

# Factors Influencing Auditors' Self-Perceived Ability to Assess Fraud Risk

Benita Gullkvist and Annukka Jokipii

## Abstract

*This study investigates the relationship between perceived personal, ethical, and contextual factors on external auditors' self-perceived ability to assess the risk of management fraud in a financial statement. Using partial least squares (PLS) analysis, the theoretical model is tested with survey data from 200 Finnish auditors and controls for the effects of auditor-related variables such as age, gender, education, and type of audit firm are applied. The results indicate that auditors consider red flag indicators, classified according to the fraud triangle approach, to be important and to significantly enhance their self-perceived ability to assess fraud risk. Further, there are significant positive relationships between both auditors' perceived ethical values (professionalism, responsibility, and objectivity) and professional experience and their self-perceived ability to assess fraud risk. In addition, a higher level of perceived auditor independence appears to be negatively associated with self-perceived ability to assess fraud risk. It is suggested that auditors and audit firms consider these factors when team building and audit planning to increase the quality of auditor performance.*

**Keywords:** *Fraud, Auditor, Self-Perceived Ability, Red Flag, Fraud triangle, PLS*

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## 1. Introduction

Incidences of corporate fraud occur and do not seem to be declining (Hogan et al. 2008) in spite of the implementation of revised legislation, standards, and global corporate governance regulations to reduce opportunities to commit fraudulent acts. International standards of auditing (ISA) 240 (IFAC 2009) and many national auditing acts require auditors to assess the risks of material misstatements in financial statements due to fraud<sup>1</sup> and to design and implement appropriate responses to audit evidence obtained thereby.

Identifying fraud risk and assessing its scope<sup>2</sup> are, however, difficult and complex tasks for auditors (e.g., Hassink et al. 2010) owing to the necessity of interpreting numerous cues in relation to one another. Moreover, auditors have little experience with fraudulent reporting (Rose 2007) and the perpetrators deliberately conceal the resulting irregularities (Knapp and Knapp 2001). Consequently, it is up to the auditors to use their professional judgement when performing tasks. Previous research reveals many factors that might influence auditor judgements, including individual ability<sup>3</sup>, knowledge, motivation, and the characteristics of the accounting and auditing environment (Libby and Luft 1993). Previous research studying ability has largely focused on the association between ability and various levels of performance, such as actual fraud risk assessment or detection. For example, Bonner (2008) examines the effects of ability on judgements and decisions. However, there is rather limited research on factors contributing to ability.

While research into the circumstances and conditions related to an auditor's ability to assess fraud risk has been called for in the literature (e.g., Landsittel and Bedard 1997; Nieschwietz et al. 2000), conducting empirical studies is problematic. First, fraud cases are relatively rare. Financial statement fraud accounts for 5–10 % of all fraud cases (Helms 2011), only some 10 % of the fraud cases detected by people outside of companies are found by auditors (Johnson 2007), and only 10 % of all detected economic offences by firms were reported to police and registered (Niemi and Lehti 2006). Second, unlike other previous auditing studies where variables of interest have been manipulated in experimental settings (e.g., Nelson et al. 2002), risk assessment ability, and subsequent individual performance, are traits associated with the individual auditor and not easily manipulated empirically. Nor is archival data available.

In practice, when it is impractical for researchers to obtain an objective measure, a subjective measure such as auditors' self-assessments of the subject may be available (Abdolmohammadi and Shanteau 1992). Therefore, and in line with the study of Bonner and Lewis (1990), which measured auditors' self-assessments of systems expertise, this study measured auditors' self-perceived ability to assess fraud risk, while recognizing the limitations of the measure. The objective of this study is to examine the relationship between perceived personal, ethical, and contextual factors on external auditors' self-perceived ability to assess the risk of management fraud in a financial statement.

Data were collected through a survey of 200 Finnish authorized auditors and analysed using a partial least squares (PLS) technique to empirically test and verify proposed simultaneous relationships between self-perceived personality-related and contextual factors identified from prior studies and auditors' self-perceived ability to assess fraud risk. The PLS technique was used due to the relatively small sample size and exploratory nature of the study (Wold 1985). In Finland, there is evidence of fraud cases becoming graver and more complex in recent years (Muttillainen and

1 Many definitions of fraud exist. Following ISA 240 (IFAC 2009), fraud is defined as "an intentional act by one or more individuals among management, those charged with governance, employees, or third parties, involving the use of deception to obtain an unjust or illegal advantage." Further, the auditor should consider the risks of material misstatements in the financial statements due to fraud.

2 For auditors, the task of fraud risk identification involves connecting issues from memory and recorded data, and documenting considerable risk factors in planning the audit engagement. Risk assessment involves combining and weighting these factors to form risk judgements (Bedard and Graham 2002).

3 Ability is defined in the literature as a determinant of an individual's capacity to perform physical or mental tasks (e.g., Benford and Hunton 2000),

Kankaanranta 2012), which emphasizes the need for research on auditors' ability to assess fraud risk effectively. Further, unlike most other countries, Finnish auditors have not yet had to report their findings of fraudulent activity to the authorities. A debate within the Finnish auditing profession has arisen about the benefits and consequences of reporting fraudulent activity, given the difficulty of assessing fraud risk. Prior studies have also found that auditors are reluctant to pass on warning signals to stakeholders (e.g., Rodgers et al. 2009).

The focus on fraud and auditors' self-perceived ability contributes to the contemporary research on, and professional discussions about, auditors' responsibilities and capabilities to detect and assess fraud risk. While self-perceived ability is not the same as actual ability (e.g., Owhoso and Weickgenannt 2009), prior studies have found that perceived ability may mimic the expectations of ability. Bandura (1992) asserts that beliefs will influence actions and the realization of goals, and can determine the outcomes even before the actions occur. Thus, by investigating factors that influence auditors' self-perceived ability to assess fraud risks, there may be an opportunity to change the conditions so as to improve the performance of audit tasks like the fraud risk assessments examined in this study. This study also contributes by empirically testing the fraud triangle as a second-order construct. While research on the fraud triangle concept is emerging (e.g., Wilks and Zimbelman 2004; Moyes 2008; Lou and Wang 2009; Skousen et al. 2009), the number of studies is still limited.

The remainder of the paper is structured as follows. Section Two provides a brief overview of the existing literature as well as developing the motivation for the study and the hypotheses guiding it. The research design and results are presented in Sections Three and Four, respectively. Section Five concludes the paper with a discussion of the findings, the potential implications, limitations, and some directions for future research.

## 2 Literature Review and Development of Hypotheses

Despite issues related to fraud risk assessment having attracted substantial attention both in literature and in practice (for reviews, see, e.g., Allen et al. 2006; Hogan et al. 2008; Nieschwietz et al. 2000), the collection of accounting and auditing research focusing on auditors' ability to assess potentially fraudulent financial reporting or auditors' judgements concerning misstatements remains sparse (e.g., Bonner et al. 1996; Jaffar et al. 2008; Knapp and Knapp 2001; Phillips 1999; Pincus 1984; Rose 2007; Wilks and Zimbelman 2004; Zimbelman 1997).

