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Status of Audit Quality among the Big 4: Trends and Insights for Audit Quality Management

Mark Francis G. Ng
Doctor of Philosophy in Management, University of the Cordilleras, Baguio City, Philippines
Associate Professor, Bicol University, Legazpi City, Philippines

Abstract: *Audit quality is crucial for upholding the integrity of theaudit profession. However, due to its complexnature, auditing firms find it challenging tointegrate audit quality as part oftheir organizational mandates.The main purpose of this study was to describe and analyze the status of audit quality within the global audit industry over the past decade thru the perspective of the Big 4 firms.Data were gathered from published annual reports spanning a ten-year period thru in-depth document analysis and were subjected to statistical, trends, and comparative analyses.Results revealed that the Big 4have already been integrating audit quality concepts in their organizational operations even before formal audit quality management standards have been promulgated.They were able to identify proxies for effectively measuring audit quality.In addition, they also determined indicators that could potentially influence audit quality and classified them according to both organizational and operational parameters. These findings suggest that the Big 4 identify themselves as comprehensive organizational entities other than being mere external assurance providers. Smaller and local auditing firms can therefore look to the Big 4 for guidance on how to achieve and integrate audit quality within their own unique organizational and operational contexts.*

Keywords: Auditing, Audit Firms, Audit Quality, Big 4, Comparative Analysis, Document Analysis, Trends Analysis

I. INTRODUCTION

Financial statement audits are crucial in the creation of value for organizations (Kurznack et al., 2021; Fossung & Verges, 2022; Khorshid et al., 2022). The stringent implementation and strong emphasis on the significance of auditing standards and ethical codes of conduct have led to salient organizational benefits such as increased stakeholder confidence, rigorous standards compliance, risk identification and mitigation, and better decision-making (Hameedi et al., 2021; Barth et al., 2023). However,while audit standards provide a framework for auditors to follow, their effectiveness can also be compromised by various factors (Awolowo et al., 2018; Kizil &Kasbasi, 2018; Tosun et al., 2020) such as lack of independence, inadequate professional skepticism, conflicts of interest, pressure to meet financial targets, and management override. These challenges collectively underscore the importance of audit quality to promote improved regulatory supervision of audit firms and their engagements with clients, as well as uphold public trust in the global audit profession.

The need for audit quality derives its mandate from serving the public interest, thereby placing it as a significant global industry trend in the current post-pandemic era (Deb et al., 2023). It is essential for building organizations, financial markets, and economies that are robust, resilient, and globally competitive. Scientific literature on the study of audit research (Peng & Chau, 2023; Suwarno & Mayangsari, 2023; Tewelde et al., 2023; Ximenes & Guntur, 2023) have consistently maintained that audit quality promotes greater investor confidence, fosters stakeholder trust, maintains market integrity, encourages strict regulatory compliance, and facilitates global financial system integrity. In addition, global regulatory bodies have also mandated all audit firms to include audit quality as part of their attestation functions in accordance with newly promulgated international standards on quality management (ISQM) (International Auditing and Assurance Standards Board [IAASB], 2020). There is, therefore, a need to probe how these audit quality concepts were attained and integrated by auditing firms in their overall organizational operations given such global regulatory mandate as well as to meet the changing demands of the global audit industry in these modern times.

A wide range of theoretical perspectives collectively lend a research lens in explaining the significance of audit quality as part of the organizational mandate of audit firms. One such perspective is the lending credibility theory which states that the primary service that auditors provide is credibility, such that the quality of economic decisions improves when founded on credible data (Efrakeya& Edgars, 2021). The theory of inspired confidence is another perspective, which suggests that audit quality plays a crucial role in inspiring trust and confidence among stakeholders

(Olagunju& Owolabi, 2020) by reducing information asymmetry, providing credible and reliable information, and reducing uncertainty (Tessema&Abou-El-Sood, 2022). Finally, signaling theory, while originating from economics, also explains how audit firms signal their competence and reliability to their stakeholders thru high-quality audits (Jokar&Daneshi, 2020; Almaharmeh et al., 2021; Efrakeya& Edgars, 2021; Tarmidi et al., 2021; Diya, 2022; Kim, 2023).

Comprehensive literature review of prior audit quality research, however, reveals that majority of the studies on audit quality for the past four decades focused only on single country or cross-country research approaches (Francis, 2023).These studies also utilized smaller and local auditing firms as research subjects(Feng et al., 2022).The reference to audit clients as the main unit of analysis was also given perennial focus rather than on audit firms themselves (Al-Qatamin& Salleh, 2020; Husain, 2020). To address these gaps, this study adopted a global perspective to allow a more comprehensive and multinational understanding of complex audit quality issues. It also utilized leading global auditing firms collectively known as the Big 4 as the population of the study. This study also used a firm-level or managerial perspective using the audit firm as the main unit of analysis to delve deeper into an auditing firm's organizational aspects.

The primary objective of this paper, therefore, is to describe and analyze the status of audit qualityon a global scale within the audit industry and how it forms part of the salient organizational operations of auditing firms.This necessitates using the perspective of the Big 4 auditing firmssince they are considered as the primary movers and leaders in the global audit industry. With their stature and reputation, they serve as noteworthy examples of effective audit quality management and implementation thru their novel policies and practices.Studying these firms, therefore, allows researchers to examine a substantial and influential segment of the audit profession from a global perspective, and examine the evolution of audit quality practices as well as the various issues, prospects, and challenges surrounding them.

II. LITERATURE REVIEW

Audit quality has undergone a series of conceptual evolutions for the past four decades (1981 to 2023) as a result of changes in the business environment, regulatory requirements, and societal expectations (Ciger, 2020). The concept of audit quality in the 1980s focused on traditional assurance and compliance (DeAngelo, 1981). During this period, audit quality was often perceived as the degree of adherence to established auditing standards and procedures. The emphasis was on the auditor's ability to provide reasonable assurance that financial statements were free from material misstatements. Audit quality was also closely associated with salient auditor attributes such as technical competence, professional skepticism, independence, and due professional care (Husain, 2020). The concept of audit riskwas also well-established during this period. Proper, comprehensive, and organized documentation of audit procedures and findings was also emphasized to ensure that the audit work could be adequately reviewed and understood by others.During the 1990s, audit quality placed an emphasis on the capability of detection and elimination of material misstatements (Davidson & Neu, 1993). Auditors began to focus not only on compliance but also on the effectiveness of internal controls and risk management processes. Later, the definition of audit quality also expanded (Sulaiman et al., 2014) to include a more comprehensive assessment of business risks. Auditors were also encouraged to engage in ongoing professional development to stay abreast of changes in accounting standards, auditing methodologies, and regulatory requirements. The implementation of robust quality control procedures to ensure the consistent application of auditing standards and the delivery of high-quality audit services was also emphasized.The 2000s were a time that saw a significant shift in the perception of audit quality following audit controversies such as the Enron scandal and the enactment of the Sarbanes-Oxley Act (SOX) that introduced stringent requirements for auditor independence, corporate governance, and internal control assessments to enhance the reliability of financial reporting. The focus shifted to the auditor's ability to detect and report on fraudulent financial reporting (Sulaiman et al., 2014). The 2000s also brought a shift toward a risk-based approach to auditing, prompting auditors to start focusing on identifying and assessing risks of material misstatement in financial statements. Concepts like materiality and audit risk gained prominence in discussions about audit quality. The culture within audit firms and their governance structures were also recognized as important factors influencing audit quality. A renewed focus on corporate governance and accountability, as well as the oversight role of audit committees in ensuring audit quality, also grew in prominence. Moreover, as part of the social expectation and increased scrutiny of audit engagements in response to the 2008 global financial crisis, the concept of audit quality also included the accurate reflection of a company's financial position and performance (Schauer, 2002) as well as the effectiveness of audits in detecting and preventing financial irregularities.During the 2010s, the concept of audit quality expanded to consider the communication of information beyond traditional financial statements. Integrated reporting, which includes non-financial information, became more relevant (DeFond& Zhang, 2014). Technology also played a significant role, with discussions on the integration of technology in audit processes such as effective use of data analytics, artificial intelligence, and other advanced tools believed to bring about enhanced audit quality aside from achieving audit effectiveness and efficiency. Changes in

