Please do not quote this version of the paper. Please quote:

Montenegro, T. M., & Brás, F. A. (2018). Review of the Concept and Measures of Audit Quality in Three Decades of Research. *International Journal of Accounting, Auditing and Performance Evaluation*. Forthcoming.

A Review of the Concept and Measures of Audit Quality across Three Decades of Research

Tânia Menezes Montenegro - University of Minho - School of Economics and Management
Filomena Antunes Bras -University of Minho - School of Economics and Management

Abstract

This study provides a comprehensive literature review of audit quality and it explores three decades of audit research (1980 to 2010). The DeFond and Zhang (2014) framework is used to present and discuss several perspectives on the concept and measures of audit quality, its inherent limitations and main strengths, adding a United States of America (U.S.) *versus* international studies comparative approach. The study is of interest to students, academic researchers, practitioners, standard setters/regulators and all those interested in understanding audit quality, from a U.S. *versus* international perspective.

Keywords: Audit quality; Audit quality definition; Audit quality dimensions; Audit quality proxies; Audit quality indicators; USA; International.

JEL Classification: M4, M42

1. Introduction

At the beginning of the 21st century, financial statement fraud cases by high-profile companies such as Xerox, Enron, WorldCom, and Tyco, have emphasised the importance of credibility and integrity in financial reporting, and have raised serious concerns about corporate governance and audit efficacy in deterring and detecting financial statement fraud (Wells, 2005). More recently, the deepening of the financial crisis that began around 2007 triggered further questions about the role and value of the financial statements audit, as many financial institutions that had not received a qualified audit opinion underwent financial distress or, in some cases, collapsed (Sikka, 2009). Such events cast doubt on whether auditors lack the necessary independence, expertise, or incentives to construct a 'true' and 'fair' account of corporate affairs, while providing an opportunity to reflect and (re)construct the role of auditing in contemporary society, and a greater understanding of the day-to-day provision of audit services (Humphrey et al., 2009; Sikka, 2009). In short, the key drivers of audit quality were questioned and regulators of the profession worldwide made efforts to improve the credibility and integrity of financial reporting, and audit quality. We found several recent initiatives by different regulators of the audit profession reflecting efforts to identify the most effective way to determine and assess audit quality.

The *Framework for Audit Quality* issued by the International Auditing and Assurance Standards Board (IAASB, 2014) argues that, conceptually, audit quality encompasses five key elements that create an environment which maximize the likelihood that quality audits are performed on a consistent basis. The key elements are: 1) inputs (values, ethics and attitudes of auditors and their knowledge, skills, and experience); 2) process (the rigor of the audit process and quality control procedures); 3) outputs (reports and information that are formally prepared and presented by one party to another, as well as outputs that arise from the auditing process that are generally not visible to those outside the audited organization); 4) key interactions between the stakeholders within the financial reporting supply chain, and 5) context factors (laws and regulations and corporate governance, which could impact on the nature and quality of financial reporting and, audit quality).

With a similar view, the Public Company Accounting Oversight Board (PCAOB, 2015) issued the *Concept Release on Audit Quality Indicators* revealing 28 potential indicators of audit quality that fall into three groups: 1) the audit professionals, including measures dealing with the availability, competence, and focus of those performing the audit; 2) the audit process, that includes measures about an audit firm's tone

at the top and leadership, incentives, independence, attention to infrastructure, and record of monitoring and remediation; 3) the audit results, including financial statements, internal control, going concern, communications between auditors and audit committees, and enforcement and litigation.

Released in January 2016 by the Center for Audit Quality (CAQ, 2016), the *Audit Quality Indicators: The Journey and Path Ahead* also provides insights on a potential set of audit quality indicators, that fall into four key areas: 1) firm leadership and tone at the top; 2) engagement team knowledge, experience, and workload; 3) monitoring, and 4) auditor reporting.

As stated by PCAOB (2015), the indicators formulated in these frameworks provide stakeholders with insight into audit quality for their decisions and policy-making, and audit firms with additional incentives to compete based on their (audit) quality.

Although the conceptualization of audit quality as a product of several "key drivers" is a current approach for the regulators of the audit profession, there still remains little consensus on a definition of audit quality, on an audit quality framework, and on the most relevant indicators of audit quality and how and to whom they should be communicated (CAQ, 2016). Furthermore, as Simnet et al. (2016, p.22) highlight, "[W]hile auditing has become a truly international profession, it is not clear how audit research has significantly contributed to and informed this observed phenomena".

In the last two decades, in parallel with a significant growth in the number and complexity of multinational corporations, we have witnessed a significant internationalization of the auditing profession and the related auditing standard-setting and regulatory processes, with continuous convergence in adoption of the International Standards on Auditing (ISA) (issued by the International Federation of Accountants (IFAC), through the IAASB), and the dissemination of public oversight bodies across international jurisdictions (Simnet et al., 2016). However, while more than 100 countries have so far adopted ISAs using different bases (wholesale adoption by law, wholesale adoption by standard setter, or partial adoption to meet the needs of a country), the U.S. has not adopted ISAs. U.S. auditors use the Statements on Auditing Standards (SAS) issued by the Auditing Standards Board of the American Institute of Certified Public Accountants (AICPA) when auditing non-public firms, and the PCAOB's Auditing Standards (AS) when auditing publicly traded companies.[1] The ISAs are principle-based standards, while SAS and AS are rules-based standards.

According to Linberg & Seifert (2011), there are four major differences between U.S. and international auditing standards that may influence audit quality, and thus, resulting in differences between U.S. and international studies: internal control over financial reporting, use of another auditor, going concern considerations, and risk assessment. SAS and ISA require testing internal controls to make sure they are sufficient and functional, but only the AS requires auditors to express an opinion on the effectiveness of the client's internal controls over financial reporting (Linberg & Seifert, 2011). Under SAS and AS, auditors have option to not mention the use of other auditor or clearly mention the division of responsibilities. Under ISA, the main auditor cannot mention other auditors and must take full responsibility, even though he/she has used other auditor for part of the audit (Linberg & Seifert, 2011). But, the most significant differences between U.S. and international auditing standards are probably in going concern considerations and in risk assessment. SAS and AS define going concern period as one year from the date of fiscal year being audited (maximum), but ISA's going concern period is at least one year but not limited to one year (Linberg & Seifert, 2011). While ISA and AS both require specific risk assessment procedures in order to obtain a broad understanding of the entities business risks (and operating and strategic risks), only ISA requires to assess how the entities respond to these risks. Furthermore, SAS requires auditors to assess material misstatement based on companies operating environment, and considers more relevant to assess fraud risk rather than integrating it into risk assessment standards (Linberg & Seifert, 2011).

The dichotomy between the U.S. and the international (IAASB) standard-setting process on auditing raises interesting questions on the cost-benefits of a particular unique policy or disclosure in different jurisdictions, and how different regulations influence several aspects of audit quality. Nevertheless, a recent review of auditing research by DeFond and Zhang (2014), while providing evidence that regulatory intervention has driven auditing research, also indicates that most of the auditing research has been conducted in the U.S. (especially, archival auditing research).

In terms of global audit quality and audit standard-setting, William Parrett, the CEO of Deloitte, Touche, Tohmatsu from 2003 until 2007, said (*in*, Michas, 2011, p. 1733):

> While the global auditing networks need to focus on continuous quality improvement, worldwide consistency [in audit quality] will remain elusive unless regulators and standard setters are equally committed to achieving a greater degree of uniformity in the professional environments, including the regulatory regimes, in which auditors work. The varying environments create enormous challenges to the audit function, including the differing accounting and auditing standards, the quality of regulation and degree of oversight and enforcement, and auditor qualifications.

Michas (2011) argues that global auditors are not able to provide consistent audit quality across countries due to large differences in audit professional environments worldwide, and that it is important to investigate these issues empirically. Boolaky and Soobaroyen (2017) further indicate that specific national economic, social, legal, cultural and political systems interact in different ways with accounting and auditing developments, which may generate particular accounting and auditing outcomes and/or practices. Therefore, as Simnet et al. (2016) highlight, auditing research that has examined a specific international setting or settings can inform audit practice, theory, standard setting, and regulation worldwide. Additionally, research that examines audit quality across multiple countries also has the ability to examine why certain regulations may work better in certain jurisdictions than others, and has the potential to better inform international standard setters, by exploring the impact of contextual factors on audit quality, including differences in cultural factors, litigation environment, and audit laws and regulations (Gordon et al., 2013; Simnet et al., 2016).

The fact that there is little consensus about what are the most relevant and efficient proxies to measure audit quality, the high concentration of auditing research in the U.S., and the limited amount of evidence-based analysis of auditing as a global profession, motivated us to perform a comprehensive review of studies on audit quality, based on a duality analysis – U.S. studies *versus* international studies on audit quality, while considering single and cross-country studies within the international context.

Grounded on the DeFond and Zhang (2014) framework, which divides the audit quality indicators into input-based and output-based measures of audit quality, we analyse and discuss the most common proxies used to measure audit quality, bearing in mind the context of U.S. *versus* international literature. For each audit quality indicator, we provide a summary of the findings; present and discuss the data sources, the methodological approaches used, and the challenges that are faced by the U.S. and international auditing research on audit quality. We further present and discuss the main strengths and the inherent limitations of each measure of audit quality.

We use the literature of the past three decades (1980-2010). The initial reference for our research are the early years of the eighties, because the most widely cited definition of audit quality dates from that time (DeAngelo, 1981). We first identified key research papers on audit quality, and then we conducted a deep search for articles related to audit quality in research journals from sources such as Google Scholar, ABI Inform Global - ProQuest, Jstor, B-on, EBSCO, ScienceDirect, Wiley Online Library, Taylor and Francis Online Journals, and the Social Science Research Network. Within each bibliographic database, we used keywords, such as 'audit quality' and 'auditor quality' (or similar), to search and identify relevant papers (when possible, the search was made using the search option 'title, abstract and full text'). To be selected, an article always had to contain the keywords in the title, the abstract, or full text. Similar to Bing et al. (2014), we also searched on Google for relevant documents issued by international regulatory bodies. Our review covers more than 180 articles from 36 accounting and auditing (and management) journals. The journals with the greatest coverage in terms of number of articles used in this research are: *The Accounting Review* (32 articles); *Auditing: A Journal of Practice & Theory* (23 articles); *Journal of Accounting & Economics* (17 articles); *Contemporary Accounting Research* (15 articles); *Journal of Accounting Research* (13 articles); *Managerial Auditing Journal* (12 articles); *Accounting Horizons* (11 articles); *Journal of Accounting & Public Policy* (9 articles); *European Accounting Review* (8 articles). In Appendix 1, we provide a Table containing detailed data on the journals that were used in our review.

To our knowledge, the current research includes nine studies reviewing audit quality literature, which were performed by Francis (2004; 2011a), Watkins et al. (2004), Hussein and MohdHanefah (2013), Knechel et al. (2013), Bing et al. (2014), DeFond and Zhang (2014), Tepalagul and Lin (2015), and Simnet et al. (2016).

Francis (2004) reviewed empirical research on audit quality from 1980 to 2004, mainly from the U.S., and in the audit services market of the listed companies, and located past research according to the approach used to analyse audit quality.

In their synthesis, Watkins et al. (2004) located prior research on audit quality for two segments: 1) studies investigating the incentives for quality-differentiated audits (exploring the demand/supply drivers for audit quality) and, 2) studies analysing the products of audit quality.

Francis (2011a) took a supply-side perspective of audit quality and focused on archival-based audit research without exploring behavioural, experimental, and survey method research, and limited his attention to studies published in North American journals.

The Hussein and MohdHanefah (2013) paper makes a synthetic review of studies using the following proxies of audit quality: audit firm size, litigation, auditor tenure, non-audit services, industry experience, and peer review. While they somehow discuss both the arguments for and against using those audit quality measures, they do not identify the inherent limitations of all the proxies.

Knechel et al. (2013) developed a framework for synthesizing and understanding research related to audit quality, that includes linkages across the primary attributes of the audit (incentives, uniqueness, process, uncertainty, and judgment), and among the different aspects of the audit-inputs, process, outcomes, and context (they explore archival-based, behavioural, experimental, and survey method audit research from an international perspective).

The synthesis made by Bing et al. (2014) is based on the definition and proxies applied by researchers to measure the quality of audit. They selected literature from fifty research journals and they classified the definitions of audit quality into direct and indirect, and discussed their implications respectively. Then, they reviewed around twenty audit quality proxies which were grouped into five main categories: earnings quality proxies, auditor characteristics (related to competence), independence related proxies, market perceptions related proxies, and other proxies.

DeFond and Zhang (2014) provided a review of archival auditing research on audit quality. They limited the scope to studies published in the major accounting journals, from 1996 through to 2013, and they organized the review around an economics-based framework that examines the supply and demand forces that shape the audit market. They structured the discussion around four questions: 1) what is audit quality?, 2) what drives client demand for audit quality?, 3) what drives auditor supply of audit quality?, and 4) what are the regulators' concerns about audit quality?

Tepalagul and Lin (2015) conducted a literature review related to auditor independence and audit quality, but they limited the scope of their search to the nine leading journals related to auditing. They structured the review based on four main threats to auditor independence: 1) client importance, 2) non-audit services, 3) auditor tenure, and 4) client's affiliation with CPA firms.

More recently, Simnet et al. (2016) reviewed 130 international archival auditing and assurance research articles, but they limited their sample to studies that were published in eight leading accounting and auditing journals for 1995–2014. They coded the international archival auditing research against the five key elements of the IAASB's (2014) *Framework for Audit Quality*, providing a summary of the findings and outlining how they can inform standard setters and regulators, and also discussed the measures of audit quality, data sources used, and methodological approaches.

Our literature review contributes to the existing research on audit quality. It complements and extends the prior syntheses on audit quality by providing a comprehensive analysis of the audit quality concept and the measures, from a global perspective. The scope of our research was not limited to archival auditing research and to the traditional/most influential journals related to auditing. Rather, our review includes literature on audit quality that used different research methods, drawing from a large scope of international scientific journals and from a worldwide perspective. More importantly, our paper distinguishes itself from the previously mentioned syntheses, because the analysis and discussion of the measures of audit quality is made within the context of the U.S. *versus* international literature, and from an international perspective, we further explore single and cross-country studies. For each category of audit quality indicators, we provide tables where studies are grouped according to their U.S./international provenance (and single versus cross-country studies), the specific measure of audit quality they use, and their purpose (the main findings are also presented).

This paper is of interest to a number of parties, including researchers, practitioners, standard setters and regulators, and all those interested in understanding audit quality. We map the U.S. and international audit research undertaken from 1980-2010 according to the DeFond and Zhang (2014) framework (based on the duality input-based and output-based measures of audit quality), in order to help inform interested parties on the evolution of the audit quality research from a global perspective, by analyzing how the proxies for

audit quality, the data sources, and the methodological approaches used have evolved over time and the challenges they pose, and by providing information on the degree of consistency in evidence collected worldwide by studies on audit quality. By comparing studies that examined audit quality in the U.S, with those from a specific international setting, or across multiple countries, it has the potential to inform researchers, audit practice, standard setters and regulators worldwide, as to why certain rules may work better in certain jurisdictions than others, and about the impact of country-level institutional factors on audit quality, including legal and regulatory systems, economic, political, cultural and religious factors, the development of audit profession, and the development and importance of equity markets. Our review also identifies areas that have been researched extensively and areas with opportunities for future research.

The paper proceeds as follows. Section 2 analyses and critiques the conceptualization of audit quality. Section 3, revises and discusses the proxies that have been used to measure audit quality, using a U.S. *versus* international literature basis and provides syntheses of studies on audit quality. Section 4 concludes the study.

2. Defining Audit Quality

From all the attempts to define audit quality in the past, none have resulted in a definition that has achieved universal recognition and acceptance, because audit quality is, in essence, a complex and multi-faceted concept (IAASB, 2011; PCAOB, 2013; CAQ, 2016).

From a practitioner's perspective, audit quality is defined in relation to the degree to which the audit conforms to applicable auditing standards, and promotes a reasonable level of assurance on the truth and fairness of the financial statements for users (IFAC, 2009: ISA 200). From a research perspective, DeAngelo (1981) presented a widely cited definition, in which audit quality is viewed as the joint probability of detecting and reporting material misstatements.

According to DeAngelo (1981, p. 186), audit quality is "(…) the market-assessed joint probability that a given auditor will *both* (a) discover a breach in the client's accounting system, and (b) report the breach". DeAngelo's definition highlighted two important aspects of audit quality: first, the competence of the auditor, which determines how likely a misstatement will be detected; and second, the auditor's independence/objectivity, which determines what the auditor is likely to do about a detected misstatement (Knechel, 2009). The expression "market-assessed joint probability" refers to the market perception of auditors' competence and independence, which was captured by DeAngelo through the audit firm size. DeAngelo grounded its definition of audit quality on the product-differentiation hypothesis, based on the observation that large audit firms have "more to lose" by failing to report a discovered material misstatement in the client's records (Watkins et al., 2004).

While the DeAngelo's definition has been considered the classic concept of audit quality, several limitations have been associated with it. To Knechel et al. (2013), the definition suffers from two main problems: 1) it has not been reconciled with the audit risk model, which is used to guide the audit and reflects the auditor's perceptions, and 2) the perception of market participants can be erroneous. DeFond and Zhang (2014) further argue that DeAngelo portrays auditing as a binary process, with the auditor's role reduced to simple detection and reporting of mechanical violations of the generally accepted accounting principles (GAAP). While there is no doubt that auditors are charged with assuring the correctness of financial statements, DeAngelo's characterization understates the benefits of a high level of audit quality, which extends well beyond the simple detection and reporting of GAAP violations to assuring financial reporting quality (DeFond and Zhang, 2014). Consistently, Francis (2011a) states that DeAngelo's definition provides no insight about the multiple factors that affect an auditor's capacity to detect misstatements, and that the definition implicitly defines fraud, which means that an auditor who knowingly fails to report a material misstatement has committed fraud and this is a crime in some countries, namely in the U.S..

Linked with DeAngelo's definition, some researchers conceive audit quality in terms of audit failures, and focus on defining ''poor audit quality''. Under this conceptualization, audit quality is related to the level of assurance provided by an audit, and is inversely related to audit failures, being thus defined as the probability that financial statements contain no material misstatements (Titman and Trueman, 1986; Palmrose, 1988; Lee et al., 1999). Defining audit quality in terms of failure is appealing because it is easy to operationalize the definition (Knechel et al., 2013). However, while poor audit quality is observable with

hindsight, if an engagement results in litigation or a claim of malpractice against the audit firm (Casterella et al., 2009), there are relatively few cases of detectable audit failures (Francis 2011a).

Carcello et al. (2002) also define audit quality in terms of the level of assurance provided by an audit, but they limit the concept to audit effort, by indicating that audit quality is directly linked to the amount of audit work. As in DeAngelo's conceptualization of audit quality, this definition does not provide a comprehensive image about the multiple factors that affect the auditor's work (Francis, 2011a).

As stated by Bedard et al. (2010), taken together, the displayed definitions reveal the importance of various aspects of audit quality: adherence to professional standards, auditor effort, and auditor independence. However, each of these definitions articulates the construct quite differently.

Grounded on the criticisms associated with earlier definitions of audit quality, in which prior concepts are suspected of being incomplete and not broad enough, Francis (2011a) and DeFond and Zhang (2014) claim that audit quality must be conceptualized as a theoretical continuum ranging from very low to very high audit quality. Under this reasoning, one must expect high quality auditors to evaluate not only whether the client's accounting choices are in technical compliance with GAAP, but also how faithfully the financial statements reflect the firm's underlying economic activities (DeFond and Zhang, 2014). DeFond and Zhang (2014, p. 276) go further and define higher audit quality as "greater assurance that the financial statements faithfully reflect the firm's underlying economics, conditioned on its financial reporting system and innate characteristics".

As Knechel et al. (2013) highlight, there is currently no unified definition of audit quality. The perception of audit quality depends on whose eyes one looks through, that is, all stakeholders in the financial reporting process can have different views as to what is audit quality (Knechel et al., 2013). This diversity of views is derived from the fact that audit quality itself is not directly observable (Moizer, 1997). According to the IAASB (2011), the context in which an audit is undertaken is continually evolving to keep pace with changes in the business environment, financial reporting standards, regulation and technology. Thus, auditing is an activity that evolves over time, and the pursuit of audit quality, therefore, is not a program with a definitive outcome (IAASB, 2011). Knechel (2009) supports this view and further indicates that the difficulty in capturing audit quality comes from the fact that auditing is a professional service with uncertain outcomes executed by individuals in response to idiosyncratic client conditions. The audit process is designed to assess the likelihood of material misstatements and to reduce the likelihood of undetected and uncorrected misstatements to an "appropriate" assurance level. Yet, the level of assurance is unobservable and the audit risk model does not assume perfect assurance. Moreover, two audits are not identical: the characteristics and the risk profile of each client are different, the resources needed to conduct each audit are different, the personnel assigned to an audit vary from engagement to engagement, and even the attitudes, attention, and level of care vary daily for a given auditor (Knechel, 2009).

Following the concept of "key drivers of audit quality" shared by several regulators of the audit profession worldwide, the CAQ (2016) highlights that determining audit quality is more art than science, and that exploring the context and relevance of certain indicators is critical to obtaining a deeper understanding of the quality of a particular audit. Nevertheless, this organism also recognizes that the potential indicators of audit quality cannot by themselves lead to a holistic understanding of audit quality. DeFond and Zhang (2014) further observe that, while the literature uses a large number of proxies to measure audit quality, there is no consensus on which measures are best, and little guidance on how to evaluate them. To address this issue, in the next section, we draw on the framework provided by DeFond and Zhang (2014), by considering the inputs and outputs of the audit process, and we evaluate and critique the commonly used audit quality proxies, using a U.S. *versus* international literature approach.

3. Audit Quality Units of Analysis – U.S. *versus* International Literature Perspective

Using a U.S. *versus* international literature perspective, in this section we analyse and discuss the most commonly used proxies to measure audit quality grounded on the DeFond and Zhang (2014) framework, which divides the audit quality surrogates into input-based and output-based measures of audit quality.