In general, scholars maintain that individuals' ability is associated with their capability to encode, retrieve, and analyse information (e.g., Libby and Luft 1993). Prior studies on the assessment of fraud risk have identified many factors that may influence an auditor's ability to assess fraud risks. These factors include, among others, experience and ethical reasoning (Hassink et al. 2010). ISA 240 (IFAC 2009) states that auditors assess fraud risks through fraud risk factors<sup>4</sup>, analytical procedures, client enquiries, and other information. Given the growing concern about fraudulent activity worldwide, this study investigates the relationship between auditors' perceptions of the importance of red flag factors, perceived ethical values, professional experience, and their ability to assess fraud risk as they themselves perceive it.

Fraud risk factors, commonly called red flags, represent conditions associated with fraud and serve to alert auditors to possible fraudulent activity (Krambia-Kapardis 2002). They are classified as either incentives (pressures), attitudes (rationalizations), or opportunities under the fraud triangle approach (IFAC 2009). First, management or other employees have an *incentive* or are under *pressure*, and that provides a reason to commit fraud.

<sup>4</sup> Fraud risk factors (in this study called red flags) are events or conditions that indicate an incentive or pressure to commit fraud or provide an opportunity to commit fraud. Some individuals possess an attitude, character or set of ethical values that allow them knowingly and intentionally to use the opportunity or pressure to commit a dishonest act (IFAC 2009).

Prior research has investigated various forms of pressure such as that to meet analysts' forecasts, compensation and incentive structures, the need for external financing, and poor performance (Hogan et al., 2008). Second, those involved have an *attitude* towards, or *rationalization* of, committing fraud. Cressey (1953) pointed out that rationalization is not an *ex post facto* means of justifying an act of theft, but a necessary precondition of the crime before it occurs. That is to say, rationalization is a part of the motivation for the fraud. Finally, circumstances provide an *opportunity* to perpetrate fraud. They might include the absence of controls, the presence of weak controls, or the ability of management to override controls.

Prior studies (Bernardi 1994; Matsumura and Tucker 1992; Moet 1997; Krambia-Kapardis 2002) have examined the influence of *fraud risk indicators* on an auditor's ability to assess the likelihood of fraud. Whereas Moet (1997) in her experiment treated the variable fraud risk indicators in the aggregate and expected that the fraud risk factors alone should provide sufficient cues for suspecting fraud (Jaffar et al. 2008), other scholars have examined individual indicators such as client integrity and competence (Bernardi 1994) and internal control quality (Matsumura and Tucker 1992). Krambia-Kapardis (2002) built on Loebbecke et al.'s (1989) assessment model and argued that in order to be able to assess fraud risk, an auditor will initially need to utilize the rationalizations, opportunity, and person (ROP) risk assessment model and, second, identify the fraud risk information available relating to endogenous risk factors in the auditee's organization.

The last decade has seen the emergence of research on fraud risk assessment using the fraud triangle approach. The study by Wilks and Zimbelman (2004) was one of the first studies to investigate auditors' sensitivity to high levels of fraud risk, decomposed into attitude, opportunity, and incentive risks. This was a departure from previous studies that had simply assessed overall fraud risk. The findings of Wilks and Zimbelman (2004) indicate that auditors who decompose fraud risk assessments are more sensitive to op-

portunity and incentive cues than auditors who assess overall fraud risk. In addition, Skousen et al. (2009) and Moyes (2008) empirically examined the effectiveness of red flag indicators based on the fraud triangle approach in detecting financial statement fraud. Skousen identified a number of pressure and opportunity proxies significantly related to financial statement fraud, while Moyes (2008) investigated Certified Public Accountants' (CPA's) perceptions of the level of effectiveness of red flags used in fraud detection. Finally, Lou and Wang (2009) examined the association between risk factors in the fraud triangle and the likelihood of fraudulent financial reporting. To our knowledge, only Jaffar et al. (2008) have investigated an external auditor's ability to assess fraud risk. Their study adopts an experimental approach and the results indicate that in a high fraud risk scenario, an external auditor's ability to assess fraud risk has a positive effect on his/her ability to detect the likelihood of fraud, whereas in a low fraud risk scenario it does not.

To provide additional evidence of auditor ability to assess fraud risk, this study examines auditors' self-perceived ability. Joyce (1976) argues that self-insight is critical in judgement situations where a role involves communicating a high level of professional expertise. Further, research by Bandura (1982, 1991) suggests that behavioural controls should influence individuals' thought patterns, choices of activities, preparation for activities, and effort expended. For example, the *Theory of Planned Behavior* (Ajzen 1991) suggests that higher levels of perceived expertise should enhance auditors' perceived ease of performing audit activities. Moreover, Owoso and Weickgenannt (2009) have argued that auditors should be able to assess their own effectiveness and ability, but individuals have also been described as having limited self-insight, leading to a tendency to over-estimate or under-estimate their abilities in self-ratings.

Drawing on the theories above, the current research proposes that auditors' perceptions of their own ability to assess fraud risk are positively associated with the perceived importance of red

flags, professional experience, and perceived ethical values. The inter-relationships among the red flag indicators, based on the categories of the fraud triangle approach, are conceptualized as a formative second-order construct. The expected relationships are depicted in the theoretical model in Figure 1.

The next section expands on the research model by developing a set of related empirical hypotheses on the relationships.

### 2.1 Perceived importance of red flag indicators

ISA 240 (IFAC 2009) and other contemporary auditing standards require auditors to attempt to detect the presence of fraudulent behaviour by

comprehensively assessing the extent to which the fraud triangle categories of pressure, opportunity, and rationalization are present. The underlying premise is that fraud triangle indicators can help predict the context in which managers and staff in firms may act unethically, and so can help auditors identify and assess potential fraud risks. Accounting professionals, academics, and various regulatory agencies have broadly supported the notion that these three conditions of pressure, opportunity, and rationalization are generally present and coexistent when fraud occurs (e.g., Bell and Carcello, 2000; Rezaee 2005).

