual assessment on materiality decision making is an important factor that affects how the same issue could be judged differently by different auditors. The problem is made even more significant when considering that each of the interested parties (management, auditors and inhomogeneous group of investors) has personal interests that result in different assessments and expectations regarding a reasonable materiality threshold (e.g., Turley & Cooper, 1991; Chong, 1992; Iselin & Iskandar, 1999; Gibbins et al., 2001; DeZoort et al., 2006). Hence, this materiality threshold issue is linked to the problem of third-party verification; without having access to the auditors' documentation (documentation on how the auditor assessed materiality), investors may find less value in the audit.

One reason for this third-party verification problem is the absence of clear materiality guidelines (Iselin & Iskandar, 2000). To address this problem, the IAASB provides general recommendations for the materiality judgment decision

in ISA 320, ‘Materiality in Planning and Performing an Audit’. This standard does not contain any quantitative indicative values or thresholds; however, it provides recommendations regarding the basis for deriving materiality thresholds. From the standard setters’ perspective, this change should enhance the uniformity and comparability of materiality judgment decisions.

In developing a second hypothesis, we want to analyse whether materiality guidelines reduce the range of materiality assessments. We propose that the range will become narrower after introduction of a materiality guideline. We therefore analyse how the range of materiality assessments changes after the introduction of standardized materiality guidelines. We therefore formulate the following hypothesis as follows:

H II: Quantitative guidelines do not lead to a narrower range of materiality assessments.

Quantitative guidelines do not result in a reduction of the range of materiality assessments.

After the introduction of standardized materiality guidelines, we expect more uniformity (less variation) from the materiality threshold judgments (referring to the financial statements as a whole) as well as from the treatment of special issues related to the materiality threshold for a particular account balance or disclosure.

2.3.3 Development of Hypothesis III

We suggest that the magnitude of materiality judgments will be reduced through the implementation of quantitative guidelines. Nevertheless, we do not expect that the relative position of the individual judgment will change with introduction of the quantitative guideline. That means that if, for example, an auditor sets a high materiality threshold in relation to other auditors when no guideline exists, this auditor will also define a materiality at the upper border of the materiality threshold when a guideline is given. Due to hypotheses I and II, the assessment of materiality is investigated in consideration of audit risk in general. Furthermore, the change in the range of estimates, taking into account the introduction of a materiality guideline, is examined. Of further interest is whether the introduction of the materiality guideline leads to a change in the assessment of materiality for a given risk situation. The question is, does the introduction of materiality guidelines make the risk assessment irrelevant? We suggest that this is not the case. This means that the position of an individual materiality assessment relative to other materiality assessments will not change. If an auditor is risk-averse, he or she will choose – in relation to less risk-averse auditors – a lower materiality threshold anywhere. Within this context, we formulate the third hypothesis as follows:

H III:

Quantitative materiality guidelines do not result in a change in the relative position of an individual materiality assessment.

To address our hypotheses, we used a laboratory experiment (for more on the benefits of experiments in accounting, see Swieringa & Weick, 1982; Dopuch et al., 1989; or McDaniel & Hand, 1996). The method adopted and the research design are described next.

3. Method Adopted and Research Design

3.1 Method Adopted

To date, the effects of auditors’ quantitative materiality judgments have not been studied in a thorough or systematic way. To test our two-tailed hypotheses, we use a judgmental experiment to study the auditors’ materiality judgments. It is very difficult to explore the impact of quantitative materiality guidelines on the auditors’ materiality judgments if one considers the entire financial statement preparation and audit process. We therefore developed a specific case for the experimental study. We designed a simplified annual financial statement for the participants to use in assessing a materiality threshold. Additionally, the participants were provided with information regarding the risk environment of the audit client and four potential audit issues revealed by members of the audit team. The risk environment is described in two different ways (two scenarios).

Students of different nations and different study programs were enlisted in the study. All enlisted students are trained in auditing and audit practices; they also had taken as a prerequisite at least three semesters of auditing and accounting lectures at a university and had passed practical training at a national or international audit firm. The distribution of the participants and the sample are described in the next section.

The use of students instead of practitioner participants in experimental audit (judgment) research has been widely discussed in the literature. Numerous papers have been published discussing the validity of accounting and auditing experiments in which students are the participants (e.g., Dickhaut et al., 1972; Abdel-Khalik, 1974; Ashton & Kramer, 1980; Walters-York & Curatola, 1998). Peacher & Solomon (2001) provide an overview and present a

fundamental discussion regarding the use of students in experimental (decision making) settings. As a result of this discussion, they come to the conclusion that the use of students is preferable in most research settings and does not affect the often questioned quality and validity of the results. Particularly with regard to our research, which addresses the implementation of quantitative guidelines, there are several aspects that support the use of student participants. The students can be randomly assigned to experimental groups. Less experienced attendees can be randomly assigned to pre-experimental teaching sessions. Due to the inclusion of less experienced student participants, we were able to measure the influence of quantitative guidelines without encountering an excessive influence of practical experience. Furthermore, we can distinguish between different levels of education with regard to materiality issues. In this context, pre-experimental teaching sessions differ in intensity and length. In addition, the use of students with advanced degrees and more experience enables us to analyse the effects of expertise. Hence, this setting enables us to control the level of experience and education.

