



# The Effect of Client Complexity on Audit Quality

Diogo Morais

Dissertation written under the supervision of Fani Kalogirou

Dissertation submitted in partial fulfilment of requirements for the MSc in Finance, at the Universidade Católica Portuguesa, June 2020.

*Page intentionally left blank*

**Abstract:** Previous research suggests that audit quality may be influenced by various client characteristics. This dissertation examines whether changes in audit quality between different companies may be a reflection of audited companies' own complexity. In this research, audit quality is proxied by 'Absolute Discretionary Accruals' and client complexity is proxied by 'Sales to Industry', the 'Net Intangible Assets per Employee', and a dummy variable for listed/unlisted companies ('Listed Factor'). A series of regressions are run and aim to evaluate the relation between client complexity and audit quality and also to understand if that relations are similar between Big4 and NonBig4 clients. Additionally, a survey with audit professionals and an interview with an audit manager are conducted in order to evaluate how field professionals perceive the relation between the two factors. The regression results generally suggest that client complexity does not influence audit quality. The interviewed manager also does not perceive that there is a relation between the two factors. On the other hand, the survey results suggest that most junior auditors believe that audit quality is improved by client complexity.

**Keywords:** audit quality; client complexity; Big4 *versus* NonBig4 auditors; discretionary accruals; sales to industry; intangible assets per employee; listed *versus* private firms.

**Title:** The Effect of Client Complexity on Audit Quality

**Author:** Diogo Morais

**Resumo:** Estudos anteriores sugerem que a qualidade da auditoria pode ser influenciada por várias características dos clientes. Esta dissertação explora a influência da complexidade das empresas na qualidade das auditorias que lhes são efetuadas. Neste estudo, é utilizado um *proxy* para a qualidade da auditoria – valor absoluto de provisões discricionárias – e três *proxies* para complexidade das empresas – vendas relativamente ao total da indústria, valor líquido de ativos intangíveis por funcionário e uma variável *dummy* relativa aos fatores cotada ou não cotada. São realizadas várias regressões que pretendem avaliar a relação entre a complexidade dos clientes e a qualidade da auditoria, e ainda perceber se essa relação é semelhante entre empresas auditadas por Big4 e por outras auditoras que não Big4. Adicionalmente, foi realizado um questionário junto de profissionais da área e uma entrevista com uma *manager* de auditora, com o objetivo de compreender o ponto de vista destes profissionais relativamente à relação entre os dois fatores. De forma geral, os resultados da regressão sugerem que a complexidade dos clientes não influencia a qualidade das auditorias. A *manager* entrevistada é também da

opinião de que não existe qualquer relação entre os dois fatores. Contrariamente, os resultados do questionário sugerem que a maioria dos auditores juniores acredita que quanto maior for a complexidade de um cliente, maior será a qualidade da auditoria.

**Palavras-chave:** qualidade da auditoria; complexidade do cliente; Big4 *versus* NonBig4; provisões discricionárias; vendas face à indústria; ativos intangíveis por funcionário; empresas cotadas *versus* empresas privadas.

**Título:** O Efeito da Complexidade dos Clientes na Qualidade das Auditorias

**Autor:** Diogo Moraes

*Page intentionally left blank*

## **Acknowledgements**

First, I would like to thank Professor Fani Kalogirou for all the support and guidance, and for accepting the challenge to supervise this dissertation. I would like to express my gratitude to Professor José Faias for his help during the Master and for all the knowledge he has shared. A special thanks to João Ferreira for all the trust placed in me. I would also like to thank all survey respondents, who took their time to help me build a better dissertation. I am also thankful to the manager who provided enriching insights to this dissertation. Finally, I want to thank my parents and girlfriend for their full support throughout my entire academic path.

*Page intentionally left blank*

## Table of Contents

1. Introduction .....	1
2. Literature Review .....	3
2.1. Defining Audit Quality .....	3
2.2. Measuring Audit Quality .....	4
2.3. Determinants of Audit Quality .....	5
2.4. Hypotheses .....	9
3. Methodology .....	10
3.1. Regression Analysis .....	10
3.1.1. Variable Selection – Audit Quality Proxy .....	10
3.1.2. Variables’ Selection – Complexity Proxies .....	11
3.1.3. Variables’ Selection – Control Variables .....	12
3.2. Survey and Interview .....	13
4. Sample Selection .....	14
5. Results and Discussion .....	16
5.1. Regression Analysis .....	16
5.1.1. Analysis I: Sales to Industry .....	16
5.1.2. Analysis II: Net Intangible Assets per Employee .....	19
5.1.3. Analysis III: Listed Factor .....	21
5.2. Survey and Interview .....	22
6. Conclusion .....	30
References .....	32
Appendix .....	35
Exhibit 1 – Survey .....	35
Exhibit 2 – Manager interview script .....	45

## List of Tables

Table 1: Sample selection.....	15
Table 2: Descriptive Statistics .....	17
Table 3: Sales to Industry - Analysis.....	18
Table 4: Net Intangible Assets per Employee - Analysis.....	20
Table 5: Listed Factor - Analysis .....	22
Table 6: Survey Results – Summary of Answers to Question 1 .....	24
Table 7: Survey Results – Summary of Answers to Question 6 and 7.....	26
Table 8: Survey – Summary of Answers from Question 8 to 12 .....	29

## **List of Abbreviations**

ADACC – Absolute Discretionary Accruals

AQ – Audit Quality

CC – Client Complexity

DACC – Discretionary Accruals

EQCR – Engagement Quality Control Review

IAASB – International Auditing and Assurance Standards Board

ISA – International Standards on Auditing

LEV - Leverage

MOC – Manager Override of Controls

NAICS – North American Industry Classification System

PCAOB – Public Company Accounting Oversight Board

ROA – Return on Assets

SEC – Securities and Exchange Commission

SIC – Standard Industrial Classification

TACC – Total Accruals

TRE – Thomson Reuters Eikon

## 1. Introduction

---

Financial statements should present fair information about a company's financial position and performance. Stakeholders, including owners, investors, governmental institutions, creditors and even costumers, make decisions based on the information presented in financial statements (Kanapickienė and Grundienė, 2015). Investors depend on companies' financial statements and economic data to better evaluate their investment decisions. Companies have incentives to falsify financial statements due to capital market pressure (Chen *et al.*, 2019), reducing the purpose of fairness and integrity in which financial statements should be based on. For those reasons, falsified financial statements may result in enormous losses for both investors and creditors (Chen *et al.*, 2019). According to the International Standards on Auditing (ISA), management is in a favorable position to manipulate accounting records by overriding controls (MOC – Management Override of Controls) and skewing records in the way that best suits the companies' interests or even the management's personal interests (Kanapickienė and Grundienė, 2015).

For those reasons, audit firms play an important role in the economy, assuring the quality, integrity, and transparency of financial statements. For audited companies (clients), audit is a valuable monitoring process to reduce agency costs with debt holders and stockholders (Becker *et al.*, 1998).

Prior literature studies the influence of different factors on Audit Quality (AQ), such as auditor size (DeAngelo, 1981; Lennox, 1999; Yuniarti, 2011), auditor mindset (Griffith *et al.*, 2015), auditor report changes (Reid *et al.*, 2019), amongst others. Lawrence *et al.* (2011) (hereafter LMZ), study the difference in audit-quality proxies between Big4 and NonBig 4 auditors. The study examines whether the differences in quality proxies could emerge as a reflection of clients' characteristics. The results suggest that differences found in audit quality proxies between Big4 and NonBig 4 audits largely reflect clients' characteristics, especially size. However, the authors highlight the fact that the study has not resolved the main underlying question and therefore encourage other researchers to explore alternative methodologies that separate client characteristics from audit quality effects. Eshleman and Guo (2014) follow the line of research proposed by Lawrence *et al.* (2011) and investigate the likelihood of accounting restatements issuance in

companies audited by Big4 and NonBig4, concluding that Big4 auditors do perform higher-quality audits.

Following the suggestion of Lawrence *et al.* (2011) and the lines of thought of Griffith *et al.* (2015) regarding complexity, this research aims to analyze how Audit Quality is influenced by Client Complexity (CC) and how the performance of similar sized audit companies varies according to client complexity. To the best of my knowledge, no research has been developed to study this relationship.

Using one audit quality proxy – ‘Absolute Discretionary Accruals – and three complexity proxies – ‘Sales to Industry’, ‘Net Intangible Assets per Employee’ and a dummy variable for listed/unlisted companies (‘Listed Factor’) – I find, through a set of regressions, that audit quality, in general, is not affected by client complexity. On the other hand, the results present statistical evidence that NonBig4 auditors perform worst in complex clients, when measuring complexity by the ‘Net Intangible Assets per Employee’. The survey and interview conducted reveal a difference of opinions between junior auditors and the interviewed manager, as the majority of junior auditors believe that client complexity increases audit quality and the manager’s perspective is that client complexity does not have an impact on audit quality.

The results of this research are of interest to regulators, investors, creditors, audit committees, audit partners and managers, and even to other academics. More specifically, this study can be helpful to regulators as it helps them to better understand if audit firms are providing the same AQ across different types of firms. Investors and creditors might also find relevance in this research, as it can support them in assessing the credibility of a firm’s financial information, according to its characteristics. Managers and audit committees might find the analysis useful in the process of choosing an audit firm. This research could also provide important information to audit partners and managers as it may support them in managing teams’ efforts and mindsets according to the clients’ level of complexity. Lastly, the second part of the research, concerning the survey and the interview, may also provide relevant information to academics about their approach’s consistency with practitioners’/auditors’ views.

## 2. Literature Review

---

### 2.1. Defining Audit Quality

---

Audit firms play an important role in the economy, assuring the quality, integrity, and transparency of financial statements. They are the agents responsible for detecting and examining the fairness of a company's financial statements (Yuniarti, 2011).

