OmniaScience

Intangible Capital

IC, 2022 – 18(2): 195-218 – Online ISSN: 1697-9818 – Print ISSN: 2014-3214

https://doi.org/10.3926/ic.1756

Transparency in the transparency reports: Empirical evidence from Portugal

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Received March, 2021

Accepted February, 2022

Abstract

Purpose: The purpose of this research is to analyze the degree of transparency reports (TR) transparency and its relation with the audit firm size, fees, either from audit services, or from other services, and with the human capital.

Design/methodology: In this study we considered 282 audit firms, and our final sample includes 268 transparency reports from 2013 through 2017. For the period under analysis, audit firms financial information, human resources information and TR were collected. TR report information was divided in four types of information: Mandatory Information I, Mandatory Information II, Voluntary Information and Extra Information. These indexes measure the fulfillment of each information on the total of information considered in each index. Non-parametric tests were applied to analyze the behavior of each index for the different years, whereas the Generalized Linear Models were performed to study the impact of various factors on each disclosure index.

Findings: Our results show a high level of transparency regarding Mandatory Information I, but a lower accomplishment regarding all other information. In general, the auditor experience, the number of auditors, the number of clients that are public-interest entities (PIE) and the percentage of extra audit services have a significant impact on the information disclosed in the TR.

Originality/value: Our paper contributes to the current literature by assessing the influence that human capital has on the information disclosed in the transparency reports, also it covers a 5-year period and the compliance with the new disclosures added by Regulation No. 537/2014.

Keywords: Transparency reports, Auditing, Human Capital, Quality, Audit fees

Jel Codes: M42

To cite this article:

Almeida, B., Viseu, C.M., & Silva, A.F. (2022). Transparency in the transparency reports: Empirical evidence from Portugal. *Intangible Capital,* 18(2), 195-218. https://doi.org/10.3926/ic.1756

1. Introduction

The financial scandals that occurred in Europe since 2008 (Barclays, Fortis, Hypo Real Estate, ING, Loyds TSB, Royal Bank of Scotland, etc.) have again undermined confidence in capital markets and reinforced the role of

auditing as an important contribution to ensure financial statements reliability, as well as reinforcing its role within stakeholders. Auditing, together with audit supervision and corporate governance, must contribute to financial stability, assuring the real financial health of companies. An increase in the transparency of the audit firms can contribute to better governance practices, since it allows the performance evaluation of audit firms, comparing each other and, consequently, increasing audit quality. An increase in the information reported by audit firms makes it possible to improve these firms management assessment (Patel and Dallas, 2002).

The existence of the transparency reports (TR)aims to ensure that audit firms have a certain degree of internal accountability and helps to inform the market about audit firms and audit quality, since in these reports several information regarding audit firms legal structure and ownership, education and independence practices, internal quality control system, firm revenue information regarding public interest entity (PIE) and others clients, partner remuneration and lists of PIE audit clients is disclosed.

In fact, in 2011, the Consultative Committee of Accountancy Bodies (CCAB) considers that there are certain sections of the TR that are of particular interest to audit committees and investors, such as the internal control system quality and the audit employees training hours. Audit firms can be differentiated based on service and employees' qualities, and the TR can be used as a way to demonstrate how quality was achieved in these two areas (CCAB, 2011).

The main reason why audit firms are required to issue the TR is related to the fact that more transparent audit firms reveal the quality of the audits performed, as well as to allow the differentiation between the different audit firms (Wyman, 2004; Deumes, Schelleman, Bauwhede & Vanstraelen, 2012). Audit quality can be seen in several ways. DeAngelo (1981a) defines audit quality as the joint probability that an auditor will detect material misstatements in the financial statements and communicate them to the financial statements users. For Palmrose (1988) audit quality is seen as the probability that the financial statements are free from material misstatements. For Francis (2004), audit quality is related to the compliance with legal and professional standards that govern the audit profession.

The International Organization of Securities Commissions (IOSCO, 2009) states that audit firms governance is of great importance in audit quality and that the transparency of audit firms can lead to their differentiation by clients, which, in turn, results in an increase of the audit quality. Undoubtedly, the TR can help financial statements users to form an opinion regarding the audit firm quality, as long as information related to the audit firms governance structure, professional practices and supervisory bodies reports on the work quality of audit firms, are disclosed (Vanstraelen, Schelleman, Neuwissen & Hofmann, 2012).

In an international level, TR disclosure is mandatory in some countries. The European Union, Directive 2006/43/EC of 17 May 2006 (EU, 2006), forces audit firms, since 2008, that have PIE as clients, to publish on their website, within three months of the end of each financial year, an annual TR that shall include the information mention in article 40º of the mention Directive). According to the Directive (Article 2, nº 13), the following entities are considered to be PIE: (i) entities governed by the law of a Member State whose transferable securities are admitted to trading on a regulated market of any Member State; (ii) credit institutions; (iii) and insurance companies. These three types of entities are compulsorily considered as PIE by all Member States, however individual Member States may also consider other entities as being PIE, such as the entities that have a significant public impact due to the type of activities, their size or the number of workers.

This Directive was adopted by Portugal throughout the Decree-Law No. 224/2008 of 20 November, which amends the Legal Regime of the Portuguese Statutory Auditors and Decree-Law No. 225/2008 of 20 November, which creates and approves the statutes of the National Audit Supervision Commission. Among other information this Decree-Law lists the Portuguese PIE, that along with the three mandatory entities mentioned in Directive 2006/43/EC of 17 May 2006 (EU, 2006), also considered 9 other types of entities as PIE (investment companies, collective investment entities under contractual and corporate form, venture capital companies, venture capital investment companies and venture capital funds, specialized alternative investment companies and specialized alternative investment funds, credit securitization companies and credit securitization funds, holding companies, when the shares held, directly or indirectly, grant them the majority of voting rights in

credit institutions, holding companies in the insurance sector and mixed insurance holding companies, pension funds and public companies which, for two consecutive years, have a sales of more than 50.000.000 euros, or a total net assets of more than 300.000.000 euros), and transcribes *ipsisverbis* the mandatory information referred in the Directive 2006/43 /EC of 17 May, 2006 (EU, 2006).

As a result of the financial crisis of 2008, the EU approved the Directive 2014/56/EU of 16 April 2014 (EU, 2014a) on statutory audits of annual and consolidated accounts and of the Regulation 537/2014 (EU, 2014b) of 16 April, on the specific requirements for statutory audit of PIE. The deadline for publishing the TR is four months after the end of each financial year and the information must remain available, on the website of the statutory auditor or auditors, for at least 5 years from the date of publication. Regarding the content of the TR, the regulation states that in addition to the information indicated in the Directive 2006/43/EC of 17 of May 2006, information regarding audit firm revenues, from audit services and authorized non-audit services provided to PIE, should be added as well as information regarding partner rotation policies. The Directive and the Regulation were adopted by the Portuguese legal system by Law No 140/2015 of 7 September, which approves the new Legal Regime of the Portuguese Statutory Auditors and by Law No. 148/2015 of 9 September that approves the Legal Regime of Audit Supervision.

In Japan, the CPA Act and related regulations introduced the obligation for audit firms to publish TR (IOSCO, 2009). In Canada, audit firms are required to disclose to the Canadian Public Accountability Board internal quality reports, as well as to publicly disclose information related to the number of offices and which partners have representation powers (IOSCO, 2009). In Australia, all audit firms are required to publicly disclose a TR when they audit ten or more of the following entities: listed companies, financial institutions, collective investments, or any other organizations defined by law (Fu, Carson & Simnett, 2015). In the United States of America, since 2017, audit firms are required to report to the Public Company Accounting Oversight Board (PCAOB) which partners are responsible for the audit report, as well as information regarding joint audits. This information is available in a database accessible to users of financial information (PCAOB, 2016).

