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Does voluntary non-financial reporting matter for the evaluation of audit risk after a crisis period? Perceptions from Italian auditors

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Abstract

Purpose – This paper aims to investigate the effect of voluntary non-financial reporting on the evaluation of audit risk from the auditors' viewpoint in a post-crisis period. Furthermore, this paper analyses whether auditors perceive that voluntary non-financial reporting impacts audit risk differently for old clients as compared with new clients.

Design/methodology/approach – This study is conducted on a sample of Italian audit firms through a paper-based questionnaire. Both Big4 and non-Big4 audit firms have been included in the sample.

Findings – Results show that integrated reporting is perceived to be the most relevant reporting method and intellectual capital statement the least relevant. Surprisingly, empirical findings over the sample period show that auditors do not perceive statistically significant differences between old and new clients.

Practical implications – Auditors can identify opportunities to adapt their assessment model to include voluntary non-financial report information. Moreover, they can use different assessment models regarding the research variables in the case of new and old clients.

Originality/value – Empirical findings highlight the growing role of voluntary non-financial reporting in the auditors' perception of their client's audit risk. All the observed voluntary non-financial reporting forms, except for intellectual capital, are considered as relevant by auditors in the evaluation of their client's audit

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risk when compared to an indifference point. In addition, findings reveal that female auditors perceive a reduced gap in the relevance between integrated reports and intellectual capital reports compared to their counterparts.

Keywords Auditors, Audit risk, Voluntary reporting, Non-financial reporting

Paper type Research paper

Introduction

Given the expectations of stakeholders that companies participate in the debate on societal problems (Van der Wiele *et al.*, 2001), business ethics and voluntary non-financial reporting have gained considerable attention among companies and researchers (Fukukawa *et al.*, 2007; Kolk, 2016). Voluntary non-financial reports have increased in size and scope, encouraged by Big4 accounting firms (Wang *et al.*, 2013; Pucheta-Martínez *et al.*, 2019) despite the remit of auditors being limited to the provision of assurance about the quality of their client's financial disclosures (ISA 200, IAASB, 2018). Furthermore, financial reporting standard setters are also increasingly integrating non-financial information into corporate financial reports (IFRS, 2021). Because the ability to identify (un)ethical behaviour is central to the auditing profession (Larkin, 2000), compliance with ethical standards is necessary to enhance voluntary non-financial credibility (Ackers, 2015). However, scholars have blamed audit firms for their failure to detect some declarations that diverged from reporting their performance and engaged in greenwashing practices, which has caused the distortion of "bad news" (Siano and Wysocki, 2018; Hahn and Lülfs, 2014; Lindblom and Tikkanen, 2010) and different forms of hypocrisy (Higgins *et al.*, 2020). Although voluntary non-financial reporting has become increasingly common, to the best of our knowledge investigations into how auditors perceive the relevance, or risk, of voluntary non-financial information when making their assessment of a client's audit risk are not common (Quick and Inwinkl, 2020; Bozzolan and Miihkinen, 2021). Furthermore, regarding the assessment of audit risk during times of economic downturn, recent literature has explored the link between audit procedures and audit risk during the initial COVID-19 pandemic, finding that just 3% of audit procedures during the pandemic addressed audit risk linked to the COVID-19 pandemic (Nguyen and Kend, 2021). More specifically, it is not clear whether auditors adapted their risk assessment models in situations of economic uncertainty caused by global crises (such as the Global Financial Crisis [GFC] or the COVID-19 pandemic) (Chen *et al.*, 2019; Sikka, 2015; Hay *et al.*, 2021).

Motivated by the lack of research on the association between voluntary non-financial reporting and audit risk, this paper adopts a dual theoretical approach by leveraging both information asymmetry (Healy and Palepu, 2001; Jensen and Meckling, 2019) and the incremental information approach (Merkl-Davies and Brennan, 2007) to analyse the role of voluntary non-financial reporting, as perceived by auditors, in their evaluation process in a post-crisis period. Furthermore, in the assessment of the audit risk of new clients, auditors look for more information than that collected for the evaluation of old clients to understand the credibility and the riskiness of the client's firm (Laux and Paul Newman, 2010). Therefore, this paper aims at analysing whether the auditors' perception of voluntary non-financial reporting may affect the evaluation of the audit risk in the case of old and new clients.

Given the aforementioned research gaps, the following research questions (RQs) emerge:

RQ1. Do auditors perceive that voluntary non-financial reporting impacts audit risk?

RQ2. Do auditors perceive that voluntary non-financial reporting impacts audit risk differently for old and new clients?

To answer these questions, we tested and administered a survey to 86 Big Four (Big4) and mid-tier Italian auditors (traditionally seen as any firm which is not a Big4 or a small firm). Italy, which is a civil law country, provides an interesting setting because its legal system is characterized by written rules that prevail over judges' decisions, thereby affording less room for discretion compared to common law settings (Bozzolan *et al.*, 2003) or the international context (ISA 330, IAASB, 2018). Instead, compliance with national and international standards for auditing and reporting is the main determinant of an audit manager's accountability.

Empirical findings contribute to prior research in several ways. Firstly, from a theoretical perspective, our findings enrich the voluntary non-financial reporting field, in that our study is a first attempt at understanding the role of voluntary non-financial reporting during a post-crisis period in changing the assessment model used by auditors, and hence the risk assessed by auditors that could impair financial market efficiency (De Martinis and Houghton, 2019). Thereby, this study highlights the most relevant voluntary non-financial reports used by auditors in the assessment of the audit risk after a global crisis. Moreover, our study extends previous theoretical frameworks related to the assessment of auditor risk in the evaluation of voluntary non-financial reporting (Dusenbury *et al.*, 2000). Previous studies have argued that voluntary non-financial reporting is issued to provide stakeholders with additional information on actual corporate performance (Cooper, 1980; Guthrie and Parker, 1989), which is also consistent with the incremental information approach that argues that additional disclosures lead to more informed decision-making processes (Bryan, 1997; Merkl-Davies and Brennan, 2007). This study also contributes to the literature on the relevance of voluntary information provided in a mandatory setting, where non-financial information is required by law or regulations (de Villiers and Sharma, 2020), by showing which reports and the related sustainability performance are perceived as more informative by auditors to reduce the overall audit risk of the company.

From a methodological perspective, the research method applied in the study of Beattie and Smith (2012) was replicated to analyse the perceptions of auditors regarding the effect of voluntary non-financial reporting on the evaluation of the audit risk. More specifically, empirical findings show that the Integrated Report (IR) has been found, among the different sets of non-financial information, to positively contribute to the mitigation of audit risk.

The remainder of the paper is organized as follows. The second section deals with the literature review by analysing the theoretical approaches to voluntary non-financial reporting and the assessment of the audit risk after a period of crisis to identify the missing link between voluntary non-financial reporting and audit risk, also with regards to the auditors' perceptions related to either old or new clients. Next, the paper discusses the gap in the literature and defines the research hypotheses. In the third section, the methods and data collection process are explained. Empirical findings are reported in the fourth section, while the final section discusses the results and presents the concluding remarks.