Auditors may use red flag checklists to assist in fraud risk assessment. Prior audit studies on various types of decision aids, such as checklists

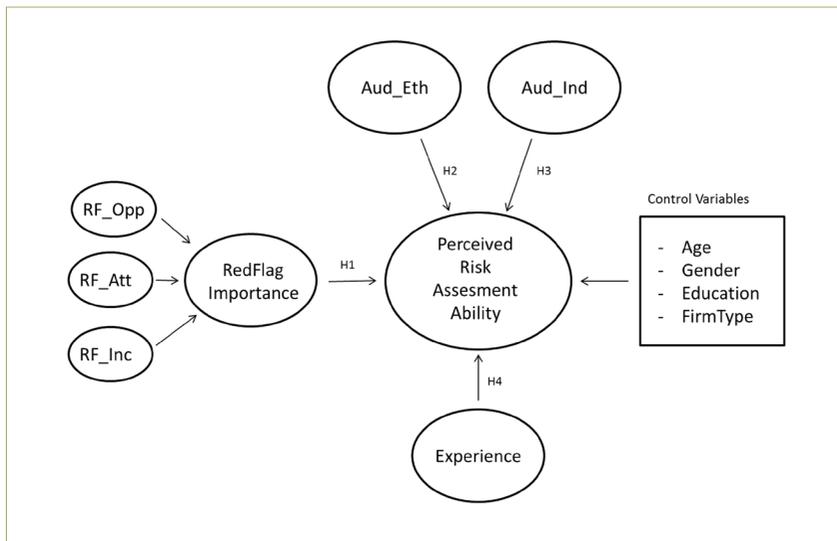


FIGURE 1. Research model of the study

The abbreviations used in the research model are as follows:

RF\_Att = RedFlag indicators of the category Attitude

RF\_Inc = RedFlag indicators of the category Incentives

RF\_Opp =RedFlag indicators of the category Opportunity

Aud\_Eth = Auditors' ethical values measured as professionalism, responsibility and objectivity

Aud\_Ind = Auditor independence

Perceived Risk Assessment Ability = Auditors' ability to assess fraud risk

Education = Auditors' basic education level

Experience = Auditor position (rank)

FirmType = Big4/non-Big4 firm

and expert systems, have found that they generally improve accounting judgements in a variety of tasks (e.g., Eining et al. 1997; Glover et al. 1997), as they offer structure to the decision process, the psychology literature suggests will improve decision-making (MacGregor et al. 1988). It has, however, also been argued that the use of too many risk assessment cues with low diagnostic ability will, contrary to normative expectations, reduce the accuracy of an auditor's inherent risk assessment (e.g., Hoffman and Patton 1997). Further, previous studies on red flag indicators show that even if red flags are present, the ability of an auditor to recognize and evaluate red flags cannot always be clearly determined and a checklist gives "no mechanical assistance for weighting and combining the red flag cues into an overall assessment" (Eining et al. 1997,4).

Furthermore, Ashton (1990) and Boatsman et al. (1997) found that auditors were reluctant to rely on available decision aids because of problems with the high incidence of false positive signals of fraud risk. Thus, a large body of literature shows that the adoption and usage levels of such checklists are rather low (e.g., Ashton 1990; Ashton 1992). Auditors, like other professionals, prefer to rely on their own experience and judgement. Therefore, it is important to investigate the importance (or relative emphasis) that auditors place on information cues when producing judgements.

For example, Heiman-Hoffman and Morgan (1996) discovered that auditors perceived different red flags to carry different weights and showed that external auditors tended to rate "management attitudes" as the most important category of red flag. Therefore, this study particularly addresses red flags related to management fraud and integrity. Management integrity is considered a key determinant of client risk structure, and to provide the foundation for internal controls (Kizirian et al. 2005). Previous research has also found that auditor judgement is influenced by factors such as the quality of the internal control system and the auditor's perceptions of the integrity of the management of the client firm (Beaulieu 2001; Kizirian et al. 2005).

Reviewing prior studies suggests it is highly likely that auditors who consider red flags very important will be confident in their ability to assess fraud risk. Accordingly, the first hypothesis is as follows:

H1. There is a positive relationship between how important an auditor perceives red flag indicators to be and his/her self-perceived ability to assess fraud risk.

## 2.2 Perceived relevance of ethical values

Ethics in general, professional codes of conduct, auditors' ethical orientations, and ethical reasoning are of particular concern in the audit process. Ethical reasoning refers to the decision processes that an individual employs to judge whether a course of action is ethically or morally appropriate in a particular situation. Ponemon and Gabhart (1993) identified ethical reasoning as a form of expertise that may positively relate to an auditor's ability to assess fraud risk. Their research provided evidence that the higher the auditor's level of ethical reasoning, the better his/her ability to assess the likelihood of management engaging in fraudulent activity. In addition, Rest (1986) maintains that individuals have different levels of sensitivity to ethical situations. Shaub et al. (1993) indicate that individuals with high levels of moral development<sup>5</sup> are more sensitive to ethical situations and issues similar to client integrity and competence. Moreover, Bernardi (1994) reported that audit managers with a high level of moral development detected fraud at a higher rate than managers with lower levels of moral development.

Contemporary auditing standards emphasize that auditors must be independent in fact and also be seen to be independent. This is central to the value of attestation services and thus to the credibility of the auditing profession. Schultz and Hooks (1998) examined the effect of the re-

<sup>5</sup> According to Bernardi (1994), moral development relates to the reasoning process individuals use to frame their responses to ethical issues.

relationship between client personnel and auditors on reports of wrongdoing. They found that the stronger the relationship between the auditor and the client personnel with knowledge of fraud, the more likely the client personnel would be to report the wrongdoing. However, a close relationship between auditor and auditee may endanger the auditor's independence and objectivity. Researchers have pointed out that, as auditors are economically dependent on their clients, this may lead them to adopt their clients' objectives (e.g., Moore et al. 2006; Guiral et al. 2010). Although close auditor-client relationships are restricted by legislation, such as the SOX 2002 requirements of audit-partner or audit-firm rotation and limitations on the provision of non-audit services, and the auditor independence requirements have recently been reviewed in the contemporary International Standards of Auditing (IFAC 2009), the findings of Guiral et al. (2010) suggest that current legislation and auditing standards may still be inadequate to address auditors' unintentional reporting bias.

This study examines auditors' perceived ethical reasoning and orientations in relation to their self-perceived ability to assess fraud risks. Because the probability of reporting fraud is contingent upon auditor independence (Watkins et al. 2004), perceived independence was considered to be of vital importance. The independence construct was assessed separately from the other ethics-related items. Despite doubts expressed in prior studies on the effects of auditor-auditee relationships on auditor independence (Schultz and Hooks 1998; Guiral et al. 2010), this study proposes a positive relationship between perceived auditor independence and self-perceived ability to assess risk. The hypotheses are as follows:

H2: There is a positive relationship between an auditor's self-assessed level of ethical values and self-perceived ability to assess fraud risk

H3: There is a positive relationship between an auditor's self-assessed level of independence and self-perceived ability to assess fraud risk

### 2.3 Professional experience

Previous research has found that the ability of auditors to process information or to take subsequent action increases with experience (Gibbins 1984). Libby and Luft (1993) note that experience and ability determine knowledge, and that knowledge and ability are directly linked to performance. Bedard and Graham (2002) found that prior engagement experience with the client was significant to risk identification. Auditors with prior engagement experience with the client identify more risk factors, thus highlighting the importance of the accumulation of risk knowledge through repeated client experience. From an analysis of the literature, it appears that researchers (Bernardi 1994; Moyes and Hasan 1996; Carpenter et al. 2002) agree that auditors' experience levels may be significantly related to their ability to detect a risk of fraud.