3.1. Input-Based Measures of Audit Quality

According to Francis (2011a), the two inputs to the audit process are the people who perform audits and the audit tests that are used to gather evidence. Thus, the inputs are primarily reflected in the individual

characteristics of the audit team such as professional skepticism, knowledge, and expertise, and, overall, it is expected that improvements in the inputs to the audit process should lead to improvements in other indicators of audit quality (i.e., outcomes) (Knechel et al., 2013). However, as claimed by Knechel et al. (2013), the inputs required to effectively carry out an audit may vary substantially across audit engagements, due to the riskiness of audits and the idiosyncratic nature of audit engagements. Client-related incentives, such as client retention and internal economic pressures in audit firms, can also threaten the quality of an auditor's judgments and, thus, audit quality. Francis (2011a) further states that, while we might reasonably assume that auditors are competent based on general education requirements and CPA licensing, the fact remains that we know very little about the people who conduct audits. Accordingly, there is no prescriptive level of inputs designed to yield a desired level of auditor assurance; rather, the level of inputs is qualitative and based on the auditor's professional judgment (Knechel et al., 2013).

Next we discuss two main categories of input-based proxies commonly used in the literature, which are based on actual observed characteristics: 1) auditor–client contracting features, in particular, audit fees, and 2) auditor-specific characteristics such as auditors' brand name or size and industry specialization.

The auditor–client contracting features – audit fees

In 1976, the U.S. Senate Subcommittee on Reports, Accounting, and Management provided data suggesting the existence of monopolistic practices by the Big Eight auditors, and that more activist regulation of the audit industry was needed (Nichols and Smith, 1983). Given these findings, in 1980, Dopuch and Simunic (*in* Nichols and Smith, 1983: 534) examined a wide variety of evidence and concluded that the auditing industry in the U.S. was competitive. In a subsequent paper, in 1982, Dopuch and Simunic (*in* Nichols and Smith, 1983: 534) argued that many of the apparent monopolistic characteristics of the industry could be explained by product-differentiation. Their hypothesis was that different audit firms (Big N/non-Big N) provide audit services which are perceived by investors to be different in quality (Nichols and Smith, 1983).

Based on Dopuch and Simunic's "product-differentiation hypothesis", several authors theorized that higher fees charged by larger audit firms reflect a higher quality of audit services. They argued that it is reasonable to assume that the brand name price premium implies a deep audit work, more audit hours and/or the use of more specialized audit staff. Table 1 provides a synopsis of studies that used audit fees as surrogate for audit quality.

Table 1. Input–based measures of audit quality (AQ) – Audit fees

AQ Measure	Purpose	U.S. Studies	International Studies		Main Findings
			Single country	Cross-country	
Audit fees	**To study factors determining AQ (audit fees):** **1) audit firm size**	Simunic (1980) – listed firms; Simon (1985) – listed firms; Palmrose (1986); Francis and Simon (1987) – listed firms; Ashbaugh et al., (2003)	Francis, (1984) – Australian listed firms; Pong and Whittington (1994) - UK listed firms; Craswell et al. (1995) – Australian listed firms; DeFond et al. (2000) – Hong Kong listed firms; Ireland and Lennox (2002) - UK listed firms		It was found significant evidence of a fee premium of Big N auditors, when compared to non-Big N auditors, thereby validating the product differentiation hypothesis.
		Antle et al. (2006) – listed firms	Francis and Stokes (1986) – Australian listed firms; Seetharaman et al. (2002) - UK firms; Chaney et al. (2004) – UK firms; Antle et al. (2006) – UK listed firms		Results do not confirmed the existence of a Big N auditor fee premium.
	2) provision of non-audit services	Simunic (1984) – listed firms; Simon (1985) – listed firms			Joint provision of audit and non-audit services resulted in a positive information spillover and efficiency gains for auditor and client.

Note: Whenever there is no reference of the type of firms, it means authors used unlisted companies. (*Continued*)

Table 1. Input–based measures of audit quality (AQ) – Audit fees - Continued

AQ Measure	Purpose	U.S. Studies	International Studies		Main Findings
			Single country	Cross-country	
Audit fees	**To study factors determining AQ (audit fees):**	Palmrose (1986); Pearson and Trompeter (1994)			No evidence was found of an audit fee premium for industry specialist auditors, in a sample of utilities and insurance companies.
	3) auditors' industry specialization		Craswell et al. (1995) – Australian listed firms; DeFond et al. (2000) – Hong Kong listed firms		The auditors' industry specialization significantly explains the fee premium of Big N auditors.
			Ferguson and Stokes (2002) - Australian listed firms		Limited support for a positive relation between Big N auditors industry expertise and audit fee premiums.
		Casterella et al. (2004)			Fee premiums for industry specialization arise for Big N auditors when clients have low bargaining power.
		Francis et al. (2005) – listed firms	Ferguson et al. (2003) - Australian listed firms		It was found a positive association between a fee premium for Big N auditors and auditors' industry expertise, but only when auditor was the industry specialist leader at the city and the national level.
				Carson (2009) – listed firms from 62 countries	Global industry specialists attracted a highly significant, positive premium for audit fees, in addition to that received by global audit firm networks. There were significant fee premiums associated with national industry leaders. National U.S. auditors' industry leaders also received fee premiums outside the U.S. market.
	4) client firms' corporate governance mechanisms and ownership structure		O'Sullivan (2000) – UK listed firms		A large proportion of non-executive directors significantly increased audit fees. No evidence that higher ownership concentration significantly impacts on audit fees.
				Rusmin et al. (2009) – Asian Pacific listed firms (Australia, Hong Kong and Malaysia)	No statistical linkage was found between corporate governance mechanisms of the client and audit fees. Higher ownership concentration of the client firm resulted in higher audit fees.
	5) countries' legal and regulatory regime			Choi et al. (2008) – firms from 15 countries	The fee premiums of Big N auditors became smaller as the countries' legal and regulatory regimes changed from weaker to stronger regimes. Countries' legal and regulatory regimes (and litigation environment) are causal factors of audit effort and audit pricing.

Note: Whenever there is no reference of the type of firms, it means authors used unlisted companies.

DeFond and Zhang (2014) highlight that audit fees are used as a proxy for audit quality because they are expected to measure the auditor's effort, which is an input to the audit process that is intuitively related to audit quality. However, auditors cannot unilaterally charge higher fees for additional effort unless there is a corresponding increase in client demand for the additional effort. As a result, audit fees are the outcome of both supply and demand factors of audit quality (DeFond and Zhang, 2014).

Using audit fees as a measure of audit quality, several U.S. and international single country studies tested whether audit quality is associated with the auditors' size and auditors' industry specialization, but empirical results exhibit inconsistencies and uncertainties.

Table 1 provides information that shows that, while some studies based on U.S., UK, and Australia data confirm the product-differentiation hypothesis (e.g., Simon, 1985; Palmrose, 1986; Ashbaugh et al., 2003; Pong and Whittington, 1994; Craswell et al., 1995; Ireland and Lennox, 2002), other studies, using data from the same countries, do not support the existence of a Big N auditor fee premium (Francis and Stokes; 1986; Seetharaman et al., 2002; Chaney et al., 2004; Antle et al., 2006).

With regard to the effect of auditors' industry specialization on audit pricing, empirical results are also mixed. U.S. studies generally suggest limited support for the presence of an audit fee premium for industry specialist auditors (Palmrose, 1986; Pearson and Trompeter, 1994; Casterella et al., 2004), or show that national industry leadership by itself does not result in an audit fee premium for Big N auditors (simultaneous leadership at the national and city levels is required) (Francis et al., 2005). Two studies using

data from Australia and Hong Kong listed firms reveal that auditors' industry specialization significantly explains the fee premium of Big N auditors (Craswell et al., 1995; DeFond et al., 2000), but two subsequent studies with Australian listed firms found limited support for the existence of a fee premium for the largest audit firms (Ferguson and Stokes, 2002) and reveal that only national and city-specific industry leadership jointly affect Big N auditors pricing (Ferguson et al., 2003).

The inconsistencies in the results of the audit pricing models described above may be derived from the changes that occur in market conditions over time and/or by the size differences between the U.S., the Australian, the UK and the Hong Kong audit markets, or even by the type of firms that are included in the samples (Casterella et al., 2004). Another issue is that the results of these models are highly sensitive to the type of audit fee or auditor industry specialization measures that are used (Hay and Jeter, 2011; Audousset-Coulier et al., 2016). Audit fees are not always publicly available, leading researchers to use a variety of audit fee surrogates (such as client size or number of clients), and measures of auditor industry specialization are imperfect, suffer from econometric and conceptual problems, and fail to capture the complexity of the audit industry specialization concept properly (Audousset-Coulier et al., 2016).[2] Additionally, most of these research models can suffer from omitted variables bias, as audit pricing can be affected by other factors that are omitted from the models, or even suffer from spurious correlation, or from endogenous auditor choice. As reported by Ireland and Lennox (2002), while most of these studies treated auditor choice as exogenous, the effects of auditor selection bias on audit fees may be statistically significant, and thus, they should be controlled for. Choi et al. (2008) argue that audit fee studies conducted in single-country settings leave unresolved the question of what institutional factors drive cross-country variations in audit fees, and how these factors influence the magnitude of the Big N auditors' premium. We encourage future research using better specified models, that control for a large number of variables that may affect audit pricing (including country- or city-level contextual factors), and the use of specific techniques to address endogeneity econometric concerns (such as including reference to the Hausman test, the use of fixed effects models, among other techniques). We further recommend the use of complementary measures of audit fees.

In terms of cross-country studies using audit fees as an indicator of audit quality, Carson (2009) used the data of listed firms from 62 countries and tested whether audit quality is associated with auditors' industry specialization, concluding that there are returns to global audit firm networks from investments in industry specializations, and significant fee premiums associated with national industry leaders. The authors also show that the national U.S. auditors' industry leaders also receive fee premiums outside of the U.S. market. Two other studies explored the effects of client firms' governance mechanisms and ownership structure, and countries' legal and regulatory regimes on audit quality. Rusmin et al. (2009) analysed data from listed firms from Australia, Hong Kong and Malaysia, concluding that, while a higher ownership concentration in the client firms resulted in higher audit fees, the corporate governance mechanisms of the client firms have no impact on audit pricing. Choi et al. (2008) used a sample of firms from 15 countries, and demonstrated that fee premiums of Big N auditors became smaller as the countries' legal and regulatory regimes changed from weaker to stronger regimes.

One advantage of a cross-country study in this research field is the ability to exploit international variation in terms of audit pricing causal factors. However, as Gordon et al. (2013) argue, there are many different sources of variation across countries, such as market differences based on economic development, growth, and investment opportunities, variations in culture, religion, political, legal and regulatory systems, that should be considered when making research design choices in this type of studies. Simmnet et al. (2016) highlight that endogeneity concerns are a significant challenge in this sort of research, as it is often difficult to solely attribute the results to the variables being examined. From an econometric perspective, endogeneity can have several dimensions, including (correlated) omitted variable bias, simultaneous equation bias, and variables measurement bias (Simmnet et al., 2016).

In terms of the level of analysis, a cross-country study may be designed at a firm- or country- level. Firm-level data provide larger samples (resulting in higher explanatory power of empirical tests) and a micro-level analysis, allowing the examination of firm-level incentives (Gordon et al., 2013). Country-level data provide macro-level analysis and offer insights into aggregate country level characteristics, but it typically results in smaller sample sizes (reducing the power of the empirical tests), and the aggregation of firm-specific data can result in different and potentially incorrect inferences (Gordon et al., 2013). In relation to the research design, in terms of data and sample collection in cross-country studies, researchers

must address concerns about differences in firm size and industry composition across countries in order to ensure that samples are representative of each country (Gordon et al., 2013).

The three cross-country studies described in this section were designed to conduct firm-level analysis. Two of them (Carson, 2009; Rusmin et al., 2009), only included a country indicator variable to control for institutional differences across countries. Choi et al. (2008) went further and developed a model where they controlled for the effects of country's legal regime on audit pricing and the Big N auditors premium, and how these pricing effects change as the legal regime shifts across countries. In their model, they controlled for the strictness of a country's legal regime (by partitioning the sample into strong legal-regime and weak legal-regime countries), but they also included several country-level factors that may cause variations in audit fees across countries (gross domestic product; foreign direct investment; the importance of each equity market; the required level of financial statement disclosures, and the inverse Mills ratio to control for potential endogeneity problems associated with auditor choice). Fixed effects for industries and years were also included to control for potential variations in audit fees across industries and over time.

We strongly recommend future research on audit pricing determinants using cross-country studies, but researchers need to be aware that the validity and strength of conclusions drawn in these studies are a function of the research design choices, and that key issues specific to cross-country research include identifying an appropriate population to study, and a suitable sample selection criteria and methodology (Gordon et al., 2013). A good research model will include several variables that control for country-institutional factors that may drive cross-country variations in audit fees (and the Big N auditor premium). In addition to the variables accounted for by the model proposed by Choi et al. (2008), country-level political, cultural and religious factors may be included (whenever possible, contextual factors could be measured at the region or city-level). The country-level development of the audit profession may be an important factor to be included, as it may influence audit quality (Michas, 2011).[3] Endogeneity concerns should be accounted for from an econometric perspective by using specific techniques, such as the two-stage least squares with instrumental variables, the Heckman selection models, propensity score matching, fixed effects models, and (quasi-) natural experimental settings (Simmnet et al., 2016).

Audit fees can have advantages in measuring audit quality. As DeFond and Zhang (2014) argue, they are continuous and thus capture subtle variations in quality. However, the mixed evidence on the existence and magnitude of a Big N auditor fee premium across countries raises at least three questions that researchers must take into consideration when performing studies using audit fees as a proxy for audit quality. Audit fee premiums, if they exist, are due to monopolistic behaviour or evidence of greater monitoring effort (Watkins et al., 2004)? If in addition to capturing audit effort, audit fees also capture risk premium and improved audit efficiency, an increase in audit fees can be unambiguously interpreted as in increase in audit quality (DeFond and Zhang, 2014)? If audit fees capture the joint outcome of both supply and demand factors (DeFond and Zhang, 2014), to what extent the existence of audit fees premiums or higher audit fees can be clearly understood as higher audit quality? Given the inconsistencies and uncertainties in empirical results exhibited by auditing price models, and the inherent methodological concerns of these models, the existence of audit fee premiums is not a guarantee of higher levels of audit quality.

The auditor-specific characteristics

DeAngelo (1981) used the audit firm size (brand name) as a surrogate for audit quality and developed a concept of audit quality which has been deemed a classic and the most cited definition of audit quality by audit researchers. Following on her study, many other researchers used the audit firm's brand name or size as an indicator of audit quality. This concept of audit quality assumes that large audit firms have competent human resources working there and more reputational capital to protect (Francis and Krishnan, 1999). Concerning auditor-specific characteristics, several studies also used the auditors' industry expertise as a proxy for audit quality, assuming that specialist auditors are expected to have greater competency and stronger reputation incentives to provide high audit quality (DeFond and Zhang, 2014).

Table 2 supplies a synthesis of studies that used auditor-specific features to measure audit quality.

Table 2. Input–based measures of audit quality (AQ) – Auditor-specific characteristics

AQ Measure	Purpose	U.S. Studies	International Studies		Main Findings
			Single country	Cross-country	
Auditors' Brand Name (Big N/non-Big N auditor)	**To analyse the relationship between AQ (auditors' brand name) and: 1) Agency costs**	Francis and Wilson (1988)			A positive association between Big N auditors and firms' agency costs was found.
	2) Audit reporting accuracy		Barbadillo et al. (2004) - Spanish firms; Johl et al. (2007) – Malaysia listed firms		When compared to non-Big N, Big N auditors revealed a higher propensity to issue a going-concern (a modified) audit opinion for distressed firms or firms presenting higher levels of earnings management.
	3) Market reaction	Nichols and Smith (1983) – listed firms			No significant differences were found in positive market reactions between changes from a non-Big N to a Big N auditor.
		Beatty (1989) – listed firms			The Big N auditors' clients exhibited lower returns in Initial Public Offerings (IPO) (as opposed to non-Big N auditors' clients).
		Teoh and Wong (1993)			It was found higher Earnings Response Coefficients (ERC) for Big N auditors' clients, as opposed to non-Big N auditors' clients.
		Behn et al. (2008)			Big N auditors were associated with better forecasting performance by analysts.
			Hussainey (2009) – UK firms		Investors of profitable clients of Big N auditors anticipated better future earnings, as opposed to those of profitable non-Big N auditors' client firms.
	4) Investment opportunities	Lai (2009)			Firms with high investment opportunities were more likely to hire Big N auditors.
	5) Financial decisions	Chang et al. (2009) – listed firms			The Big N auditors' clients were more likely to issue equity as opposed to debt, when compared to clients of non-Big N auditors.
			Tsai and Hua (2009) - Taiwan listed firms		Small and medium-sized clients of Big N auditors paid lower interest rates, than non-Big N auditors' clients.
	6) financial reporting quality	Aharony et al. (1993) - listed firms			Weak evidence that earnings management was related to the quality of the auditors (Big N/non-Big N auditor) employed by IPO firms.
		Becker et al. (1998); Francis et al. (1999); Krishnan (2003a)			Clients of Big N auditors presented lower discretionary accruals than clients of Non-Big N auditors.
		Lai (2009)			Big N auditors constrained efficiently discretionary accruals in clients with high investment opportunities, as opposed to non-Big N auditors.
		Jordan et al. (2010) – listed firms			Clients of Big N auditors showed no major signs of earnings manipulation to achieve users' reference points in earnings per share (EPS), as opposed to clients of non-Big N auditors.
			Lee et al. (2003) - Australian listed firms		The IPO clients of Big N auditors voluntarily provided information about expected earnings, as opposed to IPO clients of non-Big N auditors.
			Van Caneghem (2004) – UK listed firms		Big N auditors were not negatively related with less earnings management in client firms.
			Chen et al. (2005) – Taiwan listed firms		Big N auditors were related to less earnings management in the IPO firms.
				Maijoor and Vanstraelen (2006) – firms from France, Germany and UK	There was no evidence of an international Big N audit quality effect in Europe. Stricter audit environments reduced the magnitude of earnings management.

Note: Whenever there is no reference of the type of firms, it means authors used unlisted companies. (*Continued*)

Table 2. Input–based measures of audit quality (AQ) – Auditor-specific characteristics - Continued

AQ Measure	Purpose	U.S. Studies	International Studies		Main Findings
			Single country	Cross-country	
Auditors' Brand Name (Big N/non-Big N auditor)	**To analyse the relationship between AQ (auditors' brand name) and:**		Chia et al. (2007) – listed firms from Singapore		Only Big N auditors significantly constrained the earnings management of the (service-oriented) firms.
	6) financial reporting quality			Francis and Wang (2008) – firms from 42 worldwide countries	Earnings quality increased for the Big N auditors' clients, in countries with higher investor protection regimes (smaller abnormal accruals; greater likelihood of reporting losses, and greater earnings conservatism). Earnings quality of clients of the non-Big N auditors was unaffected by different investor protection regimes.
				Van Tendeloo and Vanstraelen (2008) – firms from six European countries	Only in higher tax alignment countries, Big N auditors constrained more earnings management than non-Big N auditors. In countries with stronger legal systems firms engaged less in earnings management.
			Benkraiem (2009) – French listed firms		The presence of Big N auditors reduced the magnitude of discretionary accruals.
			Rodríguez (2010) – Spanish firms		Big N auditors promoted conditional conservatism, thus increasing the contracting efficiency of their clients. For high levels of litigation and reputational risk, Big N auditors tended to promote unconditional conservatism, which could reduce the quality of earnings.
Auditors' Industry Experience	**Relation between auditors' industry experience and: 1) Market reaction**	Behn et al. (2008)			The industry specialist non-Big N auditors were associated with better forecasting performance by analysts.
	2) Audit reporting accuracy		Barbadillo et al. (2004) - Spanish firms; Johl et al. (2007) – Malaysia listed firms		No significant association was found between the propensity to issue a going-concern (modified) audit opinion and industry specialist auditors.
	3) Financing reporting quality	Krishnan (2003b)			The auditors' industry expertise significantly reduced earnings management among clients of Big N auditors.
			Van Caneghem (2004) – UK listed firms; Chen et al. (2005) – Taiwan listed firms		The auditor industry specialization was not significant at reducing earnings management.
			Rusmin (2010) – Singaporean listed firms		A strong negative association between industry specialist auditors and earnings management was found.
Hours of audit work	**To test the effect of audit effort on earnings management.**		Caramanis and Lennox (2008) – Greek firms		It was found a significant negative association between the hours of audit work and earnings management.
Measure of auditor reputation	**To analyse the relation between AQ and IPO underpricing and audit fees.**	Albring et al. (2007) – listed firms			The auditor reputation measure (AQ) was positively associated with lower IPO underpricing and higher auditor compensation.

Note: Whenever there is no reference of the type of firms, it means authors used unlisted companies.

As reported by DeFond and Zhang (2014), most studies in literature used auditor-specific characteristics during tests of client demand drivers for audit quality. Both U.S. and international studies capture the demand for high audit quality by referring to client's choice of auditor-specific characteristics. However, while the U.S. studies mostly analyse factors guiding the client's demand for audit quality related to agency costs, market reactions, investment opportunities, financing decisions and financial reporting quality, the international studies (including the cross-country studies) are typically located in demand drivers related to financial reporting quality.

Two single country studies, one using data from U.S. listed firms (Chang et al., 2009) and the other using data from Taiwan listed firms (Tsai and Hua, 2009), consistently support the view that Big N auditors facilitate financing decisions of client companies. Also, two studies with data from Spain and Malaysia reveal that Big N auditors present higher audit reporting accuracy (Barbadillo et al., 2004; Johl et al., 2007).