TR literature is rather limited. Previous TR literature related disclosures to countries, number of audit clients (Pheijffer, 2010), audit fees charged to listed companies (Pivac & Cular, 2012), cross country variations (Deumes et al., 2012), investor confidence in TR (La Rosa, Bernini & Caserio, 2018) compliance with EU Directives (Zorio-Grima, García-Benau, Grau-Grau & Pajera-Ojeda, 2017), variations between big-4 audit firms (Girdhar & Klarskov Jeppesen, 2018), and if Big-4 audit firms use TR as a tool to standardize their brand image or whether the semantic and content analysis varies from country to country (Zorio-Grima & Carmona, 2019).

The purpose of this research is to analyze the degree of TR transparency and its relation with the audit firm size, the fees, either from audit services, or from other services, and with the human capital. To this end, we will analyze TR from 2013 to 2017, covering two periods: 2013-2015 and 2016-2017, that is, before and after the approval of Regulation No. 537/2014 (EU, 2014b), of 16 April, as well as whether the disclosures comply with the established legal requirements and if additional information is disclosed.

Our study contributes to the existing literature as follows: first, it extends the current literature on audit firms transparency (Pivac & Cular, 2012; Zorio-Grima et al., 2017); second, our study covers a long period of time, 5 years, the compliance with the new disclosures added by Regulation No. 537/2014 (EU, 2014b) is analyzed, our sample involves about 60 audit companies, about 920 PIE and 268 TR and for the first time the transparency degree is related to human capital. The study contributes to several stakeholders. For the regulators, our empirical study provides evidence regarding the audit firms transparency degree, and to the financial statements users who see transparency degree as a variable in the auditor's selection.

2. Theory and literature review

The theoretical basis for supporting our study is based on the agency theory and on the theoretical model of sociological analysis (meso theory of management). Berle and Means (1932), Ross (1973), Jensen and Meckling (1976) highlighted the divorce between ownership and control, a situation that generated the agency theory problem. One of the main assumptions of this theory focuses on the conflict between the principal and the

agent. In effect, in financial theory it is assumed that the shareholders' goals are to maximize wealth in the long term, and that the agents, in turn, show a tendency to maximize their interests, assuming selfish behavior. The search for audits with greater quality can be explained by the asymmetry of information that exists between the managers and the financial statements users. Thus, the managers are interested in assuring the shareholders that the resources at their disposal are being properly managed, that is, according to the shareholders' interests and not according to management interests. As a consequence, they hire an independent third party to assure the proper resources management. The greater the agency conflicts, the greater the demand for a quality audit. Most studies focus on the demand for a higher quality audit on the auditor's characteristics, size and specialization. The information that auditors decide to disclose in TR may contribute to asymmetry information between auditors and principals, since that information may influence investors' confidence and have an impact in market competition.

The theoretical model of sociological analysis addresses the interaction relations (micro), the relations of constitution of groups (meso) and the relations of systemic interdependence (macro). These relations can be summarized in three types: relations between individual acts, relations of coordination and relations related to the properties of the relations between people and between groups. Transposing this theory to the field of auditing, we can say that audit companies play an institutional role for the financial statements users, and in fact, their confidence in auditing varies according to the legal and institutional framework applied in each country (macro), the same occurring in the relationship between audit companies (meso) and their customers (micro) (La Rosa et al., 2018). The confidence of investors depends on the legal and institutional environment of each country, as well as on the audit firms through the TR.

A distinguishing feature of auditors is related to their responsibility to third parties. Thus, unlike other professions whose responsibility is only to the client, auditors have a responsibility to the general public. This responsibility stems from the fact that the auditor's work is designed to serve a wide range of stakeholders. When carrying out their work, auditors face pressure from the management, investors, financial statements users, regulators and other third parties, who often do not have aligned interests, and the auditor must pay attention to all these stakeholders when is doing its work (Johnstone, Sutton & Warfield, 2001). Thus, social controls are established between the various actors in the financial reporting process, which can range from the simplest controls, such as the ones that influence audit behavior, to the more complex ones, such as ethical standards, auditing standards and legal framework issued by government agencies in order to protect audit quality (Almer, Higgs & Hooks, 2005). Audit companies relations with their clients have also been studied by several authors, Fontaine and Pilote (2012) found that clients expect auditors to provide more services beyond the regular audit services, and that audit clients prefer a relational approach with their auditors instead of a transactional approach, for Beattie, Fearnley and Brandt (2000), audit value is measured by the value-added services above and beyond the basic audit requirements.

According to Deumes et al. (2012) an increase in the audit companies transparency, focusing on aspects regarding audit firm governance and procedures, should allow market participants to differentiate the audit firms and, as consequence, provide incentives for the audit firms to increase audit quality.

The analysis of European Union TR is a subject that has not yet deserved a profound study; in fact Maijoor and Vanstraelen (2012) choose transparency as one of the areas of audit research, in particular addressing how transparency reports inform about audit quality, by analyzing their disclosures.

One of the first TR studies was conducted by Pott, Mock and Watrin (2008), inquiring accounting and auditing professionals about the publication of TR. Respondents were asked whether the content of the TR should necessarily include aspects that focused on the policies and procedures implemented by audit firms related to independence. They responded that a mandatory, or voluntary, TR would have no relevance to the auditor's independence, since they considered that the TR did not provide important information. Regarding the content of the TR, the respondents considered that the most important information would be related to the independence of the company, its internal control and the result of quality controls inspections.

Petersen and Zwirner (2009) and Pheijffer (2010) examined the extent of disclosures in TR, based on the countries where they are published and on the number of audit clients that are PIE. The first author's findings show that the extent of disclosures of German audit firms varies from firm to firm and is positively correlated with a proxy for audit. The second author found that only the minimum legal disclosures requirements are met by Netherlanders Big 4 audit firms.

In Croatia, Pivac and Cular (2012) studied the TR of the audit firms that the audit companies listed in the Zagreb Stock Exchange (ZSE). They concluded that there is no correlation between the audit fees and the audit firm's transparency. The transparency is measured by an index, called IQRT (quality index of transparency report of audit firms), developed by the authors, and is considered to be low. In effect, the authors consider that the Croatian TR are not in accordance to EU legislation. Cular (2017) studied the TR contents of audit firms in Croatia, and found out that only 32% are considered to be transparent.

Zorio-Grima et al. (2017) analyzed the TR published in Spain in 2010 and 2013. The results show that they have a strong compliance regarding mandatory information. Nevertheless, information regarding voluntary disclosures is substantially fewer. The biggest audit firms and the ones that are less dependent on non-audit services are the ones that present a higher level of transparency.

In the UK, the Financial Reporting Council, in 2015, emphasizes that the TR quality, in audit firms that audit PIEs, has been increasing since 2010. However, there are some disclosures that need to be improved, such as: the international networks and the effective measures that were taken to access the audit firm's internal control. They also suggest that the TR content should also include the results of external investigations made to the audit firm, the reports regarding audit quality and the investment made in employees.

Deumes et al. (2012) analyzed the TR of United Kingdom, Austria, Germany and Holland audit firms, trying to accomplish a relation between audit quality and the information that is disclosed in the TR. They found no relation between the audit quality and TR disclosures but there is a weak association between an audit firm's statement on the effectiveness of its internal quality control system and actual audit quality.