The research was conducted in two experimental sessions at the university. All participants were divided into two groups (two treatments/situations). Group participation was randomly selected. The differences in the groups are described in the next section.

The researchers and two assistants were present at the sessions and administered the experimental materials and the final payment to each participant. To obtain a more realistic materiality assessment, a financial incentive for the attendees was integrated. Next, the design of the study, including our variables and the experimental procedure, is described.

3.2 Design of the Study

The participants were advised to be the audit manager. First, they had to conduct a risk assessment and then decide on a planning materiality threshold for the financial statements as a whole. Depending on the experimental treatment/situation, the participants either received information (quantitative guidelines) on how to handle materiality or they did not. The group with the guidelines is designated treatment (situation) 1, and the group without guidelines is designated treatment (situation) 2. Based on audit standard setters recommendations (eg. ISA 320.A4 (IFAC 2013a)), previous literature (Iselin & Iskandar, 1999, Messier et al., 2005) and common practice (Arens et al., 2014) we defined the following five benchmarks with percentage ranges as quantitative guidelines:

- 1) profit before tax 5-10%;
- 2) total revenues 0,5-1%;
- 3) gross profit 0,5-1%;
- 4) total equity 2-5%; and
- 5) net asset value 0,5-1%.

ISS 320.A4 explains that profit before tax from continuing operations is often used for profit-oriented entities. When profit before tax from continuing operations is volatile, other benchmarks may be more appropriate, such as gross profit or total revenues.

Regarding the risk assessment, the case was created using two different scenarios: a “low-risk” scenario (scenario 1) and a “high-risk” scenario (scenario 2). The aim was to reflect the influence of the risk environment on the materiality assessment. Additionally, the risk assessment of each participant was necessary to later examine their individual professional judgment. The second task of the participants was to draw their final conclusion on how to proceed with the potential audit findings. This was intended to study the materiality level for particular account balances.

Therefore, the participants received four potential audit issues. For the four issues, the accounting policies based on estimates given by management were rejected by the audit assistants. The issues were described as having a 50% probability of causing a misstatement in a specified amount. The participants were confronted with the task of quantifying an adjustment for the four issues that would enable them to provide a clean audit opinion. They were informed that the client was not willing to book any adjustments. To obtain a more realistic materiality assessment, we added a financial incentive (AF) for the participants with regard to the assessment of a materiality decision on a particular account balance. This should stimulate the participants to assess a realistic materiality threshold. The participants being able to buy more accurate information regarding the audit issues should positively impact their decisions.

To receive more accurate information regarding the probabilities of potential issues occurring, the participants could spend audit costs (C). The purchasable information was categorized into five stages. A diminishing marginal utility was assumed. The final payment (P) of each participant was determined by the following equation:

$$P = AF - C - LP \quad (1)$$

The litigation payment (LP) needed to be paid if the adjustment demanded by the participant varied too much from the adjustment required in the realistic setting, which was predefined according to the given risk scenario (“low-risk” or “high-risk”). For every participant, we simulated a realistic setting that was confronted with the audit adjustment demanded by the participant. The realistic setting was characterized by a randomized simulation of the occurrence of the audit issues after the investigation. Depending on the given risk scenario the predefined materiality threshold in the experimental situations varied in size. In the “high-risk” scenario, we used a given materiality threshold for the financial statements as a whole of five percent of the pretax profit. In the “low-risk” scenario, we used a given materiality threshold for the financial statements as a whole of seven percent of the pretax profit. These percentages were evaluated using the professional judgments of four very experienced auditors (two audit seniors and two audit managers).

3.2.1 Variables

3.2.1.1 Independent Variables

The independent variables were three environmental red flags that were manipulated into the study. Each of the three independent variables was selected after reviewing relevant professional auditing standards (e.g., ISA 540 “Auditing Accounting Estimates, Including Fair Value Accounting Estimates, and Related Disclosures”), which indicated a potential for the variables to influence the auditors’ decisions relating to accounting estimates. Similar environmental red flags were used by Kaplan & Reckers (1995). The included red flags were management’s lifestyle, bonus compensation programs and the strength of the internal audit department. Two characteristics of each red flag indicated either a high-risk or a low-risk scenario.

3.2.1.2 Dependent Variables

Two types of dependent measures, intermediate judgments and reporting decision, were included in the study. Each type is discussed below.

Participants were required to make intermediate judgments regarding management’s intentions and the materiality threshold of the given financial statements as a whole. First, to obtain participants’ assessments of management’s intentions, a risk assessment with a seven-point Likert scale was required. Next, participants were asked to provide a materiality assessment for the financial statements as a whole. The procedures used to make a materiality assessment differed between the two groups. For group 1, only a short description of the task was provided, whereas the participants of group 2 were able to choose among benchmarks (e.g., pretax profit or net asset value) as well as percentage ranges for those benchmarks, which were based on the ISA 320 requirements, to determine materiality thresholds.

