The external auditors’ reliance on internal auditors’ work: An exploratory, multi-method study on determinants of independence and objectivity

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Abstract

In this paper, we aim to empirically explore determinants of the IAF’s independence and internal auditors’ objectivity from both the external auditors’ and the internal auditors’ perception. We thereby employ a multi-method approach. First, we review regulations and the current literature to collect determinants of independence and objectivity. Second, we conduct a number of interviews with external and internal auditors to understand and complement these determinants. Third, we explore their importance by conducting a survey with 118 experienced internal auditors. The results of the survey stress the importance of the CAE’s attitude for the IAF’s independence and internal auditors’ objectivity. Finally, we perform two experiments with experienced internal auditors. We explore if the CAE can bias internal auditors’ judgments in their potentially competing roles of serving two masters: management and the audit committee. Both masters can have different visions for the use of the internal audit function and we argue that it depends on the Chief Audit Executive (CAE) which vision will dominate. We test our hypotheses in a mixed experimental design with communicated preferences of the CAE (cost reduction vs. effectiveness) as between-subjects manipulation and different degrees of task complexity (low, medium, high) as within-subjects manipulation. Our main findings suggest that CAE instructions can impair internal auditors’ judgments under the condition that task complexity is high. The studies’ results question whether the independence of the internal audit function is always achievable and stress the crucial role of the CAE. We also discuss implications for the external auditors’ reliance decision.

Keywords: Corporate governance, internal audit function, independence, judgment, effectiveness, internal controls.
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1. Introduction

The internal audit function (IAF) is a main cornerstone of corporate governance besides management, the audit committee and external auditors (Abbott, Parker, & Peters, 2010; Prawitt, Smith, & Wood, 2009; Glover, Prawitt, & Wood, 2008; Gramling, Maletta, Schneider, & Church, 2004). According to the Institute of Internal Auditors (IIA, 2009a), the IAF should be independent on an organizational level and individual internal auditors should provide objective judgments to contribute to quality corporate governance (IIA, 2009a and 2009b; see also e.g. Abbott et al., 2010, Goodwinn & Yeo, 2001). However, internal auditors serve as providers of both assurance and consultancy services within the organization. This dual role might generate conflicts of interest and thus impair independence and objectivity (Stewart & Subramaniam, 2010; Hoos, 2010; Ahmed & Taylor, 2009). In the light of regulation that encourage external auditors to “use the work of others to a greater extent when the work is performed by sufficiently competent and objective persons” (PCAOB, 2007, 13), it is crucial to financial reporting quality that internal auditors are sufficiently objective and competent, and that the IAF is an independent function within organizations. This importance is also stressed in auditing standards which suggest that external auditors should rely on the work of internal auditors (ISA 610, AS 5).

To explore the nature of internal auditor’s objectivity and independence, we used a multi-method approach. First, we review regulations and the current literature to collect determinants of independence and objectivity. Second, we conduct a number of interviews with external and internal auditors to complement and confirm determinants of the literature review. Third, we explore their importance by conducting a survey with 118 experienced internal auditors. The results of the survey stress the importance of the CAE’s attitude for independence and objectivity. Finally, we perform two experiments with experienced internal auditors. We explore if the CAE can bias internal auditors’ judgments in their potentially competing roles of serving two masters: management and the audit committee. Both masters can have different visions for the use of the internal audit function and based on our survey study, we argue that it depends on the Chief Audit Executive (CAE) which vision will dominate. Consequently, the hierarchy
within the IAF, and especially communicated preferences of superior internal auditors like the Chief Audit Executive (CAE), are crucial for the vision (e.g. cost reduction vs. effectiveness of internal controls) that will dominate. Despite the positive and constructive role that the CAE and senior internal auditors can play to balance the conflicting priorities of management and the audit committee (Bailey, Gramling & Ramamoorti, 2003), we posit that their current role in the serving two masters setting is also a threat to the IAF’s independence. The CAE plays a very prominent role in terms of the amount of information that is disclosed to external auditors, the use of reporting lines, and the discussion of the audit plan in general (e.g. Soh & Martinov-Bennie, 2011; Goodwin & Yeo, 2001). Numerous incentives exist that motivate the CAE to use this prominent role to influence subordinated internal auditors. For instance, many CAEs are promoted into management positions or they are part of a rotation system in which managers become the CAE for a certain period of time before returning to a management position (Messier, Reynolds, Simon, & Wood, forthcoming; Goodwin & Yeo, 2001; PwC, 2000). Furthermore, the CAE can be biased by the tone at the top or unconsciously communicate priorities of management and the audit committee in an unbalanced manner. We draw on research that shows that superiors are able to exert a tremendous influence on the judgment of subordinates in order to develop our hypotheses (e.g. Davis, DeZoort, & Kopp, 2006; Lord & DeZoort, 2001; Brief, Dietz, Cohen, & Vaslow, 2000; DeZoort & Lord, 1994). We argue in line with Norman et al. (2010) and based on research on external auditors (Bazerman & Moore, forthcoming; Moore, Tetlock, Tanlu, & Bazerman, 2006; Bazerman, Morgan, & Loewenstein, 1997; Moore, Tanlu, & Bazerman, 2010), that the independence of the IAF might not be achievable in the two masters setting.

Our research is important because it is expected that internal auditors can make objective judgments – the precondition for their prominent role in corporate governance. For instance, the Institute of Internal Auditors (IIA) defines that internal auditors should not be “unduly influenced by their own interests or by others in forming judgments” (IIA, 2009b). Additionally, external auditors are encouraged by legislation to use the work of the IAF to a greater extent when performed by objective internal auditors (PCAOB, 2007). Finally, professional auditing standards like ISA 610 and AS 5 stress that internal auditors’ objectivity is a precondition to use their work results during an external audit (see AICPA, 1990; IFAC, 2008). Consequently, internal auditors absolve a rigorous set of professional trainings, certificate programmes, and
they use codes of conduct and professional standards. Like external auditors, they go through a unique professional socialisation process that is supposed to provide them with the attitude to withstand conflicts of interest. Research on internal auditors’ judgments in the two masters setting is also timely and relevant due to major legislative developments. For instance, the recently adopted 8th EU Directive (EU, 2006, Art. 41) obliges public-interest companies to implement an audit committee that monitors the effectiveness of internal controls. In light of recently published articles (e.g. Norman et al., 2010; Messier, 2010), it is important to provide further evidence on internal auditors’ judgments to provide recommendations for practitioners and regulators.

In the experiment, we investigate internal auditors’ judgments in a realistic setting where internal auditors face a concrete trade-off: On the one hand, they are employed by management that usually demands cost reductions of internal controls. On the other hand, internal auditors are committed to their profession and to the audit committee to provide assurance regarding the effectiveness of internal controls (Messier, 2010; Hermanson & Rittenberg, 2003). In two experiments that we conducted in collaboration with a Swiss-based (Experiment 1) and a German-based (Experiment 2) international corporation, internal auditors were randomly assigned to two different groups and were afterwards exposed to two different between-subjects manipulations (cost reduction vs. effectiveness). The experimental task required participants to evaluate different processes in terms of their internal controls and their inherent costs. The processes differed in their degree of task complexity, our within-subjects manipulation. Participants were asked to decide whether to drop internal controls to reduce potential costs.

An actual internal audit director (Swiss-based company) and an actual CAE (German-based company) gave instructions to their current subordinates that represented the between-subjects manipulation. In the first between-subjects experimental group (cost reduction condition), the CAE placed emphasis on the internal auditor’s obligation to management which was represented by a call for cost reduction. In the second experimental group (effectiveness condition), the CAE placed emphasis on the fact that internal auditors have to ensure the effectiveness of internal controls and to assure compliance with their obligations towards the audit committee. In our experimental settings, we posit that task complexity – our within-subjects manipulation – is an important variable to take into account. It determines the amount of elastic justification that is employed by internal auditors (see Hsee, 1996). In other words, higher
amounts of task complexity provide internal auditors with the possibility to make judgments that are in line with superior instructions.

Our findings indicate that internal auditors drop significantly more costs of internal controls and design less effective processes in the cost reduction condition when task complexity is high. This result shows that superior instructions can bias subordinated internal auditors’ judgments. It also suggests that internal auditors’ objectivity and the IAF’s independence might not always be achievable in an institutional setting where internal auditors serve two masters with different priorities. Moreover, in Experiment 1 we found that internal auditors who are provided with additional information that contradicts the CAE’s instructions need significantly more time to perform their judgments.

The remainder of the paper is organized as follows. In the next section, we provide background for our study. The subsequent section presents the development of the hypotheses tested. This is followed by a section that presents the methodology used. The results of the study are presented next. The last section contains a discussion of the results, propositions for future research and limitations.

2. Background and preliminary study

2.1. Independence and objectivity

The internal audit function (IAF) has been gaining in importance both as a main cornerstone of the financial reporting process and for corporate governance in general (Abbott et al., 2010; Prawitt et al., 2009; Glover et al., 2008; Gramling et al., 2004; Cohen et al., 2004). One major precondition for a potentially positive contribution of the IAF is its organizational independence and the internal auditors’ judgment objectivity. For instance, auditing standards like AS 5 and ISA 610 describe objectivity as a major precondition for using the IAF’s results as part of an external audit (see AICPA 1990; IFAC, 2009). Regulators even encourage external auditors to use the work results of the IAF to a greater extent if it is performed by sufficiently objective internal auditors (PCAOB, 2007).