The International Auditing and Assurance Standards Board (IAASB)<sup>1</sup> attributes great importance to achieving a common vision, among stakeholders, regarding the idea of AQ. According to IAASB (2011), AQ is, in its essence, a "complex and multi-faceted" concept. The perception of AQ may vary amongst stakeholders depending on their involvement in audits. IAASB suggests that, from an investor's perspective, AQ may be perceived through the auditor's report, the auditor's reputation, or relevance/expectations of the audit. On the other hand, from the audit committee's perspective, AQ may be perceived by the individual assessment of the auditor's quality and its processes, alongside with the auditor's communications and interactions. IAASB frames AQ in three different aspects: i) audit inputs, such as audit standards, auditor attributes (skill, experience, ethical values, and mindset) and audit processes (methodology and tools); ii) audit outputs (auditor's report and communications); and iii) context factors (governance, laws, and regulations).

Similarly, the Public Company Accounting Oversight Board (2015)<sup>2</sup> (PCAOB) states that AQ can be viewed from three different perspectives: i) the auditor's compliance to professional audit standards and the applicable law; ii) the auditor's capability to meet the needs of public company's investors and the marketplace, by performing independent, effective and reliable audits, led by skeptical professionals; iii) the timely and effective provision of information to audit committees and investors.

Academics have also tried to define AQ. DeAngelo (1981) defines it as the market assessed probability that the auditor will both discover and report a breach in the client's accounting system. Such probabilities are based on different characteristics of the audit firm. The first, discovering a breach, is dependent on the auditor's technological and

---

<sup>1</sup> An independent standard-setting boarding, responsible for setting high-quality international standards for auditing.

<sup>2</sup> Nonprofit corporation established to oversee the audits of public companies in order to protect investors and public interest.

technical capabilities, while the second, reporting a breach (if found), depends on the auditor's independence and integrity.

The definition proposed by DeAngelo (1981) suggests a binary perspective over auditing processes. It emphasizes the simple detection and report of breaches, understating the importance of auditors in assuring that the clients' financial statements genuinely reflect the firms' underlying economics. DeFond and Zhang (2014) extend the previous definition by stating that AQ is a continuous construct that is not fully reflected in the auditors' opinion/report. The authors defend that AQ refers to the quality of the auditors' assurance/opinion and not to the opinion itself. They define AQ as the degree of "assurance that the financial statements faithfully reflect the firm's underlying economics, conditioned on its financial reporting system and innate characteristics".

## 2.2. Measuring Audit Quality

---

Given that the degree of assurance provided by auditors is unobservable, an audit's quality strikes as a difficult feature to measure and for that reason audit researchers have been using a large set of proxies that rely on measurable inputs and outputs of the audit process (Robert Knechel *et al.*, 2013). DeFond and Zhang (2014) summarized and reviewed a wide set of proxies used in the AQ literature. This section highlights some of those proxies as well as others found in the literature.

Francis (2004) suggests that AQ can be measured by the rate of audit failure, which can be inferred by several sources such as auditor litigation and business failures, investigations by the Securities and Exchange Commission (SEC), and earnings restatements. Based on the same idea, research has used accounting restatements as a proxy for AQ. For example, Eshleman and Guo (2014) study differences between AQ in Big4<sup>3</sup> and NonBig4 auditors by proxying AQ as the '**likelihood of a firm issuing an accounting restatement**'. It is an output-based measure that allows to detect clear cases of poor AQ. However, it directly meets the definition provided by DeAngelo (1981), simply focusing on the auditor's final report, which means it does not capture quality variations between companies that have not issued restatements.

---

<sup>3</sup> Big4 refers to the four largest audit and consulting companies in the world: Deloitte Touche Tohmatsu Limited; Ernst & Young Global Limited; KPMG; PricewaterhouseCoopers.

‘**Absolute discretionary accruals**’<sup>4</sup> are also often used as a proxy for AQ (Becker *et al.*, 1998; Lawrence *et al.*, 2011; Bandyopadhyay *et al.*, 2014). The rationale for using it is that higher-quality auditors will tolerate fewer earnings management from the client, therefore, companies with higher values of absolute discretionary accruals are associated with lower quality audits. This proxy allows to detect misstatements and to capture quality variation between firms. However, it implies that all discretionary accruals are equally harmful to earnings quality (Eshleman and Guo, 2014).

Based on the assumption that firms with more reliable financial reports have lower perceived risk, research has used the ‘**cost-of-capital**’ as a proxy for AQ (Mansi *et al.*, 2004; Pittman and Fortin, 2004). The underlying idea is that investors are willing to finance companies at a lower price if they perceive that their financial statements are more reliable. It is a perception-based proxy, easily obtainable for most companies and that accounts for subtle quality variations. However, it is a controversial measurement among researchers given that it is based on perception and not on direct measures.

Lastly, Behn *et al.* (2008) find evidence that analysts of Big4 clients provide more accurate forecasts than analysts of NonBig4 clients. The reasoning for taking ‘**analysts forecasts**’ as an AQ proxy is that audit firms that perform higher-quality audits will increase the reliability of their clients’ financial reports and therefore analysts’ forecasts will tend to be more accurate for those firms.

### 2.3. Determinants of Audit Quality

---

Considering the previously reviewed proxies, frequently used to find or understand the determinants of AQ, this section describes some of the most relevant research papers on AQ.

Prior research has identified several distinct factors that influence AQ. A well-known factor found in the literature is the effect of **auditor size**. DeAngelo (1981) argues that larger auditors, measured by the number of clients and consequently by the lower relevance of each client in the auditor’s portfolio, have stronger incentives to issue accurate reports since no single client is important to the audit firm. Therefore, large auditor firms have fewer incentives to behave opportunistically or to jeopardize their

---

<sup>4</sup>Discretionary accruals are non-mandatory expenses, recorded in a company’s accounting system, that are yet to be realized. Several studies show that managers may use discretionary accruals to “hide” information from investors (Bartov *et al.*, 2010).

independence and integrity. The author also mentions that Big4 auditors perform better audits than other auditors because they have better training programs. Dye (1993) identifies the same relationship between auditor size and AQ by inferring that larger auditors, with more wealth at risk from litigation, have a bigger incentive to issue accurate reports. Early literature provides evidence consistent with DeAngelo's (1981) and Dye's (1993) theory. For example, Lennox (1999) studies the two effects described earlier and concludes that the threat of litigation stands out as the major driver to the superior accuracy of larger auditors. Research finds that Big4 auditors reveal a higher level of conservatism when issuing audit reports (Francis and Krishnan, 1999). Lennox and Pittman (2010) also show that the frequency of fraudulent financial reports is consistently lower for larger auditors.

Nevertheless, there are also valid arguments defending that Big4 and NonBig4 firms could provide similar AQ. First, both Big4 and NonBig4 act according to the same regulations and professional standards, and for that reason, both firm types should provide an acceptable level of quality (LMZ). Second, NonBig4 have a closer relationship with their clients and a better knowledge of local markets (Louis, 2005). Third, NonBig4 firms cannot obtain the same level of assurance from insurance companies which could lead to an increase of the audit effort comparatively to Big4 (GAO, 2008 cited in LMZ). Fourth, personnel transfers as well as knowledge transfers between Big4 and NonBig4 may mitigate potential quality differences between auditors (LMZ).

Despite the majority of studies supporting the relationship between auditor size and AQ, Reynolds and Francis (2001) find evidence indicating that differences in AQ may also reflect client characteristics, more specifically **client size**. The research results suggest that larger clients have smaller accruals and are more likely to receive “going concern” audit reports. This means that the importance of the threat of litigation and the risk of reputation damage, that audit firms face when they perform low quality audits, exceed the economic dependence on large clients that may encourage audit firms to compromise their independence and report favorable opinions in order to retain such clients.

LMZ and Eshleman and Guo (2014) question the reliability of the above and other studies by identifying a potential endogeneity problem and by arguing that auditors will tend to prefer less risky clients the same way firms with better performance and higher

earnings will prefer Big4 auditors.<sup>5</sup> Consequently, given that, for Big4 firms, clients have a smaller relevance in their portfolios than for NonBig4 firms, there will be a tendency for NonBig4 auditors to accept riskier clients. LMZ corrected for the endogenous choice of auditor by evaluating whether the Big4 effect<sup>6</sup>, identified by DeAngelo (1981), could emerge as a reflection of client characteristics. By using a propensity-score matching model<sup>7</sup> to control for the differences in client characteristics between Big4 and NonBig4 auditors, LMZ find evidence suggesting that the Big4 effect appears to be attributable to client characteristics. However, the authors highlight that the study has not resolved the main underlying question – “Can Big 4 *versus* Non-Big 4 Differences in Audit-Quality Proxies Be Attributed to Client Characteristics?” - and therefore encourage other researchers to explore alternative methodologies that separate client characteristics from AQ effects.

Eshleman and Guo (2014) complemented and extended LMZ’s research by using a different AQ proxy – ‘likelihood of a firm issuing an accounting restatement’. By applying the same method as LMZ, the propensity-score matching model, Eshleman and Guo (2014) provide evidence that contradicts LMZ and suggest that Big4 firms provide higher AQ since their clients are significantly less likely to issue an accounting restatement.

Another major topic discussed in the literature is the effect of **audit firm rotation** on AQ. There are two main views on this topic. The first, argues that longer audit tenures result in greater knowledge of the company’s business and therefore in higher AQ. The second, on the other hand, believes that longer tenures lead to closer relationships between audit staff members and client staff members which may compromise the audit independence. Van Johnson *et al.* (2002) show that short audit-firm tenures (two or three years), provide lower quality financial reports when compared to medium audit-firm tenures (four to eight years). Corbella *et al.* (2015), on the other hand, find that audit firm rotation improves AQ for NonBig4 clients, which may indicate a higher tendency for NonBig4 firms to let auditor-client relationships jeopardize AQ.