regulatory frameworks and standards, such as updates to auditing standards and the introduction of new regulations, also had a significant impact on audit quality (Taqi et al., 2021). There were also discussions and debates about the potential benefits of mandatory audit firm rotation and limitations on auditor tenure (Sulaiman, 2018). In addition, improving the ability of auditors to detect and reportfraud also became a focus, with the belief that enhancing audit procedures to better address the risk of fraud contributed to enhancement of audit quality.The recent years of the early 2020s now witnessed a growing recognition that audit quality is not solely the responsibility of auditors but is also influenced by various stakeholders. There is currently an increased focus on transparency, communication, and addressing the broader needs of investors and the public (Mohammed et al., 2022). Environmental, Social, and Governance (ESG) considerations have also gained prominence. With the increasing globalization of businesses, there is also a push for international harmonization of auditing standards, with the adoption of International Standards on Auditing (ISAs) aimed to bring consistency to audit quality on a global scale. Discussions around audit quality also included the concept of continuous improvement and monitoring (Pacuraru-Ionesco, 2023) which involves using technology to monitor financial data in real-time, potentially enhancing the timeliness of audit reporting. Furthermore, this period also highlights the development and use of audit quality indicators (AQIs) to assess and monitor audit quality, which may include metrics related to engagement team experience, firm culture, and other relevant factors (Abdelwahed et al., 2023; Sulaiman, 2023). Moreover, the concept of audit quality has further expanded and included the encompassing notions of audit firm and audit team attributes, effective corporate governance practices, and techniques used that result in perceived satisfaction by stakeholders (Ismail &Ghaidan, 2022).Given these conceptual developments on the historical evolution of audit quality, it can be surmised that audit quality is both a complex and multifaceted subject matter. Even the IAASB acknowledges that describing and evaluating audit quality is a challenging task (IAASB, 2014).

Aside from achieving a universal consensus on the definition and concept of audit quality, measuring audit quality is also considered a daunting task primarily because the amount of assurance that auditors provide is unobservable (DeFond& Zhang, 2014). Subjectivity also makes audit quality difficult to measure since different stakeholders may have different perspectives on what constitutes a high-quality audit. The inherent limitations of financial reporting and the auditing process also contribute to this measurement difficulty. While auditors rely on these financial statements for their work, they do not have absolute certainty about the accuracy and completeness of the information provided. Auditors also often have less information about the audited entity than the management itself. This information asymmetry can also make it challenging to assess the quality of the audit accurately. In addition, there is also a lack of universally accepted metrics for audit quality (Gros &Worret, 2014). Furthermore, since audits involve a complex set of procedures and judgments, it is also challenging to encompass the overall quality of an audit into a single metric or set of metrics that can be easily measured and compared across different engagements. Moreover, the continued evolution of the business environment and its context (Dunakhir, 2016) brought about by changes in financial reporting requirements, regulations, and accounting standards also adds complexity to the audit quality measurement process. More importantly, unobservable factors (Van Raak&Thurheimer, 2016) that play a crucial role in the quality of an audit but are difficult to quantify also contribute to the difficulty of audit quality measurement, such as the auditor's professional skepticism, professional judgment, and adherence to ethical standards.

Since audit quality is a complex and multifaceted concept that is challenging to measure precisely, various assessment methods are utilized by audit professionals and organizations that involve a combination of both quantitative and qualitative aspects. Some commonly used standalone or combination of methods to provide a comprehensive measure and assessment of audit quality as provided by global regulatory bodies are as follows: (1) conduct of peer review (Yuniarti&Nisjar, 2015), where other audit professionals or firms evaluate the quality of an audit engagement in order to provide valuable insights into the effectiveness of the audit process; (2) internal inspection programs (Aobdia&Petacchi, 2022) where senior professionals review the work of audit teams in order to help identify areas for improvement and ensure adherence to audit standards; (3) client satisfaction surveys (Marsely, 2019) where surveys and feedback from clients can provide insights into the effectiveness of the audit process, communication, and overall satisfaction; (4) compliance with professional standards (Ragothaman et al., 2014; Institute of Chartered Accountants in England and Wales [ICAEW], 2020) that involve assessing whether an audit meets the requirements set by regulatory bodies and professional organizations; (5) adequate audit documentation and evidence (Niktaba&Aslani, 2015) which leads to a well-documented audit trail that provides transparency and supports the conclusions drawn by the auditor; (6) continuous professional development (Ocak et al., 2022) since staying abreast of changes in accounting standards, regulations, and industry practices thru ongoing training and professional development of audit teams contribute to audit quality; and (7) audit firm culture and leadership (Salih &Hla, 2016) that prioritizes quality and ethical conduct as part of the tone for the entire organization.

However, for purposes of empirical research where audit quality needs to be expressed in quantitative terms, extant literature has documented that researchers have resorted to using proxies to measure audit quality (Rijwani, 2017) which are inferential measures used in place of an unobservable or immeasurable construct. Proxy variables also refer to observable characteristics or measures that are believed to be associated with the underlying construct of interest (Nilsson et al., 2022). Since audit quality is difficult to measure directly, researchers often use proxy variables to capture aspects of audit quality indirectly. Using proxy variables in audit research (Rajkopal et al., 2021; Yousaf & Dey, 2022) is a common practice since some dimensions such as technical competence, independence, due professional care,and professional skepticism are not always directly observable or measurable. Because of this, proxy variables can help capture these aspects indirectly by using related observable indicators. Directly measuring certain aspects of audit quality might also be impractical or too expensive to carry out. Proxy variables can therefore offer a more feasible and cost-effective way to approximate the desired research constructs. Furthermore, in statistical modeling, the availability of proxy variables can improve the precision and reliability of the analysis. Researchers may therefore choose to include proxy variables to enhance the explanatory power of their models.

Aside from the use of proxies as potential measures for audit quality, research literature have also underscored the identification of factors that were empirically observed to have an effect or influence on audit quality (Hategan, 2019). These are called audit quality indicators (AQIs) or drivers. AQIs are tools that help evaluate the effectiveness and reliability of an audit, providing insights into the level of assurance that can be placed on financial statements. They are also factors that significantly influence the effectiveness, reliability, and quality of an audit since ensuring high audit quality is essential for maintaining confidence in financial reporting and the integrity of financial markets. The use of AQIs is important to audit quality research for a number of reasons (Al-Khaddash et al., 2013; Neri& Russo, 2014; Healy, 2016; Aziza &Agus, 2019; Bender, 2023). First, the assessment of audit quality through AQIs or drivers helps enhance the credibility of financial statements. It also boosts investor confidence and stakeholder trust on the financial statements, thereby reducing the perception of financial risk associated with inaccurate or misleading information. Assessing audit quality against established AQIs or drivers also helps auditors and firms comply with relevant regulatory standards in the conduct of audit engagements. Focusing on audit quality drivers can also help auditors allocate resources more efficiently, in that by identifying and prioritizing key areas that impact audit quality, auditors can allocate time and resources to the most critical aspects of the audit engagement.

III. METHODOLOGY

Research Design

This study utilized the quantitative descriptive research approach in identifying and analyzing the status of audit quality along specific audit quality proxies and indicators. This type of research design aims to observe, describe, and document the characteristics of a phenomenon or subject without manipulating variables (Manjunatha, 2018). It focuses on providing a detailed account of the existing conditions, relationships, or patterns within a given population or situation. This type of research is particularly useful when the goal is to gain a better understanding of a topic or to generate hypotheses for further investigation (Nassaji, 2015).

Population and Scope

The population of this study were the Big 4 auditing firms globally recognized by the International Federation of Accountants (IFAC) as of 2023, which include EY (Ernst & Young), PwC (Price Waterhouse Coopers), Deloitte, and KPMG. Using these leading global auditing firms as primary research subjects is beneficial since they dominate the global audit market, handling a significant portion of audits for large public companies across various industries. Studying these firms, therefore, allows researchers to examine a substantial and influential segment of the audit profession from a global perspective. The Big 4 firms also serve complex and diverse clients, including multinational corporations with intricate financial structures, thereby providing insights into the challenges auditors face and the strategies they employ to ensure high-quality audits. Researchers can also benefit from the wealth of expertise within these firms, gaining insights into their best practices, challenges, and innovations in the field of audit quality. These leading global auditing firms also serve as benchmarks for comparison with smaller and local audit firms and can help researchers identify similarities and differences in audit quality practices across various-sized audit firms. In addition, given the prominence and operating scale of the Big 4 firms, there is more data available publicly for research purposes. This availability facilitates the empirical analysis needed for rigorous audit quality research, enabling researchers to draw more robust conclusions. Finally, these Big 4 firms have a long history and have been involved in significant global audit initiatives and regulatory changes. Studying these firms over time therefore allows researchers to examine the evolution of audit quality practices as well as the various issues, prospects, and challenges surrounding them.