Two questions were used to measure the participants’ reporting decisions. The first question asked participants to indicate the extent to which they would like to obtain further audit findings. They could obtain further assurance for the proposed adjustments. The adjustments in question concerned the areas of warranty expenses, construction contracts, inventories and property (plant and equipment). The case mentioned that the management was not willing to make any adjustments and communicated management’s judgments of estimated values.

At the beginning of the experimental study, the participants received information that the audit team had preliminarily detected a possible misstatement (with a 50% probability of occurrence) in each of the mentioned areas and also received an estimation of the maximal amount of misstatement (e.g., they later received information that the warranty expenses had a 50% probability of being misstated by € 110,000). The participants could purchase further audit evidence, which would give them further information regarding the risk of occurrence of the possible misstatement. Depending on their investment decisions, the participants received new percentages indicating the probability that the adjustment is misstated. For each of the four audit adjustments, the participants could receive at most five additional pieces of audit evidence, but they could only choose one of the five given decision stages because a diminishing marginal utility was assumed. If decision stage five was chosen, the participant would gain all of the available information (100%), but would need to pay the highest price associated with the audit issue, which reducing his or her income. After communicating their investment decision to the conductor of the experiment, the participants were given new percentages regarding the probability of occurrence of the misstatement (e.g., the probability of misstatement in warranty expenses amounting to an estimated value of € 110,000 is 90%).

Based on this information, the second question asked participants to indicate the extent to which they would insist on full adjustment by management on all four issues to preserve a clean opinion. By referring to the prior materiality assessment in question one, conclusions on the appropriateness of the required adjustments can be made.

3.2.2 Experimental procedure

The participants were informed about the experimental procedure, the purpose of the experiment and the experimental task. At the beginning of the experiment, each participant received a booklet containing the case instructions and background, the consolidated financial data, the proposed adjustments from the audit and the requirements for the participants.

In the case introduction, the client is described as a publicly traded corporation that manufactures a variety of products for industrial applications. The instructions and background of the study are defined in two different scenarios (see description of the independent variables). In both scenarios, the participants received information about the client, its industry and its management. The information regarding the management is described to fit both a “low-risk” scenario and a “high-risk” scenario. In the high-risk scenario, the management should be viewed as risky. The consolidated financial data consist of a balance sheet, an income statement and some financial ratios. The data are provided for two years. To evaluate the audit, proposed adjustments for four audit findings are given. Each adjustment is under six per cent of net income. Thus, when considered individually, the amount of each proposed adjustment compared with net income might be considered relatively immaterial. In aggregate, however, the total amount of the proposed adjustments exceeds traditional standards of materiality. The financial data and the proposed adjustments are equal in the two scenarios. The requirements contain the instructions for the participants. Their task was to define a materiality threshold for the financial statements as a whole and to make decisions at the account balances level, determining whether the proposed adjustments would need to be booked for the client to receive a clean audit opinion.

The requirements also include some questions regarding individual background information (gender, nationality, age, study/profession, experience, etc.), which were gathered at the end of the laboratory experiment. Next, the results of our study are presented.

3.2.3 Sample

Before the results of statistical analyses are discussed, the study sample is presented. The laboratory experiment was conducted at Innsbruck University. The participating students come from Austria and Germany. In total, 102 students participate in the study; 53 of them receive a guideline for their materiality assessment; 58% of the participants are male and 42% female. Most of them are studying in a master’s degree program (67 students), whereas only 21 are enrolled in a bachelor’s degree program, and 14 are in a Ph.D. program. Fifty-five per cent of the students are from Austria. Both nationalities are represented at all three education levels. The laboratory experiment is conducted using different treatments/scenarios. The number of participants in each scenario is illustrated in the following figure.

Case scenario	Low risk		High risk	
	With guidelines (LR)	Without guidelines (LR-)	With guidelines (HR)	Without guidelines (HR-)
Participants in the treatments	22	28	31	21

Figure 1. Number of participants in the different scenarios and treatments/situations of the laboratory experiment

Most of participants are between 20-25 years old (~ 50%), approximately 30% are between 26- 30, and nearly 20% are over 30 years old. The age classification is based on the education system in Austria and Germany. Usually, career entry in these countries begins at age 25. Hence, participants older than age 30 are expected to be more experienced. Next, we refer to the experience of the participants. The self-assessment of the participants regarding their experience in handling materiality indicates that all levels of experience are represented within our experiment. The following table shows the participants’ self-assessment of their experience. A self-assessment score of between one and three represents less experience, and between five and seven represents more experience. The two

experience level groups are nearly the same size. Thus, half of the students enlisting in the study have audit experience. The self-assessment illustrates that the mean experience level is higher in group one than in group two.

Table 1. Participants' self-assessment of their experience level

Column	Situation	Participants	Mean	Std Dev	Std. Error	C.I. of Mean
High-risk treatment	1	30	4.286	4.499	1.700	4.161
Low-risk treatment	1	25	3.571	4.158	1.571	3.845
High-risk treatment (without g.)	2	21	3.000	1.000	0.378	0.925
Low-risk treatment (without g.)	2	26	3.714	2.563	0.969	2.371

Further, the analysis does not reveal a correlation between experience and age, but does indicate a weak correlation between experience and education level. Although students from the master's program have had more training in materiality issues, they may be conservative in their self-assessment. The spread of results might also be explained by the different practical backgrounds of the Ph.D. students (e.g., audit assistant, tax consultant or accountant).