---

<sup>5</sup> Lawrence *et al.* (2011) and Eshleman and Guo (2014) were not the first authors to identify an endogenous choice of auditor. (Hogan, 1997), (Ireland and Lennox, 2002), and Lennox and Pittman (2010), all observe that the choice of auditor is endogenous.

<sup>6</sup> The assumption that Big 4 audit firms will provide higher quality audits.

<sup>7</sup> The propensity-score matching model is used to eliminate selection bias in observational studies by balancing covariates (the characteristics of participants) between treated and control groups.

Lastly, Griffith *et al.* (2015) claim that task **complexity** may have an influence on audit teams' performance. Larger clients may be associated with more complex audits, which can lead to significant differences in AQ. On the other hand, if auditors are aware of that, they may even adopt a more **critical mindset** when auditing large firms. Griffith *et al.* (2015) point out the importance of mindsets in auditing procedures. The authors stress that auditors experience significant difficulty in auditing complex estimates and demonstrate that a deliberate mindset, defined as a mindset that leads to a careful and balanced analysis of the alternatives before taking action, improves auditor's ability to identify unreasonable estimates and consequently, improves AQ. Griffith *et al.* (2015) explain that, on the other hand, an implemental mindset leads to a quick and decisive action without appropriate consideration.

## 2.4. Hypotheses

---

The purpose of this dissertation is to extend the research of LMZ, Eshleman and Guo (2014) and Griffith *et al.* (2015) on how AQ may be influenced by client characteristics. Most specifically, I will study the effect of client complexity on AQ. Instead of focusing on the endogenous choice of auditor to explain or disprove AQ differences between Big4 and NonBig4 firms, this research aims to assess how audit teams engage and manage their efforts according to different types of CC, and to understand if audit firms of comparable size provide audits of equivalent quality across all of their client portfolio, independently of their complexity. Therefore, in this dissertation, the following hypotheses will be tested:

H1: Client Complexity is not related to Audit Quality.

H2: The effect of Client Complexity on Audit Quality is similar for Big4 and NonBig4 audits.

Investigating these hypotheses will allow to conclude whether comparable audit firms are performing different quality audits according to CC or, in other words, if audit firms perform comparable audits in simple and complex clients. It may seem natural that complex companies will make it harder for auditors to perform as well as they would in simpler firms. However, if the auditor is already aware of a firm's complexity, it may be encouraged to take measures regarding the amount of effort and resources that are allocated to such audit processes, as a way to compensate for the complexity of the tasks. If those measures are, on average, taken in a perfectly balanced manner, then, CC should not have an impact on AQ. However, if the auditor over or under compensates the amount of resources allocated to complex clients, in a way that it is reflected in differences in the audit's quality, when compared with noncomplex clients, then we can say that CC has an influence in AQ.

### 3. Methodology

---

To answer the proposed research questions, I perform two types of analysis. First, I collect secondary data, from established databases, and perform regression analyses to study the effect of complexity on AQ. The selected proxies and control variables are also used to compare the performance of similar-sized auditors on non-complex clients with their performance on complex clients. Similar auditors are defined in two groups: i) Big4 auditors; ii) NonBig4 auditors. Second, surveys and interviews are conducted with auditors, to complement and provide possible justifications to the results of the regressions.

#### 3.1. Regression Analysis

---

The following regression model is used across the different complexity proxies to test the relationship between client complexity and audit quality:

$$ADACC = \alpha_0 + \alpha_1 Complexity + \alpha_2 SIZE + \alpha_3 LEV + \alpha_4 ROA + \varepsilon \quad (1)$$

##### 3.1.1. Variable Selection – Audit Quality Proxy

---

Taking into consideration the definitions of AQ and the proxies mentioned in the literature, this research resorts to the ‘**absolute value of discretionary accruals**’ (*ADACC*) to proxy for AQ, as it strikes as the proxy that better fits and captures the definition provided by DeFond and Zhang (2014).

The estimation of discretionary accruals requires the computation of ‘**total accruals**’ (*TACC*). Following the early lines of research of Jones (1991), later used by several researchers (Dechow *et al.*, 1995; Kothari *et al.*, 2005; Bartov *et al.*, 2010; LMZ), I use the balance sheet approach to compute *TACC*:

$$TACC_t = \Delta CA_t - \Delta Cash_t - \Delta CL_t + \Delta DCL_t - DEP_t \quad (2)$$

where:

$$\Delta CA_t = \text{Current Assets in year } t - \text{Current Assets in year } t-1$$

$$\Delta Cash_t = \text{Cash and cash equivalents in year } t - \text{Cash and cash equivalents in year } t-1$$

$$\Delta CL_t = \text{Current Liabilities in year } t - \text{Current Liabilities in year } t-1$$

$\Delta DCL_t$  = Debt included in Current Liabilities in year  $t$  – Debt included in Current Liabilities in year  $t-1$

$DEP_t$  = Depreciation and amortization expense in year  $t$

There are several models for computing discretionary accruals. As proven by Dechow *et al.* (1995), the Modified Jones Model proves to be very efficient in detecting earnings management<sup>8</sup>. While the Jones Model is designed to control for the effects of changes in a firm's economic circumstances, the Modified Jones Model also attempts to eliminate a potential error on the Jones Model, that arises when discretion is applied to revenue recognition (Bartov *et al.* 2010). The Modified Jones Model, estimated by year and industry, is the following:

$$\frac{TACC_{i,t}}{A_{i,t-1}} = \alpha_1 \frac{1}{A_{i,t-1}} + \alpha_2 \frac{(\Delta REV_{i,t} - \Delta REC_{i,t})}{A_{i,t-1}} + \alpha_3 \frac{PPE_{i,t}}{A_{i,t-1}} + \varepsilon_{i,t} \quad (3)$$

where:

$A_{i,t-1}$  is the total amount of assets at the end of year  $t-1$

$\Delta REV_{i,t}$  = Revenues in year  $t$  – Revenues in year  $t-1$

$\Delta REC_{i,t}$  = Net Receivables in year  $t$  – Net Receivables in year  $t-1$

$PPE_{i,t}$  is the amount of gross Property, Plant, and Equipment at the end of year  $t$ .

$\varepsilon_{i,t}$  is the residual, which represents the firm-specific discretionary portion of accruals ( $DACC$ ).

### 3.1.2. Variables' Selection – Complexity Proxies

---

There are four main proxies for client complexity identified in the literature. One of them is the '**conglomerate dummy**', which is equal to 1, in case the client firm is present in more than one industry, and equal to 0, in case the client firm has business divisions in a single industry (Markarian and Parbonetti, 2007). Another measure of complexity is the '**number of affiliates**', calculated by the number of affiliates owned, in more than 50%, by a parent organization (Cetorelli and Goldberg, 2016). Complexity may also be measured by the amount of '**R&D expenditures per employee**' (Markarian and

---

<sup>8</sup> The use of accounting techniques to adulterate financial statements in order to present a better view of a company's financial position.

Parbonetti, 2007). The underlying idea behind this measure is that the higher the amount of intangible know-how within the firm, the higher its complexity. Finally, the percentage of the firm's sales to the total industry sales is also another proxy for complexity – '**Sales to Industry**' – the higher this measure is, the higher the customer base being captured by the firm, therefore requiring, on one side, a greater capability to deal with continuously changing needs and on the other, a greater capability to deal with larger competitive forces.

The selection of some of these variables constrains the total amount of observations for the regressions since some of them are not as accessible as desired. For that reason, the 'conglomerate' and the 'number of affiliates' are not be employed as complexity proxies.

Also, in alternative to 'R&D expenditures per employee', and based on the same underlying idea, I use the '**Net Intangible Assets per Employee**' as a proxy for complexity since it allows for the collection of a larger amount of data and captures, in its essence, the same information.

Finally, I study the effect of the '**Listed Factor**' since listed companies may be subjected to more rigorous requirements from regulators which might increase the level of complexity of the audit process. I use a binary variable (dummy) to measure CC, in which listed companies will be defined as 1 and non-listed firms as 0.

Summing up, the selected complexity proxies are 'Sales to Industry' (*SalesToInd.*), 'Net Intangible Assets per Employee' (*I.A./Emp.*), and the 'listed' dummy variable (*ListedFactor*).

### 3.1.3. Variables' Selection – Control Variables

---

Previous literature identifies several factors that influence discretionary accruals, for that reason, a group of control variables will be used. Following the lines of research of Corbella *et al.* (2015), I use: company size ('**SIZE**') measured by the natural log of sales - larger companies tend to have lower accruals; total leverage ('**LEV**'), defined as long-term debt plus current debt, scaled by total assets; return on assets ('**ROA**'), defined by the income before extraordinary items, divided by total assets.

### 3.2. Survey and Interview

---

A questionnaire is sent to approximately 60 audit analysts and senior audit analysts<sup>9</sup> of the Portuguese branch of a Big4 audit firm, with the objective of evaluating their perception of how CC influences AQ (see **Exhibit 1**). The questionnaire starts by asking auditors about their level of agreement with the complexity proxies used in this research and also with the definition of AQ provided by DeFond and Zhang (2014). Then, it focuses on each auditor's personal experience regarding AQ, including several questions that relate factors believed to influence AQ, with different types of clients and moments of the audit process. Finally, the questionnaire includes a section that aims to understand how auditors perceive the influence of CC on AQ and what reasons may drive such influence.

Additionally, an interview with an experienced auditor, with more than six years of experience (manager), is conducted (see **Exhibit 2**). The goal of this interview is to understand the point of view of knowledgeable professionals regarding AQ and CC, and how they believe these variables correlate. This interview is held after the regression and survey analysis, which allows for the discussion of the results with the qualified auditor. Inputs from an experienced professional add extreme value to this research.

---

<sup>9</sup>Audit analysts and senior audit analyst have generally up to 6 years of audit experience.