Prior studies often use auditor rank as a substitute and proxy for auditor experience. Christ (1993) found significant differences in the knowledge structures of audit managers/partners compared to those of senior and junior auditors in a study related to auditors' planning knowledge. Knapp and Knapp (2001) found that audit managers are more effective during fraud risk assessment than audit seniors when using analytical procedures, whereas Phillips (1999) found that audit managers do not pay any more attention to evidence of aggressive reporting than audit seniors. Despite the conflicting evidence in previous studies, this study anticipates that auditors' perceptions of their own ability to assess fraud risk may vary with auditor rank.

The fourth hypothesis of this study addresses the relationship between professional experience and auditors' self-perceived ability to assess fraud risk. The hypothesis is as follows:

H4: There is a positive relationship between an auditor's professional experience and self-perceived ability to assess fraud risk.

The current research does include consideration and control of demographic variables. Although there might be numerous individual characteristics acting alone or in combination with other characteristics and events (DeZoort and Lord 1997) that might relate to an auditor's perceived ability or that can potentially pressure the auditor, this study controls for age, gender, education, and type of audit firm. Regarding age and education, Bonner and Lewis (1990) found that senior managers outperformed students on three of four tasks and on all knowledge tests. The respondents in the present study are all professional auditors, the majority have a professional certification and only a minority of the respondents are young with little experience. Therefore, the homogeneity of the current sample would indicate that age and education will not be significantly associated with self-perceived ability. Investigations of the behavioural differences between women and men have largely been reported in the psychology and behavioural economics literature (e.g., Croson and Gneezy 2009; Feingold 1994; Schmitt et al. 2008), and the findings indicate that gender-based differences may exist in, for example, cognitive information processing. Using Finnish data, Niskanen et al. (2011) found that auditor gender was positively associated with actual earnings quality, which may imply that female auditors are more risk averse in their judgement. Owsho (2002) found, however, that gender had no bearing on an auditor's likelihood of making fraud risk assessments, which is the relevant proposed outcome in this study. Finally, audit firm size may be associated with the auditor's self-perceived ability to resist management pressure. For example, Gul (1991) found that bankers expected that larger auditing firms would be more able to withstand management pressure than small audit firms, whereas results by McKinley et al. (1985) show no effect for audit firm size. A survey investigating au-

ditors' perceptions of fraud risk indicators found the perceptions were not influenced by the demographic factors of gender or type of audit firm (Smith et al. 2005). Considering that those results stemmed from a similar approach, the author does not anticipate that type of audit firm will be associated with self-perceived ability in this study.

### 3 Research method

#### 3.1 Survey and data

This study is based on survey data collected through a web-based form. The web pages of two Finnish auditors' associations provided 932 email addresses of external auditors. In addition, 400 external auditors working in one particular Big 4 firm were sent an inter-company email requesting their assistance. Following Dillman's Tailored Design Method (2000) in the design and administration of the questionnaire, the survey instrument was pre-tested by a group of academics and practitioners and distributed after minor changes accompanied by a covering email explaining the aim of the study and response practice. Two reminders were also sent.

A total of 200 useful responses were received generating a response rate of approximately 15%. Although the response rate may appear low, it is well within the response rate range of contemporary empirical studies for web-based questionnaires. The total population of auditors in Finland in 2010 holding KHT certification was 719, and 717 held HTM certification<sup>6</sup>. The median age in the total auditor population is in the range of 50–59 years, which is consistent with the ages of the certified auditors of this sample. The median age in this study is, however, somewhat lower, because

<sup>6</sup> Finland has a two-tier system of certification of auditors: the lower certification level being known as HTM, and the higher, KHT. The prerequisites for taking the KHT exam include three years of work experience under the supervision of a KHT auditor and a suitable academic degree (e.g., a master's degree in economics or business administration) (Knechel et al. 2008). Thus, a KHT auditor represents expertise of the highest level in accountancy and meets the requirements of the EC's 8th Council Directive.

the sample also includes 39 non-certified respondents working as senior assistants or assistants. Overall, measures such as age and position (Table 1) indicate that the respondents are professionals with considerable work experience, and so might be assumed to be familiar with auditing issues.

### 3.2 Variable measurement

#### Perceived importance of red flag indicators

The red flag indicators used here were compiled from previous research (Albrecht and Romney 1986; Apostolou et al. 2001; Bell and Carcello 2000; Hackenbrack 1993) and matched against ISA 240 (IFAC 2009). Respondents were asked to indicate how they perceived the importance of several red flags for fraud risk assessment on a 7-point

Likert scale anchored with *not important at all* (1) and *extremely important* (7). For this study, the red flag indicators were classified into the three fraud triangle categories based on example conditions provided in ISA 240 (IFAC 2009) and reanalysed using only the highest-loading items from the PLS measurement model. Only red flags that could clearly be classified as indicators of the categories *attitudes* (RF\_Att), *opportunities* (RF\_Opp), or *incentives* (RF\_Inc) were considered (Appendix), and as the sample size posed a limitation, only four items per variable were included (X1-X12). A separate factor analysis with Varimax rotation was conducted confirming that the factors loaded on their own constructs<sup>7</sup>.

The literature (Wilks and Zimbelman 2004; IFAC 2009) suggests that generally all three conditions must be present for fraud to exist. The work of Norman et al. (2010) indicates that incentives and opportunities will influence attitudes, so that the greater the incentive or opportunity, the more likely it is that management will be able to rationalize committing a fraudulent act. With regard to the inter-relationships among the three conditions of the fraud triangle, the current research categorizes the fraud triangle as a formative second-order construct (*red flag importance*, RF\_Imp). Chin (1998a) suggested that for formative structures the second-order factor is caused by the first-order factors that each make a unique contribution to the second-order factor. In this study the three first-order red flag conditions *attitude*, *incentive*, and *opportunity* facilitate or form the second-order overall *red flag importance* construct. The research also revealed high cross-loadings between the fraud triangle variables *attitude*, *incentive*, and *opportunity* (Table 5). This study assumes that the weighting among the variables is equal, as there are no statistical or empirical grounds indicating otherwise. Although no hypotheses on the fraud triangle variables are offered, the aim is to examine how well the over-

**TABLE 1. DESCRIPTIVE DATA ON THE RESPONDENTS (N = 200)**

<b>Gender</b>	
Male	152 (77 %)
Female	46 (23 %)
<b>Age</b>	
Under 30	29 (15 %)
30–39 years	43 (21 %)
40–49 years	32 (16 %)
50–59 years	47 (23 %)
60 years or over	49 (25 %)
<b>Education</b>	
College degree	34 (17 %)
Bachelor's degree	34 (17 %)
Master's degree	131 (66 %)
Doctoral or licentiate degree	0 (0 %)
<b>Audit firm type</b>	
(FirmType)	
Non-Big4	105 (53 %)
Big4	95 (47%)
<b>Position</b>	
(Experience)	
No response	4 (2 %)
Assistant	53 (26.5 %)
Senior assistant	23 (11.5 %)
Manager	28 (14 %)
Senior manager	26 (13 %)
Director	20 (10 %)
Partner	46 (23 %)

<sup>7</sup> The results of the separate confirmatory factor analysis for each variable indicate that the explained variances of each factor were: *opportunities* 64.47%, *attitudes* 74.21%, and *incentives* 65.76%.

all fraud triangle construct, operationalized as *red flag importance*, is associated with the construct of the self-perceived ability to assess fraud risk in the proposed research model.