Concerning the examination of the demand for high audit quality based on the client's demand for positive market reactions, up to 2010, we found several single country studies, but just one from outside the U.S., the Hussainey (2009) study, with data from UK. These studies generally indicated that Big N and industry specialist auditors are associated with positive market reactions. This denotes the high importance that capital markets assume in the U.S. and UK when compared with other countries worldwide. Due to specific attributes of these countries, in the U.S. and UK the capital markets dominate the financial systems, in marked contrast to other countries such as France, Germany, and Japan, where banks are more important (Dudley and Hubbard, 2004). In the U.S., banking regulation and economies of scale have been important factors in the development of capital markets. The U.S. banking system has been much less concentrated than those of other countries, because for much of its history, the U.S. commercial banking system was regulated with the goal of preventing individual banks from achieving great economic power. Scale is relevant because the U.S. is a big economy with numerous large companies, and while securities issuance is characterized by relatively high setup costs, there are very low incremental costs as the size of a securities issue increases (Dudley and Hubbard, 2004). In the UK, the development of the capital market was spurred by London's long history as a major financial center in the global economy (Dudley and Hubbard, 2004).

Further research is warranted on how capital markets react to incentives for high audit quality based on auditor-specific characteristics, namely with data from countries outside the U.S. and UK and from countries with emerging capital markets, including in the research models variables related to the institutional context. As highlighted by the Association of Chartered Certified Accountants (ACCA, 2012) there are unique challenges arising from the systems of control and governance in emerging markets.

As we have said, when compared to U.S. studies, there is a particular incidence of international studies that used auditor-specific characteristics in testing the factors that drive the clients' demand for audit quality related to financial reporting quality. U.S. studies, and single country studies using data from Australia, Asian countries, and France (Lee et al., 2003; Chen et al., 2005; Chia et al., 2007; Benkraiem, 2009) generally support the argument that, compared to non-Big N, Big N auditors promote the quality financial reporting of their clients. However, single country studies measuring audit quality through the auditors' industry experience provide mixed evidence on the association between industry specialist auditors and earnings quality. Krishnan (2003b) used U.S. data and Rusmin (2010) data from Singaporean listed firms, and they confirmed that Big N industry specialist auditors significantly reduced earnings management among their clients, but two studies based on UK and Taiwan listed firms (Van Caneghem, 2004; Chen et al., 2005) do not provide such evidence.

The mixed evidence reported may arise from the type of auditor industry specialization measures and/or the type of earnings quality measures that are used, as the results of these models are highly sensitive to these type of variables (Hay and Jeter, 2011; Audousset-Coulier et al., 2016). As reported by Audousset-Coulier et al. (2016), measures of auditor industry specialization suffer from econometric and conceptual problems, failing to capture the complexity of the audit industry specialization concept properly (we will discuss the main limitations below in this section). Concerning the financial reporting quality measures, Dechow et al. (2010) argue that all proxies used by researchers are somehow affected by both a firm's fundamental performance and its measurement and, accordingly, they do not measure the same underlying construct and they should not be expected to perform equally well under all circumstances. Earnings quality measures tend to have high measurement error and even bias (DeFond and Zhang, 2014). As reported in the previous section, additionally, most of these research models can suffer from omitted variables bias, from spurious correlation, or from endogenous auditor choice. We encourage future research using better specified models and the use of complementary measures of auditors' industry specialization and earnings quality. We further recommend the use of specific techniques to address endogeneity econometric concerns.

In terms of cross-country studies using auditor-specific characteristics in tests of the client's demand drivers for audit quality, we found three studies that used demand drivers related to financial reporting quality and the audit firm's brand name as a proxy for audit quality. While single country studies largely support the notion that Big N auditors tend to promote the quality financial reporting of their clients, the cross-country studies provide no evidence of an international Big N auditor effect on earnings quality of audit clients (Maijoor and Vanstraelen, 2006), and suggest that the strength of the countries' legal and regulatory systems is the factor explaining the Big N auditor effect on audit quality (Maijoor and Vanstraelen, 2006; Francis and Wang, 2008; Van Tendeloo and Vanstraelen, 2008).

Cross-country studies have a major advantage over single country studies because they have the capacity to exploit the causal factors of international variations in audit quality related to audit firm brand name/size, but endogeneity concerns and differences in firm size and industry composition across countries are a significant challenge in this sort of research (Gordon et al., 2013; Simmnet et al., 2016).

Two of the cross-country studies described in this section were designed to conduct firm-level analysis, and the third at the country-level (Van Tendeloo and Vanstraelen, 2008). In terms of country-level factors that may cause variations in earnings quality, Maijoor and Vanstraelen (2006) controlled for the national audit regime and for the international capital markets; Francis and Wang (2008) used five variables to characterize a country's investor protection regime, and Van Tendeloo and Vanstraelen (2008) controlled for a country's tax alignment, legal and litigation system. The simultaneous inclusion of fixed effects for industries and years, as a mean to control for potential variations in earnings quality across industries and over time, was only made by Francis and Wang (2008). With regard to the measurement of financial reporting quality, Maijoor and Vanstraelen (2006) used a single measure of abnormal accruals, Van Tendeloo and Vanstraelen (2008) used an aggregate measure of earnings management (computed at country-level), and Francis and Wang (2008) used three alternative proxies for earnings management. The three cross-country studies essentially controlled for institutional differences on audit quality related to a country's legal and regulatory systems, and for differences in firm size and industry composition across countries. However, the research models used still suffer from endogeneity problems.

We strongly recommend future research on determinants of international variations in audit quality related to auditors' brand name or size, using cross-country studies, but with better specified research designs. In addition to the country's legal and regulatory systems, a good research model will include variables that control for other country-institutional factors that may drive cross-country variations in financial reporting quality, such as country-level economic, political, cultural and religious factors, the country's development of the audit profession and the development and the importance of equity markets (when possible, contextual factors could be measured at the region or city-level) (Michas, 2011; Gordon et al., 2013; Simmnet et al., 2016). As stated by Francis (2011a), the institutional setting in which audits are conducted creates incentives for both individuals and audit firms, and this should be taken into consideration in this type of research.[4] Endogeneity concerns should be further controlled (Simmnet et al., 2016). Additionally, as, especially in cross-country studies, earnings management models exhibit considerable variation in performance, caused by the international variation in model misspecification problems as well as sample size (Meuwissen et al., 2007), researchers should use alternative proxies for earnings quality. Emerging countries offer an excellent opportunity for future research in this area (Michas, 2011; ACCA, 2012).

Using auditor-specific characteristics to measure audit quality can be appellative to researchers because there are variables that can be constructed from public disclosures such as auditor size and client-based measures of auditor industry expertise. A major strength of the Big N proxy is its relatively high construct validity (Big N is associated with almost all other proxies for audit quality), and a strength of industry specialization is that it provides a measure of quality variation among Big N auditors, and this allows researchers to address questions related to within-Big-N quality differences (DeFond and Zhang, 2014). DeFond and Zhang (2014) further state that a distinguishing feature of these measures is that, at least over a reasonable horizon, Big N and industry specialization are fixed characteristics of the auditor (not engagement-specific), and this restricts auditors to use Big N membership, or industry specialization as choice variables in determining the level of audit quality they supply. Nevertheless, auditor size and industry expertise can be relatively noisy measures of audit quality.

A major limitation of these proxies is that they are typically measured dichotomously, implicitly assuming a homogeneous level of audit quality within each group (DeFond and Zhang, 2014). Furthermore, as Francis (2004) pointed out, findings revealing strong support that Big N auditors are more likely to promote the client's earnings quality than non-Big N auditors, can be explained as "good" companies are more likely to select a Big N auditor and less likely to manage earnings. In other words, it is not high-quality auditing that causes the observed audit outcomes, but rather that auditor choice is endogenous, and it may be the case that good firms with good earnings quality hire high-quality auditors (Francis, 2004).[5]

Regarding auditors' industry expertise, a major concern is related to its measurement. Audousset-Coulier et al. (2016) argue that auditor industry specialization measures fail to capture the complexity of the audit industry specialization concept properly. Given that an audit firm's level of industry specialization

is not observable, researchers must use indirect proxies of this concept to test it empirically, and the two main categories of methods used are the market-share based and the client portfolio-based approaches (Audousset-Coulier et al., 2016). A variety of surrogates have been used to measure auditor market and portfolio shares: the proportion of audit fees (Rusmin, 2010); the proportion of industry sales audited (Krishnan, 2003b; Barbadillo et al., 2004; Chen et al., 2005); the proportion of clients in a particular industry to the total clients of the auditor (Van Caneghem, 2004); the proportion of the clients' total assets in a particular industry to the total assets of all the clients of the auditor (Behn et al., 2008). This diversity of proxies, as well as the various criteria adopted to classify auditors as industry specialists, render the empirical results difficult to compare and interpret (Audousset-Coulier et al., 2016). Several issues could limit the validity of the auditor's market share as a proxy for its industry specialization. For instance, just because an auditor reaches a certain level of audit fees or audits the bigger companies in a given industry, this does not mean that the auditor is an industry specialist. Likewise, the market share tends to classify the Big N auditors as industry leaders, and this may make it difficult to disentangle the effects of industry specialization from an auditor's size (Behn et al., 2008). Additionally, Minutti-Meza (2013) suggests that earlier observed industry specialization benefits are explained by self-selection, in particular, that these observed benefits may be due to client characteristics.

As stated by Simmnet et al. (2016), the area of input-based measures of audit quality needs further research on audit effort, because it has the ability to provide evidence-based results as to, for example, how different auditors approach the audit for clients with different risk profiles, or, what is the role of the engagement partner, the review partner, or the senior manager, who are all key players in the audit process. The audit team composition, which is generally considered to be exogenous, including assigning tasks within the team, and characteristics of high-performing teams, are areas that would benefit from future research (Simmnet et al. (2016).

In summary, as Knechel et al. (2013) argue, the resources needed for an audit depend on the personnel available for an engagement, the abilities and expertise of the audit team, and the audit technology and methodology being used. Furthermore, the idiosyncratic nature of the audit process implies that an auditor's effort level needs to be tailored to each client within the structure of the basic audit methodology, as applied by the auditor, using his/her best judgment. Thus, it is important to realize that inputs of audit quality cannot be defined in strictly quantitative terms, as would be the case in a process that produces a large volume of nearly identical tangible products. It is also important to understand the nature of incentives and cognition in the audit process and how they relate to the inherent uncertainty and idiosyncrasies of the audit engagement (Knechel et al., 2013). Francis (2011a) further highlights the importance of control for incentives to individuals and audit firms arising from the institutional setting in which audits are conducted.

3.2. Output-Based Measures of Audit Quality

Since the purpose of an audit is to provide assurance on financial statements, audit quality is defined as the probability that financial statements contain no material misstatements (Titman and Trueman, 1986; Palmrose, 1988; Lee et al., 1999). Under this approach, the literature has traditionally viewed the presence of higher audit quality in terms of lacking certain negative outcomes or having certain positive outcomes (Knechel et al., 2013).

In this section we evaluate the most commonly used output-based measures of audit quality. The main proxies used by prior studies to capture audit outcomes are the auditors' litigation activities, PCAOB inspections, accounting restatements, audit reports, the quality of financial reporting, and perception-based measures.

Auditors' litigation activities

Several authors have used auditors' litigation activities as a measure of audit failures, and therefore as a measure of audit quality. These studies assume that the existence of a legal action against an auditor indicates a higher likelihood of an audit failure. Table 3 provides a synthesis of studies that used legal actions (or claims) against auditors a proxy for audit quality.

Table 3. Output–based measures of audit quality (AQ) - Legal actions (or claims) against auditors

AQ Measure	Purpose	U.S. Studies	International Studies		Main Findings
			Single country	Cross-country	
Legal actions (or claims) against auditors	To compare litigation rates across auditors	Palmrose (1988)			Big N auditors group had lower litigation rates than group of non-Big N audit firms.
		Fuerman and Kraten (2009)			Significant differences in litigation rates were found among the Big N auditors.
	To explore factors related to the occurrence of litigation against auditors	Stice (1991)			The client' asset structure, financial condition, market value, and the variability of its returns influenced the chance of litigation against the auditor.
		Lys and Watts (1994)			Overall, lawsuits were associated with both misleading financial statements and audit failures.
		Carcello and Palmrose (1994)			Issuance of a modified audit reports on the firm's last pre-bankruptcy period was negative associated with audit litigation.
		DeFond and Subramanyam (1998); Heninger (2001); Cahan and Zhang (2006)			The probability of auditor litigation increases as clients report more positive (income-increasing) abnormal accruals, i.e., auditor conservatism was negative associated with audit litigation.
		Casterella et al. (2009)			Peer-review findings (from AICPA) were useful in predicting audit failures and audit ligation. They signaled specific indicators of potentially weak quality control or risky practices within audit firms that may explain audit failures and litigation.

According to Francis (2011a), the legal system of a country has an important role in defining an audit failure, the parties that can take legal action against auditors when there is an alleged failure, the standard of proof for determining if a failure occurs, and the legal remedy against auditors if there is failure. Reflecting this situation, auditors generally face more exposure to litigation in common law countries such as U.S. and Australia where courts are used to settle disputes, and, in contrast, auditors generally face less direct legal exposure in code law countries such as Continental Europe, because disputes in these countries are more likely to be handled administratively by the audit public oversight bodies (Francis, 2011a). Table 3 denotes this reality, and only presents studies based on U.S. data. Prior research revealed that there are significant differences in litigation rates across the Big N auditors, but also that the Big N auditors have lower litigation rates than non-Big N auditors (Palmrose, 1988; Fuerman and Kraten, 2009). In relation to the factors that lead to litigation actions against auditors, they are essentially related to the client firm's financial condition and potentially weak quality control or risky practices within audit firms (Stice, 1991; Carcello and Palmrose, 1994; Lys and Watts, 1994; Casterella et al., 2009). Auditor conservatism seems to be negatively related to audit litigation (DeFond and Subramanyam, 1998; Heninger, 2001; Cahan and Zhang, 2006).

As reported by Knechel et al. (2013), the majority of lawsuits against auditors are settled out of court and the settlement amounts are often confidential. Francis (2011a) further states that the number of legal actions against auditors worldwide is small and that legal actions may tell nothing about audit quality because audit quality is conceptualized as a continuum, from very low to very high quality, and audit failures more commonly occur at the extreme low end of quality. Legal actions against auditors only focus on extreme situations which are not representative of a more holistic state of audit quality, and, thereby, using auditors' litigation activities as a measure of audit quality is somewhat limited (Knechel et al., 2013). Using lawsuits against auditors as a proxy for audit quality is more suitable in studies from common law countries, where auditors generally face more exposure to litigation and courts are used to settle disputes (Francis, 2011a).

PCAOB Inspections

Knechel et al. (2013) highlight that one of the most direct outcomes of audit quality are the results of regulatory reviews of audit firms.

Many countries worldwide have established public oversight systems of auditors. In the U.S., regulatory views of audit firms include self-regulation through peer reviews for auditors of private firms and independent inspection by the PCAOB for auditors of public companies (Knechel et al., 2013). In the European Union (EU), the Directive 2006/43/EC, of May 17, of the European Parliament and of the Council

(EU, 2006) required Member States to organize, by 2008, an effective system of public oversight for statutory auditors and audit firms on the basis of home country control. Canada, Australia, Brazil, New Zealand, Ireland, The Netherlands, Finland, Norway, Russia, Japan, China, Turkey, and many other countries worldwide also have independent audit oversight authorities**.** The International Forum of Independent Audit Regulators (IFIAR) brings together independent audit regulators from a total of 52 jurisdictions.[6]

Compared with other national audit oversight bodies, PCAOB has a much larger scope, since it inspects both U.S. and non-U.S. registered auditing firms. Created in 2002 by the Sarbanes-Oxley Act (SOX), the PCAOB has, today, over 2,000 auditing firms registered, of which 57% are firms located in the U.S. and 43% are located outside the U.S. The non-U.S. registrants come from 86 different jurisdictions around the world. The PCAOB mission is to oversee the audits of public companies in order to protect the interests of investors and further the public interest in the preparation of informative, accurate, and independent audit reports.[7] Thus, the PCAOB inspections results of U.S. and non-U.S. registered auditing firms may be valuable for signaling audit quality (DeFond, 2010; Gunny and Zhang, 2013). Table 4 provides an overview of studies that used the results of PCAOB inspections to signal audit quality.

Table 4. Output–based measures of audit quality (AQ) - PCAOB Inspections

AQ Measure	Purpose	U.S. Studies	International Studies		Main Findings
			Single country	Cross-country	
PCAOB Inspections	**To analyse the PCAOB inspections results tendency**	Hermanson et al. (2007); Church and Shefchik, 2010; Landis et al. (2011)			The average number of auditing deficiencies per PCAOB inspection has significantly decreased over time, suggesting that audit quality has improved as a result of PCAOB inspection process.
	To analyse the relation between PCAOB inspections results and: **1) Auditor dismissals**	Lennox and Pittman (2010)			No association was found between PCAOB inspection results and subsequent changes in client's audit firm choices.
		Abbott et al. (2008);			Audit firms with PCAOB inspection deficiencies were more likely to be dismissed by their clients.
		Dougherty et al. (2011)			Audit firms with PCAOB inspection deficiencies were more likely to be dismissed by their clients and were more likely to voluntarily make a resignation from publicly traded clients.
	2) Auditors' survival and resignation from PCAOB	DeFond and Lennox (2011)			Small audit firms were increasingly likely to exit the market since the inception of the PCAOB inspections.
		Dougherty et al. (2011)			Audit firms with PCAOB inspection deficiencies were more likely to ceasing to be registered with the PCAOB.
	3) Audit Reporting	Gramling et al. (2011)			PCAOB inspections led to an increase in the number of going concern opinions issued by inspected auditors.
	4) Financing reporting quality	Carcello et al. (2011)			It was found a positive association between PCAOB inspection results to B4 audit firms (domiciled in U.S.) and earnings quality of their clients (significant reduction of abnormal accruals).
	5) Stock market reaction	Dee et al. (2011)			It was found a significant negative stock market reaction for clients of a B4 audit firm after a PCAOB enforcement action.
		Offermanns and Peek (2011)			It were found abnormal market reactions following PCAOB inspections that reveal audit deficiencies.

Although our literature review focuses on studies published between 1980 and 2010, in the particular case of studies that used the results of PCAOB inspections to signal audit quality, the literature is scarce. As such, in Table 4 we include several studies whose publication date is 2011 but for which the preliminary versions were made available up to 2010.

Three studies reported a tendency for significant reduction in the number of auditing deficiencies identified since the first years of the PCAOB inspections (Hermanson et al., 2007; Church and Shefchik, 2010; Landis et al., 2011), suggesting improvements in audit quality. Nevertheless, Knechel et al. (2013) argue that this downward linear trend in the number of deficiencies in PCAOB inspection reports may simple suggest that audit firms are better at managing the inspection process, rather than suggesting enhancements in audit quality.

The results of Gramling et al. (2011) and Carcello et al. (2011) further indicated that the PCAOB inspections promote the quality of audit reporting and the financial reporting quality of audit clients. These

two studies were performed at the audit client level and the authors controlled for several client characteristics (size, leverage, size, financial performance) and for auditors' behaviour concerning audit prices and audit reporting.

Other studies analysed the association between PCAOB inspection results and auditor dismissals. While Lennox and Pittman (2010) found no association between the PCAOB inspection results and subsequent changes in clients' audit firm choices, Abbott et al. (2008) and Dougherty et al. (2011) provided evidence that audit firms with PCAOB inspection deficiencies are more likely to be dismissed by their clients. The inconsistencies between these results may be derived from the research designs that were used. Lennox and Pittman (2010) and Dougherty et al. (2011) estimated their models at the audit firm level. Rather, Abbott et al. (2008) estimated their model at the client level and controlled for several client characteristics (corporate governance mechanisms, leverage, size, and financial performance) and for auditors' behaviour concerning audit prices and audit reporting. Lennox and Pittman (2010) highlight that estimating these models at the level of the audit firm leads to parsimonious specifications since client characteristics do not come into play. DeFond and Lennox (2011) and Dougherty et al. (2011) provided further evidence revealing that small audit firms were increasingly likely to exit the market since the inception of the PCAOB inspections and that audit firms with PCAOB inspection deficiencies were more likely to resign from the PCAOB. Other studies analysed stock price reactions to publication of the PCAOB inspection reports, revealing negative market reactions following PCAOB inspections that revealed audit deficiencies (Dee et al., 2011; Offermanns and Peek, 2011).

In summary, while some research suggests that PCAOB inspections stimulate improvements in audit quality and have been beneficial to the audit profession, several studies support the position that the PCAOB inspection process has been penalizing for audit firms. A major concern in this type of research is that these studies used different research designs, different levels of analysis and almost only apply to smaller U.S. audit firms that are inspected triennially (DeFond and Zhang, 2014).

The studies published up to 2010/2011 examined the effects of PCAOB inspections on auditing, reporting quality and the overall audit market, but research was centered on the effects of PCAOB's inspection program in the U.S., leaving out the effects of PCAOB's international inspection program. The PCAOB is required by SOX to inspect audit firms even if the auditor is not domiciled in the U.S, but only a few recent studies have explored the effectiveness of the PCAOB's inspection of non-U.S. auditors.[8] Given the importance of the PCAOB international inspections, and the efforts and resources that PCAOB has devoted to international inspections, research is needed to examine whether and how the PCAOB international inspections influence the audit market and inspected auditors (Song and Ye, 2014). Notwithstanding the fact that many countries around the world have established public oversight systems of auditors, access to data on the findings from inspections of audit firms and individual audit engagements reports is a major problem for researchers (the IFIAR only makes available to the public the aggregate findings of inspections, and it is also the national level of reporting that is available in the majority of countries worldwide). In the U.S., PCAOB conducts inspections of both U.S. and non-U.S. registered audit firms and, upon completion of each inspection, it prepares a written report on the inspection and subsequently makes portions of those reports available to the public on PCAOB's website. Therefore, PCAOB inspections of U.S. and non-U.S. audit firms seem to be the most relevant context to explore the inspection results of public oversight systems of auditors as a proxy for audit quality.