4. Results

Next, the results related to the participants' risk assessments and materiality judgments are presented using statistical analyses.

The participants' experience should be reflected in their individual risk assessment and materiality judgment pertaining to the information they are given. Approximately 50% of the participants claim to be experienced in handling materiality.

4.1 Hypothesis I results

First, we examine the risk assessments the participants made based on their given information. Recall that the case information for scenario 1 suggests low-risk and that for scenario 2 suggests high-risk. The findings presented in Table 2 and Figure 2 indicate that the risk assessment differs between the two scenarios. In scenario 1, the most frequent risk assessment (modus) is two compared with a risk assessment of five in scenario 2. Moreover, the distribution of the risk assessments differs significantly between the two scenarios. This result is in line with prior literature indicating risk assessment as a significant factor for materiality determination (Wolz, 2003; Whittington & Margheim, 1993; Braun, 2001; Emby & Pecchiari, 2013). For the purpose of our further analysis we gathered evidence that the participants are able to distinguish between the high-risk scenario and the low-risk scenario and we got evidence that our experimental setting is appropriate for investigating issues on materiality. Through these findings, the participants' risk assessments can be used for further analyses.

Table 2. Descriptive statistics of risk assessments in the two scenarios

Column	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
High-risk scenario	52	0	4.981	1.229	0.170	0.342
Low-risk scenario	50	0	2.820	1.320	0.187	0.375
Column	Range	Max	Min	Median	25%	75%
High-risk scenario	.000	7.000	2.000	5.000	4.500	6.000
Low-risk scenario	.000	6.000	1.000	2.500	2.000	3.000
Column	Skewness	Kurtosis	K-S Dist.	K-S Prob.	SWilk W	SWilk Prob
High-risk scenario	-0.622	0.072	0.256	<0.001	0.899	<0.001
Low-risk scenario	0.956	0.369	0.233	<0.001	0.863	<0.001

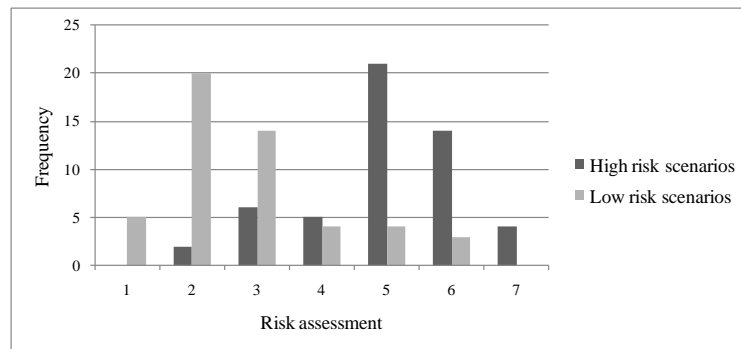


Figure 2. Participants' risk assessment in the two scenarios

For the purpose of an audit, an auditor needs to assess the identified risks and evaluate whether they relate more pervasively to the financial statements as a whole and potentially affect many assertions. Risk is a function of the risk of material misstatement and detection risk. In accordance with auditing standards, the risk assessment should be reflected in the materiality assessment for the financial statements as a whole. Therefore, we use a regression model to examine the participants' behaviour regarding this aspect. The independent variable risk assessment is ordinally scaled, and the dependent variable materiality is metrically scaled.

The results shown in Table 3 indicate that risk assessment (RASS) has a significant influence on materiality judgment. The regression model, in which the materiality threshold is directly controlled with the risk assessment, leads to the following (equation 2):

$$M = 1,026,339.077 - 110,418.990 * RASS + \varepsilon \quad (2)$$

Table 3. Regression for all materiality judgments and risk assessments

Model	R	R square	Adjusted R square	Std. error of the estimate
1	.480 ^a	.230	.223	338,683.69

a. Predictors: (constant), risk assessment

The adjusted R-square (0.223) and the significance of the F-Statistic ($P < 0.001$) indicate some explanatory power of the model. As expected, the risk assessment has a significant negative coefficient. According to this result, we would expect for an average audit with average audit risk a materiality threshold of approximately € 1,000,000. Depending on risk class (for a high-risk level), the materiality threshold is expected to decrease by € 110,419. Further independent variables such as experience do not increase the explanatory power of our regression model. We therefore focus on the impact of standard setting related to the materiality risk consideration.