*Professional experience*

Consistent with prior research (e.g., Knapp 1995), this study used position as a proxy for experience (Experience), and assumed that the more senior an auditor's position, the more extensive their experience. The pilot testing led to six ranks ranging from *assistant* to *partner* being included in the research instrument to identify the respondent's position. The sample shows a fairly even distribution across various positions (Table 1).

*Perceived relevance of ethical values*

Three indicators were used to measure auditors' ethical values: *professionalism* (Aud\_Eth: Eth1), *responsibility* (Aud\_Eth: Eth2) and *objectivity* (Aud\_Eth: Eth3). The Code of Ethics sets forth these values to help guide auditors in their profession. The current research considered auditor independence (Aud\_Ind) extremely important and

operationalized it as a separate variable (see also e.g., Lee and Stone 1995; Gul and Tsui 1992). The auditors indicated how relevant the four ethical values were to their professional work on a 7-point Likert scale anchored with *not relevant at all* (1) and *extremely relevant* (7). The auditor ethics (Aud\_Eth) construct is modelled using reflective indicators in the PLS assessment.

*Self-perceived fraud risk assessment ability (dependent variable)*

The dependent variable, *auditors' self-perceived ability to assess fraud risk (RiskAssAb)*, was measured on a 7-point Likert scale anchored with *strongly disagree* (1) and *strongly agree* (7), that had the respondents indicate their level of agreement with the statement: "Based on my own judgement, I am able to assess fraud risks very well". Previous fraud literature (e.g., Jaffar et al. 2008; Fraser et al. 2004) has measured auditors' self-perceived ability to assess fraud risk in a similar way via a single indicator.

The control variables were measured as follows. Respondents were asked to give their age in one of five categories: under 30 years old, 30–39 years old,

TABLE 2. Descriptive statistics on research variables

	MEAN	MEDIAN	MINIMUM	MAXIMUM	STD.DEVIATION
RF_Att	4.93	5.63	1.00	7.00	1.97
RF_Inc	4.58	4.75	1.00	7.00	1.43
RF_Opp	4.77	5.25	1.00	7.00	1.53
Experience	3.32	3.00	1.00	6.00	1.70
Aud_Ind	6.77	7.00	4.00	7.00	0.55
Aud_Eth	6.58	6.83	4.67	7.00	0.52
RiskAssAb	4.59	5.00	1.00	7.00	1.04

The abbreviations used were as follows:

RF\_Att = RedFlag indicators of the category Attitude

RF\_Inc = RedFlag indicators of the category Incentives

RF\_Opp =RedFlag indicators of the category Opportunity Experience = Auditor position

Aud\_Ind = Auditor independence

Aud\_Eth = Auditors' perceived ethical values measured as professionalism, responsibility and objectivity

RiskAssAb= Auditors' perceived ability to assess fraud risk

40–49 years old, 50–59 years old, or 60 years old or over. These categories (Age) were coded on a 1–5 scale in the analysis. Gender was measured as a dummy variable. Basic education level (Education) was measured on a four-level scale, where 1 indicated a college degree, 2 a bachelor's degree, 3 a master's degree, and 4 a doctoral or licentiate degree. Finally, type of audit firm (FirmType) was measured with a dummy variable denoting that the respondent does / does not work for a Big 4 audit firm.

### 3.3 Method

The research model of this study was tested with the path analytic modelling technique of PLS, using Smart PLS (version 2-M3). PLS was considered more appropriate than other structural equation modelling (SEM) techniques because of the relatively large number of variables relative to the sample size and the existence of the second-order construct. PLS has also been considered suitable for small sample size studies as the assumptions underlying PLS are less strict than in more traditional covariance-based SEM (Langfield-Smith and Smith 2003). Specifically, PLS does not impose any requirements regarding the distribution or measurement scale of indicators used (Dijkstra 1983). PLS is, however, similar to using multiple regression analysis, as the objective is to maximize explained variance in the dependent construct and additionally to evaluate the data quality ba-

sed on measurement model characteristics (Hair et al. 2011). PLS estimates the structural model using an iterative OLS regression-like procedure. It does not, however, aim for the optimization of the model or report on the fit of the whole model (see Chin 1998a).

## 4. Results

The analysis follows the typical two-stage approach (Barclay et al. 1995) which first assesses the reliability and validity of the measurement model and then assesses the structural model. Table 2 provides descriptive statistics on the research variables.

### 4.1 Measurement model

As shown in Table 3, the factor loadings of each item meet or exceed the criteria of 0.6 (Hulland 1999). Moreover, the reliability of each variable, as assessed using Fornell and Larcker's (1981) measure of composite reliability (CR), is above 0.80, which demonstrates acceptable reliability (Nunnally 1978). Third, the convergent and discriminant validity of each construct, as assessed by examining the average variance extracted (AVE) statistics, shows that the AVEs for all constructs are above or close to 0.60, which demonstrates adequate convergent validity (Chin 1998a; Hair et al. 1998).

**TABLE 3.** Estimation of the measurement model parameters (n = 200)

		ORIGINAL SAMPLE	SAMPLE MEAN	STANDARD DEVIATION	T STATISTICS	AVE	CR
<b>RF_Att</b>						0.742	0.920
	X1	0.839	0.840	0.020	41.481		
	X2	0.887	0.885	0.012	71.142		
	X3	0.899	0.897	0.011	84.401		
	X4	0.819	0.822	0.017	46.926		
<b>RF_Inc</b>		0.657	0.884				
	X5	0.788	0.789	0.018	44.247		
	X6	0.793	0.792	0.017	45.786		
	X7	0.796	0.794	0.022	36.567		
	X8	0.863	0.861	0.015	57.165		
<b>RF_Opp</b>		0.644	0.878				
	X9	0.848	0.847	0.016	54.433		
	X10	0.776	0.776	0.018	42.312		
	X11	0.843	0.843	0.018	47.345		
	X12	0.738	0.738	0.028	26.023		
<b>RF_Imp second-order construct)</b>						0.577	0.942
	X1	0.748	0.747	0.024	31.738		
	X2	0.811	0.810	0.017	48.114		
	X3	0.836	0.837	0.015	57.457		
	X4	0.784	0.786	0.019	42.046		
	X5	0.745	0.748	0.021	35.488		
	X6	0.718	0.718	0.026	27.903		
	X7	0.657	0.654	0.030	21.768		
	X8	0.799	0.796	0.024	33.197		
	X9	0.843	0.844	0.016	52.751		
	X10	0.755	0.755	0.018	42.916		
	X11	0.742	0.742	0.026	28.954		
	X12	0.647	0.646	0.034	18.882		
<b>Aud_Eth</b>						0.621	0.830
	Eth1	0.838	0.833	0.040	20.809		
	Eth2	0.828	0.830	0.032	25.611		
	Eth3	0.690	0.680	0.062	11.145		
<b>Aud_Ind</b>							
	Aud_Ind	1	1	0			
<b>Experience</b>							
	Position	1	1	0			
<b>RiskAssAb</b>							
	Ability	1	1	0			