Background

Voluntary non-financial reporting: theoretical approaches and empirical evidence

Voluntary reporting is part of the wider concept of voluntary disclosures, which are "disclosures in excess of requirements" (Meek *et al.*, 1995, p. 555). Several scholars have analysed voluntary reporting research for many years (Jayaraman and Shuang Wu, 2020; Lemma *et al.*, 2020; Zaini *et al.*, 2018). Voluntary disclosure can take many forms to increase clarity for investors and, thus, reduce the information asymmetry between the company and stakeholders (Verrecchia, 1983). With the introduction of European Directive 2014/95/EU, the disclosure of non-financial information has increased (Leopizzi *et al.*, 2020). Indeed, companies with specific characteristics are required to disclose additional information concerning the mandatory financial information required by law (Venturelli *et al.*, 2017). In addition, the number of companies voluntarily disclosing non-financial information is increasing, and those companies which are mandated to produce non-financial reports are disclosing more information than required (Rossi and Harjoto, 2020; Assidi, 2020).

Previous studies have underlined the term "information overload" (Financial reporting faculty 2013), used to describe the status of stakeholders who are receiving a large quantity of information to consider in their decision-making process (Eppler and Mengis, 2004; Stolowy and Paugam, 2018). In fact, non-financial information can take a variety of forms, and different definitions of the kinds of reporting companies could adopt are provided by academics, preparers and standard setters (Stolowy and Paugam, 2018). Previous studies underlined that there is not a uniform method of measurement of non-financial information in the company (Unerman, 2000), nor a single and uniform document in which their value could be disclosed (Striukova *et al.*, 2008; Unerman, 2000). Instead, non-financial information could be disclosed differently in different documents. Different reasons are leading to this choice. Firstly, this could be related to management perceptions of either the differing interests of the audiences for each type of corporate report, and/or the differing roles of each type of corporate report (Striukova *et al.*, 2008). Secondly, different typologies of reports could be adopted to "communicate a different balance of information, presumably targeted at different audiences, for each specific type of corporate report" (Striukova *et al.*, 2008, p. 310). Thus, despite there may be overlapping features to the different non-financial reports, excluding them might result in capturing an incomplete picture (Striukova *et al.*, 2008; Unerman, 2000; Roberts, 1991). Therefore, as previous studies pointed out, the relative importance of different documents cannot be established *a priori* (Unerman, 2000). As advised by previous studies, "future content analysis studies need to carefully consider analysing a reasonably wide range of corporate reports" (Unerman, 2000, p. 678). For this reason, a comprehensive list of items has been considered for this study. Below are the most common definitions in the literature:

- intellectual capital report (IC) refers to the disclosure of the "Knowledge-based resources that contribute to the sustained competitive advantage of the firm from intellectual capital" that "are not registered in the financial accounts" (de Pablos, 2003, pp. 63–64);
- Human capital report (HC) refers to the disclosure of the individual tacit knowledge that the organization's members possess (i.e. inarticulable skills necessary to perform their functions) (Bontis, 1998).
- Relational capital report (RC) refers to the disclosure of the "knowledge embedded in the marketing channels and customer relationships that an organisation develops" (Bontis, 1998).
- Organizational capital report (OC) refers to the disclosure of the "knowledge used to combine human skills and physical capital into systems for producing and delivering want-satisfying products" with reference to "operating capabilities [. . .], investment capabilities [. . .], and innovation capabilities" (Lev and Radhakrishnan, 2003, p. 4).
- Environmental report (ER) refers to "the preparation, presentation and communication of information relating to an organisation's interactions with the natural environment" (Morelli, 2011).
- Sustainability report (SR) refers to "an organization's practice of reporting publicly on its economic, environmental, and/or social impacts, and hence its contributions –

positive or negative – towards the goal of sustainable development" (Global Sustainability Standards Board, 2016).

- IR refers to "a concise communication about how an organization's strategy, governance, performance and prospects, in the context of its external environment, lead to the creation of value over the short, medium and long term" (International Integrated Reporting Council, 2013, p. 8).

Previous studies have considered voluntary and mandatory disclosure not as substitutes but as complements given their contribution to decreasing information asymmetry between managers and investors (Ball *et al.*, 2012; Deumes and Knechel, 2008). Although the literature on voluntary financial information is abundant, more recent research has focused on the effect of disclosing non-financial information (Directive 2014/95/EU; Biondi *et al.*, 2020; Di Vaio *et al.*, 2020) because no clear consensus has yet emerged in this field. While voluntary non-financial reporting has been found to have an impact on the cost of capital, by decreasing this cost when stand-alone reports on social activities are disclosed (Dhaliwal *et al.*, 2011), other studies did not find a relationship between environmental reporting and environmental performance (Cho and Patten, 2013; Melloni, 2015; Merkl-Davies and Brennan, 2007). Moreover, ICs have been found to produce positive effects on audit risk and audit fees (Demartini and Trucco, 2016).

Furthermore, it seems that this kind of reporting has received increasing attention over time since the number of reports disclosing voluntary non-financial information has increased (Wang *et al.*, 2013; Rossi and Harjoto, 2020; Assidi, 2020). However, the concern regarding the quality and reliability of such voluntary non-financial reporting persists (García-Benau *et al.*, 2013). To the best of our knowledge, the effect of voluntary non-financial reporting on the risk of a company has only been partially addressed so far (Demartini and Trucco, 2016; Krishnan *et al.*, 2012). More specifically, the link between voluntary reporting and audit risk needs further attention. Indeed, it may be interesting to understand how auditors consider voluntary non-financial reporting in assessing the audit risk model, even if firms are not obliged to do this.

The assessment of the audit risk after an economic downturn

"Given the speed of information creation and dissemination, the role of auditors may need to adapt", "the economic value of an audit derives from the reduction in risk of erroneous or manipulated information" (Knechel, 2021, p. 133). According to a variety of stakeholders, audit risk entails the possibility that the auditors will not issue a fair and correct opinion on the financial statements of their clients (Hogan and Wilkins, 2008; Houston *et al.*, 1999; Shibano, 1990, ISA 200, (IAASB, 2018); Sikka, 2009).

Recently, some scholars have emphasized the relevance for external auditors in providing a clear definition and understanding of the audit risk model, which can be explained by a combination of inherent, control and detection risks [American Institute of Certified Public Accountants (AICPA), 2002; Dusenbury *et al.*, 2000]. Based on the professional guidelines, audit risk can be expressed as follows: audit risk = detection risk * inherent risk * control risk (ISA 200, IAASB, 2018). Although auditors usually define the audit risk as "high", "medium" or "low", there is no common formula they can use to evaluate the threshold for defining each class of risk (Chen *et al.*, 2019; Niemi *et al.*, 2018). Scholars have emphasized that both international auditing standards and professional guidelines are unable to define the audit risk model (Spector, 2007). SAS Nos. 39 and 47 [American Institute of Certified Public Accountants (AICPA), 2007] provide a clearer guide to auditors in assessing audit risk and in defining the audit risk model, thereby identifying the key determinants of the audit risk.