In the recent literature, only a few studies empirically examine independence and objectivity issues placing the focus on the following issues: First, several studies examined reporting relationships with management and the audit committee. The IAF has to disclose its
information to management and the audit committee while at the same time both parties can have different visions of the role of the IAF (Gramling et al., 2010). This was often called the serving two masters problematic (e.g. Messier, 2010; Abbott et al., 2010). Norman et al. (2010) provide experimental results showing that internal auditors adapt their judgment about fraud risks according to the audience they report to (i.e. management vs. the audit committee). Second, Messier et al. (2011) highlight the importance of whether the IAF is used as a management training ground (i.e. a company targets internal auditors for hire into management positions outside of the IAF) or not. The authors find that external auditors perceive internal auditors as less objective if the IAF is used as a management training ground (Messier et al., forthcoming). The rational mentioned in the literature is that the internal auditors could expect in this case that the chance of being promoted into a management position increases (akin to Messier et al., forthcoming). Given that around 50% of companies use the IAF as a management training ground (Messier et al., 2011), further understanding the impact of this practice on internal auditors’ objectivity is relevant not only from a theoretical but also practical point of view. Third, there is a number of articles that mentions important aspects without examining them empirically. These aspects are mentioned below.

2.2. Legislative background

According to national and international professional guidance (ISA 610, AS 5, SAS 65), the external auditor’s reliance decision depends on the evaluation of the IAF. In particular, the auditor should assess independence, objectivity and competencies of the IAF. The independence of the IAF, however, depends on its implementation within the organisation. Since our interviews – the practitioner’s view – were conducted in Switzerland, we will briefly describe relevant regulations of the International Auditing and Assurance Standards Board (IAASB), the American Institute of Certified Public Accountants (AICPA) and the Swiss Institute of Certified Accountants and Tax Consultants.

The IAASB functions as an independent standard setting body under the auspices of the International Federation of Accountants (IFAC) and publishes standards on auditing (ISA). Among the required methodology of external auditing, ISA 610 (redrafted) is specifically dedicated to questions of using the work of internal auditors:

“The objective of the external auditor is to obtain an understanding of the internal audit function
and determine whether the activities of the internal audit function are relevant to planning and performing the audit and, if relevant, the effect on the procedures performed by the external auditor.”

Therefore, the internal audit department is evaluated and will influence the nature, timing and extent of auditing procedures to be performed by the external auditor. During this assessment, the first and most crucial variables are the IAF’s independence and objectivity criteria:

“In determining whether the work of the internal auditors is likely to be adequate for purposes of the audit, the external auditor shall evaluate:

(a) The objectivity of the internal audit function;
(b) The technical competence of the internal auditors;
(c) Whether the work of the internal auditors is likely to be carried out with due professional care; and
(d) Whether there is likely to be effective communication between the internal auditors and the external auditor.”

Additionally, the ISA framework (IIA, 2009a) proposes more accurate details regarding the methodology to assess independence of the IAF and objectivity by recommending the external auditors to consider the following factors:

- The status of the IAF within the organisation;
- The reporting relationship of the IAF and whether they have direct access to those in charged of governance;
- The detection of conflicting responsibilities within their function;
- The surveillance of their employment by those charged with governance and whether the management comply with their recommendation and
- Recognition of restrictions coming from the management or those charged with governance.

The U.S. regulator - the AICPA (the American Institute of Certified Public Accountants, 1997) - also developed a standard for the use of internal auditors’ work: The “SAS 65 - Statement of Auditing Standards No. 65; coordination between internal and external auditors”. The required methodology regarding the evaluation of independence and objectivity is similar.
Nevertheless, this regulation recommends external auditors to consider additional factors such as:

- Previous experiences with the client’s IAF;
- Discussion with management;
- External quality review of the IAF and
- IIA frameworks or other internal audit standards (if applicable) as basis for the objectivity assessment.

In Switzerland, the profession of external auditors is required to perform the external audit in accordance with the Swiss Auditing Standard. The PS 610 (NAS 610) states that the IAF is part of the company and, as a result, regardless of its degree of autonomy, it cannot benefit from the same independence as that expected towards the external auditor. If the external auditor is using parts of the IAF’s work, the external auditor remains integrally responsible for the issued opinion. From another point of view, the Swiss Institute of Internal Audit (IIAS) also encourages this collaboration because it recommends in section 2050 that “the chief audit executive should share information and coordinate activities with other internal and external providers of assurance and consulting services to ensure proper coverage and minimise duplication of efforts” (IIA framework (2009a), section 2050 – Coordination). In order to reduce potential threats to independence and objectivity, the Swiss Institute of Internal Auditing developed a quality assurance that internal audit departments should perform on a regular basis. This self-assessment enables the chief audit executive to ensure that fundamental assertion of internal audit function is fulfilled, notably the independence requirement of section 1110.

2.3. Preliminary study

We developed a questionnaire in order to test the findings from conducted interviews. Their main result was a list of items that could potentially determine the IAF’s independence and individual internal auditors’ objectivity (see Table 1). We asked thirteen questions on how to strengthen the independence of the IAF and the objectivity of the internal auditors and collected demographic variables. We distributed the questionnaire during the annual congress of the German Institute for Internal Auditing in November 2011. This is the annual meeting of the internal audit profession with approximately 800 participants.
We collected 113 questionnaires. Most participants work in an internal audit department, thereof 34 (30%) are head of the IAF and 52 (46%) respondents work as internal auditor. Other participants are external auditors, staff working in related departments such as risk management or accounting and consultants. 11 participants did not provide an answer. The mean internal audit work experience is 11.85 (SD = 1.54) years. Most of the respondents work in the financial industry (43%), followed by manufacturing companies (27%), and the public sector (9%). Measured by number of employees the sample represents smaller as well as large organizations (see Table 1). 55% are capital market orientated, 42% are not whereas 3% did not know whether their organization is capital market orientated or not.

[Insert Table 1 here]

We applied a 5-point Lickert scale from 5 “totally agree” to 1 “do not agree at all”. We ranked the answers to the level of average agreement. Table 1 shows the ranked questions according to the mean of the respondents’ level of agreement. We found strong agreement for an internal audit mission statement stressing independence and objectivity. In line with the findings of the interviews there is almost equally strong agreement that the attitude of the head of the IAF determines considerably the independence of the IAF as well as the objectivity of internal auditors. Accordingly, already the item with the second highest agreement level is a soft factor that is normally not considered in the external auditor’s reliance decision. Also, the head of the IAF should report to the supervisory body such as the audit committee. For some questions we found rather mixed results. Especially, the role of a variable bonus that is profit-related is debated. We found a mean in the middle of the scale (2.46) combined with a high standard deviation of (1.36). The question on whether the Chief Audit Executive should be also nominated and withdrawn by the supervisory body shows the highest standard deviation, an indicator for a mixed level of agreement.

Internal auditors seem to be rather pessimistic about the role of some more formal measures to improve independence. E.g. the role of external trainings as well as of self-certifications are not be considered very important. Furthermore, internal auditors do not think that the collaboration with external auditors jeopardize their role in process optimization. This is in line with the perception of internal auditors, that they are still able to provide both consulting and insurance services without jeopardizing independence. Also they do not see the independence in danger because they are part of their organization. In contrast to recent literature
internal auditors do not judge the influence of the IAF as management trainings ground to decrease independence.

Based on the result that the CAE plays a crucial role for the IAF’s independence and individual internal auditors’ objectivity, we designed an experiment based on the following reasoning: Internal auditors can face a trade-off between cost reduction and effectiveness of internal controls (Messier, 2010). They have to decide how much emphasis they place on the somewhat conflicting priorities. As Kinney et al. (1990, p. 1) stress, "the cost effectiveness criterion is problematic, however, because without a specific statement of required outputs, even a relatively weak system can be judged to be 'cost-effective'.” The COSO (1992) report mentions the same trade-off. The report explicitly names effectiveness and efficiency of operations as objectives of the IAF and thus implicitly addresses that internal controls have two competing characteristics: Cost and effectiveness. In contrast, the Sarbanes-Oxley Act of 2002 and the 8th EU Directive, as the most recent legislative milestone affecting internal controls, do not explicitly mention this trade-off and its potential problems for the new role of the IAF. However, the tension between costs and effectiveness is reinforced by new legislation and is discussed in research and practice as a major issue (e.g. Messier, 2010).1

3. Hypotheses development

3.1. Internal auditors’ objectivity and the IAF’s independence

The definition of the IIA (2009a) stresses that internal auditing is "an independent, objective assurance and consulting activity". It defines independence as a central characteristic. In their code of ethics, the IIA (2009b) defines further what it means by objectivity. It states that internal auditors "make a balanced assessment of all the relevant circumstances and are not unduly influenced by their own interests or by others in forming judgments." However, this assumption stands in contrast to experimental findings and was criticized in an external audit context (Bazerman & Moore, forthcoming; Moore et al., 2006; Bazerman et al., 1997; Moore et al., 2010). For instance, Bazerman et al. (1997, p. 90) draw on evidence from psychological experiments and question whether external auditors can make objective judgments "that respond

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1 Note for example that the headline of the annual meeting of the German Institute of Internal Auditors (Deutsches Institut für Interner Revision, DIIR) in 2010 was as follows: The internal audit function and the trade-off between adding value and assuring effectiveness. The German title was: “Die interne Revision im Spannungsfeld zwischen Wertbeitrag und Schutzfunktion.”
to the interests of creditors, stockholders, and the general public, rather than to the interests of the companies that hire them." The authors argue that it is impossible to avoid unconscious bias that is contradictory to the auditor's role as an objective decision maker (Moore et al., 2010; Moore et al., 2006; Bazerman et al., 1997). In other words, "judgments are likely to be unconsciously and powerfully biased in a manner that is commensurate with the judge's self-interest" (Bazerman et al., 1997, p. 91; see also Kunda, 1990). As a result, independence remains a problem for auditors despite professional trainings, auditing standards, and codes of conduct (Bazerman & Moore, forthcoming; Bazerman et al., 1997; Moore et al., 2006; Nelson, 2006).

