

# The pricing of audit services: evidence from South Africa

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## Abstract

**Purpose** – Regulatory interventions to maintain audit quality are intrinsic to the audit market and may affect the setting of audit fees. South Africa is the country that most recently implemented mandatory audit firm rotation (MAFR). This study investigated the determinants of audit fees in this developing country during a period marked by increased audit firm rotations in response to the promulgation of an MAFR regime. The study period encompassed the 2020 COVID-19 year, during which worldwide regulatory interventions were implemented to extend the release of annual financial statements.

**Design/methodology/approach** – Determinants of audit fees for companies listed on the Johannesburg Stock Exchange were studied for the 2015–2020 period. Two-way fixed effects and ANOVA regressions were applied to assess the influence of rotations in an MAFR regime as well as of the financial reporting extension granted in the 2020 COVID-19 years, on audit fees.

**Findings** – Audit firm rotations under an MAFR regime were found not to have significantly affected the pricing of audit services in South Africa. Contrary to expectation, the audit fees paid by companies eligible for the COVID-19 financial reporting extension did not differ significantly from the audit fees paid by companies which were not eligible for the extension.

**Practical implications** – The study identified the deterioration of audit quality and the risk of audit firm failure as possible unintended consequences of the MAFR regime in South Africa.

**Originality/value** – This study provides insights into the pricing of audit services in a developing country with an advanced audit industry in a time of regulatory reform relating to MAFR and a financial crisis caused by COVID-19.

**Keywords** Audit fees, COVID-19, South Africa, Mandatory audit firm rotation

**Paper type** Research article

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## 1. Introduction

Subsequent to the seminal work of [Simunic \(1980\)](#), there has been an increased interest in studying and understanding audit fees and their determinants ([Eierle et al., 2022](#)). Auditing is a highly regulated sector, making this discipline – particularly audit pricing – a relevant and popular field of research ([Widmann et al., 2021](#)). Understanding audit pricing is critical in an environment where auditors are continually subjected to regulatory changes enacted in response to criticism of their role in financial crises and financial scandals ([Eierle et al., 2022](#)).

This study incorporated two audit-related regulations, namely the introduction of a mandatory audit firm rotation (MAFR) regime and the granting of a financial reporting extension during the COVID-19 pandemic. MAFR aims to strengthen auditor independence by limiting the duration of the auditor–client relationship and is regarded as the most significant audit reform ([Widmann et al., 2021](#)). The financial reporting extension refers to the granting of extra time by regulatory bodies in many jurisdictions to submit audited financial statements, owing to the unprecedented obstacles caused by the COVID-19 pandemic for clients and auditors alike ([Bentleys, 2020](#); [Eierle et al., 2022](#)).

Audit pricing research has mainly focused on auditor–client attributes as determinants of audit fees with external factors (like new regulations and financial crises) increasingly being

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incorporated in audit pricing models (Eierle *et al.*, 2022). Literature predominantly affirms that the client attributes of size, complexity and risk have a positive impact on audit fees (Hay, 2013; Hay *et al.*, 2008; Xue and O'Sullivan, 2023). Tighter regulations – such as those imposed by the adoption of the International Financial Reporting Standards (IFRS) and the enactment of corporate governance legislation like the Sarbanes-Oxley Act in the United States of America – generally lead to an increase in audit fees (Agana *et al.*, 2023; Eierle *et al.*, 2022; Hay *et al.*, 2021). Empirical evidence on the effect of MAFR on audit fees is, however, sparse – mainly owing to the limited application of MAFR in jurisdictions (Hay, 2015; Widmann *et al.*, 2021). Although the increased cost associated with MAFR has motivated certain jurisdictions not to adopt or to abolish MAFR (Ewelt-Knauer *et al.*, 2013), empirical evidence on audit fee pricing from recent adopters (like the European MAFR regulation promulgated in 2016) is lacking (Agana *et al.*, 2023; Van Deventer, 2023; Widmann *et al.*, 2021). Furthermore, the COVID-19 pandemic differed in nature and severity from the earlier financial crises and research on the effect of COVID-19 on audit fees is meagre (Al-Qadasi *et al.*, 2022; Hassan and Zhang, 2022; Hay *et al.*, 2021).

With audit pricing literature being dominated by evidence from developed countries, this study attempted to address a gap in literature pertaining to regulatory reform and the developing country perspective (Cobbin, 2002; Eierle *et al.*, 2022; Saleh and Ragab, 2023). This study focused on South Africa, a developing country that has kept pace with the corporate governance codes of developed countries (Corrigan, 2014). South Africa is the country that most recently adopted a MAFR regime. When promulgating the regime in 2017, the South African Independent Regulatory Board for Auditors (IRBA) conceded that, owing to the limited application of MAFR in other jurisdictions, there is hardly any empirical evidence in support of MAFR as an effective measure to increase audit quality (IRBA, 2017a). From the inception of IRBA's consultation process on the MAFR regime, opponents have raised concerns that MAFR could prove to be detrimental to the already struggling South African economy and its audit market. This would be a consequence of the potential increase in audit fees (and other MAFR-related costs) without offering any benefits in the form of improved audit quality (Harber and Maroun, 2020; Harber and Marx, 2019; Harber *et al.*, 2020). Furthermore, early survey studies indicated that audit committees are unlikely to allow a recoupment of MAFR-related costs in the form of increased audit fees, which may result in profit margin pressure for audit firms (Harber *et al.*, 2020). MAFR as a determinant of audit fees is as yet unexplored in a South African context.

The aim of this study was to assess the determinants of audit fees for companies listed on the Johannesburg Stock Exchange (JSE) of South Africa from 2015 to 2020. The study period encompassed the promulgation of the MAFR regulation in South Africa, the outbreak of the global COVID-19 pandemic, and the granting of a time extension to JSE-listed companies for the release of their financial statements in the COVID-19 year of 2020.

The study addresses three research questions, namely (1) Was there a significant relationship between audit firm rotations in a MAFR regime and audit fees? (2) Were JSE-listed companies eligible for the financial reporting extension subject to significantly higher audit fees than JSE-listed companies that were not eligible for the extension? (3) What was the moderating effect of the financial reporting extension on audit fee determinants of JSE-listed companies during the COVID-19 pandemic?

The study therefore addressed the call for country-specific research on the intended and unintended consequences of audit-related regulatory reform (Agana *et al.*, 2023; Widmann *et al.*, 2021). The study extended the work of Simon (1995), Firer and Swartz (2006) and Muniandy (2022) on audit fee determinants in South Africa by incorporating variables relating to client complexity (specifically audit report lag) and regulatory interventions (specifically a MAFR regime and the COVID-19 financial reporting extension) as audit fee determinants. Furthermore, the study aimed to contribute to literature on South Africa's response to a global pandemic (De Villiers *et al.*, 2020).

The results of the study provide insights that may benefit a wide range of stakeholders (regulators, auditors, clients and investors) by elucidating the effect of a MAFR regime and the COVID-19 financial reporting extension on audit fees in a country with a dual (developing and developed) economy (Grant *et al.*, 2018). These insights may guide regulators when implementing new audit-related regulations (Agana *et al.*, 2023), support clients and auditors in their audit fee negotiations (Saleh and Ragab, 2023; Widmann *et al.*, 2021), and provide evidence on audit quality and investor protection in a regulatory environment (Agana *et al.*, 2023).

Section 2 of this paper provides an overview of the South African audit market, while Section 3 reviews relevant literature and presents the hypotheses. Section 4 and 5 respectively set out the methodology and results. Section 6 draws conclusions and identifies areas of future research.

## 2. The South African audit market

Audit fee pricing studies in South Africa are largely reliant on the availability of data on audit fees. Prior to April 2011, South African company legislation required the disclosure of external audit fees in financial statements. The new Companies Act (RSA, 2009), effective from 1 April 2011, no longer mandates the disclosure of audit fees and some companies have therefore elected to cease disclosing audit fees in their financial statements (Kleynhans and Wesson, 2020). Audit fee disclosure in South Africa generally only encompasses external audit fees – with no specific disclosure on non-audit services. Furthermore, there is no regulatory limit in South Africa pertaining to the level of non-audit services that may be provided by the external auditor. South African company legislation does, however, require the audit committee to evaluate the extent of non-audit services provided by the external auditor when assessing the independence of the external auditor (Wesson, 2021).