## 4. Sample Selection

---

For the regression analysis, I use firm-year data from a set of European companies, from 2010 to 2020. I restrict the analysis to this time period and geography because it provides a large amount of data, assuring a reliable analysis, and also because it better reflects the current audit conditions. Resorting to an older time period would influence the research with data from a time where audit knowledge and technology were not comparable with those we witness nowadays.

To build the sample with the required variables that allow for the estimation of the discretionary accruals, I use data from Thomson Reuters Eikon (TRE). Two types of firms are selected. Firstly, I select all European listed companies, which amounts to 78,054 firm-year observation. Secondly, in order to assure a higher probability of available data and a comparable size between private and public companies, I select large European private firms, which, according to the European Commission (2003) are the companies with more than 250 employees and with either an annual turnover greater than EUR 50 million or a balance sheet total larger than EUR 43 million. It is assumed that listed companies and large private companies are audited. After applying the criteria for the selection of large companies, based on the latest annual report issued by each of them, I arrive at the total amount of 201,165 firm-year observations from large European private companies, leading to a total sample of 279,219 observations. After excluding all companies in the financial services industries (Standard Industrial Classification (SIC) Codes between 6000 and 6999) and after imposing all the necessary variables for the calculation of the discretionary accruals, I obtain a sample of 29,690 firm-year observations with data from 6,123 different companies. The main variable limiting the sample size due to its unavailability is 'Property Plant and Equipment'. Table 1 summarizes the sample selection process. Note that sample selection differs for each complexity proxy used.

**Table 1: Sample selection**

European Listed Firms	78,054
Large European Private Companies	201,165
Less: Financial Services Firms (SIC Codes 6000-6999)	(63,380)
Less: Missing data necessary to estimate discretionary accruals	(186,149)
<b>Discretionary Accruals – Full Sample</b>	<b>29,690</b>
Less: Missing data necessary to calculate control variables	(65)
<b>Regression using Proxies ‘Sales to Industry’ and ‘Listed Factor’ – Sample</b>	<b>29,625*</b>
Less: Missing ‘number of employees’	(8,131)
Less: Missing ‘intangible assets’	(7,487)
<b>Regression using Proxy ‘Net Intangible Assets per Employee’ - Sample</b>	<b>14,007**</b>

\* composed by 21,939 (74.06%) observations from currently listed companies and 7,686 (25.94%) from private companies.

\*\* composed by 13,680 (97.67%) observation from currently listed companies and 327 (2.33%) from private companies.

## 5. Results and Discussion

---

In this chapter, I analyze the results of the model described in equation (1) when taking ‘Sales to Industry’, ‘Net Intangible Assets per Employee’, and the ‘Listed Factor’ as a proxy for client complexity. I also analyze the survey results and the inputs provided by the interviewed manager.

### 5.1. Regression Analysis

---

#### 5.1.1. Analysis I: Sales to Industry

---

Table 2 presents the descriptive statistics regarding the sample used to study the influence of complexity on audit quality when taking ‘Sales to Industry’ as a proxy for complexity. This variable was calculated based on the three-digit North American Industry Classification System (NAICS) code of the entire initial sample, by dividing the total revenue of a firm, in a given year, by the sum of the revenue of the remaining companies in the same industry, in the same year. There are 29,625 firm-year observations, of which 5,961 (20.1%) reflect NonBig4 clients and 15,524 (52.4%) reflect Big4 clients. The remaining 8,140 (27.5%) firms did not have their auditor available on TRE. It is important to state that, among the firm-year observations with available information about the auditor, only 385 of them represent private firms, which means the test of Hypothesis II is limited since the analysis is essentially reflecting listed firms. This is a limitation that extends to the following sections.

The descriptive statistics of this sample indicate that Big4 clients are significantly different from NonBig4 clients. NonBig4 clients present a mean value of absolute discretionary accruals higher than Big4 clients, as the results show a positive and significant difference in means between them ( $t=3.51$ ;  $p\text{-value}<0.01$ ), which implies that there is a tendency for Big4 auditors to perform better than NonBig4, meeting the ideas of DeAngelo (1981) and Dye (1993). Big4 clients are larger in size, more leveraged, and have approximately 5 times the return on assets of NonBig4 clients. Regarding the complexity proxy being analyzed, the results show that Big4 clients have a significantly higher percentage of their industry’s sales than NonBig4 clients, which means, they are significantly more complex ( $t=-12$ ;  $p\text{-value}<0.01$ ). The fact that Big4 clients are significantly larger (with a 99% confidence level) and have a higher percentage of their industry’s sales (with a 99% confidence level), confirms the ideas from LMZ and Eshleman and Guo (2014), about the endogenous choice of clients and auditors, by which

they state that Big4 auditors will tend to choose larger and often less risky clients, the same way larger companies will prefer larger audit firms.

I start by measuring the effect of client complexity on AQ by taking ‘Sales to Industry’ as a proxy for complexity. The analysis shows that we cannot reject the null hypothesis (Table 3). In other words, we cannot affirm, by any standard degree of confidence, that client complexity has an influence on AQ when measuring these variables through ‘Sales to Industry’ and ‘Absolute Discretionary Accruals’, respectively. The estimated coefficient ( $\alpha_1$ ) of 0.044 (Table 3), could mean that the higher the value of ‘Sales to Industry’, the higher the ‘Absolute Discretionary Accruals’, *ceteris paribus*, meaning smaller AQ. However, the estimation is not significant ( $p\text{-value} > 0.05$ ) and for that reason, we cannot infer a relationship between the two variables. Additionally, the goodness of fit of the model is low, with an  $R^2$  of 0.006, which means the model accounts for less than 1% of the changes in absolute discretionary accruals.

**Table 2: Descriptive Statistics**

	<b>All Obs.</b>	<b>NonBig4</b>	<b>Big4 Mean</b>	<b>Difference in</b>
	<b>Mean</b>	<b>Mean</b>	<b>Std. Dev</b>	<b>Means</b>
	<b>Std. Dev.</b>	<b>Std. Dev.</b>		<b>(t-statistics)</b>
<i>ADACC</i>	0.0884	0.1060	0.0770	0.0290***
	0.4890	0.2559	0.6162	(3.51)
<i>SalesToInd.</i>	0.0063	0.0024	0.0105	-0.0081***
	0.0381	0.0196	0.0506	(-12.00)
<i>I.A./Emp.</i>	190,690.3	132,253	199,298.2	-67,045.19***
	1,349,176	1,276,078	1,177,998	(-2.76)
<i>ListedFactor</i>	0.9821	0.9886	0.9796	0.0090***
	0.1327	0.1062	0.1414	(4.4605)
<i>SIZE</i>	19.8036	18.6188	20.6955	-2.0767***
	2.4146	2.5421	2.4319	(-55.34)
<i>LEV</i>	0.2603	0.2449	0.2965	-0.0516***
	0.8593	0.7254	1.0176	(-3.58)
<i>ROA</i>	3.0096	0.6039	3.2623	-2.6588***
	24.4138	34.8951	17.8972	(-7.31)
No. Obs.	29,625	5,961	15,524	
% of Total	100%	20.1%	53.4%	

\*, \*\*, \*\*\* indicate significance at the 10, 5, and 1 percent levels, respectively, using a two-tailed t-test of differences in means.

Variables are as defined in section 3.1.

**Table 3: Sales to Industry - Analysis**

<b>Variable</b>	<b>Full Sample Estimated Coefficient (p-value)</b>	<b>NonBig4 Sample Estimated Coefficient (p-value)</b>	<b>Big4 Sample Estimated Coefficient (p-value)</b>
<i>Intercept</i>	0.298*** (0.000)	0.344*** (0.000)	0.230*** (0.000)
<i>Sales to Industry</i>	0.044 (0.0574)	0.072 (0.764)	0.0120 (0.907)
<i>SIZE</i>	-0.011*** (0.000)	-0.013*** (0.000)	-0.007*** 0.001
<i>LEV</i>	0.034*** (0.000)	0.004 (0.331)	-0.001 0.880
<i>ROA</i>	0.000 (0.317)	0.000*** (0.000)	-0.001*** 0.002
R <sup>2</sup>	0.006	0.017	0.002
Adj. R <sup>2</sup>	0.006	0.016	0.002

\*, \*\*, \*\*\* indicate significance at the 10, 5, and 1 percent levels, respectively, using a two-tailed t-test of differences in means.

Variables are as defined in section 3.1.

Nevertheless, the regression results confirm that two of the selected control variables present significant estimated coefficients. On one hand, we can affirm, with a 99% degree of confidence, that size has a negative influence on the absolute value of discretionary accruals (-0.011; p-value<0.01), which means, larger firms have higher quality audits. On the other hand, higher leveraged clients have a larger value of absolute discretionary accruals (0.034; p-value<0.01), probably because, as previous researches concluded, leverage can be an incentive to use accruals to manage earnings, in order to avoid violating debt covenants (Jaggi and Lee, 2002).

In order to test for Hypothesis II and evaluate if complexity has an influence on the AQ of similar-sized audit firms, I estimated the same variables, by regressing the model, in two separate samples. The first included only NonBig4 clients and the second only Big4 clients. The results of both analyses (Table 3) show that the proxy for complexity, ‘Sales to Industry’, still has no significant influence on AQ, by any standard degree of confidence, as for NonBig4 clients we obtained a p-value of 0.764 and for Big4 clients, a p-value of 0.907.

Size still maintains a significant negative coefficient (-0.013; p-value<0.01 and -0.007; p-value<0.01), indicating that auditors perform better in larger firms. The

goodness of fit of each model is still low, though it fits the NonBig4 client sample much better than the Big4 client –  $R^2=0,017$  and  $R^2=0,002$ , respectively.

