



Audit Risk Management and Audit Effort in Small and Medium Audit Firms

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ABSTRACT

The purpose of this paper is to analyze audit planning decisions of small and medium-sized Spanish audit firms about risk evaluation and audit effort. Prior research examining audit risk overwhelmingly focuses on the 4 large audit firms, and little is known about how audit planning decisions influence audit risk in smaller firms; a significant part of the audit profession. Thus, it is important to examine the planning judgments in small and medium-sized audit firms and the link between planning risk assessments and the extent of the effort made to achieve an acceptable level of audit risk. Using specific audit engagement data derived from publicly available databases and survey data, this study investigates the factors which explain the risk evaluation of client material misstatement and whether the effort made to execute the audit effectively responds to that risk. We find a significant statistical relationship between audit risk and audit effort, which provides empirical evidence that auditors modify the extent of audit effort based on perceived audit risk and makes the work of the small firms debatable. Additional analysis shows that audit effort (i.e., hours) is significantly influenced by the tenure and the timing of the audit (i.e., peak audit season). However, audit engagements with longer tenure do not adjust their audit effort in response to low management integrity or weak internal controls, which suggests familiarity, that is, auditors may not be so skeptical of management incentives. This paper contributes to the debate on audit quality and whether the size of audit firms serves as an observable characteristic associated with higher audit quality.

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Gestión del riesgo de auditoría y esfuerzo del auditor en pequeñas y medianas firmas de auditoría

RESUMEN

El objetivo de este trabajo es analizar las decisiones de planificación de la auditoría de las pequeñas y medianas firmas de auditoría españolas en relación a la evaluación del riesgo y el esfuerzo de auditoría. Las investigaciones previas se centran casi en exclusiva en las 4 firmas de auditoría grandes y poco se sabe sobre cómo las decisiones de planificación de la auditoría influyen en el riesgo de auditoría en las firmas más pequeñas, una parte muy significativa de la profesión auditora. Por lo tanto, es importante examinar los juicios de planificación en firmas de auditoría pequeñas y medianas y el vínculo entre las evaluaciones de riesgo de planificación y el grado de esfuerzo realizado para lograr un nivel aceptable de riesgo de auditoría. Usando datos derivados de bases de datos disponibles públicamente y datos obtenidos a través de encuestas, este estudio investiga los factores que explican la evaluación del riesgo de error material del cliente y si el esfuerzo aplicado en el desempeño del trabajo de auditoría responde efectivamente a ese riesgo. Encontramos una relación estadística significativa entre el riesgo de auditoría y el esfuerzo de auditoría, lo que proporciona evidencia empírica de que los auditores modifican el alcance del esfuerzo de auditoría en función del riesgo de auditoría percibido y pone en debate el trabajo de las pequeñas empresas. El análisis adicional muestra que el esfuerzo de la auditoría, medido a través de las horas, está significativamente influenciado por la antigüedad del encargo y el momento del trabajo de auditoría (es decir, la temporada alta de auditoría). Sin embargo, los trabajos de auditoría con una antigüedad más larga no ajustan su esfuerzo de auditoría en respuesta a una baja integridad de la administración o controles internos débiles, lo que sugiere familiaridad, esto es, los auditores pueden no ser tan escépticos con respecto a los incentivos de la administración. Este artículo contribuye al debate sobre la calidad de la auditoría y si el tamaño de las firmas de auditoría sirve como una característica observable asociada con una mayor calidad de la auditoría.

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1. Introduction

The objective of financial statement audits is to provide reasonable assurance about the reliability of financial information, specifically that financial statements are free of material misstatements. The occurrence of undetected material misstatements reduces the informative value of financial statements and is viewed, post hoc, as resulting from poor audit quality. For this reason, it is reasonable to expect that audit firms respond to the risk of material misstatement by increasing the planned level of audit effort. If the auditor's planning risk assessment is adjusted in response to higher levels of audit risk¹ by increasing audit effort, then the likelihood of undetected material misstatements is reduced and audit quality is increased. Therefore, the audit effort may be considered a more direct proxy of audit quality than other variables usually employed in archival studies (Aobdia, 2019).

Prior empirical research examining the relationship between audit risk and audit effort has found that audit effort is associated with auditors' planning risk assessments (Davis et al., 1993; O'Keefe et al., 1994; Davidson & Gist, 1996; Simunic & Stein, 1996; Bell et al., 2001; Johnstone & Bedard, 2001; Kizirian et al., 2005). However, previous studies generally examine large audit firms' judgments in the face of risky clients. Thus, little is known about the extent to which small audit firms adjust their audit effort in response to assessed risk and therefore there is a limited perspective of the audit firm which neglects a significant part of the audit profession². The objective of this study is to fill this knowledge gap.

Audits are conducted by the risk model that requires the auditors to evaluate specific client risks and apply a variety of procedures to respond to the assessed risk to maintain the desired level of audit risk. In this sense, to render a high audit quality, the planned audit effort must be sufficiently adjusted for the assessed risk. For this reason, it is expected that auditors have strong incentives to control audit risk through auditor efforts. However, prior research has suggested that small audit firms, in comparison to large firms, may have fewer economic incentives to adjust their effort in response to auditee risk levels. In effect, undetected errors expose large audit firms to potential economic losses because they may be considered liable for user losses and losses that can arise from a damaged reputation due to negative publicity (Palmrose, 1986; Stice, 1991; Dye, 1993). However, it is possible that litigation and poor reputation do not work adequately in the context of small audit firms. These differences might affect both small and large firms' audit planning decisions in the face of their clients' risk levels, and ultimately affect the audit quality provided by both types of audit firms.

While the behaviour of small audit firms may not be affected by issues related to international reputation and liability, the strategies and economic incentives to address audit risk may probably differ from larger audit firms. Therefore, to maintain audit risk at a reasonably low level, small audit firms may also have strong incentives to increase their effort when faced with risky clients. In this paper, we justify that, like large audit firms, small audit firms have economic incentives to offer a high-quality service, such as their local reputa-

tion and the regulatory sanctions they may face in the event of an unacceptably low audit quality. This potential economic effect may incentivize them to maintain reasonably low audit risk levels and increase audit efforts for risky clients. However, in contrast to larger audit firms, small audit firms may find it difficult to meet the higher costs of increasing their audit effort for risky clients due to the competitive pressures in their market segment to keep audit fees low. In conclusion, while the competition for clients may create incentives to substantially reduce audit effort and audit quality (Houston 1999; Pratt & Stice 1994), the need to maintain the local reputation and avoid costly regulatory sanctions generates strong incentives to increase audit effort and audit quality. Hence, the conduct of small audit firms in response to the risk of material misstatement remains as an interesting empirical question to be investigated.

Studies that have addressed this issue analyze fundamentally the Anglo-Saxon context, but empirical evidence of a differentiation of quality by auditor size does not necessarily hold in contexts outside the Anglo-Saxon (Navarro García & Martínez Conesa, 2004; Eilifsen & Willekens, 2008). The Spanish audit market possesses some peculiarities that differentiate it from the Anglo-Saxon context, which generates an interesting scenario to test empirically if small audit firms adjust efforts to audit risk, and therefore offer a similar level of audit quality to international audit firms. In effect, the Spanish context provides an interesting empirical site for several reasons. First, the Spanish market is less mature and developed in comparison to the Anglo-Saxon market, so the Big Four may not have developed the historical reputation of higher quality they have acquired in the Anglo-Saxon environment. While the reputation effect to preserve auditor quality has been validated in Anglo-Saxon settings, previous studies have found that auditor reputation is a local issue and the importance of reputation is higher in common law countries than in civil law countries (Ferguson et al., 2003; Francis et al., 2005). Therefore, whether the auditor's reputation in different countries with different institutional arrangements is equally strong and effective in making them competitive remains as an empirical question (Numan & Willekens, 2012)³.

Second, in contrast to the Anglo-Saxon context, Spanish auditors face significantly less litigation liability costs. In Spain, shareholders' ability to succeed in claims of negligence against auditors is very limited, given that the legal system makes it very difficult for investors to recover losses from auditors that may have resulted from incorrect audited financial statements (Ruiz Barbadillo et al., 2000). The difficulty in winning a lawsuit against audit firms has reduced the perceived risk of litigations. This economic incentive, which works mainly for large international firms, is inefficient in the Spanish context and the incentives for different types of auditors are more similar, so observable differences between large and small auditors are less probable.