In Australia, Fu et al. (2015) and King (2016) examined the TR of audit firms. The first authors studied 21 audit firms TR and concluded that the information reported is diversified. This means that despite mandatory information is reported in all TR examined, the detail of that information may influence audit quality. The areas where the information is more diversified are: internal control system, independence disclosures, continuous training of partners and employees, and partners' remuneration. The second author compared 2014 TR with 2015 TR, assessing the measures that Australian audit firms adopted to increase audit quality. He concluded that despite audit firms comply with the mandatory information that must be disclosed in the TR, only the larger firms provide information beyond the minimum required. They describe those actions taken to assure audit quality, the internal indicators that assure that quality and the internal and external control conclusions. It was also found that the length of the TR decreased one year to the next, and this may indicate that some audit firms are somewhat reluctant to provide information beyond the minimum required.

Girdhar (2015) examined the Big-4 TR in Germany, Denmark, and the United Kingdom to determine what influences the TR content within the Big-4 network. The study reveals that the content of the TR is influenced by the legal and institutional environment of the country where the audit firms operate. Thus, UK regulators encourage the audit firms to disclose more information than the legally minimum required. In countries such as Germany and Denmark, transparency is seen only as meeting the minimum disclosure requirements.

Research hypotheses

According to international studies, the audit firms' size can be considered as an audit quality indicator. DeAngelo (1981a), Francis and Yu (2009), Reynolds and Francis (2000), demonstrate the Big-4 audit firms provide audit services with more quality than those provided by other audit firms, since for Big-4 audit firms the loss of a client has a reduced impact on the total income and the reputation issue has a greater weight for these big firms. Choi, Kim, Kim and Zang (2010), refer that the emphasis that the Big-4 place on staff training, on internal

control quality, on standardization of audit procedures and techniques and on the transfer of knowledge within the audit firm allows them to present services with higher quality.

Audit quality can be measured in two ways: through output measures (material misstatements, auditor's communication, financial reporting quality, financial statements, users' perceptions), or by input measures (firm size, specialization, audit fees, changes in audit fees) (Defond & Zhang, 2014).

Audit firms size has been a wide field of study, deserving special care by the regulators. Indeed, the regulators are concerned that an excessive audit market concentration could lead to losses in competitiveness and consequently in quality (GAO, 2008; UE, 2010). On the other hand, the audit market concentration can also lead to an increase in audit quality, as threats due to client's importance decrease, since they have fewer choices to shop for an opinion (Newton, Whang & Wilkins, 2013; Kallapur, Sankaraguruswamy & Zang, 2010). In Portugal, the PIE audit market is strongly concentrated in the Big-4 (Almeida & Silva, 2015).

Thus we formulated the following hypothesis:

H1: There is a significant positive relationship between audit firm size and TR transparency indexes.

In recent years, we have seen an increasing concern from the regulators with the impact that extra-audit services (EAS) can have on the auditor's independence and, consequently, on audit quality (Levitt, 1998; SEC, 2000; EU, 2010). DeFond, Raghunandan, and Subramanyam (2002) and Craswell (1999) argue that the auditor's independence can be compromised, if EAS have a significant weight in the total fees charged to the audit client.

Regulation No. 537/2014 (EU, 2014b)), of April 16, approved a blacklist of EAS that cannot be provided by auditors to PIE clients, as well as imposed limits on EAS that can be provided to these clients. Thus, paragraph 2 of article 4 refers that EAS fees cannot exceed 70% of the average fee paid regarding audit services for the last three consecutive years, and paragraph 3 of article 4, mentions that we may be facing an independence threat when the PIE fees are greater than 15% of the total fees received by the auditors in that year. However, the 70% ratio has not been contrasted empirically. Turley, Islam and Siddiqui (2011) only establish a relationship between a low-quality audit and the EAS for ratios between 150% and 200%.

These measures were adopted by Portuguese legislation through Law No. 140/2015, of 7 September. Article 77, in addition to listing EAS blacklist, states that if the fees received from a PIE client represented more than 15% of the total of the audit firms revenues, the auditor may be facing a threat of independence, as well as it imposes a restriction on EAS that can be provided to PIE. Thus, these services cannot exceed 30% of all the fees received from that client in the previous three years.

The relationship between EAS and audit quality has been subject of study by the academic community, which seeks to assess whether there is any relationship between auditor's independence and the EAS (DeAngelo, 1981b; Antle, 1984; Simunic, 1984; Acemoglu & Gietzmann, 1997), however, the conclusions are not consensual. Wines (1994), argues that too much dependence on EAS weakens the auditor's independence, this researcher found that there is a relationship between EAS and auditor's opinion. Basioudis, Papakonstantinou and Geiger (2008) work showed that, in the United Kingdom, companies that pay more for EAS are less likely to face going concern opinions. Chukwunedu and Okafor (2014), Joshi, Bremser, Hemalatha and Al-Mudhaki (2007) and Causholli, Chambers and Payne (2015) have reached the conclusion that the auditors independence is impaired when he provides EAS. Khasharmeh and Desoky (2018) questioned Bahrain auditors, accountants, and chief financial officers about whether the provision of EAS affects the auditor's independence and audit quality. The results support that both are affected by EAS. Patrick, Vitalis and Mdoom (2017) analyzed the relationship between the auditors' independence and audit quality, and reached the conclusion that there is a strong relationship between both, that is, that auditors lack of independence negatively influences audit quality. However, several academic studies point out that there is no relationship between the EAS and the auditors' independence (Sucher & Bychkova, 2001; Quick & Warming-Rasmussen, 2005; Zhang, Hay & Holm, 2016). Sobrinho and Bortolon (2016) show that the provision of EAS does not affect the auditors' independence, however, they emphasize that economic dependence may be more relevant thanEAS regarding auditors'

independence. Carmona, Momparler and Lassala (2015) researched whether the provision of EAS decreases the audit quality, concluding that a high amount of EAS does not necessarily imply a decrease in audit quality. Lim and Tam (2008) concluded that there is evidence that the auditors' specialization allows them to retain independence when EAS are provided. The following hypothesis is formulated:

H2: There is a significant positive relationship between EAS and TR transparency indexes.

Human capital is considered a key driver of audit firm in our-knowledge based society Pennings, Lee & Van Witteloostuijn, 1998). It refers to the level of expertise and experience of firm's employees (Blair & Kochan, 2000). Human capital can be assessed in several ways: experience, qualifications, and number of workers, among others. Academic studies on the effect of human capital in audit quality are still incipient, especially due to the difficulty in collecting data. Fernandez, Gisbert and Salazar (2013) study concluded that audit quality is significantly affected by the audit team technical abilities and by interpersonal relationships between the audit team. Bonner (1990) states that the experience can be measured by several factors: experience related to the client, experience related with the number of years in service, experience related to the industry or experience related to a specific task. He concluded that in risk assessment, the auditor's experience in performing specific tasks has a positive effect on his performance.

The few studies carried out in this area reveal some contradictory results. In fact, Bonner and Lewis (1990) suggest that the experience measured by the number of years in service does not have a positive influence on the auditor's knowledge, because it does not take into account the nature and the number of tasks performed, nor whether the past experiences can be used in current tasks. Libby and Frederick (1990) find evidence that experience increases the auditor's knowledge, namely in matters related to the detection of misstatements in the financial statements. Qualifications, continuing training and fieldwork experience also have a positive effect on audit quality (Gul, Wu & Yang, 2013; Chen, Li & Chen, 2009). Tan (1999) and Abdolmohammadi and Shanteau (1992) consider that the personal skills and technical knowledge are essential for the development of the audit profession and that these are strengthened as the auditor progresses in his career. An increase in experience, technical knowledge and specialization contributes to better work quality (Craswell, Francis & Taylor, 1995). Considering these possibilities, we propose the following hypothesis:

H3: There is a significant positive relationship between human capital and TR transparency indexes.

3. Methodology

Construction of indexes

Following Zorio-Grima et al. (2017) methodology, we distinguished between four types of disclosures that TR may include: mandatory information I, mandatory information II, voluntary information and extra information.