#### 5.1.2. Analysis II: Net Intangible Assets per Employee

---

This analysis was based on a sample with 14,007 firm-year observations, of which 3,197 (22.8%) reflect NonBig4 clients and 10,415 (74.4%) reflect Big4 clients. The remaining 395 (2,8%) companies did not have their auditor available on TRE. The amount of firm-year observations from companies with auditor information available is mainly reflecting listed firms (97,7%), which is an important limitation when testing for Hypothesis II.

As presented in Table 2, the difference between the net value of intangible assets per employee of NonBig4 clients and of Big4 clients is also significant (-67,045; p-value<0.01), as Big4 clients have a higher amount of intangible know-how within the firm and therefore they are more complex.

Since the average value of ‘Net Intangible Assets per Employee’ of the sample is 190,690 euros. For the regression of this model, that takes this value as a proxy for complexity, I divided each observation value by 10,000 to provide a more accessible interpretation of the results. This is represented in Table 4 by the variable ‘I.A./Emp.’.

The results obtained through the regression of the model, presented in Table 4, indicate that we cannot, once again, reject the null hypothesis, that states the absence of an effect of complexity in AQ, by any standard level of confidence, given that, the estimated coefficient ( $\alpha_1$ ) is approximately 0 and presents a p-value of 0.602. The goodness of fit of the model is even lower than the previous,  $R^2=0.002$ .

Nevertheless, the regression results confirm that two of the selected control variables present significant estimated coefficients. In this case, size and return on assets have a significant influence on absolute discretionary accruals. On one hand, larger clients are related to higher quality audits, as the estimated coefficient is significantly negative (-0.013; p-value<0.01). On the contrary, the higher the return on assets, the worse the performance of auditors, as the estimated coefficient is significantly positive (0.001; p-value<0.05).

**Table 4: Net Intangible Assets per Employee - Analysis**

Variable	Full Sample	NonBig4 Sample	Big4 Sample
	Estimated Coefficient (p-value)	Estimated Coefficient (p-value)	Estimated Coefficient (p-value)
<i>Intercept</i>	0.346*** (0.000)	0.457*** (0.000)	0.274*** (0.000)
<i>I.A./Emp</i>	0.000 (0.602)	0.000** (0.012)	-0.000 (0.954)
<i>SIZE</i>	-0.013*** (0.000)	-0.019*** (0.000)	-0.009*** (0.006)
<i>LEV</i>	0.000 (0.959)	0.015 (0.225)	-0.001 (0.915)
<i>ROA</i>	0.001** (0.017)	0.001*** (0.000)	-0.000 (0.556)
R <sup>2</sup>	0.002	0.034	0.001
Adj. R <sup>2</sup>	0.002	0.033	0.001

\*\*\*, \*\* indicate significance at the 10, 5, and 1 percent levels, respectively, using a two-tailed t-test of differences in means.

Variables are as defined in section 3.1.

As done in section 5.1.1, Table 4 shows the results of the regression of equation (1), when taking the ‘Net Intangible Assets per Employee’ as a proxy for complexity and separating the sample in two different groups (NonBig4 and Big4 clients). The purpose is, once again, to study the impact of complexity on AQ, within a sample of similar-sized audit firms, to comprehend if there is a type of auditor more susceptible to complexity changes. The results show a positive and significant influence of intangible assets per employee on absolute discretionary accruals, for NonBig4 clients, as the estimated coefficient is 0.0001 and the p-value is 0.012. Therefore, we can reject the null hypothesis and affirm, with a 98.8% level of confidence, that complexity, when measured by the net value of intangible assets per employee, has a negative influence on audit quality, for NonBig4 clients. The impact is small since an increase of 10,000 euros in this proxy, is only expected to lead to an increase of 0.0001 on the absolute discretionary accruals, *ceteris paribus*, and the average value of absolute discretionary accruals of the sample is 0.0884. The NonBig4 model presents the highest fitness so far, with an R<sup>2</sup> of 0.034, meaning that these variables can explain 3.4% of the changes in absolute discretionary accruals.

Concerning Big4 clients, no relationship between complexity and AQ can be inferred, as the p-value of the estimated coefficient is not significant by any standard level of confidence. The degree of fitness of the model is low ( $R^2=0.001$ ).

Size, however, has a negative and significant estimated coefficient for both samples, indicating, once again, that auditors tend to perform better in larger firms.

### 5.1.3. Analysis III: Listed Factor

---

This sample is composed of 29,625 firm-year observations, of which 21,939 (74.1%) of them correspond to currently listed firms and 7,686 (25.9%) are private.

Table 5 summarizes the outputs that resulted from the regression of equation (1) when taking the listed dummy variable as a proxy for CC. The analyzed sample is the same as the one used in Section 5.1.1, and the estimated coefficients of the control variables as well as their p-values are very similar. The  $R^2$  and the Adjusted  $R^2$  values are also identical. The estimated coefficient for 'SIZE' shows that auditors tend to perform better in larger clients (-0.011, p-value<0.01) and in less leveraged companies (0.034; p-value<0.01). Regarding the complexity proxy analyzed – 'Listed Factor' – we cannot reject the null hypothesis, which means that we cannot affirm, by any standard level of confidence, that a company being listed or private has an influence on AQ (0.000; p-value>0.05).

When excluding companies that do not have available information about their auditor, in order to test for Hypothesis II and separate the sample in NonBig4 and Big4 clients, I obtain a sample of 21,485 firm-year observations, of which 21,100 (98.2%) are currently listed companies. The amount of dropped firm-year observations due to lack of auditor information amounts to 8.140, of which 7.301 (89.7%) are non-currently listed companies. I conclude that private companies are barely represented in this analysis since the majority of them do not have auditor information available on TRE, and for that reason, the Big4 *versus* NonBig4 analysis is not performed in this section.

**Table 5: Listed Factor - Analysis**

<b>Variable</b>	<b>Estimated Coefficient (p-value)</b>
<i>Intercept</i>	0.295*** (0.000)
<i>ListedFactor</i>	0.000 (0.93)
<i>SIZE</i>	-0.011*** (0.000)
<i>LEV</i>	0.034*** (0.000)
<i>ROA</i>	0.000 (0.323)
R <sup>2</sup>	0.006
Adj. R <sup>2</sup>	0.006

---

\*\*\* indicate significance at the 10, 5, and 1 percent levels, respectively, using a two-tailed t-test of differences in means.  
Variables are as defined in section 3.1.

## 5.2. Survey and Interview

---

In this section, I present and discuss the results of the survey, as well as relate them with the main ideas and opinions provided by the audit manager during the interview.

The questionnaire is divided into five parts. The first part (Q1 and Q2) aims to assess the perception of auditors about how the proxies identified in section 3.1.2 increase CC, on a scale from 1 (Definitely Not) to 5 (Definitely Yes). It also includes an open-ended question about other possible factors that may influence CC. The second part (Q3 and Q4) includes a question about the level of agreement with the definition provided by DeFond and Zhang (2014), on a scale from 1 (Strongly Disagree) to 7 (Strongly Agree), and also an open-ended question about possible comments on such definition. The third part (Q5 to Q12) includes eight questions about AQ, in which auditors are asked to relate different factors believed to improve AQ, with different types of clients and moments of the audit process – on a scale from 1 (Strongly Disagree) to 5 (Strongly Agree). The fourth, and probably most important part (Q13 to Q15), includes a direct question regarding the influence of CC on AQ and a different question (conditioned on the answer given before) regarding the reasons that might explain such influence. Finally, the questionnaire includes two optional demographic questions (Q16 and Q17), one for gender and the other for years of experience in the audit field.

Before moving to the discussion of the survey, it is important to restate that it was conducted only with auditors whose current/former position in the audit firm is/was below Manager, which generally means that auditors have up to six years of experience. On the other hand, the interview was held with an experienced audit manager, responsible for the oversight of several audit teams in different client firms and with more than six years of experience.

The survey gathers answers from a total of 42 audit professionals. The results show a balanced gender distribution, with 21 (50%) female answers and 20 (48%) male answers. As gender was an optional question, one (2%) of the respondents did not answer.

The average experience of respondents is 2.63 years, with a maximum of 6 years and a minimum of approximately 10 months. This was also an optional question and six (14%) respondents did not answer. The distribution regarding the years of experience shows that it is a low experienced sample, revealing a mode of 2 years.

The first question of the survey asks respondents about their agreement regarding the influence of the proxies mentioned in section 3.1.2 on CC (on a scale from 1 to 5). The answers reveal that, on average, auditors agree that the five proxies increase CC (Table 6). The number of subsidiary firms and the fact that a company has businesses in several industries strike as the most determinant factors that increase CC, according to respondents. The first has a mean level of agreement of 4.60 and the second of 4.40. 93% of respondents indicate a positive relationship between the number of subsidiary firms and CC, and 95% agree that clients that work in more than one industry are also more complex. On average, auditors also believe that listed clients are more complex ( $\bar{X} = 4.29$ ), as well as clients with high market share ( $\bar{X}=3.98$ ) and high R&D expenditures ( $\bar{X}=3.76$ ). This reveals that the proxies used for CC ('Sale to Industry', 'I.A./Emp.' and 'ListedFactor') reflect what auditors perceive as factors that make clients more complex. However, the two most relevant factors for auditors were not used as proxies due to the unavailability of information on the established database used (TRE), although they were mentioned and described in section 3.1.2 ('number of affiliates' and 'conglomerate dummy'). When asked about other factors that might influence CC, auditors state that a client's history of *past problematic issues* with regulators, *dysfunctional working systems*, and *lack of opening and professionalism* from the client's employees, are also drivers for CC. The interviewed manager agrees that the five determinants may influence CC and adds that the *political and economic context* and *complex shareholder structures* may also

increase a client’s complexity. Moreover, the manager states that *the relationship between auditor and client* may impose difficulties in the audit process, as the majority of clients do not see auditors as someone that may add value to the firm, but as someone that will make the job harder, increase the amount of work as well as constantly ask for additional information and requests that take time from client employees to respond. Additionally, the manager adds that “a *robust Internal Control System (ICS)* is essential to achieve a higher quality audit making the job easier and less complex”.