In addition to the findings derived from the regression analyses, a Pearson Correlation is computed to analyse the risk assessment of the two different scenarios in more detail. Recall that the independent variable risk assessment is ordinally scaled, and the dependent variable materiality is metrically scaled. In both situations, a significant correlation can be observed. The Pearson Correlation shows a negative correlation of -0.441 between materiality and risk assessment in the low-risk situation and a negative correlation of -0.424 between materiality and risk assessment in the high-risk situation. The negative correlation indicates that a higher risk assessment is associated with a lower materiality threshold. This phenomenon is attributed to interdependency between risk assessment and materiality judgment. Remember that there is an inverse relationship between materiality and the level of audit risk; the higher the materiality level, the lower the risk and vice versa. Auditors must take this inverse relationship into account when determining the nature, timing and extent of audit procedures, which are mainly influenced by the materiality judgment.

With regard to the investment possibility in our study, gathering better information regarding the possible misstatements provide significantly more investments in the high-risk situations than in the low-risk situations. Most of the investments are made in the riskier fields of construction contracts and inventory rather than in the safer fields of property, plant and equipment (T- and F-Statistics indicate significant differences in the level of investment between the four decisions fields). Particularly in the cases of "construction contracts" and "inventory," the distribution function differs significantly between the high and the low-risk scenarios. In the low-risk scenario, step 2

is the most frequent investment decision, whereas in the high-risk scenario, most of the participants decide to invest in step 4. Hence, these findings are in line with our expectations, revealing that the participants try to minimize their risk of erroneous adjustments by increasing audit effort through buying more information to assure their final decision. Table 4 summarizes these findings.

Table 4. Statistics for both treatments/situations

	Warranty expenses	Construction cost	Inventory	Property plant and equipment
F-statistics	0.030445	1.668911E-06	0.611026	0.033005
T-statistics	0.000014	1.124447E-07	0.000372	0.000604

Based on these findings, we can state that the assessed level of risk affects the materiality threshold. Thus we can reject the H_0 hypothesis. The alternative hypothesis (H_1) is supported.

Regarding the relationship between risk and materiality our results are in line with prior research (Whittington & Margheim, 1993; Braun, 2001; Emby & Pecchiari, 2013).

4.2 Hypothesis II results

Our second hypothesis addresses whether materiality assessment differs depending on whether quantitative materiality guidelines are present. We hypothesize that quantitative guidelines do not result in a reduction in the range of materiality assessments. The findings presented in Table 5 indicate that quantitative materiality guidelines have a significant effect on materiality judgments at least in the high-risk situations.

Table 5. Mean and standard deviation for the materiality judgments in all treatments

	High-risk situation with guideline	Low-risk situation with guideline	High-risk situation without guideline	Low-risk situation without guideline
Mean	429,131.29	807,695.00	604,150.95	598,552.14
Standard deviation	136,088.95	332,736.52	462,760.21	466,974.27

In both risk scenarios, the use of materiality guidelines has an influence on the materiality judgments and more obviously on the standard deviation of the materiality judgments. Additionally, the findings provide evidence that in both scenarios, the mean value standard deviation is lower when using the quantitative guidelines. The standard deviation is significantly lower (F-statistics $p < 0.000$) in the high-risk scenario when quantitative guidelines are present. Even the judgment of the absolute materiality threshold is more uniform and the mean materiality threshold is lower (T-statistics $p = 0.05$) when the quantitative guidelines are present compared to when they are not. This indicates that quantitative guidelines have an influence on the defining of materiality thresholds.

Interestingly the individual minimum of the materiality assessment is higher when standards are given compared to the minimum materiality assessment without standards. Hence, a higher risk is accepted as long as the requirements of the standards belong the materiality assessments are fulfilled. At the first glance this might be a disadvantage of standardization because this is linked to a higher accepted risk in the audited financial statements. This fact should be investigated by further studies. In addition the results support a definition of materiality with an open minimum value. In other words to resolve the problem of negative aspects of standardization the standard could only provide one percentage of a materiality benchmark (e.g. 10%), instead of a range of a benchmark (e.g. 5% to 10%). This might prevent anchor effects at the lower value. Figure 3 illustrates these findings for the high-risk situations:

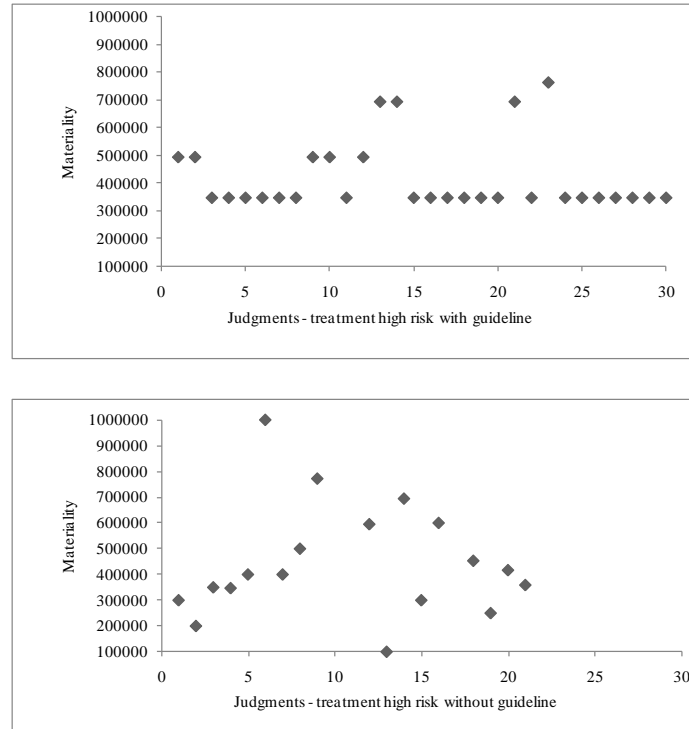


Figure 3. Materiality judgments in the high-risk scenarios

In the low-risk situations, the mean materiality threshold is higher when using quantitative guidelines than when not using them. However, the value of the standard deviation is lower. Thus, the results of the descriptive statistics indicate that materiality judgments in the low-risk scenario also tend to be more uniform when guidelines are used, but not to the extent of uniformity observed in the high-risk scenario. The higher mean value may indicate that judgments are less conservative when quantitative guidelines provide a range of possible benchmarks.

The results of a Mann-Whitney rank sum test indicate that the difference in the median values between the two low-risk situations is greater than would be expected by chance; the difference is statistically significant ($p = 0.030$). For the high-risk situations, the significance of difference is ($p = 0.006$).

The results indicate that quantitative materiality guidelines lead to a narrower range of materiality judgments. They show that the ranks in the situations are significantly different depending on whether the quantitative guidelines are present. Moreover, our findings demonstrate that the materiality judgment is more objective (having a narrower range) if quantitative materiality guidelines are provided. This increased objectivity could improve financial statement addressees' confidence in the audit. We gather evidence that quantitative guidelines result in a reduction of the range of materiality thresholds. Thus, we can reject the H_0 hypothesis and support the alternative hypothesis (H_1).

Furthermore, the results reveal that the participants mostly prefer the use pretax profit as the benchmark for materiality judgment. With this benchmark, the materiality judgment is predominantly oriented toward the higher end of the range (e.g., 10% of pretax profit) when quantitative materiality guidelines are given and the engagement appears to be less risky. As displayed in Figure 4, the results of the study show that participants tend to orient their materiality judgment toward the lower end of a provided materiality range (e.g., 5% profit before tax) when audit risk is high.

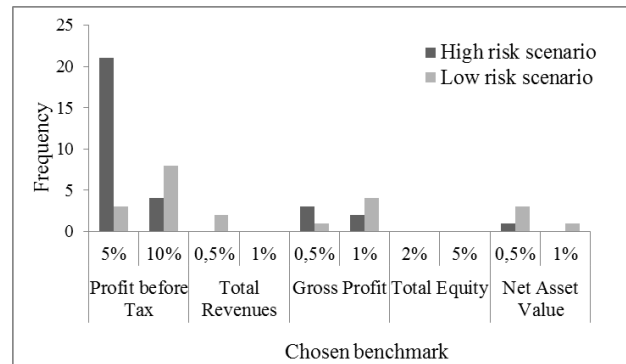


Figure 4. Benchmarks chosen by the participants

Using Spearman's Rho correlation, we investigate the relationship between benchmark and risk scenario for the high and the low-risk scenarios in more detail. The variable benchmark is ordinaly scaled, the variable risk scenario has only two levels (high and low-risk), and the variable risk assessment is ordinaly scaled. The Spearman's rank correlation coefficient of -0.512 shows a significant negative relationship between the chosen benchmark and risk scenario. In addition, the Spearman's rank correlation coefficient of -0.480 shows a significant negative relationship between the chosen benchmark and risk assessment. Thus, the results signify that an assessment of high-risk is associated with a lower materiality threshold.

These findings again indicate that participants consider audit risk when determining the materiality threshold. This is further evidence supporting the alternative hypothesis (H_1) of our first hypothesis.

As expected by intuition the standard setting process results in a narrower range of materiality judgments. On one side this supports arguments toward standardization because this results in a higher objectivity to re-assess and understand the auditors' materiality assessment for the addressees. At the same time, again the negative results of standardization come to light because even in a higher risk scenario the minimum materiality level is higher with standardization. In this context a question for further research is how this is linked with audit fees because a higher materiality assessment should be linked with lower audit effort and thus finally with a lower audit fee.

4.3 Hypothesis III results

Finally, we turn to our third hypothesis. To analyse whether the introduction of quantitative guidelines results in a change in the relative position of the materiality assessment, our experimental setting needs to be changed so that participants take part in both situations, first the situation without a guideline and afterwards the situation with a guideline. Therefore, a new experimental setting is created. 68 students from 12 European countries participate in this new setting. All the students attend an international master's program in accounting and auditing. 37 of the participants are enlisted in the high-risk scenario whilst 31 are enlisted in the low-risk scenario. First, all the participants must assess the audit risk and make the materiality judgment without guidelines (similar to situation (2) without guidelines). Again, the results reveal that risk assessment is highly negatively correlated ($-.625^{***}$) with the materiality assessment. The results of the new setting's regression model, in which the materiality threshold is directly controlled with the risk assessment, lead to an adjusted R-square of 0.391. The significance of the F-Statistic ($p < 0.001$) again indicates some explanatory power of the model. As in the prior setting, the risk assessment variable has a significant negative coefficient. The mean value of all materiality judgments is € 580,577. The maximum value is € 1,500,000 and the minimum € 30,000.