The South African auditing profession is highly regulated: it is subject to constant regulatory oversight and is fully compliant with IFRS (Kamarudin *et al.*, 2022). Indeed, the country's audit profession is globally recognised for its regulatory strength. South Africa was ranked first in the world (out of 140 countries) for the strength of its auditing and reporting standards for seven consecutive years – 2010 to 2016 (IRBA, 2017b) and South African chartered accountants earned the top position in a professional trust survey conducted in 2023 in eight global markets (SAICA, 2023). South African audit fees are among the highest globally, which supports the highly regulated audit profession and the litigious environment in the country (Eierle *et al.*, 2022). Furthermore, the South African audit market concentration resembles that of most developed economies, with about 68% of JSE-listed companies having been audited by the so-called Big 4 audit firms (Deloitte, Ernst and Young (EY), KPMG, and PricewaterhouseCoopers (PwC)) in 2018 (Wesson, 2021).

The South African auditing landscape differs from that of most developing and emerging economies, where market concentration of Big 4 audit firms is generally low and financial reporting is weak (Kamarudin *et al.*, 2022; Tawiah, 2022). The audit market of Nigeria shows similarities to South Africa in respect of size and Big 4 audit market concentration, although Nigeria adopted IFRS much later than South Africa did (Tawiah, 2022). In a developing market context, Malaysia is comparable to South Africa based on its ranking in the financial reporting strength index of the World Economic Forum – with South Africa having only a slight edge on Malaysia (Kamarudin *et al.*, 2022).

In line with a global focus on the strengthening of auditor independence in the aftermath of high-profile audit failures, IRBA in 2015 initiated a process of research and consultation around measures to strengthen auditor independence in South Africa (IRBA, 2016). In December 2015, IRBA introduced a new rule on the mandatory disclosure of audit firm tenure in the audit report of South African public interest entities to promote transparency and monitoring of the relationship between auditors and their clients (IRBA, 2015). On 28 July 2016, the IRBA board decided to implement MAFR. An investor and public participation process was followed and the MAFR regime was promulgated in June 2017 (IRBA, 2017c).

The MAFR requirement limits audit firm tenure to 10 years and is applicable to all audit engagements for South African public interest entities, effective from year-ends commencing on or after 1 April 2023 (IRBA, 2017c).

A significant increase in the number of audit firm replacements in the South African audit market has been observed since 2015 (Wesson, 2021) due largely to clients opting to replace their auditors in anticipation of MAFR (Buthelezi, 2019). This study therefore gathered the audit firm tenure disclosures over the period 2015–2020 to obtain empirical evidence of the effect of MAFR on audit fees. Classifying South Africa as a MAFR regime adopter from the point at which the MAFR concept was introduced aligns with the methodology applied by Kamarudin *et al.* (2022).

South Africa was applauded for its relatively quick reaction to the COVID-19 pandemic and rigorous lockdown measures, despite its poor economic and social circumstances prior to the pandemic (De Villiers *et al.*, 2020). Following the declaration of the COVID-19 outbreak as a global pandemic by the World Health Organisation on 11 March 2020, South Africa announced its first lockdown on 23 March 2020. Strict lockdowns were imposed in the country until the end of May 2020, with the gradual opening of the economy in the months that followed (De Villiers *et al.*, 2020). Financial reporting relief measures were applied in the COVID-19 period. On 3 April 2020, the South African Financial Sector Conduct Authority (FSCA) granted JSE-listed companies which had year-ends falling between December 2019 and July 2020 a two-month extension on releasing their financial statements (FSCA, 2020). These companies were therefore allowed to release their financial statements five months after year-end, as opposed to the companies not eligible for extensions which were required to adhere to the three-month period requirement for JSE-listed companies.

### 3. Literature review and hypothesis development

Studies on audit pricing and its determinants mostly applied the core auditor–client attributes incorporated in the audit fee model of Simunic (1980), which has often been adapted to reflect specific market conditions or to address specific issues (Cobbin, 2002; Hay *et al.*, 2008; Widmann *et al.*, 2021). The determinants of auditor–client attributes can be categorised as client attributes (e.g. size, complexity and inherent risk); auditor attributes (e.g. Big N versus non-Big N, and tenure); and engagement attributes (e.g. busy season) (Hay *et al.*, 2008).

This section initially addresses empirical evidence on the effect of auditor–client attributes on audit fees. The discussion focuses on the variables commonly applied in global studies (Cobbin, 2002; Hay *et al.*, 2008; Simunic, 1980; Widmann *et al.*, 2021) and evidence from South African audit fee pricing studies. This is followed by a discussion on audit fee pricing research related to MAFR and during financial crises (as well as COVID-19). The section concludes with the hypotheses developed for the study.

#### 3.1 Auditor–client attributes

**3.1.1 Client attributes.** Client size is the most commonly applied determinant in audit pricing research and is also the variable that shows the closest association with audit fees (Widmann *et al.*, 2021). Large clients generally require more effort from the auditor when compared with the work required for smaller clients. Large companies need more time and more audit tests to investigate a greater number of balances (Owusu and Amoah Bekoe, 2019; Widmann *et al.*, 2021).

Furthermore, audit report lag is the client complexity variable which shows the strongest correlation with audit fees when compared with other client complexity variables (Widmann *et al.*, 2021) and is measured as the time period between the financial year-end of the client and the date on which the audit opinion is issued (Durand, 2019). Most previous studies have indicated a strong, positive correlation between the audit report lag and audit fees (Hay *et al.*, 2008; Kanakriyah, 2020; Santhosh and Sankar Ganesh, 2020).

In respect of the inherent risk attributable to clients, variables such as the client's net assets, financial position and profitability are applied to measure inherent risk (Widmann *et al.*, 2021). The net asset variable predominantly applied in audit pricing models is the ratio of inventories plus receivables to total assets (Widmann *et al.*, 2021) and a significant positive relationship with audit fees is frequently reported (Cobbin, 2002; Hay *et al.*, 2008; Widmann *et al.*, 2021). When measuring inherent risk based on profitability, the ratio of the profit figure to a capital base (e.g. the return on asset, or ROA, ratio) is generally applied (Hay *et al.*, 2008; Widmann *et al.*, 2021). While empirical evidence generally supports the business risk argument with auditors charging higher fees if the client is not profitable (Simunic, 1980; Widmann *et al.*, 2021), some studies support the fee pressure argument, which asserts that there is a reduction in audit fees when clients experience financial difficulties (Hay *et al.*, 2008; Vafeas and Waegelien, 2007).

*3.1.2 Auditor attributes.* Audit pricing studies often incorporate the size of an auditor based on a dummy variable for Big N audit firms. It is assumed that, owing to their higher market power, Big N audit firms can demand a higher fee (the so-called "fee premium"). The higher fee charged by Big N auditors may be attributed to their perceived higher audit quality when compared with smaller auditors (Kanakriyah, 2020; Simunic, 1980) and to the profit targets (affected by high staff costs for skilled employees, litigation and reputation risks) of Big N firms (Ye, 2020).

The auditor attribute of audit firm tenure refers to the number of consecutive years that a client retains the services of an audit firm. Since clients generally perceive the engagement of new audit firms as a costly undertaking (often referred to as "setup and transition costs") owing to the considerable effort required to acquaint themselves with new clients (Harber *et al.*, 2020), audit firms often initially offer reduced fees (colloquially known as "lowballing") in the hope of recouping losses in subsequent years (DeAngelo, 1981). Most research has, however, found no significant relationship between audit firm tenure and audit fees (Widmann *et al.*, 2021) and limited evidence of lowballing during the initial years of auditor engagements (Hay, 2013).

*3.1.3 Engagement attributes.* While the closing date of a client's financial year is generally not prescribed by law (Widmann *et al.*, 2021), auditors may experience time pressure to issue timeous audit reports if a number of their clients share the same fiscal year-end date. To mitigate a flood of work during busy periods ("busy season"), auditors may try to complete a considerable amount of preliminary work, such as testing the internal control environment, well before the client's year-end (Barua *et al.*, 2019). The possibility also exists that auditors charge a premium fee to compensate for the overtime work that may be required during busy periods (Kanakriyah, 2020). Auditors could also provide discounted audit fees to conduct audits outside the busy season (Hay *et al.*, 2008). While most global studies report a positive relationship between the busy season and audit fees, the results are mostly not statistically significant (Widmann *et al.*, 2021).