Knechel et al. (2013) claim that there are several empirical challenges to be resolved in research around the effectiveness of the PCAOB inspection process: on the one hand, the auditing deficiencies are publicly disclosed in the inspection reports without identifying the client affected, i.e., the inspection reports do not identify the issuers inspected; on the other hand, PCAOB uses a risk-based approach to selecting issuer engagements for review, implying that the sample of issuers is not representative of the population. Furthermore, empirical findings from analysing PCAOB inspection reports and changes in the overall audit market may be confounded with other changes in the audit market during the same period (Knechel et al., 2013). Also, many argue that PCAOB inspection results are not valuable for signaling audit quality because the reports do not include an overall evaluative assessment and the quality control deficiencies are often not disclosed (DeFond 2010; Lennox and Pittman 2010). DeFond (2010) further indicated that PCAOB inspections have also been criticized because inspectors lack current auditing expertise.

Whether PCAOB inspections improve audit quality remains unclear (Abernathy et al., 2013; DeFond and Zhang, 2014), but there is some potential for improvement due to the potential regulation, litigation,

and reputation costs associated with noncompliance (DeFond, 2010). Abernathy et al. (2013) highlight that these costs can extend to the marketplace, where investors may penalize firms whose auditors have been singled out by PCAOB.

Accounting Restatements

As reported by Knechel et al. (2013), a common indicator used to proxy for negative audit quality is the presence of an accounting restatement. Regarding the accounting restatements, prior literature distinguishes between irregularities and errors, and irregularities tend to be considered more egregious restatements, which are much more likely to be intentional, i.e., fraudulent (Knechel et al., 2013). Palmrose et al. (2004) argue that the perceived need to reduce the number of restatements helped motivate the formation of the Panel on Audit Effectiveness in the U.S.. The Panel stated that ''restatements of previously audited financial statements raise questions about whether the system that provides assurances about both the quality of audits and the reliability of financial reports is operating effectively'' (Panel on Audit Effectiveness, 2000, Chapter 3, paragraph 26). Table 5 provides a synthesis of studies that used accounting restatements as a proxy for audit quality.

Table 5. Output–based measures of audit quality (AQ) - Accounting Restatements

AQ Measure	Purpose	U.S. Studies	International Studies		Main Findings
			Single country	Cross-country	
Accounting Restatements	**To analyse the relation between AQ and:** **1) Auditor industry expertise and experience**	Romanus et al. (2008) – listed firms	Chin and Chi (2009) - Taiwan listed firms; Li and Chen (2010) - Taiwan listed firms		Presence of restatements was negatively associated to auditor's industry expertise, and the aggregate audit team experience.
	2) Auditor endorsement, tenure and auditor changes	Stanley and DeZoort (2007) - listed firms; Liu et al., (2009) - listed firms			Occurrence of restatements was negatively associated to longer periods of auditor tenure and ratifications of auditor selection by shareholders.
		Williams (1988); Srinivasan (2005); Wallace (2005); Calderon and Ofobike (2008); Thompson and McCoy (2008) - Fortune 500 Firms; Agrawal and Cooper (2009) - listed firms			Auditor change (turnover) was significantly higher for restating firms than for non-restating firms.
	3) Provision of non-audit services	Kinney et al. (2004) – listed firms			Provision of non-audit services (tax services) was significantly negatively related to the occurrence of restatements.
	4) Audit fees	Stanley and DeZoort (2007) - listed firms;			For short tenure engagements, audit fees were negatively related to the likelihood of restatements.
		Hribar et al. (2010) - listed firms			Abnormal audit fees were positively associated with subsequent restatements.

Note: Whenever there is no reference of the type of firms, it means authors used unlisted companies.

Eilifsen and Messier (2000) argue that accounting restatements provide an interesting and relevant domain to examine the drivers of audit quality, as one of the primary antecedents of accounting restatements is a failure by the external auditor to detect a misstatement prior to the issuance of the financial statements.

Research analysing accounting restatements as an outcome of audit quality comes essentially from the U.S. (Table 5 denotes this reality: up to 2010, from outside the U.S., we only found two studies from Taiwan). Nevertheless, the number of restatements in the U.S. has declined significantly since its peak in 2006 (Badertscher and Burks, 2011; Scholz, 2014). For Badertscher and Burks (2011), the decline may be due to corporations solving their internal control inadequacies, and corporations adapting to the changes imposed by Sarbanes Oxley Act.

Studies from U.S. and Taiwan consistently report that the occurrence of restatements is negatively associated with auditor industry expertise (Romanus et al., 2008; Chin and Chi, 2009), and aggregate audit team experience (Li and Chen, 2011). U.S. studies also revealed that the event of restatements is negatively associated with the ratifications of auditor selection by shareholders (Liu et al., 2009) and auditor tenure (Stanley and DeZoort, 2007), and positively related with auditor turnover (Williams, 1988; Srinivasan, 2005; Wallace, 2005; Calderon and Ofobike, 2008; Thompson and McCoy, 2008; Agrawal and Cooper, 2009). A major concern in this type of research design is that it does not focus solely on restatements, nor distinguish between turnover resulting from auditor resignations and from dismissals by clients. As such, one cannot infer whether the switches were prompted by auditor resignations in response to an increase in client risk, or by client dismissals in response to poor auditor performance (Hennes et al., 2014).

Other studies investigated whether audit fees and non-audit fees are associated with restatements. Kinney et al. (2004) indicated that the provision of non-audit services significantly reduces the likelihood of restatements and Stanley and DeZoort (2007) reported a negative association between audit fees and subsequent restatements. However, Hribar et al. (2010) found evidence that abnormal audit fees are positively associated with subsequent restatements.

Notwithstanding the theoretically negative relation between audit effort and accounting restatements, some studies fail to find the predicted relation. Lobo and Zhao (2013) identify two research design issues that could explain the inconsistency: 1) failure to control for misstatement risk leads to an upward bias in the estimated relation between audit effort and the likelihood of restatements, reflecting a serious correlated omitted variable problem (because audit effort is endogenous); 2) the predicted negative relation between audit effort and subsequent restatements is applicable only to audited financial reports, and commingling restatements of audited with unaudited reports introduces an additional upward bias in the association between audit effort and restatements. Hennes et al. (2008) further claim that the research on the causes and consequences of restatements can be significantly improved by distinguishing errors from irregularities, i.e., controlling for the type of restatement (error *versus* irregularity) is likely to improve the power of tests in restatement settings.

Plumlee and Yohn (2010) state that empirical evidence on the underlying causes of restatements has been lacking, and Coffee (2005) reports that accounting restatements are rare in Europe, and that sources of information on restatements outside the U.S. are also scarce (Taiwan is an exception). In the U.S., public companies are required by regulation (Section 4.02 of Securities and Exchange Commission) to disclose of the error(s) in a report (Form 8-K), and they are available two databases of restatement announcements (the Government Accountability Office (GAO) and the Audit Analytics databases).[9] The Audit Analytics database includes data on restatements of approximately 20,000 SEC registrants, including foreign and Canadian filers. Therefore, in our view, SEC registrants (U.S. and non-U.S. firms) seem to be the most suitable context to use accounting restatements as an outcome of audit quality.[10]

We suggest future research on the drivers of audit quality, using restatements as an outcome of audit quality, based on U.S. and non-U.S. data, but with better specified research designs and more reliable variables. In particular, the type of restatement (error *versus* irregularity) should be controlled for and samples restricted to restatements of audited reports. In cross-country studies, research models should include variables that control for several country-institutional factors that may drive cross-country variations in accounting restatements.[11] Furthermore, endogeneity concerns ought to be controlled for.

Knechel et al. (2013) argue that restatements focus only on extreme events which could be rare and may not represent a holistic state of audit quality. But for DeFond and Francis (2005) and Hennes et al. (2014), restatements can provide a salient signal of poor audit quality and more direct evidence that the auditor failed to either detect or report an accounting treatment that is inconsistent with GAAP.

Audit reporting

Currently, the audit opinion is the auditor's only direct channel of communication with stakeholders about the audit process and its outcome, and the accuracy of audit reports is often viewed as a signal of audit quality (Knechel et al., 2013; DeFond and Zhang, 2014). Table 6 outlines prior studies that used the accuracy of audit reporting as a measure of audit quality.

Table 6. Output–based measures of audit quality (AQ) – Audit reports

AQ Measure	Purpose	U.S. Studies	International Studies		Main Findings
			Single country	Cross-country	
Audit Report	To explore factors that determine auditor's propensity to issue a modified/going concern audit opinion:		Vanstraelen (2000) - Belgian firms		Long-term auditor client relationships significantly reduced the auditors' willingness to qualify audit reports.
	1) Auditor tenure	Geiger and Raghunandan (2002)			The propensity to issue a going concern audit opinions for distressed firms/bankrupt firms was not associated with auditors' tenure.
			Vanstraelen (2002) – Belgian firms		
			Knechel and Vanstraelen (2007) - Belgian firms		
			Shafie et al. (2009) – Malaysia listed firms		
			Barbadillo et al. (2004) - Spanish firms		The auditors' decision to issue a going concern opinion was not affected by long periods of auditors' tenure.
			Carey and Simnett (2006) – Australian listed firms		It was found evidence of a lower propensity to issue a going-concern audit opinion for long periods of audit partner tenure.
			Jackson et al. (2008) - Australian listed firms		Propensity to issue a going-concern opinion increased with audit firm tenure.
			Barbadillo et al. (2009) - Spanish listed firms		Abolishment of mandatory audit rotation incremented the auditors' probability to issue going-concern audit opinions to distressed firms.
	2) Client economic importance	Reinolds and Francis (2001)			In a sample of distressed firms, larger clients in offices of Big N auditors were more likely to receive going concern audit reports.
			Vanstraelen (2002) – Belgian firms		Auditors were significantly less likely to issue a going-concern opinion to clients that paid higher audit fees and when the audit firm had lost a relatively high proportion of its clients.
			Chen et al. (2010) – Chinese firms		Up to an institutional setting change, the propensity to issue modified audit opinions was negatively correlated to client importance. When the institutional environment became more investor-friendly, the propensity to issue modified audit opinions was positively related to client importance.
	3) Provision of non-audit services	Robinson (2008)			It was found a significant positive relation between the level of tax services fees and the likelihood of issuing a going-concern audit opinion, prior bankruptcies.
	4) Prior affiliation of executive officers with audit firms	Lennox (2005)			Affiliated clients were significantly more likely to receive clean audit opinions than unaffiliated clients.
	5) Auditors' industry experience	Lim and Tang (2008)			Propensity to issue going-concern audit opinions to financially distressed firms increased with the level of non-audit services acquired from industry specialist auditors, as opposed to non-specialist auditors.
		Reichelt and Wang (2010)			Propensity to issue going-concern audit opinions to financially distressed firms increased as Big N auditors were both national and city-specific industry specialists, as opposed to Big N non-specialist auditors.

Note: Whenever there is no reference of the type of firms, it means authors used unlisted companies.

(*Continued*)

Table 6. Output–based measures of audit quality (AQ) – Audit reports - Continued

AQ Measure	Purpose	U.S. Studies	International Studies		Main Findings
			Single country	Cross-country	
Audit Report	To explore factors that determine auditor's propensity to issue a modified/going concern audit opinion:		Lennox (1999) – UK listed firms		Compared to small auditors, Big N auditors were significantly more likely to issue qualified audit reports to bankrupt firms.
			Vanstraelen (2002) – Belgian firms		Association between the propensity to issue going concern audit opinions for distressed firms and auditor size (Big N/ non-Big N auditors) was not significant.
		Francis and Krishnan (2002) – U.S. listed firms			Under litigation reforms, both Big N and non-Big N auditors reported less conservatively.
	6) Auditor size	Geiger et al. (2006) – U.S. listed firms; Geiger and Rama (2006) – U.S. listed firms			Under litigation reforms, the propensity of Big N auditors to issue a going-concern modified opinion significantly decreased.
		Francis and Yu (2009)			Larger offices of Big N auditors were more likely to issue going-concern audit opinions (even to financially distressed firms), as opposed to small offices of Big N auditors.
		Boone et al. (2010)			Big N auditors had a higher propensity to issue going concern audit opinions for distressed firms, when compared to non-Big N auditors.
	To explore whether there are differences in auditor reporting behaviour between countries, across legal frameworks, types of audit firms.			Carson et al. (2010) – U.S., UK, Australia, France and Germany listed firms	Firms in code law countries were significantly more likely to receive going concern audit opinions than to those in common law countries. Global audit firm networks provided a more consistent approach to the application of going concern audit reporting standards. The country differences between auditors were much less pronounced if the clients' level of financial distress was either extremely high or very low.

Note: Whenever there is no reference of the type of firms, it means authors used unlisted companies.

According to DeFond and Zhang (2014), the accuracy of audit reports has been used to capture audit quality in a diversity of settings, with a particular emphasis on tests of perceived threats to audit quality, such as those potentially posed by auditors' tenure, client economic importance, and the provision of non-audit services. The correctness of audit reports is also used to test whether audit quality is related to auditor size and industry expertise.

Our synthesis reveals that the effect of auditor tenure on the accuracy of audit reports was mainly analysed by international single country studies (up to 2010, we only found one study using U.S. data). Evidence provided by those studies is mixed. While studies that used data from Belgian and Australian firms reported that long-term auditor client relationships significantly reduce the auditors' willingness to qualify audit reports (Vanstraelen, 2000; Carey and Simnett, 2006), studies from U.S., Belgian, Spain, Australia, and Malaysia found evidence that the propensity to issue a going concern audit opinion (namely for distressed firms) does not depend on the auditors' tenure (Geiger and Raghunandan, 2002; Vanstraelen, 2002; Barbadillo et al., 2004; Knechel and Vanstraelen, 2007; Jackson et al., 2008; Shafie et al., 2009), and that the abolishment of mandatory audit rotation even increased the likelihood of auditors issuing going-concern audit opinions to distressed firms (Barbadillo et al., 2009). The level of analysis (audit firm-level versus engagement partner level) and the control variables included in the research models may explain the inconsistency between the results. Carey and Simnett (2006) conducted their analysis at the audit-partner level, but all the other studies used the audit-firm level. Regarding the control variables, generally, all studies included a set of client firm characteristics related with age, size, leverage and several controls for financial performance, but only a few studies included corporate governance controls (Geiger and Raghunandan, 2002; Shafie et al., 2009) and industry controls (Carey and Simnett, 2006; Jackson et al., 2008; Barbadillo et al., 2009). All studies controlled for audit firm size and audit pricing, but only three studies controlled for auditor industry specialization (Barbadillo et al., 2004; Jackson et al., 2008; Barbadillo et al., 2009). A key point in these research-type models is endogeneity bias related with auditors' tenure and auditor selection, but none of the studies analysed had focused in this important issue.

The benefits of long periods of auditor tenure on audit reporting seem to overcome those of auditors' rotation. Yet, this is an area where more research is need. The research designs should control for endogeneity bias by using specific econometric methods, and should include controls for firms' corporate

governance mechanisms, because this is an issue of great importance with regard to audit reporting behaviour (Carcello and Neal, 2000; Barbadillo et al., 2004; Shafie et al., 2009). Furthermore, there is a lack of research involving cross-country studies (that should control for country's institutional features), and studies that analyse the effects of auditor tenure at the audit partner-level and audit firm-level (Lennox et al., 2014). As Lennox et al. (2014) describe, many jurisdictions (such as U.S., Argentina, Australia, China, Hong Kong, Mexico, New Zealand, Norway, The Netherlands, Russia, Taiwan, and EU Member States up to June 2016) impose limitations on the length of audit partner tenure, but they impose no limitations on the length of audit firm tenure.[12] Despite the widespread prevalence of this practice, there is very little evidence on the consequences of mandatory partner rotation when audit firms do not have to be rotated (Lennox et al., 2014). In that case, the audit methodology, procedures, and other engagement personnel do not certainly change, and so, it is an open question as to whether mandatory partner rotation can really improve audit quality (Lennox et al., 2014). A limitation of this type of research is that most countries do not require partners' names to be disclosed in audit reports and so researchers are unable to identify the partner rotation. This may be a reason for the low number of studies examining this matter in the U.S. context (Lennox et al., 2014).

The persistence of international studies (compared to U.S. studies) analysing the relation between audit reporting accuracy and threats related with auditor tenure can also be explained by the differences in legal and regulatory settings worldwide, and thus, it may be that regulatory changes drive this type of research. While in the U.S., mandatory partner rotation was implemented back in 1978 and by 2002, SOX imposed a five-year rotation of the audit engagement partner and had already considered the issue of mandatory audit firm rotation, Europe was reluctant to make changes in the regulation of auditor rotation (mandatory partner rotation was imposed by the Directive 2006/43/EC (EU, 2006) and Member States had to comply with the Directive up to 2008), and Australia introduced in 2004 a five year period of mandatory rotation of the audit engagement partner of listed firms, but no mandatory audit firm rotation (see, Cameran et al. (2015) for a recent review). In the timeline of our literature review (1980-2010), and as reported by Cameran et al. (2015), mandatory audit firm rotation was only in force for Brazilian, Italian and South Korean listed firms (Canada had in force mandatory audit firm rotation between 1923-1991 and Spain between 1988-1995). In the EU, audit firm rotation for public interest companies became mandatory after June 2016 (EU, 2014) and in the U.S., in 2014, PCAOB abandoned its project for mandatory audit firm rotation.

Up to 2010 we found four studies that analysed the threats to audit reporting imposed by auditor economic dependence from a client and the provision of non-audit services, but the evidence provided by these studies is not consensual. Whilst Reinolds and Francis (2001) used U.S. data confirming that audit reporting is more conservative for larger clients of Big N auditors offices (in a sample of distressed firms), Vanstraelen (2002) and Chen et al. (2010), while using data from Belgian and Chinese firms, found that the propensity to issue a modified audit opinion is negatively correlated with client importance. Chen et al. (2010) revealed, however, that when the institutional environment become more investor-friendly, client economic importance was no longer a threat to audit reporting quality, perhaps due to the imposition of greater regulatory sanctions. Robinson (2008) further indicated that, prior to the bankruptcies of U.S. firms, auditor-provided tax services acted as a spillover of audit reporting quality. While these studies used similar research designs, Chen et al. (2010) calls attention to the importance of regulatory environments in this type of research. Carcello and Neal (2000) further highlight the importance of firms' corporate governance mechanisms on audit reporting behaviour, but none of the studies controlled for this issue. Additionally, a subject that could lead to different findings is the level of analysis that is used when computing variables related with audit and non-audit fees, i.e., the audit firm-level, audit office-level, or engagement partner-level. Future research should account for these issues and should be expanded to cross-country studies (that control for country-level characteristics).

Prior studies also analysed whether the accuracy of the audit reports depends on supply drivers of audit quality, namely those related with auditors' industry expertise and size. Evidence collected from U.S. studies indicate that the propensity to issue a going concern audit opinion to financially distressed firms increased with the level of non-audit services acquired from industry specialist auditors (Lim and Tang, 2008), and when Big N auditors were both national and city-specific industry specialists (Reichelt and Wang, 2010). Studies based on UK and U.S. data further indicate that Big N auditors (and their larger offices) presented a higher propensity to issue a going concern audit opinion for distressed firms, when compared to non-Big N auditors (Lennox, 1999; Francis and Yu, 2009; Boone et al., 2010). However,

Vanstraelen (2002), using data from Belgian firms, found no association between the propensity to issue a going concern audit opinion for distressed firms and auditor size (Big N/non-Big N auditors), and Francis and Krishnan (2002), Geiger et al. (2006), and Geiger and Rama (2006) highlighted that, in the U.S., under litigation reforms, Big N and non-Big N auditors reported less conservatively.

While the auditors' brand name effect on audit reporting, *per se*, is not consistently relevant across the studies, industry specialization seems to act as a spillover of audit reporting quality. However, this type of research models are highly sensitive to the type of auditors' industry specialization variables that are used and the level at which they are computed (Audousset-Coulier et al., 2016). DeFond and Zhang (2014) further argue that research examining the supply drivers of audit quality associated with auditors' industry expertise can be constrained by a limitation inherent in the assumption that industry-specific knowledge is transferrable across clients, personnel and over time. Concerning the effects of auditors' size on audit reporting, the evidence obtained by prior studies is not consensual. While in some cases auditor brand name appears to be a driver of audit reporting quality, several authors stressed the importance of litigation reforms in this type of research (Geiger et al., 2006; Geiger and Rama, 2006). Research models exploring the effects of supply drivers of audit quality associated with auditors industry and auditor size may suffer from omitted variables bias, from spurious correlation, or from endogenous auditor choice (Boone et al., 2010). Thus, additional research in this area that controls for these issues is recommended.

The only cross-country study that we found up to 2010 (Carson et al., 2010) explored whether, holding the financial characteristics of the firms constant, there were differences in auditor reporting behaviour between countries, across legal frameworks, types of audit firms and whether these differences had changed over time. Carson et al. (2010) explored data from three common law countries (U.S., UK and Australia) and two code law countries (France and Germany). They found evidence that firms in code law countries were significantly more likely to receive going concern audit opinions relative to those in common law countries. Also, that global audit firm networks provided a more consistent approach to the application of going concern audit reporting standards and, the country differences between auditors were much less pronounced if the clients' level of financial distress was either extremely high or very low. In their model, Carson et al. (2010) controlled for the audit firm type and for several firms' characteristics (such as propensity to bankruptcy, size, leverage, financial performance, and return on assets), for the country's litigation risk, and included dummy variables for years and countries. However, the model may still suffer from omitted variables bias, from spurious correlation, or from endogenous auditor choice. This is a very interesting field of work for future research. In addition to the already incorporated variables by Carson et al. (2010), future studies should additionally control for auditors tenure, audit fees and non-audit fees, firms' corporate governance mechanisms, and country-level legal, economic, cultural, and religious characteristics. We further recommend using specific techniques to address endogeneity econometric concerns. Further research is warranted on how changes in the market for audit services impact on audit reporting decisions among differentially sized audit firms and different countries (Kaplan and Williams, 2012).