It is widely accepted in the literature that a variety of benefits can be obtained from the disclosure of voluntary non-financial information (Beattie and Smith, 2013; Bukh, 2003; Del Bosco and Misani, 2016). However, this can be perceived as valuable by investors only if it represents the performance of the firm (Abeysekera, 2008). In fact, in making investment decisions, investors need relevant information, especially in light of recent economic and financial scandals (Clarke, 2007; Pedersen *et al.*, 2020). To respond to the increased risk, auditors' efforts also increase (Asthana *et al.*, 2009; Bell *et al.*, 2008; Mautz and Sharaf, 1961) because it is more difficult to obtain sufficient audit evidence to reduce those audit risks to an acceptable level (Xu *et al.*, 2013). More specifically, according to previous studies, higher business risk aggravates the litigation risk faced by auditors, who, in turn, increase audit fees (Jubb *et al.*, 1996; Niemi, 2002; Yen *et al.*, 2018; Chen *et al.*, 2019; Hsieh *et al.*, 2020).

The economic downturns, such as those during the recent COVID-19 pandemic and the previous GFC, represent challenging environments for both companies and auditors (Allen and Carletti, 2008; Hesse *et al.*, 2008; Alvarado *et al.*, 2019; Sanoran, 2018; Carson *et al.*, 2019). Indeed, as argued in previous studies: "A crisis can often lead to dramatic effects on auditing" (Hay *et al.*, 2021, p. 179) where the respect for deadlines is of utmost importance and the crisis makes the reconstruction of audit evidence more difficult. Furthermore, another effect of economic crises on audit risk assessment has been analysed in other studies that have focused on the link between the audit efforts in terms of audit procedures and the assessment of the audit risk specific to the COVID-19 pandemic, finding that just a very small percentage of audit procedures at these times were carried out to address the part of the audit risk linked to the pandemic (Nguyen and Kend, 2021).

The missing link between voluntary non-financial reporting and audit risk

Firms can voluntarily disclose non-financial information for a variety of reasons, such as to enhance the firm's value (Ball *et al.*, 2012; Hope *et al.*, 2013), reduce the cost of capital (Karolyi, 1998), improve their competitiveness and undertake self-regulation (Rodríguez and LeMaster, 2007) and improve non-financial performance (Beretta *et al.*, 2018; Freeman, 1984). During the GFC, companies were more willing to provide voluntary disclosure to mitigate the concern about a company's performance (Mia and Al Mamun, 2011). To avoid litigation risks, non-financial disclosures must be reliable even in periods of economic downturns (Beattie and Smith, 2012; Demartini and Trucco, 2016). Hence, to provide credible and transparent non-financial information, companies will be requiring non-auditing services to a greater extent to gain support for their extended reporting area (Svanström and Sundgren, 2012). Thus, firms operating in a distressed economic period will disclose more non-financial information through a high level of non-auditing services.

The literature on disclosure theories applied to voluntary reporting points out that social, human and environmental reporting should reduce information asymmetry and thus the adverse selection and the information risk of a company (Beattie *et al.*, 2004; Holland, 2006). This is in line with the incremental information approach (Bryan, 1997; Merkl-Davies and Brennan, 2007). However, as argued instead by other studies, companies can adopt an impression management approach in their non-financial reporting to present the company in a more favourable light (Melloni, 2015; Merkl-Davies and Brennan, 2007). Although information risk has been found to predict audit risk (Hogan and Wilkins, 2008), we believe the relationship between voluntary reporting, specifically non-financial reporting, and audit risk has not yet been sufficiently investigated. This gap in the literature also depends on the fact that the assurance regarding voluntary non-financial reporting is carried out on a voluntary basis by firms and that the assurance regarding qualitative documents is more difficult to provide than the traditional auditing of financial statements due to a lack of a clear framework (Bozzolan and Miihkinen, 2021). Furthermore, some studies have demonstrated that auditors, especially Big4 audit firms, tend to avoid high levels of litigation risk to protect their brand name (Lennox 1999; Khurana and Raman, 2004). In addition, Bozzolan and Miihkinen (2021) found that the quality of client risk disclosure is linked to the features of audit partners, such as expertise and gender, concluding that "audit partners can have a positive effect on the usefulness of non-financial information if they refrain from thinking that this kind of information is irrelevant and easy to assure by following the 'tick-the-box' approach" (Bozzolan and Miihkinen, 2021, p. 48) in a mandatory context.

We believe that the previous literature leaves room for further investigation about the effect of voluntary non-financial information on the evaluation of the features of audit risk from the auditors' viewpoint, especially after a global crisis. In this regard, previous studies have analysed whether the assurance of corporate social responsibility (CSR) has some effects on the perceptions of capital providers, finding that such assurance positively affects the credibility of voluntary non-financial information (Quick and Inwinkl, 2020).

Indeed, disclosure theory focuses mainly on the firm with little or no research on the auditors' perspective. To the best of our knowledge, few studies have been conducted in this area, and these have focused on the perspectives of either senior managers or rating agencies. For example, KPMG carried out a survey in which they agree on the relevance of the social, human and environmental information since, given the relevance of corporate responsibility reporting worldwide, this is now considered a standard business (KPMG, 2013; Escrig-Olmedo *et al.*, 2019). Cohen and Simnett (2015) noted a growing market for CSR reports and related assurance (Cohen and Simnett, 2015; García-Sánchez *et al.*, 2019; Hassan *et al.*, 2020); in fact, KPMG's report stated that the number of large firms that voluntarily seek assurance is increasing (KPMG, 2013).

Audit risk has been analysed mainly in the context of voluntary reporting, in which financial and non-financial reporting are conceived as complements; the truthfulness of auditable financial information reduces the risk that non-auditable forward-looking voluntary reporting will be unreliable (Athanasakou and Hussainey, 2014; Graham *et al.*, 2005; Liu *et al.*, 2018). The truthfulness of disclosure is becoming increasingly important in light of the international trend related to the integration of both financial and non-financial reporting in a single report (CSRD, 2021; ISSB, 2022).

Similarly, Zhanxia *et al.* (2011) suggest measures auditors can adopt to facilitate the use of non-financial reporting to avoid fraud. Scholars argue that to improve the credibility of non-financial reporting, such as CSR, it is relevant for this kind of information to be verified or assured (Simnett and Nugent, 2007). Indeed, firms are aware that through the assurance of voluntary non-financial reporting it is possible to increase stakeholder confidence and corporate reputation, as well as to assess and contain environmental and social risks more effectively (Adams and Evans, 2004; Sethi *et al.*, 2017). To assure non-financial information, auditors should be independent and have appropriate skills regarding the various ways of measuring and reporting non-financial information (Huggins and Izushi, 2015; CSRD, 2021). In this framework, Coram *et al.* (2009) argued that the managerial choice to disclose voluntary information is associated with the audit risk. In this way, auditors could have more of a basis for their evaluation about the overall level of their clients' business risk and uncover a positive association between audit fees (which are considered as a proxy of audit risk) and some features of management earnings forecast (such as likelihood, bias, error and frequency; Coram *et al.*, 2009; Krishnan *et al.*, 2012).