Comparable issues arise in the judgment process of internal auditors (Norman et al., 2010). Internal auditors. This influences the chosen judgment strategy and output (Buchman, Tetlock, & Reed, 1996; Messier & Quilliam, 1992; Gibbins, 1984; Beach & Mitchell, 1978). In terms of internal auditors' accountability, superior internal auditors like the CAE play a crucial role. First, they communicate the policies of the audit committee to subordinated internal auditors. Second, they merge instructions received by management and the audit committee and forward them to subordinates. In addition, if no direct reporting duty to management exists for a given task, internal auditors might still feel an accountability to the tone at the top (Cohen et al., 2004), which might unconsciously impair their judgment. This is especially true for companies where the IAF serves as a training ground for future managers (Messier et al., forthcoming; Goodwin & Yeo, 2001). Subordinated internal auditors can use a variety of strategies to cope with the fact that they are held accountable. Contingency theory predicts different effects on subordinates' judgments (Beach & Mitchell, 1978; Tetlock, 1985 and 1992; Tan, Jubb, & Houghton, 1997; Buchman et al., 1996). In general, internal auditors are motivated to gain the approval and respect of those to whom they are held accountable (Hogan, 1982; Pfeffer, 1981; Schlenker, 1980). In a setting where internal auditors are explicitly held accountable to their superiors, whose preferences are known, the judgment strategy that seems to be most important is the acceptability heuristic. According to Buchman et al. (1996, p. 380), it implies "that when the views of those to whom one is accountable are known, and if one has yet to make a decision, one often takes the path of least resistance and simply chooses an option likely to be acceptable to 'important others'." In this context, research in different fields has shown that superiors can

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2 The tone at the top is understood as an (ethical) environment that is created by senior managers and directors by example and action (Schwartz, Dunfee & Kline, 2005).
exert a tremendous influence on subordinates’ judgments (e.g. Davis, DeZoort, & Kopp, 2006; Lord & DeZoort, 2001; Brief et al., 2000; DeZoort & Lord, 1994; Milgram, 1974). The auditing literature provides evidence that auditors tend to tailor their judgment to their specific audience (Buchman et al., 1996; Hackenbrack & Nelson, 1996). More specifically, auditors tend to tailor their judgment to the views of their clients (Bamber & Iyer, 2007) and superiors (Koonce, Anderson, & Marchant, 1995). In a slightly different auditing context, studies on obedience pressure found evidence that subordinates tend to obey when pressure was exerted by a superior (DeZoort & Lord, 1994). Others found that the judgment of accountable subordinates is significantly influenced if the preference of their superior is known versus not known (e.g. Tan et al., 1997). The literature on motivated reasoning provides strong arguments that subordinates adapt their judgment to superior preferences (Kunda, 1990). Hence, research provides strong evidence that known superior preferences influence subordinates’ judgments. This leads us to the following hypothesis:

H1: Internal auditors will cut significantly more costs of internal controls when a superior preference favors management’s position (cost reduction) than when it favors the position of the audit committee (effectiveness).

### 3.2. Task complexity

We hypothesize that communicated superior preferences will influence internal auditors’ judgments. However, we acknowledge that a given task can be described along various dimensions and that some of these dimensions account for the influence that a superior preference can have on internal auditors’ judgments (e.g. Beach & Mitchell, 1978; Kunda, 1990; Hsee, 1996, 1997; Schweitzer & Hsee, 2002). Kunda (1990) and Hsee (1995, 1996) argue that people’s ability to arrive at a motivated conclusion is constrained by their ability to construct acceptable justifications for these conclusions. According to Hsee (1995, 1996), people tend to apply what he calls “elastic justification” to construct seemingly reasonable justifications for their conclusions. He argues that people’s judgments are influenced by two factors: Justifiable factors (those which judges should take into account) and unjustifiable factors (those which judges are motivated to take into account). According to Hsee (1996, p. 122), “for most judgment tasks, there is elasticity in justifiable factors”. This means that these factors can be interpreted in multiple ways. Regarding motivated conclusions, Hsee (1996) argues that
elasticity in justifiable factors leads to an influence of unjustifiable factors on judgments.

For our setting, we infer that internal auditors consider unjustifiable factors to make a judgment if the characteristics of the judgment task allow them to do so. We posit that two task characteristics determine the extent to which internal auditors will be unduly influenced in forming their judgments. First, a task without one single solution increases the possibility to use elastic justification strategies. Internal auditors have to deal with a high amount of uncertainty regarding the desired output of their task and this allows them to take unjustifiable factors into account (Schweitzer & Hsee, 2002). Second, processes that internal auditors have to examine during internal audits differ in their degree of task complexity, a major task characteristic that was extensively considered in accounting research (Tan, Ng, & Mak, 2002; Tan & Kao, 1999; Chang, Ho, & Liao, 1997). It is assumed that increases in task complexity increase systematic bias (Einhorn, Hogarth, & Klempner, 1977) and decrease judgment quality (Bonner, 1994). In sum, we argue that this can be explained by increased possibilities for elastic justification in more complex tasks that lack one single solution.

Bonner (1994) proposes a judgment model in which judgment quality is negatively related to task complexity. Additionally, she acknowledges that there can be interactive effects of task complexity and skills and/or motivation on judgment performance. In our studies, we assume that skills do not interact with task complexity because in each experiment all participants were from the same company and familiar with the evaluation task they had to perform. Thus, their perception of a process’ task complexity should not differ significantly. However, we manipulate the motivation of participants by exposing them to different between-subjects manipulation conditions (cost reduction vs. effectiveness). Consequently, by following the arguments that were put forward by Schweitzer & Hsee (2002) and Hsee (1995, 1996), we

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3 We use the definitions of the construct task complexity that were developed by Wood (1986) and Bonner (1994). They have been widely used in auditing research (e.g. Tan & Kao, 1999; Tan et al., 2002; Chang et al., 1997). According to Wood (1986), a higher degree of task complexity is represented by a higher number of information cues to be processed and steps to be executed while performing a task. Moreover, increased task complexity is given when a task depends more on steps taken earlier and thus a higher degree of backward/forward-reasoning is required. Bonner (1994) distinguishes generally between amount and clarity of information that determine the complexity of a task. Also, she adds number of goals, number of solutions, goal specification and presence of criteria for testing the solution as important task characteristics for the judgment output.

4 Note that we asked participants in familiarity checks how familiar they were with the task that they had to perform. Our checks revealed a high familiarity. We asked participants to what extent they had understood the exercise they had to perform. On a five-point Likert scale (1 = strongly disagree, 5 = strongly agree) participants of both experiments indicated that they understood the exercise (Experiment 1: M = 4.28; SD = 0.53; Experiment 2: M = 4.26; SD = 0.81). Additionally, the high agreement between items was confirmed during the unstructured interviews and discussions after both experiments.
argue that different degrees of task complexity determine different levels of elastic justification possibilities. Based on our arguments, we predict that higher task complexity will lead to higher compliance with communicated superior preferences (cost reduction vs. effectiveness). This leads us to the following hypotheses for three different levels of task complexity:

H2a: The effect of known superior preferences on internal auditors’ judgments will be greater for a task of high complexity than for a task of medium complexity.

H2b: The effect of known superior preferences on internal auditors’ judgments will be greater for a task of medium complexity than for a task of low complexity.

3.3. Cognitive effort

So far, we have considered only preferences that are communicated by a superior internal auditor as a factor motivating internal auditors to arrive at a certain conclusion. They are the most direct instructions that subordinated internal auditors receive. However, internal auditors know if the original assignment to perform a task stems from management or the audit committee, which can release expectations about the desirable judgment output. For instance, the expectation that management wants to reduce costs (or the expectation that the audit committee seeks effective internal controls) can conflict with the directly communicated preferences of the CAE. Consequently, in some judgment situations, internal auditors might face contradicting information or they are unconsciously influenced by other available information. In these situations, an additional layer of complexity emerges which influences the internal auditor’s judgment process. First, people cannot simply adopt the position of their audience, e.g. the direct superior, because contradicting information is available and also creates accountability pressure (Green, Visser, & Tetlock, 2000; Lerner & Tetlock, 1999). As a consequence, the judgment process is more complex than the application of a simplistic acceptability heuristic (Green et al., 2000; Lerner & Tetlock, 1999; Beach & Mitchell, 1978). Second, contradicting information exacerbates elastic justification because the motivation to arrive at a certain conclusion is not straightforward. Due to contradicting information in addition to the communicated superior preferences, people analyze the pros and cons of alternative judgments before they make a judgment (Lerner & Tetlock, 1999). Thus, the justification to follow the instructions of a superior demands a higher amount of cognitive effort (Green et al., 2000). Based on this argument, we predict the following:
H3: Internal auditors need more cognitive effort to make a judgment when known superior preferences are in contradiction to other available information than when they are not in contradiction to other available information.