Third, Spain shares most of the institutional properties of code-law countries. There are important institutional differences across countries that mean the results of previous literature may not be generalized to different contexts. Governance peculiarities come from the institutional rules and markets where the firm operates. Institutional characteristics such as the legal rules protecting the shareholder's investment and market characteristics such as the development of the financial market and ownership structure affect the need for supervisory activity and can influence how control and supervision of company managers are exerted. La Porta et

¹Audit risk is defined as the risk that auditors will issue a clean audit opinion when the financial statements contain undetected material misstatements (e.g. International Standard on Auditing ISA 315, 330; Public Company Accounting Oversight Board, Auditing Standard PCAOB AS 1101).

²One exception is Niemi (2004) who examines pricing differences arising from product differentiation among small audit firms as a signal for audit quality.

³The evidence concerning the value of auditor reputation in Europe is rather mixed (see Eilifsen & Willekens, 2008).

al. (1999) show that corporate governance structures differ across countries depending on the rules covering the protection of corporate investors, the origin of these rules and the quality of their enforcement. In this sense, while Francis et al. (2003) suggest that the weak legal environment may fail to produce a credible disciplinary mechanism to ensure strong incentives for audit quality, Choi & Wang (2007) suggest that audit quality may play a stronger governance role in weak legal environments than in strong legal environments because they serve as a governance substitute for legal protection of outside shareholders. Therefore, whether the demand for audit quality in different countries with different institutional arrangements is equally strong and effective or not, remains as an empirical question. All the above-mentioned peculiarities of the Spanish audit market stress the importance of analyzing the relationship between auditor size, audit risk evaluations and audit effort.

Unlike previous studies using data from a single auditing firm (O'Keefe et al., 1994; Davidson & Gist, 1996; Simunic & Stein, 1996; Bell et al., 2001; Johnstone & Bedard, 2001), our research takes into account actual audit engagement hours for diverse small audit firms in Spain. Using a sample of audit engagements of small audit firms in Spain, this study investigates whether the audit effort (audit hours) expended in response to the client's risk of material misstatement results in maintaining audit risk at desired levels. This is not only a unique, but suitable setting to evaluate the audit effort of small audit firms because regulations require all Spanish audit firms to disclose their hours spent on each engagement. We use a proprietary dataset of small audit firms to hand-collect the hours and audit fees that auditors report to the Accounting and Auditing Institute (ICAC) in Spain for each engagement, as well as information obtained directly from the collaborating firms based on an auditor survey soliciting specific audit engagement information. Specifically, we randomly select auditors from small firms for the period from 2001 until 2009, and we matched these observations with the SABI⁴ database to determine the client audit risk factors. Finally, we sent the collaborating auditors the list of clients audited by them, asking them to indicate their materiality thresholds for each engagement and to provide their evaluation of the client's internal control, management integrity, and audit tenure. This provided us with a final sample of 898 observations. We found a statistically significant and positive relationship between audit risk and audit effort, thus providing empirical evidence that small audit firms adjust their effort in response to the risk of material misstatement consistent with the audit risk model. The results address the debate about the audit quality in small firms and demonstrate that audit firm size may be a useful, but not sufficient differentiator of audit quality.

Our study contributes to the literature in several ways. First, we study whether audit planning decisions are risk-adjusted in the context of small audit firms, a topic that is not well-studied in audit literature. Studies analyzing the influence of audit risk and audit planning decisions are scarce, being limited usually to larger audit firms. While prior empirical literature in the context of larger audit firms provides some evidence about audit effort, audit risk and audit quality, there is limited research to date that provides an understanding of whether audit risk is associated with audit effort in the context of small audit firms (Gonzalo Angulo & Garvey, 2018). We contribute to the limited existing literature con-

cerning small audit firms' behaviours in the presence of risky clients.

Second, there has been an ongoing debate over the relationship between audit quality and the size of audit firms (e.g., Krishnan & Schauer, 2000; Colbert & Murray, 1998) with many researchers arguing that large audit firms provide higher audit quality in comparison to small audit firms (e.g., DeAngelo, 1981; Nichols & Smith, 1983; Lennox, 1999). We investigated audit quality in small audit firms analyzing audit effort and auditor's assessments of audit risk. In this sense, we provide empirical evidence about the planned audit effort in response to client risk factors for actual audit engagements, a variable that can be considered a more direct proxy for audit quality. This paper provides evidence that auditors in small firms work with the same professional planning models as multinational audit firms by responding to increases in client risk with greater effort to achieve an acceptable level of audit risk. Although the prevalent argument among researchers is that audit quality relates to audit firm size (e.g., DeAngelo, 1981; Lennox, 1999), our findings provide some evidence consistent with regulators who generally contended that quality is not dependent on the size of the audit firm (e.g. Krishnan & Schauer, 2000; Navarro García & Martínez Conesa, 2004).

Third, we study a segment of the audit market in which competition is high, which can negatively affect the level of audit quality provided by small audit firms. Prior research has found that large audit firms are more likely to avoid riskier clients than small audit firms (Johnstone & Bedard, 2004). If audit effort is not adjusted to the risk in the client's financial statements, audit and financial reporting quality is negatively influenced which could lead to investor litigation or regulatory sanctions. The ability of small audit firms to survive may be reduced, which could affect the structure and the competitiveness of the audit market. Following this, regulators around the world have expressed increasing concern over the high concentration of audit engagements performed by larger audit firms, and the effect that the possible lack of competition may have on audit quality (GAO 2008; European Commission 2010). To improve audit quality, it is important to develop and extend the audit market of small audit firms to achieve less concentration in the audit market which is necessary to mitigate any perceived differences in audit quality (Lai, 2013; Cassell et al., 2013; Gómez Aguilar et al., 2018). In this sense, to limit excessive competition in the sub-market of small audit firms and make it possible for these audit firms to be able to recover the cost of the audit and obtain a normal profit through the fees that they charge, regulators could consider regulatory initiatives such as joint audit and audit firm and partner rotation.

The study is structured as follows: in Section 2, we describe the audit risk model and review the literature used. In Section 3, we explain the proposed model and the empirical results of the regressions carried out. The conclusions of our research are described in Section 4.

2. Background and research question

2.1. Audit effort and audit quality

The audit aims to allow financial statement users to assess the reliability of financial information, enhancing their ability to make rational economic decisions. To this end, auditors are expected to minimize audit risk by detecting material misstatements, if they exist, contained in the financial statements during the audit engagement. Audit risk is

⁴Bureau van Dijk. A Moody's Analytic Company. The database contains financial reporting data for Spanish and Portuguese companies. <https://www.bvdinfo.com/en-gb/our-products/data/national/sabi>.

defined as the risk that auditors will issue a clean audit opinion when the financial statements contain undetected material misstatements. Professional auditing standards such as International Standard on Auditing (ISA 315, 330) and Public Company Accounting Oversight Board, Auditing Standard (PCAOB AS 1101) require the audit to be performed based on the audit risk model. This model serves as a framework for evaluating the risk that a material misstatement will occur and creates a basis for audit planning decisions. To evaluate the risk of material misstatement, the audit risk model requires the auditor to assess inherent risk and control risk and determine the acceptable level of detection risk in response to the assessed risk of material misstatement that will result in an acceptable level of audit risk. While auditing standards do not mandate audit risk levels, the standards provide guidance within which auditors should plan the scope of the audit to keep audit risk at low to very low levels. Thus, when the risk of material misstatement is high, auditors should establish detection risk at a reasonably low level to increase the quantity and quality of evidence gathered.

Inherent risk is the probability that financial statements contain a material misstatement before considering the effectiveness of the firm's internal control systems. In assessing the inherent risk, auditors consider various factors that could explain the existence of material misstatements, such as the client's operating environment, the client's industry and the characteristics of management. Control risk is the probability that a material misstatement is not detected by the firm's internal control system. The audit risk model emphasizes the relevance of the firm's internal control system in the detection of material misstatements, so the auditors must obtain an understanding of the internal control structure designed by the company and assess its effectiveness (Kreutzfeldt & Wallace, 1986; Bell et al., 2001). If auditors detect an internal control weakness, they should consider that the control activities designed by the company are not sufficient to detect a material misstatement, and therefore, control risk must be evaluated as high.

Once both the inherent and control risks have been assessed to determine the joint probability of materially misstated financial statements, auditors must determine the appropriate level of detection risk, which, along with audit risk, is the only factor in the audit risk model that auditors control. Detection risk is the risk that the audit procedures performed by auditors do not detect a material misstatement that exists in the financial statements. If auditors assess inherent and control risk as high, there is a strong likelihood that the financial statements contain a material error. In this situation, the auditors must reduce their detection risk to maintain the desired audit risk level. This increases their audit effort through additional time and effort (i.e., labour).

