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The effects of audit partners' busyness on audit report lag and audit report quality in Germany

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Master in Accounting and Management Control

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BUSINESS
SCHOOL

Department of Accounting

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Resumo

Este estudo pretende avaliar a influência que o grau de ocupação dos auditores responsáveis, exerce no período até à assinatura do relatório de auditoria e na qualidade da auditoria, em empresas cotadas na Alemanha, entre 2017 e 2023.

O estudo utiliza uma amostra final de 185 empresas e 1665 observações, com informação financeira e de auditoria obtida na base de dados Eikon e nos relatórios anuais. O grau de ocupação do auditor é medido pelo número de empresas clientes cotadas, presentes na sua carteira. O atraso do relatório de auditoria é calculado como o número de dias entre o encerramento do exercício financeiro da empresa cliente e a data de assinatura do relatório de auditoria, enquanto a qualidade da auditoria é avaliada através dos acréscimos discricionários, estimados com base no modelo de Jones modificado e ajustado por Kothari et al. (2005), e da manipulação de resultados, de acordo com os modelos de Roychowdhury (2006).

Através da aplicação de regressões OLS em painel, com efeitos fixos de indústria e ano, os resultados revelam uma associação positiva e significativa entre o grau de ocupação do auditor e o atraso do relatório de auditoria. Relativamente à qualidade da auditoria, os resultados mostram que auditores mais ocupados estão associados a níveis mais elevados de acréscimos discricionários, sugerindo uma redução na qualidade da auditoria, embora não surjam evidências consistentes quando consideradas as variáveis de manipulação de resultados. Não são encontradas evidências robustas relativamente ao efeito combinado do grau de ocupação do auditor e do atraso do relatório de auditoria, sobre a qualidade da auditoria.

Este estudo contribui para a literatura ao fornecer evidências a nível de parceiros de auditoria num contexto europeu, com implicações para a compreensão do volume de trabalho dos auditores e das suas consequências no reporte financeiro.

Palavras-chave: Grau de ocupação do auditor, atraso no relatório de auditoria, qualidade de auditoria

Classificação JEL: M41 M42

Abstract

This study investigates the influence of audit partner busyness on audit report lag and audit quality, in German listed companies, from 2017 to 2023.

The study utilizes a panel dataset comprising a final sample of 185 firms and 1665 observations, with financial and audit-related information sourced from the Eikon database and annual reports. Audit partner busyness is measured as the number of publicly listed clients in a partner's portfolio. Audit report lag is calculated as the number of days between the fiscal year-end and the date of the audit report signature, while audit quality is proxied through discretionary accruals, estimated using the modified Jones model adjusted by Kothari et al. (2005), and real earnings management, based on the models of Roychowdhury (2006).

Using panel OLS regressions with industry and year fixed effects, the findings reveal a positive and significant association between audit partner busyness and audit report lag. For audit quality, results show that busier partners are associated with higher discretionary accruals, indicating reduced audit quality, while no consistent evidence emerges when considering real earnings management proxies. No robust evidence is found regarding the combined effect of busyness and audit report lag on audit quality.

This study extends the literature by providing some partner-level evidence from a European country context, with implications for understanding auditor workload and its consequences for financial reporting.

Key word: Audit partner busyness, audit quality, audit report lag

JEL classification: M41 M42

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1 Introduction

In businesses, audits play a crucial role, and the audit quality is essential for the business's prosperity. This way, audit quality is necessary to provide confidence to investors and creditors, which leads to a better economic environment. However, corporate collapses have damaged the credibility of auditing, and this has led to a growing dissatisfaction among the users of financial reporting information (Kilgore et al., 2011).

Thus, it is essential to have a better understanding of the factors that affect audit quality and what can be done to preserve and improve it. One factor that is being a focus of discussion is auditor busyness, and whether it has an impact on audit quality. Across the globe, regulators have grown concerns regarding auditors' workloads and how they affect their ability to perform their activities (Cunningham et al., 2019; DeFond & Zhang, 2014; Public Company Accounting Oversight Board, 2024; Singh et al., 2022). With legislation mandating the identification of the auditor responsible for the engagement, it becomes possible to analyse whether a partner's busyness has an impact on the quality of the audit engagement, in terms of financial reporting quality, or in terms of the timeliness of releasing financial information.

Throughout the decades, regulators, like the Financial Accounting Standards Board (FASB), the Securities Exchange Commission (SEC), and the International Accounting Standards Board (IASB), have emphasized the importance of the timeliness of financial reporting in terms of the usefulness of the presented information for economic agents. Without prompt information, economic agents have less up-to-date knowledge, which is a key factor in their decision-making. Audit report lag is seen by Clatworthy and Peel (2016), as the most impactful factor on financial reporting timeliness. Previous studies have scarcely delved into the relationship between audit partner busyness, typically measured by the number of audit assignments per partner, and audit report lag. The conclusions retracted from these previous studies are aligned, being that it is found that busier audit partners exhibited higher levels of audit report lag(Hussin et al., 2018; Singh et al., 2022), which confirms the concerns of regulators.

To evaluate audit quality, authors often resort to the use of proxies, such as discretionary accruals (Jones, 1991) and real earnings management (Roychowdhury, 2006), as these models enable the analysis of possible accounting and activities manipulation by the audited firms. If high values for each model are detected, it is considered that there was lower audit quality during the engagement process, as it was unable to detect these practices. As for the impact of

a higher number of clients on each audit partner's quality of audit engagement, previous results do not exhibit a consensus. Some results provide evidence that supports regulators' concerns about auditor workload and its negative impact on audit quality (Gul et al., 2017; Lai et al., 2018; Singh et al., 2022; Sundgren & Svanström, 2014), other studies do not reach the same conclusions, this is, not finding evidence that busier auditors produce lower quality reporting (Burke et al., 2019; Goodwin & Wu, 2016).

In this study, it is intended to add evidence about audit partner busyness and its possible consequences, regarding reporting timeliness and quality, due to the scarce and contradicting results, respectively, of previous research, an increased concern of regulators around auditors' workload, and a growing dissatisfaction from financial information users, since Singh et al. (2022) developed their research on this topic in Australia, it would be essential to avoid any country from the Anglosphere, since research has found that common law countries have better protection for both shareholders and creditors (La Porta et al., 1997) and the common law legal system is perceived as a critical determinant of high-quality financial statements and audit quality (Persakis & Iatridis, 2016). With this, the selected geography for this study is Germany, to avoid any Anglosphere bias and due to the possible dimension of the sample, given the number of listed companies on the stock exchange market. The period of analysis is between 2017 and 2023, due to the regulatory changes that occurred in 2016, also applied in Germany, that mandate the disclosures of new elements on the audit report[1]. This way, the initial sample of the study consists of 506 companies, listed on the Frankfurt Stock Exchange.

According to the report of the European Commission on developments in the European Union (EU), the number of statutory auditors declined by 6% between 2018 and 2021. Specifically, there were fewer than 11% of audit firms, and within those, the number of audit firms auditing public-interest entities, which includes all listed companies, declined by 8%. Also, there is evidence that suggests that auditors play a more critical governance function in a weak legal protection country (countries outside of the Anglosphere), making a bigger contribution to get better financial reporting quality (Choi & Wong, 2007), so it is essential to understand if financial reporting quality is maintained in Germany.