Regarding the AQ definition proposed by DeFond and Zhang (2014), stating that AQ is a continuous construct defined by the “degree of assurance that the financial statements faithfully reflect the firm’s underlying economics”, the majority of auditors (93%) show some level of agreement (at least 5 on a scale from 1 to 7) and only one (2%) of the respondents show some level of disagreement (3 on the same scale) proving that this definition was a good starting point to support the choice of the AQ proxy. The remaining 5% did neither agree nor disagree. Other important issues raised by the auditors regard the *quality of the given recommendations* and *the quality of the working papers* that sustain the auditors’ opinion, as these factors also define the quality of an audit procedure and do not seem to be included in DeFond and Zhang's (2014) definition. Interestingly, in the interview, and before being presented with the definition, the manager defines AQ as the degree of confidence that most of the financial information is accurate, visibly converging to the idea of DeFond and Zhang's (2014). The manager also highlights the importance of the quality of working papers, as they should allow for an easy revision by managers, partners, and by the Engagement Quality Control Review (EQCR).

**Table 6: Survey Results – Summary of Answers to Question 1**

	Does this factor increase Client Complexity?	
	Mean	Agree (%)*
Client firm has business divisions in several industries	4.4	95,24%
Client firm has high market share	3.98	71.43%
Client firm has R&D expenditures	3.76	65.85%
Client firm has several subsidiary firms	4.6	92.86%
Client is listed	4.29	78.57%

\* percentage of responses that present a minimum level of agreement, meaning at least 4 on a scale from 1 (strongly disagree) to 5 (strongly agree).

The survey results reveal that, from the auditors' perspective, high audit teams' experience, high likelihood of external revision, and high CC increase AQ, with  $\bar{X}=4.74$ ,  $\bar{X}=4.48$ , and  $\bar{X}=3.83$ , respectively, on a scale from 1 to 5. On average, auditors believe that high audit firm rotation and a high number of working hours have a smaller influence on AQ,  $\bar{X}=3.07$  and  $\bar{X}=3.00$ , respectively.

Auditors consider (on a scale from 1 to 5) that AQ should be higher in the six different situations they were asked about (Q6) (Table 7). Question 7 aims to understand how well auditors believe they are performing in those situations. As can be seen in Table 7, there are four situations in which, on average, auditors believe AQ should be higher than the one they are actually performing, since the mean difference between Q6 and Q7 is positive: during the first year of the audit tenure ( $\bar{X}=2.92$ ) with a difference of 0.75; last year of the audit tenure ( $\bar{X}=3.91$ ) and a difference of 0.16; when auditing a renowned firm ( $\bar{X}=3.66$ ) with a difference of 0.27; and when the client is considered complex ( $\bar{X}=3.77$ ) with a difference of 0.35. When auditing a listed firm ( $\bar{X}=4.30$ ), the mean difference is nearly 0, which means auditors believe they are performing as well as they think they should. The only situation in which auditors' opinion is that they are performing an audit of higher quality than they should is when the work is likely to be reviewed since the mean is higher in Q7 ( $\bar{X}=4.6$ ) than in Q6 ( $\bar{X}=4.26$ ) and the difference is -0.34. After testing for the significance of the mean difference, I find that during the first year of the audit tenure and when clients are complex, auditors significantly believe to be underperforming, with a degree of confidence of 95% and 90%, respectively. Both situations lead to task complexity and difficulty. The first, due to the fact that all tasks are being performed for the first time for that client, and audit teams are still in a learning process regarding the client's business. The second because of the client's characteristics or the client's business itself. Auditors seem to assume the importance of providing a high-quality audit for such clients, but at the same time admit that those are situations in which they generally cannot meet their own expectations. I also find that the mean difference for works that are likely to be externally reviewed is significant, except for this time, auditors believe to be overperforming. This is one situation in which auditors are pressured to perform a better job and may even be concerned that an error will be detected during the external revision process, those are possible reasons that may lead to a better quality audit, although, on average, auditors do not believe AQ should be that high.

**Table 7: Survey Results – Summary of Answers to Question 6 and 7**

	Q6. When should AQ be higher?		Q7. When do you feel you perform a higher quality audit?		Difference in means (t-statistics)
	Mean	Agree (%)****	Mean	Agree (%)****	
First year of tenure	3.67	61.9	2.92	32.43	0.75** (2.5131)
Last year of tenure	4.07	73.81	3.91	70.59	0.16 (0.6223)
Auditing renowned firm	3.93	73.17	3.66	57.14	0.27 (1.2536)
Auditing listed firm	4.31	85.17	4.30	83.79	0.01 (0.0655)
Work is likely to be externally reviewed	4.26	80.95	4.6	97.50	-0.34* (1-.9412)
Client firm is complex	4.12	76.19	3.77	64.10	0.35* (-1.7854)

\*. \*. \*. \*\*\*\* indicate significance at the 10. 5. and 1 percent levels. respectively. using a two-tailed t-test of differences in means.  
\*\*\*\* percentage of responses that present a minimum level of agreement, meaning at least 4 on a scale from 1 (strongly disagree) to 5 (strongly agree).

The results from the third part of the survey (Table 8) reveal how different situations of the audit work are associated with a demand for higher AQ, by relating them with factors believed to increase AQ. During the first year of the audit firm’s tenure, auditors feel workloads are higher ( $\bar{X}$ =4.58), they have more skeptical mindsets ( $\bar{X}$ =4.24), the quality of supervision from managers and partners is superior ( $\bar{X}$ =4.08), teams are larger ( $\bar{X}$ =4.00) and there is a high pressure from managers and partners ( $\bar{X}$ =3.95). This happens, most likely, because first-year audits tend to be more complicated than the following ones. Auditors need to understand the company’s business, its structure, and its systems for the first time, which might be why they tend to have a more skeptical mindset. As years go by, audit procedures tend to be more standardized for each company, therefore auditors’ workload may be reduced, managers and partners will tend to trust the work more easily, and workloads, as well as teams’ size, may be reduced. The last year of the audit tenure is also associated with a high demand for AQ, as all the previous factors

present means above 3, except for teams' size ( $\bar{X}=2.61$ ), possibly for the reasons mentioned before - auditors have a better knowledge about the client and can perform the work more easily and so fewer team members are required. However, all of the factors show a lower mean than the responses related with the first year of the audit tenure, as expected - higher workload ( $\bar{X}=3.74$ ), higher quality of supervision ( $\bar{X}=3.85$ ), more skeptical mindsets ( $\bar{X}=3.24$ ) - except for the higher pressure from managers and partners ( $\bar{X}=4.00$ ).

When auditing a renowned firm, auditors seem to feel a high demand for AQ. Because these types of clients are better known and are more subjected to media exposure, it possibly leads to higher pressure from managers ( $\bar{X}=4.25$ ) and higher workloads ( $\bar{X}=4.00$ ). The quality of supervision also tends to be high ( $\bar{X}=3.91$ ), according to respondents, while there seems to be a difference in opinions regarding larger teams' size ( $\bar{X}=3.29$ ) and more skeptical mindsets ( $\bar{X}=3.49$ ), as the means are closer to 3 (neither agree nor disagree) and only 47.37% and 51.35% of the respondents show some level of agreement (at least 4 on a scale from 1 to 5), respectively. Respondents perceive the audit process of listed firms similarly to renowned firms, regarding the demand for AQ. In this case, all the factors described show a higher mean than in the case of renowned firms, possibly because most listed firms share the same media exposure but also get more attention from regulators. Teams' size ( $\bar{X}=3.87$ ) and skeptical mindsets ( $\bar{X}=4.03$ ) are also the factors with the lowest means and lower level of agreement - 71.79% and 68.42%, respectively - while a higher pressure from managers and partners is strongly felt by respondents ( $\bar{X}=4.55$ ) with almost 95% showing some level of agreement. Auditors also feel that workloads and the quality of supervision are higher when auditing listed firms -  $\bar{X}=4.29$  and  $\bar{X}=4.28$ , respectively. The most extreme situation identified is when the work is likely to be reviewed. This situation presents the highest mean on all factors except for teams' size ( $\bar{X}=3.88$ ), which according to auditors, are only larger during the first year of the audit tenure ( $\bar{X}=4.00$ ). "Work is likely to be reviewed", is the situation, amongst the six described in Table 8, when auditors feel the highest pressure from managers and partners ( $\bar{X}=4.83$ ), when workloads are perceived as higher ( $\bar{X}=4.71$ ), when the quality of supervision from managers and partners is higher ( $\bar{X}=4.83$ ) and also when auditors feel they have a more skeptical mindset ( $\bar{X}=4.47$ ). This situation appears to be a huge driver for AQ, according to respondents. When asked about this, the manager disagrees that a higher likelihood of external revision would lead to a higher level of confidence in the

financial statements' accuracy. According to the manager, "auditors tend to be more thorough and exhaustive in documenting and supporting the audit procedures, but it does not impact the degree of assurance that the financial statements truly reflect the firms' underlying economics". If we take into consideration both the manager's and the respondents' opinions, that mention reporting/documenting quality as a component of AQ, we can affirm that, from their perspective, the likelihood of external revision is a driver for higher AQ. Finally, CC is also perceived as a driver for higher AQ demand. Respondents feel higher pressure from managers and partners ( $\bar{X}=4.13$ ), higher workloads ( $\bar{X}=4.20$ ), a higher quality of supervision from managers and partners ( $\bar{X}=3.85$ ), they believe teams tend to be larger ( $\bar{X}=3.68$ ) and also believe they have a more skeptical mindset ( $\bar{X}=3.85$ ).