4. Method

4.1. Overview

We conducted two experiments in collaboration with two European companies to examine our research question. Both experiments were preceded by intensive preparation in collaboration with two involved CAEs and two audit directors of the companies. Both companies had comparable IAF mission statements. Our experimental setting of two conflicting priorities (cost reduction focus vs. effectiveness focus) mirrored the current situation in both companies (i.e. there was an ongoing discussion how to balance the two requirements). The scenario and experimental task remained the same, apart from slight adoptions to react to feedback received from participants and researchers after Experiment 1. Both experiments were followed by unstructured interviews with participants and company staff. In the following sections, we describe Experiment 1 in detail and subsequently describe modifications of Experiment 2.

4.2. Experiment 1

Design

We conducted Experiment 1 in collaboration with a Swiss-based international corporation. It took place during an internal auditor’s in-house training week and was announced as a joint research project of the firm and the authors. We used a 2 x 3 mixed experimental design for Experiment 1 with superior preference as between-subjects independent variable and task complexity as within-subjects independent variable. The experimental task consisted of an evaluation of internal controls of a fictitious company that was recently acquired. Dependent variables were (i) cost of internal controls dropped, (ii) average perceived effectiveness per process and (iii) cognitive effort.

Our first independent variable – the superior preference – was manipulated between subjects. Participants were randomly assigned to two different rooms and received two different instructions from their actual superior. In the first experimental condition (cost reduction condition), instructions were in favor of cost reductions and therefore aligned with potential
preferences of management. In the second experimental condition (effectiveness condition), instructions were in favor of effective internal controls and therefore aligned with the preferences of the audit committee. Our second independent variable – task complexity – was manipulated within-subjects. In both conditions, participants had to evaluate internal controls and their inherent costs of three processes which differed in their degree of task complexity (low, medium, high). We describe the measurement of our dependent variables (i) cost of internal controls dropped and (ii) average perceived effectiveness per process below. We proxy cognitive effort by the time people needed to make a judgement (see also DeZoort, Harrison, & Taylor, 2006). After the experiment, we conducted six unstructured interviews to gather further information. Ten weeks after the experiment, we presented our results and discussed them with participants, the CAE and audit director, and other staff of the company.

Participants

Twenty-nine internal auditors participated in Experiment 1. Table 2 provides descriptive information about participants. Participants’ mean years as an employee of the company were 6.56 years, mean internal audit experience was 3.86 years and the mean number of subordinates was 1.5. Despite randomized assignment of participants to the experimental groups, we also tested if these demographic variables varied among between-subjects treatment groups due to our small sample size. Table 1 indicates that none of these demographic variables was significantly different between treatment groups (cost reduction vs. effectiveness). Fourteen participants were female and we find that they are equally distributed among groups. The vast majority of the participants held a Master’s degree (83 %). Significant other education, such as certified internal auditor (CIA), is common within the company. Additionally, our unstructured interviews revealed that the participants who do not yet hold a title like CIA are likely to pursue the certificate in the future. About half of the participants speak German as their mother tongue, while the primary working language is English for all but two subjects.

[Insert Table 2 here]
Materials and experimental task

Case materials and a questionnaire were used to collect the data of interest. Participants were provided with a case, a flow chart of three processes with associated internal controls, and an evaluation tool. We asked participants to evaluate the effectiveness of internal controls and whether they would drop a control to avoid its cost. The debriefing questionnaire contained questions to obtain descriptive statistics and several checks (manipulation checks and general understanding of the exercise related to internal auditors’ experience). We developed case materials as well as the visual design of the processes in collaboration with the internal audit director who was in charge of the manipulation (cost reduction versus effectiveness). This was done to achieve a high level of realism and fit of the materials regarding the daily work of participating internal auditors.

The experimental task consisted of an evaluation of internal controls of three different processes of the purchase department in terms of effectiveness and inherent cost. The three processes that internal auditors had to evaluate differed in their degree of task complexity. Process 1 consisted of 6 procedures with a total of 13 controls to evaluate and total potential cost of 27. Process 2 consisted of 5 procedures with a total of 32 controls to evaluate and total potential cost of 79. Process 3 consisted of 5 procedures with a total of 11 controls to evaluate and total potential cost of 19. Due to the absence of a direct manipulation check for task complexity, we employed an ex-post expert rating by five professionals who possessed an average experience of 14 years in internal auditing or related fields. Our experts rating revealed that Process 2 was ranked as the most complex process (high task complexity), followed by Process 1 (medium task complexity) and Process 3 (low task complexity).\footnote{Note that we did not employ a manipulation check for task complexity in our initial study and therefore asked internal audit experts to evaluate the task complexity of the three different processes. We asked the experts to rank the three processes in terms of their complexity based on the dimensions that were derived from Bonner (1994) and Wood (1986). All experts indicated that Process 2 was the most complex process. All but one expert indicated that Process 1 was the second most complex and Process 3 was the least complex process. We also provided the experts with 6 items regarding the complexity of the three processes. Each item was based on a seven-point Likert scale. To rank the processes, we calculated the average perceived task complexity per process based on the responses of the experts. This also revealed that Process 2 was perceived as the most complex process ($M = 5.01; SD = 0.56$), followed by Process 1 ($M = 4.40; SD = 0.51$) and Process 3 ($M = 3.43; SD = 0.44$).}

Participants received a flow chart for each process in which controls and its costs were presented as shown in Figure 1 for Process 1. Together with the flow chart, participants received
a case description and an evaluation tool. An extract of the latter is presented in Figure 2. All participants were told in the case description that their employer had recently bought a company and that one cornerstone in the acquisition concept of their company's management is cost reductions concerning internal controls. The processes presented contained an exaggerated amount of internal controls, which generally allowed participants to delete internal controls. In bold letters, participants were told that their primary objective on behalf of their management was to provide recommendations on how to reduce cost. This part matched the company's real situation. That is, the company was about to acquire other firms and internal auditors are most likely to be assigned to tasks that contain cost reductions of internal controls by management in an acquisition process. The case description also contained further explanations of the three processes and of the evaluation tool.

In the evaluation tool, participants were asked two questions per control, as shown in Figure 2. They were asked to make a decision (i) to which extent they thought a control is effective without considering its cost and (ii) whether they would drop a control or keep it under consideration of its cost. To answer the first question, we provided participants with a five-point Likert scale measuring the extent to which participants thought a control was effective. Answers for the second question were binary: Participants could either drop or keep a control. The costs per control were measured in cost units. It was explained in the case description that the relationship between cost units was linear, i.e. a control that induces a cost of four cost units is twice as expensive as a control that induces two cost units. The costs of a control were assigned to each control by using realistic numbers that were discussed with the internal audit director of the company who was in charge for the experimental manipulation.

**Procedure**

At the beginning of Experiment 1, all participants were assembled in one seminar room. One of the researchers introduced the purpose of the experiment as a study on the judgment of internal auditors. She explained the procedure and that two different groups would have to perform an evaluation of processes with a tool that was developed in collaboration with their company. She stressed that the results were important for both research in general and their company. Participants were also told that the participation was voluntary and that there were no right or wrong answers. Afterwards, participants were randomly assigned to one of two groups.
which were assembled in two separate seminar rooms. In each seminar room, the researcher explained the experimental task in detail: An evaluation of three processes and their cost of control. She also informed participants to write down the time they needed for the exercise because this information would be important for research purposes only. It was stressed that participants would have as much time as they wanted to finish their evaluation and that the primary objective was an appropriate answer to the questions in the evaluation tool.

After these general instructions the internal audit director took over and gave instructions to the participants. These instructions represented the manipulation. In both seminar rooms, she stressed the importance of the results of this experiment for the company and asked participants to solve the problem with appropriate effort. The manipulation was as follows: In the first seminar room (cost reduction condition), the superior told her subordinates the following: "I just want to remind you that it is the objective of this evaluation to decrease costs to a minimum as stated in the case. Please try to reduce costs to an absolute minimum. We are responsible to management in terms of cost." The sentence was repeated three times during general instructions with a slightly different wording meant to avoid an artificial situation.

In the second seminar room (effectiveness condition), the superior told her subordinates the following: "Concerning the case, do not forget that it is your objective as internal auditors to make sure that controls are effective. Even if we also want to ensure that controls are performed with the lowest possible cost, please make sure that they are effective. Do not only try to reduce cost to a minimum. Remember that we are responsible to the audit committee." The stress of effectiveness as an important judgment criterion of internal auditors was also repeated three times as described for the cost reduction condition.

The participants' superior left after the instructions and participants started the evaluation of the processes by using the flow chart and the evaluation tool. A stopwatch was projected on the wall during the experiment to measure the time participants needed for the evaluation of the processes. After a participant had finished the evaluation of the processes and written down the time needed, a questionnaire was assigned to this participant. Every participant who had finished the requirements of the experiment left the seminar room. After everybody had finished the requirements of the experiment, participants were assembled and fully debriefed. Subsequent to the experiment, we conducted six unstructured interviews with participants who agreed to stay to obtain an impression regarding the experimental task and the manipulations. We took notes of
participants’ comments and compared them to find general patterns.

4.3. Experiment 2

Design, materials, and experimental task

We used feedback on Experiment 1 and our conclusions based on the analyses of Experiment 1’s results to adapt some of the experimental materials. Mainly, we improved the between-subjects manipulation check and used only two levels of task complexity instead of three, as explained below. We also faced a small sample size in Experiment 1 because our between-subjects manipulation was based on the actual audit director giving instructions to subordinated internal auditors. We gathered additional participants by conducting Experiment 2 in collaboration with a German-based international corporation. The company agreed to use the same manipulation as in Experiment 1 based on an online tool. The experimental task represented a realistic scenario for this company.