Analysing audit reports can represent an effective method to capture audit failures. DeFond and Zhang (2014) argue that modified audit opinions are discrete measures, with relatively high consensus on their measurement, relatively low measurement error, and are very direct measures of audit quality. The qualified audit opinion formulation process is a setting that allows direct insights into auditor independence and quality, because the audit opinion is the auditor's responsibility and is directly under his or her influence and control, and a failure in reporting a modified audit opinion when it is necessary is an egregious audit failure and evidence of poor audit quality (DeFond and Zhang, 2014).

Beyond the advantages of using the accuracy of audit reports when measuring audit quality, several limitations have been also appointed. Qualified audit opinions are relatively rare, related only to a few extreme situations, and cannot differentiate audit quality for a broad cross-section of firms (Myers et al., 2003; DeFond and Zhang, 2014). Several authors also state that the effectiveness of the auditor's report, as an indicator of audit quality, is limited due to the restricted content of the report, that is, the inputs of the auditor's reporting decision, such as information on materiality, independence, and significant audit risks, are not disclosed (Church et al., 2008; Mock et al., 2013). DeFond and Zhang (2014) further highlight that qualified audit opinions do not fully capture the broad value of an audit, and while the literature interprets more qualified audit opinions as greater auditor independence, this can also indicate excessive auditor conservatism, which arguably reduces audit quality. Thinking of audit quality as a continuous construct,

appears to be inconsistent with the binary nature of the audit opinion, because the audit opinion communicates the auditor's assurance that the financial statements comply with GAAP, and audit quality refers to the quality of the auditor's opinion (i.e., assurance), not the opinion itself (DeFond and Zhang, 2014). Thus, an interesting context to explore the audit reports as a proxy for audit quality could involve using a field work approach to examine the audit report formulating process.

Financial reporting quality

Recognizing the importance of auditing in the financial reporting process, Antle and Nalebuff (1991) suggest that financial statements should be viewed as a joint statement from the audit firm and the company's management. Consistently, Knechel (2009) state that audit quality as an outcome should not be separated from reporting quality, and Dechow et al. (2010) further claim that higher earnings quality provides relevant information to any decision that depends on an informative representation of financial performance. Under this argument, several authors measured audit quality through the informativeness of reported earnings. Several indicators of earnings quality have been used by researchers, which can be categorized into three broad categories: properties of earnings (including earnings persistence and smoothness, timely loss recognition, the magnitude of accruals and target beating), investor responsiveness to earnings, and external indicators of earnings misstatements (Dechow et al., 2010). Table 7 provides a synthesis of studies that linked the concept of audit quality directly to the financial reporting quality of audit clients.

Table 7. Output–based measures of audit quality (AQ) – Financial reporting quality

AQ Measure	Purpose	U.S. Studies	International Studies		Main Findings
			Single country	Cross-country	
Financial Reporting Quality	**To analyse the relation between financial reporting quality and:**	Johnson et al. (2002)			No significant association was found between long audit partner tenure and lower financial reporting quality.
		Gul et al. (2007)			It were found higher levels of earnings management but only in the early years of the auditor-client relationship, and not when auditor tenure was long.
		Manry et al. (2008)			As audit partner tenure increases, auditors became less willing to accept abnormal accruals, but only for small client firms.
		Davis et al. (2009)			The use of abnormal accruals to meet/beat earnings forecasts increased in both the early and later years of the auditor-client relationship. In the post-Sarbanes-Oxley period, the described relationship was not observed.
	1) Auditor tenure		Jeong and Rho (2004) – Korean listed firms		Audit firm rotation (non-Big N to Big N auditors and vice versa) did not produce higher earnings quality to client firms.
			Chi and Huang (2005) – Taiwan firms		Audit-partner tenure or audit-firm tenure produced higher quality of financial reporting, but the cut-off point of positive effects was about five years.
			Carey and Simnett (2006) – Australian listed firms; Jackson et al. (2008) - Australian listed firms		No significant association was found between long audit partner tenure and higher abnormal accruals.
			Chen et al. (2008) - Taiwan firms		Discretionary accruals values decreased significantly with both audit firm and audit partner tenure.
			Fargher et al. (2008) – Australian listed firms		Audit partner rotation produced higher quality of reported earnings but only in the initial years of tenure. Audit firm rotation produced lower earnings quality.
			Chi et al. (2009) – Taiwan listed firms		No significant differences were found in abnormal accruals between firms with mandatory partner rotation and firms from a non-rotation sample.

Note: Whenever there is no reference of the type of firms, it means authors used unlisted companies. (*Continued*)

Table 7. Output–based measures of audit quality (AQ) – Financial reporting quality - Continued

AQ Measure	Purpose	U.S. Studies	International Studies		Main Findings
			Single country	Cross-country	
Financial Reporting Quality	**To analyse the relation between financial reporting quality and:**	Reinolds and Francis (2001)			Larger clients in offices of Big N auditors presented higher earnings quality.
	2) Client economic importance	Chung and Kallapur (2003)			No evidence was found of a significant association between abnormal accruals and audit client's economic importance.
		Hoitash et al. (2007)			It was found a significant positive association between audit fees and abnormal accruals.
	3) Provision of non-audit services	Frankel et al. (2002) – listed firms; Gul et al. (2007); Lim and Tang (2008)			It was found a positive association between the level of non-audit services and the clients' levels of abnormal accruals.
		Ashbaugh et al. (2003); Antle et al. (2006) – listed firms	Antle et al. (2006) – UK listed firms; Ruddock et al. (2006) - Australian listed firms		Earnings quality was not significantly reduced as non-audit services increased.
	4) Auditor size	Krishnan and Schauer (2000)			The firms' noncompliance with accounting disclosure requirements decreased as one moves from non-Big N to Big N auditors.
		Francis and Yu (2009)			Clients of larger offices of Big N auditors evidenced less aggressive earnings management behaviour, as opposed to small offices of Big N auditors.
		Choi et al. (2010)			Audit office size had a significantly negative relation with earnings management, even after controlling for national-level audit firm size and office-level industry expertise.
		Frankel et al. (2002) – listed firms; Antle et al. (2006) – listed firms; Boone et al. (2010)	Bauwhede et al. (2003) – Belgium listed firms; Bauwhede and Willekens (2004) - Belgium firms; Jeong and Rho (2004) – Korean listed firms		No significant differences were found between earnings management of Big N and non-Big N auditors' clients.
				Kwon et al. (2007) - firms from several countries	Clients of Big N auditors presented lower levels of earnings management.
	5) Auditors' industry experience	Reichelt and Wang (2010)			Big N auditors who were both national and city-specific industry specialists had clients with the lowest abnormal accrual.
				Kwon et al. (2007) - firms from several countries	Clients of industry specialist auditors presented higher financial reporting quality, when compared with clients of non-specialist auditors. The impact of auditor industry specialization on earnings quality increased as the legal environment weakens.
	6) Characteristics of the auditors' client portfolio		Gaeremynck et al. (2008) – Belgium firms		For a sample of financial distressed firms, the audit-firm portfolio characteristics (client visibility and solvency) better explain variations in client financial reporting quality than the traditionally used Big N indicator variable.
	7) Litigation risk	Venkataraman et al. (2008) – listed firms			It was found a negative relation between abnormal accruals and higher-litigation risk.
		Fafatas (2010)			Auditors implicated in audit failure events occurred in the post-Enron and SOX period enforced a decline in clients' abnormal accruals, but only in the year following the event.
	8) Regulatory designation of auditor		Kim and Yi (2009) – Korean listed firms		Level of abnormal accruals was significantly lower for firms whose auditors were designated by the regulatory, than for firms with free selected of auditors.
	9) Audit market structure			Francis (2011b) - listed firms from 40 countries	In countries with a Big N auditors' market concentration, clients of Big N auditors had higher earnings quality. Yet, in countries with a higher concentration within the Big N group of auditors, clients of Big N auditors had lower earnings quality (compared to those with less concentration within the Big N auditors). Big N auditors' control of audit market by itself does not harm audit quality, but concentration within the dominant Big N group of auditors may be harmful to audit quality.

Note: Whenever there is no reference of the type of firms, it means authors used unlisted companies.

The quality of reported earnings has been used to capture audit quality in a diversity of contexts, particularly, in tests of perceived threats to audit quality, related with auditor tenure, client economic importance, and the provision of non-audit services. Most studies in literature also used earnings quality in tests of supply drivers of audit quality, namely those related with auditors' reputation (size), competence and exposure to legal liabilities.

When compared with U.S. studies, there is a higher prevalence of international studies, namely from Australia and Asiatic countries, that used earnings quality as a proxy for audit quality and examined the perceived threats arising from auditor tenure. Nevertheless, U.S. and international single country studies, in general, consistently indicated that there is no significant association between long periods of audit partner/audit firm tenure and lower financial reporting quality (Johnson et al., 2002; Carey and Simnett, 2006; Gul et al., 2007; Jackson et al., 2008; Chi et al., 2009), or even revealed that financial reporting quality increases with auditor tenure (Chi and Huang, 2005; Chen et al., 2008; Manry et al., 2008). Studies from outside the U.S. further reported that audit firm/audit partner rotation did not promote higher earnings quality to client firms (Jeong and Rho, 2004; Fargher et al., 2008; Chi et al., 2009). While we have verified a line of consistency in the findings of U.S. and international (single country) studies, and that the benefits of long periods of auditor/audit firm tenure on financial reporting quality seem to overcome those of auditor/audit firm rotation, there are important issues that we must keep in mind when analysing this type of research. First, despite, in general, all the studies controlled in their models for a set of client firm characteristics related with age, size, leverage and financial performance, and for audit firm size and audit pricing, some studies were performed at the audit partner level (of tenure or rotation), while others used the audit firm level. Second, these research-type models should control for endogenous auditor choice. Third, all the studies are from single countries that impose limitations on the length of audit partner tenure, but no limits on the length of audit firm tenure (U.S., Australia, Taiwan and Korea – for details see Lennox et al. (2014)). Therefore, future research should explore the effects of auditor/audit firm tenure/rotation on financial reporting quality in jurisdictions where there are no rotation rules for auditors, namely in emerging markets, or where there are both engagement partner and audit firm rotation rules (EU Member States). Cross-country studies that control for countries' institutional features are also necessary.

Regarding the tests of perceived threats to financial reporting related to client economic importance, the U.S. studies (Reinolds and Francis, 2001; Chung and Kallapur, 2003; Hoitash et al., 2007) provided mixed results. The evidence on the threats imposed by the provision of non-audit services is also mixed. While two U.S. studies (Ashbaugh et al., 2003; Antle et al., 2006) and two international single country studies from UK (Antle et al. (2006) and Australia (Ruddock et al., 2006) concluded that earnings quality was not significantly reduced by the provision of non-audit services to audit clients, Frankel et al. (2002), Gul et al. (2007) and Lim and Tang (2008) used U.S. data and found a negative association between the level of non-audit services and the clients' financial reporting quality. As we discussed previously, the inconsistencies in the results may be driven by the different levels that may be used when computing variables related with audit and non-audit fees (the audit firm-level, audit office-level, or engagement partner-level). Future research should account for this issue, also control for the effects of firms' corporate governance mechanisms on financial reporting quality, and expand to cross-country studies (that control for country-level institutional characteristics).

A subset of the literature has also indirectly captured auditor incentives to supply higher financial reporting quality, using auditors' size and industry specialization. Studies analysing the effects of auditors' size on financial reporting quality have yielded to inconsistent results. Several U.S. studies generally indicated that clients of large auditors present higher earnings quality (Krishnan and Schauer, 2000; Francis and Yu, 2009; Choi et al., 2010). Kwon et al. (2007) found similar evidence using data from several countries. Nevertheless, three studies from the U.S. (Frankel et al., 2002; Antle et al., 2006; Boone et al., 2010) and three international studies with data from Belgian and Korea (Bauwhede et al., 2003; Bauwhede and Willekens, 2004; Jeong and Rho, 2004) revealed no significant differences in earnings quality between clients of Big N and non-Big N auditors. An issue that can contribute to the mixed results is the computation of the variable representing the audit firm size. While the majority of the studies used the dichotomy Big N/non-Big N auditors, two U.S. studies used the audit office-level to compute auditors' size (Francis and Yu, 2009; Choi et al., 2010). According to Reinolds and Francis (2001), Francis and Yu (2009) and Choi et al. (2010), the examination of individual practices offices is of fundamental importance because this is where audit contracting occurs and where auditors make decisions with respect to the audited financial

statements of clients. DeFond and Zhang (2014) further highlight that audit office-level offers the possibility of capturing within-firm differentials in terms of audit quality.

Concerning the effects of auditors' industry specialization, evidence collected by a U.S. (Reichelt and Wang, 2010) and a cross-country study (Kwon et al., 2007) consistently supported that clients of industry specialist auditors present higher financial reporting quality. DeFond and Zhang (2014) indicate that a criticism of this type of research is that it makes a strong assumption about the mechanisms through which specialization improves audit quality, by assuming that industry-specific knowledge is transferrable across clients, personnel and over time, which requires sophisticated knowledge management systems. These research models are also highly sensitive to the type of auditors' industry specialization variables that are used (Audousset-Coulier et al., 2016).

Up to 2010 we only found a cross-country study that simultaneously tested the effects of auditors' industry specialization and size in financial reporting quality (Kwon et al., 2007). Kwon et al. (2007) controlled for several firms' characteristics (such as size, age, leverage, financial performance), but concerning the countries institutional features, they only included a variable related with the country's legal system (law enforcement and outside investor rights). Thus, future research in cross-country studies should further control for country-level economic, regulatory, political, cultural and religious factors that may affect the financial reporting system. According to Boone et al. (2010), research models examining the effects of supply drivers of audit quality associated with auditors' size and industry specialization may suffer from omitted variables bias, from spurious correlation, or from endogenous auditor choice. DeFond and Zhang (2014) argue that studies revealing a positive effect of auditor size and industry expertise on earnings quality can be explained by self-selection, because it may be that large and industry specialist auditors choose less risky clients.Therefore, additional research that controls for endogeneity issues is recommended.

Our review also includes studies that primarily focus on auditors' incentives for independence (and audit quality) arising from litigation risk and exposure to legal liabilities. DeFond and Zhang (2014) indicate that litigation damage claims against auditors can be large enough to threaten the viability even of the largest audit firms, and thus are expected to have significant incentive effects. Consistently, both U.S. and international studies generally confirmed that higher-litigation regimes and exposure to legal liabilities are an incentive to supply higher levels of audit quality (Venkataraman et al., 2008; Kim and Yi, 2009; Fafatas, 2010). This is an interesting area for future research, namely exploring, through cross-country studies, how different auditing litigation regimes (measured by different aspects of legal environments) impact on financial reporting quality, while controlling for other country-level institutional characteristics.

Our final reference is to a cross-country study of Francis (2011b) that related financial reporting quality and audit market structure.[13] Francis used data on listed firms from 40 countries and concluded that the dominance of the audit market by the Big N auditors by itself does not harm audit quality, but concentration within the dominant Big N group of auditors may be detrimental to audit quality. This study is of extreme importance to audit quality literature given the major concerns that have been expressed worldwide over the domination of the audit market by Big N auditors. U.S. and European superior government bodies warn that concentration of supply in audit markets can be harmful for audit quality, because the lack of competition reduces the incentives of Big N auditors to conduct high-quality audits (Francis et al., 2013).

In summary, there is an important research stream that examines audit quality by considering the overall quality of financial reporting quality. This type of research assumes that audited financial statements are a joint product of both the manager's and the auditor's work (Antle and Nalebuff, 1991). As reported by DeFond and Zhang (2014), this close link has made financial reporting quality an intuitively appealing proxy to measure audit quality.

Given that no comprehensive or generally accepted measure of earnings quality exists, researchers have examined various dimensions of earnings quality (Knechel et al., 2013). While financial reporting quality is conceptually broad, auditing researchers have primarily used earnings quality measures designed to detect opportunistic earnings management, motivated by the assumption that high quality auditing constrains opportunistic behaviours over financial reporting (DeFond and Zhang, 2014). The most frequently used measures include earnings persistence and smoothness, timely loss recognition, the magnitude of accruals and target beating (Dechow et al., 2010).

DeFond and Zhang (2014) highlight that financial reporting quality measures have several advantages that make them attractive candidates for capturing audit quality. In particular, earnings quality proxies

capture the quality of accounting information and of the audit process in a general sense, and, thus, they are conceptually suitable for measuring audit quality (Choi et al., 2010; DeFond and Zhang, 2014). Another advantage of the earnings quality measures is that they are expected to detect within GAAP earnings manipulation, which is likely to represent the qualitative aspects of management's accounting choices that reflect potential bias in management's judgments that auditors are required to evaluate (DeFond and Zhang, 2014). Also, the continuous nature of earnings quality measures captures variations in audit quality even in studies that are restricted to relatively small samples, and within the subset of clients who do not have egregiously poor audit quality (Francis, 2011a; DeFond and Zhang, 2014). As stated by Francis (2011a), all companies have financial statements and there is potentially far greater cross-sectional variation earnings quality, which creates more powerful research designs. Thus, cross-country studies is a suitable context to use earnings quality as a proxy for audit quality (while controlling for country-level institutional features).

While earnings quality measures are widely used by researchers to compute audit quality and present several advantages, it could be argued that earnings quality metrics are not an appropriate measure of audit quality (Francis, 2011a).

Dechow et al. (2010) and DeFond and Zhang (2014) highlight that financial reporting quality is determined by the firm's financial reporting system, which maps its underlying economics into the financial reports, and by the firm's innate characteristics, which determine its underlying economics. In other words, together, the firm's financial reporting system and innate characteristics affect the quality of the pre-audited financial statements, and, accordingly, higher audit quality reflects the greater assurance that the financial statements faithfully reflect the firm's underlying economics, conditioned on its financial reporting system and innate characteristics (DeFond and Zhang, 2014). Consistently, because it is inextricably intertwined with financial reporting quality, audit quality also depends a firms' innate characteristics and financial reporting systems, and, therefore, it is critically important for empirical models of audit quality to disentangle these constructs (Knechel, 2009; DeFond and Zhang, 2014). According to Dechow et al. (2010) and DeFond and Zhang (2014), all the proxies for earnings quality are affected by both fundamental performance and its measurement, and by firms' innate characteristics, although not equally, and, therefore, they do not measure the same underlying construct. Dechow et al. (2010) further claim that the earnings quality measures focus on different elements of decision usefulness of the information and, so, they should not be expected to perform equally well under all circumstances. Finally, DeFond and Zhang (2014) argue that earnings quality measures tend to have high measurement error and even bias and that there is little consensus on how these proxies should be measured.

As reported by Perotti and Wagenhofer (2014), since earnings quality is not directly observable, the literature has developed a variety of proxies for earnings quality, most of them based on intuitive and plausible concepts about desirable characteristics of an accounting system. However, although the measures are intended to capture the same fundamental construct, they correlate only weakly and this raises the question of which measure to use in a particular research design, and is likely to have a significant impact on the results. Perotti and Wagenhofer (2014) claim that there is little guidance as to how good the proxies for earnings quality really are and what the best measure in any given circumstance might be.

Perception-based measures of audit quality

By way of taking a different line to the studies presented in the prior sections, several authors analysed audit quality using perception-based measures. While users' perception on audit quality plays a critical role in maintaining systemic confidence in the integrity of financial accounting reports, prior research that evaluates audit quality from a stakeholder perspective is relatively sparse (Boone et al., 2008). Under this research perspective, our review includes studies that used single proxies as user perceptions of audit quality, such as audit client equity risk premium, bid-ask spread or earnings response coefficients (ERC), and other studies that used a multidimensional construct based on users' perceptions on several attributes of audit quality. Table 8 provides a synopsis of studies that used perception-based measures to capture audit quality.

Table 8. Output–based measures of audit quality (AQ) – Perception-based measures

AQ Measure	Purpose	U.S. Studies	International Studies		Main Findings
			Single country	Cross-country	
Market and shareholders perceptions on Audit Quality	To analyse the relation between perceptions of audit quality and: 1) auditors tenure/rotation	Ghosh and Moon (2005) – listed firms			Long periods of audit firm tenure positively affected the market perceptions of earnings quality (generated higher ERCs).
		Boone et al. (2008)			The equity risk premium of audit clients decreased in the early years of tenure but increased with additional years of tenure. Overall, the cost of capital decreased with long periods of audit firm tenure.
		Dao et al. (2008)			The shareholder votes against auditor ratification were positively correlated with auditor tenure. Long periods of auditor tenure adversely affects audit quality.
			Chi et al. (2009) – Taiwan listed firms		It was not found support for the belief that mandatory audit partner rotation enhances investor perceptions of audit quality. ERC values were not significantly different between samples of firms with/without audit firm rotation.
	2) provision of non-audit services	Lim and Tang (2008)			Audit quality increased (higher ERCs) with the level of non-audit services acquired from industry specialist auditors when compared to non-specialist auditors.
	3) auditors' industry specialization			Kwon et al. (2007) – firms from several countries	Clients of industry specialist auditors presented higher ERCs than clients of non-specialist auditors. The impact of auditors' industry specialization on earnings quality increased as the legal environment weakens.
		Almutairi et al. (2009)			A sufficiently long industry specialist auditor-client tenure improved the disclosure quality (the client bid-ask spread).
Multidimensional construct based on shareholders perceptions on several audit quality attributes	To explore the relationship between audit quality and: 1) Auditor tenure	Deis and Giroux (1992)			It was found evidence that audit quality declines with the length of auditor tenure.
	2) Audit fees and audit effort	Deis and Giroux (1996)			Evidence showed that initial audits were associated with lower fees, higher audit hours and higher audit quality.
	To analyse the effects of auditor specialization on perceived audit quality	Lowensohn et al. (2007)			Specialist auditors were positively associated with perceived audit quality. Big N auditors were not uniformly associated with increased perceived audit quality.
	To study the relation between audit quality attributes and audit clients satisfaction	Behn et al. (1997)	Takiah et al. (2010)		Client satisfaction was significantly related to auditors' competence, experience and independence attributes.
	To analyse how external users and auditors evaluate several audit quality attributes	Schroeder et al. (1986); Carcello et al. (1992)	Beattie and Fearnley (1995); Duff (2009)		Auditors' technical competence (and experience) and independence features were perceived as very important audit quality attributes.
			Warming-Rasmussen and Jensen (1998)		Auditor's skeptical attitude, independence and industry knowledge were perceived as very important aspects of audit quality.
			Duff (2004)		Auditors' technical quality dimensions of reputation and capability were perceived by users as very important audit quality attributes.