Assessing discriminant validity requires taking into account model parameters and measurement errors. Table 4 shows that the square roots of the AVEs (diagonally, in bold) are all greater than the respective correlations among the constructs, except for those among the three fraud triangle constructs, which were expected to be highly correlated.

In addition, a matrix of cross-loadings (Table 5) was constructed to test discriminant validity on the item level. As expected, the loadings of a certain item with its associated construct were all

higher on their associated constructs compared to their cross-loadings, even for the components of the fraud triangle. As stated, high cross-loadings were found among the fraud triangle variables *attitude*, *incentive*, and *opportunity*. This was expected as they are the categories of the fraud triangle (second-order construct *red flag importance*, *RF\_Imp*), although measured by different variables. The result indicates that all scales behaved reliably, demonstrated satisfactory convergent and discriminant validity, and exhibited adequate psychometric properties.

TABLE 4. Discriminant validity coefficient (n= 200)

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
<b>1. RF_Att</b>	<b>0.861</b>											
<b>2. RF_Inc</b>	0.722**	<b>0.809</b>										
<b>3. RF_Opp</b>	0.806**	0.791**	<b>0.801</b>									
<b>4. RF_Imp</b>	0.923**	0.903**	0.936**	<b>0.759</b>								
<b>5. RiskAssAb</b>	0.239**	0.265**	0.224**	0.264**	<b>NA</b>							
<b>6. Aud_Eth</b>	0.126	0.144*	0.159	0.154	0.273**	<b>0.788</b>						
<b>7. Aud_Ind</b>	0.133	0.110	0.135	0.137	-0.013	0.479**	<b>NA</b>					
<b>8. Experience</b>	0.101	0.114	0.058	0.100	0.262	0.107	0.090	<b>NA</b>				
<b>9. Age</b>	-0.059	0.068	-0.068	-0.023	0.102	-0.097	-0.130	0.197*	<b>NA</b>			
<b>10. Gender</b>	0.020	0.080	0.084	0.064	-0.027	0.198**	0.124	-0.236**	-0.282**	<b>NA</b>		
<b>11. Education</b>	0.154**	0.010	0.132*	0.110	-0.031	0.152	0.172*	0.057	-0.477**	0.106	<b>NA</b>	
<b>12. FirmType</b>	0.061	-0.025	0.068	0.039	-0.063	0.191	0.218**	-0.068	-0.621**	0.308*	0.355**	<b>NA</b>

\*\* Correlation is significant at the 0.01 level

\* Correlation is significant at the 0.05 level

Square roots of the AVEs (diagonally, in boldface)

NA information is not available

The additional abbreviations used were as follows:

RF\_Imp = Red Flag importance, the second-order construct

FirmType = Audit firm type

TABLE 5. Cross-loadings

	RF_ATT	RF_INC	RF_OPP	RF_IMP	RISKASSAB	AUD_ETH	AUD_IND	EXPERIENCE	AGE	GENDER	EDUCATION	FIRMTYPE
RF_Att: X1	<b>0.839</b>	0.577	0.626	<b>0.748</b>	0.206	0.093	0.107	0.116	-0.090	0.041	0.190	0.141
RF_Att: X2	<b>0.887</b>	0.636	0.695	<b>0.811</b>	0.223	0.087	0.103	0.051	-0.025	-0.052	0.085	-0.031
RF_Att: X3	<b>0.899</b>	0.646	0.744	<b>0.836</b>	0.224	0.169	0.142	0.084	-0.047	-0.006	0.137	0.022
RF_Att: X4	<b>0.819</b>	0.627	0.707	<b>0.784</b>	0.168	0.084	0.105	0.100	-0.045	0.090	0.125	0.086
RF_Inc: X5	0.666	<b>0.788</b>	0.603	<b>0.745</b>	0.283	0.029	-0.039	0.118	0.231	-0.058	-0.079	-0.150
RF_Inc: X6	0.565	<b>0.793</b>	0.643	<b>0.718</b>	0.175	0.099	0.114	0.093	0.021	0.184	0.035	0.028
RF_Inc: X7	0.450	<b>0.796</b>	0.596	<b>0.657</b>	0.128	0.167	0.144	0.026	-0.024	0.049	0.031	0.019
RF_Inc: X8	0.643	<b>0.863</b>	0.714	<b>0.799</b>	0.260	0.174	0.143	0.125	-0.011	0.087	0.048	0.024
RF_Opp: X9	0.782	0.699	<b>0.848</b>	<b>0.844</b>	0.244	0.161	0.062	0.106	-0.120	0.055	0.169	0.088
RF_Opp: X10	0.725	0.581	<b>0.776</b>	<b>0.755</b>	0.184	0.043	0.089	0.032	0.006	0.036	0.091	0.004
RF_Opp: X11	0.559	0.670	<b>0.843</b>	<b>0.742</b>	0.099	0.152	0.138	-0.068	-0.084	0.069	0.074	0.084
RF_Opp: X12	0.487	0.580	<b>0.738</b>	<b>0.648</b>	0.186	0.156	0.159	0.117	-0.007	0.118	0.080	0.039
RiskAssAb	0.239	0.265	0.224	0.264	<b>1.000</b>	0.273	-0.013	0.262	0.102	-0.027	-0.031	-0.063
Aud_Eth: Eth1	0.131	0.069	0.140	0.124	0.251	<b>0.838</b>	0.326	0.109	-0.057	0.139	0.205	0.178
Aud_Eth: Eth2	0.154	0.194	0.183	0.191	0.192	<b>0.828</b>	0.470	0.044	-0.112	0.243	0.127	0.244
Aud_Eth: Eth3	0.006	0.092	0.049	0.050	0.193	<b>0.690</b>	0.356	0.093	-0.067	0.093	0.002	0.025
Aud_Ind	0.133	0.110	0.135	0.137	-0.013	0.479	<b>1.000</b>	0.090	-0.130	0.124	0.172	0.218
Experience	0.101	0.115	0.058	0.100	0.262	0.107	0.090	<b>1.000</b>	0.197	-0.236	0.057	-0.068
Age	-0.059	0.068	-0.068	-0.023	0.102	-0.097	-0.130	0.197	<b>1.000</b>	-0.282	-0.477	-0.621
Gender	0.020	0.080	0.084	0.064	-0.027	0.198	0.124	-0.236	-0.282	<b>1.000</b>	0.106	0.308
Education	0.155	0.010	0.132	0.110	-0.031	0.152	0.172	0.057	-0.477	0.106	<b>1.000</b>	0.355
FirmType	0.061	-0.025	0.069	0.039	-0.063	0.191	0.218	-0.068	-0.621	0.308	0.355	<b>1.000</b>