Data Collection Methods

The identification of specific audit quality proxies and indicators were conducted thru document analysis anddata mining. Document analysisinvolves the systematic examination of written, visual, or audio materials to extract valuable information and insights (Bowen, 2009; Morgan, 2022). It is also particularly valuable when researchers aim to understand the content, context, and meaning embedded in existing documents. Data mining, on the other hand,involves the extraction of raw data, patterns, trends, and insights from secondary data or existing datasets that were collected for purposes other than the researcher's current study (Ogunleye, 2021). Data mining for secondary data is also a valuable research method that enables researchers to leverage existing datasets for knowledge discovery and hypothesis testing. This method also offers a cost-effective and time-saving approach, especially when dealing with large and diverse datasets across various research domains. This study utilized both document analysis and manual data mining in the process of inspecting relevant documents published by leading global auditing firms, detailing their various audit quality policies and practices and identifying relevant secondary data for use as audit quality proxies and indicators, respectively.The main documents reviewed consisted of the annual reports (publicly available and accessible in official company websites) of the Big 4 firms. However, only reports from 2013 to 2023 were included to highlight the period in which global developments related to audit quality, transparency, and ESG (environment, social, governance) standards have emerged.

Audit Quality Proxies and Indicators

For purposes of data analysis and statistical treatments, only variables that are commonly available and accessible throughout the official company reports of the Big 4 auditing firms were selected and utilized despite the sheer number of metrics and indicators that can be identified. These audit quality proxies include: (1) annual total revenues; (2) ratio of audit fees to total fees; and (3) audit inspection compliance rates. The identified audit quality indicators, on the other hand, were classified into firm-specific, human-resource-specific, and investment-specific categories. Firm-specific indicators include: (1) age of the audit firm; (2) number of employees; (3) number of industry specializations; (4) number of non-audit services; and (5) community engagement hours. Human resource-specific indicators include:(1) total training hours; (2) gender distribution ratio; (3) number of new hires; and (4) employer attractiveness ranking. Finally, investment-specific indicators include: (1) investments in audit quality technology and innovation; and (2) investments in community engagements.

Data Analysis Techniques

Descriptive statistics were used in this study for purposes of data summarization, data presentation, and understanding data characteristics. It provides a foundational understanding of data, making complex information accessible and interpretable, which is essential for effective research analysis. Key figures such as the mean (arithmetic average) and standard deviation were highlighted for this purpose. Computing the mean provides a clear, concise, and comprehensive measure of central tendency, which is fundamental for understanding and interpreting data. The standard deviation, on the other hand, provides a comprehensive measure of data variability, allowing for deeper insights into the structure and characteristics of the data by measuring data dispersion from the mean, understanding data spread, and comparing variability. In addition, since the raw data of the study involved a panel data structure, a concise trend analysis of the variables in the study (time series element) was also utilized to identify and describe key patterns observed, with comparative analysis of the audit firms (cross sectional element) providing additional supporting discussions.

IV. RESULTS AND DISCUSSION

AUDIT QUALITY PROXIES

Audit quality proxies serve as indirect but potential measures of audit quality. This study identified threeproxy variables for audit quality comprised of the following: (1) annual total revenues; (2) ratio of audit fees to total fees; and (3) audit inspections compliance rate. Annual total revenues is a traditional proxy that indicate the firm’s overall market position and financial capacity to sustain audit quality. In this study, they were represented by the total fees earned by auditing firms for both its audit and non-audit services. The ratio of audit fees to total fees indicates the firm's emphasis on providing audit services as opposed to non-audit services. In this study, they were represented by the percentage of audit and assurance fees in relation to the total revenues of the audit firm. This percentage metric is also an alternative way to represent audit and assurance fees earned by the audit firm other than using absolute amounts. On the other hand, the audit inspections compliance rate measures the extent of the firm's adherence to standards, laws, and regulations relative to the audit profession. In this study, this pertained to the rate of adherence of auditing firms with global regulatory standards on audit engagements, audit quality, and other related standards resulting from inspections

conducted by the Public Company Accounting Oversight Board (PCAOB).The sections that follow provide a detailed supplementary discussion of the individual audit quality proxy metrics. **Table 1** shows the relevant summary descriptive statistics, while the line graphs for purposes of trend and comparative analysis are displayed in **Figure 1** (Annual Total Revenues), **Figure 2** (Ratio of Audit Fees to Total Fees), and **Figure 3** (Audit Inspections Compliance Rate).

Table 1
Descriptive Statistics for Audit Quality Proxies

Proxy Metrics	Obs	Mean	SD
Annual Total Revenues	44	37,300,000,000	9,510,000,000
Ratio of Audit Fees to Total Fees	44	35.16955	7.49374
Audit Inspections Compliance Rate	44	74.70455	13.43993

Source: Output calculations using STATA software

Annual Total Revenues

Descriptive statistics of annual total revenues show that while the mean revenue is quite high, there is a substantial variability in revenues among the leading global auditing firms. Both measures suggest that the firms vary greatly in size and market presence, in that larger firms are observed to dominate the market and potentially have more resources to invest in quality audits. The high standard deviation also indicates that the annual total revenues of the firms are spread out over a wide range resulting from different scales of operations.A combined trend and comparative analysis of annual revenues reveal that all the leading global auditing firms showed growth in annual total revenues during the previous decade. This indicates a competitive landscape among the firms, with Deloitte leading in revenue growth, followed closely by PwC. EY exhibited steady and consistent growth but did not match the accelerated growth rates of the two former firms. KPMG, meanwhile, showed the slowest growth, consistently trailing behind but maintaining steady revenue increases.

Ratio of Audit Fees to Total Fees

Descriptive statistics of the audit fee ratios show that, on average, audit fees constitute approximately one-thirdof the total fees of the leading global auditing firms. The moderate level of dispersion also means that there are noticeable differences in the ratios of the firms that are either much higher or lower percentages than the average.A combined trend and comparative analysis reveal that all the firms exhibit a general downward trend in terms of their audit fees ratio, suggesting that the proportion of revenues generated from audit services is declining relative to other services provided by these firms. This also suggests a diversification of services offered by the Big 4 due to the increased demand for consulting, advisory, and other non-audit services in recent years. Deloitte demonstrated the most aggressive shift towards non-audit services, while the other firms exhibited a slower and more uniform decline over the period.

Audit Inspections Compliance Rate

Descriptive statistics of the audit inspection compliance rates show that while the average compliance rate is relatively high, there was still notable variability. This implies that most firms comply with audit inspections to a significant extent. The observed variability, meanwhile, indicates that some firms have much higher compliance rates than others. A combined trend and comparative analysis reveal that the compliance rates of all firms generally showed an upward trend despite some observed fluctuations. This suggests that audit firms have been improving their practices over the years as likely driven by regulatory scrutiny and the need for higher audit quality. Among the firms, PwC and Deloitte consistently showed high compliance rates. EY and KPMG, despite some fluctuations, still showed relatively high compliance.

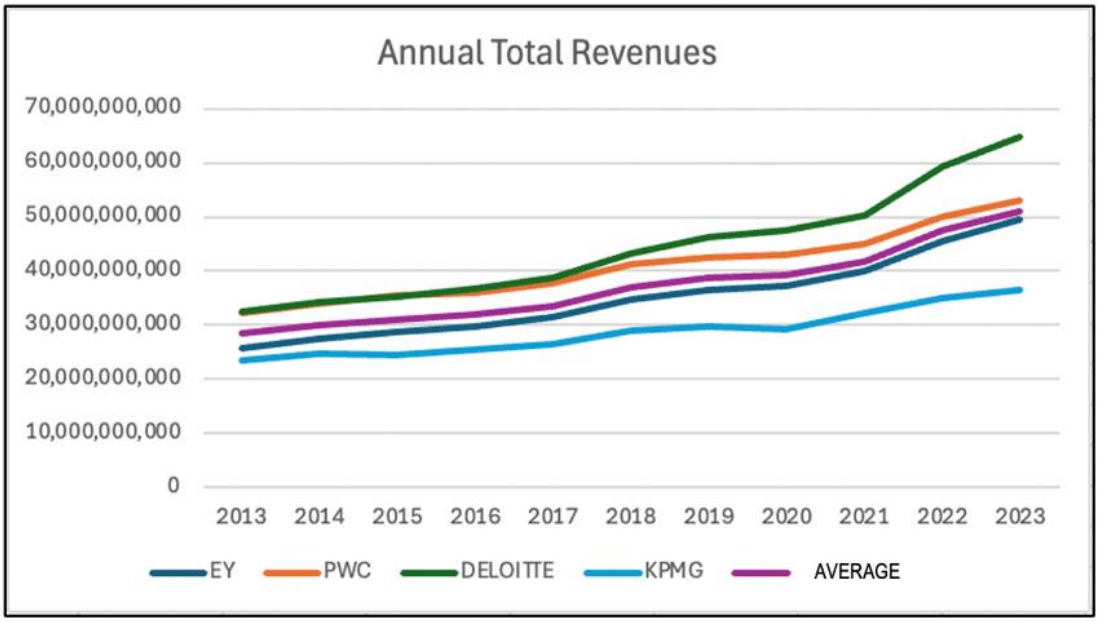

Figure 1
Annual Total Revenues (US Dollars)