To analyse whether the introduction of quantitative guidelines results in a change in the relative position of the materiality assessment, the participants are next provided with the following five benchmarks and the associated percentage ranges as quantitative guidelines: profit before tax 5-10%, total revenues 0.5-1%, gross profit 0.5-1%, total equity 2-5% and net asset value 0.5-1%. The participants must assess which benchmark they deem to be appropriate depending on the risk scenario. Table 6 summarizes these findings.

Table 6. Descriptive statistics of materiality assessment in a new experimental setting

Column	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
Materiality judgment without guideline	68	0	580577	328690	39859	79560
Materiality judgment with guideline	68	0	585934	284886	34547	68957
Materiality judgment without guideline (high-risk scenario)	37	0	389439	250280	41145	83447
Materiality judgment with guideline (high-risk scenario)	37	0	388492	120798	19859	40276
Materiality judgment without guideline (low-risk scenario)	31	0	808709	259380	46586	95141
Materiality judgment with guideline (low-risk scenario)	31	0	821590	241418	43360	88553
Column	Range	Max	Min	Median	25%	75%
Materiality judgment without guideline	1470000	1500000	30000	500000	326380	925000
Materiality judgment with guideline	1180640	1527840	347200	347200	347200	763920
Materiality judgment without guideline (high-risk scenario)	970000	1000000	30000	350000	200000	407500
Materiality judgment with guideline (high-risk scenario)	416720	763920	347200	347200	347200	347200
Materiality judgment without guideline (low-risk scenario)	1200000	1500000	300000	800000	600000	1000000
Materiality judgment with guideline (low-risk scenario)	1180640	1527840	347200	763920	694400	988140
Column	Skewness	Kurtosis	K-S Dist.	K-S Prob.	SWilk W	SWilk Prob
Materiality judgment without guideline	0.423	-0.744	0.150	<0.001	0.924	<0.001
Materiality judgment with guideline	1.073	1.047	0.314	<0.001	0.778	<0.001
Materiality judgment without guideline (high-risk scenario)	1.306	1.108	0.24	<0.001	0.843	<0.001
Materiality judgment with guideline (high-risk scenario)	2.678	5.571	0.526	<0.001	0.370	<0.001
Materiality judgment without guideline (low-risk scenario)	0.165	0.193	0.221	<0.001	0.917	0.020
Materiality judgment with guideline (low-risk scenario)	1.031	2.882	0.272	<0.001	0.824	<0.001

The first and the second rows of Table 6 show the statistics for all materiality assessments. Again, we examine the impact of risk and present the results for the two risk scenarios separately. Rows three and four contain only the assessments data for the high-risk scenario, and rows five and six contain only the assessments data for the low-risk scenario.

We find that the mean value of all materiality assessments changes from € 580,577 to € 585,934. At first glance, there is no change in the relative position of the materiality assessment compared to when a guideline is absent. However, in examining the standard deviation, we see that the assessments with guidelines have a much lower standard deviation than those without guidelines and their range is much narrower. These results indicate that in general, the materiality range is based on the risk assessment, and the relative position of the individual materiality judgment will not change when guidelines are implemented.

Once more particularly for the high-risk scenario a narrower range of assessments can be observed when guidelines are introduced. In the high-risk scenario, the mean materiality threshold value when the guidelines are given is nearly the same as the mean value when the guidelines are not given (~€ 389,000). Nevertheless, the standard deviation is much lower when guidelines are given (€ 120,798). Without guidelines, the standard deviation is € 250,280. The results presented in Table 6 show that the maximum materiality assessment in the high risk scenario is lower when standards are given. This is a positive effect of standardization. Again the findings previously derived in analysing hypothesis II are supported, because in both risk scenarios the materiality threshold increases due to standard setting and shows the potential negative effects of the standard setting process.

Based on these findings, we can reject our H_0 hypothesis. The alternative hypothesis (H_1) is supported.

5. Conclusions

The reputation of auditors has reached a critical point worldwide. There is currently an ongoing discussion on improving the quality of audits and, in particular, the quality of the issued audit report by implementing new methods and regulations. National and international suggestions for reorganizing the auditing profession focus on ensuring that auditors are independent from their clients, are highly qualified, and perform their work in accordance with high technical standards. In this context, the adoption of ISA in the European Union is being widely discussed. Audit quality is primarily influenced by the requirements of accounting bodies and standard setters, as well as the professional judgment of each auditor involved. The materiality judgment is especially influenced by the individual judgment of the auditor because there is a lack of clear standardized guidelines for materiality judgments. Thus, the same materiality issue could be judged differently by different auditors. Additionally, it is possible that financial statement auditors and addressees have divergent understandings of materiality due to their differing specific interests. Previous studies revealed that auditors tend to determine higher thresholds than expected by investors but lower thresholds than preparers (e.g., Messier et al., 2005). For this reason, in the near future auditors may be required by a revision of ISA 700 to report in the auditor's report how they applied the concept of materiality in performing the audit and how their materiality judgments affected the scope of their audit. The new exposure drafts of ISA 700 revisions and the new ISA 701 will enhance auditor reporting globally and are a response to calls in the wake of the global financial crisis from investors, analysts and other users of audited financial statements for the auditor to provide more relevant information in the auditor's report.