Given these statistics in Europe, the necessity of maintaining confidence in the audit report work (Kilgore et al., 2011) a growing discussion around auditor's busyness and its potential

[1] The main changes on the audit report were the inclusion of key audit matters for listed companies, beyond prominent placement of the auditor's opinion and other entity-specific information, reporting on going concern and reporting on other information.

impacts, as well as scarce and conflicting results regarding its effects on reporting timeliness and quality, respectively (Singh et al., 2022).With increased concerns from regulators regarding auditors' workload and dissatisfaction from financial information users, it is essential to address questions on this topic and expand the existing literature. This study aims to answer whether audit partner busyness has an impact on reporting timeliness, audit quality, and whether both reporting timeliness and audit partner busyness influence reporting quality. Regarding the development of literature, this study aims to provide additional insights into how auditors' busyness and audit report lag impact financial reporting.

To address the research questions, this dissertation employs a quantitative methodology based on a panel dataset of German listed companies, covering the period from 2017 to 2023. Financial and audit-related data are collected from a database and company annual reports.

Audit partner busyness is measured as the number of publicly listed clients in each partner's portfolio. Audit report lag is calculated as the number of days between the firm's fiscal year-end and the signing date of the audit report. Audit quality is proxied through discretionary accruals, estimated using the modified Jones (1991) model adjusted by Kothari et al. (2005), and real earnings management, based on Roychowdhury (2006) model.

The empirical analysis provides evidence of a positive association between audit partner busyness and audit report lag, suggesting that busier auditors take longer to sign audit reports. Regarding audit quality, the results indicate that busier audit partners are associated with higher discretionary accruals, indicating reduced audit quality. However, no consistent evidence is obtained when using real earnings management proxies. Finally, the study does not find robust support for the combined effect of busyness and audit report lag on audit quality.

This dissertation contributes to auditing literature in three ways. First, it provides partner-level evidence from a European civil law setting, expanding research that has primarily focused on common law countries. Second, it sheds light on the relationship between audit partner workload and audit reporting timeliness. Thirdly, it increases the literature on the effects of audit partner busyness on audit quality, in a different setting from previous studies and after the introduction of new regulation around the mandatory disclosures on the audit reports.

The remain of this study is organised as follows. Section 2 discusses the literature review and the formulation of the hypotheses. Section 3 describes the process of sample selection and procedures undertaken in the study. Section 4 presents the obtained results and the conclusions drawn. Section 6 concludes the study, with the final remarks.

2 Literature review and development of hypotheses

2.1 Audit partner busyness

Before the implementation of legislation, in many countries, that mandates auditors' names to be disclosed in the audit reports of public-interest companies, the research on audit quality at partner-level was scarce, with most investigations being done at audit-firm level (Gul et al., 2017; Singh et al., 2022). Authors advocated for increased investigation at a partner-level, when legislation would enforce and allow the audit partner identification (Defond & Francis, 2005; Garcia-Blandon & Argiles-Bosch, 2018).

Regulators have highlighted the need for an increase in transparency and the possible consequences that heavy workloads may have on the audit process (Cunningham et al., 2019; Public Company Accounting Oversight Board, 2024), with this being one of the reasons for the implementation of the auditor's tenure limit per client (DeFond & Zhang, 2014). For the past decade, audit partner busyness (APB) has been gradually coming under scope of researchers, with most hypothesizing a negative consequence, on the audit process (Singh et al., 2022). This is the case, since it is assumed that managing multiple audit clients divides the auditor's focus and effort, reducing their ability to concentrate and perform a competent audit process, for each client engagement (Shang et al., 2022).

When studying the effects of busyness, on the audit process, it is more adequate for it to be done at a partner level, instead of firm, or office level, since the audit partners hold the highest accountability for each audit engagement, which enables the capability to better understand its real consequences (Lai et al., 2018; Reynold & Francis, 2000). With the implemented regulation, mandating the identification of the responsible audit partner, investigation around auditor's busyness shifted to an analysis at partner level (Singh et al., 2022).

Audit partner's busyness has been measured through various proxies, being the most common one, audit engagements (Burke et al., 2019; Goodwin & Wu, 2016; Gul et al., 2017; Heo et al., 2021; Hussin et al., 2018; Singh et al., 2022; Sundgren & Svanström, 2014). A lot of these studies evaluated whether APB has an impact on audit quality. As for the correlation between APB and audit report lag, the research has been scarce on the topic (Singh et al., 2022).

2.2 Audit report lag

Audit report lag (ARL) is commonly defined as "the length of time from a company's fiscal year-end to the date of the auditor's report" (Ashton et al., 1987).

Various authors and entities considered ARL as one of the most determining factors for financial reporting timeliness (Abbott et al., 2012; Chan et al., 2016; Clatworthy & Peel, 2016; International Accounting Standards Board, 2010). This is the case, since most securities regulators do not allow financial statements to be issued before the completion of the audit process (Bronson et al., 2011; Krishnan & Yang, 2009). A possible delay is a matter of importance for companies, because when a delay occurs in the release of the financial statements, previous studies found an adverse market reaction, meaning that it discounts a positive variation on the presented results, or it takes a negative variation of the results, in a worse way (Abbott et al., 2012; Ashton et al., 1987; Asthana, 2014; Bronson et al., 2011; Kalelkar & Xu, 2023; Krishnan & Yang, 2009).

Abernathy et al. (2017) argue that a better understanding of what determinants lead to ARL can enhance new practices or changes in audit processes to make them more efficient. Prior research typically separates the factors that influence ARL into two categories: client firm factors and audit firm factors (Abernathy et al., 2017).

A client firm in the industrial sector experiences longer audit delays than a firm in the financial sector (Ashton et al., 1987; Bonsón-Ponte et al., 2008). The size of a company, measured through total assets, or revenue, or yearly capitalization, is negatively associated with audit delay, meaning that the larger companies have their reports signed in a shorter period, which suggests that these companies have access to more resources and have put in place better control systems, resulting in a quicker and smoother audit process. (Ashton et al., 1987; Bonsón-Ponte et al., 2008; Givoly & Dan, 1982; Owusu-Ansah, 2000). The findings of Abbott et al. (2012) also support this, as companies with internal audit assistance experience lower delays in their audit reports, which corroborates the association between higher company resources and shorter ARLs. Reported company losses have been documented, as well as a positive influencing factor of ARL (Ashton et al., 1989; Haw et al., 2003; Owusu-Ansah, 2000; Simnett et al., 1995). Authors also argue that auditors are more cautious when auditing companies with higher levels of leverage, which contributes positively to ARL (Ashton et al., 1989; Chan et al., 2016; Simnett et al., 1995). Higher complexity of operations is another determinant and positive contributor for ARL, with studies measuring complexity as total

current revenues, presence of extraordinary items and contingencies in the financial statements (Ashton et al., 1987; Chan et al., 2016; Givoly & Dan, 1982; Simnett et al., 1995). As for multinational companies, that can be seen as having higher business complexity, their audit reports did not exhibit a higher or lower lag than domestic companies (Lee et al., 2008). Sultana et al. (2015) also find that audit committee financial expertise, experience, and independence are negatively connected with ARL, while they did not find any evidence that points towards an association between audit committee meetings and ARL.