Since the period under analysis, from 2013 to 2017, involves several legislations, we have considered two distinctive periods related to the mandatory information I. In the first period, from 2013 to 2015, the Decree-Law nº 224/2008, of 20 November, that issued in order to address the Directive 2006/43/EC of the European Parliament and of the Council of 17 May 2006 was in force, while from 2016 to 2017 the Decree-Law nº 148/2015, of 9 September, that implemented the Directive 2014/56/EC of the European Parliament and of the Council of 16 April 2014 was applied. There are no differences between mandatory TR disclosures in both Decree-Laws.

From 2016, with the transposition of Regulation 537/2014 (EU, 2014b), of 16 April, through Law No 148/2015 of 9 September, more information is obliged to be disclosed beside the one mention in "Mandatory Information I". This new information regards financial information and partner rotation policies as well as an obligation of maintaining for 5 years the TR available on the website. We call these new disclosures"mandatory information II".

IOSCO (2009) analyzed the information that should be disclosed in the TR, having divided this information into input and output. The input information is related with: i) Experience, competency and technical resources

(average training hours, percentage of the revenues that are spent on training of employees, employees turnover ratio, average years of service, employees experience and academic degrees and partners/employees ratio). The disclosure of this information would allow evaluating the importance that audit firm gives to knowledge, technical skills and academic education of the employees, and the ability to supervise the employees. ii) Workload (employees workload and partners workload). The release of this information would allow to access if the workload of the employees is managed to increase audit quality.

The output information covers the following disclosures: i) Independence matters (information related to audit firms independence breach). This information can be used by financial statements users to access the quality and the capacity of the services provided; ii) Disciplinary proceedings and litigation (information about pending disciplinary proceedings and lawsuits that have been moved against the audit firm). This information can be used to identify weakness in the quality of the service provided; iii) Disclosure of quality inspections results (information's regarding audit firms proceedings that must be revaluated in result of quality control inspections). This information may able financial statements users to access audit services; iv) Client acceptance and dismissal (information about new clients and client's dismissal). The disclosure of this information will allow financial statements users to know the position of the audit firm in the audit market, as well as, to evaluate if the audit firm is gaining or loosing market.

This information described and suggested by IOSCO (2009), were designated by us as "voluntary information".

The last group of information is called "extra information". As an example we suggest the disclosure of information related to compliance of the International Code of Ethics for Professional Accounts (IESBA), that sets out fundamental principles of ethics for professional accountants, reflecting the profession's recognition of its public interest responsibility, establishing the standard of behavior expected of a professional accountant, and to the International Standard on Quality Control 1 (ISQC 1), that addresses the responsibilities of an audit firm for its quality control system for audits and reviews of financial statements and for others reliability assurance work and related services, in order to assure audit quality.

Based on the compliance, or not, of each item for each information type we obtain the four variables that we intend to analyze in the Portuguese context: mandatory information index (MandInfI), mandatory information index II (MandInfII), voluntary information index (VolunInf) and extra information index (ExtInf). The four types of information, the disclosures each one covers, the European and Portuguese Law addressed to each mandatory disclosure are referred in the Appendix. In the Appendix "Mandatory information I" covers disclosures 1 to 16, "mandatory information II", is addressed in disclosures 17 to 20, "voluntary information" is referred in disclosures 21 to 26 and "extra information" is mentioned in disclosures 27 and 28.The transparency indexes are measured by verifying the compliance with the items above mentioned. Dividing the items complied in the audit report by the total number of items, regarding each type of information we obtain the transparency index, which can be defined as follows:

$$Ind_{jtk} = \frac{\sum_{i=1}^{n_k} D_{jti}}{ni_k}$$

In the following table we can analyze the legislation applicable to each time period:

Transparency Index	2013 to 2015	2016 to 2017
MandInf I	Decree-Law No 224/2008, 20 of November	Law No 140/2015, 7 of September
MandInf II		Law No 148/2015, 9 of September
VolunInf	IOSCO 2009	IOSCO 2009
ExtraInf	IESBA Code of Ethics ISQC 1	IESBA Code of Ethics ISQC 1

Table 1 – TR and Portuguese legislation

The explanatory variables

To analyze the size of the audit firms, we used the following variables: i) number of clients that are PIE; ii) Revenues (LogRevenues); ii) number of audit firm workers (Workers) and iv) the dummy variable Big4. The variable Big 4 is equal to 1 if the audit firm is one of the following: E&Y, KMPG, Deloitte or PwC and 0, otherwise.

To measure human capital, we consider the following variables: i) number of audit partners vs number of partners (% PartAud); ii) experience of the partners (Experience). The variable experience is evaluated based on the year that the partner became an auditor.

Following Ke, Lennox and Xin (2003) and Bianchi (2018) studies, we use control variables related to profitability, return on equity (ROA), measured through the net result by total assets, size (SIZE), measured by total assets. Financial health is controlled by long-term debt for total assets (LEVERAGE).

Table 2 shows the expected signs of the coefficients associated to the explanatory variables.

Explanatory Variables	Description	Expected sign
PIE	Number of Public Interest Entities	Positive
Revenues	Revenues	Positive
Workers	Number of audit firm workers	Positive
EAS	Revenues from extra-audit services to total revenues	Positive
% PartAud	Number of audit partners vs number of partners	Positive
Experience	Experience of the partners	Positive
Big-4	PwC, KPMG, E&Y and Deloitte	Positive

Table 2 – Explanatory variables and expected signs

Sample selection

Although there is no public PIE list in Portugal, nor a public list of audit firms that audit them, the fact that all Portuguese audit firms must be registered within the stock market regulator (CMVM) makes it possible to access some information regarding the audit firmsthat operate in Portugal. Among the information available on CMVM website we find the addresses of the audit firm web page.After collecting the web addresses we consulted each of them to see if TR were available or not. Thus, during the period under review, from 2013 to 2017, we obtained 268 TR. In table 2 we can see the number of auditors that audit PIE, the overall income and the number of PIE for each year of study. In our sample we included all the TR, as well as all audit firms whose TR were available on their site. Probably the entire population isn't covered, since, before 2016, there was no minimum period for the TR to remain on the website, and sometimes the audit firms do not provide the TR on their home page, which makes it difficult to find them on the website.

Year	Nº of audit firms	Nº of TR	Revenues(*)	Nº of PIE
2013	62	58	267	1,173
2014	64	60	284	1,282
2015	56	56	327	1,237
2016	53	49	300	1,072
2017	47	45	311	1,123
TOTAL	**282**	**268**	**-**	**-**

(*) in millions of euros

Table 3 – Sample data

The control variables, ROA, SIZE and LEVERAGE were obtained using Bureau van Dijk's SABI database.

Univariate and bivariate analysis

To explore each variable in the data set, the common descriptive statistics were calculated. Measures of central tendency, measures of non-central tendency, measures of variability and extremes values are essential to describe data. Bivariate statistical tests are used to compare the behavior of each disclosure index for the different years considered in this research. The disclosure index is quantitative and the independent variable can be treated as qualitative ordinal, so a possible test is the one-way analysis of variance (one-way ANOVA). If the disclosure index is approximately normally distributed for each year, the one-way ANOVA test is the most appropriate. Otherwise, it must be applied a non-parametric test, like the Kruskal-Wallis test or the Jonckheere-Terpstra test.

Multivariate analysis

In order to attain the research objectives, the Generalized Linear Models regression was applied. The choice of these models is due to the type of variables used to assess the disclosures indexes. These indexes are defined as the proportion of the number of items disclosed on the total number of possible items, that is, it can take any value between 0 and 1, not just 0 and 1. Therefore the fit of the model, concretely, the logit model is carried out using the quasi-binomial distribution.