Auditors' materiality judgments are important because they have a significant influence on what information is recorded in the accounts and disclosed in the financial statements, and thus on what information is available for decision making by external parties.

Standard setters have long refused to quantify materiality thresholds, arguing for professional judgment, but since 2009 the ISA has cautiously recommended an exemplary set of benchmarks that can be used to form a certain percentage or range of percentages as a starting point to determine materiality. For example, the explanatory material of ISA 320 states that five percent of pretax profit or one percent of total revenues can be used for the determination of materiality. The standard also recommends using a higher or lower percentage if required by professional judgment. When defining a percentage or a range of percentages, standard setters are confronted with the problem of auditors tending to minimize their costs and adjusting the audit effort only to the level at which the minimum standard requirements are fulfilled. Standard setting has the risk of reducing the influence of professional judgment and the importance of experience. That means that although the standard stresses professional judgment as an essential element of the materiality judgment, the focus on professional judgment may fade due to the process of standard setting. In other words, due to the implementation of materiality guidelines, less experienced persons are able to assess a materiality threshold. Even more experienced auditors could tend to orientate themselves toward the

guidelines and neglect their professional judgment. As long as the standard requirements can be fulfilled, the risk of litigation is low. Hence, there is a risk that guidelines could become a substitute for professional judgment.

The research literature has found different procedures and factors driving materiality thresholds, but relatively little is known about how auditors assess materiality. Some studies reveal that the determination of materiality thresholds depends on the experience of the auditor (e.g., Krogstad et al., 1984); and on the pressure (e.g., DeZoort et al., 2006) to justify the assessed threshold. Auditors with less experience tend to be more conservative, which means that they determine lower materiality thresholds. Justification pressure produces the same result; the more the participants must justify their decision, the more they rely on (internal audit company) guidelines (e.g., DeZoort et al., 2003; DeZoort et al., 2006).

A substantial amount of research has studied disclosure thresholds. However, some papers note that the findings demonstrate a lack of consensus among accountants and auditors as to the magnitude of the thresholds. Furthermore, considerable disagreement regarding the appropriate magnitude of these thresholds is suggested by the literature. One reason for the lack of consensus is the lack of clear materiality guidelines from professional accounting bodies and standard setters to date. A second reason for the lack of consensus is that qualitative variables may also affect the thresholds. Additionally, it is possible that auditors and addressees of financial statements have different understandings of materiality due to their differing specific interests. These considerations demonstrate the importance of the auditors' materiality judgments in financial reporting. Moreover financial statement preparers have significant influence on what information is recorded in the accounts and disclosed in the financial statements. The importance of materiality judgments and the lack of clear knowledge on them was the rationale for this study. The objective of this research is to study the effects of standardized materiality guidelines on auditors' planning materiality judgment through an experimental study. The findings reveal that the materiality assessment is significantly influenced by the risk assessment. We find that standardized quantitative materiality guidelines lead to better uniformity of judgment among different auditors and that materiality judgments span a wider range in the absence of quantitative materiality guidelines.

The last finding is that the implementation of quantitative guidelines does not result in a change of the relative position of the materiality assessment in comparison to when guidelines are absent, but the standard deviation of the assessments is much lower when guidelines are implemented, which implies that the range of assessments is narrower.

Although these findings partially support the implementation of standardized quantitative materiality guidelines, we must emphasize that these guidelines can only provide an initial basis for the decision and can never be a substitute for the required professional judgment. From this point of view, the approach of ISA 320 is appropriate because the standard draws attention to basic requirements. Moreover, ISA 320 focuses on possible benchmarks but highlights the importance of professional judgment.

Our results show that the expected range of materiality assessments is narrower when standards are given. This might be positive from the financial statements' users' perspective due to a higher comprehensibility of the auditor's materiality assessment. However for the first time our results show that the arguments against standardization with regard to the materiality assessment get some support. This is manifested by the fact that in all (high and low risk) our scenarios the minimum level of materiality assessment is higher with standardization. In this context further research is needed that investigates the relationship between standardization and risk assessments and the handling of audit risk. This issue is of high relevance because it would be difficult to blame an auditor not to care reasonable diligence as long as the requirements of the standards are fulfilled.

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Notes

Note 1. Especially Footnote 2 of ISA 320.2: For example, the Framework for the Preparation and Presentation of Financial Statements, adopted by the International Accounting Standards Board in April 2001, indicates that, for a profit-oriented entity, as investors are providers of risk capital to the enterprise, the provision of financial statements that meet their needs will also meet most of the needs of other users that financial statements can satisfy.

Note 2. For details see FRC, 2013.

Note 3. We focus on planning materiality decisions (i.e., those that determine the extent of audit testing) and not on evaluative materiality decisions (i.e., those that affect the disposition of detected misstatements).