### 3.2 South African audit fee pricing studies

Based on the nature and strength of the South African audit profession, it was expected that the determinants of audit fee pricing would mirror the experience of developed countries. Earlier South African studies on the determinants of audit fees were conducted by Simon (1995), Firer and Swartz (2006) and Muniandy (2022). These authors confirmed that the determinants of South African audit fees generally resemble global evidence with the client attributes of size, complexity and inherent risk showing a significant positive association with audit fees, while it is only more recently that the Big 4 audit premium has been significantly related to audit fees (Firer and Swartz, 2006; Muniandy, 2022). None of these earlier South African studies incorporated audit firm tenure or audit report lag as determinants and neither did they incorporate MAFR or the COVID-19 period – aspects that this study has addressed.

### 3.3 Mandatory audit firm rotation

The mandating of audit firm rotation, dubbed MAFR, remains a controversial intervention and is subject to much research. Several studies hold that mandating the periodic switching of audit

firms could avoid auditor familiarity and, by this means, obviate impaired auditing independence and objectivity (Hay, 2013; Malagila *et al.*, 2020). The effect of MAFR on audit fees is expected to differ from voluntary auditor replacement because MAFR increases the demand for audit services without increased supply being available in the short term (Kamarudin *et al.*, 2022). It is therefore expected that a more competitive audit market under a MAFR regime would support a decrease in audit market concentration and the charging of lower audit fees (Bleibtreu and Stefani, 2018).

Empirical evidence of the effect of MAFR on audit fees is, however, sparse. Although MAFR has been adopted in some jurisdictions (e.g. Italy, Brazil, Oman and the European Union), it is often only applied in certain industries (mainly banking and state-owned entities). Many countries have since abolished the practice (e.g. Canada, Austria, Singapore, Spain, Greece, Latvia, South Korea and the Czech Republic), owing mainly to the cost outweighing the benefits obtained (Bleibtreu and Stefani, 2018; Kleynhans and Wesson, 2020; Malagila *et al.*, 2020; Van Deventer, 2023). Numerous countries have opted to rather apply audit partner rotation (Ewelt-Knauer *et al.*, 2013) in line with the mandatory audit partner rotation requirement of the International Federation of Accountants (IFAC). Professional accountancy organisations in 130 countries are members of IFAC (Van Deventer, 2023).

It is only in Italy – where MAFR has been applied since 1975 – that empirical findings on the MAFR experience over a substantial period have been provided (IRBA, 2017a). In Italy, Cameran *et al.* (2015) and Corbella *et al.* (2015) reported that MAFR has increased total audit fees over time and has had no observable positive effect on audit quality. Similar results were reported by Kwon *et al.* (2014) in the South Korean market where MAFR was applied from 2006 to 2010. Furthermore, lowballing (in the first year of the audit engagement) was observed in Italy in respect of Big 4 auditors (Cameran *et al.*, 2015; Corbella *et al.*, 2015), but for non-Big 4 auditors the audit fees remained unchanged (Corbella *et al.*, 2015).

In an emerging market context in 10 countries, namely China, India, Malaysia, Pakistan, the Philippines, Poland, Russia, South Africa, Thailand and Türkiye, Kamarudin *et al.* (2022) reported that jurisdictions which apply MAFR charged higher audit fees compared with those that did not apply MAFR. However, in India during the period 2014–2017, Narayanaswamy and Raghunandan (2019) found in their comparison of pre- and post-MAFR that MAFR had no significant effect on audit fees.

While it is acknowledged that a MAFR regime and the financial reporting strength in a jurisdiction translate to an increase in audit quality and audit effort (therefore an increase in audit fees), Kamarudin *et al.* (2022) reported that both MAFR and the financial reporting strength were moderating measures that weakened the positive relationship between high auditor market concentration and audit fees. However, early evidence from the United Kingdom MAFR regime showed that MAFR did not significantly decrease Big 4 audit market concentration in a jurisdiction with a high financial reporting strength, indicating that audit market competition (and therefore audit fees) in these markets would not necessarily change in a MAFR regime (Godawska and Kutera, 2021). On the contrary, evidence from Poland (which is the European Union member state that applies the shortest allowable tenure, i.e. five years) showed an increase in audit market concentration in a MAFR regime (Indyk, 2019). Similarly, Wesson (2021) reported a significant increase in Big 4 market concentration in South Africa under a MAFR regime, which might indicate that audit market competition would decrease and an increase in audit fees was therefore to be expected in the South African audit market.

### 3.4 The financial crisis and the COVID-19 pandemic

Results from studies on the effect of the global financial crisis of 2008–2009 have generally supported the business risk argument, reporting a significant increase in audit fees during the crisis. Downward fee pressure was also reported in some countries and industries (specifically the banking industry in the United States of America) during the 2008–2009 financial crisis (Eierle *et al.*, 2022).

The dire financial consequences of the COVID-19 pandemic in 2020 differed from the earlier financial crisis, mainly because the pandemic woes were not caused by factors in the financial system, but rather were the outcome of the mandatory lockdown restrictions that led to the closure of many industries and economies (Shen *et al.*, 2020). The practice of working remotely and the high investment in technology to allow the continuation of operations during these restrictions were evident in most companies. A global infectious disease (like COVID-19) can potentially have a severe impact on auditors and their clients (Eierle *et al.*, 2022). The regulatory bodies in many jurisdictions, therefore, responded to the COVID-19 pandemic by granting companies an extension of time on the release of their audited financial statements (Bentleys, 2020). For example, the United States Securities and Exchange Commission extended the filing deadlines of financial reports falling between 1 March and 1 July 2020 by 45 days (KPMG, 2020); Australia granted listed companies an additional month for 2020 financial reporting up to 7 July 2020 (Bentleys, 2020); Croatia granted companies an additional two months for their 2020 financial reporting (Šušak, 2020); and the FSCA in South Africa granted JSE-listed companies with reporting dates falling between December 2019 and July 2020 an additional two months to publish their annual financial statements (FSCA, 2020).

The number of studies on the effect of COVID-19 on audit fees is limited and initially comprised mainly literature reviews (Al-Qadasi *et al.*, 2022; Hay *et al.*, 2021). Empirical evidence on the effect of COVID-19 on audit fees showed mixed results. In a developed country context, Hassan and Zhang (2022) reported no significant change in abnormal audit fees during COVID-19 in four European countries (France, Germany, Spain and the United Kingdom) and Hay *et al.* (2021) observed that the effect of COVID-19 on audit outcomes and financial reporting in New Zealand appeared to be less severe than predicted. However, from a developing country perspective, a significant increase in audit fees during COVID-19 was reported for Malaysia (Bajary *et al.*, 2023), Oman (Al-Qadasi *et al.*, 2022) and Ghana (Musah *et al.*, 2023) – and in Oman it was largely the Big 4 audit firms that increased their fees. Furthermore, in cross-country studies – including both developing and developed countries – Alkebeese *et al.* (2023) and Harjoto and Laksmana (2022) reported contradictory results. Alkebeese *et al.* (2023) studied 52 countries and reported significantly lower audit fees in the COVID-19 period, whereas Harjoto and Laksmana (2022) studied 42 countries and reported significantly higher audit fees in the COVID-19 period. Alkebeese *et al.* (2023) attributed the contradictory results to Harjoto and Laksmana's (2022) inclusion of observations mainly from the United States of America in their study, and attributed the reported decrease in audit fees during the pandemic to the fact that audit costs were reduced in respect of certain procedures to be performed (e.g. auditors did not need to be physically present to observe assets) and it was therefore likely that clients negotiated reduced audit fees (Chen *et al.*, 2019).

To the best of the authors' knowledge, no study has yet incorporated the COVID-19-related extensions for financial reporting as a determinant of audit fees. An increase in audit report lag was, however, associated with an increase in audit fees during COVID-19 in Malaysia (Bajary *et al.*, 2023) and Ghana (Musah *et al.*, 2023). Šušak (2020) incorporated the COVID-19 financial reporting extension as a moderating variable when studying the relationship between earnings management and audit report lag in Croatia and reported that COVID-19 extensions allowed for increased earnings management during the COVID-19 period. Furthermore, in their cross-country study, Harjoto and Laksmana (2022) reported that high audit risks enhanced the positive relationship between the duration of COVID-19 restrictions and audit fees – but only for countries other than the United States of America.