Materials and the experimental task of Experiment 1 and Experiment 2 were identical. However, some adoptions of Experiment 2 were necessary for the following reasons: First, we were limited in terms of the time that the experiment should last as requested by the company. Consequently, we did not use the third process (low task complexity) for Experiment 2. Discussions with participants and results of Experiment 1 suggested that the medium task complexity manipulation was not significantly different from the low task complexity condition. Consequently, the experimental task in Experiment 2 consisted of Process 1 (medium task complexity) and Process 2 (high task complexity). This guaranteed the same beginning and order of the within-subjects manipulation by representing a shorter task. Furthermore, we did not collect the effectiveness dependent variable and shortened the questionnaire to adapt the experiment to the time limit required by the company. Second, internal auditors were not available at the same place at short notice and we decided to run the study online. Third, due to company regulations, participants performed the experiment anonymously. Fourth, participants had to report the time they needed instead of the authors checking the time of each participant. During the presentation of the results of Experiment 2, multiple participants mentioned that they did not appropriately check and report the time. Consequently, we decided to consider this variable only for Experiment 1. Lastly, we translated the materials for Experiment 2 into the company’s working language.
Procedure
We used the same experimental task and materials as in the first experiment with the slight modifications described above. 36 internal auditors received an email of the CAE (i.e. their direct superior) in which he asked the internal auditors to participate in a research project on internal auditors’ judgments. The email contained a link that directed participants towards a homepage on which they were randomly assigned to one of the two between-subjects treatment conditions. The manipulation was presented in email format on the homepage and was signed by the CAE of the participating company. It consisted of the same sentences as in the first experiment. On the homepage, participants read the case description and solved the experimental task. Afterwards, they responded to the questionnaire. Participants had ten days to finish the task online. Subsequently, they were fully debriefed.

Participants
[Insert Table 3 here]
We received a final database that was automatically created by the limesurvey software package. It contained 31 questionnaires, representing a response rate of 86.11 %. The data of four participants was excluded because they did not finish the experimental task. One participant withdrew his participation and data was also excluded. We used the remaining 26 questionnaires for further analyses. Table 3 provides descriptive information about the participating internal auditors who were all full-time employees. 24 participants were male and two participants were female. Participants had mean experience of 15.46 years with their current employer and mean internal audit experience of 15.19 years. The mean mean number of subordinates was 9. T-tests confirmed that there was no significant difference between mean values of demographic variables in the two experimental groups as reported in Table 3. However, all values were significantly higher than in Experiment 1. In terms of their primary education, all but one participant held a Master’s degree, which represents a similar percentage compared to Experiment 1. In contrast, significant other education such as the certified internal auditor (CIA) was not as common within the second company. Only seven participants held a CIA certification. Most of the participants speak German as their mother tongue and all participants indicated that German is their primary working language.
5. Results

5.1. Manipulation and familiarity checks

We employed manipulation checks for our between-subjects manipulation in both experiments. In Experiment 1, our main manipulation check consisted of an item in which participants were asked if the verbal instructions of their superior focussed on effectiveness or efficiency as their main task. A considerable number of participants did not detect their treatment group due to an imprecise wording of our manipulation check that did not precisely correspond to the wording of the between-subjects manipulation. As a result of our discussions with participants, we changed the wording of our manipulation check according to their suggestions. In Experiment 2, a clear pattern evolved. Almost all participants in the effectiveness condition detected the following: “My primary objective was to focus on the effectiveness of internal controls” whereas almost all participants in the cost reduction condition detected the following: “My primary objective was to increase the efficiency of the processes by dropping internal controls”. Only three participants were not able to detect their experimental group and their data was excluded from the sample. We considered all 29 participants of Experiment 1 and the remaining 23 participants of Experiment 2 for further analyses.

Familiarity checks were employed to test whether our experimental task represented a realistic scenario. We asked participants to what extent they had understood the exercise they had to perform. On a five-point Likert scale (1 = strongly disagree, 5 = strongly agree) participants of both experiments indicated that they fully understood the exercise (Experiment 1: M = 4.28; SD = 0.53; Experiment 2: M = 4.26; SD = 0.81). Additionally, we asked participants of Experiment 1 whether their job contained tasks that deal with similar processes than those of the exercise. On a binary yes-no-item, 25 of 29 participants stated that their job contained similar tasks and the high agreement to these items was confirmed during discussions with participants.

6 The item was as follows: “During the verbal instructions before you filled in the evaluation tool, the person in charge of COMPANY’S internal audit placed emphasis on the following item (choose only one item): Efficiency or Effectiveness. At first glance, our results suggest that participants were not able to detect their treatment group since in both groups an equal number of participants chose “efficiency” in the manipulation check item. We discussed our issue with participants of Experiment 1 during the presentation of our results. It turned out that there was confusion about the definition of both terms. Participants argued that they did not consider efficiency and effectiveness as a “black or white” issue which was suggested by the wording of our manipulation check. Rather they argued that there was a difference between a cost reduction and an effectiveness focus, which corresponds precisely to the wording of the instructions of our between-subjects manipulation.”
and unstructured interviews after the experiments.\(^7\) We conclude that we provided participants of both companies with a realistic scenario that they understood and felt able to solve.

5.2. **Descriptive statistics and hypotheses testing**

We first measured the dependent variable *dropped cost per process* to examine our predictions. We coded one if a control was dropped and zero otherwise and multiplied this value with the corresponding costs of the internal control. By adding the dropped cost, we obtained dropped cost per participant for each process and calculated the group means. Table 4 provides descriptive results for both experiments individually and for the full sample.

[Insert Table 4 here]

An individual analysis of the results of Experiment 1 and Experiment 2 indicates that participants in the cost reduction and the effectiveness groups drop a comparable amount of costs of internal controls for Process 1 (medium task complexity) and Process 3 (low task complexity).

In contrast, the difference in dropped cost between the cost reduction and the effectiveness conditions is rather high for Process 2 (high task complexity). Participants in the cost reduction condition of Experiment 1 dropped 9.50 cost units more than participants in the effectiveness condition. Participants in the cost reduction condition of Experiment 2 dropped 7.74 cost units more than participants in the effectiveness condition. In sum, both experiments’ descriptive results suggest that participants dropped more costs in the cost reduction condition than in the effectiveness condition for Process 2, whereas judgment differences are rather small for Process 1 and 3.

To test our hypotheses we considered the full sample of 52 participants. The full sample allows controlling for demographic variables that might influence our results and analyses have more statistical power. The same descriptive patterns of Experiment 1 and Experiment 2 and individual ANOVA analysis that show similar effects support our decision.\(^8\) Consequently, we

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\(^7\) Note that all of these four participants indicated that overall, they had no problem in understanding the exercise. However, we performed the main analysis of Experiment 1 without these four participants and our results are even stronger with regards to our hypothesis when we exclude these four participants. Due to our limited sample size and to avoid losing data that might shed light on important questions, we did not exclude the four participants’ data from the sample.

\(^8\) Individual analysis of our experiments shows that there was a significant main effect of the degree of task complexity on dropped cost in Experiment 1; \(F(1,20, 32.41) = 163.79, p < .01\); and Experiment 2; \(F(1, 21) = 253.33, p < .01\). The main effect of “treatment group” was significant neither in Experiment 1; \(F(1, 27) = 2.74, p = 0.11\); nor in Experiment 2; \(F(1, 21) = 1.11, p = 0.30\). The individual results do not support H1 since we did not
considered only Process 1 and Process 2 for further analyses. We first conducted a repeated measures ANCOVA analysis to determine whether any demographic variables would influence our hypothesis tests. We controlled for the company in which the experiment was conducted (Experiment 1 vs. Experiment 2), for differences in internal audit experience, and gender. These control variables are important for potential differences between the experiments and had also been taken into account by previous research on internal auditors’ judgments in the two masters setting (Norman et al., 2010). Our dependent variable was dropped cost per process and we included task complexity and treatment group as independent variables representing our within-subjects and between-subjects manipulation. The covariates company (F(1, 45) = .77, p = .38), internal audit experience (F(1, 45) = 1.72, p = .20), and gender (F(1, 45) = 1.64, p = .21) were not significantly related to our dependent variable.9 We can conclude that none of these demographic factors significantly influenced our dependent variable.10

[Insert Table 5 here]

To test our hypotheses with the full sample, we subsequently performed a repeated measures ANOVA. We report the results in Table 5. We find that there was a significant main effect of the degree of task complexity on dropped cost; F(1, 50) = 335.37, p < .01. The main effect of treatment group was also significant; F(1, 50) = 4.26, p < .05. These main effects generally support our prediction that the CAE’s communicated priorities and task complexity influence internal auditors’ judgements. However, these findings should be interpreted in light of the significant interaction between task complexity and treatment group; F(1, 50) = 9.01, p < .01. We examined the simple effects and found that internal auditors did not drop more costs in the cost reduction condition than in the effectiveness condition for Process 1; F(1, 50) = 0.32, p = 0.58. In contrast, internal auditors dropped significantly more costs in the cost reduction

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9 Additionally, we find that there was a significant main effect of the degree of task complexity on dropped cost; F(1, 45) = 6.78, p < .05. Results also show a significant main effect of treatment group; F(1, 45) = 4.17, p < .05. Moreover, the results indicate that task complexity interacted with treatment group; F(1, 45) = 7.53, p < .01.