### 4.2 Structural model

The second step in the PLS analysis is the estimation of the specified structural equations, which in this study was undertaken by assessing the size and significance of path coefficients, R-squared, and the Stone–Geisser Criterion  $Q^2$ . Chin (1998b) argues that the key approach when considering model fit in PLS analyses is to demonstrate strong loadings, high R-squares and substantial/significant structural paths. Factor loadings of each item, which were discussed in the previous section 4.1, are considered strong as they meet and exceed the criteria of 0.6 (Hulland 1999). While R-squared ranges from 0 and 100 %, in general the higher the R-squared, the better the model fits the data. Some research fields, such as psychology, R-squared values are, however usually expected to be low, especially when the aim is to predict human behavior (e.g. Mahama and Cheng 2013). In this study, the explanatory power of the endogenous constructs in the model was about 22 % (R-square = 0.217, Table 6). Even if the R-squared value may be considered rather

low, the standardized paths indicate meaningful relationships. According to Chin (1998b) standardized paths should be around 0.20 and ideally above 0.30 in order to be considered meaningful. In this study the standardized paths are around 0.20 or above and significant (see also Table 6). Thus, regardless of the rather low R-squared, the statistically significant coefficients indicate that conclusions can be drawn about how changes in the independent constructs are associated with changes in auditor’s self-perceived ability. As PLS makes no distributional assumptions, a bootstrapping process (500 samples with replacement) was used to evaluate the statistical significance of each path coefficient (Chin 1998a). Table 6 presents the structural model including the standardized betas and statistical significance as well as outlining the results of the hypothesis testing.

Hypothesis 1 proposed a positive relationship between the second-order construct of perceived importance of red flag indicators (RF\_Imp) and auditors’ self-perceived ability (RiskAssAb) to

TABLE 6. Structural Model Results

INDEPENDENT VARIABLES	SECOND-ORDER CONSTRUCT		DEPENDENT VARIABLE		TEST OF HYPOTHESES
	RF_Imp		RiskAssAb		
RF_Att	0.344	(46.868)***			
RF_Inc	0.398	(39.425)***			
RF_Opp	0.344	(57.114)***			
RF_Imp			0.228	(5.472)***	H1 supported
Aud_Eth			0.331	(5.847)***	H2 supported
Aud_Ind			-0.199	(3.900)**	H3 rejected
Experience			0.219	(5.614)***	H4 supported
<i>Control Variables</i>					
Age			0.010	(0.213)	
Gender			-0.007	(0.157)	
Education			-0.062	(1.356)	
FirmType			-0.047	(1.008)	
	$Q^2$	0.332	0.002		
	$R^2$	1.000	0.217		

n = 200

Standardized path coefficient and (t-value) reported above

\*\*\*p<0.001 (one-tailed tests)

\*\*p<0.01 (one-tailed tests)

\*p<0.05 (one-tailed tests)

assess fraud risk. As expected, the results confirm this hypothesis and show a positive association between the perceived importance of red flag indicators based on the fraud triangle and self-perceived risk assessment ability (0.228,  $p < 0.001$ ). Hypothesis 2 posits that auditors' perceived ethical values will relate to their self-perceived ability to assess fraud risk. The path coefficient from Aud\_Eth to RiskAssAb shows a positive association (0.331,  $p < 0.001$ ) and support for Hypothesis 2. Furthermore, Hypothesis 3 posits that auditors who perceive themselves to be more independent will exhibit a greater self-perceived ability to assess fraud risk. The path coefficient from Aud\_Ind to RiskAssAb shows a negative association (-0.199,  $p < 0.01$ ) and rejects Hypothesis 3. Finally, Hypothesis 4 addressed the relationship between auditors' professional experience and their self-perceived ability to assess fraud risk. Path analysis reveals that the path coefficient from Experience to RiskAssAb is significant (0.219,  $p < 0.001$ ), which supports Hypothesis 4. Moreover, none of the control variables show a significant relationship with RiskAssAb, which was not expected based on prior research.

The predictive validity of the parameter estimates can be assessed on a cross-validated redundancy index or a Stone-Geisser  $Q^2$  test (Geisser 1974; Stone 1974). As PLS models lack an index for goodness of fit statistics, Tenenhaus et al. (2005) argue that, besides the reliability and validity of constructs and the significance of variance explained, positive  $Q^2$  ratings for all constructs provide sufficient evidence of model fit. As prediction relevance ( $Q^2$ ) for all latent variables is greater than zero (Table 6) this study indicates the model is of sufficient predictive relevance (Tenenhaus et al. 2005).

## 5 Discussion and Conclusions

This study examines four factors that might be associated with external auditors' self-perceived ability to assess fraud risk. Owing to the rather low incidence of fraud cases detected in Finland and

the sensitive nature of fraud situations, this study focused on auditors' self-perceived ability, not actual ability, or performance. The study developed a path model based on previous studies and tested it using SEM with PLS with a sample collected from 200 Finnish external auditors. The research model explains approximately 22 % of professional auditors' self-perceived risk assessment ability. The empirical findings demonstrate that there are statistically significant relationships between all independent variables and auditors' self-perceived risk assessment ability. Hypothesis H3 however was rejected; as the findings indicate that perceived auditor independence is negatively related to an auditor's self-perceived ability to assess fraud risk.

The findings show that auditors perceive red flag indicators related to management fraud and integrity to be both important and associated with their self-perceived ability to assess fraud risk. This finding is in line with those in previous studies that show auditors' perceptions of management integrity form the basis of auditor judgements (e.g., Ponemon and Gabhart 1993; Bernardi 1997). Further, Hammersley (2011) argues that high-level red flags (incorporating general incentives, opportunities, or rationalizations for fraud) may signal a general concern about fraud. This study provides empirical evidence that an auditor's perception that red flags are very important is associated with that auditor's self-perceived ability to assess fraud risk. Prior studies (e.g., Mear and Firth, 1987) have found that the indications offered by individuals of how important they find something (e.g. fraud risk indicators) in fact correlate closely with their eventual decisions on the matter. Therefore, it is suggested that the results of the present study may be relevant and useful, even if based on perceptions and not actual facts.