### 3.5 Hypothesis development

The two explanatory variables of interest in this audit pricing study were the rotations in an MAFR regime and the COVID-19 financial reporting extension. This study applied the audit firm tenure variable to gain an understanding of how the audit firm replacement in a MAFR

regime affected audit fees (Widmann *et al.*, 2021). In line with global literature, the effect of the audit firm tenure variable on audit fees was a binary variable, representing short tenure (one to three years) (Johnson *et al.*, 2002; Riccardi, 2019). When assessing the effect of the COVID-19 reporting extension on audit fees, a binary variable representing the period covered by the reporting extension granted during the 2020 COVID-19 year (namely, January to July 2020) was applied as an explanatory and moderating variable.

The theoretical framework that best explains the pricing of audit fees is the agency theory (Musah *et al.*, 2023; Van Deventer, 2023; Verbruggen *et al.*, 2015). This requires that external audits are performed to provide assurance to shareholders and other stakeholders (the principals) that the financial statements presented by management (the agents) are a faithful representation of the company's financial performance and position. In respect of agency theory, conflicts of interest between the agents and principals (i.e. an agency problem) require high-quality audits and increased audit efforts (Verbruggen *et al.*, 2015). Audit fees are therefore an agency cost, with more challenging agency problems associated with higher audit fees (Verbruggen *et al.*, 2015).

Based on agency theory, the requirement to limit the tenure of an audit firm under a MAFR regime is a governance measure to address information asymmetry between management and stakeholders (Van Deventer, 2023). The incoming auditor under a MAFR regime is expected to reduce information asymmetry between management and stakeholders by providing a higher-quality audit based on a fresh perspective and by being more thorough than the outgoing auditor. Furthermore, owing to the incoming auditor having limited knowledge of the business of the new client, a MAFR regime increases information asymmetry between auditors and clients – therefore requiring an increased audit effort (i.e. setup and transition costs) in the process of obtaining the necessary understanding of the client's business (Van Deventer, 2023). The higher agency problems associated with a MAFR regime therefore translate to an expected increase in audit fees (Verbruggen *et al.*, 2015). Global evidence generally supports a positive association between a MAFR regime and audit fees (Cameran *et al.*, 2015; Corbella *et al.*, 2015; Eierle *et al.*, 2022; Kwon *et al.*, 2014).

Hypothesis 1 is therefore formulated as:

- H1. There is a significant positive relationship between audit firm tenure (when measured as short audit firm tenure) and audit fees.

An agency theory perspective on the 2020 COVID-19 year postulates that information asymmetry between managers and stakeholders increased during the COVID-19 pandemic as stakeholders sought to maintain the quality of the audit, while management may have been more focused on reducing costs (including audit fees) (Musah *et al.*, 2023). Specifically, during the peak of the COVID-19 pandemic when the COVID-19 extension on financial reporting was granted, the risk of managers manipulating earnings may have necessitated increased audit efforts to mitigate the increase in audit risk (Šušak, 2020). Global literature generally acknowledges the positive relationship between audit report lag and audit fees that occurred during COVID-19 (Bajary *et al.*, 2023; Musah *et al.*, 2023). Furthermore, the increased audit effort required during the peak of the pandemic was likely to be more pronounced for clients with inherent risks (Harjoto and Laksmana, 2022).

Hypotheses 2 and 3 are therefore formulated as:

- H2. Companies eligible for the financial reporting extension granted in 2020 have significantly higher audit fees than companies which were not eligible for the extension.
- H3. The financial reporting extension in the time of COVID-19 have a more pronounced effect on audit fees for companies with higher levels of inherent risk (represented by higher levels of inventories plus receivables to total assets, and lower levels of profitability) when compared to those with lower levels of inherent risk.

## 4. Methodology

### 4.1 Study sample

This study was based on a positivist paradigm and applied secondary quantitative company-specific data for companies listed on the JSE for the 2015–2020 period. Data were obtained from published annual reports (extracted via the IRESS database: Product Library) and the IRESS Expert database. Where information was incomplete or unavailable on either of these two databases, data were sourced directly from the published financial statements publicly available on the companies' websites.

Data were collected for the 405 companies listed on the JSE during the period 2015–2020. Delisted companies were included in the sample to eliminate survivor bias. Company years during which audit fees were not disclosed, or where data on other variables were not available, were omitted from the final sample. A total of 269 companies (representing 1996 company-year observations) met the data requirements for the regression analyses on audit fees over the 2015–2020 target period.

Table 1 elucidates the sample composition per year based on total number of listed companies, audit firm replacements, Big 4 audit firm concentration, and audit fee data availability. A total of 223 audit firm replacements were affected over the target period— with higher levels of audit firm replacements evident in 2019 (at 49, or 21.97%) and 2020 (at 43, or 19.28%). Furthermore, Big 4 audit firm concentration increased from about 67% in 2015 to about 70% in 2017, whereafter it slightly decreased in 2018 (to 69.88%) and stabilised at slightly lower levels in 2019 (at 67.69%) and 2020 (at 67.56%). Table 1 also shows that audit fee data were available for more than 83% of all company year observations, thus rendering the study sample adequate to investigate the determinants of audit fee pricing in South Africa.

### 4.2 Data collection

Table 2 lists the variables included in the study; their measurement; primary data source; and the expected relationship between the dependent, independent and control variables. Independent and control variables reported in Table 2 were chosen on the basis of their prominence in audit fee pricing literature. The two independent variables of interest for the purpose of this study were the audit firm tenure variable (representing the MAFR application) and the COVID-19 extension variable. The dependent variable is current year audit fees

**Table 1.** Sample composition

Financial year	2015	2016	2017	2018	2019	2020
Total number of companies listed on the Johannesburg Stock Exchange	340	345	345	342	325	299
Number of audit firm replacements (Percentage, based on 223 audit firm replacements in 2015–2020)	28 (12.56%)	34 (15.25%)	33 (14.80%)	36 (16.14%)	49 (21.97%)	43 (19.28%)
Number companies audited by Big 4 audit firms (Percentage, based on listed companies per annum)	227 (66.76%)	236 (68.41%)	243 (70.43)	239 (69.88%)	220 (67.69%)	202 (67.56%)
Number of companies disclosing current year audit fees (Percentage, based on listed companies per annum)	302 (88.8%)	299 (86.7%)	295 (85.5%)	290 (84.8%)	278 (85.5%)	250 (83.6%)

**Source(s):** Authors' own creation

**Table 2.** Variables and measurements applied

Variable	Type	Code	Measurement	Primary source of data	Expected relationship with audit fees
Current year audit fees	Dependent	CYFEE	Current year audit fees charged to the client (Log10)	IRESS Expert database	
Audit firm tenure	Independent	TENURE	(0, 1) variable where (1) if audit firm tenure is three years or less	Annual financial statement	Not significant
COVID-19 extension	Independent	COVID19	(0, 1) variable where (1) if the company qualified for the FSCA <sup>1</sup> extension (i.e. January 2020 to July 2020 financial year-ends)	IRESS Expert database	Positive
Total assets	Control	ASSETS	Total assets at year-end (Log10)	IRESS Expert database	Positive
Ratio of inventory and receivables to total assets	Control	INVREC	(Inventories + receivables)/total assets	IRESS Expert database	Positive
Audit report lag	Control	LAG	Number of days between the financial year-end and the audit opinion (Log10)	Annual financial statement	Positive
Busy season	Control	BUSY	(0, 1) variable where (1) if year-end is in the busy season (June and December)	IRESS Expert database	Positive
Return on assets	Control	ROA	Non-financial companies = EBIT <sup>2</sup> /total assets (winsorised) Financial companies = profit before tax/total assets (winsorised)	IRESS Expert database	Negative
The presence of a dominant audit firm	Control	BIG4	(0, 1) variable where (1) if the auditor is a Big 4 auditor	Annual financial statement	Positive

**Note(s):** <sup>1</sup>FSCA is defined as the Financial Sector Conduct Authority of South Africa, <sup>2</sup>EBIT is defined as earnings before interest and tax

**Source(s):** Authors' own creation

(CYFEE). The IRESS database reports five audit fee lines: total audit fees, current year audit fees, prior year audit fees, audit expenses, and other fees. For the purposes of this study, the current year audit fees (CYFEE) were deemed most appropriate as they related to the external audit fee of the current year, whereas the total audit fees may have included non-audit services, internal audit fees, and other expenses.