Furthermore, Chen *et al.* (2012) found that auditors use CSR reporting in assessing the client's audit risk; firms with a better CSR performance face lower audit fees and the reduced possibility the auditor will issue a modified audit opinion. In a similar vein, Zhanxia *et al.* (2011) analysed the relationship between intellectual capital disclosure and the audit results of public accounting firms, concluding that human capital and customer capital are key assets for audit firms. Other scholars have investigated the link between the effectiveness of the audit committees, audit quality and the quality of voluntary reporting, finding that the presence of Big4 audit firms and a good quality of the audit committee have some effects on the quality of voluntary reporting (Agyei-Mensah, 2019). Demek *et al.* (2020) studied the joint effects of the principal auditor's and the other auditors and how their use of voluntary reporting may affect the investors' perceptions of audit quality. They found that voluntary reporting reduced the investors' perception of low quality associated with the effect of using other auditors (Demek *et al.*, 2020).

Studies analysing the relevance of non-financial information during the GFC found mixed results. On the one hand, in periods of crisis, when the risk is spread everywhere, the benefits generated by intangible assets are scarcely perceived (Manolopoulou and Tzelepis, 2014; Mia and Al Mamun, 2011). On the other hand, more recent studies argue that the relevance of intangibles is supported even during an economic shock (Raithel *et al.*, 2010; Rodrigues *et al.*, 2017), because non-financial reporting is considered time-invariant, even during the GFC (Rodrigues *et al.*, 2017; Sumedrea, 2013; Hay *et al.*, 2021).

In the integrated reporting field, Dumay *et al.* (2016) have posited that auditing and assurance have not been a matter of concern so far for integrated reporting scholars, who instead have focused more on external reporting issues According to Demartini and Trucco (2016), the reporting of intellectual capital information has mixed effects on audit risk. They report evidence on the positive (negative) link between intellectual capital reporting and qualitative (quantitative) audit risk in the UK and Italy (Demartini and Trucco, 2016). In fact, the previous literature has found that some factors such as the internal control system, the auditors' experience and the role of the clients' corporate governance are considered relevant by auditors in the evaluation of the components of audit risk, and further investigation on the topic is encouraged (Demartini and Trucco, 2016).

Based on the previous studies and on the lack of studies that analyse the link between voluntary non-financial reporting and the evaluation of the audit risk from the auditors' perspective, we posit the following research hypothesis:

H1. Different voluntary non-financial reporting forms have differing effects on the evaluation of the audit risk by auditors.

Voluntary non-financial reporting and audit risk: differences between old and new clients

Scholars have pointed out that auditors spend more effort in evaluating financial risk, litigation risk and audit risk when assessing potential new clients (Johnston *et al.*, 2000; Johnstone and Bedard, 2003). If the client is new, the auditor must decide whether to accept them or not, given the fact that two kinds of potential client firms exist (Johnston *et al.*, 2000): high risk and low risk. In this context, auditors need to acquire information to understand if the potential client is risky or not (Laux and Paul Newman, 2010). Researchers state that if the potential client is particularly risky, the auditor can decide not to accept the new client to avoid reputation losses (Laux and Paul Newman, 2010). Scholars have demonstrated that especially large auditing companies are less likely to accept risky clients, because large audit firms can have more negative consequences to their reputation and more attention from the mass media (Jones and Raghunandan, 1998). To contrast this phenomenon, auditors usually ask for higher billing rates if they decide to accept new risky clients (Johnstone and Bedard, 2003). In this framework, Catanach *et al.* (2011) have analysed auditor resignations and client acceptance decisions, finding that smaller accounting firms assume the role of successor auditor at a greater rate than do the larger ones, highlighting the importance for successor auditors to proceed carefully in accepting new engagements from which the prior auditor had resigned (Catanach *et al.*, 2011). Based on the previous studies, we are aware that in evaluating the audit risk auditors search for information to understand the credibility and the riskiness of the client's firm (Laux and Paul Newman, 2010), and we believe that the auditors' perception of the voluntary non-financial reporting may lead to different evaluations of the audit risk for old and new clients. Indeed, for the evaluation of new clients, auditors require more information than what is required for the old clients. However, the previous literature is scant on this topic; therefore, we posit the following research hypothesis:

H2. Different voluntary non-financial reporting forms affect the evaluation of the audit risk by auditors for old and new clients in different ways.

Methodology

Data collection

To answer the above-mentioned RQs, the present study was conducted on a sample of Italian audit partners and managers. Italian companies are required to deposit their financial statements with the Chambers of Commerce, and European Directive 2006/46/CE regulates annual audits for companies with specific features: total assets higher than €4.4m, net turnover higher than €8.8m and a total number of employees higher than 50. When these limits are exceeded for at least two consecutive years, a board of statutory independent auditors is formed to check the company's audit activity. In addition, audit firm rotation was first introduced in Italy in 1975. In this context, the reporting of non-financial information at the time data was collected was done on a voluntary basis. Data was collected through a survey sent to audit managers in October 2013, when the concept of corporate sustainability was gaining importance but was still in a voluntary setting (Taticchi *et al.*, 2013; Schaltegger *et al.*, 2012; Przychodzen and Przychodzen, 2013).

The research design of the survey is described below and presented in Appendix A. Both Big4 and non-Big4 audit firms have been included in the sample because prior studies claim that non-Big4 companies might face greater pressure than Big4 companies when evaluating their clients' audit risk (Pong *et al.*, 2007). Firstly, the paper-based questionnaire was tested by experts in the field to collect feedback and improve the research design, the research hypotheses and the subsequent survey (Chen *et al.*, 2010). Subsequently, the paper-based questionnaire was sent by post to the board of the Italian Big4 audit firms and to the main non-Big4 audit firms. A total of 86 paper questionnaires were sent to the partners of audit firms and a total of 56 valid questionnaires were received back, representing a response rate of around 65%. The number of observations is consistent with prior studies in the accounting literature (Bisbe and Otley, 2004).

Research design

The survey was prepared to obtain information related to the personal data of the interviewee, the features of the client and the perceptions about the topic under investigation (Gable, 1994).

In line with previous studies (Demartini and Trucco, 2017; Demartini and Trucco, 2018), the research variables are mainly intended to capture the perceptions of respondents on the importance played by voluntary non-financial reporting in the evaluation of audit risk, differentiating between clients represented by listed companies before (old clients) and after (new clients) the GFC. In addition, following previous research (Demartini and Trucco, 2018), procedural and statistical remedies were applied to mitigate the effect of common method bias (Podsakoff *et al.*, 2003).

Regarding the voluntary non-financial reporting, the survey questions identified the following items: IC, HC, RC, OC, SR, ER and IR.

The following definitions have been provided in the survey, consistent with the definitions provided in the literature and described above:

> The intellectual capital measures intangible assets of a company under three profiles: human capital, relational capital and organizational capital. Human capital measures the performance related to skills, abilities and training of company employees. Relational capital measures the company's ability to establish relationships with important stakeholders. Organizational capital measures the performance related to effectiveness of the organizational structure and of the business processes. The sustainability (or social) report measures the performance related to the social activities carried out by the company. The environmental report measures the environmental impact of production processes and activities aimed at promoting sustainability of the company. The integrated reporting is the set of accounting and non-accounting documents aimed at measuring the company's economic, social and environmental performance.

Thus, by providing the definitions of the different non-financial disclosure items, respondents were aware of possible overlapping between them.