In this way, the audit risk model proposes a theoretical framework that relates audit risk, audit effort, and audit quality. The quality of the audit services is determined by the joint probability that an existing material misstatement is detected (dimension associated with the audit effort) and reported (dimension associated with the audit independence) (DeAngelo, 1981), so the quality of audit services will be higher as audit effort increases. To ensure that the financial statements are free of undetected material error, thus achieving a high level of audit quality, the auditor must plan for more audit effort when confronted with risky clients.

2.2. Small audit firms and audit effort: Research question

Prior research has suggested that large audit firms are more likely to adjust their effort for risky clients than smaller audit firms, so it is usually concluded that audit quality is lower among small audit firms (Colbert & Murray, 1998; Bedard et al., 2008). The assumption that links audit firm size and audit quality rests on economic incentives that audit firms face to provide higher audit quality, especially litigation risk and the loss of international reputation (e.g., DeAngelo, 1981; Dye, 1993). These economic incentives may not work similarly for small audit firms.

However, although small audit firms may not have the same economic incentives as large firms, the sub-market of small audit firms also generates economic incentives to increase the quality of service provided. In effect, even when small and medium auditors do not have an internationally recognized brand name like larger audit firms, small audit firms have local reputational value. This local reputation arises fundamentally because small audit firms have a better understanding of the client's businesses and local industries, which is important to increase their incentives to provide higher audit quality (Peel & Roberts, 2003). Louis (2005) compares audit services in mergers and acquisitions (M&A) for Big 4 and smaller audit firms and finds evidence that small audit firms provide greater value when the firm being acquired is privately owned and when the audit firm plays an advisory role. The paper supports the "superior clientele-advising hypothesis" that small audit firms' partners and staff have close connections with, and the trust of their local business communities. This creates an environment in which the non-Big 4 audit firms are likely to provide superior advice in the acquisition and valuation of private firms by attracting better investors and reducing the cost of capital. Reichelt & Wang (2010) also highlight the importance of network synergies of local auditors to explain better audit quality. They conclude that individual auditors' local connections and deep industry knowledge at the office level are important factors in delivering higher-quality work. Thus, there is a local reputational effect for small audit firms. Further, small firms are also motivated to signal reputation. For example, Read, et al. (2004) find evidence that many local and regional audit firms with no SEC clients voluntarily register with the SEC to signal their audit quality to their stakeholders. In this sense, small audit firms also face local reputational damages.

In addition, small firms face higher scrutiny by regulators concerned with these firms offering a lower audit quality than legally required. Recent research also considers the size of the audit firm as an explanation for the risk of regulatory sanctions in the market of small audit firms. Sundgren & Svanström (2013) estimate the quality of audits based on disciplinary sanctions. They find a positive association between sanctions and the size only in the subsample of small auditors, not for Big 4 audit firms. Thus, regulatory sanctions may act as economic incentives that result in increased audit quality. In this sense, De Fuentes et al. (2015) have found that of the total number of sanctions imposed by the Accounting and Auditing Institute (ICAC) in Spain between 1992 and 2010 (478 sanctions), 451 have been to small audit firms, which emphasizes the importance that this incentive can have in the context of small audit firms.

However, despite these economic incentives it is necessary to highlight that, due to continued fee pressure in the market segment of the small audit firms, it may be more difficult for them to charge their risky clients the cost of increasing their audit effort. Small audit firms may also find it difficult to adjust their audit effort to their clients' risk levels due to

competition in the audit sub-market of small firms. There is presumably a higher level of market competition for clients than in the sub-market of the large audit firms due to the lack of strong entry barriers for other small audit firms. This characteristic means that there is a greater number of firms competing in the market, and since these firms cannot develop a differentiation strategy, all small firms in the market may be perceived as perfect substitutes. Therefore, to increase their competitiveness small firms may attempt to differentiate themselves using a strategy based on audit fees charged. As a result of the highly price-competitive sub-market in which small audit firms operate, they can develop aggressive strategies to retain clients by reducing the cost of the engagement (Houston 1999)⁵. Ghosh & Lustgarten (2006) attribute the difference in fee setting to the difference in the overall level of competition in the two subsectors, finding that the audit fee discount is 4% for large audit firms, compared to 24% in small audit firm market. Hence, while larger audit firms transfer the cost of increased effort to their clients (Bell et al. 2001), small audit firms face strong competitive pricing pressures, so they may choose lower audit quality to reduce cost and maintain clients. This question makes it interesting to analyze firstly whether in the context of small audit firms, the loss of local reputation and the cost of sanctions generate the same incentives as international reputation and litigation risk in large audit firms, and secondly, whether the incentives that adjust their audit effort to clients' risk level outweigh the difficulty involved in charging their risky clients the cost of increasing audit effort.

In summary, the preceding discussion suggests that the question of how small audit firms increase their audit effort on audit engagements with significant audit risk could be analyzed in the context of the trade-off between the desire to maintain their local reputation and avoid regulatory sanctions and the difficulty to increase audit fees adjusted to audit effort. On one side, whether the economic incentives to increase audit effort when dealing with risky clients are greater than the difficulty of recouping the cost of additional audit effort, the small audit firm likely increases the audit effort when challenged with audit risk. However, on the other hand, if small audit firms are not able to recoup the cost of any unexpected business risk that requires increased effort, the incentives could have a negative shift, influencing their audit strategy in response to assessed risks. To verify which of the two effects is dominant in the auditor's behaviour, we issue the following research question:

RQ: Do small audit firms adjust their audit efforts to the audit risk level of their clients?

3. Sample selection and empirical methodology

3.1. Sample description

The collection of data for the period 2001-2009 was based on the information obtained according to the following process, and limited, to some extent, by its availability. During a congress attended by one of the authors of this study, many small audit firms were contacted, requiring them to have at least ten or more clients and that auditing was their main activity. The objective of the study was explained to these

firms and the information required, assuring the confidentiality with which the data would be treated. They were also informed that the results would be made available to them. Initially, 21 companies expressed interest in participating in the study, although only 11 provided us with the data definitively. Despite the number of companies that participated in this study, what is important to highlight is the high number of audit engagements we dealt with, a much higher number than the rest of the studies that normally deal with single-firm engagement, generally large auditing firms.

We gathered information from their regulatory filings with the Spanish Accounting and Auditing Institute for 2001 through 2009, which represents the years when these audit firms reported their audit fees. A total of 1,884 observations of hours and audit fees of different engagements were obtained. From these observations, we eliminated voluntary audits, since the size of these clients is considerably smaller, and previous studies show that auditors focus on clients differently, depending on the dimension of the audited company (Frishkoff, 1970; Wright & Wright, 1997; Costigan & Simon, 1995). To avoid the influence of these audits on the results, 184 observations referred to as 'voluntary audits' were eliminated. The sample represents 1,700 observations from a total of 607 audited companies for nine years.

Finally, the information obtained was merged with hand-collected economic and financial data taken from the SABI database to determine the audit risk factors. The observations that did not match the SABI database were removed. Finally, we sent the collaborating auditors the list of companies audited by them and a survey about 1) their planning materiality thresholds relating to each audit engagement; 2) their evaluation of each client's internal control and 3) their assessment of each client's management integrity. This provides us with a final sample of 898 observations. Panel A of Table 1 shows the sample composition per year, and Panel B shows the sample composition per business sector.

Table 1. Sample characteristics per year and sector

Panel A: Sample characteristics per year		
Year	Frequency	Percentage
2001	3	0,33%
2002	16	1,78%
2003	79	8,80%
2004	123	13,70%
2005	131	14,59%
2006	156	17,37%
2007	143	15,92%
2008	123	13,70%
2009	124	13,81%
TOTAL	898	100,00%
Panel B: Sample characteristics per industry		
Industry	Frequency	Percentage
Industrial	174	19,38%
Agriculture	28	3,12%
Construction	215	23,94%
Supply	3	0,33%
Services	103	11,47%
Consumer goods	375	41,76%
TOTAL	898	100,00%

3.2 Audit effort model

The model used in this paper considered audit effort as a function of inherent audit risk, control audit risk and a set of

⁵According to prior research (Deis & Giroux, 1992), when the competition in the audit market is high, it is easier for the client to replace the auditor than it is for the auditor to replace lost business, thereby leading to an opportunistic reduction in the audit quality level to retain the client.

other variables that prior research has found associated with audit effort (Johnstone & Bedard, 2001; Davis et al., 1993; Houston et al., 1999). To measure the effect of internal control risk and inherent risks on the audit engagement hours, we examined the factors that could affect the complexity of the audit engagement and lead to increased audit effort. The proposed model is based on a model used by Johnstone & Bedard (2001), Davis et al. (1993) and Houston et al. (1999).

$$HOURS = f(INHERENT\ AUDIT\ RISK, \\ CONTROL\ RISK, CONTROL)$$

The dependent variable (HOURS) gathers the audit hours declared to the Spanish Accounting and Auditing Institute and measures the effort made during the engagement. The audit engagement hour is the most effective proxy to evaluate the audit effort and is measured as the natural logarithm of the hours used (Simunic & Stein, 1996; Bell et al., 2001; Johnstone & Bedard, 2001).