For variables that were captured directly from the published annual reports (namely audit report lag, audit firm tenure, and Big 4 audit firm), some captured variables required additional calculations and interpretations. Audit report lag was calculated in days, based on the difference in days between the reporting date (reported as the last day of the financial year in the published annual report) and the audit report date (as per the signed audit report). Information on audit firm tenure was obtained from the audit firm tenure disclosure in the audit report. However, in certain circumstances it was evident that audit firm tenure was incorrectly disclosed, in which case the captured audit firm tenure was amended to portray the actual audit firm tenure. These incorrect disclosures related mainly to earlier years (when the application of the tenure rule was not always consistently applied, especially in the event of audit firm mergers in the non-Big 4 category) and became evident in subsequent tenure disclosures. In

respect of joint audit engagements, the longest audit firm tenure was applied and the status of Big 4 audit firm was awarded if one of the audit firms was a Big 4 audit firm. Joint audit engagements were applicable only to 12 companies (representing 53 company-year observations) over the target period. For the busy season variable, the reporting dates of all JSE-listed companies in the sample were extracted from the IRESS database for the 2019 financial year and the months of June (29%) and December (22%) were identified as representing the busy season. The non-busy season was represented by the months of March (17%), February (16%), September (9%), and August (5%), with the remaining months (January, April, May, July, October and November) representing only 2%.

#### 4.3 Data analysis

Before applying the descriptive and inferential statistics, data were examined for the existence of outliers that might cause asymmetry and non-linearity. As a result, ROA was winsorised and the natural algorithmic method ( $\log_{10}$ ) was applied to the CYFEE, total assets (ASSETS), and audit report lag (LAG) variables. These data transformations were applied in all data analyses. A significance level of 5% was consistently applied.

Initially, descriptive statistics were applied to assess the effect of the COVID-19 pandemic on audit report lag. To describe the trend in audit report lag for JSE-listed companies eligible for the financial reporting extension granted in 2020 compared to the audit report lag for JSE-listed companies which were not eligible, the timelines of the publication of financial statements (represented by the LAG variable) for the 12-month period from December 2019 to November 2020 was assessed on the basis of three separate categories. The first two categories represented companies eligible for the financial reporting extension, split between the 2019 years (companies with December 2019 years-ends) and the 2020 years (companies with January to July 2020 years-ends). The third category represented the companies not eligible for the financial reporting extension (August to November 2020 years-ends). A mixed-model analysis of variance (ANOVA), executed in the LMER in R package, was applied to compare the differences in mean audit report lag between groups. In addition, Box-Cox transformation was applied to normalise the data to assess whether the mean audit report lag differed significantly between the three categories. The Kenward-Roger degrees of freedom were used for the ANOVA.

Before applying the inferential statistics to the factors affecting audit fees, a variance inflation factor (VIF) analysis was applied. It indicated no correlation between the independent variables. Additionally, normal probability plots and scatterplots of the residuals were examined. This further confirmed that no adjustments for multicollinearity were required.

For the inferential statistics, a two-way fixed effects regression (2FE) with unit and time fixed effects was applied to evaluate the factors that affect audit fees. The 2FE allows for the adjustment of unobserved variables. A multiple regression model similar to the [Simunic \(1980\)](#) model was therefore adopted ([Equation 1](#)) and applied to current audit fees (CYFEE) for the entire 2015–2020 period. Furthermore, ANOVAs were executed using the LM function in R for the 2020 COVID-19 years to isolate the impact of the COVID-19 financial reporting extension on audit fees ([Equation 2](#)) and to assess the moderating effect of the COVID-19 financial reporting extension on the determinants of audit fees ([Equation 3](#)).

$$\text{CYFEE} = \alpha + \beta_1 \text{ASSETS} + \beta_2 \text{INVREC} + \beta_3 \text{LAG} + \beta_4 \text{BUSY} + \beta_5 \text{ROA} + \beta_6 \text{TENURE} + \beta_7 \text{BIG4} + \varepsilon \quad (1)$$

$$\text{CYFEE} = \alpha + \beta_1 \text{ASSETS} + \beta_2 \text{INVREC} + \beta_3 \text{LAG} + \beta_4 \text{BUSY} + \beta_5 \text{ROA} + \beta_6 \text{TENURE} + \beta_7 \text{BIG4} + \beta_8 \text{COVID19} + \varepsilon \quad (2)$$

$$CYFEE = \alpha + \beta_1 ASSETS + \beta_2 INVREC + \beta_3 LAG + \beta_4 BUSY + \beta_5 ROA + \beta_6 TENURE + \beta_7 BIG4 + \beta_8 COVID19 + \beta_{9-15} INTERACTION + \varepsilon \quad (3)$$

Where:

CYFEE: Log ten of current year audit fees.

$\alpha$ : The constant (intercept).

ASSETS: Log ten of the value of total assets at year-end.

INVREC: Ratio of the inventories plus receivables to the total assets.

LAG: Log ten of the number of days between the financial year-end and the issuance of the audit opinion.

BUSY: Dummy variable of 1 if the financial year-end is June or December; otherwise 0.

ROA: Ratio of net income to total assets (winsorised).

TENURE: Dummy variable of 1 if the audit firm tenure is three years or less; otherwise 0.

BIG4: Dummy variable of 1 if the auditor was a Big 4 auditor; otherwise 0.

COVID19: Dummy variable of 1 if the financial year-end was between January and July 2020; and 0 if the financial year-end was between August 2020 and December 2020.

INTERACTION: The interaction of the COVID-19 variable with each of the seven audit fee determinants.

$\varepsilon$ : The normal error term.

## 5. Results

### 5.1 Descriptive statistics

Descriptive statistics on the variables applied in this study are reported in [Appendix 1](#). The number of observations (N) reported for the audit fee variable (CYFEE) supports the observations from [Table 1](#) on audit fees being the variable affected most by missing data as the disclosure thereof has not been mandated since 2011. Furthermore, the mean audit report lag (LAG) of about 92 days reflects the fact that most companies adhered to the three-month reporting requirement during the target period. The mean audit report lag over the period 2015–2020 is longer than the average audit report lag of about 81 days reported by [Boshoff and Wesson \(2019\)](#) during the pre-COVID-19 period of 2002–2014 in South Africa. [Boshoff and Wesson \(2019\)](#) stated that the average South African audit report lag was in line with that of developed countries like the United States of America, but higher than the average audit report lag reported in developing countries. Studies from developing countries on audit report timeliness during the 2020 COVID-19 years show that the average audit report lag in Malaysia was about 100 days for the period 2017 to 2020 ([Bajary et al., 2023](#)) and 105 days in Ghana for the period 2017 to 2021 ([Musah et al., 2023](#)) – longer than the 92 days reported in South Africa for the 2015–2020 period. An analysis of the effect of the two-month extension of time granted in the 2020 COVID-19 years is addressed in a subsequent analysis in this paper. Similar to the findings of [Muthu and Wesson \(2023\)](#), it is evident from the mean ROA variable (of –9.691) that most JSE-listed companies were under financial strain even before the 2020 COVID-19 years.

The descriptive statistics on the audit firm tenure variable (TENURE) support the audit firm replacement observations from [Table 1](#) and earlier findings ([Buthelezi, 2019](#); [Wesson,](#)

2021) on the increased audit firm rotations conducted in anticipation of the MAFR regime. The mean TENURE variable (which represents short tenure, based on a binary variable for tenures from one to three years) reflects that about 28% of companies had a short tenure over the target period of this study. Based on only the 2020 data of the present study, about 39% of companies had a short tenure in 2020 compared to the 24% reported by Wesson (2021) at the end of 2018. The audit firm rotations that took place in anticipation of MAFR increased audit market concentration on average, as reflected by the mean BIG4 variable of about 69% over the target period compared to 66% for 2015 reported by Wesson (2021). However, based on the Big 4 audit firm concentration trends reported in Table 1, increasing levels of Big 4 audit firm concentration were evident in the 2015–2017 period – with Big 4 audit firm concentration stabilising at slightly lower levels in 2019 and 2020.