A regression model links the mean of the dependent variable to a set of independent variables. A generalized linear model can be written as:

$$g\left(E(Y_i)\right) = \beta_1 + \beta_2 X_{2i} + \cdots + \beta_k X_{ki}, \qquad i = 1, \ldots, n,$$

where g is the link function. The choice of the link function g depends on the type of the response Y_i.

For binary responses it is considered the following link function (logit link):

$$g(x) = log\left(\frac{x}{1-x}\right).$$

Then, a regression model for the binary response Y can be written as:

$$log\left(\frac{P(Y_i = 1)}{1 - P(Y_i = 1)}\right) = \beta_1 + \beta_2 X_{2i} + \cdots + \beta_k X_{ki}, i = 1, \ldots, n,$$

which is the known logistic regression model, the most popular generalized linear model.

In this research, the logit model is carried out using the quasi-binomial distribution instead of the binomial distribution since the response ranges from 0 and 1.

The model assumes a relation between each dependent variable Y (MandInf I, MandInf II, VolunInf, ExtraInf) and the independent variables $X_2,\ldots,X_k$, through the following equation:

$$Y = \frac{1}{1 + e^{-(\beta_1 + \beta_2 X_2 + \cdots + \beta_k X_k)}} + \varepsilon,$$

Then, Y represents the different disclosures indexes and the X_k are the independent variables proposed (explanatory variables plus control variables).

In the beginning all independent variables X_k were included but after the most appropriate model was obtained, we only present the final model.

In the beginning all independent variables X_k were included in the model. However, a statistical test was applied in order to compare two nested models. For each dependent variable, only the best model is presented. For

example, the variable Big-4 is not statistically significant, for all models and all years, therefore it was omitted in the results section.

4. Results

The R software version 3.5.3 and IBM SPSS Statistics (version 27) were used to perform the statistical analysis. Table 4 reports the descriptive statistics for independent variables (include the control variables) and the dependent variables.From the 268 TR collected in the 5 years under analysis, the compliance with the MandInf I was always very high, the lowest mean was in 2014, 0.9833 and the highest was in 2017, 0.9875. The median for all the years is 1.0000 and the minimum value is 0.9375 in 2013 and 0.8750 for the remaining years. This means that from the16 items of mandatory disclosure, in 2014 at least one report only discloses 15 items and on the following years at least one report only discloses 14 items.

The average of MandInf II disclosures is below 15% in all the years, 0.0460 in 2013, 0.0500 in 2014, 0.1012 in 2015, 0.1224 in 2016 and 0.1481 in 2017. Before MandInf II became mandatory in 2016, in the previous years some reports already disclosed some part of that information. The median is 0.00 for all the years. The disclosure of VolunInf is around or less than 1% in all the years. Most reports didn't mention any voluntary information. In none of the years does any report fulfil all the requirements in voluntary information. The mean of TR that disclose ExtraInf has being rising in the period under analysis. From 0.2672 in 2013 to 0.4111 in 2017. The median has been similar in all the years exceptin 2013.

In average the number of PIE *per* audit firm raised from 20.22 in 2013 to 24.96 in 2017. In 2013 one audit firm had 394 PIE clients. The number of workers mean increased from 49.79 to 62.08 in the 5 years under analysis. The revenues *per* audit firm have been increasing, due to fewer audit firms that have PIE clients. In the period under analysis the mean increased from 4897 in 2013 to 7210 in 2017. The median of %EAS is relatively stable, we can see that some audit firms don´t present any revenues from extra audit services, while for some these revenues represent more than 70% of total revenues. The average experience mean raised from 18.09 in 2013 to 22.91 in 2017. The mean of % PartAudit ranges from 83.32 to 90.69.

Regarding control variables, ROA maximum value was reached in 2013 with 75.51 and the highest average also in 2013 with 23.86. The mean of SIZE ranged from 6.88 to 7.10 and the median from 14.81 to 14.27. LEVERAGE mean decreased from 61.80% in 2013 to 60.51% in 2017, the lowest value was in 2014, 57.25%.

2013		N	Mean	Std Deviation	Q1	Median	Q3	Min	Max
	Dependent variables								
	MandInf I	58	0.9871	0.0255	1.0000	1.0000	1.0000	0.9375	1.0000
	MandInf II	58	0.0460	0.1159	0.0000	0.0000	0.0000	0.0000	0.3333
	VolunInf	58	0.0057	0.0307	0.0000	0.0000	0.0000	0.0000	0.1667
	ExtraInf	58	0.2672	0.3137	0.0000	0.0000	0.5000	0.0000	1.0000
	Independent variables								
	PIE	58	20.22	59.99	1.00	3.00	10.00	1.00	394.00
	Workers	58	49.79	113.06	4.00	11.50	29.50	0.00	492.00
	Revenues *	58	4897.14	14778.74	426.00	738.87	1501.60	28.86	78408.00
	%EAS	58	0.10	0.15	0.00	0.05	0.16	0.00	0.72
	Experience	58	7.20	7.11	3.00	5.54	9.17	0.50	36.00
	%PartAud	58	0.91	0.14	0.81	1.00	1.00	0.50	1.00
	Control variables								
	ROA	58	23.86	22.75	5.10	14.81	36.09	1.34	75.51
	SIZE	58	7.10	1.42	6.24	6.70	7.63	5.08	10.45
	LEVERAGE	58	61.80	17.38	51.99	65.13	75.60	21.22	90.66
	* in thousands of euros								

2014		N	Mean	StdDeviation	Q1	Median	Q3	Min	Max
	Dependent variables								
	MandInf I	60	0.9833	0.0302	0.9531	1.0000	1.0000	0.8750	1.0000
	MandInf II	60	0.0500	0.1200	0.0000	0.0000	0.0000	0.0000	0.3333
	VolunInf	60	0.0083	0.0366	0.0000	0.0000	0.0000	0.0000	0.1667
	ExtraInf	60	0.3000	0.3215	0.0000	0.5000	0.5000	0.0000	1.0000
	Independent variables								
	PIE	60	21.73	60.52	1.00	3.00	11.00	1.00	385.00
	Workers	60	49.91	110.09	7.00	12.00	32.00	0.00	494.00
	Revenues *	60	5073.62	15353.69	423.86	712.04	1652.99	98.52	85151.00
	%EAS	60	0.12	0.18	0.00	0.05	0.17	0.00	0.77
	Experience	60	5.73	5.09	2.19	5.13	7.00	0.50	24.00
	%PartAud	60	0.88	0.14	0.76	0.89	1.00	0.50	1.00
	Control variables								
	ROA	60	19.87	18.21	5.57	13.69	28.05	1.02	72.18
	SIZE	60	6.83	1.51	5.88	6.45	7.59	3.65	10.59
	LEVERAGE	60	57.25	19.28	42.55	64.13	70.30	11.41	91.33
	* in thousands of euros								
2015		**N**	**Mean**	**StdDeviation**	**Q1**	**Median**	**Q3**	**Min**	**Max**
	Dependent variables								
	MandInf I	56	0.9855	0.0292	1.0000	1.0000	1.0000	0.8750	1.0000
	MandInf II	56	0.1012	0.2285	0.0000	0.0000	0.0000	0.0000	1.0000
	VolunInf	56	0.0089	0.0379	0.0000	0.0000	0.0000	0.0000	0.1667
	ExtraInf	56	0.3393	0.3178	0.0000	0.5000	0.5000	0.0000	1.0000
	Independent variables								
	PIE	56	22.09	51.28	2.00	3.00	12.00	1.00	257.00
	Workers	56	53.69	113.69	9.00	12.50	31.00	3.00	496.00
	Revenues *	56	5851.02	17551.52	435.19	747.40	1603.11	112.00	95070.00
	%EAS	56	0.14	0.19	0.00	0.06	0.18	0.00	0.79
	Experience	56	6.65	5.77	3.08	5.58	7.63	0.58	25.00
	%PartAud	56	0.84	0.16	0.75	0.85	1.00	0.50	1.00
	Control variables								
	ROA	56	20.29	20.82	4.91	10.94	31.24	1.08	71.30
	SIZE	56	6.86	1.44	5.93	6.58	7.45	4.62	10.59
	LEVERAGE	56	57.88	19.16	43.14	59.02	75.36	20.17	91.26
	* in thousands of euros								
2016		**N**	**Mean**	**StdDeviation**	**Q1**	**Median**	**Q3**	**Min**	**Max**
	Dependent variables								
	MandInf I	49	0.9847	0.0300	1.0000	1.0000	1.0000	0.8750	1.0000
	MandInf II	49	0.1224	0.2518	0.0000	0.0000	0.1667	0.0000	1.0000
	VolunInf	49	0.0102	0.0404	0.0000	0.0000	0.0000	0.0000	0.1667
	ExtraInf	49	0.3673	0.3191	0.0000	0.5000	0.5000	0.0000	1.0000
	Independent variables								
	PIE	49	22.33	45.57	1.25	3.50	12.25	1.00	163.00
	Workers	49	63.36	128.20	7.25	15.00	45.75	3.00	541.00
	Revenues *	49	6258.54	17282.14	464.77	744.74	2037.09	30.31	90362.00
	%EAS	49	0.19	0.20	0.03	0.13	0.34	0.00	0.78
	Experience	49	5.86	4.37	2.81	5.40	7.13	0.59	25.00
	%PartAud	49	0.83	0.16	0.72	0.83	1.00	0.50	1.00