Several variables are used as proxies for inherent risk. Receivables and inventories have been considered by previous literature as the components of the financial statements which are the most susceptible to material misstatement and therefore have a higher inherent risk. We introduce the variable CATA as the sum of receivables and inventories scaled by total assets (Simunic, 1980; Francis & Simon, 1987; Palmrose, 1983; Davidson & Gist, 1996). We expect that the higher the value of CATA, the higher the inherent risk of the company and therefore, a positive relationship between this variable and the auditor's effort is expected.

Similarly, uncommon company growth could be considered an inherent risk. We calculate the sales growth VARS-ALE (total sales for this year minus the total sales for the previous year) and expect that the higher the value, the higher the inherent audit risk. Following Johnson & Lys (1990), rapid growth in the firm's operations usually increases the transaction volume and accounting complexity. For example, auditing standards suggest that auditors should presume that there is a higher risk related to improper revenue recognition⁶. Therefore, we expected a positive relationship between this variable and the auditor's effort (Hall & Renner, 1988).

Auditors learn about the audit risk associated with a client over time, prior research has suggested that a new client is an important inherent risk factor. A new client means less client-specific knowledge, and therefore a greater risk of unexpected misstatement. To alleviate the lack of client-specific knowledge, auditors must increase audit efforts. NEW is an indicator variable that takes the value 1 if the client is new to the auditor and 0 otherwise (Simunic, 1980; Niemi, 2004; Bell et al., 2008).

As suggested by prior research, the lack of integrity in client management provides useful information about the risk of material misstatement. This lack of client management integrity increases inherent risk and therefore the audit effort (e.g., Bedard & Johnstone, 2004; Tsui et al., 2001; Carcello et al., 2002). We measured the perceived manager's integrity by the auditor as a rating: high, medium or low through two dichotomous variables. The variable HIGHINT takes the value 1 when auditors perceive high integrity in management and 0 otherwise, while, LOWINT takes the value 1 when auditors perceive low management integrity and 0 otherwise, so medium integrity acts as a base category. We expect a positive relationship between LOWINT and audit hours and a

negative relationship between HIGHINT and the audit effort made.

To measure control risk, we used the evaluation of internal controls made by the auditor during the planning phase of the audit. Weak internal control increases management discretion over the financial statement increasing the risk of material misstatement (Bedard & Johnstone, 2004; Hoitash et al., 2007; Hogan & Wilkins, 2008). To evaluate the control risk, we use the auditor's assessment of reliance on the internal control system: high, medium and low. Two dichotomous variables have been used. HARDIC takes the value 1 if auditors place high confidence in internal control, and 0 otherwise. WEAKIC is 1 when auditors have found internal control deficiencies, and 0 otherwise. We expect a positive relationship between weak internal controls and audit hours and a negative relationship between the variable for strong internal controls (HARDIC) and the audit effort made.

In addition, we introduced several variables that the extant literature has shown to be associated with the audit effort. We introduced the following variables: MATERIALITY, SIZE, SERVICES, LOSS, ROI, LEVERAGE, GCOPINION and SPANISH FINANCIAL ACT.

Auditors determine materiality by establishing an acceptable audit risk level and evaluating inherent and control risks (Houston et al., 1999). From this, the detection risk is determined, which in turn drives the nature, timing and extent (effort needed) of audit evidence gathered. A negative relationship between the variable MATERIALITY and audit effort is expected, because a higher materiality implies less evidence gathered and fewer hours spent by the audit team.

The variable SIZE captures the complexity of the auditee. It has also been noted in the literature that companies which have more complex business operations require more audit work (O'Keefe et al., 1994; Choi et al., 2010). As surrogates of the complexity of the client's operations, we have used the SIZE variable which is measured as the logarithm of total assets. A positive relationship is expected between this variable and the audit effort.

Auditors' efforts depend on their experience with a particular company so that the provision of non-audit services could be associated with audit efforts. Johnstone & Bedard (2004) argue that companies that require other services of audit firms can face problems that need important organizational changes and therefore require more extensive work. However, the provision of non-audit services may make the auditor more efficient in the production of audit services. Thus, the audit effort could be negatively associated with non-audit services. For this reason, we cannot predict the sign of the variable. The variable SERVICES distinguishes those engagements during which the auditor also provided other types of services.

We also control the effect of the potential financial problems that may affect the audit effort (Prawitt et al., 2011). In this sense, four variables have been introduced in our models to control the effect of client risk. The LEVERAGE variable has been measured as a total of debts between the total of assets (Wu et al., 2016; Sierra-García et al., 2012). A positive relationship is expected, since the auditor will increase their effort for those companies that have high indebtedness (Messier et al., 2011). The ROI variable is measured as profits before taxes divided by total assets and a negative relationship is expected with the audit effort (Velte, 2018). The LOSS variable is a dichotomous variable that takes the value 1 if the company has incurred losses in the previous year, and 0 otherwise (DeFond & Zang, 2014). Given that loss-making companies have a higher level of risk for the auditor, a pos-

⁶Staff Audit Practice Alert No. 12 (PCAOB); https://pcaobus.org/Standards/QandA/9-9-14/_SAPA/_12.pdf.

itive relationship is expected between this variable and the auditor's effort (Zaman et al., 2011). Finally, we have introduced the GCOPINION variable that takes the value 1 when the company has received a going-concern opinion and 0 otherwise. In many instances, the decision about what type of audit report to issue to the client involves negotiation with the client. These negotiations are particularly sensitive in the case of a financially stressed client facing the possibility of receiving a going-concern qualified opinion, where we expected a positive relationship between this variable and the audit effort.

We also control the effect of change in the legal environment on audit efforts, concretely the passage of the Spanish Financial Act. Prior international research (Geiger et al., 2005; Geiger & Rama, 2006; Feldmann & Read, 2010) has suggested that new regulations can be considered as an exogenous shock that could explain auditor behaviour. The Spanish Financial Act produced a major revision of the audit regulatory system, particularly concerning its framework for auditor independence. The Financial Act prescribed new independence requirements and restrictions for auditors of publicly traded companies, specifically prohibiting auditors from providing several non-audit services to their audit clients and introducing mandatory audit partner rotation. For this reason, we expected a positive relationship between the issuance of the Financial Act and the auditor effort. The variable Spanish Financial Act (SPANISH FINANCIAL ACT) takes

the value 1 from the year 2003, the first year audited after the passage of this law, to 2009, and 0 otherwise.

Finally, we also include audit firm, year and industry effects (Wang & Chui, 2015). The variable audit firm controls the political measures of the different audit firms regarding the audit effort. The indicator variable INDUSTRY controls the differential complexity across industries. We segment our sample according to the clients' Spanish industry codes (CNAE) for the following activities: Agriculture, Industry, Construction, Supplies, and Consumer Goods and Services. Lastly, we introduce dichotomous year variables (YEAR) to control macroeconomic factors that can change over time.

Table 2 shows the variables that were used in this study (other than the industry and year variables) and describes the way that they were measured and their expected signs.

4. Empirical results

4.1. Statistical descriptions

The descriptive data in Table 3 reveals that inherent risk for the companies included in our sample is relatively low since inventories and debts make up only 35% of their assets (CATA), and variation in net turnover (VARSALE) only increases by 9.2% on average. Further, auditors participating in our study indicate that 76% of their clients have high management integrity, and only 9% of the companies are considered to have low management integrity, which suggests that the likelihood of irregularities (i.e., intentional misstatements) is low. Thus, for the companies in our sample, the data suggests that there is a low probability of misstatements before considering the effectiveness of the firm's internal control systems. However, because of the subjective nature associated with the valuation components of inventory and accounts receivable, the inherent risk may be considered high, resulting in greater time spent auditing these areas. To control risk, almost half of the audited companies were perceived by the auditors to have strong internal controls, while only 13% of the companies in the sample were perceived to have a weak internal control.