Note: Whenever there is no reference of the type of firms, it means authors used unlisted companies.

Although it is recognised that the stakeholders' perception of audit quality plays a critical role in maintaining market systemic confidence in the truthfulness of the financial reporting system, studies that examined audit quality from a stakeholder perspective are limited (Ghosh and Moon, 2005; Boone et al., 2008). Ghosh and Moon (2005) argue that this type of research is necessary as it provides valuable insights into how capital market participants perceive the effects of auditors' independence and competence on audit quality.

As we can see from Table 8, up to 2010 we found five U.S. studies and two international studies (one cross-country study) that analysed the relationship between market-based perceptions of earnings quality (and audit quality) and variables that are traditionally linked with auditors' independence and competence. Overall, those studies suggest that long periods of audit firm tenure positively affect the market perceptions of earnings quality (Ghosh and Moon, 2005; Boone et al., 2008; Chi et al., 2009), and that auditors' industry specialization acts as a spillover of users' perceptions of earnings quality and audit quality (Kwon et al., 2007; Lim and Tang, 2008; Almutairi et al., 2009). The evidence collected from the cross-country study of Kwon et al. (2007), highlights, however, that the impact of auditor industry specialization on users' perceptions of earnings quality is dependent on the country's legal environment.

A key point in this type of research is that the findings must be interpreted with caution, because they critically depend on the ability of market-based proxies (ERC, client equity risk premium, or bid-ask spread) to capture perceived audit quality (Chi et al., 2009). As acknowledged by Lim and Tang (2008) and Chi et al. (2009), although widely used in the accounting literature, market-based proxies for perceived audit quality can be noisy measures, which weakens the inferences. Furthermore, the research models examining the effects of auditors' competence and independence on users' perceptions of earnings quality may suffer from endogeneity bias, especially, from endogenous auditor choice (Kwon et al., 2007). Thus, additional research in this area is recommended, namely, studies using several alternative market-based measures of perceived audit quality, and cross-country studies that control for endogeneity concerns, and for several country-level institutional characteristics that may affect the stakeholders' perceptions about the quality of the financial reporting system and, by consequence, audit quality.

Table 8 also reports several studies that used multidimensional constructs to measure users' perceptions of audit quality. Those studies view audit quality from a behavioural perspective and usually identify attributes that are perceived by financial preparers, auditors, and other users as being related to audit quality, and then create constructs of audit quality (*i.e.*, audit quality is measured by using multi-attribute models). In 1982, a seminal study from Mock and Samet (*in* Duff, 2004: 21) drafted a list of 110 factors related to audit quality (derived from Statements on Auditing Standards, Statements on Quality Control Standards, peer review manuals, and firm quality control standards) that were then reviewed by a group of auditors. This process reduced the 110 factors to a 32-item questionnaire used for evaluating audit quality. Several authors followed the Mock and Samet's method and evaluated perceptions of audit quality among different groups of stakeholders. Duff (2009) highlights that multidimensional constructs of audit quality include common elements but these constructs are also used with little reference to one another. Our review includes several U.S. (Schroeder et al., 1986; Carcello et al., 1992; Behn et al., 1997; Lowensohn et al., 2007) and international studies (Beattie and Fearnley, 1995; Warming-Rasmussen and Jensen, 1998; Duff, 2004, 2009; Takiah et al., 2010) that followed this approach and, interestingly, they consistently indicate that auditors' technical competence, experience and independence attributes were systematically perceived by users as very important dimensions of audit quality. It was also interesting to note that a U.S. and an international study consistently reported that Big N auditors were not uniformly perceived by users as associated with higher audit quality (Lowensohn et al., 2007; Takiah et al., 2010). These findings are important as they report a consistent pattern about the attributes that are perceived by the U.S. and international users as the most important dimensions of audit quality.

Studies using multidimensional constructs to access the stakeholders' perceptions of audit quality offer a different, but very interesting, perspective of audit quality. As stated by Pratt (2009), this type of study allows the researcher to better understand the world from the perspective of those studied, and to examine real-life processes. It is especially suitable for studying the complexities of expert practices like auditing, allowing the researcher to develop insights into the backstage of expertise (Cooper and Morgan, 2008). It also has the potential to generate rich descriptions of processes and grounded categorizations that are useful for quantitatively oriented studies, allowing researchers to develop new concepts, refine existing ones, and identify novel relationships and trends for further testing (Power and Gendron, 2015). Future research in auditing should explore this "constructivist spirit" of analysis, where auditing is viewed as a practice with a high degree of unique and specific features that vary widely (Power and Gendron, 2015). Recently, several global initiatives have developed audit quality frameworks which are essentially based on key indicators of audit quality (IAASB, 2014; PCAOB, 2015; CAQ, 2016), revealing the importance of using multidimensional constructs of audit quality in identifying the most effective ways to determine and assess audit quality.

4. Conclusion

In this study we review critically three decades of literature (1980-2010) with a primary focus on audit quality. We first discuss audit quality conceptualization, and then, grounded on the DeFond and Zhang (2014) framework, we provide a comprehensive analysis of the most used measures of audit quality, under the perspective of the U.S. *versus* international studies.

Regarding the concept of audit quality, and consistent with Knechel et al. (2013), we conclude that past attempts to define audit quality have failed to produce a consensual and universally accepted definition. Audit quality is, in essence, a complex and multi-faceted concept, with two critical attributes, its inherent uncertainty and idiosyncrasy (Knechel, 2009). Given the difficulties in defining audit quality, exploring the context and relevance of certain indicators has been critical to obtain a deeper understanding of the quality of a particular audit, even if those indicators do not provide a holistic understanding of audit quality (CAQ, 2016).

The input-based measures essentially reflect individual characteristics of auditors and audit teams, such as knowledge, expertise and professional skepticism. Yet, as Knechel et al. (2013) noted, the riskiness of audits and the idiosyncratic nature of audit engagements lead to no prescribed level of inputs to yield a desired level of audit assurance. We find that most of the research located in the input-based measures of audit quality has been concentrated on the auditor-client contracting features (in particular, audit fees) and auditors' brand name, while auditors' industry experience has only began to be used as a surrogate of audit quality since the 2000s. We conclude that there is a lack of research exploring measures of audit quality based on audit effort. As Simmnet et al. (2016) argued, information on audit effort has the ability to provide evidence-based results that are of fundamental importance to audit quality, such as the auditors' approach to deal with clients with different risk profiles, the role of the engagement partner, the review partner, the senior manager, or the audit team composition.

Our review indicates that there is not a general consensus inside the U.S. studies and across international studies about the existence of a Big N auditor fee premium, and a cross-country study even demonstrated that the fee premiums of Big N auditors became smaller as the countries' legal and regulatory regimes changed from weaker to stronger regimes. Concerning the effect of auditors' industry specialization on audit pricing, the evidence of U.S. and international studies is also not consensual, but there is some consistency between U.S. and Australian data revealing that only jointly national and city-specific industry leadership results in an audit fee premium for Big N auditors. A cross-country study concluded that there are returns to global audit firm networks from investments in industry specializations and significant fee premiums for national industry leaders, and that the national U.S. auditors' industry leaders also receive fee premiums from outside the U.S. market.

We also verify that both U.S. and international studies capture the demand for high audit quality through auditor-specific characteristics (namely, auditors' brand name and industry expertise). Yet, while the U.S. studies mostly analyse factors that drive the client's demand for audit quality related to agency costs, market reactions, investment opportunities, financing decisions and financial reporting quality, the international studies (including cross-country studies) are typically located in demand drivers related to financial reporting quality. While U.S. and international single country studies largely support the notion that Big N auditors tend to promote the quality of financial reporting of their clients, the cross-country studies provide no evidence of such an international effect, and suggest that it is the strength of the countries' legal and regulatory systems that explains the Big N auditor effect on audit quality. Our review also reveals that there is not a consensus between U.S. and international single country studies over the idea that industry specialist auditors promote earnings quality.

The output-based measures of audit quality assume that audit quality is related to the probability that financial statements contain no material misstatements. The most used output-based proxies are the auditors' litigation activities, PCAOB inspections reports, accounting restatements, audit reports, financial reporting quality, and perception-based measures. We find that most of the research using output-based measures of audit quality, has been centralised in proxies based on audit reporting and financial reporting quality, and that this is a research branch that has begun to be explored essentially since the 2000s.

Our review shows a higher concentration of U.S. studies using auditors' litigation activities as a surrogate of audit quality, and a lack of international studies in this area. This is explained by differences in the legal systems worldwide, which provide a scenario wherein auditors face more exposure to litigation

in common law countries, and less direct legal exposure in code law countries such as Continental Europe (Francis, 2011a). In the U.S., factors that mostly seem to cause litigation actions against auditors are essentially related to the client firm's financial condition and to weak quality control or risky practices within audit firms.

Though many countries worldwide have established public oversight systems of auditors, the PCAOB inspections reports are those that have mostly been used to signal audit quality, since PCAOB inspects both U.S. and non-U.S. registered auditing firms. Research on PCAOB inspections has been essentially centered on the effects of PCAOB's inspection program in the U.S., and, while some studies suggest that PCAOB inspections stimulate improvements in audit quality and have been beneficial to the audit profession, other studies indicate that the PCAOB inspection process has been penalizing for audit firms. Regarding the PCAOB international inspection program, up to 2010, we did not find any study. Only recently, a few studies have started to investigate this issue.

Another indicator that has been used as a proxy for negative audit quality is the presence of accounting restatements. Our review shows that studies using restatements as an outcome of audit quality come mainly from the U.S., and up to 2010, we only found two international studies, from Taiwan. Studies from the U.S. and Taiwan consistently reported that the occurrence of restatements is negatively related with auditor industry expertise and the experience of the audit team. U.S. studies further revealed that the event of restatements is negatively associated with auditor tenure, but they are not consensual on whether audit fees are related to restatements.

Prior research has also used the accuracy of audit reporting and the financial reporting quality of audit clients as measures of audit quality.

Our synthesis reveals that the effect of auditor tenure on the accuracy of audit reports and earnings quality has been mainly analysed by international single country studies, and that the evidence collected by those studies mostly indicates that the benefits of long periods of auditor tenure on audit reports and on financial reporting seem to overcome those of auditors' rotation. The persistence of international studies (compared to U.S. studies) analysing the relationship between audit reporting and financial reporting accuracy and auditor tenure seems to be explained by regulatory changes to audit partner/audit firm rotation that have occurred worldwide, and in particular in the European context, over the last ten years. The accuracy of audit reports and of financial reporting has been also used by several U.S. and international (single country) studies, in tests of perceived threats to audit quality, related to client economic importance, and the provision of non-audit services, but the evidence collected is not consensual.

Prior studies have further analysed whether audit reporting accuracy and earnings quality depends on auditors' brand name and industry expertise. In light of the evidence collected by U.S. and international single country studies, auditors' brand name, *per se*, seems not to be consistently a relevant driver of audit reporting quality and of the clients' earnings quality. Yet, two cross-country studies, found evidence that Big N auditors promote quality of financial reporting of their clients, and that global audit firm networks provide a more consistent approach to the application of going concern audit reporting standards. Regarding industry expertise, U.S. studies and a cross-country study consistently indicate that auditors' industry expertise seems to act as a spillover of the accuracy of audit reports and of financial reporting.

Under the output-based measures, several studies have also analysed audit quality through users' perceptions. On the one hand, we found five U.S. studies and two international studies (one cross-country study) that linked market-based perceptions of earnings quality to variables that are traditionally linked with auditors' independence and competence, overall suggesting that long periods of audit firm tenure and auditors' industry expertise have a positive influence on the market-based perceptions of earnings quality. On the other hand, several studies used multidimensional constructs to access users' perceptions of audit quality. While we report a lack of research evaluating audit quality from a stakeholder viewpoint (qualitative perspective), our review allows us to conclude that U.S. and international studies consistently indicate that auditors' technical competence, experience and independence attributes are systematically perceived by users as very important dimensions of audit quality.

Finally, while we note that the proxies used by researchers to capture audit quality are indirect and have inherent limitations, we acknowledge that due to the lack of ability to observe audit quality, combining multiple proxies can be the best solution to capturing audit quality, and therefore reducing the impact of the intrinsic limitations of each individual proxy and taking advantage of their strengths. Furthermore, future research should rely on qualitative measures of audit quality, which allows researchers to better

understand the world from the perspective of those studied and to examine real-life auditing processes (Pratt, 2009). This type of research may generate rich descriptions of processes and grounded categorizations useful for quantitatively studies, allowing the development of new concepts (or refining the existing ones), and identify novel relationships and trends for further testing (Power and Gendron, 2015).

References

Abbott, L.J., Gunny, K. and Zhang, T. (2008) '*When the PCAOB Talks, Who Listens? Evidence from Client Firm Reaction to Adverse, GAAP-Deficient Inspection Reports*' [online]. Working paper, The University of Memphis, University of Colorado at Boulder, and Singapore Management University. http://ink.library.smu.edu.sg/soa_research/96/ (Accessed 05 January 2017).

Abernathy, J.L., Barnes, M. and Stefaniak, C. (2013) 'A summary of 10 years of PCAOB research: What have we learned?', *Journal of Accounting Literature*, Vol. 32, No. 1, pp.30–60.

ACCA (2012) *The rise of capital markets in emerging and frontier economies*. [online] http://www.accaglobal.com/content/dam/acca/global/PDF-technical/global-economy/pol-tp-rcm.pdf. (Accessed 10 May 2013).

Agrawal, A. and Cooper, T. (2009) '*Corporate Governance Consequences of Accounting Scandals: Evidence from Top Management, CFO and Auditor Turnover*' [online]. Working paper, The University of Alabama. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=970355. (Accessed 04 January 2015)

Aharony, J., Lin, C. and Loeb, M.P. (1993) 'Initial Public Offerings, Accounting Choices, and Earnings Management', *Contemporary Accounting Research*, Vol. 10, No. 1, pp.61-81.

Albring, S.M., Elder, R.J. and Zhou, J. (2007) 'IPO Underpricing and Audit Quality Differentiation within Non-Big 5 Firms', *International Journal of Auditing*, Vol. 11, No. 2, pp.115-131.

Almutairi, A.R., Dunn, K.A. and Skantz, T. (2009) 'Auditor tenure, auditor specialization, and information asymmetry', *Managerial Auditing Journal*, Vol. 24, No. 7, pp.600-623.

Antle, R. and Nalebuff, B. (1991) 'Conservatism and Auditor-Client Negotiations', *Journal of Accounting Research*, Vol. 29, No.3, pp.31-54.

Antle, R., Gordon, E., Narayanamoorthy, G. and Zhou, L. (2006) 'The joint determination of audit fees, non-audit fees and abnormal accruals', *Review of Quantitative Finance and Accounting* , Vol. 27, No. 3, pp.235-66.

Ashbaugh H., LaFond, R. and Mayhew, B. (2003) 'Do non-audit services compromise auditor independence? Further evidence', *The Accounting Review*, Vol. 78, No. 3, pp.611-39.

Audousset-Coulier, S., Jeni, A. and Jiang, L. (2016) 'The Validity of Auditor Industry Specialization Measures', *Auditing: A Journal of Practice & Theory*, Vol. 35, No. 1, pp.139-161.

Badertscher, B.A. and Burks, J.J. (2011) 'Accounting Restatements and the Timeliness of Disclosures', *Accounting Horizons*, Vol. 25, No. 4, pp.609-629.

Barbadillo, E.R, Aguilar, N.G., Barbera, C.F. and Benau, M.A.G. (2004) 'Audit Quality and the Going-concern Decision-making Process: Spanish Evidence', *European Accounting Review*, Vol. 13, No. 4, pp.597–620.

Barbadillo, E.R., Aguilar, N.G. and Pena, N. C. (2009) 'Derogación de la rotación obligatoria de auditores y calidad de la auditoria', *Revista de Economía Aplicada*, Vol. 17, No. 49, pp.105-134.

Bauwhede, H.V. and Willekens, M. (2004) 'Evidence on (the Lack of) Audit-quality Differentiation in the Private Client Segment of the Belgian Audit Market', *European Accounting Review*, Vol. 13, No. 3, pp.501-522.

Bauwhede, H.V., Willekens, M. and Gaeremynck, A. (2003) 'Audit firm size, public ownership, and firms' discretionary accruals management', *The International Journal of Accounting*, Vol. 38, No. 1, pp.1-22.

Beattie, V. and Fearnley, S. (1995) 'The importance of audit firm characteristics and the drivers of auditor change in UK listed companies', *Accounting and Business Research*, Vol. 25, No. 100, pp.227-239.

Beatty, R.P. (1989) 'Auditor Reputation and the Pricing of Initial Public Offerings', *The Accounting Review*, Vol. 64, No. 4, pp.693-909.

Becker, C., DeFond, M., Jiambalvo, J. and Subramanyam, K.R. (1998) 'The effect of audit quality on earnings management', *Contemporary Accounting Research*, Vol. 15, No. 1, pp.1-24.

Bedard, J.C., Johnstone, K.M. and Smith, E.F. (2010) 'Audit Quality Indicators: A Status Update on Possible Public Disclosures and Insights from Audit Practice', *Current Issues in Auditing*, Vol. 4, No. 1, pp.C12-C19.

Behn, B.K., Carcello, J.V., Hermanson, D.R. and Hermanson, R.H. (1997) 'The determinants of audit client satisfaction among clients of Big 6 firms', *Accounting Horizons*, Vol. 11, No. 1, pp.7-24.

Behn, B.K., Choi, J. and Kang, T. (2008) 'Audit Quality and Properties of Analyst Earnings Forecasts', *The Accounting Review*, Vol. 83, No. 2, pp.327-349.

Benkraiem, R. (2009) 'Does the Presence of Independent Directors Influence Accruals Management', *The Journal of Applied Business Research*, Vol. 25, No. 6, pp.77-86.

Bing, J., Huang, C.X., Li, A. and Zhu, X. (2014) '*Audit Quality Research Report*' [online]. Working paper. Australian National Centre for Audit and Assurance Research. https://www.rsa.anu.edu.au/media/319746/audit_quality_research_intern_report_smaller. .pdf. (Accessed 10 January 2016).

Bishop, C.C., Hermanson, D.R. and Houston, R.W. (2013) 'PCAOB inspections of international audit firms: Initial evidence', *International Journal of Auditing*, Vol. 17, No. 1, pp.1–18.

Boolaky, P.K. and Soobaroyen, T. (2017) 'Adoption of International Standards on Auditing (ISA): Do Institutional Factors Matter?' *International Journal of Auditing*, Vol. 21, No. 1, pp.59-81.