	Control variables								
	ROA	49	15.32	18.09	3.58	8.54	18.27	0.29	72.85
	SIZE	49	6.88	1.58	6.00	6.51	7.54	3.62	10.63
	LEVERAGE	49	60.82	17.65	51.21	62.91	75.16	14.07	86.18
	* in thousands of euros								
2017		**N**	**Mean**	**StdDeviation**	**Q1**	**Median**	**Q3**	**Min**	**Max**
	Dependent variables								
	MandInf I	45	0.9875	0.0286	1.0000	1.0000	1.0000	0.8750	1.0000
	MandInf II	45	0.1481	0.2892	0.0000	0.0000	0.3333	0.0000	1.0000
	VolunInf	45	0.0111	0.0420	0.0000	0.0000	0.0000	0.0000	0.1667
	ExtraInf	45	0.4111	0.3069	0.0000	0.5000	0.5000	0.0000	1.0000
	Independent variables								
	PIE	45	24.96	46.56	2.00	4.00	16.00	1.00	206.00
	Workers	45	62.08	131.25	7.50	17.50	37.25	0.00	559.00
	Revenues *	45	7210.80	19243.40	520.95	823.35	1992.33	22.87	95010.31
	%EAS	45	0.20	0.21	0.03	0.11	0.32	0.00	0.76
	Experience	45	6.19	4.63	3.13	5.60	7.25	0.64	26.00
	%PartAud	45	0.83	0.14	0.69	0.83	1.00	0.50	1.00
	Control variables								
	ROA	45	17.07	19.87	5.86	14.27	27.74	-58.29	59.94
	SIZE	45	6.89	1.69	5.94	6.59	7.57	2.68	10.67
	LEVERAGE	45	60.51	16.42	48.21	63.67	72.74	15.63	82.67
	* in thousands of euros								
	Legend:								
	MandInf I	Mandatory information disclosure under Decree Law No 224/2008, of 20 November to TR issued from 2013 to 2015							
		Mandatory information disclosure under Decree Law No 140/2015, of 7 September to TR issued from 2016 to 2017							
	MandInf II	Mandatory information disclosure under Decree Law No 148/2015, of 9 September to TR issued from 2016 to 2017							
	VolunInf	Information disclosure under IOSCO 2009							
	ExtraInf	Information disclosure under IESBA code of ethics and ISQC1							
	PIE	Number of Public Interest Entities							
	Workers	Number of the audit firm workers							
	Revenues	Revenues, in thousands of euros							
	Big-four	PwC, KPMG, E&Y and Deloitte							
	Non Big-Four	All other audit firms							
	%EAS	Revenues from extra-audit services to total revenues							
	Experience	Partner years as an auditor (ROC)							
	%PartAud	Audit partners to total partners							
	ROA	Return to total assets							
	SIZE	Total assets							
	LEVERAGE	Debt to total assets							

Table 4. Descriptive statistics

We began by comparing the behaviour of the disclosure indexes over the five years. In this case, the non-parametric tests are most appropriate because the disclosure index is not approximately normally distributed for each year. The Kruskal-Wallis test was conducted to compare the behaviour of MandInf1 for the different years. Table 5 displays the mean ranks as well as the result of the test.

Variable	Year	N	Mean Rank	Kruskal-Wallis H	Sig.
MandInfI	2013	58	136.19	0.822	0.935
	2014	60	130.02		
	2015	56	134.70		
	2016	49	133.28		
	2017	45	139.39		

Table 5. Kruskal-Wallis Test

The results suggest that there are no differences in the mean rank between the different years (Sig.=0.935).

To compare the behavior of the disclosure indexes MandInf II, VolunInf and ExtraInf over the years, the Jonckheere-Terpstra test was applied. This test allows the analysis if the differences follow a significant trend. When the differences follow a significant trend, the Jonckheere-Terpstra test is generally more powerful than Kruskal-Wallis test. Regarding the results of the Jonckheere-Terpstra test (Table 6), it can be indicated that there was an underlying increase in the five years trend for the disclosures indexes MandInf2 and ExtraInf (Sig. = 0.023 and Sig. = 0.007, respectively). Therefore, our results show that the distribution of these two indexes changed over the period 2013-2017.

In relation to the VolunInf, the test shows that the distribution of this disclosure index remains identical over the analyzed period.

Variable	Number of Levels in Year	N	Std. J-T Statistic	Sig.
MandInf II	5	268	2.27	**0.023**
VolunInf	5	268	0.78	0.435
ExtraInf	5	268	2.70	**0.007**

Table 6. Jonckheere-Terpstra Test

Then, to study the potential influence of various factors on disclosures indexes, we carried out a multivariate analysis, as stated above, and the Generalized Linear Models regression was used.

To analyze the question of multicollinearity between the independent variables, the matrix of correlations was calculated using the Spearman correlation coefficient (appropriate to non-normal data). The results summarized in Table 7 show that there is a very strong correlation between Revenues and Workers. For this reason, for each regression model, these two variables do not appear simultaneously. In the other cases, the absolute value of Spearman correlation coefficient is less than 0.8, it shows that collinearity is very less likely to exist.