Table 2. Description of the variables

Variable	Description	Label	Expect Sign
HOURS	Logarithm of the number of hours that the auditors declare in each engagement	continuous	n/a
CATA	Receivables plus inventories divided by total assets	continuous	+
VARSALE	(Sales figures for the year "n" - Sales figures for the year "n-1") %	continuous	+
NEW	1 if it is a new client; 0 otherwise	dichotomous	+
HIGHINT	1 when the integrity of the managers perceived by the auditor is high	dichotomous	-
LOWINT	1 when the integrity of the managers perceived by the auditor is low	dichotomous	+
WEAKIC	1 when the auditor evaluates the Internal Control of the client as weak and 0 otherwise	dichotomous	+
HARDIC	1 when the auditor values the Internal Control of the client as strong and 0 otherwise	dichotomous	-
MATERIALITY	Materiality fixed by the auditor for the performance of the work divided by the total assets in %	continuous	-
SIZE	Natural logarithm of total assets	continuous	+
SERVICES	1 when the auditor has provided additional audit services	dichotomous	?
LEVERAGE	total of debts between the total of assets	continuous	+
ROI	profits before taxes divided by total assets	continuous	
LOSS	1 if the company has incurred losses in the previous year; 0 otherwise	dichotomous	-
GCOPINION	1 when the auditor issue a going concern opinion; 0 otherwise	dichotomous	+
SPANISH FINANCIAL ACT	1 for year 2003 to 2009; 0 otherwise	dichotomous	+

Table 3. Descriptive Statistics

	Mean	Standard Deviation	Minimum	Maximum
HOURS	132.53	46.39	15,00	390,00
CATA	0.35	0.23	0,00	0,98
NEW	0,11	-	0	1
VARSALE	9,198	0,955	-0.001	12,158
HIGHINT	0,76	-	0	1
LOWINT	0,09	-	0	1
WEAKIC	0,13	-	0	1
HARDIC	0,47	-	0	1
MATERIALITY	14,389	2,331	0,247	22,791
SIZE	9,10	0,92	4,62	13,37
SERVICES	0,07	-	0	1
LEVERAGE	0,663	0,345	1,88	0
ROI	0,05	0,03	-1,87	0,639
LOSS	0,08	-	0	1
GCOPINION	0,01	-	0	1
SPANISH FINANCIAL ACT	0,9789	-	0	1

Audit tenure is on average less than what the regulatory bodies regard as long tenure, which is generally considered to be between seven and nine years. Further, only 7% of

the participating audit firms in our sample rendered services other than financial audits, and approximately 90% reported that they did not bill fees for the non-audit services that they rendered. This is a characteristic of small and medium-sized audit firms (Monterrey & Sánchez, 2007; Carmona & Momparler, 2011).

Table 4, Panel A shows the total audit engagement hours for companies in our sample. The mean values of this variable are described in panel B for different periods of our study to analyze the temporal evolution. Panel C shows the industry distribution of the hours (mean values). Finally, Table 5 reports the bivariate correlations among variables; the Pearson correlation matrix, demonstrates that only 33 out of 120 correlations analysed are significant, with 0.471 being the largest correlation (variables LOWINT and WEAKIC), making the presence of multicollinearity very unlikely in our model (see Gujarati 1997).

Table 4. Descriptive statistics engagements hours

Panel A: Descriptive statistics hours									
Variable	Average	Deviation	Minimum	Maximum					
Hours	132,53	46,39	15	390					
Panel B: Temporary distribution of hours									
Variable	2001	2002	2003	2004	2005	2006	2007	2008	2009
Hours	131,67	142,25	139,45	141,53	137,63	127,56	131,93	125,54	126,48
Panel C: Industrial distribution of hours									
Variable	Agriculture	Industry	Construction	Supplies	Consumables	Services			
Hours	107,57	146,24	138,69	161,67	128,59	116,81			

Supporting the lack of multicollinearity, the variance inflation factors (VIFs) for the effort Model are reported in the corresponding Tables 6, 7, 8 and 9. In general, values around the threshold of 1 mean that there is no correlation between one explanatory variable and the remaining explanatory variables. Although there is no consensus on the acceptable value of VIFs, the general rule is that values equal to or exceeding 4 warrant further investigation. Our results widely comply with this limit. Thus, multicollinearity among our variables is not a severe problem (see Gujarati 1997).

Table 5. Correlation matrix

	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15
V1	1	0,016	0,056*	-0,074**	0,020	0,016	0,024	0,097**	-0,036	-0,023	0,110***	0,003	0,167***	-0,021	0,023
V2		1	0,013	0,029	0,012	0,029	0,155**	0,090**	-0,002	-0,016	-0,005	0,045*	-0,036	0,024	0,098**
V3			1	-0,153***	-0,143**	0,253***	0,011	-0,096**	-0,057*	-0,022	-0,002	-0,025	0,036	0,056*	0,021
V4				1	0,495***	-0,291***	-0,012	0,023	0,106***	-0,014	-0,004	-0,142**	-0,023	0,046**	0,014
V5					1	-0,371**	-0,035	0,015	0,085*	-0,018	0,023	0,064*	0,032	-0,091**	0,067
V6						1	0,092**	0,020	-0,026	-0,076*	0,025	-0,040*	-0,018	-0,171***	0,032
V7							1	0,132**	-0,012	0,007	-0,017	0,098**	0,079*	0,026	0,087
V8								1	-0,027	0,107***	-0,110***	0,017	0,037	0,038	0,012
V9									1	-0,007	-0,039	0,116***	0,020	0,076**	0,021
V10										1	-0,053	-0,021	-0,027	-0,010	0,011
V11											1	0,023	0,023	0,043*	0,035
V12												1	0,234***	0,025	0,041
V13													1	0,056	0,032
V14														1	0,028
V15															1

The statistical significance is expressed in asterisks, at probability levels higher than 90%(*), 95%(**) and 99%(***)

V1.CATA	V6.HARDIC	V11.LEVERAGE
V2.VARSALE	V7.MATERIALITY	V12.ROI
V3.HIGHINT	V8.SIZE	V13.LOSS
V4.LOWINT	V9.SERVICES	V14.GCOPINION
V5.WEAKIC	V10.NEW	V15.SPANISH FINANCIAL ACT

4.2. Multivariate results

This study is developed using panel data of 898 firm-year observations for the period 2001-2009. Empirically, regression models employ the panel generalized method of moments (GMM) which estimates to control unobservable heterogeneity. Panel data enhance the consistency and explanatory power of the regression analysis at the same time as providing more informative data and greater variability. They also allow unobservable heterogeneity to be controlled. The presence of heteroscedasticity and autocorrelation serial problems that our regression effort models suffer (we have corroborated by the Wald test and Wooldridge test, respectively) implies the use of an estimator that guarantees that these problems are controlled⁷. Concretely, this research addresses these issues by employing the dynamic panel GMM (Arellano & Bond, 1991), specifically the two-step estimator proposed by Roodman (2009). GMM controls heteroscedasticity and serial autocorrelation, employing lagged values as suitable instruments.

We find evidence that five of the six experimental variables used to measure audit risk are statistically significant, which shows that small audit firms increase the effort (hours) according to audit risk models like large audit firms.

Inherent Risk Factors

First, for CATA there is a positive and significant relationship with audit effort ($t= 3.256$, $p < 0.000$) indicating that higher risk associated with trade receivables and inventory results in greater audit hours. Accounts that require approximations based on value judgments by management increase inherent risk and, as such auditors are likely to expend more effort to assess the reasonableness of the estimates also valuation, and reconciliation of related accounts. Both trade receivables and inventories have a subjective component due

⁷In relation to heteroscedasticity, we use the modified Wald test under the null hypothesis of homoscedasticity. The test result shows that the null hypothesis at 99 percent confidence is rejected; there is a problem of heteroscedasticity. Regarding the serial autocorrelation, the Wooldridge test is proposed under the null hypothesis of no autocorrelation problems. Its p-value allows rejection of the null hypothesis at a 99 percent confidence level, supporting the existence of autocorrelation problems.