In the next part of the survey, auditors are directly asked about their perspective on how CC influences AQ. Interestingly, answers are quite dispersed as 24% believe CC decreases AQ, 69% believe it increases AQ and only 7% believe that there is no relation between these two variables. Those who believe that CC decreases AQ, present as major reasons the lack of help and support from Managers and Partners in complex clients, the unappropriated teams' size and workload, and also the fact that staff should be more experienced in those clients. On the other hand, those who believe CC increases AQ, indicate as the main reasons the fact that staff is more experienced and also have a more skeptical mindset in such clients, as well as the fact that Managers/Partners are more demanding and perform better quality revisions. Nevertheless, three (7%) respondents believe that CC does not have an influence on AQ, which meets the main results found in the regression of the models described in sections 5.1.1, 5.1.2 and 5.1.3. When asked about how CC influences AQ, the interviewed manager disagrees with the majority of respondents by stating that CC does not influence AQ as nowadays "methodologies are more and more tailored and adapted to each client's characteristics, assuring a standardization of audit quality". The manager also states that audit works involve several layers of revision and for that reason, gaps in quality are more likely to be detected. The manager affirmed that when clients are considered complex, audit teams bring together specialists from different areas to assure a better understanding of the company, which eventually guarantees a better-quality audit.

**Table 8: Survey – Summary of Answers from Question 8 to 12**

	<b>Q8. Higher pressure from Managers/Partners</b>		<b>Q9. Higher Workloads</b>		<b>Q10. Higher Quality of Supervision from Managers/Partners</b>		<b>Q11. Larger Audit Teams</b>		<b>Q12. More skeptical Mindsets</b>	
	<b>Mean</b>	<b>Agree (%)*</b>	<b>Mean</b>	<b>Agree (%)*</b>	<b>Mean</b>	<b>Agree (%)*</b>	<b>Mean</b>	<b>Agree (%)*</b>	<b>Mean</b>	<b>Agree (%)*</b>
During the first year of the audit firm's tenure	3.95	72.97	4.58	91.64	4.08	75.00	4.00	69.24	4.24	78.38
During the last year of the audit firm's tenure	4.00	65.71	3.74	61.77	3.85	64.71	2.61	19.45	3.24	41.18
When auditing a renowned firm	4.25	86.11	4.00	75.67	3.91	71.43	3.29	47.37	3.49	51.35
When auditing a listed firm	4.55	94.74	4.29	84.21	4.28	83.33	3.87	71.79	4.03	68.42
When the work is likely to be externally reviewed	4.83	97.57	4.71	97.56	4.83	97.50	3.88	66.66	4.47	85.00
When the client firm has a complex business	4.13	77.5	4.20	80.48	3.85	69.23	3.68	56.09	3.85	72.5

\* percentage of responses that present a minimum level of agreement, meaning at least 4 on a scale from 1 (strongly disagree) to 5 (strongly agree).

## 6. Conclusion

---

In this dissertation, I examined whether client complexity causes differences in the quality of audits. By using three different methodologies (regression analysis, survey, and interview), I aimed to understand the relation between client complexity and audit quality, and also whether this relation is similar for Big4 and NonBig4 auditors.

By using three different complexity proxies ('Sales to Industry', 'Net Intangible Assets per Employee', and 'Listed Factor') and by taking 'Absolute Discretionary Accruals' as a proxy for audit quality, the results of the regression analysis suggest that there is no statistical evidence that client complexity influences audit quality. One interpretation of this is that audit teams are aware of clients' complexity and are able to properly manage efforts, mitigating the eventual difficulties that may arise when auditing this type of client. When evaluating differences between Big4 and NonBig4, the regression shows that, for NonBig4 clients, higher client complexity, when measured by the 'Net Intangible Assets per Employee', leads to higher discretionary accruals, meaning lower AQ, however the economic magnitude is very low. The survey results suggest that the majority of auditors believe that client complexity improves audit quality and consider that the main driver for a high-quality audit is the likelihood of external revision. The interviewed manager, however, does not believe in any relation between client complexity and audit quality as audit firms have resources to mitigate task complexity, making the audit quality similar between all client portfolio. Regarding the likelihood of external revision, the manager believes it only leads to a clearer and more extensive documentation of the audit work, and not to a higher degree of assurance that the financial statements truly reflect the companies' underlying economics.

The findings in this dissertation are subject to a few limitations. First, the regression inferences are dependent on an audit quality proxy that may measure it with error, by implying that all 'discretionary accruals' are harmful to earnings quality (Eshleman and Guo, 2014). According to the survey respondents' comments on Question 4, there are several different aspects that define the quality of an audit work and that are not being captured by the selected proxy. Second, although the complexity proxies that were used are consistent with the respondents' opinions, they are not the ones that better reflect client complexity. Those proxies were not used due to lack of available information on the database used (TRE). Third, it is not assured that all relevant control variables are

included. Fourth, and probably the main limitation of this research, is related to a significant loss of observations due to lack of data. Moreover, the majority of companies, for which there is auditor information available, are listed companies, which may introduce some biases in the results (when testing for Hypothesis II), in the sense that those results might not be extended to private firms. That is also the reason why Hypothesis II was not tested for the third complexity proxy ('Listed Factor').

The research model used could be extended by using different proxies, either for complexity or audit quality. The results of the regressions also leave space for further investigation, whether by extending the sample size, in a way that more private companies are included, or even by evaluating the effect of client complexity in different regions of the world. Since the results only concern European firms, different conclusions could arise if the study was conducted in the United States of America, for example. I leave these suggestions for future research.

## References

---

- Bandyopadhyay, S. P., Chen, C. and Yu, Y. (2014) 'Mandatory audit partner rotation, audit market concentration, and audit quality: Evidence from China', *Advances in Accounting*. Elsevier Ltd, 30(1), pp. 18–31. doi: 10.1016/j.adiac.2013.12.001.
- Bartov, E., Gul, F. A. and Tsui, J. S. L. (2010) 'Discretionary-Accruals Models and Audit Qualifications', *Elsevier*, (January), pp. 1–5. Available at: <https://www.sciencedirect.com/science/article/pii/S0165410101000155>.
- Becker, C. L. *et al.* (1998) 'The Effect of Audit Quality on Earnings Management', *Contemporary Accounting Research*, 15(1), pp. 1–24.
- Behn, B. K., Choi, J.-H. and Kang, T. (2008) 'Audit Quality and Properties of Analyst Earnings Forecasts', *The Accounting Review*, 83(2), pp. 327–349.
- Cetorelli, N. and Goldberg, L. S. (2016) 'Economic Policy Review', *Measures of Complexity of Global Banks*, 20.
- Chen, Y. J. *et al.* (2019) 'Fraud detection for financial statements of business groups', *International Journal of Accounting Information Systems*, 32, pp. 1–23. doi: 10.1016/j.accinf.2018.11.004.
- Corbella, S. *et al.* (2015) 'Audit firm rotation, audit fees and audit quality: The experience of Italian public companies', *Journal of International Accounting, Auditing and Taxation*. Elsevier Inc., 25, pp. 46–66. doi: 10.1016/j.intaccaudtax.2015.10.003.
- DeAngelo, L. E. (1981) 'Auditor size and audit quality', *Journal of Accounting and Economics*, 3, pp. 183–199. doi: 10.1016/0165-4101(81)90002-1.
- Dechow, P. M., Sloan, R. G. and Sweeney, A. P. (1995) 'Detecting Earnings Management', *The accounting Review*, 70(20), pp. 193–225.
- DeFond, M. and Zhang, J. (2014) 'A review of archival auditing research', *Journal of Accounting and Economics*. Elsevier, 58(2–3), pp. 275–326. doi: 10.1016/j.jacceco.2014.09.002.
- Dye, R. A. (1993) 'Auditing Standards, Legal Liability, and Auditor Wealth', *Journal of Political Economy*, 101, pp. 887–914.
- Eshleman, J. D. and Guo, P. (2014) 'Do big 4 auditors provide higher audit quality after controlling for the endogenous choice of auditor?', *Auditing: A Journal of Practice & Theory*, 33(4), pp. 197–219. doi: 10.2308/ajpt-50792.
- European Commission (2003) *Structural Business Statistics - Small and Medium Enterprises*. Available at: <https://ec.europa.eu/eurostat/web/structural-business-statistics/structural-business-statistics/sme> (Accessed: 7 April 2020).
- Francis, J. R. (2004) 'What do we know about audit quality?', *British Accounting Review*, 36, pp. 345–368. doi: 10.1016/j.bar.2004.09.003.
- Francis, J. R. and Krishnan, J. (1999) 'Accounting Accruals and Auditor Reporting Conservatism', *Contemporary Accounting Research*, 16(1), pp. 135–165. doi: 10.1111/j.1911-3846.1999.tb00577.x.
- Griffith, E. E. *et al.* (2015) 'Auditor mindsets and audits of complex estimates', *Journal*