10 Note that the examination of interaction terms with covariates in our model revealed that the assumption of homogeneity of regression slopes had not been violated.
condition than in the effectiveness condition when faced with high task complexity in Process 2; F(1, 50) = 6.65, p < 0.05. In other words, internal auditors dropped significantly more costs in the cost reduction condition than in the effectiveness condition when task complexity is high.

According to H3, participants in the effectiveness condition need more cognitive effort to solve the experimental task than in the cost reduction condition. We consider the dependent variable cognitive effort – proxied by the time participants needed to solve the experimental task – only in Experiment 1. To test our hypothesis, we ran an independent samples t-test and found that the participants in the effectiveness condition needed significantly more time to solve the exercise (M = 2626; SD = 811) than participants in the cost reduction condition (M = 2033; SD = 434); t (27) = -2.42, p < .05, two-tailed. Thus, on average participants in the effectiveness condition needed ten minutes (593 seconds) more to solve the experimental task. This supports the prediction of H3. Conflicting information increases internal auditors’ effort to make a judgment.

5.3. Robustness testing

We considered further dependent variables based on the effectiveness evaluation of Experiment 1’s participants to test the robustness of our results. Our intention was to test whether a significantly higher amount of dropped cost in the cost reduction condition translated into the design of less effective processes. We calculated the average effectiveness per internal control based on the evaluation of Experiment 1’s participants. Afterwards, we computed the sum of what we label deleted effectiveness points per participant and process and used this score for further analysis. To construct a second dependent variable, we multiplied each deleted effectiveness point by the cost of the corresponding deleted control. We label this dependent variable weighted deleted effectiveness points. Lastly, we examined the difference in the number of deleted internal controls between the experimental groups. The descriptive results of additional dependent variables are reported in Table 6. The pattern is in line with our general findings. There are marginal differences between the two between-subjects groups (cost reduction vs. effectiveness) for Process 1 and considerable differences for Process 2 for all dependent variables.

11 Time was measured in seconds.
12 The item was as follows (1= to a very small extent; 5= to a very great extent): “To what extent do you think the control is effective (do not consider its costs)?” See also Figure 2.
We conducted a repeated measures ANOVA analysis based on these additional dependent variables. Results are reported in Table 7. The main effect of task complexity, the main effect of treatment group, and the interaction between task complexity and treatment group remained significant in all analyses. In sum, our additional tests reveal that participants in the cost reduction condition designed significantly less effective processes and dropped a significantly higher number of internal controls under the condition that task complexity was high. These results are consistent with our predicted effects and show that our results are robust.

5.4. Additional results

Professional standards require that the IAF is an independent function and that internal auditors make objective judgments. Consequently, our results are particularly important if internal auditors believe that they should make objective judgments, because this self-perception stands in contrast to our results for Process 2 (high task complexity). We asked participants after both experiments whether they agreed with the following item (i) “internal auditors should decide independently” and (ii) “internal auditors should decide objectively”. On a five-point-Likert scale (1 = strongly disagree, 5 = strongly agree), we found strong agreement to these items in Experiment 1 (Item (i): M = 4.03; SD = .82; Item (ii): M = 4.51; SD = .57) and Experiment 2 (Item (i): M = 4.30; SD = .82; Item (ii): M = 4.78; SD = .42). We also searched for indications that participants employed elastic justification strategies to follow superior instructions. We asked participants in the questionnaire on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree) if they were thinking of justifications which they could provide for their judgments during the exercise. Participants in Experiment 1: (M = 4.03; SD = 0.98) and Experiment 2 (M = 3.78; SD = 1.38) strongly agreed with this item.

From our qualitative investigations – mainly six unstructured interviews with participants of Experiment 1, two discussions of about two hours after the presentations of our results with participants, and general feedback – the following patterns evolved:13

13 Please note that this information is based on the authors’ notes during discussions and interviews. They were not formally coded or registered on tape. We report our shared impressions that are based on our notes and intensive follow-up discussions. The six unstructured interviews refer to informal discussions of about ten minutes each with six participants of Experiment 1 who agreed to stay after the debriefing.
1. The terminology **effective internal controls** that is stressed in new legislation (e.g. 8th EU Directive) is understood and interpreted in very different ways within and across companies. Often, there is a perceived difference between cost reduction and effectiveness but not necessarily between efficiency and effectiveness.

2. Participants of the second company argued that Process 1 and Process 2 varied on a number of dimensions that represent the construct task complexity. In particular, the steps to be executed and the degree of backward/forward-reasoning to be executed were mentioned. However, they did not generally agree that Process 2 was more complex. One participant labeled Process 2 as “giving more rise for different interpretations”, which supports our argument that more task complexity translates into a higher degree of elastic justification.

3. Participants of both experiments clearly said that there was not one single objective solution to the design of internal control processes. Rather, there was an acceptable range of possible solutions. Our results also show that there is no clear pattern for a benchmark solution: 29 participants of the first experiment and 23 participants of the second experiment never proposed the same process design.

4. We asked participants of both experiments during the presentation of our results whether they felt that the difference between the two experimental groups for the high task complexity condition was acceptable. Participants of both experiments and the CAE of the second company were concerned about the difference and stressed that it was surprisingly high.

5. A great number of participants stressed that they did not expect the tremendous influence of communicated preferences of their superior even though they were very much aware of the conflict between cost reduction of internal controls and effectiveness of internal controls. Both superior internal auditors (i.e. the audit director and the CAE) who presented the manipulation expressed that they were surprised about their influence on subordinated internal auditors’ judgments.

To sum up, these additional results suggest that the self-perception of participating internal auditors (i.e. people who make objective judgments) stands in contrast to their actual judgments during the experimental task for conditions with high task complexity. Our interpretation is that this speaks for an unconsciously biased judgment process rather than an intentionally changed
judgment to follow superior instructions.

6. Conclusions

In this study we examined the role of the IAF as one cornerstone of corporate governance. We conducted two experiments to examine the judgment of 52 internal auditors. Their experimental task was to evaluate internal controls of different processes in terms of their costs and effectiveness. Two different superior preferences – one stressing the cost reduction priority of management and the other stressing the effectiveness priority of the audit committee – mirrored internal auditors’ role conflict in a setting where a task is assigned to them by management during an acquisition process. We found that the effect of known superior preferences significantly influences internal auditors’ judgments (H1) and that this influence is greater for a high degree of task complexity than for a lower degree of task complexity (H2a). Apparently, participants followed the call for cost reductions of their superior only for conditions with high task complexity. Assumingly, higher task complexity allows for a higher amount of elastic justification. Our results also suggest that conflicting information in addition to communicated superior preferences increases judgment effort (H3).

A number of important research implications, recommendations for practitioners and comments on current internal auditing standard setting emerge from these findings. From a research perspective, we contribute to the recently emerged debate on the bigger role of the IAF for corporate governance, particularly, the issue of serving two masters (Norman et al., 2010; Abbott et al., 2010, Messier, 2010). We provide an answer to the question that Gramling et al. (2004, p. 240) posed: “If the audit committee and management have different visions for the corporate governance role of the IAF, which vision will dominate?” Based on our findings, we answer that the dominant vision depends on communicated superior preferences. We based our study on the assumption that priorities of the audit committee and management will be communicated by a superior internal auditor to subordinated internal auditors. In this setting, the CAE is a key player to balance potentially differing visions of management and the audit committee. From a broader research perspective, our results suggest that the hierarchy within the IAF is important for the IAF’s independence in addition to organizational criteria such as reporting lines. There is not only a tone at the top for the whole company, but also from the top of the IAF. Future research could investigate individual and interpersonal factors that might
influence internal auditors’ judgments in addition to organizational criteria. We interpret that internal auditors’ judgment is unconsciously biased but suggest further research that includes more individual variables to test this assumption. Furthermore, research should investigate if there is a certain level of task complexity that allows for elastic justification strategies or if internal auditors will always choose the most complex task to follow superior preferences despite the absolute level of task complexity.

From a standard setter’s perspective, our experimental findings provide evidence that objectivity – as defined by professional standards – is not always achievable. First, our findings support research that suggests that two reporting lines to serve two masters with potentially differing interests bear a great potential for unintended effects on internal auditors’ judgments (see also Norman et al., 2010). Second, our results question if professional trainings and standards are sufficient to strengthen internal auditors’ objectivity in the two masters setting. It seems that conflicts of interest bias internal auditors’ judgments although internal auditors are aware of them and despite their professional socialisation as internal auditors. Our perception of professional internal auditing standards is that there is a focus on organizational criteria such as reporting lines, an IAF’s mission statement and regular meetings with the audit committee to evaluate the IAF’s independence. However, other criteria might be equally important. For instance, we doubt that the IAF’s independence is achievable in a company where internal auditors and the CAE are assigned to management positions after their time in the IAF as part of the company’s policy. Their judgment might be influenced by personal factors such as their career plan and personal relationships to senior management versus the audit committee. We suggest further examination of these factors to provide recommendations to standard setters for the development of internal auditing standards.