Table 6. Estimation of the effort model

Variable	Expected Sign	Coefficient	Statistic	Level of significance
Experimental Variables				
CATA	+	0,126***	3,256	0,000
VARSALE	+	0,132***	2,697	0,000
NEW	+	0,218***	3,347	0,000
HIGHINT	-	0,017	0,731	0,456
LOWINT	+	0,152***	1,989	0,000
WEAKIC	+	0,148***	2,072	0,000
HARDIC	-	-0,162***	-3,210	0,000
Control Variables				
MATERIALITY	-	-0,321***	-4,376	0,000
SIZE	+	0,129***	3,022	0,000
SERVICES	?	0,001	0,654	0,396
LOSS	+	0,102***	2,784	0,000
ROI	-	-0,018***	-1,986	0,000
LEVERAGE	+	0,097***	3,543	0,000
GCOPINION	+	0,001	0,623	0,823
SPANISH FINANCIAL ACT	+	,001	0,323	0,798
Firms control	YES			
Industry control	YES			
Temporal control	YES			
Z	Prob>chi2: 0.000			
AR (2)	Prob<z: 0.238			
Hansen test	Prob<chi2: 1.000			

Z is a Wald test of the joint significance of the reported coefficients under the null hypothesis of no relationship; AR (2) is serial correlation tests using residuals in first differences, under the null hypothesis of no serial correlation; Hansen is a test of over-identifying restrictions under the null hypothesis of non-correlation between the instruments and the error term;

VIF values CATA: 1,236; VARSALE: 1,798; NEW: 1,034; HIGHINT: 1,176; LOWINT: 1,012; WEAKIC: 1,240; HARDIC: 1,373; MATERIALITY: 1,098; SIZE: 1,604; SERVICES: 1,371; LOSS: 1,469; ROI: 1,031; LEVERAGE: 1,154; GCOPINION: 1,318; SPANISH FINANCIAL ACT: 1,496

to valuation considerations, whether due to the uncollectibility of customers' trade receivables or the estimation of inventory obsolescence. As an example of the relationship between CATA and audit effort, the variation in receivables turnover is positive and statistically significant. This relationship is indicative of the auditor's increasing inherent risk because the longer it takes for receivables to turnover, the more likelihood there is for the client to experience collection difficulties, which could require a higher valuation allowance.

As we expect, VARSALE and NEW are statistically significant. Rapid sales growth will increase the volume and complexity of substantive auditor testing, an increase in inherent risk that is offset by hours of work. The effort in hours of a new client is greater due to less client-specific knowledge, and therefore a greater risk of unexpected misstatement.

About variables used to measure the inherent risk that were obtained directly from the auditors' evaluations, we found that auditors only increase their effort when they perceive managers' integrity as low ($t = 1.989$, $p = 0.000$), which is consistent with the audit risk model. Management integrity impacts the persuasiveness of evidence provided by management, as well as the extent of planned audit procedures. Small audit firms that perceive management as having low integrity spend more time on their audits, while auditors that perceive their clients' systems of internal controls as strong show no substantial effects. Thus, when management integrity is assessed as low auditors are likely to be more sceptical of client-provided evidence, especially in situations where financial reporting entails more subjective accounts (e.g., valuation estimates). As a result, the auditor should design and perform alternative procedures to check the quality of the information provided by the client's management.

Indeed, Kizirian et al. (2005) found that assessments of management integrity are negatively related to the nature, timing and extent of audit evidence gathered. While our results indicate that auditors respond to low management integrity consistent with the audit risk model, there may be an optimistic bias on the part of auditors in our sample, in that 76% of the auditors indicated that the client management is of high integrity. Overall, the findings for these variables support the assumption that auditors increase their effort when a firm's inherent risks are greater.

Control Risk

Regarding the indicators used to measure control risk, it should be highlighted that both weak ($t = 2.072$, $p = 0.000$) and hard ($t = -3.210$, $p = 0.000$) internal controls are significantly related to audit effort, although they have opposite effects. The weaker the internal control, the more audit effort is necessary. If auditors evaluate the internal control as weak, they should gather a greater amount of evidence using substantive tests. This requires spending more hours to reduce the risk that audit procedures used will not detect a material misstatement if one exists. By contrast, if internal controls are strong, the required effort will be lower. These findings demonstrate that auditors adjust the nature and extent of audit effort as prescribed by the audit risk model. Thus, we can also affirm that auditors increase their efforts when control risk increases.

The variable MATERIALITY is statistically significant ($t = -4.376$, $p = 0.000$) and has an opposite effect compared to audit effort. In other words, if the materiality level for recognizing a significant error is high, the effort spent will be low, even less than 32 per cent. The other control variables are also statistically significant ($p < 0.10$), except the variable SERVICE and SPANISH FINANCIAL ACT. We found that the level of auditor effort was not affected by the passage of the Financial Act, probably because a large part of the new requirements introduced in the new law were aimed at public companies, which are normally audited by large international firms. On the other hand, the important regulatory intervention on the audit market proposed by the Financial Act has generated conflicting opinions in Spain (see De las Heras et al., 2012; Ruiz Barbadillo, 2016). In addition, it has been suggested that in the context of the United States of America, positive changes in auditor reporting behaviour post Sabarnes-Oxley Act (SOX) 2002, (e.g., see Geiger et al., 2005; Nogler, 2008; Li, 2009) could have been driven significantly by other factors, such as the profession reacting to an increased questioning of the role and performance of auditors that occurred post-Enron and also in the immediate aftermath of the global financial crisis that started in 2007 (see, for example, Geiger et al., 2005; Geiger & Rama, 2006; Feldmann & Read, 2010). Indeed, as Geiger et al. (2005, 34) emphasized, increased auditor conservatism post-SOX could have been a temporary blip due to the "bright lights" shone on the profession by the media and legislators⁸.

⁸In effect, after the intense scrutiny stimulated by a series of high-profile corporate collapses, any increase in auditor conservatism could have been driven by a corresponding increase in auditors' expected liability. Given that SOX empowers the Federal Court and the SEC to impose equitable remedies for the violation of federal securities laws, it is probable that the increased threat of litigation in post-SOX years increased auditor conservatism. Therefore, changes in reporting behavior may not be primarily related to SOX, but could be more directly related to auditors becoming more conservative in order to reduce potential litigation costs.

5. Other analyses as robustness check

To verify that the results obtained are robust we have carried out several additional analyses that seek to control different situations that could affect the audit firm effort, such as the length of the auditor-client relationship, the peak season and the economic dependence. We estimate the audit effort model with restricted samples and compare the results in different contexts.

5.1. Audit risk, audit effort and the length of the auditor-client relationship

We analyze the potential effects of audit tenure on audit efforts. This relationship is important because the evaluation of risk factors can be altered as audit tenure increases. In effect, on one side, the client-specific knowledge will increase over time when the client's accounting system, internal controls, operations and the industry within which the client's firm is operating are better known (Beck et al., 1988; Chi & Huang, 2004). Therefore, in comparison with short-tenure auditors, as the tenure increases, a learning experience may take place that facilitates audit firms to detect and evaluate audit risk factors. However, on the other hand, long auditor-client engagements can have adverse effects on audit efforts. In effect, long tenure has the potential to create closeness between the auditor and the client to lead to less objectivity in the auditor's behaviour, where a "learned confidence" in the client is developed (Hoyle, 1978; Arruñada & Paz-Ares, 1997). This learned confidence could result in the auditor making assumptions about outcomes and using less rigorous audit procedures or static audit programs (Johnson et al., 2002). This argument suggests that in comparison with short-tenure, auditors are more likely to reduce the level of skepticism needed for an effective audit (audit risk factors) as the length of the auditor-client relationship increases.

However, the net effect of the increase of client-specific knowledge and the loss of professional scepticism on risk assessment as the length of the auditor-client relationship increases is an empirical question that must be evaluated. To this end, we estimate the audit effort model across different sub-samples depending on the length of the engagement between the audit firm and the client. Specifically, we compare the effort model to short-term (if the engagement is four years or less) with long-term (if the engagement is longer than eight years) such as suggested by Johnson et al., (2002) and Gul et al., (2007). This allows us to determine whether the audit effort is affected by the duration of the engagement. Table 7 reports the results from the re-estimating of the audit effort model according to the two subsamples⁹.

We found that proxies for inherent risk are significant for all of the sub-samples. However, management integrity is not significant in the long-term sample and auditors are more likely to focus on other risk factors. But as tenure increases, they focus less on qualitative risk factors, such as management integrity except in the case of clients classified by the

⁹By defining these different periods, our aim is to create scenarios where either the learning effect or loss of skepticism affects the auditor's effort. However, it is likely that, as you point out, the cut-off points chosen may be arbitrary. To analyse this aspect, we have repeated our study by altering the cut-off points. Specifically, we performed two new analyses in which the cut-off points used were as follows:

- Short term: 3 or less years; long term: 7 or more years.
- Short term: 5 or less years; long term: 10 or more years.