Regarding audit partner tenure, some studies do not find any relation with ARL (Ashton et al., 1987; Hussin et al., 2018), while Sharma et al. (2017), find, for United States of America (USA) companies, a higher ARL following a mandatory audit partner rotation. On the other hand, Dao and Pham (2014) and Lee et al. (2009) obtain results that indicate that auditor tenure is negatively associated with ARL. In China, it was found that auditor expertise can have an adverse effect on ARL (Ashton et al., 1989; Chan et al., 2016). Increased experience in a particular industry, acquired by an auditor, has also been studied as a factor, where evidence shows a negative relation with ARL (Dao & Pham, 2014; Habib & Bhuiyan, 2011). When comparing ARL between Big-4 and non-Big-4 audit firms, the first exhibit a shorter value, then their counterpart (Hussin et al., 2018; Sharma et al., 2017). Hussin et al. (2018) also found that companies with a fiscal year-end on December 31st, during busy season, experience higher audit report delays.

Audit fees and their association with audit report delay have been the subject of study for many years, which has resulted in conflicting results, regarding a possible positive or negative relation between the variables (Abernathy et al., 2017). The auditor's opinion on the report has also been examined, and the results show an impact on audit report delay. Haw et al. (2003) obtained, because of their research, that going concern reports take longer to be signed and disclosed. Non-standard opinions also lead to higher ARL, in subsequent years, due to possible negotiations and disagreements between the audit partner and the company, which delay the overall process (Chan et al., 2016).

2.3 Audit partner busyness and audit report lag

Using Malaysian data, relative to public companies in the year of 2011, Hussin et al. (2018) find that busy auditors have higher levels of ARL.

As for the other developed study, which addresses the relation between APB and ARL, Singh et al. (2022) analysed data from the period of 2004 to 2015, of Australian public

companies. As they hypothesized, busier audit partners take longer to complete their audit processes, resulting in higher levels of ARL.

Following the research of Hussin et al. (2018) and Singh et al. (2022), in this study, it is hypothesised that, for German companies, busier audit partners have higher levels of ARL. Thus, the first hypothesis (H1) is as follows:

H1: Client firms audited by busy audit partners have greater audit report lags.

2.4 Audit quality

Throughout time, the audit industry and researchers have not been able to find a universal definition for audit quality and a proper way to measure it (Kilgore et al., 2011; Knechel & Vanstraelen, 2007). Nonetheless, one of the most recognized definitions of audit quality (Kilgore et al., 2011) is from DeAngelo (1981) who defined it as "the market-assessed joint probability that a given auditor will both (a) discover a breach in the client's accounting system, and (b) report the breach". Discretionary accruals are considered a metric to evaluate the actions deployed by management to manipulate revenues and expenses, both upward and downward subtly (DeAngelo, 1986).

As for possible measures of audit quality researchers have adopted many proxies (DeFond & Zhang, 2014), like discretionary accruals (Becker et al., 1998; Burke et al., 2019; Cunningham et al., 2019; Singh et al., 2022), which can be calculated using various models, such as: the Jones Model (Jones, 1991); the modified Jones Model (Dechow et al., 1995); the Dechow-Dichev Model (Dechow & Dichev, 2002), or the discretionary accruals adjusted to performance model (Kothari et al., 2005). The evaluation of the real earnings management activities is also another proxy taken into consideration, to evaluate audit quality, where three metrics for activities manipulation are considered: the abnormal levels of cash flow from operations, discretionary expenses, and production costs (Cohen & Zarowin, 2010; Roychowdhury, 2006; Singh et al., 2022; Viana et al., 2023). Other audit quality measurements that are considered are the propensity of issuing a going concern opinion (Garcia-Blandon & Argiles-Bosch, 2018; Gul et al., 2017; Sundgren & Svanström, 2014), the incidence of misstatements (Cunningham et al., 2019), audit fees (Abbott et al., 2003; Lai et al., 2017), or classification shifting (Mcvay, 2006; Seve & Wilson, 2019; Singh et al., 2022). Important to note that previous literature has demonstrated the positive correlation between audit quality and earnings quality, which leads to some of the used proxies to measure the first, arise from

variables related to earnings management and financial reporting quality (Becker et al., 1998; DeFond & Zhang, 2014; Francis, 2004; Francis & Krishnan, 1999).

Many studies have examined the correlation between audit quality and audit related factors, client firm factors, or even legal environment factors, that may impair or enhance the quality of audit reports.

For client firm factors, size, measured through total assets, leverage, loss in net income, return on assets, price to book value, changes in net income and sales between periods, and total accruals (Becker et al., 1998; Chen et al., 2008; DeFond & Zhang, 2014; Garcia-Blandon et al., 2020; Goodwin & Wu, 2016; Kothari et al., 2005; López & Peters, 2012; Myers et al., 2003; Persakis & Iatridis, 2016; Singh et al., 2022), are used as control variables in previous studies, due to the known impacts they have on audit quality. These are the control variables considered when audit quality is being evaluated through output-based measures, such as discretionary accruals, due to the influence that a client firm's innate characteristics have on the outputs of the audit process, which makes it essential to be able to isolate the evaluation of audit quality (DeFond & Zhang, 2014). Abott et al. (2003) establish a relation between audit committee independence and financial expertise, with audit quality, through the amount of audit fees spent on external audits, suggesting that higher fees imply higher assurance and quality in the audit process.

Regarding audit related characteristics, one of the most evaluated factors is the dichotomy of Big-N audit firms and their counterparts (DeFond & Zhang, 2014). Most evidence suggests that Big-N audit firms provide higher audit quality, measured through the various, commonly used, proxies (Becker et al., 1998; DeAngelo, 1981; Francis, 2011; Francis & Krishnan, 1999; Iatridis & Dimitras, 2013; Lennox & Pittman, 2010; Zang, 2012).

Due to the long-standing debate surrounding auditor tenure, per client, and its implications, the literature is also extensive on the topic. Some studies have found evidence across many geographies that indicates that auditor tenure contributes positively to audit quality, due to the enhancement of the auditor's knowledge of the client (Cahan & Sun, 2015; Chen et al., 2008; Garcia-Blandon et al., 2020; Gul et al., 2017). Other studies have not found any positive or negative association between auditor tenure and audit quality (Knechel & Vanstraelen, 2007; Myers et al., 2003). In contrast, Carey and Simnett (2006) found that auditors with longer tenure have a lower propensity to issue going-concern opinions. Regarding this topic, regulators expressed concerns that long auditor tenure would lead to a loss of independence, resulting in

a decrease in audit quality (DeFond & Zhang, 2014). With this, legislation around the world has been approved to limit auditor tenure (Garcia-Blandon et al., 2020). In Europe, these limitations were introduced in June 2016 (European Parliament and the Council of the European Union, 2014), imposing, generally, a 10-year limit on audit partner tenure.

The possible improvements in audit quality that could arise from audit partner industry specialization have also been investigated, to some extent. Some studies found that industry specialization contributes positively to audit quality (Balsam et al., 2003; DeFond & Zhang, 2014; Francis, 2004; Solomon et al., 1999; Sun & Liu, 2013). Garcia-Blandon and Argiles-Bosch (2018), on the other hand, did not find any evidence in Spain of a significant impact of auditor industry specialization on audit quality.

Regarding audit quality during busy season, meaning audits of companies with a fiscal year-end on 31st December, it was found that the occurrence of higher discretionary accruals, or a higher number of misstatements, during this period (Heo et al., 2021; López & Peters, 2011, 2012).