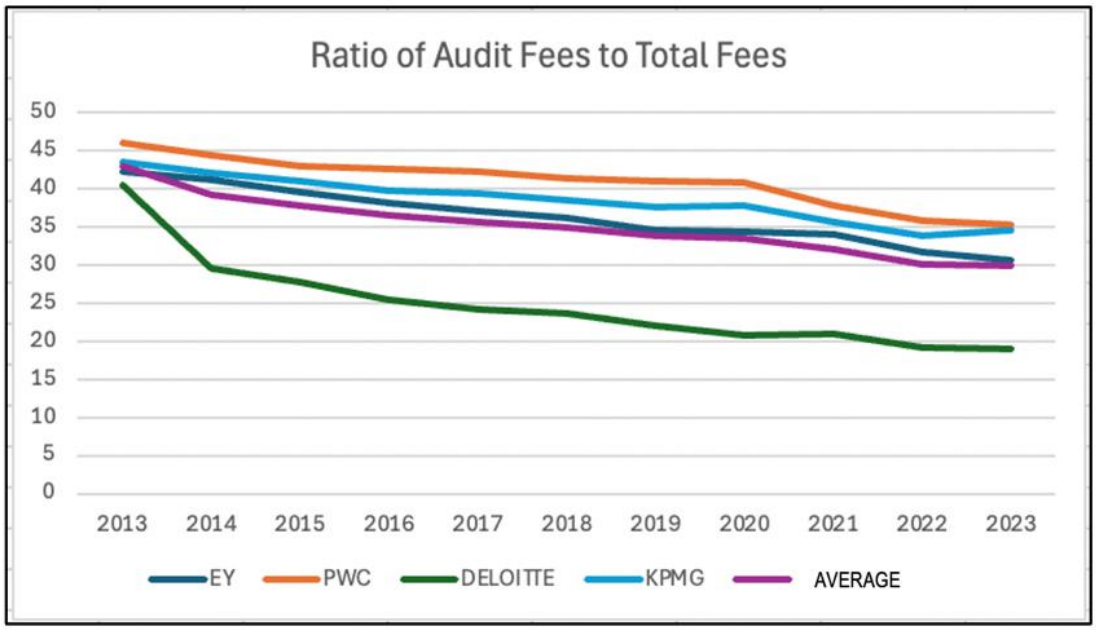

Figure 2
Ratio of Audit Fees to Total Fees (%)

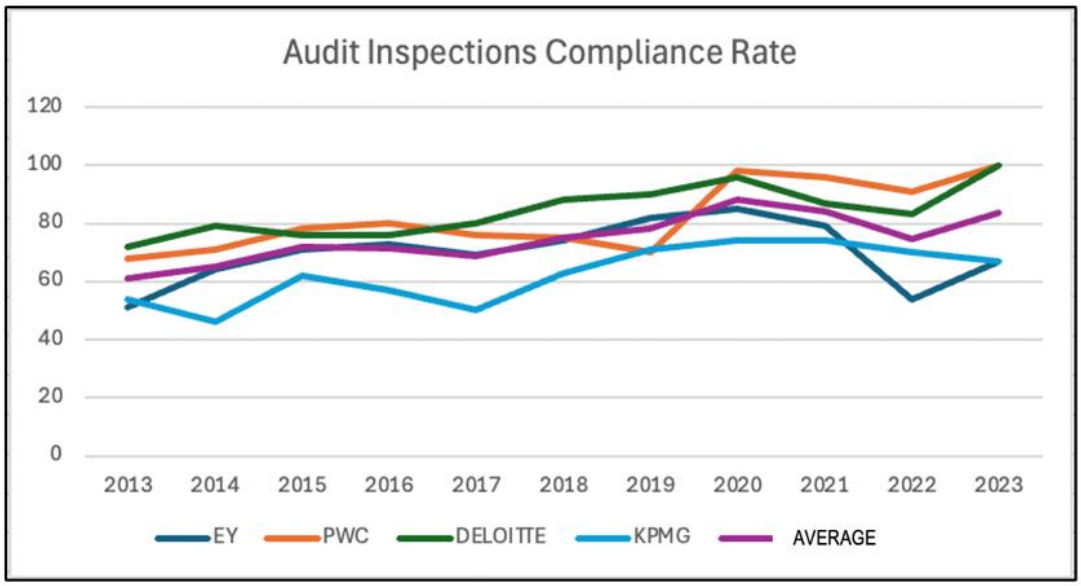

Figure 3
Audit Inspections Compliance Rate (%)

FIRM-SPECIFIC INDICATORS

Firm-specific indicators are related to the overall structure and organizational attributes of the audit firm. In this study, they include: (1) age of the audit firm; (2) number of employees;(3) number of industry specializations; (4) number of non-audit services; and (5) community engagement hours.The age of the audit firm indicates the number of years that the audit firms have been in operations globally. The number of employees refers to the total headcount of manpower employed globally by the auditing firms. The number of industry specializations denotes the number of specialized industries in which the auditing firms provide audit and related services. The number of non-audit services refers to related professional engagements provided by the firms other than audit and assurance engagements. Finally, community engagement hours represent the time utilized by audit firms for projects and activities related to corporate social responsibility (CSR) and sustainability efforts.The sections that follow provide a detailed supplementary discussion of the individual firm-specific indicators. **Table 2**shows the relevant summary descriptive statistics, while the line graphs for purposes of trend and comparative analysis are displayed in **Figure 4** (Age of the Audit Firm), **Figure 5** (Number of Employees), **Figure 6** (Number of Industry Specializations), **Figure 7** (Number of Non-Audit Services), and **Figure 8** (Community Engagement Hours).

Table 2
Descriptive Statistics for Firm Specific Audit Quality Indicators

Indicators	Obs	Mean	SD
Age of the Audit Firm	44	26.23	5.322724
Number of Employees	44	259,435.3	70,014.85
Number of Industry Specializations	44	10	4.539235
Number of Non-Audit Services	44	2.772727	.8314637
Community Engagement Hours	44	786,903.9	388,242.9

Source: Output calculations using STATA software

Age of the Audit Firm

On average, the audit firms have been in operation for about twenty-six (26) years, with a relatively low variability in age, as indicated by the standard deviation. This suggests that while most firms are close to the average age, there are some that are either significantly older or younger.A combined trend and comparative analysisreveal that all firms showed an increasing age over the ten-year period, suggesting a trend of growing experience within the audit industry. The higher-than-average ages of both EY and KPMG suggest a longer operating experience within the industry. PwC and Deloitte, meanwhile, suggest a relatively younger operational experience based on their company ages as compared to the average age.

Number of Employees

The large average number of employees suggests that, collectively, the Big 4 firms are characterized as very large firms with substantial resources dedicated to personnel and human capital. The high standard deviation,

meanwhile, indicates a large spread in firm sizes, with some firms having significantly more employees than others.A combined trend and comparative analysis reveal that all firms showed a clear upward trend in the number of employees for the past ten (10) years. The consistent increase in the number of employees across all firms indicates a period of expansion and increased demand for accounting and auditing services over the last decade. Deloitte's significant rise in terms of global employee headcount likely because of aggressive hiring strategies resulted to the firm having the largest workforce by 2023. PwC and EY, meanwhile, remained closely matched competitors, while KPMG consistently had the smallest workforce among the group.

Number of Industry Specializations

Summary descriptive statistics of the number of industry specializations show that, on average, the audit firms specialized in about ten (10) different industries, with a moderate level of variability, indicating that some firms may have focused on more or fewer industries.A combined trend and comparative analysis reveal that there was a slight downward trend towards the end of the decade, indicating a possible industry-wide shift towards concentrating on fewer but more high-impact areas of expertise. EY demonstrated remarkable consistency, maintaining a steady number of specializations throughout the period. KPMG also showed the same consistency, reflecting a focused specialization strategy with a narrower industry focus. Deloitte, meanwhile, showed a gradual reduction in specializations before remaining stable in the later years. The significant change or drop observed in PwC, on the other hand, indicates a major strategic shift towards a more focused industry specialization strategy in the later years.