The results obtained (which have not been tabulated for reasons of space) reveal that the effects are qualitatively similar to our primary analysis.

Table 7. Estimation of effort model by length of contract duration

Variable	Short term	Long term
	Coefficient (Statistic)	Coefficient (Statistic)
Experimental variables		
CATA	0,128*** (2,403)	0,223*** (3,656)
VARSALE	0,147*** (2,615)	0,153*** (2,849)
NEW	0,169*** (3,317)	n/a
HIGHINT	-0,087 (-0,074)	0,129 (1,109)
LOWINT	0,198*** (3,323)	0,092 (0,412)
WEAKIC	0,578*** (4,693)	0,102 (0,843)
HARDIC	-0,348*** (-3,138)	-0,219*** (-2,261)
Control Variables		
MATERIALITY	-0,127*** (-1,925)	-0,267*** (-2,910)
SIZE	0,325*** (3,116)	0,245 *** (3,328)
SERVICES	0,001 (0,234)	0,002 (0,392)
LOSS	0,168*** (2,154)	0,153*** (2,239)
ROI	-0,139*** (-1,824)	-0,152*** (-1,712)
LEVERAGE	0,145*** (1,539)	0,138*** (1,625)
GCOPINION	0,006 (0,599)	0,005 (0,547)
SPANISH FINANCIAL ACT	0,002 (0,581)	0,003 (0,574)
Firm Control	YES	YES
Industry control	YES	YES
Temporal control	YES	YES
Observations	377	254
Z	Prob>chi2: 0.000	Prob>chi2: 0.000
AR (2)	Prob<z: 0.426	Prob<z: 0.352
Hansen test	Prob<chi2: 1.000	Prob<chi2: 1.000

Z is a Wald test of the joint significance of the reported coefficients under the null hypothesis of no relationship; AR (2) is serial correlation tests using residuals in first differences, under the null hypothesis of no serial correlation; Hansen is a test of over-identifying restrictions under the null hypothesis of non-correlation between the instruments and the error term;

VIF values CATA: 1,592; VARSALE: 1,773; NEW: 1,681; HIGHINT: 1,640; LOWINT: 1,205; WEAKIC: 1,693; HARDIC: 1,696; MATERIALITY: 1,328; SIZE: 1,498; SERVICES: 1,701; LOSS: 1,460; ROI: 1,842; LEVERAGE: 1,254; GCOPINION: 1,322; SPANISF FINANCIAL ACT: 1,284

auditor as low integrity and short tenure. For the first four years of the engagement, the auditors increase their effort by almost 20 per cent to compensate for the low integrity of their clients, although, in the long term, this relationship is not statistically significant, which we interpret as the company's and manager's knowledge that corrects inherent risk. Regulators have expressed concerns that when auditors have long tenure with a client they may become less skeptical and as a result, audit quality is decreased.

We also found that internal control effectiveness is significant across all sub-samples and in the direction dictated by

the audit risk model. Specifically, if the auditor believes that internal controls are strong, audit effort will decrease. However, when the effect of weak internal controls on audit effort is lower, it is not statistically significant for the long-term sub-sample. This suggests that as tenure increases auditors may over-rely on their testing in prior years and not appropriately adjust their audit effort in subsequent ones. Additionally, when the engagement spans a period longer than eight years, the audit firm may face a loss of knowledge due to changes inside the audit team. Further, materiality and size are statistically significant in both periods. However, the increase of client-specific knowledge related to materiality level explains a higher reduction of effort in the long-term which could reflect the effect of familiarity with the client to the extent that auditors take a “same as last year” approach. Because of that, we tested the sensitivity of our results to the period cutoff date.

5.2. Audit risk, audit effort and peak season

Auditors of financial statements have peak seasons that correspond to the period when most companies close their annual accounts at the end of the tax year, often on December 31st. Depending on whether the audit work is performed during peak season, the audit strategies used could differ. We tested the sensitivity of the model in peak season where auditors have greater time constraints to analyze a possible change of strategy. This intensity may not depend so much on the closing date, but on the date when the report is issued. There may be companies with a different closing date from December 31st where work is carried out at the same time of the year as those with a closure that matches the calendar year. We considered the “auditor’s offseason” from June 15th to December 31st.

In audits carried out during periods of high workload, auditors will try to displace some tasks from those dates. International Auditing Standards allow for intermediate and extrapolated procedures at year-end, but according to ISA-330, what must be checked is the greater the risk of material misstatement, or the greater the confidence in controls, and the lower the interval between them. Then, the auditor will take into account the inherent risk and the control risk to reduce the tests as much as possible in high season. The results obtained are shown in Table 8. The regressed effort model to analyse the peak season effect has only considered the experimental variables of the effort model. Considering the effective losing degrees of freedom decreasing the sample (135 observations), which could also reduce the power of the statistical tests performed, we have opted to reduce the number of parameters.

We evidenced that variables related to control risk and some of the variables related to inherent risk are significant in times of high workload, it is more efficient for auditors to spend time on the evaluation and verification of control risk and inherent risk to reduce their subsequent effort. However, it is striking that the only variable that is not significant for inherent risk and season auditor is manager integrity, neither when it is high integrity nor when it is low.

During the “auditor’s low season”, they have more resources and hours available to perform fieldwork and accumulate evidence through more substantive tests. That is why we found that only CATA and NEW are significant, requiring a greater effort from the auditor. However, when internal control is hard, even in a low-season auditor, the level of effort is significantly lower.

Table 8. Estimation of the effort model by reporting date (Dependent variable hours)

Variable	Low season auditor	High season auditor
	Coefficient (Statistics)	Coefficient (Statistics)
Experimental variables		
CATA	2,214*** (2,818)	2,572** (2,554)
VARSALE	0,083 (0,452)	0,134** (1,139)
NEW	0,189*** (1,851)	0,169*** (2,321)
HIGHINT	-0,073 (-0,573)	0,061 (1,023)
LOWINT	0,021 (0,245)	0,047 (1,260)
WEAKIC	0,087 (1,043)	0,128*** (2,144)
HARDIC	-0,296*** (-2,762)	-0,268*** (-2,714)
Control Variables		
MATERIALITY		-0,145*** (-2,418)
ASSETS		0,227*** (3,267)
SERVICES		0,009 (0,018)
LOSS		0,139*** (2,169)
ROI		-0,167*** (-1,278)
LEVERAGE		0,187*** (2,584)
GCOPINION		0,006 (0,739)
SPANISH FINANCIAL ACT		0,025 (0,359)
Firm Control	YES	YES
Industry control	YES	YES
Temporal control	YES	YES
Observations	135	763
Z	Prob>chi2: 0.000	Prob>chi2: 0.000
AR (2)	Prob<z: 0.237	Prob<z: 0.419
Hansen test	Prob<chi2: 1.000	Prob<chi2: 1.000

Z is a Wald test of the joint significance of the reported coefficients under the null hypothesis of no relationship; AR (2) is serial correlation tests using residuals in first differences, under the null hypothesis of no serial correlation; Hansen is a test of over-identifying restrictions under the null hypothesis of non-correlation between the instruments and the error term; VIF values CATA: 1,361; VARSALE: 1,804; NEW: 1,159; HIGHINT: 1,163; LOWINT: 1,114; WEAKIC: 1,249; HARDIC: 1,732; MATERIALITY: 1,471; SIZE: 1,617; SERVICES: 1,719; LOSS: 1,602; ROI: 1,184; LEVERAGE: 1,730; GCOPINION: 1,329; SPANISF FINANCIAL ACT: 1,462

5.3 Audit risk, audit effort and economic dependence

Finally, to support the robustness of the findings, we took into consideration the economic dependence of the auditors. Auditor independence is an important professional imperative that contributes to sustaining the credibility of financial information provided to investors. A key component in the auditor independence debate has been the nature of the auditor-client relationship, which has been highlighted as causing self-interest threats to auditor independence. The economic dependence risk has aroused continuous concern over the possible loss of auditor independence from the regulators. A large body of auditing literature has developed the notion that economic incentives may erode auditor inde-

pendence and, therefore, influence auditor behaviour. While in theory, auditors work for society at large, the effective client is the management who determines both the remuneration and the engagement tenure. Therefore, the conflict of interest confronting auditors is that they are required to remain independent of the client, but at the same time depend upon them for their livelihood. The implicit assumption is that auditors may be confronted with the decision to compromise independence if it helps to maintain potential and perpetual economic rents (DeAngelo, 1981; Reynolds & Francis, 2001; Defond et al., 2002), and therefore the significant economic rents can create an unacceptable risk of reduced independence.