Legal regimes of each country and the incentives they create also have an impact on audit quality (Francis, 2004). In previous research, evidence of higher audit quality was found in common law countries (e.g. United Kingdom, United States of America, Australia) (Goodwin & Wu, 2016; Persakis & Iatridis, 2016). This is the case since the legal systems of these countries provide higher protection for shareholders and creditors of organizations (La Porta et al., 1997), that enhances the ability to sue auditors for misconduct or negligence, which in turn leads to higher auditor conservatism (Francis, 2004).

2.5 Audit partner busyness and audit quality

With the implementation of the mandatory disclosure of audit partner signature, in many geographies, it became possible to understand how, or if, APB plays a role in audit quality (Defond & Francis, 2005; Garcia-Blandon & Argiles-Bosch, 2018; Singh et al., 2022).

Sundgren and Svanström (2014) found that, for Swedish private companies, busy auditors exhibit lower levels of audit quality when considering their propensity to issue going concern reports. Gul et al. (2017) obtained similar results for Chinese public companies during the period from 2000 to 2009, when evaluating audit quality like that of Sundgren and Svanström (2014). Using Malaysian companies' data, from the period between 2010 and 2013, and measuring audit quality through total accruals and discretionary accruals, Lai et al. (2018),

found that client firms of busier audit partners exhibit higher levels of total and discretionary accruals, which means lower audit quality. When examining the levels of discretionary accruals and misstatements in audits during the busy season, Heo et al. (2021) found a positive relationship between the two factors, arguing that workload imbalance leads to a reduced capability of auditors to complete their assignments with the necessary assurance and quality. Considering the data from 2004 to 2015, of public Australian Companies, Singh et al. (2022) obtained evidence that confirmed their hypothesis that busier audit partners have lower levels of audit quality in their reports.

On the contrary, Goodwin and Wu (2016), obtained from Australian companies' data, between 1999 and 2010, measuring audit quality through discretionary accruals and the propensity of going concern opinions, that only in a situation of disequilibrium, APB has an impact on audit quality, and arguing that there is no causal relation between the former and the latter. Consistent with their results and arguments, during a period of crisis, such as the 2008 financial crisis, higher APB led to a reduction in audit quality. The research of Burke et al. (2019), they did not find evidence that pointed to a relation between busyness and audit quality, through data of companies in the United States of America, between 2016 and 2017.

In this study, the correlation between APB and audit quality is also posited, being H2:

H2: Client firms audited by busier auditors have lower audit quality

2.6 Audit partner busyness, audit report lag, and audit quality

Previous studies have also examined the possible relationship between ARL and audit quality. Krishnan and Yang (2009) found no evidence that higher ARL led to any impacts on audit quality, when proxying for discretionary accruals, considering data of companies from many countries, between 2001 and 2006. Contrary to this, the more recent studies of Asthana (2014), considering data from companies, between 2000 and 2006, Blankley et al. (2014), with companies' data that ranged between 2004 and 2007 and Singh et al. (2022), considering data from the previously mentioned Australian setting, point towards the fact that a bigger ARL leads to higher levels of discretionary accruals and with this, lower audit quality.

Hereby, following the previous study of Singh et al. (2022) I hypothesize that the impact of APB on audit quality is mediated by the ARL, being that a higher level of the former leads to an increase in the latter. Due to the mixed results of previous research and given the fact that

the selected country had not been under scope for this topic previously, the third hypothesis is as follows:

H3: Client firms audited by busy audit partners, which exhibit higher delays on their audits, have lower audit quality

3 Methodology

This study follows a positivist perspective, in which empirical observation is used to draw conclusions about the studied population, within the context of the research objective, with this research design being a commonly adopted approach in the field of accounting and auditing (Watts & Zimmerman, 1986).

This quantitative research is supported by the collection of the firm's accounting information from the Eikon database, as well as audit and company reports. The obtained information is later submitted to statistical procedures and inference tools, with the purpose of obtaining impartial and reliable evaluations (Luoma & Hietanen, 2024) on the subject under scope, in this case, how auditors' busyness affects the timeliness of delivery of their reports and their quality.

Each of the following estimation models has been developed considering a panel-arranged database.

3.1 Sample

The initial sample comprises all publicly listed companies on the Frankfurt Stock Exchange between 2017 and 2023, totalling 506 companies and 3542 observations. All these companies are mandated to disclose their annual reports, financial statements, prepared under IAS, and the auditing reports on the companies.

Regarding the collection of data, it is primarily done through the Eikon database, apart from the auditor's names and the dates of signature on the audit reports, which are gathered through individual consultation of each year's audit report for the period under scope.

After this, the companies that are part of the sample, are classified according to the Standard Industrial Classification Codes (SIC codes), considering each firm sector of activity, from the following: agriculture, forestry and fishing (SIC 1); mining (SIC 2); construction (SIC 3); manufacturing (SIC 4); transportation, communications, electric, gas and sanitary services (SIC 5); wholesale trade and retail trade (SIC 6); finance, insurance and real estate (SIC 7); services (SIC 8).

Following previous literature, the firms of the finance, insurance and real estate sector (SIC 7) are removed from the sample (Fama & French, 1992; Singh et al., 2022; Viana et al., 2023), due to the differing business structure, accounting practices and the applied legislation to the sector, from the rest of the companies, of the previously mentioned sectors. After this,

companies with missing data regarding the variables considered in this study between 2015 and 2023 are also excluded from the sample. Additionally, if it is not possible to identify the date of signature of the audit report and the responsible auditor for each year between 2017 and 2023. In that case, the corresponding firms are also removed from the sample. Table 3.1 presents the exclusion process, indicating the number of firms and observations excluded after each criterion was applied. Table 3.2 demonstrates the final sample distribution across each SIC code.

Table 3.1 – Sample Selection

	No. of companies	Observations
Initial sample	506	3542
Excluded companies/observations		
Finance, insurance and real estate companies	112	784
Missing data	209	1463
Final sample	185	1295

Table 3.2 – Final sample distribution by SIC code

SIC code	Industry	No. of companies	Observations
1	Agriculture, forestry and fishing	0	0
2	Mining	1	7
3	Construction	2	14
4	Manufacturing	104	728
5	Transportation, communications, electric, gas and sanitary services	20	140
6	Wholesale trade and retail trade	10	70
8	Services	48	336
	Total	185	1295

3.2 Measurement of audit report lag

As adopted by previous studies, ARL is measured as the number of days from the financial year-end of the firm to the date of the signature of the audit report (Ashton et al., 1987; Blankley et al., 2014; Singh et al., 2022).

To obtain the value for this variable, each financial year-end report of each firm part of the final sample is analysed, where the date of signature of the audit report, as well as the financial year-end date of the audited firm, is attained.

3.3 Measurement of audit partner busyness

APB is measured as the number of listed clients audited by the responsible auditor in a single year, as in previous studies (Goodwin & Wu, 2016; Singh et al., 2022).

Contrary to previous studies, which also measured APB, in this case, there are instances where two auditors sign the audit report and neither of them is identified as the one responsible for the engagement. In these instances, I consider APB, for that firm in that year, as the average of each auditor's number of listed companies on their client portfolio. For the instances where two auditors sign the audit report, but there is an identified responsible auditor for the engagement, APB is measured only considering the number of firms in the responsible auditor's portfolio. Finally, in the situations where only one auditor signs the report, APB is measured considering the number of client firms in his client portfolio.

APBs for each firm, which is part of the final sample, are obtained, like ARLs, through the individual analysis of each annual report.