Number of Non-Audit Services

Summary descriptive statistics for number of non-audit services show that the Big 4 firms provided, on average, approximately three (3) non-audit services, with low variability, suggesting that most of the firms offered a similar number of non-audit services throughout the period.A combined trend and comparative analysis reveal that Deloitte maintained a leading position with the highest number of non-audit services throughout the period, suggesting a more robust non-audit service portfolio compared to its peers. For most of the decade, the number of non-audit services provided by EY, PwC, and KPMG remained stable, indicating a steady demand and consistent offering of theseservices. However, PwC showed a notable exception in 2023 thru a sharp increase in its non-audit services likely as a result of strategic shifts and service offering expansion.

Community Engagement Hours

The average number of community engagement hours logged by the leading global auditing firms over the last decade was approximately 786,904, with a high degree of variability. This suggests a wide range of community engagement activities among the firms as well as significant differences in their levels of community engagement, with some firms contributing a greater number of hours while others far fewer.A combined trend and comparative analysis reveal that all the firms showed a general upward (albeit fluctuating) trend in community engagement hours over the ten-year period. The observed decline in 2020 across most firms suggests the possible impact of the COVID-19 pandemic that affected community engagement activities due to global quarantines and travel restrictions. However, post-2020, there was a significant rise in engagement hours, indicating a strong recovery and increased emphasis on community engagement due to the advent of sustainability requirements and continued focus on CSR efforts.

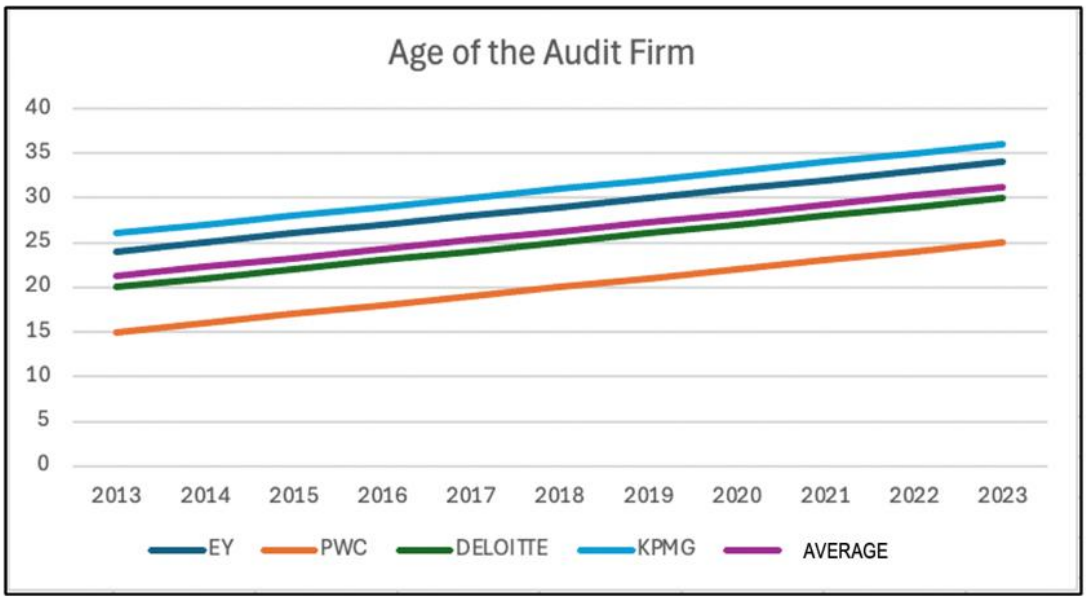

Figure 4
Age of the Audit Firm (Years)

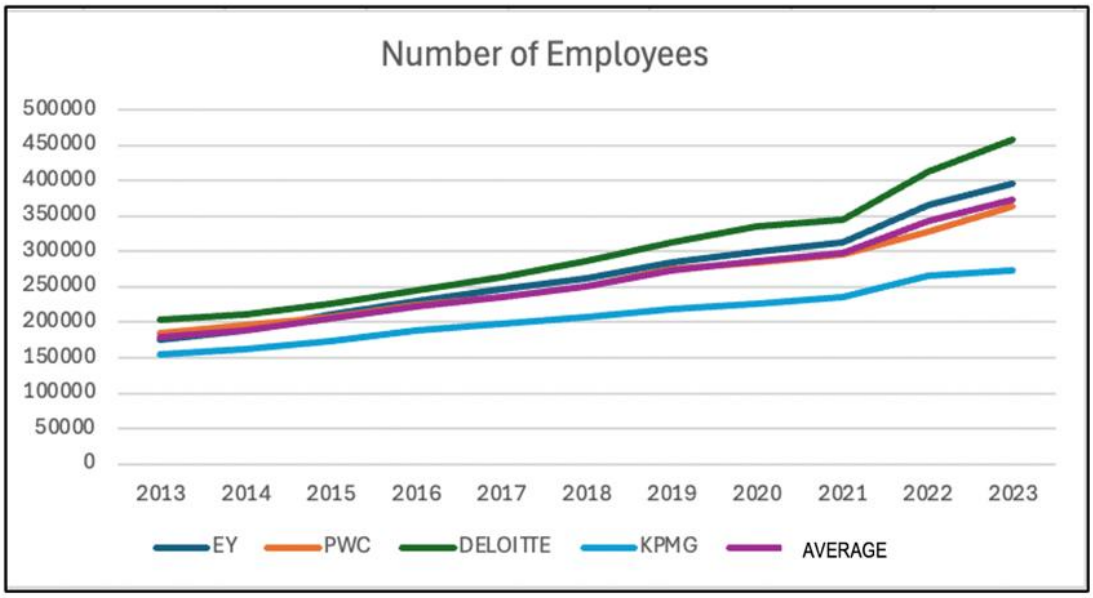

Figure 5
Number of Employees (Headcount)