The survey question for each item for voluntary non-financial reporting was: "In the evaluation of the audit risk for new clients (listed firms), which factors do you think have more/less relevance after the global financial crisis? (1 less relevance; [...]; 7 more relevance)". We repeated the same question for both new and old clients.

In line with previous studies (Demartini and Trucco, 2016), we used the following control variables: Gender, Seniority (years in firm) and Actual Position in the Firm. For Seniority (years in firm), the survey question was: "How long have you been working for the same audit firm?"; for Actual Position in the Firm, the survey question was: "What is your actual position in the audit firm?"

Research and control variables are presented in Table 1.

Data analysis

Following Beattie and Smith's (2012) approach, we used non-parametric tests to falsify the previously presented hypotheses. As argued in their previous study (Beattie and Pratt, 2003), Likert-scale responses are not interval-level measures, and thus non-parametric tests are considered more appropriate than parametric tests.

As the first step in our analysis, for each question adopting a Likert scale, we ranked each item in the voluntary non-financial statements included in the analysis in a descending order (Al Matarneh, 2011; Shibano, 1990; Strawser, 1991) according to their mean value; a one-sample *t*-test was performed to determine whether the mean response was significantly different from the indifference level (= 4).

As a second step in our analysis, two sample *t*-tests were also applied to adjacent ranked responses. To check for any difference in the increased relevance of voluntary non-financial reporting in the assessment of audit risk for new and old clients after the GFC, we performed a paired *t*-test analysis.

Table 1.
Research and control variables

Voluntary non-financial reporting variables	
New clients	*Old clients*
In the evaluation of the audit risk for *new clients* (listed firms), which factors do you think have more/less relevance after the global financial crisis? (1 less relevance; [. . .]; 7 more relevance) • Intellectual capital report (IC) • Human capital report (HC) • Relational capital report (RC) • Organizational capital report (OC) • Sustainability report (SR) • Environmental report (ER) • Integrated report (IR)	In the evaluation of the audit risk for *old clients* (listed firms), which factors do you think have more/less relevance in the last three years? (1 less relevance; [. . .]; 7 more relevance) • Intellectual capital report (IC) • Human capital report (HC) • Relational capital report (RC) • Organizational capital report (OC) • Sustainability report (SR) • Environmental report (ER) • Integrated report (IR)
Control variables Gender Seniority Actual position in the firm	

In line with Beattie and Smith (2012), the third step in our analysis was a principal component analysis to test whether the different components of voluntary non-financial reporting are correlated and to determine the underlying dimensions. As advocated in previous studies, the statistical method chosen is in line with a small sample size (Jung and Marron, 2009). The Keiser–Meyer–Olkin (KMO) test and Bartlett's sphericity test (Snedecor and Cochran, 1989) were performed to test the sampling adequacy and ensure validity and reliability of the factor analysis (Kaiser, 1960); Cronbach's alpha was analysed to assess the scale reliability (Nunnally and Bernstein, 1978); and, finally, the eigenvalue of each item was calculated to define the number of factors to be retained in the analysis (Hayton *et al.*, 2004).

To conclude, importance of the voluntary non-financial reporting variables was analysed for each control variable, and a *t*-test between the most and the least important item for each analysed category was performed.

Empirical findings

Response bias test

To check the robustness of the sample, a test on an early-late response and a *t*-test based on gender of respondents were conducted.

The first test was conducted for all the relevant research variables (voluntary non-financial reporting new client, voluntary non-financial reporting old client) to check for differences in the two groups, adopting the wave analysis proposed by Rogelberg and Stanton (2007). Results obtained from a two-sample *t*-test with equal variances show that the mean differences of the variables included in the research models are not statistically significant, which allows us to reject the hypothesis of a significant bias between early and late respondents in the surveyed sample. The test for respondent bias included a comparison of respondents and the sample of respondents contacted based on gender. A two-tailed *t*-test confirmed that the mean of gender for the initial respondents and responding sample was not significantly different statistically at a 5% level.

Descriptive statistics

The first step in our empirical analysis was to conduct descriptive statistics of the variables under investigation. For each item and the related composite variable, the minimum, maximum, mean value and standard deviation are reported in Table 2.

Table 2 shows some descriptive statistics for both the research and control variables. The results show that IR has the highest mean value, followed by Environmental Report and Sustainability Report. Furthermore, our sample of respondents is 85.5% male and 14.5% female, with the following breakdown: 32.1% are equity partners, 39.3% are partners, 19.6% are managers and 8.9% are senior managers (Table 2). Average seniority in the respondent sample is almost 18 years, with a minimum of 2 and a maximum of 37 years in the firm (Table 2).

Influence of voluntary non-financial reporting on audit risk assessment

To reply to this study's RQs and test the research hypotheses, consistent with previous studies (Beattie and Smith, 2012), respondents were asked to rate the importance of different items. In particular, we asked auditors to rank items based on the auditors' perceived relevance of them after the GFC when assessing the audit risk of old and new clients. We then ranked each item in a descending order according to their mean value (Table 3). This enabled us to ascertain that auditors rely more on some types of voluntary non-financial reporting than others in the evaluation of a client's audit risk. According to the results, IR represents the most relevant factor for auditors, whereas the intellectual capital statement is perceived the least relevant, followed by relational capital. Moreover, environmental reporting is gaining a lot of attention from auditors, even more than that granted to voluntary non-financial reports. Human capital and the relational capital statement are not perceived to be as relevant as the IR and ER (Table 3). This applies to both old and new clients (Table 3). In fact, the ranking of the items does not differ much in the two cases (old and new client). In general, the perceived relevance of voluntary non-financial reporting is slightly lower for new clients than for old clients for all the items of voluntary non-financial reporting, apart from the sustainability report, organizational and relational capital in both cases (old and new client).

Variable	Observations	Mean	Standard deviation	Min	Max
IC	55	4.100	0.723	1	6
HC	55	4.209	0.599	3	6
RC	55	4.155	0.560	3	6
OC	55	4.309	0.635	3	6
SR	55	4.291	0.815	1	6
ER	55	4.391	0.750	3	6
IR	55	4.809	0.925	3	7
Seniority	54	17.99	8.944	2	37
Variable			*Frequency*	*Percent*	*Cumulative*
Gender	Male		47	85.45	85.45
	Female		8	14.55	100.00
Hold position	Shareholders		18	32.14	32.14
	Partners		22	39.29	71.43
	Senior managers		5	8.93	80.36
	Managers		11	19.64	100.00

Table 2. Descriptive statistics of the research variables (old and new clients)

Table 3.
Relevance of determinants of audit risk assessment for firms that are already clients of the auditor and for new clients after the global financial crisis

Variable	Observations	Min	Max	Mean	Significant difference from the next highest ranking group	Standard deviation
Old clients						
IR	52	3	7	4.87	Yes (0.0078)	0.950
ER	53	3	6	4.40	No	0.817
OC	53	3	6	4.30	No	0.668
HC	53	3	6	4.23	No	0.609
SR	53	1	6	4.23	No	0.847
RC	53	3	6	4.15	No	0.601
IC	53	1	6	4.13	N/A	0.785
New clients						
IR	54	2	7	4.76	Yes (0.0449)	1.063
ER	55	2	6	4.38	No	0.871
SR	55	1	6	4.35	No	0.985
OC	55	2	6	4.33	No	0.818
HC	55	2	6	4.20	No	0.730
RC	55	2	6	4.16	No	0.688
IC	55	1	6	4.07	N/A	0.813

The existing literature contains little practical guidance on how auditors should consider the various features of voluntary non-financial reporting in evaluating the risk associated with clients (Cohen *et al.*, 2002), especially with reference to a period of economic downturn, such as the GFC (Cao *et al.*, 2015). To check for any difference between the increased relevance of voluntary non-financial reporting in the assessment of audit risk for either new or old clients after the GFC, a paired *t*-test analysis was performed. Empirical findings show that even though there is a difference in the mean values between new and old clients, this is negligible and non-significant for each investigated variable, apart from the IR (Table 3). Thus, auditors do not perceive the impact of voluntary non-financial reports on audit risk to be relevant in general, although there are significant differences between old and new clients.