3.4 Measurement of audit report quality

To measure audit report quality, two approaches are considered in this research: discretionary accruals, based on the Jones (1991) model modified by Kothari et al. (2005) and the real earnings management approach, developed by Roychowdhury (2006).

3.4.1 Discretionary accruals

To obtain the values for discretionary accruals, it is considered equation 1:

$$\frac{TA_{it}}{A_{it-1}} = \alpha_0 + \beta_1 \frac{1}{A_{it-1}} + \beta_2 \frac{REV_{it}}{A_{it-1}} + \beta_3 \frac{PPE_{it}}{A_{it-1}} + \beta_4 ROA_{it} + \varepsilon_{it} \quad (1)$$

where, *TA* is the total accruals, for each firm i, in year t; *A* is the total assets, for each firm i during year t-1; *REV* is the amount of revenues recognised, for each firm i during year t; *PPE* is the gross amount of property plant and equipment, for each firm i during year t; *ROA* is the quotient between net income and assets, for each firm i during year t.

$$TA_{it} = \frac{\Delta CA_{it} - \Delta CASH_{it} - \Delta CL_{it} - \Delta STDEBT_{it} - DEP_{it}}{A_{it-1}} \quad (2)$$

where, for each firm i in year t, *TA* are the total accruals; *A* is the total assets, for each firm i during year t-1; Δ*CA* is the change in current assets, for each firm i from year t-1 to year t; Δ*CL* is the change in current liabilities, for each firm i from year t-1 to year t; Δ*CASH* is the change in total cash reserve, for each firm i from year t-1 to year t; Δ*STDEBT* is the change in short-term debt, for each firm i from year t-1 to year t; *DEP* is the amount of depreciation expenses, for each firm i during year t;

After each present variable is calculated, equation 1 is estimated, separately between each industry, considering year fixed effects, the absolute values of the residuals obtained from this estimation are the discretionary accruals (DA), for each firm i, during year t. In this model, as well as the following ones used to obtain the audit quality measurements, all variables are winsorized to the 5th and 95th percentiles to reduce the impact of outliers on the obtained residuals.

3.4.2 Real earnings management

Regarding real earnings management, two out of three methods developed by Roychowdhury (2006) to detect activities manipulation, are considered, more specifically, sales manipulation and expenditures manipulation. The overproduction method is not considered due to the presence of firms with reduced production levels in the sample.

The sales manipulation method is as follows:

$$\frac{CFO_{it}}{A_{it-1}} = \alpha_0 + \beta_1 \frac{1}{A_{it-1}} + \beta_2 \frac{SALES_{it}}{A_{it-1}} + \beta_3 \frac{\Delta SALES_{it}}{A_{it-1}} + \varepsilon_{it} \quad (3)$$

where, *CFO* is the cash flow from operations, for each firm i, during year t; *A* is the total assets, for each firm i during year t-1; *SALES* is the value of sales, for each firm i, during year t; Δ*SALES* is the change sales, for each firm i, from year t-1 to year t.

As for the expenditures manipulation method, it is as follows:

$$\frac{DISX_{it}}{A_{it-1}} = \alpha_0 + \beta_1 \frac{1}{A_{it-1}} + \beta_2 \frac{SALES_{it}}{A_{it-1}} + \varepsilon_{it} \quad (4)$$

where,

$$DISX_{it} = SG\&AEXP_{it} + R\&DEXP_{it} + ADVEXP_{it} \quad (5)$$

where, *DISX* is the discretionary expenses, for each firm, i during year t; *SG&AEXP* is the selling, general and administrative expenses, for each firm i, during year t; *R&DEXP* is the research and development expenses, for each firm i, during year t; *ADVEXP* is the advertising expenses, for each firm i, during year t;

As for Equation 4, all terms are as previously explained, with the corresponding signs.

After each variable is calculated, Equation 3 and Equation 4 are independently estimated, separately between each industry, with year fixed effects, to obtain the residuals of each model for all observations. Since a negative value of the residuals, obtained from Equation 3 and Equation 4, means lower audit quality (Roychowdhury, 2006), the results are multiplied by -1. This way, a positive value is to be interpreted as lower audit quality. Obtained results for the residuals and multiplied by -1, of Equation 3 and Equation 4 originate variables *REM1* and *REM2*, respectively. The average of both variables, *REM*, is also utilised to test the hypothesis.

3.5 Statistical tests and models

In this study, the results are presented considering a dataset with a panel arrangement. To test for each hypothesis, Ordinary Least Squares (OLS) regressions are executed, with year and industry fixed effects. All the variables used, whether dependent, independent, or for control purposes, in the following models, are explained in Table 3.3.

For hypothesis 1, the following model is considered:

$$\begin{aligned} \mathrm{ARL}_{it} = {} & \beta_0 + \beta_1 APB_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 GRSALES_{it} + \beta_5 GRNI_{it} + \\ & \beta_6 PBV_{it} + + \beta_7 ROA_{it} + \beta_8 LOSS_{it} + \beta_9 LAGTA_{it} + \beta_{10} BUSYSEASON_{it} + \\ & \beta_{11} BIG4_{it} + \beta_{12} QUICK_{it} + \beta_{13} CFOVOL_{it} + \sum INDUSTRY + \sum YEAR + \\ & \varepsilon_{it} \end{aligned} \quad (6)$$

In the case of β_1 being statistically significant and with a positive value, H1 is accepted, meaning that a higher number of listed client firms on an audit partner's portfolio leads to a higher delay in the signature of the audit report.

This model is executed, firstly, with *ARL* and later, re-run with the natural logarithmic value of the variable (*LNARL*).

Regarding hypothesis 2, the regression is executed, considering:

$$AQ_{it} = \beta_0 + \beta_1 APB_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 GRSALES_{it} + \beta_5 GRNI_{it} + \beta_6 PBV_{it} + + \beta_7 ROA_{it} + \beta_8 LOSS_{it} + \beta_9 LAGTA_{it} + \beta_{10} BUSYSEASON_{it} + \beta_{11} BIG4_{it} + \beta_{12} QUICK_{it} + \beta_{13} CFOVOL_{it} + \sum INDUSTRY + \sum YEAR + \varepsilon_{it} \quad (7)$$

where, for the variable *AQ*, it is considered the absolute value of the obtained values for discretionary accruals (*DA*) and the real value for real earnings management (*REM1, REM2, REM*).

For the model, in which *DA* is utilised, if β_1 is positive and statistically significant, H2 is accepted, meaning that a higher APB leads to a decrease in audit quality. As for the models where the real earnings management variables are considered, for H2 to be accepted, the coefficient must be positive, as well, and statistically significant.

Finally, for hypothesis 3, the following model is considered,

$$AQ_{it} = \beta_0 + \beta_1 APB_{it} + \beta_2 ARL_{it} + \beta_3 \text{LNARL} * \text{APB} + \beta_4 SIZE_{it} + \beta_5 LEV_{it} + \beta_6 GRSALES_{it} + \beta_7 GRNI_{it} + \beta_8 PBV_{it} + + \beta_9 ROA_{it} + \beta_{10} LOSS_{it} + \beta_{11} LAGTA_{it} + \beta_{12} BUSYSEASON_{it} + \beta_{13} BIG4_{it} + \beta_{14} QUICK_{it} + \beta_{15} CFOVOL_{it} + \sum INDUSTRY + \sum YEAR + \varepsilon_{it} \quad (8)$$

where *LNARL*APB* is created and it is the interaction between *APB* and *LNARL*, to give a better understanding of how both factors, together, impact audit quality. To accept hypothesis 3, all the first three coefficients must be statistically significant and negative.