### 5.2 The effect of the COVID-19 financial reporting extension on audit report lag

Descriptive statistics of the sample data prior to applying the Box-Cox transformation are presented in Table 3. A total of 303 companies had December 2019 to November 2020 years-ends, with companies eligible for the financial reporting extension totalling 72 with December 2019 years-ends (2019\_1) and 191 with 2020 years-ends (2020\_1), while 40 companies did not qualify for the extension (2020\_0). The mean audit report lag for the December 2019 companies (2019\_1) of 87 days was considerably shorter than the mean of 110 days for companies with 2020 financial year-ends that qualified for the financial reporting extension (2020\_1), whereas the companies that did not qualify for the extension (2020\_0) had a mean of 86 days. The mean audit report lag of companies with December 2019 years-ends (of 87 days) was below the three-month limit of the JSE listing requirements and therefore indicated that these companies generally did not use the extension of time granted. For companies that were not eligible for the COVID-19 financial reporting extension, the mean audit report lag (of 86 days) was also below the JSE listing requirement of three months. However, the mean audit report lag of companies with 2020 financial year-ends that were eligible for the financial reporting extension (of 110 days) indicated a general use of the extension which, on average, met the five-month extension deadline. The longer audit report lag created the expectation of an increase in audit fees (Hay *et al.*, 2008; Kanakriyah, 2020; Santhosh and Sankar Ganesh, 2020) for companies with 2020 years-ends that were granted an extension of time. The shorter audit report lag for companies with December 2019 years-ends indicated that they did not use the time extension as readily as companies with year-ends in 2020, possibly because their audits were near completion when the financial reporting extension was granted on 3 April 2020 (FSCA, 2020).

The ANOVA performed after the Box-Cox transformation had a  $p$ -value of less than 0.01, indicating the significance of the analysis. A Fischer least significant difference (LSD) test confirmed that, at 0.95 confidence intervals, based on differences in mean audit report lag, there was no significant difference between the companies with December 2019 years-ends (2019\_1) and those not eligible for the financial reporting extension (2020\_0). There was,

**Table 3.** Descriptive statistics for audit report lag during COVID-19, before applying the Box-Cox transformation

	Level of factor	Number of companies	Audit lag mean	Standard deviation
Total		303	101.17	54.50
Year COVID-19 extension	2019_1	72	87.08	39.25
Year COVID-19 extension	2020_0	40	86.33	46.19
Year COVID-19 extension	2020_1	191	109.58	59.29

**Source(s):** Authors' own creation

however, a significant difference in the 2020 COVID-19 year between companies eligible for the financial reporting extension (2020\_1) and those not eligible for the extension (2020\_0).

5.3 Determinants of audit fee pricing

The panel regression (Table 4) found that audit firm tenure (TENURE) was not significantly associated with audit fees. In respect of the control variables, the ASSETS, INVREC and BIG4 variables were positively and significantly associated with current audit fees (CYFEE). The LAG, BUSY and ROA variables were not statistically significant.

The regression coefficients represented by the estimates in the panel regressions were measured in different measurement units. After converting the estimates to standardised coefficients that were unitless, thus allowing for the comparison of variables (Siegel, 2016), the ASSETS were the determinant with the largest effect (with a standardised coefficient of 0.727) on audit fees (Table 4).

As anticipated and confirmed by prior studies (Hay et al., 2008; Simunic, 1980), audit fees increased when the size of the client increased and size was the most significant driver in determining audit fees charged. Furthermore, the results pertaining to the INVREC variable supported the expectation that an increase in inherent client risk increases audit efforts, leading to higher audit fees (Hay et al., 2008; Widmann et al., 2021). Results also showed that when clients used the services of a Big 4 audit firm, higher audit fees were charged. An audit fee premium charged by these dominant audit firms therefore exists in the South African context and supports earlier findings of Firer and Swartz (2006) and Muniandy (2022).

The non-significance of the audit firm tenure variable does not support Hypothesis 1. Audit firm rotations in a MAFR regime do not increase audit fees for South Africa: a developing country with a developed audit market landscape. The results may indicate that the regulatory strength of the South African audit profession has reduced the agency cost associated with a MAFR regime (Kamarudin et al., 2022). Another explanation may be that audit committees did not allow a recoupment of MAFR-related costs in the form of increased audit fees, which negatively affects the profitability of audit firms – and may ultimately compromise sustainability and audit quality in the South African audit market (Harber and Maroun, 2020; Harber and Marx, 2019; Harber et al., 2020).

5.4 The effect of the COVID-19 financial reporting extension on audit fees

The results of the ANOVA evaluation of the impact of COVID-19 financial reporting extension on audit fees are presented in Table 5 and only cover the 2020 COVID-19 year.

Table 4. Regression results for the total period (2015–2020)

Variables	Standardised coefficient	Estimate	Standard error	t-value	p-value	VIF <sup>1</sup>
TENURE	0.004	0.000	0.001	0.221	0.83	1.1
ASSETS	0.722	0.517	0.072	7.201	0.00 ***	1.4
INVREC	0.106	0.003	0.001	2.888	0.00 ***	1.1
LAG	0.027	0.109	0.066	1.650	0.10	1.2
BUSY	-0.014	-0.019	0.053	-0.367	0.71	1.0
ROA	-0.003	-0.000	0.001	-0.286	0.77	1.0
BIG4	0.044	0.071	0.037	1.923	0.05 **	1.3

**Note(s):** \*\*\*, \*\* Indicate significance at the 1 and 5% level, respectively, <sup>1</sup>VIF stands for variance inflation factor.

**Source(s):** Authors' own creation

**Table 5.** Regression results for the 2020 COVID-19 year

N companies = 248	Single effect of COVID-19 extension $R^2 = 0.77$				Moderating effect of COVID 19 extension $R^2 = 0.78$			
	Estimate	Standard error	t-value	p-value	Estimate	Standard error	t-value	p-value
Intercept	-2.106	0.393	-5.36	<0.01 ***	-2.306	0.448	-5.15	<0.01 ***
TENURE	-0.002	0.023	0.10	0.92	-0.010	0.024	0.40	0.69
COVID19	-0.043	0.023	1.88	0.06	0.327	0.448	-0.73	0.47
ASSETS	0.617	0.027	23.05	<0.01 ***	0.628	0.027	23.05	<0.01 ***
INVREC	0.005	0.001	5.79	<0.01 ***	0.005	0.001	5.59	<0.01 ***
LAG	0.797	0.154	5.16	<0.01 ***	0.865	0.181	4.77	<0.01 ***
BUSY	0.026	0.022	-1.15	0.25	0.010	0.023	-0.44	0.66
ROA	-0.000	0.001	-0.12	0.91	0.000	0.002	0.23	0.82
BIG4	0.079	0.030	-2.64	0.01**	0.088	0.032	-2.72	0.01**
COVID19*TENURE					-0.006	0.024	-0.26	0.79
COVID19*ASSETS					-0.032	0.027	1.17	0.24
COVID19*INVREC					0.001	0.001	-1.43	0.15
COVID19*LAG					-0.100	0.181	0.55	0.58
COVID19*BUSY					0.059	0.023	2.52	0.01**
COVID19*ROA					-0.002	0.002	1.01	0.31
COVID19*BIG4					0.011	0.032	0.35	0.72

**Note(s):** \*\*\*, \*\* Indicate significance at the 1 and 5% level, respectively

**Source(s):** Authors' own creation

Table 5 reports both the results with the single effect of the COVID-19 financial reporting extension variable as an additional audit fee determinant (Equation 2) and the moderating effect of the COVID-19 financial reporting extension variable on each of the audit fee determinants (Equation 3).

In respect of the single effect of the COVID-19 extensions granted, the results show that companies that qualified for the financial reporting extension (the COVID19 variable) did not exhibit a significant change in audit fees when compared to companies not eligible for the extension (Table 5). Furthermore, the direction (i.e. negative) of the reported relationship – albeit only at the 10% level of significance – was unexpected: Notwithstanding the significantly longer period required to complete the audits of companies that qualified for the financial reporting extension (2020\_1 in Table 3), these companies exhibited lower audit fees when compared to companies not eligible for the extension. Hypothesis 2 was therefore not supported.

In respect of control variables, similar results to those reported for the total study period (Table 4) on audit fee determinants were reported for the 2020 COVID-19 year (Table 5), except for the LAG variable that is now significant at the 1% level of significance. This result is in line with evidence from Malaysia (Bajary *et al.*, 2023) and Ghana (Musah *et al.*, 2023) confirming that client complexity, as portrayed by the LAG variable, was associated with higher audit fees during the 2020 COVID-19 year.