Analysis of the perceived (IR) relevance of voluntary non-financial reporting on audit risk assessment

Following Beattie and Smith's (2012) approach, we then analysed the perceived increased relevance after the GFC of items included in voluntary non-financial reporting compared to their indifference level (theoretical mean value, Table 4). This allowed us to determine whether the mean responses of questions using a Likert scale were significantly different from a neutral mod-point.

All the analysed items, except for IC, show a significant mean difference from the indifference level. Voluntary non-financial reports had mixed results, with Sustainability Reporting and Organizational and RCs showing higher mean values for new as opposed to old clients regarding auditors' perceived relevance after the crisis.

According to the results, respondents attributed great importance to the IR and ER.

Additional analysis – principal component analysis

To gain additional insights from the observed sample, results of the principal component analysis (PCA) related to voluntary non-financial reporting are shown in Table 5. The table

Item	Mean		Standard deviation	
Voluntary non-financial reporting	*New client*	*Old client*	*New client*	*Old client*
IR	4.76***	4.87***	1.063	0.950
ER	4.38***	4.40***	0.871	0.817
SR	4.35**	4.23*	0.985	0.847
OC	4.33***	4.30***	0.818	0.668
HC	4.20**	4.23***	0.730	0.609
RC	4.16*	4.15*	0.688	0.601
IC	4.07	4.13	0.813	0.785

Notes: *, ** and *** indicate a significance degree between 0.10 and 0.05, 0.05 and 0.01, and 0.01 and 0, respectively, The single sample *t*-test was performed against a reference value of 4, which is associated with the indifference level in the scale

Table 4.
Results of the *t*-test

Item	Factor loading		Communality		Eigen value		% of variance	
Voluntary non-financial reporting	*New client*	*Old client*	*New client*	*Old client*	*New client*	*Old client*	*New client*	*Old client*
IC	0.787	0.709	0.619	0.860	4.722	3.824	67.457	54.624
HC	0.868	0.819	0.753	0.936		1.222	12.952	17.451
RC	0.875	0.809	0.765	0.856		1.048	10.561	14.968
OC	0.876	0.844	0.767	0.784			3.986	5.889
SR	0.790	0.670	0.625	0.957			2.478	4.373
ER	0.853	0.691	0.728	0.886			1.857	1.527
IR	0.682	0.598	0.465	0.814			0.709	1.168

Research variable – voluntary non-financial reporting		
	New client	*Old client*
Cronbach's alpha	0.910	0.843
Bartlett's sphericity test	Chi2 = 344.846	Chi2 = 249.776
	p-value = 0.000***	*p*-value = 0.000***
*KMO**	0.749	0.641

Notes: *KMO is the Keiser–Meyer–Olkin measure of sampling adequacy. Reported eigenvalue is the only one that showed a value greater than 1 (Kaiser, 1960). Even though more than one factor showed an eigenvalue greater than 1, we decided to retain only one factor for voluntary non-financial reporting with regards to old clients, because Human and Relational capital reports are part of the intellectual capital statement, *, ** and *** indicate a significance degree between 0.10 and 0.05, 0.05 and 0.01, and 0.01 and 0, respectively

Table 5.
Principal component analysis

shows the results of the PCA for auditors assessing both a new and an old client's audit risk associated with the reporting of non-financial information. We also checked for the eigenvalue of each item to find out how many factors should be retained in the analysis (Hayton *et al.*, 2004). All communality values are higher than 0.5. The reliability measure satisfactorily meets the 0.7 threshold (all Cronbach's alpha values > 0.9; Nunnally and Bernstein, 1978). The KMO measure of sampling adequacy achieves satisfactory levels, as it is higher than 0.7 (Hair *et al.*, 2010) in all cases. Similarly, Bartlett's test reports a satisfactory level of goodness of fit for each variable, because the Chi-square value achieves standard levels of statistical significance (Snedecor and Cochran, 1989). Moreover, the scale reliability for each component is very good, achieving levels higher than 0.9, which could be considered ideal when making relevant decisions (Nunnally and Bernstein, 1978).

Further analysis using control variables

Table 6 presents further descriptive statistics of the research variables with respect to each control variable included. In addition, a *t*-test was performed between the most and least relevant item for each category (Beattie and Smith, 2012). According to the results, there is a statistically significant difference between the most important item (IR) and the least important one (IC), apart for some exceptions, such as for females and managers in evaluating new clients and senior managers in evaluating old clients. As for gender, the findings showed that female auditors perceive a lower difference in the relevance between IR and IC reports compared to their male counterparts.

Discussion and conclusion

Results from our analysis have uncovered a number of responses to the research questions addressed and to the hypotheses formulated in the first part of this paper regarding the relevance of voluntary non-financial reporting and the greater (reduced) impact of voluntary non-financial reporting on an auditor's perception of audit risk after an economic downturn. Overall, this study is in line with that part of the literature, which highlights the perception that voluntary non-financial information is relevant because it provides additional information to the assessment of audit risk by auditors, according to the incremental information approach (Bryan, 1997; Merkl-Davies and Brennan, 2007). Nonetheless, different voluntary non-financial reporting frameworks achieved different levels of relevance regarding audit risk assessment, with IR being the most important and intellectual capital statement the least important reporting framework as perceived by auditors. The in-depth discussion of the results of this study will be provided in the following sub-sections.