Table 3.3 – Variables description

Variable	Description
ARL	Number of days from the end of the financial year, for firm i for period t, to the day the audit report is signed
LNARL	Natural logarithmic transformation of the number of days from the end of the financial year, for firm i for period t, to the day the audit report is signed
APB	The number of listed clients in an audit partner's client portfolio, for firm i during period t, or the average of the two auditors involved on the engagement, when applicable
DA	Absolute values of the discretionary accruals, measured by the modified Jones (1991) model (Kothari et al., 2005), for each firm i, during period t

Variable	Description
REM1	Real earnings management, considering sales manipulation, measured through the model of Roychowdhury (2006) and multiplied by -1
REM2	Real earnings management, considering expenditures manipulation, measured through the model of Roychowdhury (2006), and multiplied by -1
REM	Average between the variables _REM1 and _REM2
SIZE	Natural logarithm of total assets, for firm i, during period t.
LEV	Total liabilities divided by total assets, for firm i, during period t
GRSALES	Changes between sales of period t and t-1, divided by sales of period t-1, for firm i
GRNI	Changes between net income of period t and t-1, divided by net income of period t-1, for firm i
PBV	Market valuation divided by accounting value, for firm i, during period t
ROA	Net profit after taxes divided by total assets, for firm i, during period t
LOSS	Variable is scored 1, if the net income of firm i, during period t is negative, 0 otherwise
LAGTA	Total accruals of t-1, for firm i, during period t
BUSYSEASON	Variable is scored 1, if the financial year-end of firm i, during period t, is December 31st, 0 otherwise
BIG4	Variable is scored 1, if firm i, during period t is audited by an auditor of a Big4 firm (i.e, Deloitte, KPMG, EY, or PWC), 0 otherwise
QUICK	Ratio of current assets, less inventories, to total liabilities, for firm i during period t
CFOVOL	Standard deviation of cash flow from operations for the current and prior two periods of firm i, during period t
INDUSTRY	Controlling for industry effects
ε	Error term

4 Results

4.1 Descriptive statistics and variable correlations

Table 4.1 presents the descriptive statistics of all the variables utilised in this study, to test hypotheses 1, 2, and 3. Control variables, except for dummy variables, are winsorized to the 5th and 95th percentiles to reduce the influence of outliers. The variables *DA*, *REM1*, *REM2*, *REM*, *ARL*, *LNARL*, and *APB* are not winsorized, to avoid diluting their effects on the models' estimations.

Regarding the audit quality measurement variables, *DA* have a mean of 0.043, a median of 0.033, and a standard deviation of 0.036, which indicates a low dispersion of the sample. Real earnings management measurements means' exhibit that the analysed firms engage on average, on a reduced number of actions to manipulate both sales and expenditures figures. Expenditures manipulation occurred slightly in an upward manner, meaning fewer expenditures were recognised (since *REM2* is the residuals of the expenditures model, multiplied by -1). For the real earnings management proxy variables, the standard deviation from all three is also considerably low, indicating a low dispersion of the variables.

Regarding *ARL*, the mean is 78, indicating that, on average, audit reports are signed 78 days after the firm's financial year-end, and 50% of them are signed within 75 days. However, the kurtosis of this variable is exceptionally high, 140.931, which indicates a significant presence of extreme values. To avoid hindrance from these extreme values, this variable is considered through the natural logarithm of itself, based on the obtained results.

APB also has a reduced mean, 1.077, with its maximum being 6 client firms and a standard deviation of 0.716.

Given the utilisation of winsorization on the remaining non-dichotomous variables, the possibility of outliers affecting the obtained results is reduced, as evidenced by the fact that none of the kurtosis values for the control variables exhibit a disproportionate figure.

The Pearson correlation values between the utilised variables are presented in Table 4.2. Regarding H1, the correlation between *ARL*, the natural logarithm of *ARL*, and *APB* (approximately 0.2 for both cases) is not statistically significant at any significance level, which does not allow for any interpretation of the effects of the latter variable on the first variable. For H2, which posits that a bigger *APB* leads to a lower audit quality, there is a statistically significant correlation, at a 5% significance level, between *DA* and *APB* of 0.06. However, there

is no statistically significant correlation between *APB* and any of the real earnings management variables. With this, it cannot be taken, for now, as any robust hint regarding the acceptance or rejection of the second hypothesis. Considering the correlations between the variables under scope for the first two hypotheses, it is not possible to obtain any orientation regarding the third hypothesis, as its model takes into account the simultaneous relation between the variables of *ARL* and *APB*, along with the variables of audit quality. This correlation matrix is utilised to examine whether multicollinearity is a potential issue, but all the correlations are below an absolute value of 0.80.

Table 4.1 – Descriptive statistics

Variables	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
DA	0.043	0.033	0.197	0.000	0.036	1.181	4.288
REM1	2.48E-17	0.002	0.240	-0.256	0.059	0.035	4.691
REM2	-6E-17	0.028	0.654	-0.796	0.195	-0.633	4.760
REM	-1.9E-17	0.014	0.357	-0.417	0.102	-0.382	4.318
ARL	78.820	75.000	826.000	27.000	37.892	8.785	140.931
LNARL	4.307	4.317	6.717	3.296	0.323	0.847	8.215
APB	1.077	1.000	6.000	0.500	0.716	2.218	9.838
SIZE	13.816	13.689	17.975	10.349	2.151	0.260	2.113
LEV	0.580	0.585	0.881	0.265	0.166	-0.123	2.358
GRSALES	0.066	0.056	0.386	-0.211	0.147	0.232	2.856
GRNI	-0.139	-0.034	2.774	-3.189	1.271	-0.173	4.052
PBV	3.004	2.193	10.148	0.591	2.501	1.572	4.755
ROA	0.034	0.037	0.140	-0.105	0.058	-0.566	3.461
LOSS	0.192	0.000	1.000	0.000	0.394	1.562	3.439
LAGTA	-0.027	-0.026	0.079	-0.137	0.055	-0.060	2.665
BUSYSEASON	0.893	1.000	1.000	0.000	0.309	-2.550	7.503
BIG4	0.715	1.000	1.000	0.000	0.452	-0.953	1.908
QUICK	1.318	1.085	3.102	0.454	0.720	1.106	3.400
CFOVOL	0.032	0.021	0.125	0.004	0.031	1.723	5.369

This table include descriptive statistics for audit report lag, audit quality and audit quality mediated by audit report lag models, respectively. All variables defined in Table 3.3. ***, **, * indicate statistical significance from two-tailed tests at 0.01, 0.05, and 0.1, respectively.