- of Accounting Research*, 53(1), pp. 49–77. doi: 10.1111/1475-679X.12066.
- Hogan, C. E. (1997) ‘Costs and benefits of audit quality in the IPO market: A self-selection analysis’, *Accounting Review*, 72(1), pp. 67–86.
- IAASB (2011) *Audit Quality in IAASB Perspective*. doi: 10.1038/4431017b.
- Ireland, J. C. and Lennox, C. S. (2002) ‘The Large Audit Firm Fee Premium: A Case of Selectivity Bias?’, *Journal of Accounting, Auditing & Finance*, 17(1), pp. 73–91. doi: 10.1177/0148558X0201700104.
- Jaggi, B. and Lee, P. (2002) ‘Earnings Management Response to Debt Covenant Violations and Debt Restructuring’, *Journal of Accounting, Auditing & Finance*, 17(4), pp. 295–324. doi: 10.1177/0148558X0201700402.
- Van Johnson, E., Khurana, I. K. and Reynolds, J. K. (2002) ‘Audit-Firm Tenure and the Quality of Financial Reports’, *Contemporary Accounting Research*, 19(4), pp. 637–660. doi: 10.1506/LLTH-JXQV-8CEW-8MXD.
- Jones, J. J. (1991) ‘Earnings Management During Import Relief Investigations’, *Journal of Accounting Research*, 29(2), p. 193. doi: 10.2307/2491047.
- Kanapickienė, R. and Grundienė, Ž. (2015) ‘The Model of Fraud Detection in Financial Statements by Means of Financial Ratios’, *Procedia - Social and Behavioral Sciences*, 213, pp. 321–327. doi: 10.1016/j.sbspro.2015.11.545.
- Kothari, S. P., Leone, A. and Wasley, C. (2005) ‘Performance Matched Accruals Measures’, *Journal of Accounting and Economics*, 39(May), pp. 163–197.
- Lawrence, A., Minutti-Meza, M. and Zhang, P. (2011) ‘Can big 4 versus non-big 4 differences in audit-quality proxies be attributed to client characteristics?’, *The Accounting Review*, 86(1), pp. 259–286. doi: 10.2308/accr.00000009.
- Lennox, C. and Pittman, J. A. (2010) ‘Big Five Audits and Accounting Fraud’, *Contemporary Accounting Research*, 27(1), pp. 209–247. doi: 10.1111/j.1911-3846.2010.01007.x.
- Lennox, C. S. (1999) ‘Audit quality and auditor size: An evaluation of reputation and deep pockets hypotheses’, *Journal of Business Finance and Accounting*, 26(7–8), pp. 789–805. doi: 10.1111/1468-5957.00275.
- Louis, H. (2005) ‘Acquirers’ abnormal returns and the non-Big 4 auditor clientele effect’, *Journal of Accounting and Economics*, 40(1–3), pp. 75–99. doi: 10.1016/j.jacceco.2005.03.001.
- Mansi, S. A., Maxwell, W. F. and Miller, D. P. (2004) ‘Does auditor quality and tenure matter to investors? Evidence from the bond market’, *Journal of Accounting Research*, 42(4), pp. 755–793. doi: 10.1111/j.1475-679X.2004.00156.x.
- Markarian, G. and Parbonetti, A. (2007) ‘Firm complexity and board of director composition’, *Corporate Governance: An International Review*, 15(6), pp. 1224–1243. doi: 10.1111/j.1467-8683.2007.00643.x.
- PCAOB (2015) *Concept Release On Audit Quality Indicators*.
- Pittman, J. A. and Fortin, S. (2004) ‘Auditor choice and the cost of debt capital for newly public firms’, *Journal of Accounting and Economics*, 37(1), pp. 113–136. doi:

10.1016/j.jacceco.2003.06.005.

Reid, L. C. *et al.* (2019) 'Impact of Auditor Report Changes on Financial Reporting Quality and Audit Costs: Evidence from the United Kingdom', *Contemporary Accounting Research*, 36(3), pp. 1501–1539. doi: 10.1111/1911-3846.12486.

Reynolds, J. K. and Francis, J. R. (2001) 'Does size matter? The influence of large clients on office-level auditor reporting decisions', *Journal of Accounting and Economics*, pp. 375–400. doi: 10.1016/S0165-4101(01)00010-6.

Robert Knechel, W. *et al.* (2013) 'Audit quality: Insights from the academic literature', *Auditing*, 32(SUPPL.1), pp. 385–421. doi: 10.2308/ajpt-50350.

Yuniarti, R. (2011) 'Audit Firm Size, Audit Fee and Audit Quality', *Journal Of Global Management*, 2(1), pp. 1–13. Available at: [https://mules.ydir.org/audit/midyear/04midyear/dc\\_presentations/DC Presentations - Simunic.doc](https://mules.ydir.org/audit/midyear/04midyear/dc_presentations/DC_Presentations_Simunic.doc).

## Appendix

---

### Exhibit 1 – Survey

---

This survey is being conducted as part of a Dissertation Research at Católica Lisbon - School of Business and Economics: "The Influence of Client Complexity on Audit Quality". The survey is directed to current and former audit analysts. It aims to understand what is the auditors' perception of Audit Quality and Client Complexity, as well as to comprehend how Audit Quality is influenced by Client Complexity from the auditors' point of view. Your answers will be very important to complement the research.

The survey is completely anonymous and will take approximately 5 minutes. If you have any questions, please contact: [152416024@alunos.lisboa.ucp.pt](mailto:152416024@alunos.lisboa.ucp.pt)

Thank you for your time!

**Q1:** Based on your experience, do the following factors contribute to the increase of Client Complexity?

	Definitely not	Probably not	Might or might not	Probably yes	Definitely yes	N/A
Client firm has business divisions in several industries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Client firm has high market share	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Client firm has high R&D expenditures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Client firm has several subsidiary firms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Client is listed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q2:** Based on your experience, what other factors may influence Client Complexity?  
(Optional)

**Q3:** Academics often define Audit Quality as a continuous construct defined by the auditors' degree of assurance that the financial statements faithfully reflect the firm's underlying economics, conditioned on its financial reporting system and innate characteristics.

To what extent do you agree with this definition?

- Strongly disagree
- Disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Agree
- Strongly agree

**Q4:** Based on your experience, would you like to add any comments about your definition of Audit Quality? (*Optional*)

	Definitely not	Probably not	Might or might not	Probably yes	Definitely yes	N/A
More Working Hours	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
High Audit Firm Rotation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
High Audit Team's Experience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
High Client Complexity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
High Likelihood of External Revision	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q5:** Based on your experience, do the following factors improve Audit Quality as defined by academics?

**Q6:** In your opinion, when should Audit Quality be higher?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	N/A
During the first year of the audit firm's tenure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
During the last year of the audit firm's tenure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When auditing a renowned firm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When auditing a listed firm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When the work is likely to be externally reviewed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When the client firm has a complex business	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q7:** Based on your experience, when do you feel you perform a higher quality audit?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	N/A
During the first year of the audit firm's tenure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
During the last year of the audit firm's tenure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When auditing a renowned firm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When auditing a listed firm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When the work is likely to be externally reviewed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When the client firm has a complex business	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q8:** Based on your experience, when do you feel a higher pressure from Managers/Partners?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	N/A
During the first year of the audit firm's tenure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
During the last year of the audit firm's tenure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When auditing a renowned firm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When auditing a listed firm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When the work is likely to be externally reviewed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When the client firm has a complex business	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q9:** Based on your experience, when is the workload higher?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	N/A
During the first year of the audit firm's tenure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
During the last year of the audit firm's tenure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When auditing a renowned firm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When auditing a listed firm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When the work is likely to be externally reviewed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When the client firm has a complex business	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q10:** Based on your experience, when do you feel the quality of supervision from Managers/Partners is superior?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	N/A
During the first year of the audit firm's tenure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
During the last year of the audit firm's tenure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When auditing a renowned firm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When auditing a listed firm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When the work is likely to be externally reviewed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When the client firm has a complex business	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q11:** Based on your experience, when do you feel audit teams are larger?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	N/A
During the first year of the audit firm's tenure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
During the last year of the audit firm's tenure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When auditing a renowned firm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When auditing a listed firm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When the work is likely to be externally reviewed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When the client firm has a complex business	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q12:** Based on your experience, when do you feel audit teams have a more skeptical mindset?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	N/A
During the first year of the audit firm's tenure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
During the last year of the audit firm's tenure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When auditing a renowned firm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When auditing a listed firm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When the work is likely to be externally reviewed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When the client firm has a complex business	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q13:** Based on your experience, how do you think Client Complexity influences Audit Quality?

- Client Complexity decreases Audit Quality
- Client Complexity does not influence Audit Quality
- Client Complexity improves Audit Quality

*If Q13: Based on your experience, how do you think Client Complexity influences Audit Quality?  
= Client Complexity improves Audit Quality*

**Q14:** Why does Client Complexity improve Audit Quality?

- Teams' size is more appropriate in complex clients
- Staff is more experienced in complex clients
- Managers and Partners are more demanding in complex clients
- Managers and Partners are more helpful in complex clients
- Revision is of higher quality in complex clients
- There is a more skeptical mindset in complex clients
- Workload is more appropriate in complex clients
- Others \_\_\_\_\_

*If Q13: Based on your experience, how do you think Client Complexity influences Audit Quality?  
= Client Complexity decreases Audit Quality*

**Q15:** Why does Client Complexity decrease Audit Quality?

- Teams' size is not appropriate in complex clients
- Staff should be more experienced in complex clients
- Managers and Partners should be more demanding in complex clients
- Managers and Partners should be more helpful in complex clients
- Revision should be of higher quality in complex clients

- Mindsets should be more skeptical in complex clients
- Workload is not appropriate in complex clients
- Others \_\_\_\_\_

**Q16:** For how many years do you work in the audit field? (*Optional*)

**Q17:** Gender (*Optional*)

- Male
- Female

## Exhibit 2 – Manager interview script

---

1. DeFond and Zhang (2014) claim that audit quality is a continuous construct that is not fully reflected in the auditors' opinion/report. They define audit quality as the degree of "assurance that the financial statements faithfully reflect the firm's underlying economics, conditioned on its financial reporting system and innate characteristics". To what extent do you agree with the definition provided by DeFond and Zhang (2014).
2. How would you define audit quality?
3. Could you please comment the results obtained in the survey, regarding audit quality?
4. In your perspective, what is client complexity? What makes a client complex?
5. Could you please comment the results obtained in the survey, regarding client complexity?
6. To what extent do you think the proxies found in the literature are able to reflect client complexity?
7. Do you think client complexity influences audit quality? How? Why?
8. Could you please comment the regression results?
9. Finally, could you please comment the fact that the *likelihood that the work is externally reviewed* is a huge driver to superior audit quality, according to respondents?