2013	PIE	Workers	%PartAud	Experience	Revenues	%EAS
PIE	1.00					
Workers	0.58***	1.00				
%PartAud	0.39***	0.35**	1.00			
Experience	0.26**	0.04	0.17	1.00		
Revenues	0.62***	**0.89*** **	0.39***	0.03	1.00	
%EAS	0.52***	0.47***	0.32**	0.05	0.42***	1.00
2014	**PIE**	**Workers**	**%PartAud**	**Experience**	**Revenues**	**%EAS**
PIE	1.00					
Workers	0.65***	1.00				
%PartAud	0.18	0.19	1.00			
Experience	0.25*	0.23	0.17	1.00		
Revenues	0.63***	**0.87*** **	0.26**	0.16	1.00	
%EAS	0.34***	0.32**	0.29**	0.15	0.26**	1.00

2015	PIE	Workers	%PartAud	Experience	Revenues	%EAS
PIE	1.00					
Workers	0.68***	1.00				
%PartAud	0.07	0.01	1.00			
Experience	0.22	0.19	0.24*	1.00		
Revenues	0.62***	**0.92*** **	0.12	0.11	1.00	
%EAS	0.33**	0.44***	0.16	0.13	0.30**	1.00
2016	**PIE**	**Workers**	**%PartAud**	**Experience**	**Revenues**	**%EAS**
PIE	1.00					
Workers	0.75***	1.00				
%PartAud	0.00	0.20	1.00			
Experience	0.27*	0.29*	0.44***	1.00		
Revenues	0.67***	**0.95*** **	0.07	0.17	1.00	
%EAS	0.36**	0.34**	0.18	0.21	0.32**	1.00
2017	**PIE**	**Workers**	**%PartAud**	**Experience**	**Revenues**	**%EAS**
PIE	1.00					
Workers	0.77***	1.00				
%PartAud	0.12	0.21	1.00			
Experience	0.16	0.18	0.40***	1.00		
Revenues	0.66***	**0.92*** **	0.04	0.13	1.00	
%EAS	0.44***	0.37**	0.05	0.26*	0.37**	1.00

***Significant at the 0.01 level, **Significant at the 0.05 level, *Significant at the 0.10 level

Table 7. Correlation matrix 2013-2017

In relation to the indexes MandInf I and VolunInf, the previous results showed that there are no differences in their behaviour over the analyzed period. Then, for these indexes, the logit models were estimated using panel data. Table 8 shows the estimation models results, specifically the models estimated coefficients, and their significance and pseudo R-squares values.

	MandInf I	VolunInf
Intercept	3.5493**	-33.7961***
PIE	0.0667**	0.0073***
Workers		-0.0200***
log(Revenues)	0.5176	
%EAS	0.0189*	-0.0427***
%PartAud	-0.0109	0.0292*
Experience	0.0057	0.1519***
Control variables		
ROA	0.0125	-0.0685***
SIZE	-0.2759	3.2208***
LEVERAGE	-0.0179*	
Pseudo R-square	21.9%	82.6%
Observations	278	

***Significant at the 0.01 level, **Significant at the 0.05 level, *Significant at the 0.10 level

Table 8. Regression Logit: MandInf1, VolunInf

According to the results in Table 8, for the disclosure index MandInf I, the variables Revenues, %PartAud and Experience are not statistically significant to explain this index. The variable PIE is statistically significant, at a significance level of 5%, and %EAS is statistically significant, at a significance level of 10%. The positive

coefficients associated with these last two variables mean that there are positive relationships between PIE and MandInf I and between %EAS and MandInf I. Thus, audit companies that have more PIE clients and audit companies who provide more EAS have a greater compliance with the disclosure of MandInf I.

For the disclosure index VolunInf, the results suggest that the explanatory variables PIE, %PartAud and Experience are important to explain VolunInf, being positively correlated with this index. The variables Workers and %EAS are also relevant but are negatively correlated with VolunInf.

For the disclosure index MandInf II, since the previous results showed that its distribution changed over the period 2013-2017, a logit model was estimated for each year. Table 9 shows the results for all five fitted models.

MandInf II					
	2013	**2014**	**2015**	**2016**	**2017**
Intercept	-28.0782***	-40.0036***	-73.0923***	-26.8964**	-6.2577
PIE	0.0113	0.0116**	-0.0339	-0.0021	-0.0118
Workers	-0.0126	-0.0163***		0.0067	0.0187**
%EAS	0.0087	-0.0267	-0.0126	0.2293**	0.0686
%PartAud	0.1387**	-0.2202***	-0.4482***	-0.0788	0.0055
Experience	-0.0068	-0.0538	0.1310**	0.1736***	0.2896**
Control variables					
SIZE	1.5681**	2.308***	3.7600***	3.1583**	-0.7093
LEVERAGE	0.0207	0.0364**	0.0052	-0.1156**	0.0041
Pseudo R-square	61.0%	73.1%	76.6%	70.1%	50.5%
Observations	58	60	56	49	45

***Significant at the 0.01 level , **Significant at the 0.05 level, *Significant at the 0.10 level

Table 9. Regression Logit: MandInf II

As shown in Table 9, the explanatory variable PIE is statistically significant in 2014. The most important variables to explain this index are %PartAud and Experience. The variable %PartAud has a positive significant impact for the first three years (2013, 2014 and 2015), while the variable Experience has a positive significant impact for the last three years (2015, 2016 and 2017).

For the disclosure index ExtraInf, the obtained results for all five fitted models are presented in the Table 10.

ExtraInf					
	2013	**2014**	**2015**	**2016**	**2017**
Intercept	-2.2646	-0.7891	-0.2556	-0.6620	-1.0967
PIE	0.0248**	0.0186**	0.0246***	0.0249***	0.0252***
%EAS	0.0155	0.0251*	0.0062	0.0002	-0.0128
%PartAud	0.0311	0.0036	0.0013	0.0159	0.0181
Experience	-0.1140*	-0.0653*	-0.0685**	-0.0594*	0.0332
Control variable					
ROA	0.0386	0.0166	0.0234	0.0404**	0.0163
Pseudo R-square	48.9%	41.4%	47.4%	52.3%	41.4%
Observations	58	60	56	49	45

***Significant at the 0.01 level , **Significant at the 0.05 level, *Significant at the 0.10 level

Table 10. Regression Logit: ExtraInf

For each year, the explanatory variable PIE is statistically significant to explain the ExtraInf index, at a significance level of 5%, at least. The positive coefficient associated to this variable shows that PIE has a positive influence in this index, so as the number of PIE clients increases audit companies tend to disclose information

related to internal control quality and compliance with IESBA code of ethics. The variable %EAS is statistically significant, at a level of 10%, only for the year of 2014. The explanatory variable Experience has a negative relevant effect on ExtraInf, for the years 2013, 2014, 2015 e 2016. This indicates that more experience does not mean higher values of the ExtraInf index. For the variable %PartAud, there is no evidence of a significant relationship, for all the years.

5. Discussion

The results obtained show a high degree of compliance with mandatory information, however the additional information required by Regulation 537/2014 of April 16, is not being complied by a large majority of audit firms, namely regarding the disclosure of the fees charged to the PIE, either for the audit services, or for the extra-audit services, as well as in relation to the obligation of publishing the TR, in the audit form website, for five years. This lack of transparency may be related to a reluctance to make financial information available to competitors, the failure to update the TR model, and the failure to comply with the requirements for increasing the information required by Regulation 537/2014 of April 16.

Regarding voluntary information, its disclosure is very low, although, during the period under analysis, we have seen an increase in this information in the TR. However, it is curious to note that before the implementation of Regulation 537/2014 of April 16, some audit firms already disclosed part of this information. The information disclosed refers to human resources, mainly annual training hours. In all TR analyzed there was no reference to information regarding disciplinary procedures, litigations, procedures considered unsatisfactory by quality control or information regarding to new customers or customers loss, despite that some companies are facing litigation by regulatory and supervisory entities.

Regarding extra information, there is a growing concern that the audit companies report their compliance with the IESBA Code of Ethics and the ISQC 1 quality standard. Nevertheless most disclosures are only a paragraph stating that the audit company complies with ethical codes and with ISQC1, but we can also find, especially in the big audit companies TR, references to ethical and independence internal procedures as well as to the implementation of an internal department that is responsible for monitoring the staff and partners independence and to policies regarding the operationalization and monitorization of the internal quality control system. The results of our study show that there is a variation in the extent and type of disclosures across audit firms, suggesting that transparency reports are merely a fulfillment of legal disclosure requirements. We may be facing a cultural matrix characteristic of continental Europe, since the TR in Germany and Denmark also disclose little information beyond the mandatory one (Girdhar, 2015).