Table 4.2 – Correlation analysis

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1.DA	1.000	0.092***	-0.052*	-0.023	0.102***	0.130***	0.066**	-0.197***	-0.052*	0.008	-0.067**	0.103***	-0.086***	0.143***	0.102***	0.081***	-0.141***	0.168***	0.271***
2.REM1		1.000	-0.011	0.279***	0.107***	0.113***	0.018	-0.013	0.250***	-0.071**	-0.131***	-0.248***	-0.605***	0.412***	-0.022	-0.013	0.055**	-0.110***	0.123***
3.REM2			1.000	0.957***	-0.017	0.002	-0.034	0.115***	0.035	-0.131***	-0.013	-0.095***	0.023	-0.004	0.022	0.044	0.072***	-0.072***	-0.079***
4.REM				1.000	0.015	0.034	-0.028	0.107***	0.106***	-0.146***	-0.051*	-0.163***	-0.153***	0.115***	0.015	0.039	0.085***	-0.100***	-0.04
5.ARL					1.000	0.860***	0.016	-0.358***	0.136***	-0.051*	-0.027	-0.012	-0.252***	0.265***	-0.065**	0.015	-0.230***	-0.036	0.272***
6.LNARL						1.000	0.021	-0.493***	0.126***	-0.034	-0.058**	-0.01	-0.256***	0.278***	-0.038	0.051*	-0.350***	0.013	0.273***
7.APB							1.000	0.007	-0.005	0.021	0.027	0.046*	0.031	0.009	-0.011	0.008	0.082***	0.028	0.012
8.SIZE								1.000	0.206***	0.033	0.036	-0.275***	0.131***	-0.241***	0.025	-0.085***	0.515***	-0.242***	-0.355***
9.LEV									1.000	-0.081***	-0.141***	0.016	-0.329***	0.174***	-0.126***	0.057**	0.160***	-0.544***	0.03
10.GRSALES										1.000	0.148***	0.129***	0.264***	-0.240***	0.001	0.029	0.023	0.048*	-0.022
11.GRNI											1.000	0.016	0.316***	-0.287***	0.006	0.002	0.069**	0.103***	-0.113***
12.PBV												1.000	0.186***	-0.013	0.023	0.099***	-0.109***	0.137***	0.194***
13.ROA													1.000	-0.756***	0.084***	-0.006	0.029	0.163***	-0.270***
14.LOSS														1.000	-0.062**	0.01	-0.104***	-0.04	0.368***
15.LAGTA															1.000	-0.047*	-0.032	0.123***	-0.053*
16.BUSYSEASON																1.000	-0.035	-0.017	-0.009
17.BIG4																	1.000	-0.104***	-0.196***
18.QUICK																		1.000	0.071**
19.CFOVOL																			1.000

This table includes descriptive statistics for audit report lag, audit quality and audit quality mediated by audit report lag models, respectively. All variables defined in Table 3.3. The correlations with LOSS, BUSYSEASON and BIG4 variables are Spearman correlations. ***, **, * indicate statistical significance from two-tailed tests at 0.01, 0.05, and 0.1, respectively.

4.2 Main results

4.2.1 Audit report lag

Table 4.3 presents the results obtained from the OLS regression performed, considering equation 6, with *ARL* and *LNARL* as the dependent variables of the model, which enables the evaluation of H1, whether a higher level of *APB* translates into a higher delay on the signature of the audit report.

Looking at the model that considers *ARL* as the dependent variable, the obtained coefficients of the utilised variables are, for the majority, substantially high, except for the quick ratio (-0.237), which in turn, is not statistically significant for any significance level. Regarding the *APB* variable coefficient, it is 1.588, which has the expected sign, considering the first hypothesis in this study. However, since the coefficient is not statistically significant at any significance level, this model does not allow for any conclusions to be drawn regarding the relationship between *APB* and *ARL*.

Considering the inflated coefficient levels, which occur due to the dispersed variable that *ARL* is, as mentioned in the previous section, the model is rerun with *LNARL*, a transformed version of the prior, through the natural logarithm. This way, there is a lower dispersion of the considered dependent variable, which in turn avoids the hindrance of the obtained results.

Regarding the results from the second model presented in Table 4.3, its explanatory capacity is approximately 36%, which is statistically significant at a 1% level. As for the coefficients of the considered variables, this time they are on a smaller scale compared to the previous model. For *APB*, the independent variable, its coefficient is 0.019, which is statistically significant at a 10% level, indicating a positive relationship with *LNARL*, the variable under scope, in this instance. This result, combined with the fact that the regression model is statistically significant, enables the conclusion that APB leads to the fact that audit reports are signed later, which means that H1, of this study, is proven, when considering *ARL*, proxied through the natural logarithm of the number of days from the financial year-end of the audited firm, until the signing of the audit report, listed German firms. This conclusion is aligned with the findings of Hussin et al. (2018) and Singh et al. (2022), on previous studies, on the relation between these two factors.

Table 4.3 – APB and ARL

	ARL	LNARL
Variables	Coefficient (t-stats)	Coefficient (t-stats)
Intercept	137.819***	5.018011***
	(13.442)	(63.054)
APB	1.588	0.019466*
	(1.211)	(1.912)
SIZE	-5.937***	-0.067901***
	(-9.676)	(-14.257)
LEV	45.132***	0.506***
	(6.082)	(8.795)
GRSALES	5.181	0.101*
	(0.781)	(1.959)
GRNI	2.105***	0.009
	(2.696)	(1.433)
PBV	-1.899***	-0.024***
	(-4.467)	(-7.196)
ROA	-34.351	-0.110
	(-1.240)	(-0.514)
LOSS	7.897**	0.076**
	(2.046)	(2.535)
LAGTA	-12.558	0.0745
	(-0.727)	(0.556)
BUSYSEASON	-1.505	0.021
	(-0.483)	(0.879)
BIG4	-6.468976***	-0.112668***
	(-2.623)	(-5.885)
QUICK	-0.237	0.018
	(-0.147)	(1.447)
CFOVOL	145.490***	0.657**
	(4.153)	(2.417)
Year fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
Observations	1295	1295
Adjusted r-Squared	0.222	0.356
F-statistic	21,49643***	40,82301***

This table shows the coefficients and *t*-statistics for the audit report lag model. All variables defined in Table 3.3. ***, **, * indicate statistical significance from two-tailed tests at 0.01, 0.05, and 0.1, respectively.

4.2.2 Audit quality

To test hypothesis 2 of whether busier audit partners present lower levels of quality on their audit reports, due to the lower financial reporting quality of the financial statements of client

firms, the model is executed considering *DA*, *REM1*, *REM2* and *REM* as the dependent variable and utilising *APB* as the independent variable. The obtained results are presented in Table 4.4.

In accordance with what is posited by H2, when proxying audit quality through the residuals of the sales manipulation model, developed by Roychowdhury (2006), *REM1,* after being multiplied by -1, the coefficient of *APB* is positive, which implies that when audit partners, responsible for the engagements, are busier, the financial reports from the client firms exhibit higher levels of manipulation, however, for the considered sample, only in a slight positive relation. This result is statistically significant at a 10% significance level. As for the adjusted r-squared of the model, it is 0.407, being significant at a 1% level, which corroborates the second hypothesis of this study.

However, the results of the model that considers the variable *REM2,* as the dependent variable, does not allow for any conclusion to be drawn for H2, due to the coefficient value of *APB* not being statistically significant. Its value is -0.011, which is the contrary sign of what would be expected, when considering the proxy for audit quality, as the negative of the residuals from expenditures manipulation, since it is posited that busier audit partners are associated with lower levels of audit quality. With this result not being statistically significant, at any significance level, no kind of conclusion regarding H2 can be withdrawn from this model, which has an adjusted r-squared of 0.046, significant at a 1% level.