Figure 6
Number of Industry Specializations

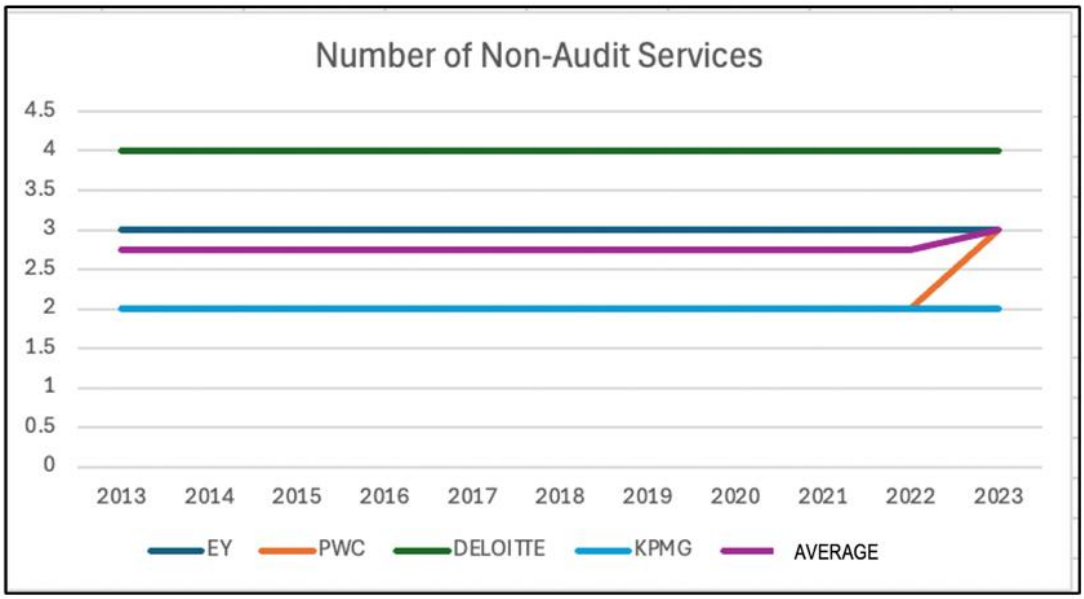

Figure 7
Number of Non-Audit Services

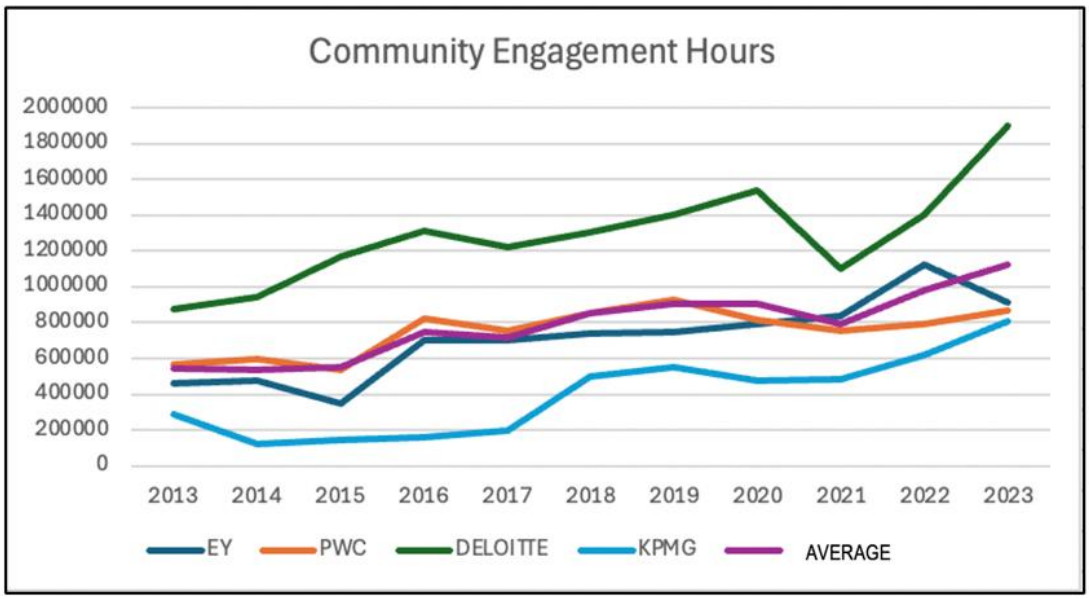

Figure 8
Community Engagement Hours

HUMAN RESOURCE-SPECIFIC INDICATORS

Human resource-specific indicators offer a comprehensive view of an auditing firm's workforce quality and organizational culture that can potentially influence audit quality, leading to the enhancement of the competence, capabilities, and professional development of its audit personnel. In this study, they include: (1) total training hours; (2) gender distribution ratio; (3) number of new hires; and (4) employer attractiveness.As used in this study, total training hours indicate the time devoted by auditing firms to initiatives aimed at the professional growth, training, development, and capacity enhancements of their employees. Gender distribution ratio measures the percentage of female executives to male executives with decision-making responsibilities within the auditing firms. The number of new hires represents the successful applicants that were recruited by the auditing firms globally. Finally, employer attractiveness was represented by the global ranking obtained by auditing firms from the annual World Most Attractive Employers (WMAE) list by Universum, the most recognized employer branding specialist in the world.The sections that follow provide a detailed supplementary discussion of the individual human resource-specific indicators. **Table 3** shows the relevant summary descriptive statistics, while the line graphs for purposes of trend and comparative analysis are displayed in **Figure 9** (Total Training Hours), **Figure 10** (Gender Distribution Ratio), **Figure 11** (Number of New Hires), and **Figure 12** (Employer Attractiveness).

Table 3
Descriptive Statistics for Human Resource Specific Audit Quality Indicators

Indicators	Obs	Mean	SD
Total Training Hours	44	14,900,000	4,467,786
Gender Distribution Ratio	44	39.25659	10.40855
Number of New Hires	44	71,874.2	30,781.85
Employer Attractiveness	44	5.977273	2.723615

Source: Output calculations using STATA software

Total Training Hours

On average, the Big 4 firms provided 14,900,000 hours of training, with a large standard deviation suggesting that some firms had much higher or much lower training hours.A combined trend and comparative analysis reveal a steady increase in total training hours over the years, indicating a robust and growing emphasis and commitment on employee training to enhance workforce capabilities. PwC consistently had high training hours, suggesting strong training investments throughout the years. EY and Deloitte, meanwhile, both demonstrated significant growth in training hours. Finally, KPMG started with observably low training hours but showed consistent growth, aligning with the other firms by the end of the decade.

Gender Distribution Ratio

The mean gender distribution ratio for the Big 4 firms is approximately 40%, with a moderate standard deviation indicating that while there is variability, it is not as pronounced or extreme. This ratio suggests that some of the firms have a more balanced ratio while others seem to be more skewed.A combined trend and comparative analysis reveal that there was an overall positive trend towards gender balance during the past decade, suggesting that gender diversity has become a significant focus for the audit firms, leading to a more balanced workforce. Deloitte, EY, and KPMG were considered as early leaders in gender diversity, while PwC's fluctuating dips and recoveries provide insights into the importance of sustained efforts to integrate gender and diversity.

Number of New Hires

On average, there were 71,874 new hires over the past decade, with a standard deviation that implies a wide range in hiring practices, with some organizations hiring more or fewer employees than the average.A combined trend and comparative analysis reveal that there was a general upward trend in the number of new hires across all firms over the past ten years, with a particular peak in 2022 and a slight decline in 2023. The peak in 2022 likely suggests a significant hiring spike due to post-pandemic recovery efforts or expansions. On the other hand, the slight decline in 2023 is likely indicative of market stabilization or adjustments following the hiring surge in the previous year. Deloitte consistently outperformed the other firms in terms of hiring, while EY and PwC showed similar trends of peaks and stable growths. KPMG, on the other hand, demonstrated more volatility but showed strong recovery and significant growth afterwards.

Employer Attractiveness

The average employer attractiveness rank of the leading global auditing firms is approximately 5.98, suggesting that they collectively ranked as the 6th most attractive employer globally as compared to other multinational companies. The standard deviation is lower compared to the mean, indicating that there are slight differences in how attractive the auditing firms are perceived to be as employers.A combined trend and comparative analysis reveal an observed gradual increase for the past ten years. Despite minor declines, the attractiveness rankings of the firms have generally improved over the decade. EY and PwC both showed a strong upward trend, indicating successful strategies in employer branding or workplace improvements. Deloitte and KPMG, on the other hand, had more volatile trends but experienced recovery and stabilization in recent years, indicating potential areas for improvement in terms of market perception. Overall, the general trend for this indicator highlights the competitive nature of the Big 4 firms in improving their attractiveness and market standing in the industry over the past decade.