Voluntary non-financial reporting and audit risk

This study aims at understanding the perception of auditors with respect to the relevance of the reporting of voluntary non-financial information in assessing their client's audit risk. The role of corporate reporting has received increasing attention in recent years (Agyei-Mensah, 2019; Gnanaweera and Kunori, 2018; Yang *et al.*, 2018), especially after recent periods of economic downturn, such as the 2007–2008 financial and economic crisis and the COVID-19 pandemic, because it is conceived of as a key element in the reduction of information asymmetries and the prevention of corporate failures (Beattie *et al.*, 2004; Holland, 2006; Hay *et al.*, 2021; Kirkpatrick, 2009). The perception of auditors regarding the assessment of their client's risk was viewed as increasingly relevant after these crises, because one of the most important roles of auditors is to assure the truthful and fair view of corporate reporting (Mangena *et al.*, 2010; Mohliver, 2019). Recently, and more frequently after the effects of the GFC, this role has been largely questioned by scholars in this field, with an explicit assigning of blame due to the "silence" of the auditors (Sikka, 2009), which is related to the issue of unqualified audit opinions of companies that went bankrupt in the subsequent financial year. Findings from this study claim that auditors pay most attention to the disclosure of the IR regarding voluntary non-financial reporting (Dumay *et al.*, 2016) by providing the lowest information asymmetry level. This result is consistent with prior research arguing that the role of the auditor needs to adapt to the dynamic context and the speed of information (Knechel, 2021). Hence, the results of this study are in line with previous studies that provide evidence that assurance positively affects the credibility of voluntary non-financial information as perceived by capital providers (Quick and Inwinkl, 2020). Moreover, this might be related to the need to appreciate the impact of non-financial information on financial information and vice versa, as witnessed by the international trend related to the integration of both financial and non-financial disclosure in a single report

Variable	New clients		Old clients			New clients		Old clients				
	Mean - Male (Obs 46)	Mean - Female (Obs 8)	Mean - Male (Obs 46)	Mean - Female (Obs 8)	Mean - Male (Obs 46)	Mean - Female (Obs 8)	Mean - Tenure less than 15 years (Obs 22)	Mean - Tenure more than 15 years (Obs 33)	Mean - Tenure less than 15 years (Obs 22)	Mean - Tenure more than 15 years (Obs 33)	Mean - Tenure less than 15 years (Obs 22)	Mean - Tenure more than 15 years (Obs 33)
IC	4.054348 (–)	4.375 (–)	4.0217 (–)	4.375 (–)	4.0909 (–)	4.375 (–)	3.9773 (–)		4.04 (–)	4.1 (–)	4.0417 (–)	
HC		4.375 (–)		4.375 (–)		4.375 (–)						
RC		4.375 (–)		4.375 (–)		4.375 (–)		4.1515 (–)				4.1724 (–)
OC		4.375 (–)		4.375 (–)		4.375 (–)						
SR						4.375 (–)						
ER												
IR	4.8261 (+)	4.8125 (+)	4.7609 (+)	4.8571 (+)	4.9068 (+)	4.75 (+)	4.7727 (+)	4.8333 (+)	4.7917 (+)	4.7333 (+)	4.875 (+)	4.8571 (+)
ttest	**0.0000*** **	**0.0875***	**0.0001*** **	0.1996	**0.0001*** **	**0.0796** **	**0.0147** **	**0.0001*** **	**0.0224** **	**0.0004*** **	**0.0203** **	**0.0000*** **
						New clients				Old clients		
Variable	Mean - Equity partners (Obs 18)	Mean - Partners (Obs 22)	Mean - Senior managers (Obs 4)	Mean - Managers (Obs 11)	Mean - Equity Partners (Obs 18)	Mean - Partners (Obs 22)	Mean - Senior managers (Obs 4)	Mean - Managers (Obs 11)	Mean - Equity partners (Obs 18)	Mean - Partners (Obs 22)	Mean - Senior managers (Obs 4)	Mean - Managers (Obs 11)
IC		4 (–)	3.875 (–)	3.9545 (–)		3.9091 (–)	3.75	4.0909 (–)		4.1 (–)	4 (–)	3.8182 (–)
HC			3.875 (–)				3.75				4 (–)	
RC	4.25 (–)		3.875 (–)		4.2778 (–)		3.75		4.2222 (–)	4.1 (–)	4 (–)	
OC			3.875 (–)				3.75		4.2222 (–)		4 (–)	

(*continued*)

Table 6.
Descriptive statistics by control variables

Table 6.

	New clients		Old clients			New clients		Old clients				
Variable	Mean - Male (Obs 46)	Mean - Female (Obs 8)	Mean - Male (Obs 46)	Mean - Female (Obs 8)	Mean - Male (Obs 46)	Mean - Female (Obs 8)	Mean - Tenure less than 15 years (Obs 22)	Mean - Tenure more than 15 years (Obs 33)	Mean - Tenure less than 15 years (Obs 22)	Mean - Tenure more than 15 years (Obs 33)	Mean - Tenure less than 15 years (Obs 22)	Mean - Tenure more than 15 years (Obs 33)
SR			3.875 (–)				3.75				4 (–)	
ER			3.875 (–)				3.75				4 (–)	
IR	5.1111 (+)	4.5682 (+)	4 (+)	5.0909 (+)	5.1667 (+)	4.4286 (+)	3.75	5.0909 (+)	5.1176 (+)	4.65 (+)	4.25 (+)	5.0909 (+)
ttest	**0.0003*****	**0.0029****	0.3910	**0.0666***	**0.0006*****	**0.0123****	N.A.	0.1023	**0.0003*****	**0.0302****	0.3910	**0.0455****

Notes: In bold, statistically significant values. Only variables with the highest and the lowest mean values are represented in the table, *, ** and *** indicate a significance degree between 0.10 and 0.05, 0.05 and 0.01, and 0.01 and 0, respectively

(CSRD, 2021; ISSB, 2022). Moreover, this could be justified by the ability of the IR to capture a wider spectrum of information compared to the IC statement (de Villiers and Sharma, 2020). Surprisingly, some of the most investigated voluntary non-financial reports, such as CSR and sustainability reports, have been receiving less attention from auditors than other types of reports. This might be because voluntary non-financial reporting is rarely audited (Caglio *et al.*, 2020; Dumay *et al.*, 2016; Pagani *et al.*, 2021), and hence outside the scope of the auditors' responsibilities. Thus, auditors either rely on mandatory non-financial reporting only or have to provide greater effort in checking for the relevance and reliability of voluntary non-financial reporting (KPMG, 2013; Escrig-Olmedo *et al.*, 2019). This second option is consistent with the incremental information approach, which states that stakeholders benefit from the additional disclosure issued by companies if their quality is ensured and, thus, it could better to support their decision-making process (Bryan, 1997; Merkl-Davies and Brennan, 2007). Voluntary information does indeed reduce information asymmetry and thus the information risk of a company (Beattie *et al.*, 2004; Holland, 2006) or frauds (Zhanxia *et al.*, 2011). In addition, findings reveal that female auditors perceive a reduced gap in the relevance of IR and IC reports compared to their counterparts. According to prior studies, this result could be due to the auditor partner's personal features (Bozzolan and Miihkinen, 2021). Therefore, we contribute to the literature on the role of non-financial reporting in the auditing activity by providing evidence concerning the auditors' perception of what is relevant to them when assessing their client's audit risk in a post-crisis period (Cao *et al.*, 2015; Sikka, 2009). The results from this study could be used in a mandatory regime where non-financial information is required by law or regulations. Empirical findings contribute, in fact, to the relative significance of voluntary information provided in different non-financial reports (de Villiers and Sharma, 2020) by showing which report and related sustainability performance is perceived as more informative by auditors to reduce the overall audit risk of the company.