Boone, J.P., Khurana, I.K. and Raman, K.K. (2008) 'Audit Firm Tenure and the Equity Risk Premium', *Journal of Accounting, Auditing and Finance*, Vol. 23, No. 1, pp.115-140.
Boone, J.P., Khurana, I.K. and Raman, K.K. (2010) 'Do the Big 4 and the Second-tier firms provide audits of similar quality?', *Journal of Accounting and Public Policy*, Vol. 29, No. 4, pp.311-402.
Cahan, S.F. and Zhang, W. (2006) 'After Enron: Auditor Conservatism and Ex-Andersen Clients', *The Accounting Review*, Vol. 81, No. 1, pp.49-82.
Calderon, G. and Ofobike, E. (2008) 'Determinants of client-initiated and auditor-initiated auditor changes', *Managerial Auditing Journal*, Vol. 23, No. 1, pp.4–25.
Cameran, M., Negri, G. and Pettinicchio, A. (2015) 'The Audit Mandatory Rotation Rule: The State of the Art', *The Journal of Financial Perspectives*, Vol. 3, No. 2, pp.1-33.
CAQ (2016) *Audit Quality Indicators: The Journey and Path Ahead*. [online] http://www.thecaq.org/docs/default-source/reports-and-publications/auditqualityindicators_journeyandpath2016.pdf?sfvrsn=6. (Accessed 13 January 2016).
Caramanis, C. and Lennox, C. (2008) 'Audit effort and earnings management', *Journal of Accounting and Economics*, Vol. 45, No. 1, pp.116-138.
Carcello, J. and Neal, T. (2000) 'Audit committee composition and auditor reporting', *The Accounting Review*, Vol. 75, No. 4, pp.453–467.
Carcello, J.V. and Palmrose, Z. (1994) 'Auditor Litigation and Modified Reporting on Bankrupt Clients', *Journal of Accounting Research*, Vol. 32, Supplement, pp.1-30.
Carcello, J.V., Hermanson, R.H. and McGrath, N.T. (1992) 'Audit quality attributes: the perceptions of audit partners, preparers, and financial statement users', *Auditing: A Journal of Practice and Theory*, Vol. 11, No. 1, pp.1-15.
Carcello, J.V., Hollingsworth, C. and Mastrolia, S.A. (2011) 'The effect of PCAOB inspections on Big 4 audit quality', *Research in Accounting Regulation*, Vol. 23, No. 2, pp.85-96.
Carcello, J.V., Neal, T.L. and Riley, R.A. (2002) 'Board characteristics and audit fees', *Contemporary Accounting Research*, Vol. 19, No. 3, pp.365–384.
Carey, P. and Simnett, R. (2006) 'Audit Partner Tenure and Audit Quality', *The Accounting Review*, Vol. 81, No. 3, pp.653-676.
Carson E.A., Simnett, R. and Tronnes, P. (2010) '*International Consistency and Convergence in the Application of International Auditing Standards: Evidence from Going Concern Modifications*', paper presented at the ISAR Conference 2919, Singapore, 24-25 June, pp.1 – 31.
Carson, E. (2009) 'Industry specialization by global audit firm networks', *The Accounting Review*, Vol. 84, No. 2, pp.355–382.
Casterella, J.R., Francis, J.R., Lewis, B.L. and Walker, P.L. (2004) 'Auditor industry specialization, client bargaining power and audit pricing', *Auditing: A Journal of Practice & Theory*, Vol. 23, No. 1, pp.123–140.
Casterella, J.R., Jensen, k.L. and Knechel, W.R. (2009) 'Is self-regulated peer-review effective at signaling audit quality?', *The Accounting Review*, Vol. 84, No. 3, pp.713–735.
Chaney, P., Jeter, D.C. and Shivakumar, L. (2004) 'Self-selection of auditors and audit pricing in private firms', *The Accounting Review*, Vol. 79, No. 1, pp.51 -72.
Chang, X., Dasgupta, S. and Hilary, G. (2009) 'The Effect of Auditor Quality on Financing Decisions', *The Accounting Review*, Vol. 84, No. 4, pp.1085-1117.
Chen, C-Y., Lin, C-J. and Lin, Y-C. (2008) 'Audit Partner Tenure, Audit Firm Tenure, and Discretionary Accruals: Does Long Auditor- Tenure Impair Earnings Quality?', *Contemporary Accounting Research*, Vol. 25, No. 2, pp.415-445.
Chen, K.Y., Lin, K. and Zhou, J. (2005) 'Audit quality and earnings management for Taiwan IPO firms', *Managerial Auditing Journal*, Vol. 20, No. 1, pp.86-104.
Chen, S., Sun, S.Y.J. and Wu, D. (2010) 'Client Importance, Institutional Improvements, and Audit Quality in China: An Office and Individual Auditor Level Analysis', *The Accounting Review*, Vol. 85, No. 1,pp.127-158.
Chi, W. and Huang, H. (2005) 'Discretionary Accruals, Audit-Firm Tenure and Audit-Partner Tenure: Empirical Evidence from Taiwan', *Journal of Contemporary Accounting and Economics*, Vol. 1, No. 1, pp.65-92.
Chi, W., Huang, H., Liao, Y. and Xie, H. (2009) 'Mandatory Audit Partner Rotation, Audit Quality, and Market Perception: Evidence from Taiwan', *Contemporary Accounting Research*, Vol. 26, No. 2, p.359-391.
Chia, Y.M., Lapsley, I. and Lee, H. (2007) 'Choice of auditors and earnings management during the Asian financial crisis', *Managerial Auditing Journal*, Vol. 22, No. 2, pp.177-196.
Chin, C. and Chi, H. (2009) 'Reducing restatements with increased industry expertise', *Contemporary Accounting Research*, Vol. 26, No. 3, pp.729–765.
Choi, J., Kim, C., Kim, J. and Zang, Y. (2010) 'Audit Office Size, Audit Quality, and Audit Pricing', *Auditing: A Journal of Practice and Theory*, Vol. 29, No. 1, pp.73–97.
Choi, J., Kim, J., Liu, X. and Simunic, D.A. (2008) 'Audit Pricing, Legal Liability Regimes, and Big 4 Premiums: Theory and Cross-country Evidence', *Contemporary Accounting Research*, Vol. 25, No. 1, pp.55–99.
Chung, H. and Kallapur, S. (2003) 'Client Importance, Nonaudit Services, and Abnormal Accruals', *The Accounting Review*, Vol. 78, No. 4, pp.931-955.
Church, B.K. and Shefchik, L. B. (2010) '*A Five-Year Look at PCAOB Inspections: How Did Large Accounting Firms Pan Out?*' [online]. Working paper, Georgia Institute of Technology. http://www2.aaahq.org/AM2010/abstract.cfm?submissionID=1656 (Accessed 05 January 2017).
Church, B.K., Davis, S.M. and McCracken, S.A. (2008) 'The auditor's reporting model: A literature overview and research synthesis', *Accounting Horizons*, Vol. 22, No. 1, pp.69–90.
Coffee, J. C. Jr. (2005) 'A Theory of Corporate Scandals: Why the USA and Europe Differ', *Oxford Review of Economic Policy*, Vol. 21, No. 2, pp.198-211.
Cooper, D.J. and Morgan, W. (2008) 'Case study research in accounting', *Accounting Horizons*, Vol. 22, No. 2, pp.159–178.

Craswell, A., Francis, J. and Taylor, S. (1995) 'Auditor brand name reputations and industry specializations', *Journal of Accounting and Economics*, Vol. 20, No. 3, pp.297–322.
Dao, M., Mishra, S. and Raghunandan, K. (2008) 'Auditor Tenure and Shareholder Ratification of the Auditor', *Accounting Horizons*, Vol. 22, No. 3, pp.297-314.
Davis, L.R., Soo, B.S. and Trompeter, G.M. (2009) 'Auditor Tenure and the Ability to Meet or Beat Earnings Forecasts', *Contemporary Accounting Research*, Vol. 26, No. 2, pp.517-548.
DeAngelo, L.E. (1981) 'Auditor size and audit quality', *Journal of Accounting and Economics*, Vol. 3, No. 3, pp.183-199.
Dechow, P.M., Ge, W. and Schrand, C. (2010) 'Understanding earnings quality: A review of the proxies, their determinants and their consequences', *Journal of Accounting and Economics*, Vol. 50, No. 2-3, pp.344-401.
Dee, C., Lulseged, A. and Zhang, T. (2011) 'Client stock market reaction to PCAOB sanctions against a Big 4 auditor', *Contemporary Accounting Research*, Vol. 28, No. 1, pp.263–291.
DeFond, M. and Zhang, J. (2014) 'A review of archival auditing research', *Journal of Accounting and Economics*, Vol. 58, No. 2-3, pp.275-326.
DeFond, M.L. (2010) 'How should the auditors be audited? Comparing the PCAOB inspections with the AICPA peer reviews', *Journal of Accounting and Economics*, Vol. 49, No. 1/2, pp.104–108.
DeFond, M.L. and Francis, J.R. (2005) 'Audit research after Sarbanes-Oxley', *Auditing: A Journal of Practice & Theory*, Vol. 24 (Supplement), pp.5-30.
DeFond, M.L. and Subramanyam, K.R. (1998) 'Auditor Changes and Discretionary Accruals', *Journal of Accounting and Economics*, Vol. 25, No. 1, pp.35-67.
DeFond, M.L., and Lennox, C.S. (2011) 'The effect of SOX on small auditor exits and audit quality', *Journal of Accounting & Economics*, Vol. 52, No. 1, pp.21–40.
DeFond, M.L., Francis, J. and Wong, T.J. (2000) 'Auditor industry specialization and market segmentation: evidence from Hong Kong', *Auditing: A Journal of Practice and Theory*, Vol. 19, No. 1, pp.49-66.
Deis, D.R. Jr. and Giroux, G.A. (1992) 'Determinants of audit quality in the public sector', *The Accounting Review*, Vol. 67, No. 3, pp.462-479.
Deis, D.R. Jr. and Giroux, G.A. (1996) 'The Effect of Auditor Changes on Audit Fees, Audit Hours, and Audit Quality', *Journal of Accounting and Public Policy*, Vol. 15, Spring, pp.55-76.
Dougherty, B., Dickins, D. and Tervo, W. (2011) 'Negative PCAOB inspections of triennially inspected auditors and involuntary and voluntary client losses', *International Journal of Auditing*, Vol. 15, No. 3, pp. 231–246.
Dudley, W.C. and Hubbard, G.R. (2004) *How Capital Markets Enhance Economic Performance and Facilitate Job Creation* [online]. https://www0.gsb.columbia.edu/faculty/ghubbard/Articles%20for%20Web%20Site/How%20Capital%20Markets%20Enhance%20Economic%20Performance%20and%20Facilit.pdf. (Accessed 10 January 2014).
Duff, A. (2004) *AUDITQUAL: Dimensions of Audit Quality* [online]. Institute of Chartered Accountants of Scotland (ICAEW). http://www.icas.org.uk/site/cms/download/res_duff_auditqual_Report.pdf. (Accessed 10 January 2011).
Duff, A. (2009) 'Measuring audit quality in an era of change - An empirical investigation of UK audit market stakeholders in 2002 and 2005', *Managerial Auditing Journal*, Vol. 24, No. 5, pp.400-422.
Eilifsen, A., and Messier, W.F. (2000) 'The incidence and detection of misstatements. A review and integration of archival research', *Journal of Accounting Literature*, Vol. 19, pp.1-43.
El Ghoul, S., Guedhami, O. and Pittman, J. (2016) 'Cross-country evidence on the importance of Big Four auditors to equity pricing: The mediating role of legal institutions', *Accounting, Organizations and Society*, Vol. 54, pp. 60-81.
EU (2006) Directive 2006/43/EC of May 17 of the European Parliament and of the Council. *Official Journal of the European Union* L 157, pp.87-107.
EU (2010) *European Commission Green Paper - Audit Policy: Lessons from the Crisis.* [online] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0561:FIN:EN:PDF. (Accessed 10 September 2011).
EU (2014) Regulation No 537/2014 of 16 April of the European Parliament and of the Council. *Official Journal of the European Union* L 158, pp.77-129.
Fafatas, S.A. (2010) 'Auditor conservatism following audit failures', *Managerial Auditing Journal*, Vol. 25, No. 7, pp.639-658.
Fargher, N., Lee, H. and Mande, V. (2008) 'The effect of audit partner tenure on client managers' accounting discretion', *Managerial Auditing Journal*, Vol. 23, No. 2, pp.161-186.
Ferguson, A. and Stokes, D. (2002) 'Brand Name Audit Pricing, Industry Specialization and Leadership Premiums post-Big 8 and Big 6 Mergers', *Contemporary Accounting Research*, Vol. 19, No. 1, pp.77-100.
Ferguson, A., Francis, J.R. and Stokes, D.J. (2003) 'The effects of firm-wide and office-level industry expertise and audit pricing', *The Accounting Review*, Vol. 78, No. 2, pp.429-448.
Francis, J.R. (1984) 'The effect of audit firm size on audit prices: A study of the Australian Market', *Journal of Accounting and Economics*, Vol. 6, No. 2, pp.133-151.
Francis, J.R. (2004) 'What do we know about audit quality?', *The British Accounting Review*, Vol. 36, No. 4, pp.345-368.
Francis, J.R. (2011a) 'A framework for understanding and researching audit quality', *Auditing: A Journal of Practice & Theory*, Vol. 30, No. 2, pp.125–152.
Francis, J.R. (2011b) '*Cross-Country Differences in Audit Market Structure and Audit Quality*', paper presented at the European Accounting Association (EAA) 34th Annual Congress, Rome, Italy, 20-22 April.
Francis, J.R. and Krishnan, J. (1999) 'Accounting accruals and auditor reporting conservatism', *Contemporary Accounting Research*, Vol. 16, No. 1, pp.135-165.
Francis, J.R. and Krishnan, J. (2002) 'Evidence on auditor risk-management strategies before and after The Private Securities Litigation Reform Act of 1995', *Asia-Pacific Journal of Accounting & Economics*, Vol. 9, No. 2, pp.135–157.

Francis, J.R. and Simon, D.T. (1987) 'A Test of Audit Pricing in the Small-Client Segment of the U.S. Audit Market', *The Accounting Review*, Vol. 62, No. 1, pp.145-157.
Francis, J.R. and Stokes, D.J. (1986) 'Audit Prices, Product Differentiation and Scale Economies: Further Evidence from the Australian Market', *Journal of Accounting Research*, Vol. 24, No. 2, pp.383-393.
Francis, J.R. and Wilson, E. (1988) 'Auditor changes: a joint test of theories relating to agency costs and auditor differentiation', *The Accounting Review*, Vol. 63, No. 4, pp.663-682.
Francis, J.R. and Yu, M.D. (2009) 'Big 4 Office Size and Audit Quality', *The Accounting Review* Vol. 84, No. 5, pp.1521-1552.
Francis, J.R., Maydew, E.L. and Sparks, H.C. (1999) 'The role of Big Six auditors in the credible reporting of accruals', *Auditing: A Journal of Practice and Theory*, Vol. 18, No. 2, pp.17-34.
Francis, J.R., Michas, P.N. and Seavey, S.E. (2013) 'Does Audit Market Concentration Harm the Quality of Audited Earnings? Evidence from Audit Markets in 42 Countries', *Contemporary Accounting Research* Vol. 30, No. 1,pp.325–355.
Francis, J.R., Reichelt, K. and Wang, D. (2005) 'The pricing of national and city-specific reputations for industry expertise in the U.S. audit market', *The Accounting Review*, Vol. 80, No. 1, pp.113-136.
Francis. J.R. and Wang, D. (2008) 'The joint effect of investor protection and Big 4 audits on earnings quality around the world', *Contemporary Accounting Research*, Vol. 25, No. 1, pp.157-91.
Frankel, R.M., Johnson, M.F. and Nelson, K.K. (2002) 'The Relation between Auditors' Fees for Nonaudit Services and Earnings Management', *The Accounting Review*, Vol. 77(Supplement), pp.71–105.
Fuerman, R.D. and Kraten, M. (2009) 'The Big 4 Audit Report: Should the Public Perceive It as a Label of Quality?', *Accounting and the Public Interest,* Vol. 9, No. 1, pp.148-165.
Fung, S.Y.K., Raman, K.K. and Zhu, X. (2016) 'Does the PCAOB's international inspection program provide spillover audit quality benefits for investors abroad?', *Journal of International Accounting Research*, Forthcoming.
Gaeremynck, A., Van Der Meulen, S. and Willekens, M. (2008) 'Audit-Firm Portfolio Characteristics and Client Financial Reporting Quality', *European Accounting Review*, Vol. 17, No. 2, pp.243-270.
Geiger, M. and Rama, D. (2006) 'Audit firm size and going-concern reporting accuracy', *Accounting Horizons*, Vol. 20, No. 1, pp.1–18.
Geiger, M., Raghunandan, K. and Rama, D. (2006) 'Auditor decision-making in different litigation environments: The Private Securities Litigation Reform Act, audit reports and audit firm size', *Journal of Accounting & Public Policy*, Vol. 25, No. 2, pp. 332–353.
Geiger, M.A., and Raghunandan, K. (2002) 'Auditor Tenure and Audit Reporting Failures', *Auditing: A Journal of Practice & Theory*, Vol. 21, No. 1, pp.67-78.
Ghosh, A. and Moon, D. (2005) 'Auditor Tenure and Perceptions of Audit Quality', *The Accounting Review*, Vol. 80, No. 2, pp.585-612.
Gordon, E.A., Greiner, A., Kohlbeck, M.J., Lin, S. and Skaife, H. (2013) 'Challenges and Opportunities in Cross-Country Accounting Research', *Accounting Horizons*, Vol. 27, No. 1, pp.141-154.
Gramling, A.A., Krishnan, J. and Zhang, Y. (2011) 'Are PCAOB-identified audit deficiencies associated with a change in reporting decisions of triennially inspected audit firms?', *Auditing: A Journal of Practice & Theory*, Vol. 30, No. 3, pp.59–79.
Gul, F.A., B. Jaggi and G. Krishnan (2007) 'Auditor independence: Evidence on the joint effects of auditor tenure and non-audit fees', *Auditing: A Journal of Practice &* Theory, Vol. 26, No. 2, pp.117-42.
Gunny, K.A. and Zhang, T.C. (2013) 'PCAOB inspection reports and audit quality', *Journal of Accounting and Public Policy*, Vol. 32. No. 2, pp.136-160.
Hay, D. and Jeter, D. (2011) 'The pricing of industry specialization by auditors in New Zealand', *Accounting and Business Research*, Vol. 41, No. 2, pp.171–195.
Heninger, W.G. (2001) 'The Association between Auditors Litigation and Abnormal Accruals', *The Accounting Review*, Vol. 76, No. 1, pp.111-126.
Hennes, K.M, Leone, A.J. and Miller, B.P. (2014) 'Determinants and Market Consequences of Auditor Dismissals after Accounting Restatements', *The Accounting Review*, Vol. 89, No. 3, pp.1051-1082.
Hennes, K.M., Leone, A.J. and Miller, B.P. (2008) 'The Importance of Distinguishing Errors from Irregularities in Restatement Research: The Case of Restatements and CEO/CFO Turnover', The Accounting Review, Vol. 83, No. 6, pp.1487-1519.
Hermanson, D.R., Houston, R.W. and Rice, J. (2007) 'PCAOB inspections of smaller CPA firms: Initial evidence from inspection reports', *Accounting Horizons*, Vol. 21, No. 2, pp.137–152.
Hoitash, R., Markelevich, A. and Barragato, C.A. (2007) 'Auditor fees and audit quality', *Managerial Auditing Journal*, Vol. 22, No. 8, pp.761-786.
Hribar, P., Kravet, T. and R. Wilson, R. (2010) '*A New Measure of Accounting Quality*' [online]. Working paper, The University of Iowa and The University of Texas at Dallas. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1283946. (Accessed 10 October 2016).
Humphrey, C., Loft, A. and Woods, M. (2009) 'The global audit profession and the international financial architecture: Understanding regulatory relationships at a time of financial crisis', *Accounting, Organizations and Society*, Vol. 34, No. 6/7, pp.810–825.
Hussainey, K. (2009) 'The impact of audit quality on earnings predictability', *Managerial Auditing Journal*, Vol. 24, No. 4, pp.340-351.
Hussein, F.E. and MohdHanefah, M. (2013) 'Overview of Surrogates to Measure Audit Quality', *International Journal of Business and Management*, Vol. 8, No. 17, pp.84-91.
IAASB (2011) *Audit Quality: An IAASB Perspective* [online]. http://web.ifac.org/publications/international-auditing-and-assurance-standards-board/policy-positions-and-papers#audit-quality–an-iaasb-per. (Accessed 6 June 2011).

IAASB (2014) *A Framework for Audit Quality – Key Elements that Create an Environment for Audit Quality* [online]. https://www.ifac.org/publications-resources/framework-audit-quality-key-elements-create-environment-audit-quality. (Accessed 15 April 2014).
IFAC (2009) International Standard on Auditing (ISA) No. 200: *Overall Objectives of the Independent Auditor and the Conduct of an Audit in Accordance with International Standards on Auditing*. New York, International Federation of Accountants.
Ireland, J.C and Lennox, C.S. (2002) 'The large audit firm fee premium: A case of selectivity bins'?, *Journal of Accounting. Auditing and Finance*, Vol. 17, No. 1, pp.73-91.
Jackson, A.B., Moldrich, M. and Roebuck, P. (2008) 'Mandatory audit firm rotation and audit quality', *Managerial Auditing Journal*, Vol. 23, No. 5, pp.420-437.
Jeong, S.W. and Rho, J. (2004) 'Big Six auditors and audit quality: The Korean evidence', *The International Journal of Accounting*, Vol. 39, No. 2, pp.175– 196.
Johl, S., Jubb, C.A. and Houghton, K.A. (2007) 'Earnings management and the audit opinion: evidence from Malaysia', *Managerial Auditing Journal*, Vol. 22, No. 7, pp.688-715.
Johnson, V.E., Khurana, I.K. and Reynolds, J.K. (2002) 'Audit-Firm Tenure and the Quality of Financial Reports', *Contemporary Accounting Research*, Vol. 19, No. 4, pp.637-660.
Jordan, C.E., Clark, S.J. and Hames, C.C. (2010) 'The Impact Of Audit Quality On Earnings Management To Achieve User Reference Points in EPS', *Journal of Applied Business Research*, Vol. 26, No. 1, pp.19-30.
Kaplan, S.E. and Williams. D.D. (2012) 'The changing relationship between audit firm size and going concern reporting', *Accounting, Organizations and Society*, Vol. 37, No. 5 , pp.322–341
Kim, J. and Yi, C.H. (2009) 'Does auditor designation by the regulatory authority improve audit quality? Evidence from Korea', *Journal of Accounting and Public Policy*, Vol. 28, No. 3, pp.207-230.
Kinney, W.R.Jr., Palmrose, Z.V. and Scholtz, S. (2004) 'Auditor independence, non-audit services, and restatements: Was the U.S. government right?', *Journal of Accounting Research*, Vol. 42, No. 3, pp.561–588.
Knechel, W.R. (2009) '*Audit Lessons from the Economic Crisis: Rethinking Audit Quality'* [online]. Maastricht University Inaugural Lecture. http://arno.unimaas.nl/show.cgi?fid=17203. (Accessed 3 January 2011).
Knechel, W.R. and Vanstraelen, A. (2007) 'The Relationship between Auditor Tenure and Audit Quality Implied by Going Concern Opinions', *Auditing: A Journal of Practice and Theory*, Vol. 26, No. 1, pp.113–131.
Knechel, W.R., Krishnan, G.V., Pevzner, M., Shefchik, L.B. and Velury, UK (2013) 'Audit Quality: Insights from the Academic Literature', *Auditing: A Journal of Practice & Theory*, Vol. 32, Supplement 1, pp.385–421.
Krishnan, G.V. (2003a) 'Audit Quality and the Pricing of Discretionary Accruals', *Auditing: A Journal of Practice and Theory*, Vol. 22, No. 1, pp.109-126.
Krishnan, G.V. (2003b) 'Does Big 6 auditor industry expertise constrain earnings management?', *Accounting Horizons*, Vol. 17, Supplement, pp.1–16.
Krishnan, J. and Schauer, P.C. (2000) 'The differentiation of quality among auditors: evidence from the not-for-profit sector', *Auditing: A Journal of Practice and Theory*, Vol. 19, No. 2, pp.9-25.
Krishnan, J., Krishnan, J. and Song, H. (2014) '*PCAOB international inspection and audit quality*'[online]. Working paper, Temple University. http://www.audsymp.dept.ku.edu/wp-content/uploads/2014/05/Satur-day-Paper-1-by-Krishnan-Krishnan-Song.pdf (Accessed 15 January 2017).
Kwon, S.Y., Lim, C.Y. and Tan, P.M. (2007) 'Legal Systems and Earnings Quality: The Role of Auditor Industry Specialization', *Auditing: A Journal of Practice and Theory*, Vol. 26, No. 2, pp.25–55.
Lai, K. (2009) 'Does audit quality matter more for firms with high investment opportunities?', *Journal of Accounting and Public Policy*, Vol. 28, No. 1, pp.33-50.
Lamoreaux, P.T. (2016) 'Does PCAOB inspection access improve audit quality? An examination of foreign firms listed in the United States', *Journal of Accounting and Economics*, Vol. 61, No. 2-3, pp.313-337.
Landis, M., Jerris, S. and Braswell, M. (2011) 'An account analysis of PCAOB inspection reports for triennially-inspected audit firms', *Journal of Business & Economics Research*, Vol. 9, No. 3, pp.11–21.
Lee, C.J., Liu, C. and Wang, T. (1999) 'The 150-hour rule', *Journal of Accounting and Economics*, Vol. 27, No. 2, pp.203-228.
Lee, P., Stokes, D., Taylor, S. and Walter, T. (2003) 'The association between audit quality, accounting disclosures and firm-specific risk: Evidence from initial public offerings', *Journal of Accounting and Public Policy*, Vol. 22, No. 5, pp.377-400.
Lennox, C. (1999) 'Are large auditors more accurate than small auditors?', *Accounting and Business Research*, Vol. 29, No. 3, pp.217-227.
Lennox, C. (2005) 'Audit quality and executive officers' affiliations with CPA firms', *Journal of Accounting and Economics*, Vol. 39, No. 2, pp.201-231.
Lennox, C. and J. Pittman, J. (2010) 'Auditing the auditors: Evidence on the recent reform to the external monitoring of audit firms', *Journal of Accounting and Economic*s, Vol. 49, No. 1/2, pp.84–103.
Lennox, C.S., Wu, X. and Zhang, T. (2014) 'Does Mandatory Rotation of Audit Partners Improve Audit Quality?', The Accounting Review, Vol. 89, No. 5, pp.1775–1803.
Li, K. and Chen, Y. (2010) '*The Effects of Pre-client Industry Experience on Restatement at the Audit Partner Level and Audit Team Level*' [online]. Working paper, Ming-Chuan University and National Taiwan University. https://www.researchgate.net/publication/255698803. (Accessed 28 October 2016).
Lim, C. and Tang, H. (2008) 'Non-audit Service Fees and Audit Quality: The Impact of Auditor Specialization', *Journal of Accounting Research*, Vol. 46, No. 1, pp.199-246.
Linberg, D. L. and Seifert, D. L. (2011) 'A Comparison of U.S. Auditing Standards with International Standards on Auditing - Moving Toward Convergence', *The CPA Journal*, April, pp. 17-21.