There are several plausible explanations for the rejection of Hypothesis 3. The topic of auditor independence has arisen in discussions around auditor tenure. For example, Solomon et al. (1999) argue that as the relationship between the client and the auditor extends, the auditors' firm-specific expertise increases and allows them to

rely less on managerial estimates and become more independent of management. Could this be read as indicating higher self-perceived ability among auditors? Other researchers maintain that the tenure of auditors may have a negative association with audit quality because long-serving auditors may sacrifice their independence to maintain close relationships with their clients (e.g., Ghosh and Mood 2005). Thus, a long-term development of personal relationships between an auditor and a client could threaten the auditor's independence, whereas too distant a relationship between the auditor and auditee could have a negative effect on the auditor's ability to collect evidence to inform decision-making, and therefore weaken the ability to assess fraud risk (Schultz and Hooks 1998).

The results should be of interest to both academics and practitioners. As the body of research on auditors' ability and on self-perceived ability to assess fraud risk is still limited, this study adds to the few emerging studies within this field (e.g., Jaffar et al. 2008; Moyes 2008; Owahso and Weickgenannt 2009). It builds on perceptions from the professional field. To our knowledge, this study is the first to provide evidence on the perceived importance of red flag indicators to self-perceived ability to assess fraud risk in the Finnish context. In addition, whereas prior research on ability has examined the association between ability and auditor performance (e.g., Bonner 2008), this study focuses on factors explaining self-perceived ability. Increasing audit quality by understanding the risk assessment process and the factors related to auditor judgement is of major importance within the auditing profession (IFAC 2009). Understanding and investigating professional auditors' perceptions of factors influencing their self-perceived ability to assess fraud risk would be an important first step: This is because ascertaining factors that are perceived to hinder or help auditors' efforts at fraud risk assessment afford opportunities to improve audit performance and possibly reduce incidences of fraud.

Many audit firms have adopted red flag instruments in practice. It is difficult to ascertain how

important auditors think red flag checklists are or how much they rely on them in the planning and conduct of the audit and the fraud risk assessment. The answer to the second question probably depends on the characteristics of individual auditors, their insight into their ability to assess fraud risk, and on the organizational setting of the audit. Furthermore, the ability to assess risk efficiently is very likely to be affected by experience, as auditors develop skills and abilities by conducting audit tasks in various client settings. Senior auditors might in turn pass their experience on to a pupil, thus promoting faster learning and enhancing the risk assessment ability of the less experienced auditor. Understanding which factors influence auditors' self-perceived ability to assess risk could help practitioners develop training, team building, and audit planning to increase the quality of auditor performance and also be useful to researchers attempting to explain auditor behaviour.

It is, however, necessary to recognize some limitations of this study. First, considering that previous studies have found evidence that auditors' self-perceived ability does not significantly correlate with their actual performance, and that auditors are overconfident of their ability relative to their actual performance (e.g., Stankov and Crawford 1997; Owahso and Weickgenannt 2009) the results of this study should be interpreted cautiously. Further, the positive association between the perceived importance of red flags and self-perceived ability does not necessarily mean that auditors use the red flags, even if they ascribe high importance to them in a questionnaire. It does, however, appear that auditors consider the red flags to be significant to their self-perceived ability to assess fraud risk. Further empirical evidence would be required to analyse these issues in more detail.

Second, there are some methodological issues to consider. The data were obtained at a single point in time, which makes it difficult to infer causality. In future studies, it would be useful to explore auditors' actual ability to identify fraud risk during the audit process. This study also suf-

fers from the usual limitations associated with the questionnaire survey method (Oppenheim 1966). One concern is that responses to the questionnaire may not always reflect practice. Difficulties involve operationalizing the variables and possible problems with the self-perceived measurements and auditors' possible over-ratings. Another limitation concerns the scales used to measure the core constructs. Many constructs were measured with only one item indicator. Although the single-item scales showed adequate validity and reliability in this study, it has been argued that multi-item scales have demonstrated greater reliability and validity overall (Churchill 1979). Therefore, the measures used may be relatively crude and, perhaps, may not achieve the depth and intensity of whole risk assessment. Furthermore, for practical analytical reasons, the three categories of the red flag constructs *attitude*, *opportunity*, and *incentives* were operationalized using the four highest-loading items from each of the respective scales. Although this approach is consistent with recommendations in the psychometric literature (Nunnally and Bernstein 1994), it may have eliminated facets of each construct and affected content validity. Future research could examine alternative measures or extend this research by validating appropriate scales.

Third, one concern with empirical studies is generalizability. Without replication, we cannot

determine what effect the sample size used has on the generalizability of the results. However, the descriptive data of the sample is consistent with the demographic data of the Finnish auditor population with regard to gender, age, and education. Moreover, whereas Bonner and Pennington (1990) hold that auditors should have eight and a half years of experience in order to make reasoned assessments of the likelihood of fraudulent financial reporting, more than half of the respondents (66%) in this study had over ten years' professional audit experience.

Future research could also focus on identifying factors that may enhance auditors' actual ability to predict and assess the extent of fraud risk. Further studies could examine to what extent environmental factors such as time pressure, task structure, accountability, and information technology are associated with auditors' fraud risk assessments or performance. Furthermore, this study did not examine auditors' ability to report on the likelihood of fraud risk, an issue that has been called for in the literature (Jaffar et al. 2008). There is considerable potential for further studies in this research area. In a period when incidences of corporate fraud seem to be increasing, there is an evident need to bolster auditors' expertise in assessing and reporting fraud risk.

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**Appendix. Red flags mean, standard deviation and original source**

		MEAN	SD	ORIGINAL SOURCES, CLASSIFIED ACCORDING TO ISA 240 (IFAC, 2009)
<b>Attitudes</b>				
X1	Management places undue pressure on the auditors.	4.74	2.32	Bell and Carcello, 2000
X2	Key managers have (or one has) a questionable or criminal background.	5.14	2.52	Bell and Carcello, 2000
X3	Dishonest or unethical management.	5.10	2.23	Albrecht and Romney, 1986
X4	Strong pressure to increase price of company's stock	4.73	2.06	Hackenbrack, 1993
<b>Incentives</b>				
X5	Key managers live beyond their means.	4.77	2.02	Albrecht and Romney, 1986
X6	Company is confronted with adverse legal circumstances.	3.62	1.49	Bell and Carcello, 2000
X7	Threat of imminent bankruptcy.	4.93	1.67	Apostolou et al., 2001
X8	Company tries to cover up temporary poor financial situation.	4.99	1.85	Albrecht and Romney, 1986
<b>Opportunities</b>				
X9	Significant and unusual related-party transactions are present.	5.22	1.90	Bell and Carcello, 2000
X10	Bank accounts or operations in tax-haven jurisdictions.	4.41	2.48	Apostolou et al., 2001
X11	Transactions are not recorded accurately and in timely manner.	4.59	1.73	Albrecht and Romney, 1986
X12	Weak internal control environment.	4.86	1.49	Bell and Carcello, 2000