In an effort to gain a better understanding of the effect of the COVID-19 financial reporting extensions on the setting of audit fees during the 2020 COVID-19 year, Table 5 also displays the moderating effect of the COVID-19 financial reporting extension variable. Contrary to expectation, the COVID-19 financial reporting extension variable did not have a significant moderating effect on the relationship between variables associated with inherent risk (INVREC and ROA) and audit fees. Although the COVID-19 pandemic severely impeded the liquidity and profitability of companies (Muthu and Wesson, 2023; Shen *et al.*, 2020), the reported results may indicate that the perceived increase in agency costs associated with the

COVID-19 pandemic did not translate into increased audit fees during the 2020 COVID-19 year owing to the regulatory strength of the South African audit profession (Hassan and Zhang, 2022; Hay *et al.*, 2021; Kamarudin *et al.*, 2022). Hypothesis 3 was therefore not supported.

### 5.5 Additional analyses

Additional analyses were performed to confirm the reported results.

In line with global literature (Hay, 2013; Widmann *et al.*, 2021), the binary TENURE variable in Equation 1 was replaced by the logarithm of the number of years ( $\log(\text{tenure})$ ) in all analyses. The results confirmed that the TENURE variable is not statistically significant over the total period, as well as during the 2020 COVID-19 year. Furthermore, the TENURE variable in Equation 1 was replaced by a binary variable representing the replacement of the audit firm, and the interaction of replacement with BIG4 was added, to assess whether lowballing was evident in the first year of the new audit engagement – as was observed by Cameran *et al.* (2015) and Corbella *et al.* (2015) in the Italian audit market in respect of Big 4 audit firms. The results confirmed that audit firm replacements (and its interaction with the BIG 4 variable) did not significantly affect audit fees. Additional analyses support the main results (as reported in Table 4) on the effect of MAFR on audit fees – namely, that the MAFR regime did not have a significant effect on audit fees. Results on additional analyses are not reported for the sake of brevity, and are available on request.

Finally, a mixed model ANOVA (with company as the random effect, and the year and the year-end related to COVID-19 extension variable as fixed effects) with an AR(1) correlation structure was applied for the entire 2015–2020 period to confirm the reported results in respect of the COVID-19 financial reporting extension in the 2020 COVID-19 year. Separate analyses were again performed for TENURE measured as a categorical variable (i.e. a binary variable for short tenure) and as a continuous variable (i.e. the logarithm of the number of years), and different interaction variables – up to four-level interactions – were added. The variable of interest was the variable termed “year-end (related to COVID 19 extension)”, which resembles financial year-ends to which the COVID-19 financial reporting extension applied (i.e. the months January to July). The ANOVA table and supporting graphs based on the categorical tenure variable are reported in Appendix 2 Table A2, Figures A1 and A2. The analyses based on  $\log(\text{tenure})$  produced similar results.

The ANOVA table (Appendix 2 Table A2) and the supporting ANOVA graph (Appendix 2 Figure A1) show that there was a significant difference across years in respect of the year-end (related to COVID 19 extension) variable ( $p = 0.02$ ) and that, for each year during the target period, the mean audit fees for companies with financial year-ends that resemble the COVID-19 reporting extension months was lower than the mean audit fees for companies with financial year-ends that do not resemble the COVID-19 reporting extension months. Furthermore, the Fisher LSD test (reflected in the superscript letters in Appendix 2 Figure A1) elucidate that there was a change in audit fee behaviour as from 2019: in both 2019 and 2020 there was a significant difference in mean audit fees in respect of the two categories of companies (i.e. those with financial year-ends that resemble the COVID-19 reporting extension months and those that do not), but there was no significant difference in mean audit fees when comparing 2019 and 2020 for each of the two categories of companies. The change in audit fee behaviour as from 2019 – the year in which the highest number of audit firm replacements occurred and in which non-Big 4 audit firm concentration showed a slight increase (Table 1) – may have been influenced by the audit fees charged by non-Big 4 audit firms (Appendix 2 Figure A2). The results of the mixed model ANOVA (Appendix 2 Table A2, Figures A1 and A2) therefore support the reported results in respect of the 2020 COVID-19 year (as reported in Table 5) – namely, that the COVID-19 financial reporting extension did not have a significant effect on audit fees.

## 6. Conclusion

The audit market is continually subjected to changes in legislation to ensure that the quality of audit services is maintained and enhanced (Widmann *et al.*, 2021). This study reports on determinants of audit fees for JSE-listed companies in a defined period (2015–2020) marked by increased audit firm replacements following the promulgation of the MAFR regime and included the 2020 year of the COVID-19 pandemic during which JSE-listed companies with financial year-ends from December 2019 to July 2020 were granted a two-month extension for submitting their financial statements.

The study attempted to contribute to audit pricing literature in respect of two regulatory aspects pertaining to audit engagements, namely whether audit firm rotations under a mandatory auditor firm rotation (MAFR) regime affect audit fees and how the financial reporting extension granted during COVID-19 affected audit fees and their determinants. Furthermore, the study was conducted in the singular institutional setting, namely South Africa. While the country is classified as a developing country and an emerging economy, the audit landscape of the country is characterised by strong regulatory oversight, high financial reporting strength and high audit market concentration by Big 4 audit firms. It is therefore comparable to the auditing landscape of developed countries.

The study found that audit fees showed a significant positive relationship with the auditor–client attributes of client size, client complexity, inherent risk and Big 4 auditor presence. In line with global evidence, client size (measured by total assets) was the most dominant determinant of audit fees. Furthermore, audit firm rotations in a MAFR regime were found not to be a significant determinant of audit fee pricing and may indicate that the regulatory strength of the South African audit profession reduces the agency costs associated with a MAFR regime. An additional explanation may be that any warranted increase in auditing fees associated with a MAFR regime is simply absorbed by audit firms.

In the 2020 COVID-19 year, most companies eligible for the financial reporting extension elected to make use of the extra time, but – contrary to expectation – the audit fees paid by companies eligible for the extension were not significantly higher than the audit fees paid by those not eligible for the extension.

The practical implications of the results suggest that the concerns relating to a significant increase in audit fees under the new MAFR regime in South Africa (Harber and Maroun, 2020; Harber and Marx, 2019; Harber *et al.*, 2020; Wesson, 2021) may be unfounded. Furthermore, regulatory interventions to lessen the time pressure on audits during financial crises allow clients and auditors to complete the audits within the extended period without a significant effect on audit fees. The results may enhance public trust in the South African audit profession by affirming its globally recognised regulatory strength and ability to respond to a global pandemic. However, an unintended consequence of regulatory intervention may be the impairment of audit quality and an increased risk of audit firm failure owing to higher costs (due to increased audit effort in a MAFR regime) having to be absorbed (Harber and Maroun, 2020; Harber and Marx, 2019; Harber *et al.*, 2020).

Although the results of this study cannot necessarily be generalised to countries with different institutional and economic settings, regulators and participants in the audit market of other developing and developed countries may obtain insights into how the institutional setting and audit market landscape of a country affects the determination of audit fees – especially in a time of MAFR and global pandemic.

It is acknowledged that the study has limitations. Although control variables based on prior literature were applied, there may still be an endogeneity concern from correlated omitted variables. Control variables that could be incorporated in future studies include the role of the audit committee and audit partner rotation in strengthening auditor independence, as well as the effect of non-audit services on audit fees. It is, however, recommended that South African regulators reinstate the mandatory disclosure of audit fees and the separate disclosure of non-audit services to allow for transparency on audit fees for all stakeholders. This will also serve to support future research on audit fee pricing.

Furthermore, research based on the collection of primary data from audit market participants is recommended to gain further insights into the reported results in respect of the rotations in the MAFR regime, and the 2020 COVID-19 year.

The study provided empirical evidence that rotations in a MAFR regime do not increase audit fees in South Africa. There is, however, inconclusive evidence on whether MAFR will enhance audit quality in South Africa (Ndaba *et al.*, 2021). This study calls for further research on the effect of MAFR on audit fees and audit quality in the South African audit landscape. Future research should be conducted over an extended period to assess whether MAFR is an appropriate regulation [1] for South Africa – especially in view of the slow economic growth of the country and the regulatory strength of its audit profession. Previous experiences are often disregarded when new regulations are implemented (Agana *et al.*, 2023). The recent introduction of MAFR in the European Union also calls for researchers to share the European experience to guide future decisions on MAFR for developing and developed countries. Furthermore, as the full economic effect of COVID-19 may only become evident after many years, more research is required to understand the full impact of COVID-19 on audit fees.