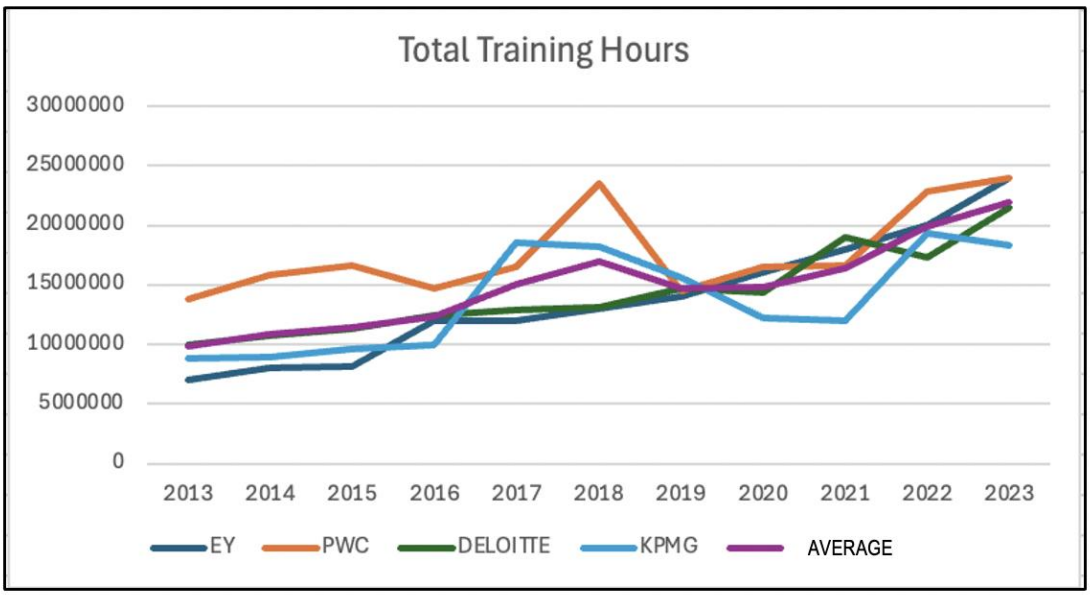

Figure 9
Total Training Hours

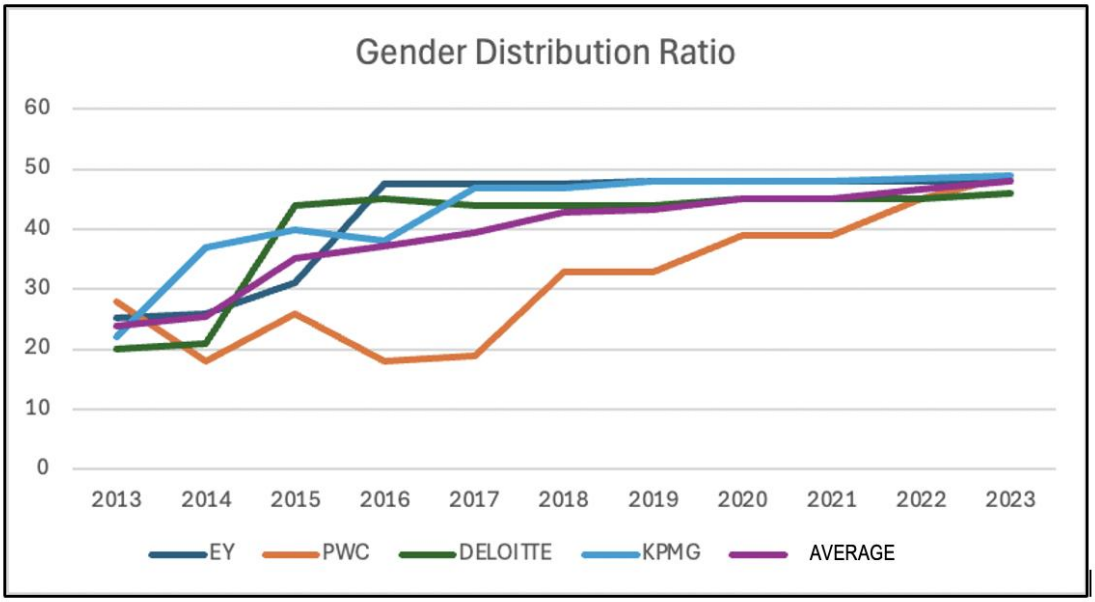

Figure 10
Gender Distribution Ratio (%)

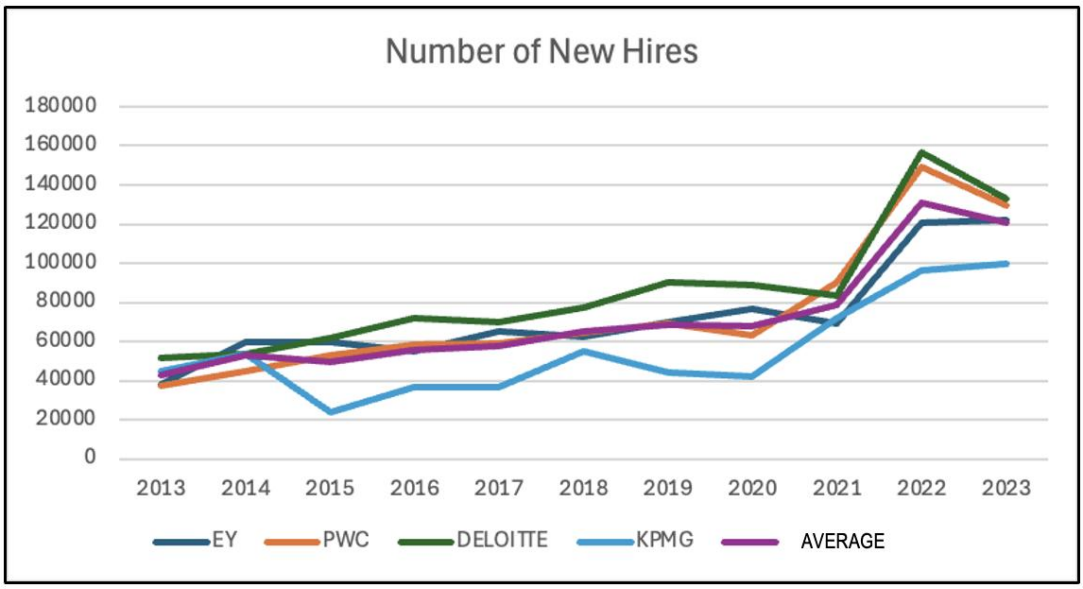

Figure 11
Number of New Hires (Headcount)

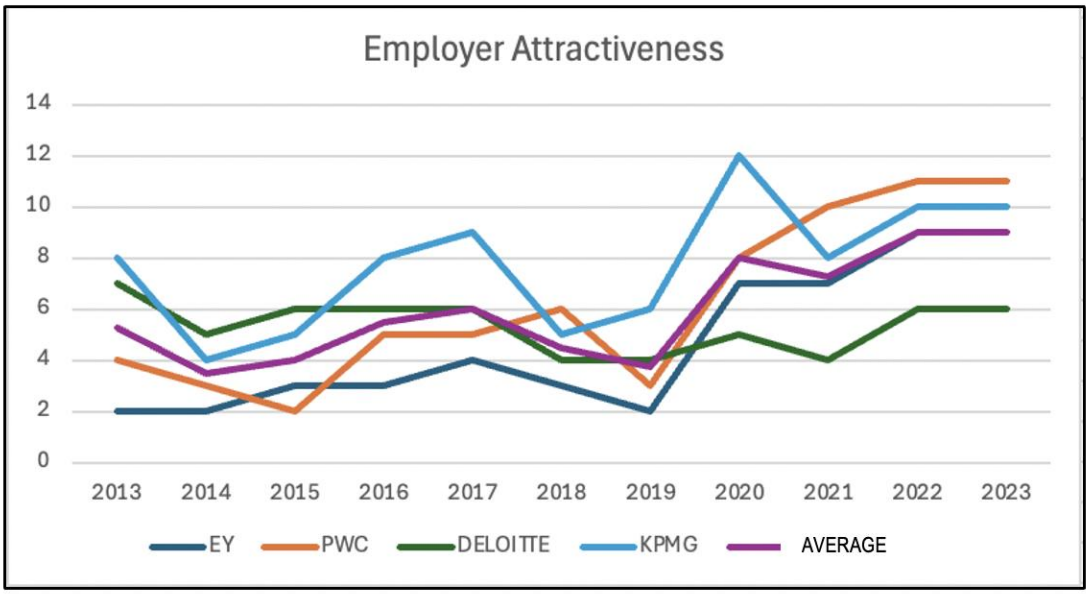

Figure 12
Employer Attractiveness (Global Rank)

INVESTMENT-SPECIFIC INDICATORS

Investment-specific indicators provide a comprehensive understanding of an auditing firm's commitment to quality, innovation, and social responsibility as part of its efforts to provide high-quality audits. In this study, they include investments in audit quality technology and innovationas well asinvestments in community engagements.As used in this study, investments in audit quality technology and innovation represent the amount of capital expenditures related to training, technology, and quality control measures to ensure the provision of consistent high-quality audits. Investments in community engagements, on the other hand, represent the amount of capital expenditures placed on various community work in support of CSR mandates such as cash and in-kind donations, management costs, and potential revenues from pro-bono or discounted engagements.The sections that follow provide a detailed supplementary discussion of the individual investment-specific indicators. **Table 4** shows the relevant summary descriptive statistics, while the line graphs for purposes of trend and comparative analysis are displayed in **Figure 13** (Investments in Audit Quality Technology and Innovation) and **Figure 14** (Investments in Community Engagements).

Table 4
Descriptive Statistics for Investment Specific Audit Quality Indicators

Indicators	Obs	Mean	SD
Investments in Audit Quality Technology and Innovation	44	1,890,000,000	1,680,000,000
Investments in Community Engagements	44	151,000,000	84,900,000

Source: Output calculations using STATA software

Investments in Audit Quality Technology and Innovation

Summary descriptive statistics show that the average investment of the Big 4 firms in audit quality technology and innovation is quite high, at 1.89 billion. The standard deviation is also very large (1.68 billion), suggesting that while some of the firms have invested heavily in this area, others may have invested considerably less.A combined trend and comparative analysis reveal that a notable increase in audit quality investmentswas observed during the second half of the previous decade, likely indicating a broad commitment to improve audit quality by embracing the role of new and advanced technology in the global audit industry. This also suggests that the Big 4 firms have collectively shifted towards a more technologically advanced audit process as driven by the need for higher accuracy, efficiency, and compliance in audit practices.

Investments in Community Engagements

Summary statistics show that average spending by the Big 4 firms for investments in community engagements is much lower than that for audit quality technology, which is at 151 million. While investments here are lower, they still show a notable amount of variability, indicating differing levels of emphasis on community engagement activities.A combined trend and comparative analysis reveal a clear upward trajectory in community engagement investments

across all major audit firms during the past decade. Overall, the general upward trend indicates a growing emphasis on community engagements across the audit firms. This also reveals the evolving competitive landscape among the major firms, indicating strategic shifts towards greater social responsibility, and reflecting a broader movement towards underscoring the growing importance of enhanced sustainability efforts as well as CSRinitiatives within the global audit industry.