Liu, L., Raghunandan, K. and Rama, D. (2009) 'Financial restatements and shareholder ratifications of the auditor', *Auditing: A Journal of Practice & Theory*, Vol. 28, No. 1, pp.225–240.
Lobo, G.J. and Zhao, Y. (2013) 'Relation between Audit Effort and Financial Report Misstatements: Evidence from Quarterly and Annual Restatements, *The Accounting Review*, Vol. 88, No. 4, pp.1385–1412.
Lowensohn, S., Johnson, L.E., Elder, R.J. and Davies, S.P. (2007) 'Auditor specialization, perceived audit quality, and audit fees in the local government audit market', *Journal of Accounting and Public Policy*, Vol. 26, No. 6, pp.705-732.
Lys, T. and Watts, R. L. (1994) 'Lawsuits against auditors', *Journal of Accounting Research*, Vol. 32, Supplement, pp. 65-93.
Maijoor, S. J. and Vanstraelen, A. (2006) 'Earnings management within Europe: the effects of member state audit environment, audit firm quality and international capital markets', *Accounting and Business Research*, Vol. 36, No. 1, pp.33-52.
Manry, D.L., Mock, T.J. and Turner, J.L. (2008) 'Does Increased Audit Partner Tenure Reduce Audit Quality?', *Journal of Accounting, Auditing and Finance*, Vol. 23, No. 4, pp.553- 572.
Meuwissen, R., Moers, F., Peek, E. and Vanstraelen, A. (2007) '*An evaluation of abnormal accruals models in an international context*'[online]. Working Paper, Universiteit Maastricht. https://www.researchgate.net/publication/245549952 (Accessed 10 January 2010).
Michas, P.N. (2011) 'The Importance of Audit Profession Development in Emerging Market Countries', *The Accounting Review*, Vol. 86, No. 5, pp.1731-1764.
Minutti-Meza, M. (2013) 'Does auditor industry specialization improve audit quality?', *Journal of Accounting Research*, Vol. 51, No. 4, pp.779–817.
Mock, T.J., Bedard, J., Coram, P.J., Davis, S.M., Espahbodi, R. and Warne, R.C. (2013) 'The auditors' reporting model: Current research synthesis and implications', *Auditing: A Journal of Practice & Theory*, Vol. 32, Supplement 1, pp.323–351.
Moizer, P. (1997) 'Auditor reputation: the international empirical evidence', *International Journal of Auditing*, Vol. 1, No. 1, pp.61-74.
Myers, J.N., Myers, L.A. and Omer, T.C. (2003) 'Exploring the Term of the Auditor-Client Relationship and the Quality of Earnings: A Case for Mandatory Auditor Rotation?', *The Accounting Review*, Vol. 78, No. 3, pp.779-799.
Nichols, D.R., Smith, D.B. (1983) 'Auditor Credibility and Auditor Changes', *Journal of Accounting Research*, Vol. 21, No. 2, pp.534-544.
O'Sullivan, N. (2000) 'The impact of board composition and ownership on audit quality: evidence from large UK companies', *The British Accounting Review*, Vol. 32, No. 4, pp.397-414.
Offermanns, M. and Peek, E. (2011) '*Investor Reactions to PCAOB Inspection Reports*' [online]. Working paper, Maastricht University and Erasmus University. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1807994 (Accessed 2 December 2016).
Palmrose, Z. (1986) 'Audit Fees and Auditor Size: Further Evidence', *Journal of Accounting Research*, Vol. 24, No. 1, pp.97-110.
Palmrose, Z. (1988) 'An analysis of auditor litigation and audit service quality', *The Accounting Review*, Vol. 63, No. 1, pp.55-73.
Palmrose, Z.V., Richardson, V. and Scholz, S. (2004) 'Determinants of market reactions to restatement announcements', *Journal of Accounting and Economics*, Vol. 37, No. 1, pp.59–89.
Panel on Audit Effectiveness (2000) '*Final report and recommendations*'[online]. Public Oversight Board, Stanford, Conn. http://www.iasplus.com/en/binary/resource/pobaudit.pdf. (Accessed 5 May 2010).
PCAOB (2013) '*Discussion–Audit Quality indicators*' [online]. http://pcaobus.org/news/events/documents/05152013_sagmeeting/audit_quality_indicators.pdf. (Accessed 2 September 2014).
PCAOB (2015) '*Concept Release on Audit Quality Indicators*' [online]. http://pcaobus.org/Rules/Rulemaking/Docket%20041//Release_2015_005.pdf. (Accessed 2 August 2015).
Perotti, P. and Wagenhofer, A. (2014) 'Earnings Quality Measures and Excess Returns', *Journal of Business Finance & Accounting*, Vol. 41, No. 5/6, pp.545–571.
Plumlee, M. and Yohn, T.Y. (2010) 'An Analysis of the Underlying Causes Attributed to Restatements', *Accounting Horizons*, Vol. 24, No. 1, pp.41-64.
Pong, C.M. and Whittington, G. (1994) 'The determinants of audit fees: Some empirical models', *Journal of Business Finance and Accounting*, Vol. 21, No. 8, pp.1071-1095.
Power, M.K. and Gendron, Y. (2015) 'Qualitative Research in Auditing: A Methodological Roadmap', *Auditing: A Journal of Practice & Theory*, Vol. 34, No. 2, pp.147–165.
Pratt, M.G. (2009) 'For the lack of a boilerplate: Tips on writing up (and reviewing) qualitative research', *Academy of Management Journal*, Vol. 52, No. 5, pp.856–862.
Reichelt, K.J. and Wang, D. (2010) 'National and Office-Specific Measures of Auditor Industry Expertise and Effects on Audit Quality', *Journal of Accounting Research*, Vol. 48, No. 3, pp.647-686.
Reinolds, 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*, Vol. 30, No. 3, pp.375-400.
Robinson, D. (2008) 'Auditor Independence and Auditor-Provided Tax Service: Evidence from Going-Concern Audit Opinions Prior to Bankruptcy Filings', *Auditing: A Journal of Practice and Theory*, Vol. 27, No. 2, pp.31-54.
Rodríguez, M.C. (2010) 'Big Auditors, Private Firms and Accounting Conservatism: Spanish Evidence', *European Accounting Review*, Vol. 19, No. 1, pp.131-159.
Romanus, R., Maher, J.J. and Fleming, D.M. (2008) 'Auditor industry specialization, auditor changes, and accounting restatements', *Accounting Horizons*, Vol. 22, No. 4, pp.389–413.
Ruddock, C., Taylor, S.J. and Taylor, S.L. (2006) 'Nonaudit Services and Eamings Conservatism: Is Auditor Independence Impaired?', *Contemporary Accounting Research*, Vol. 23, No. 3, pp.701-746.

Rusmin, R. (2010) 'Auditor quality and earnings management: Singaporean evidence', *Managerial Auditing Journal*, Vol. 25, No. 7, pp.618-638.
Rusmin, R., Scully, G., Tower, G. and Taplin, R. (2009) 'The Impact of Corporate Governance and Ownership Concentration on Audit Quality in Three Asia Pacific Stock Markets', *Asia Pacific Journal of Economics and Business*, Vol. 13, No. 2, pp.58-73.
Scholz, S. (2014) '*Financial Restatement Trends in the United States: 2003–2012*' [online]. Center for Audit Quality (CAQ). http://www.thecaq.org/financial-restatement-trends-united-states-2003-2012 (Accessed 12 December 2016).
Schroeder, M.S., Solomon, I. and Vickery, D.W. (1986) 'Audit quality: the perceptions of audit committee chairperson and audit partners', *Auditing: A Journal of Practice and Theory*, Vol. 5, No. 1, pp.86-94.
Seetharaman, A., Gul, F.A. and Lynn, S.G. (2002) 'Litigation risk and audit fees: Evidence from UK firms cross-listed on US markets?, *Journal of Accounting and* Economics, Vol. 33, No. 1, pp.91-115.
Shafie, R., Hussin, W.N.W., Yusof, M.A.M., and Hussain, M.H.M. (2009) 'Audit Firm Tenure and Auditor Reporting Quality: Evidence in Malaysia', *International Business Research*, Vol. 2, No. 2, pp.99-109.
Shroff, N. (2015) '*Real Effects of Financial Reporting Quality and Credibility: Evidence from the PCAOB Regulatory Regime*' [online]. Working paper, Massachusetts Institute of Technology (MIT) - Sloan School of Management. https://papers.ssrn.com/sol3/papers2.cfm?abstract_id=2667969 (Accessed 14 January 2017).
Sikka, P. (2009) 'Financial crisis and the silence of the auditors', *Accounting, Organizations and Society*, Vol. 34, No. 6/7, pp.868–873.
Simmnet, R., Carson, E. and Vanstraelen, A. (2016) 'International Archival Auditing and Assurance Research: Trends, Methodological Issues, and Opportunities', *Auditing: A Journal of Practice and Theory*, Vol. 35, No. 3, pp.1-32.
Simon, D. (1985) 'The Audit Services Market: Additional Empirical Evidence', *Auditing: A Journal of Practice and Theory*, Vol. 5, No. 1, pp.71-78.
Simunic, D.A. (1980) 'The Pricing of Audit Services: Theory and Evidence', *Journal of Accounting Research*, Vol. 18, No. 1, pp.161-190.
Simunic, D.A. (1984) 'Auditing, Consulting, and Auditor Independence', *Journal of Accounting Research*, Vol. 22, No. 2, pp.679-702.
Song, H. and Ye, Z.S. (2014) 'The Impact of PCAOB Reports Containing Audit Deficiencies on Non-U.S. Audit Firms: Initial Evidence', *Current Issues in Auditing*, Vol. 8, No. 1, pp.A12-A25.
Srinivasan, S. (2005) 'Consequences of financial reporting failure for outside directors: Evidence from accounting restatements and audit committee members', *Journal of Accounting Research*, Vol. 43, No. 2, pp.291–334.
Srinivasan, S., Wahid, A.S. and Yu, G. (2015) 'Admitting Mistakes: Home Country Effect on the Reliability of Restatement Reporting', *The Accounting Review*, Vol. 90, No. 3, pp.1201-1240.
Stanley, J. and DeZoort, F. (2007) 'Audit firm tenure and financial restatements: An analysis of industry specialization and fee effects', *Journal of Accounting and Public Policy*, Vol. 26, No. 2, pp.131–159.
Stice, J.D. (1991) 'Using Financial and Market Information to Identify Pre-Engagement Factors Associated with Lawsuits Against Auditors', *The Accounting Review*, Vol. 66, No. 3, pp.516-533.
Takiah, M.I., Mohd, M.R. and Hashanah, I. (2010) 'The Relationship Between Audit Client Satisfaction and Audit Quality Attributes: Case of Malaysian Listed Companies', *International Journal of Economics and Management*, Vol. 4, No. 1, pp.155-180.
Teoh, S.H. and Wong, T.J. (1993) 'Perceived Auditor Quality and the Earnings Response Coefficient', *The Accounting Review*, Vol. 68, No. 2, pp.346-366.
Tepalagul, N. and Lin L. (2015) 'Auditor Independence and Audit Quality - A Literature Review', *Journal of Accounting, Auditing and Finance*, Vol. 30, No. 1, pp.101–121.
Thompson, J. and McCoy, T. (2008) 'An analysis of restatements due to errors and auditor changes by Fortune 500 companies', *Journal of Legal, Ethical and Regulatory Issues*, Vol. 11, No. 2, pp.45–57.
Titman, S. and B. Trueman (1986) 'Information Quality and The Valuation of New Issues', *Journal of Accounting and Economics*, Vol. 8, No. 2, pp.159-172.
Tsai, H. and Hua, M. (2009) 'The Effects of Audit Quality on Loan Interest Rates for Small and Medium-Sized Enterprises in Taiwan', *International Journal of Business*, Vol. 14, No. 3, pp.265-281.
Van Caneghem, T. (2004) 'The Impact of Audit Quality on Earnings Rounding-up Behaviour: Some UK Evidence', *European Accounting Review*, Vol. 13, No. 4, pp.771–786.
Van Tendeloo, B. and Vanstraelen, A. (2008) 'Earnings Management and Audit Quality in Europe: Evidence from the Private Client Segment Market', *European Accounting Review*, Vol. 17, No. 3, pp.447-469.
Vanstraelen, A. (2000) 'Impact of renewable long-term audit mandates on audit quality', *European Accounting Review*, Vol. 9, No. 3, pp.419-442.
Vanstraelen, A. (2002) 'Auditor economic incentives and going-concern opinions in a limited litigious Continental European business environment: empirical evidence from Belgium', *Accounting and Business Research*, Vol. 32, No. 3, pp.171-186.
Venkataraman, R., Weber, J.P. and Willenborg, M. (2008) 'Litigation Risk, Audit Quality, and Audit Fees: Evidence from Initial Public Offerings', *The Accounting Review*, Vol. 83, No. 5, pp.1315-1345.
Wallace, W. (2005) 'Auditor changes and restatements: An analysis of recent history', *The CPA Journal*, Vol. 75, No. 3, pp.30–33.
Warming-Rasmussen, B. and Jensen, L. (1998) 'Quality dimensions in external audit services – an external user perspective', *European Accounting Review*, Vol. 7, No. 1, pp.65-82.
Watkins, A.L., Hillison, W. and Morecroft, S.E. (2004) 'Audit Quality: A synthesis of theory and empirical evidence', *Journal of Accounting Literature*, Vol. 23, pp.153-193.

Wells, J. T. (2005) *Principles of Fraud Examination*, John Wiley & Sons, Inc., New Jersey.
Williams, D. (1988) 'The potential determinants of auditor change', *Journal of Business Finance and Accounting*, Vol. 15, No. 2, pp.243–261.

Appendix 1

List of Journals

Journals	Nº of articles
The Accounting Review	**32**
Auditing: A Journal of Practice & Theory	**23**
Journal of Accounting & Economics	**17**
Contemporary Accounting Research	**15**
Journal of Accounting Research	**13**
Managerial Auditing Journal	**12**
Accounting Horizons	**11**
Journal of Accounting & Public Policy	**9**
European Accounting Review	**8**
Accounting and Business Research	**5**
International Journal of Auditing	**5**
Accounting, Organizations and Society,	**4**
Journal of Accounting, Auditing and Finance	**4**
Journal of Accounting Literature	**3**
Journal of Business Finance & Accounting	**3**
Asia Pacific Journal of Economics and Business	**2**
Current Issues in Auditing	**2**
The British Accounting Review	**2**
The International Journal of Accounting	**2**
Academy of Management Journal	**1**
Accounting and the Public Interest	**1**
International Business Research	**1**
International Journal of Business and Management	**1**
International Journal of Business	**1**
International Journal of Economics and Management	**1**
Journal of Applied Business Research	**1**
Journal of Business & Economics Research	**1**
Journal of International Accounting Research	**1**
Journal of Legal, Ethical and Regulatory Issues	**1**
Oxford Review of Economic Policy	**1**
Research in Accounting Regulation	**1**
Review of Quantitative Finance and Accounting	**1**
Revista de Economía Aplicada	**1**
The CPA Journal	**2**
The Journal of Applied Business Research	**1**
The Journal of Financial Perspectives	**1**

[1] See: https://www.ifac.org/about-ifac/membership/member-organizations-and-country-profiles; https://pcaobus.org/Standards; http://www.aicpa.org/RESEARCH/STANDARDS/AUDITATTEST/ASB/Pages/AuditingStandardsBoard.aspx.

[2] The major concerns related to the measures of auditor industry specialization are discussed in the next subsection.

[3] In a cross-country study based on data from 15 emergent countries, Michas (2011) explored whether the country-level development of the audit profession is associated with audit quality and auditor choice. After controlling for many other country and company-level characteristics, he found evidence that audit quality is higher in countries with more developed audit professions, but only for clients of Big N auditors, and that the likelihood that a client company hires a Big N auditor is positively associated with audit profession development. We do not include the Michas's (2011) study in main analysis because it falls out of the time period of our literature review (1980-2010).

[4] In a very recent cross-country study based on data from 37 countries, El Ghoul et al. (2016), used regressions that control for country, industry, and year fixed effects as well as other firm-level determinants, and they find evidence that corporate equity financing worldwide is cheaper when Big N auditors monitor the financial reporting process, although this relation is weaker outside the U.S. where the implicit insurance coverage that auditors afford investors is much lower. As in prior studies, they suggest that the strength of the countries' legal and regulatory

systems is the factor explaining the role of Big N auditors in terms of equity pricing. The El Ghoul et al. (2016) study was not included in main analysis because it falls out of the time period of our literature review.

[5] The European Commission Green Paper (EU, 2010) argues that within the European market for audit services, it appears that there is a higher level of "comfort" with the appointment of a Big Four auditor, namely by the the largest companies. Yet, the EC would like to understand how much of this is attributable to "perceptions" or to the "merit" of the Big Four auditors.

[6] See: https://www.ifiar.org.

[7] See: https://pcaobus.org.

[8] Some recent studies analysed the effectiveness of the PCAOB's inspection of non-U.S. auditors. However we do not include these studies in our main analysis because they fall out of the time period of the literature review (1980-2010).

Bishop et al. (2013) provided descriptive analyses on the results of inspections for international audit firms, noting that approximately one-half of the inspection reports identify audit deficiencies and two-thirds identify quality control defects, and also that affiliates of Big N auditors are less likely to have deficiencies than are other firms. Song and Ye (2014) analysed 1,604 clients of non-U.S. audit firms and found a significantly low rate of clients that dismissed their auditors within one year following the disclosure of audit deficiencies in PCAOB reports. They also reported a low rate of non-U.S auditor resignation cases and deregistration from PCAOB.

Krishnan et al. (2014) found that the clients of PCAOB inspected non-U.S. auditors have lower abnormal accruals. Similarly, Shroff (2015) and Fung et al. (2016) showed that the PCAOB inspections of non-U.S. auditors increase the reporting quality of all clients audited by a non-U.S. auditor. Lamoreaux (2016) further reported that non-U.S. auditors are more likely to issue going concern opinions and report internal control weaknesses following an increase in the threat of a PCAOB inspection.

[9] See the SEC's Final Rule: Additional Form 8-K Disclosure Requirements and Acceleration of Filing Date, at http:// www.sec.gov/rules/final/33-8400.html.

[10] Information on Audit Analytics coverage available in http://www.auditanalytics.com/doc/AA_Audit_Compliance_ds.pdf

[11] In a recent cross-country study Srinivasan et al. (2015) analysed the frequency of restatements by foreign firms listed on U.S. exchanges, based on U.S.-listed foreign firms from 51 countries. They found evidence that the restatement rate of U.S.-listed foreign firms is significantly lower than that of comparable U.S. firms and that the difference depends on the firm's home country characteristics. Foreign firms from countries with a weak rule of law were less likely to restate than are firms from strong rule of law countries. Since this study falls out of the time period of our literature review, it was not included in main analysis.

[12] The Regulation No 537/2014 of 16 April of the European Parliament and of the Council (EU, 2014), requires Member States to impose mandatory audit firm rotation on public interest companies after June 2016.

[13] We include the study of Francis (2011b) in Table 7 because despite the publication date of the document is 2011 a preliminary version had been made available up to 2010. Previous versions of this paper were presented at the 2009 European Auditing Research Network Conference, the 2010 International Symposium on Audit Research, the 2010 EIASM/Bocconi University Workshop on Audit Quality, and the 2010 Annual Meeting of the American Accounting Association.