Considering that *REM* is obtained from the averages of the variables *REM1* and *REM2*, and given the previous results, the outputs observed for the corresponding model are not surprising. The explanatory capability of this model is approximately 7%, which is a significant result at the 1% level. As for the *APB* coefficient, similar to the case of the model when considering *REM2* as the dependent variable, it has a negative sign, contrary to what is posited for H2, but it is not statistically significant at any significance level. With this, when considering the variables of a firm's activities manipulation, only one of the considered models has a statistically significant coefficient, with it being positive, for the *APB* variable.

When considering *DA* as the dependent variable, the regression model is also statistically significant at a 1% level, with an adjusted r-squared of 0.120. In this case, the *APB* variable has a coefficient of 0.003, significant at a 5% level, which means that for the considered sample of German companies, when audited by busier audit partners, exhibit slightly higher levels of discretionary accruals on their financial reports, indicating lower audit quality.

Since not all the results, when considering *REM1*, *REM2*, and *REM* as dependent variables, allow for a conclusion on the relation between *APB* and audit quality, it is not possible to draw a conclusion for H2 when considering these models. However, when considering DA as a proxy for audit quality, it can be concluded that companies utilize accruals to manage results, which is affected by audit partner's busyness.

Table 4.4 – APB and audit quality

	REM1	REM2	REM	DA
	Coefficient	Coefficient	Coefficient	Coefficient
Variables	(t-stats)	(t-stats)	(t-stats)	(t-stats)
Intercept	0.002	-0.079	-0.038	0.022**
	(0.173)	(-1.357)	(-1.280)	(2.149)
APB	0.003*	-0.011	-0.003	0.003**
	(1.844)	(-1.441)	(-0.976)	(2.536)
SIZE	0.001	0.008	0.004**	-0.001
	(0.085)	(2.436)	(2.390)	(-0.918)
LEV	0.036***	0.002	0.019	0.007
	(3.633)	(0.043)	(0.880)	(0.900)
GRSALES	0.041***	-0.186	-0.072***	0.006
	(4.596)	(-4.905)	(-3.711)	(0.870)
GRNI	0.002**	-0.002	0.001	-0.001
	(2.209)	(-0.400)	(0.121)	(-1.386)
PBV	-0.004***	-0.007	-0.005***	0.001
	(-6.725)	(-2.780)	(-4.258)	(0.188)
ROA	-0.642***	0.477	-0.082	-0.003
	(-17.087)	(3.016)	(-1.010)	(-0.132)
LOSS	-0.007	0.045	0.019*	0.004
	(-1.311)	(2.036)	(1.678)	(0.976)
LAGTA	0.041*	0.106	0.0738	0.070***
	(1.765)	(1.079)	(1.457)	(4.039)
BUSYSEASON	-0.002	0.031	0.015	0.009***
	(-0.396)	(1.772)	(1.632)	(3.026)
BIG4	0.005	0.011	0.008	-0.005**
	(1.463)	(0.774)	(1.091)	(-2.028)
QUICK	0.004*	-0.017	-0.007	0.007***
	(1.843)	(-1.874)	(-1.398)	(4.509)
CFOVOL	0.021	-0.150	-0.065	0.254141***
	(0.433)	(-0.750)	(-0.630)	(7.237)
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Observations	1295	1295	1295	1295
Adjusted r-Squared	0.407	0.046	0.070	0.120
F-statistic	50.478***	4.449***	6.453***	10.872***

This table shows the coefficients and *t*-statistics for the audit quality. All variables defined in Table 3.3. ***, **, * indicate statistical significance from two-tailed tests at 0.01, 0.05, and 0.1, respectively.

Table 4.5 presents the results obtained from the regression models utilised to evaluate hypothesis 3, which is if *APB* and *ARL*, when combined, have a negative impact on audit quality. The table presents the results for the models, considering *DA* as the dependent variable, as H2 is not accepted when considering the real earnings management variables. This model is only run considering *LNARL*, due to the previously presented results, when testing for the correlation between *APB* and *ARL*.

The considered model has an adjusted r-squared of 0.119, significant at 1% level. However, none of the obtained coefficients for any of the independent variables are statistically significant. *LNARL*, *APB*, and *LNARL*APB* have coefficients of 0.001, 0.004, and -0.001, respectively. Even though the utilized model is statistically significant, due the obtained results from previous hypothesis and due to any of the coefficients of the variables under scope for H3 being significant, at any level, it is not possible to assess whether *APB* and *ARL*, combined, have an impact, either positive or negative, audit quality, when considering as a setting, the German companies listed in the Frankfurt Stock Exchange, between 2017 and 2023.

Table 4.5 – APB, ARL and audit quality (DA)

	DA
	Coefficient
Variables	(t-stats)
Intercept	0.015
	(0.505)
LNARL	0.001
	(0.218)
APB	0.004
	(0.188)
LNARL*APB	-0.001
	(-0.029)
SIZE	-0.001
	(-0.727)
LEV	0.006
	(0.793)
GRSALES	0.006
	(0.850)
GRNI	-0.001
	(-1.391)
PBV	0.001
	(0.248)
ROA	-0.004
	(-0.129)
LOSS	0.004
	(0.949)

	DA
	Coefficient
Variables	(t-stats)
LAGTA	0.070***
	(4.031)
BUSYSEASON	0.009***
	(3.013)
BIG4	-0.005*
	(-1.944)
QUICK	0.007***
	(4.487)
CFOVOL	0.2534***
	(7.154)
Year fixed effects	Yes
Industry fixed effects	Yes
Observations	1295
Adjusted r-Squared	0.119***
F-statistic	9.776

This table shows the coefficients and t-statistics for the audit quality mediated by audit report lag model. All variables defined in Table 3.3. ***, **, * indicate statistical significance from two-tailed tests at 0.01, 0.05, and 0.1, respectively.

5 Conclusion

This study aims to evaluate whether, in Germany, between 2017 and 2023, busier audit partners hinder the quality and timeliness of their work due to a possible excess of accepted client firms. The considered timeline of the study, starting from 2017, is due to the implementation of new regulations for audit practices in Germany, which occurred in 2016. Considering that between 2018 and 2021, the number of statutory auditors and audit firms decreased in Germany, there is an increased possibility that audit partners are confronted with heavier workloads.

As stated in previous literature, ARL refers to the number of days between the financial year-end and the date of signature of the audit report and is considered one of the most significant factors determining financial reporting timeliness. The findings obtained on whether audit partners, with a larger number of publicly listed companies, experience a higher delay in signing the audit report, suggest a positive association between these two factors. To assess this, a regression model is employed, utilising various control variables consistent with the previous literature, and incorporating financial information from listed companies in Germany between 2015 and 2023.

The relation between APB and audit quality, or financial reporting quality, is also under scope. Adopting the use of an OLS regression, as well, there is evidence that busier audit partners exhibit lower quality on their audit reports. However, this evidence is not demonstrated for all the audit quality proxies that are considered.

Finally, following the previous two correlations under study, it is hypothesized that a higher level of APB and ARL, simultaneously, lead to a lower level of audit quality. With this setting, the results do not allow for any conclusion on the relation between these three factors when they are considered together.

To extend the findings of this study to future research, it would be important to include private client firms from auditors in the sample, as well as the utilisation of other control variables, such as audit partner industry specialization or years of experience. In cases of robust findings, a difference-in-differences model could be used to illustrate the gaps between audit partners with heavier workloads and their counterparts.

The obtained results provide some evidence on the impact of APB in Germany, a factor that should be kept within the scope of research, due to concerns raised by regulators and previous studies on the matter.

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