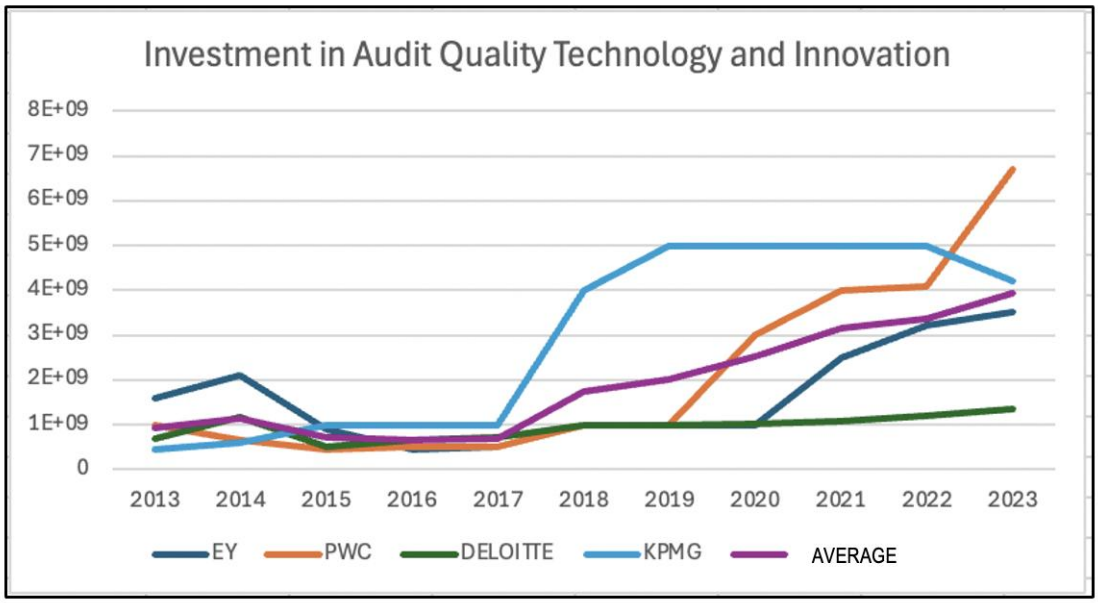

Figure 13
Investments in Audit Quality Technology and Innovation (US Dollars)

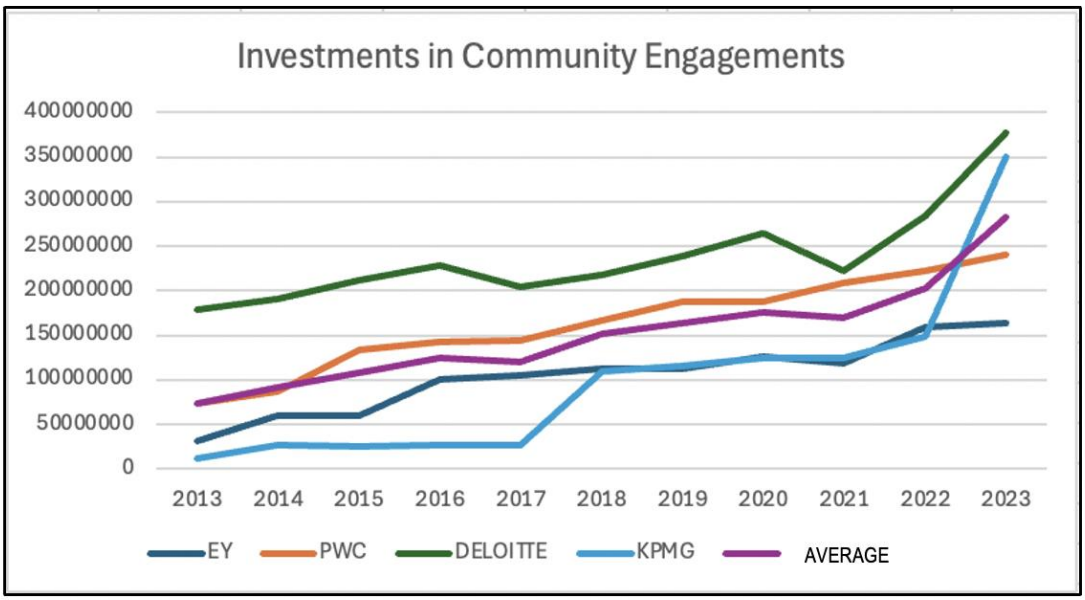

Figure 14
Investments in Community Engagements (US Dollars)

V. CONCLUSION

This paper described and analyzed the status of audit quality within the global audit industry over the past decade thru the perspective of the Big 4 firms. The results indicate that audit quality can be measured and assessed using threeproxy metrics: annual total revenues, audit fee ratio to total fees, and audit inspections compliance rate. Annual revenues showthe firm's market position and audit resources. The audit fees ratio shows the firm's emphasis on audit services as compared to non-audit services, with a higher ratio indicating a stronger commitment to audit quality and reduced conflicts of interest. The audit inspections compliance rate, on the other hand, measures regulatory compliance and the firm's internal quality control systems, with higher compliance rates indicating stronger audit practices and higher audit quality. Collectively, these metrics provide a multidimensional assessment of an auditing firm's commitment to audit excellence, credibility, and reliability.

The research findings also reveal that in order to more effectively determine the effect of audit quality indicators (AQIs)on overall audit quality, there is a need to classify them in terms of both organizational and operational parameters. As such, indicators can be categorized as either firm-specific, human resource-specific, or investment-specific.An auditing firm's stability, expertise, proficiency, and social responsibility can be assessed by its firm-specific indicators. The age of the audit firm reflects the depth of its experience and longevity in the industry, often indicating reliability and corporate reputation. The number of its employees depicts its ability to handle large and complex engagements, while its industry specializations show its ability to provide tailored audit services across various sectors. Boosting its portfolio of non-audit services, meanwhile, can generate additional revenue streams but necessitate managing conflicts of interest and maintaining audit independence. Finally, community engagement hours show the firm's commitment to social responsibility and ethical practices, boosting its public image and maintaining stakeholder trust.Humanresource-specific indicators, on the other hand, provide a comprehensive overview of an auditing firm's commitment to employee development, workforce diversity, manpower growth, and market appeal. These indicators are crucial to the study of audit quality since they represent the manpower and human capital inputs essential for delivering effective and reliable audit engagements.Total training hours demonstrate the firm's commitment to continuous professional development and equipping employees with the latest skills and knowledge to improve audit quality. A balanced gender distribution ratio shows the company's commitment to diversity and inclusion, creating a more equitable and innovative workplace environment. Its global recruitment metrics shows its manpower growth and ability to attract talent from among its pool of qualified applicants. Finally, employer attractiveness is essential for retaining and motivating productive employees.Investments in audit quality technology and community engagements, meanwhile, show an auditing firm's commitment to innovation, quality, and corporate social responsibility. The use of theseinvestment-specific indicatorsunderscores the significance of capital expenditures in enhancing both productivity and output quality as well as improving both the tangible and intangible resources of the audit firm.Capital expenditures on audit quality technology seek to improve audit accuracy, efficiency, and reliability to remain at par with industry standards and ensure regulatory compliance, thereby improving audit quality and client satisfaction. Community engagements, on the other hand, depict the firm's corporate social responsibility (CSR) and sustainability initiatives, thereby building goodwill and strengthening stakeholder relationships. They also help improve the firm's societal image towards a more ethical and sustainable business environment. These investment-specific indicators collectively demonstrate an auditing firm's holistic approach to upholding audit quality and creating social impact.

Overall, this study forwards the observation that the Big 4 firms have already been integrating audit quality concepts in their organizational operations even before actualaudit quality management standards(such as the ISQM) have been formally promulgated and implemented. Also, other auditing firms, especially the smaller and more local ones, can look to the Big 4 for guidance on how to achieve and uphold the concepts of audit quality in their own unique organizational and operational contexts. This study also opens various opportunities for future research on audit quality, such as: (1) determining innovative strategies and practices on how to attain and sustain audit quality among auditing firms regardless of size, geographical location, and scope of operations; (2) determining the extent of compliance of audit quality practices with newly promulgated quality management and sustainability standards; and (3) empirical studies focusing on quantitative metrics and how they influence overall audit quality.

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