**Appendix 1**

**Table A1.** Descriptive statistics on variables applied

Variable	N	Mean	Median	Minimum	Maximum	Standard deviation
Current year audit fees (CYFEE)	1714	22387.561	4828.282	42.115	435000.000	52611.844
Audit firm tenure (TENURE)	1993	00.282	0.000	0.000	1.000	0.450
COVID-19 extension (COVID19)	299	00.639	1.000	0.000	1.000	0.481
Total assets (ASSETS)	1996	85051967.484	5403662.073	1.000	3538062709.200	334130988.026
Ratio of inventory and receivables to total assets (INVREC)	1996	26.184	21.044	0.000	99.805	23.049
Audit report lag (LAG)	1992	91.924	80.000	23.000	1114.000	66.244
Busy season (BUSY)	1996	00.508	1.000	0.000	1.000	0.500
Return on assets (ROA)	1996	-9.691	5.729	-11531.486	81.641	302.945
The presence of a dominant audit firm (BIG4)	1995	00.685	1.000	0.000	1.000	0.465

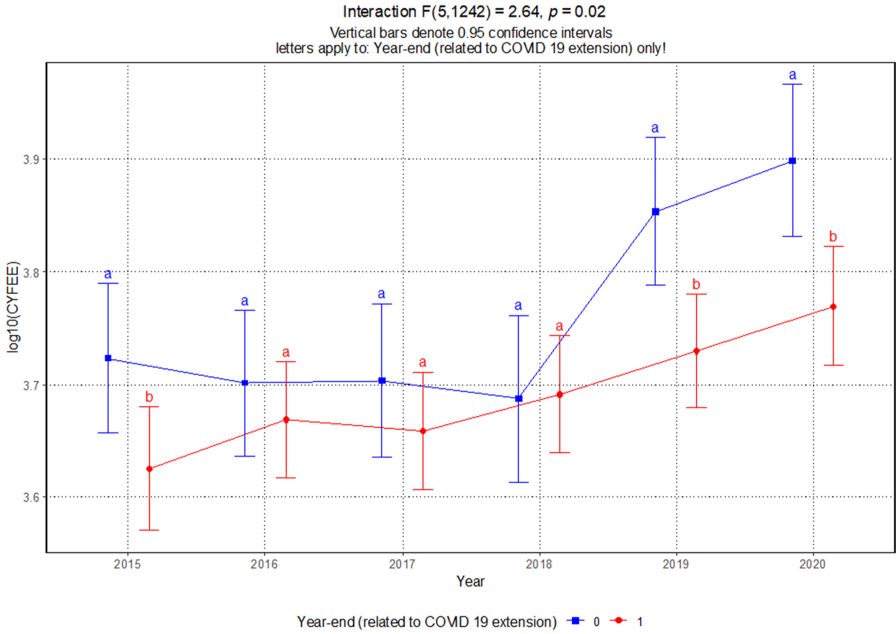
**Source(s):** Authors' own creation

**Table A2.** ANOVA table, comparing mean audit fees across different years (2015–2020)

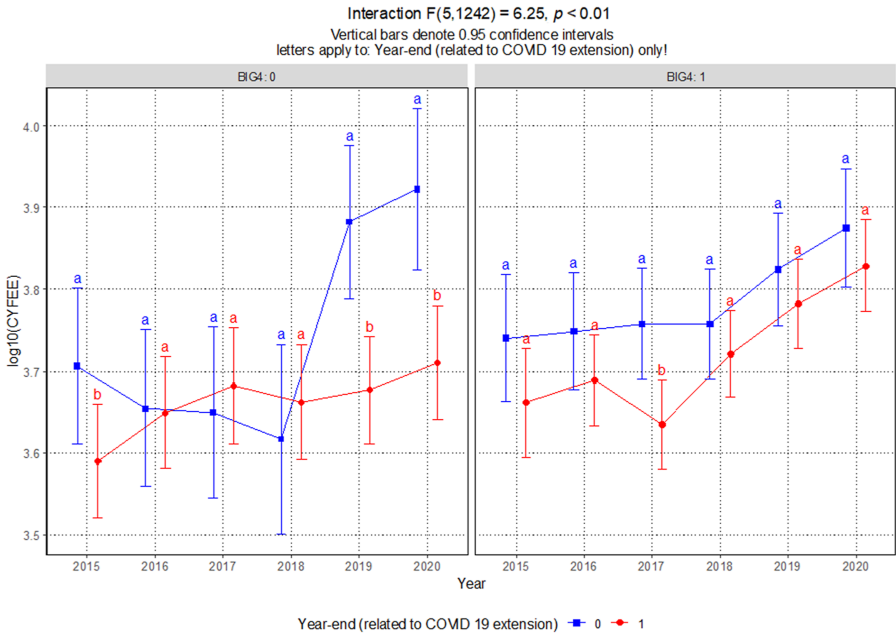
N companies = 269	F-value	p-value
(Intercept)	F(1,1242) = 40128.00	<0.01 ***
TENURE	F(1,1242) = 6.84	0.01 **
ASSETS	F(1,1242) = 1421.32	<0.01 ***
INVREC	F(1,1242) = 6.52	0.01 **
LAG	F(1,1242) = 26.03	0.00 ***
BUSY	F(1,1242) = 3.83	0.05 **
ROA	F(1,1242) = 0.40	0.53
BIG4	F(1,1242) = 3.78	0.05 **
Year-end (related to COVID 19 extension)	F(1,1242) = 2.91	0.09
Year	F(5,1242) = 21.58	<0.01 ***
Year*BUSY	F(5,1242) = 1.65	0.14
Year*BIG4	F(5,1242) = 1.16	0.33
Year*Year-end (related to COVID 19 extension)	F(5,1242) = 2.64	0.02 **
Year*TENURE	F(5,1242) = 3.21	0.01 **
BUSY*BIG4	F(1,1242) = 11.31	0.00 ***
BUSY*Year-end (related to COVID 19 extension)	F(1,1242) = 2.75	0.10
BUSY*TENURE	F(1,1242) = 1.93	0.17
BIG4*Year-end (related to COVID 19 extension)	F(1,1242) = 0.28	0.60
BIG4*TENURE cat	F(1,1242) = 1.12	0.29
Year-end (related to COVID 19 extension)*TENURE	F(1,1242) = 0.43	0.51
Year*BUSY*BIG4	F(5,1242) = 1.78	0.11
Year*BUSY*Year-end (related to COVID 19 extension)	F(5,1242) = 1.70	0.13
Year*BUSY*TENURE	F(5,1242) = 1.27	0.28
Year*BIG4*Year-end (related to COVID 19 extension)	F(5,1242) = 6.25	0.00 ***
Year*BIG4*TENURE	F(5,1242) = 2.41	0.04 **
Year*Year-end (related to COVID 19 extension)*TENURE	F(5,1242) = 3.30	0.01 **
BUSY*BIG4*Year-end (related to COVID 19 extension)	F(1,1242) = 1.78	0.18
BUSY*BIG4*TENURE	F(1,1242) = 1.29	0.26
BUSY*Year-end (related to COVID 19 extension)*TENURE	F(1,1242) = 1.95	0.16
BIG4*Year-end (related to COVID 19 extension)*TENURE	F(1,1242) = 11.64	0.00 ***
Year*BUSY*BIG4*Year-end (related to COVID 19 extension)	F(5,1242) = 2.10	0.06
Year*BUSY*BIG4*TENURE	F(5,1242) = 1.37	0.23
Year*BUSY*Year-end (related to COVID 19 extension)*TENURE	F(5,1242) = 2.91	0.01 **
Year*BIG4*Year-end (related to COVID 19 extension)*TENURE	F(5,1242) = 2.10	0.06
BUSY*BIG4*Year-end (related to COVID 19 extension)*TENURE	F(1,1242) = 2.45	0.12

**Note(s):** \*\*\*, \*\* Indicate significance at the 1 and 5% level, respectively

**Source(s):** Authors' own creation



**Figure A1.** ANOVA means graph for the interaction of year and financial year-ends that resemble the COVID-19 financial reporting extension (2015–2020). Source: Authors' own creation



**Figure A2.** ANOVA means graph for the interaction of year, Big 4 and financial year-ends that resemble the COVID-19 financial reporting extension (2015–2020). Source: Authors' own creation

**Note**

1. The Supreme Court of Appeal in South Africa set aside the MAFR ruling in South Africa on 31 May 2023 based on a technical issue. The IRBA, however, responded that they will still pursue MAFR and will work diligently with parliament and stakeholders to address the technical issue raised (IRBA, 2023).

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