From a practitioner’s perspective, we consider the following points to be important. First, our results of Experiment 1 show that internal auditors need more time to make a judgment when contradicting information to their superior’s instructions is available. Consequently, the communication of poorly defined goals to internal auditors might increase costs and potentially decrease judgment quality. Second, our main results of the full sample suggest that management and the audit committee should have an interest in a clearly defined role of the IAF and the CAE. One proposition that evolved during our research project is to separate the IAF into two departments – one in charge of efficiency issues such as cost reductions of internal controls and
one in charge of assurance issues such as effective internal controls. A separation of the IAF makes the trade-off between effectiveness and efficiency explicit and avoids unconscious bias. Third, our findings are important for the external auditors’ decision to use the work results of the IAF (see IFAC, 2008; AICPA, 1990; PCAOB, 2007). The following questions might be useful for external auditors and also for further research designs. What are personal characteristics of the CAE (i.e. internal audit experience, career plan, and experience within the current company) that might impair the IAF’s independence? Who primarily assigns tasks to the IAF? Can internal auditors make objective judgments if the IAF is used as a management training ground? We believe that these questions have so far not sufficiently been addressed in the auditing literature.

Still, our conclusions are based on experimental findings that have some limitations. First, we examine one potential scenario – the assignment of a task to the IAF by management – which restricts general conclusions on the study’s results. In particular, the assignment of a task to internal auditors by the audit committee could lead to different outcomes. Second, our experimental design demands individual judgments whereas internal auditors often work in groups. Third, a methodological drawback of our study is that we cannot control for possible demand effects. Processes were always presented in the same order to respect the flow of procedures of the participating companies. Finally, we cannot control for an exhaustive list of factors that might influence the outcome of our experiment due to our experimental design that limits the sample size.

To conclude, the independence of internal auditors should be critically discussed in combination with the role of the IAF as one cornerstone of corporate governance. Research should provide more experimental evidence on the judgment process of internal auditors in their potentially contradictory role in serving two masters. This would help to develop internal auditing standards and legislation that strengthen the role of the IAF but also acknowledge the limitations and potential costs of the IAF’s contribution to corporate governance.
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FIGURE 1
Flow chart of Process 1 (extract)

Procedure 1
Example: Need for a service or product is requested by department.

Control 1
Example: Need is confirmed by signature of department director (3 Cost units).

Control 2
(1 Cost units)

Control 3
(3 Cost units)

Control 4
(2 Cost units)

Procedure 2

Procedure 3
FIGURE 2
Evaluation tool for Process 1 (extract)

<table>
<thead>
<tr>
<th>Control</th>
<th>To what extent do you think the control is effective (do not consider its costs)?</th>
<th>Costs (CU)</th>
<th>Drop it</th>
<th>Keep it</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>To a very small extent</td>
<td>To a small extent</td>
<td>Somewhat</td>
<td>To a great extent</td>
</tr>
<tr>
<td>C1</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>C2</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>C3</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>C4</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
### TABLE 1
Survey results: Determinants of independence and objectivity

<table>
<thead>
<tr>
<th>To improve the IAF’s independence and objectivity the following should be considered:</th>
<th>N</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The IAF's mission statement should define independence and objectivity as primary goals of the IAF.</td>
<td>112</td>
<td>1</td>
<td>5</td>
<td>4.54</td>
<td>0.770</td>
</tr>
<tr>
<td>2. The Chief Audit Executive's attitude determines considerably the IAF's independence and objectivity.</td>
<td>113</td>
<td>1</td>
<td>5</td>
<td>4.43</td>
<td>0.854</td>
</tr>
<tr>
<td>3. The IAF should not only report to the management, but also to the supervisory body (e.g. the audit committee).</td>
<td>113</td>
<td>1</td>
<td>5</td>
<td>4.22</td>
<td>1.015</td>
</tr>
<tr>
<td>4. The IAF's budget should not only be approved by the management but also by the supervisory body (e.g. the audit committee).</td>
<td>113</td>
<td>1</td>
<td>5</td>
<td>3.32</td>
<td>1.263</td>
</tr>
<tr>
<td>5. The Chief Audit Executive should not only be nominated and withdrawn by the management but also by the supervisory body (e.g. the audit committee).</td>
<td>113</td>
<td>1</td>
<td>5</td>
<td>3.23</td>
<td>1.395</td>
</tr>
<tr>
<td>6. IAF’s staff should complete external trainings to improve independence and objectivity on a regular basis.</td>
<td>113</td>
<td>1</td>
<td>5</td>
<td>3.07</td>
<td>1.208</td>
</tr>
<tr>
<td>7. IAF’s staff should certify on a regular basis (e.g. yearly) the compliance with the IAF’s goals of independence and objectivity.</td>
<td>113</td>
<td>1</td>
<td>5</td>
<td>2.50</td>
<td>1.158</td>
</tr>
<tr>
<td>8. Internal auditors should only receive a fixed salary but not a variable profit-related bonus.</td>
<td>113</td>
<td>1</td>
<td>5</td>
<td>2.46</td>
<td>1.363</td>
</tr>
<tr>
<td>9. The IAF should not be used as management trainings ground to train managers for future executive positions.</td>
<td>112</td>
<td>1</td>
<td>5</td>
<td>2.38</td>
<td>1.350</td>
</tr>
<tr>
<td>10. Internal auditors that work for both the management and the supervisory authority (e.g. the audit committee) cannot act independently and objectively.</td>
<td>113</td>
<td>1</td>
<td>5</td>
<td>2.20</td>
<td>1.196</td>
</tr>
<tr>
<td>11. The IAF should provide either consulting services (e.g. to improve process efficiency) or audit services (e.g. to improve the effectiveness of the internal control system) but never both simultaneously.</td>
<td>113</td>
<td>1</td>
<td>5</td>
<td>2.06</td>
<td>1.277</td>
</tr>
<tr>
<td>12. The IAF is part of the audited organization and therefore cannot be independent and objective.</td>
<td>113</td>
<td>1</td>
<td>5</td>
<td>1.87</td>
<td>1.039</td>
</tr>
<tr>
<td>13. Generally, the IAF should not collaborate with the external auditor in order to ensure its role in process optimizing.</td>
<td>113</td>
<td>1</td>
<td>5</td>
<td>1.76</td>
<td>0.938</td>
</tr>
</tbody>
</table>

Please note, that the original questionnaire was conducted in German. We show a convenient translation by the authors above. For all items, we applied a 5-point Lickert scale from 5 “totally agree” to 1 “do not agree at all”.
**TABLE 2**
**Experiment 1: Demographic information of participating internal auditors**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Difference between groups (cost reduction vs. effectiveness)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed years for current employer</td>
<td>6.56</td>
<td>8.18</td>
<td>$t(27) = -1.03; p = 0.31$</td>
</tr>
<tr>
<td>Completed years of internal audit experience</td>
<td>3.86</td>
<td>3.01</td>
<td>$t(26) = 0.99; p = 0.33$</td>
</tr>
<tr>
<td>Number of subordinates</td>
<td>1.50</td>
<td>2.28</td>
<td>$t(26) = 0.88; p = 0.39$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest university degree</td>
<td>Bachelor 4 (13.8 %) Master 24 (82.8 %) PhD 1 (3.4 %)</td>
</tr>
<tr>
<td>Other significant education</td>
<td>CIA 13 (44.8 %) CFA 2 (6.9 %) CPA 3 (10.3 %)</td>
</tr>
<tr>
<td>Mother tongue</td>
<td>German 15 (51.7 %) Spanish 4 (13.8 %) Chinese 3 (10.3 %) French 3 (10.3 %) Other 4 (13.8 %)</td>
</tr>
<tr>
<td>Primary working language</td>
<td>English 27 (93.1 %) Spanish 1 (3.4 %) Portuguese</td>
</tr>
<tr>
<td>Employment level</td>
<td>Full-time 28 (96.6 %) Part-time 1 (3.4 %)</td>
</tr>
</tbody>
</table>

In the last column of the first three lines, we report results based on independent samples $t$-tests. We examine if the demographic variables are unequally distributed among groups and can reject this hypothesis. Note that the abbreviations CIA, CFA and CPA stand for Certified Internal Auditor (CIA), Certified Financial Analyst and Certified Public Accountant (CPA). Other mother tongues include English, Hindi, Portuguese, and Russian (one each).
### TABLE 3
Experiment 2: Demographic information of participating internal auditors

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Difference between groups (cost reduction vs. effectiveness)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed years for current employer</td>
<td>15.46</td>
<td>8.03</td>
<td>t(24) = 0.28; p = 0.79</td>
</tr>
<tr>
<td>Completed years of internal audit experience</td>
<td>15.19</td>
<td>7.15</td>
<td>t(24) = 0.20; p = 0.84</td>
</tr>
<tr>
<td>Number of subordinates</td>
<td>9.10</td>
<td>9.64</td>
<td>t(24) = 0.85; p = 0.53</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest university degree</td>
<td>Bachelor 1 (3.8 %)</td>
</tr>
<tr>
<td>Other significant education</td>
<td>CIA 7 (26.9 %)</td>
</tr>
<tr>
<td>Mother tongue</td>
<td>German 23 (88.5 %)</td>
</tr>
<tr>
<td>Primary working language</td>
<td>German 26 (100 %)</td>
</tr>
<tr>
<td>Employment level</td>
<td>Full-time 26 (100 %)</td>
</tr>
</tbody>
</table>

In the last column of the first three lines, we report results based on independent samples t-tests. We examine if the demographic variables are unequally distributed among groups and can reject this hypothesis. Note that the abbreviation CIA stands for Certified Internal Auditor (CIA). Other significant education includes further training provided by German private companies. Other mother tongues include Dutch, Spanish, and Chinese (one each).
### TABLE 4
Descriptive results - Dropped cost per process