Regarding the first hypothesis, we reach the conclusion that only the number of PIE clients is statistically significant in relation to the MandInf I index, that is, the greater the number of clients, the more transparent the audit firms are. In Portugal, Big-4 have the largest number of PIE clients, and they also have more extensive transparency reports, which shows a concern of these companies regarding the transparency of their information. Our conclusions are in line with the studies by Zorio-Grima et al. (2017) and King (2016).

With regard to the MandInf II index, the number of auditors vs the number of partners influences the disclosure of this type of information until the year 2015. After 2016, and with the mandatory disclosure, this variable is no longer statistically significant. Likewise, experience influences the disclosure of this information after 2015. Audit firms whose auditors have been in the profession for the longest time tend to disclose this mandatory information more. It should be noted that before the mandatory nature of the TR to include MandInf II, some audit companies already include part of this information in their TR.

Finally, auditing firms with a greater number of PIE clients disclose more information related to compliance with ethical requirements and compliance with ISQC1, as well as MandInf I. On the other hand, there is a negative correlation between the disclosure of that information and the experience of the auditors, that is, audit firms whose auditors have been in the profession for less time, tend to disclose these matters more.

Regarding the second hypothesis related to the importance of EAS in the total income of auditing firms, we find that there is no statistically significant relationship between these services and information transparency, whether regarding MandInf II or ExtraInf. However, this variable has a significant negative impact on MandInf I and VolunInf, that is, the greater the weight of the EAS in the total income, the less voluntary information is released and the greater the Mandinf I. In our sample, the Big-4 represents 90% of the SEA, these companies disclosing little voluntary information.

With regard to the third hypothesis, there is no evidence of significant results for MandInf I. Regarding VolunInf; we found that% PartAud and experience have a significant and positive impact. However, we found that the greater the experience of the auditors, the greater the compliance with the mandatory disclosure of MandInf II. As of 2015, this variable has become statistically significant, which may mean that audit firms that have more experienced auditors are more diligent in complying with the mandatory information issued by Regulation 537/2014 of April 16, thus according to the study by Craswell et al. (1995). Regarding InfExtra, the results suggest that the experience is also statistically significant, with a negative coefficient and, therefore, the greater the experience of the auditors, the smaller the InfExtra disclosed, that is, the more experienced auditors are less concerned with disclosing information related to compliance with ISQC 1 and the IESBA code of ethics.

6. Conclusions

The purpose of our study is to analyze the content of the transparency reports published by audit firms that audit PIE, by measuring their transparency index taking into account three components: mandatory information, voluntary information and extra information. In the period under analysis, 2013 to 2017, the mandatory information was divided in two: mandatory information I, that covers 16 disclosures, was introduced by Decree-Law nº 224/2008 of 20 November and the same disclosures continued to be mandatory with Law No 140/2015 of 7 September, this information covers all the period under analysis, from 2013 to 2017, and mandatory information II, that adds 4 new disclosures, approved by Law No 148/2015 of 9 September, that transposes Regulation 537/2014 of April 16, and that only covers the years 2016 and 2017. Our research allowed us to expand previous research by focusing on four types of information disclosed in TR, by analyzing a 5 year period and by addressing the influence of human capital in the information reported in the TR.

Our findings support the existence of a relationship between the audit firm's transparency and audit firms characteristics, as well as with human capital. We found that the greater the number of PIE clients, the more transparent are the TR and more information related to compliance with ethical requirement is disclosed. The audit firms whose auditors have more auditing experience tend to disclose more MandInf II but less extra information. So, our findings support the agency theory in regard to investor´s confidence as well as the theoretical model of sociological analysis in all its levels, the macro level (the legal framework imposed by the European Union and adopted by the Portuguese legislation), the meso level (competitiveness regarding audit firms by highlighting in the audit report the compliance with regulations and the internal mechanism of quality control) and the micro level (increasing audit firm transparency enables a greater range of choice from clients).

As the main limitation of our work, we can mention the small sample size, since there are few Portuguese audit firms that audit PIE. On the other hand, the fact that until 2016 there was no obligation to maintain the TR on the firms' websites has resulted in us not obtaining all the TR. We also recognize that our work may contain measurement errors that we are not aware of and that correlated variables that have been omitted may influence our results.

The fact that from 2016 onwards auditing companies will have to publicize the TR for a period of 5 years, will allow more studies to be carried out. As future research, it would be interesting to evaluate the use that clients and financial statements users make of the TR, to what extent the choice of one audit firm over another influence the TR, and how the comprehensibility and relevance of the TR affect the audit quality.

As for future research it can be interesting to compare the TR information disclosure between continental Europe countries and anglo-saxon countries, since culture matrix are different, while in continental Europe the

demand for auditing is carried out, mostly, by legal imperatives, in the anglo-saxon market auditing is more sought for market reasons, and audit clients may increase or decrease depending on their perception of audit quality.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

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Appendix

Mandatory information I		
Decree-Law nº 224/2008 of 20 November and Law No 140/2015 of 7 September		
(1)	Legal structure and ownership	A description of the legal structure and ownership
(2)	Network	A description of the network and the legal and structural arrangements in the network
(3)	Governance	A description of the governance structure of the audit firm
(4)	Internal quality control system (I)	A description of the internal quality control system of the audit firm
(5)	Internal quality control system (II)	A statement by the administrate or management body on the effectiveness of its functioning
(6)	Quality assurance review	An indication of when the last quality assurance review referred to in Article 29 took place
(7)	PIE	A list of PIE for which the audit firm has carried out statutory audits during the preceding financial year
(8)	Independence	A statement concerning the audit firm's independence practices which also confirms that an internal review of independence compliance has been conducted

(9)	Continuing education	A statement on the policy followed by the audit firm concerning the continuing education of statutory auditors referred to in Article 13
(10)	Financial information – Total Revenues	Financial information showing the importance of the audit firm, such as the total turnover divided into fees from the statutory audit of annual and consolidated accounts, and fees charged for other assurance services, tax advisory services and other non-audit services
(11)	Financial information – Revenues regarding statutory audit	
(12)	Financial information – Revenues regarding other assurance services	
(13)	Financial information – Revenues regarding tax advisory	
(14)	Financial information – Revenues regarding other services	
(15)	Partners remuneration	Information concerning the basis for the partners' remuneration
(16)	TR signed	The TR shall be signed by the statutory auditor or audit firm
Mandatory information II		
Law No 148/2015 of 9September		
(17)	Financial information – PIE	Revenues from statutory audits of annual and consolidated financial statements of PIEs and entities belonging to a group of entities whose parent is a PIE
(18)	Financial information – PIE other services	Revenues from authorized non-audit services rendered to entities audited by the statutory auditor or audit firm
(19)	Partner Rotation	A description of the policy followed by the statutory auditor or auditing firm regarding to rotation of key partners and staff
(20)	TR availability	The TR must be available on the website for a period of 5 years
Voluntary Information IOSCO 2009		
(21)	Human Resources	Analytical information related to training hours, income invested in training, employee turnover ratios and average years that employees remain in the company
(22)	Qualifications	Reference to the qualifications of employees and partners
(23)	Working hours	Information related to employees working hours and partners working hours.
(24)	Discipline and Litigation	Information related to disciplinary procedures, litigations and respective agreements
(25)	Quality control	References to audit procedures that were considered unsatisfactory by quality control
(26)	Clients	Information on the number of new customers and the number of lost customers.
Extra information IESBA Code of Ethics ISQC 1		
(27)	IESBA	Reference to the application of the IESBA Code of Ethics
(28)	ISQC 1	Reference to the International Standard on Quality Control ISQC