Role of voluntary non-financial reporting in the assessment of new versus old client risk after a period of economic downturn

The findings show that after a period of economic downturn there is a difference in the mean values between new and old clients for each investigated variable. Nonetheless, this difference is negligible and non-significant for each investigated typology of non-financial report, which is not consistent with prior studies suggesting that assessing audit risk for new clients is more difficult and time consuming (Johnston *et al.*, 2000; Johnstone and Bedard, 2003). However, this might be because performing the auditing activity during periods of crisis is more difficult since the reconstruction of audit evidence is generally more difficult, regardless of the availability of prior knowledge of the client (Hay *et al.*, 2021, p. 179). Hence, more research on this relationship in periods of economic crisis is needed to address whether there are determinants, and which ones are more likely to affect the difference between the assessment of old and new client audit risk (Bozzolan and Miihkinen, 2021). Moreover, regarding the perceived (ir)relevance of non-financial reports related to either new or old clients, Sustainability Reporting and the Organizational and Relational Capital report achieved higher mean values for new as opposed to old clients with regard to auditors' perceived relevance after the crisis. This could be even more relevant during a very uncertain period such as the COVID-19 or post-COVID period (Albitar *et al.*, 2020), which is in line with prior research showing that specific reporting forms are more relevant in assessing a new client's audit risk (Chen *et al.*, 2012; Demartini and Trucco, 2016; Bozzolan and Miihkinen, 2021). It is also in line with the literature stream according to which the relevance of intangibles is supported even during an economic shock (Raithel *et al.*, 2010; Rodrigues *et al.*, 2017).

Managerial and methodological implications

Managers and practitioners can benefit from this study in several ways. Auditors can identify opportunities to adapt their assessment model to include voluntary non-financial report information. Moreover, they can use different assessment models regarding the research variables in the case of new and old clients. Managers and executives can make decisions regarding investments in voluntary non-financial reporting to (a) reduce information asymmetry with the company's stakeholders and (b) reduce their audit risk, which is also related to the cost of mandatory auditing (Chen *et al.*, 2012; Simunic, 1980; Bozzolan and Miihkinen, 2021). Furthermore, given that the number of companies voluntarily disclosing non-financial information is growing and that those companies mandated to produce non-financial reports are disclosing more information than required (Rossi and Harjoto, 2020; Assidi, 2020), managers could more effectively select their voluntary non-financial information even under a mandatory regime where non-financial information is required by law or regulations (de Villiers and Sharma, 2020) by using discretion to expand the boundaries of the non-financial reporting types which are more likely to mitigate the audit risk.

From a methodological standpoint, we have contributed to the literature by replicating a methodology adopted in the previous literature (Beattie and Smith, 2012) to allow us to also assess the validity of this approach in our analysis.

Further research and limitations

Results from our analysis open the way to further research in this field. The results presented in this paper refer to a sample of auditors operating in both Big4 and non-Big4 firms. Thus, more research could be addressed in investigating the differences between the two. Moreover, preliminary findings from this paper come from a single country, which is based on civil law legislation. Prior studies have addressed differences in terms of audit risk assessment and reporting practices when considering civil law and common law countries (Bozzolan *et al.*, 2003). Therefore, further research should deal with comparative studies on this topic.

In line with previous empirical studies, this paper is not without its limitations, which opens avenues for further research. Firstly, because it is a preliminary investigation, the findings cannot be generalized, instead requiring further investigation. Secondly, because only a selected list of categories of non-financial information has been retained in the measurement of audit risk, we encourage the consideration of additional items in future studies, which could also look at the separate effect of the client's risk disclosure on the auditor's risk assessment (Bozzolan and Miihkinen, 2021). Finally, our study is a preliminary step to a further investigation of this topic. Indeed, even if the number of observations analysed here is consistent with prior studies in the accounting literature adopting survey research method (Bisbe and Otley, 2004), and our statistical method is in line with a small sample size (Jung and Marron, 2009), further research could be conducted on larger samples and in a mandatory context.

Moreover, another limitation of this study could be represented by possible different interpretations of the definitions of the non-financial items included in the analysis. To mitigate this risk, a description of the different items tested has been provided as part of the introduction of the survey. However, their understanding could be subject to the interpretation of respondents. As argued above, indeed, there is not a uniform method of measurement of non-financial information in the company, nor a single and uniform document in which their value could be disclosed (Striukova *et al.*, 2008; Unerman, 2000). Despite there may be overlapping items, excluding them might result in capturing an incomplete picture. For this reason, a comprehensive list of non-financial elements has been considered for this study.

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Appendix 1

Survey

Introduction

The first part of the surveycontains questions about the changes in the perception of the relevance of non-financial disclosure for the audit risk estimation after the economic and financial crisis of 2008, differentiated between old and new clients, while the second part of the questionnaire asks some demographic information to determine the profile of the interviewee.

The answers you provide will be used in a strictly anonymous and confidential manner.

To achieve the cognitive goals of the research, it is critical to respond to all questions, unless otherwise specified.

Compiling notes

- There are no right or wrong answers to the questionnaire.
- Please answer all questions by circling the answer choice.
- Please read the definitions marked before answering the questions.
- Any feedback is appreciated. You can write them in the appropriate spaces, the last page of the questionnaire or on a sheet to be included in the questionnaire.

Before you start answering the questions, it is important to respond personally to the questionnaire, expressing ***your*** assessments based on ***your*** experiences.

Part I: non-financial elements for audit risk estimation.

The **intellectual capital** measures intangible assets of a company under three profiles: human capital, relational capital and organizational capital.

Human capital measures the performance related to skills, abilities and training of company employees.

Relational capital measures the company's ability to establish relationships with important stakeholders.

Organizational capital measures the performance related to effectiveness of the organizational structure and of the business processes.

The **sustainability (or social) report** measures the performance related to the social activities carried out by the company.

The **environmental report** measures the environmental impact of production processes and activities aimed at promoting sustainability of the company.

The **integrated reporting** is the set of accounting and non-accounting documents aimed at measuring the company's economic, social and environmental performance

- In the evaluation of the audit risk for *new clients* (listed firms), which factors do you think have more/less relevance after the global financial crisis? (1 less relevance; [. . .]; 7 more relevance)

	Less relevance		Equal relevance			More relevance	
Voluntary disclosure							
Intellectual capital report	1	2	3	4	5	6	7
Human capital report	1	2	3	4	5	6	7
Relational capital report	1	2	3	4	5	6	7
Organizational capital report	1	2	3	4	5	6	7
Sustainability report	1	2	3	4	5	6	7
Environmental report	1	2	3	4	5	6	7
Integrated report	1	2	3	4	5	6	7

- In the evaluation of the audit risk for *old clients* (listed firms), which factors do you think have more/less relevance in the last three years? (1 less relevance; [. . .]; 7 more relevance)

	Less relevance		Equal relevance			More relevance	
Voluntary disclosure							
Intellectual capital report	1	2	3	4	5	6	7
Human capital report	1	2	3	4	5	6	7
Relational capital report	1	2	3	4	5	6	7
Organizational capital report	1	2	3	4	5	6	7
Sustainability report	1	2	3	4	5	6	7
Environmental report	1	2	3	4	5	6	7
Integrated report	1	2	3	4	5	6	7

Part II: **Respondent information**

Gender:

- Woman
- Man

How long have you been working for the same audit firm?

. . .. (Years). . .. . (Months)

What is your actual position in the audit firm?

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