Table 9. Estimation of the effort model by unexpected audit fees (Dependent variable hours)

Variable	Negative unexpected audit fees	Positive unexpected audit fees
	Coefficient (Statistics)	Coefficient (Statistics)
Experimental variables		
CATA	0,247*** (3,127)	0,198** (2,615)
VARSALE	0,032 (0,460)	0,097** (1,932)
NEW	0,147*** (2,325)	0,192*** (3,195)
HIGHINT	-0,091 (-0,917)	0,061 (0,839)
LOWINT	0,023 (0,278)	0,047 (0,311)
WEAKIC	0,068 (0,384)	0,136*** (2,396)
HARDIC	-0,271*** (-2,381)	-0,268*** (-3,129)
Control Variables		
MATERIALITY	-0,293*** (-3,261)	-0,197*** (-3,067)
ASSETS	0,273*** (2,895)	0,259*** (2,271)
SERVICES	-0,027 (-0,618)	0,031 (0,689)
LOSS	0,182*** (2,269)	0,163*** (2,073)
ROI	-0,173*** (-1,693)	-0,141*** (-1,539)
LEVERAGE	0,165*** (3,123)	0,164*** (3,124)
SPANISH FINANCIAL ACT	0,003 (0,612)	0,003 (0,623)
GCOPINION	0,021 (0,324)	0,007 (0,236)
Firm Control	YES	YES
Industry control	YES	YES
Temporal control	YES	YES
Observations	472	426
Z	Prob>chi2: 0.000	Prob>chi2: 0.000
AR (2)	Prob<z: 0.539	Prob<z: 0.218
Hansen test	Prob<chi2: 1.000	Prob<chi2: 1.000

Z is a Wald test of the joint significance of the reported coefficients under the null hypothesis of no relationship; AR (2) is serial correlation tests using residuals in first differences, under the null hypothesis of no serial correlation; Hansen is a test of over-identifying restrictions under the null hypothesis of non-correlation between the instruments and the error term; VIF values CATA: 1,129; VARSALE: 1,071; NEW: 1,279; HIGHINT: 1,281; LOWINT: 1,394; WEAKIC: 1,268; HARDIC: 1,750; MATERIALITY: 1,961; SIZE: 1,431; SERVICES: 1,348; LOSS: 1,629; ROI: 1,079; LEVERAGE: 1,428; GCOPINION: 1,813; SPANISF FINANCIAL ACT: 1,427

In this sense, a possible way to reduce independence is not to consider the determinants of the risk of audit. To evaluate empirically whether economic dependence affects auditor behaviour, we segmented the sample according to the sign of unexpected audit fees (positive or negative unexpected fees). We considered that when unexpected audit fees are positive, there could be a high risk of economic dependence because auditor-obtained economic rents are higher than expected (Defond et al., 2002; Asthana & Boone, 2012). The unexpected audit fees are calculated by the residues of the audit fees model. If the residues are positive the audit fees are higher than expected which may lead to reduced independence. On the contrary, if the residues are negative, the fees received will be lower than expected. To estimate the audit fee model, we have considered variables that have been widely used in previous studies such as size, ROI, LEV, LOSS, QUICK, tenure, audit report lag, GCOPINION and non-audit services. Finally, we included the variables INDUSTRY and YEAR to control the possible effects of the type of activity sector and the temporality of the data.

The results obtained are shown in Table 9 and show that when unexpected audit fees are positive, five of the six experimental variables used to measure audit risk are statistically significant; manager integrity is not significant neither when it is high integrity nor when it is low.

6. Conclusion

This research aims to analyse whether a sample of auditors at small and medium-sized audit firms employ greater effort to cover higher assessed client risk, broken down into inherent risk and control risk. Using a unique setting, we measured audit effort based on the hours reported to the Spanish Accounting and Auditing Institute, a restricted access database, for a sample of small and medium-sized audit firms. The variable hours spent on the audit is especially relevant because it provide an observable measure of audit quality.

After measuring the risk of material misstatement by capturing proxies and auditors' assessments of inherent risk and control risk, our results revealed that small audit firm's auditors effectively respond to the risk of material misstatement through increases in their audit effort to achieve an acceptable level of audit risk. Specifically, as assessed risk increases, more audit hours are spent to reduce the risk that the nature and extent of audit tests will not uncover a material misstatement if one exists. In other words, small audit firms are concerned about the quality of their audits and adjust their audit approach as described by the audit risk model.

Auditors participating in our study indicate that 76% of their clients have high management integrity, while only 13% of the companies in the sample are perceived to have weak internal controls. Both management integrity and internal control effectiveness are based on auditors' responses to surveys regarding their evaluation. If the nature, timing and extent of audit evidence gathered is not enough (i.e. insufficient audit efforts), but they nominally comply with the tests, then these assessments could mean auditors are collaborating through optimistic bias when it comes to evaluating management integrity. It is concerning that auditors tend to rely on companies' internal control based on a "nominal" test of the effectiveness of internal control. Since audit fees are fixed before starting any engagement under Spanish legislation, auditors may not be able to recoup the cost of any unexpected business risk that requires increased effort.

As an additional analysis, we considered the possible existence of familiarity resulting from long audit tenure. The

increase in client-specific knowledge implies that the integrity of the management is not significant whereas in cases where weak internal control effort is not increased, the Materiality level explains a higher reduction of effort in the long-term. In sum, the tenure factor is highlighted in the long-term contracts. In long audit tenure, the variables related to inherent risk are not significant, and the audit model estimation relies only on strong internal controls. Blokdijsk et al. (2006) consider that higher audit quality is associated with a less procedural and more contextual approach. In this sense, the learning effect in long-term engagements could be considered more efficient because auditors can allocate relatively more effort to planning the control risk assessment and less to substantive tests. On the contrary, they found evidence that non-Big 4 firms increase their total audit time when relying on clients' strong internal controls. Therefore, we can suggest that they are based on the conclusions and experiences obtained during previous years' engagements.

We also obtained evidence that auditors place greater emphasis on internal control risk and inherent risk (except management integrity which is not significant) when the work has been done during the high season. Auditors prefer to make additional effort during the planning stage by evaluating risks to plan the nature and extent of work performed more effectively during the fieldwork phase of the audit. However, for audits performed during low audit season, when they have less workload, auditors do not seem to engage in more effortful planning and instead appear to increase the level of substantive evidence gathered during the fieldwork phase of the audit.

However, this study presents limitations that must be explicitly emphasized. First, the estimated models may be subject to the omission of relevant variables. We have not been able to differentiate the hours devoted to each professional category (partner, manager, team leader, junior). Previous studies have revealed that the distribution of audit time among auditors at different levels of the firm may vary according to audit risk (e.g., O'Keefe et al., 1994; Hackenbrack & Knechel, 1997). In addition, like all studies that are based on the models of O'Keefe et al. (1994) and Simunic (1980), it is possible that the surrogates used to determine audit risk do not capture the intended effects. Overall, this study provides evidence that small and medium-sized audit firms act with the same professional planning models as large audit firms.

Second, about the reform that took place in 2010, we have highlighted in the limitations of our study that the conclusions obtained cannot be extrapolated to other points in time, especially because of the major change in the law on sanctions, one of the main incentives that we have justified as determining the behaviour of small audit firms and that appropriate regulatory reform can serve to enhance auditor independence and audit quality. The regulatory interventions in the Spanish audit market provide a valuable opportunity to consider future studies that should analyse whether regulatory changes have affected the effort made by the auditor (Cabal-García et al., 2019).

Third, while this study contributes to the ongoing debate on whether small firms perform quality audits, our empirical study is based on a sample of firms that have been audited by a certain number of auditors, which implies that the conclusions of this study may not apply to other types of companies, especially when considering the heterogeneity of audit firms that are included in the category of small and medium-sized firms. Thus, further research is needed to provide a more nuanced examination of product differentiation among small and medium-sized firms. For example, audit effort models

used in this, and other studies do not allow us to disentangle technical capabilities and auditor independence, two important inputs to audit quality.

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Conflicts of interest

The authors declare that they have no conflicts of interest.

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