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean (SD)</th>
<th>Mean (SD)</th>
<th>Mean Difference Group 1 – Group 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group 1</td>
<td>Group 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(cost reduction)</td>
<td>(effectiveness)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(N=29)</td>
<td>(N=23)</td>
<td></td>
</tr>
<tr>
<td>Process 1 (Total cost: 27)</td>
<td>14.00 (3.16)</td>
<td>14.53 (3.83)</td>
<td>-0.53</td>
</tr>
<tr>
<td>Process 2 (Total cost: 79)</td>
<td>44.50 (11.79)</td>
<td>35.00 (11.66)</td>
<td>9.50</td>
</tr>
<tr>
<td>Process 3 (Total cost: 19)</td>
<td>9.93 (1.90)</td>
<td>10.33 (2.74)</td>
<td>-0.40</td>
</tr>
<tr>
<td></td>
<td>(N=26)</td>
<td>(N=26)</td>
<td></td>
</tr>
<tr>
<td>Process 1 (Total cost: 27)</td>
<td>13.77 (3.40)</td>
<td>14.38 (4.38)</td>
<td>-0.61</td>
</tr>
<tr>
<td>Process 2 (Total cost: 79)</td>
<td>47.92 (12.00)</td>
<td>38.88 (13.24)</td>
<td>9.04</td>
</tr>
</tbody>
</table>

The dependent variable *dropped cost per process* is measured in cost units. Reported are the mean dropped costs per experimental group based on participants’ evaluation of internal controls of different processes. It is based on the question if participants want to delete an internal control and thus drop its inherent cost that was asked in the evaluation tool (see Figure 2).

Group 1 (cost reduction) received instructions from their superior as follows: "I just want to remind you that it is the objective of this evaluation to decrease costs to a minimum as stated in the case. Please try to reduce costs to an absolute minimum. We are responsible to management in terms of cost."

Group 2 (effectiveness) received instructions as follows: "Concerning the case, do not forget that it is your objective as internal auditors to make sure that controls are effective. Even if we also want to ensure that controls are performed with lowest possible cost, please make sure that they are effective. Do not only try to reduce cost to a minimum. Remember that we are responsible to the audit committee."
TABLE 5
Repeated measures ANOVA results of full sample – test of hypotheses one and two

<table>
<thead>
<tr>
<th>Variable</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Within-subjects:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task complexity</td>
<td>22361.78</td>
<td>1</td>
<td>22361.78</td>
<td>335.37</td>
<td>.000***</td>
</tr>
<tr>
<td>Task complexity x Group</td>
<td>605.78</td>
<td>1</td>
<td>605.78</td>
<td>9.01</td>
<td>.004***</td>
</tr>
<tr>
<td>Error</td>
<td>3333.94</td>
<td>50</td>
<td>66.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Between-subjects:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>85905.01</td>
<td>1</td>
<td>85905.01</td>
<td>792.87</td>
<td>.000***</td>
</tr>
<tr>
<td>Group</td>
<td>461.16</td>
<td>1</td>
<td>461.16</td>
<td>4.26</td>
<td>.044**</td>
</tr>
<tr>
<td>Error</td>
<td>5417.33</td>
<td>50</td>
<td>108.35</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*, **, *** Significant at 0.10, 0.05, and 0.01, respectively.

Dependent variable = dropped cost per process (N=52).
Variable definitions: The dependent variable is measured in cost units. It is further described under Table 3. Task complexity is manipulated within-subjects. This independent variable represents two different levels of task complexity that participants had to evaluate (Process 1 = low task complexity; Process 2 = high task complexity). Group is manipulated between-subjects. This independent variable represents two different manipulations that the experimental groups received (Group 1 received instructions that favoured cost reductions of internal controls; Group 2 received instructions that favoured effectiveness of internal controls). Task complexity x Group is the term measuring the interaction between Group and Task complexity.
### TABLE 6
Descriptive results – robustness tests

<table>
<thead>
<tr>
<th>DV</th>
<th>Process</th>
<th>Mean (SD) Group 1 (N=26) (cost reduction)</th>
<th>Mean (SD) Group 2 (N=26) (effectiveness)</th>
<th>Mean Difference Group 1 – Group 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Deleted eff. Points</strong></td>
<td>Process 1</td>
<td>19.10 (3.78)</td>
<td>19.78 (5.60)</td>
<td>-0.68</td>
</tr>
<tr>
<td></td>
<td>Process 2</td>
<td>57.27 (19.10)</td>
<td>42.61 (20.21)</td>
<td>14.66</td>
</tr>
<tr>
<td><strong>Weighted deleted eff. Points</strong></td>
<td>Process 1</td>
<td>39.28 (10.04)</td>
<td>41.48 (13.19)</td>
<td>-2.20</td>
</tr>
<tr>
<td></td>
<td>Process 2</td>
<td>146.90 (41.46)</td>
<td>116.16 (44.05)</td>
<td>30.74</td>
</tr>
<tr>
<td><strong>Number of deleted int. controls</strong></td>
<td>Process 1</td>
<td>6.69 (1.38)</td>
<td>6.88 (1.86)</td>
<td>-0.19</td>
</tr>
<tr>
<td></td>
<td>Process 2</td>
<td>17.85 (5.19)</td>
<td>13.73 (5.71)</td>
<td>4.12</td>
</tr>
</tbody>
</table>

Reported are different dependent variables (*deleted effectiveness points, weighted deleted effectiveness points, number of deleted internal controls*) per experimental group based on participants’ evaluation of internal controls of Process 1 and Process 2. For a detailed description of the groups see Table 3. The dependent variable *deleted effectiveness points* is based on the average effectiveness per internal control. Each deleted control accounts for its corresponding average effectiveness points. The sum of these deleted effectiveness points per participant is used to compute the mean deleted effectiveness points per process and experimental group. The dependent variable *weighted deleted effectiveness points* is calculated like the *deleted effectiveness points* whereas each deleted effectiveness point is multiplied by the cost of the corresponding control. The dependent variable *number of deleted internal controls* represents the total number of internal controls that was dropped by a participant. Means were calculated per process and experimental group.
TABLE 7  
Repeated measures ANOVA results – robustness tests

<table>
<thead>
<tr>
<th>Variable</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Panel A: ANOVA results for deleted effectiveness points (N=52)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Within-subjects:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task complexity</td>
<td>24188.60</td>
<td>1</td>
<td>24188.60</td>
<td>143.36</td>
<td>.000***</td>
</tr>
<tr>
<td>Task complexity x Group</td>
<td>1529.46</td>
<td>1</td>
<td>1529.46</td>
<td>9.10</td>
<td>.004***</td>
</tr>
<tr>
<td>Error</td>
<td>8436.18</td>
<td>50</td>
<td>168.72</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Between-subjects:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>125136.35</td>
<td>1</td>
<td>125136.35</td>
<td>519.84</td>
<td>.000***</td>
</tr>
<tr>
<td>Group</td>
<td>1270.14</td>
<td>1</td>
<td>1270.14</td>
<td>5.27</td>
<td>.026**</td>
</tr>
<tr>
<td>Error</td>
<td>12036.07</td>
<td>50</td>
<td>240.72</td>
<td></td>
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</tr>
<tr>
<td><strong>Panel B: ANOVA results for weighted deleted effectiveness points (N=52)</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Within-subjects:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task complexity</td>
<td>216028.33</td>
<td>1</td>
<td>216028.33</td>
<td>277.58</td>
<td>.000***</td>
</tr>
<tr>
<td>Task complexity x Group</td>
<td>7052.35</td>
<td>1</td>
<td>7052.35</td>
<td>9.06</td>
<td>.004***</td>
</tr>
<tr>
<td>Error</td>
<td>38913.52</td>
<td>50</td>
<td>778.27</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Between-subjects:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>768353.88</td>
<td>1</td>
<td>768353.88</td>
<td>646.32</td>
<td>.000***</td>
</tr>
<tr>
<td>Group</td>
<td>5291.92</td>
<td>1</td>
<td>5291.92</td>
<td>4.45</td>
<td>.040**</td>
</tr>
<tr>
<td>Error</td>
<td>59440.89</td>
<td>50</td>
<td>1188.82</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Panel C: ANOVA results for number of deleted internal controls (N=52)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Within-subjects:</strong></td>
<td></td>
<td></td>
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<tr>
<td>Task complexity</td>
<td>2106.00</td>
<td>1</td>
<td>2106.00</td>
<td>167.04</td>
<td>.000***</td>
</tr>
<tr>
<td>Task complexity x Group</td>
<td>120.62</td>
<td>1</td>
<td>120.62</td>
<td>9.57</td>
<td>.003***</td>
</tr>
<tr>
<td>Error</td>
<td>630.39</td>
<td>50</td>
<td>12.61</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Between-subjects:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>13252.65</td>
<td>1</td>
<td>13252.65</td>
<td>667.77</td>
<td>.000***</td>
</tr>
<tr>
<td>Group</td>
<td>100.04</td>
<td>1</td>
<td>100.04</td>
<td>5.04</td>
<td>.029**</td>
</tr>
<tr>
<td>Error</td>
<td>992.31</td>
<td>50</td>
<td>19.85</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*, **, *** Significant at 0.10, 0.05, and 0.01, respectively.
Variable definitions: The dependent variables deleted effectiveness points, weighted deleted effectiveness points and number of deleted internal controls are further described under Table 5. For independent variables see Table 4.