

Literature Review: Workload allocation process in audit firms

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1. Introduction

While the allocation of human resources in audit firms is an important research topic, it has received scant research attention to date. Ideally, when audit firms aim at improving audit efficiency and effectiveness, audit firms should properly assign their clients to auditors who manage and lead the engagement team (so-called ‘lead auditors’ in this project) based on the auditor’s expertise level, industry specialization and other relevant factors that benefit audit efficiency and quality (Becker, 1974; Chatain & Meyer-Doyle, 2012; Durlauf & Seshadri, 2003). However, lead auditors and clients alike may have their own preferences whereby they try to intervene in the allocation process. These interventions may hamper audit quality and efficiency because other factors than proper matching enter into the allocation process. Prior research on workload allocation mainly focuses on the allocation of audit hours to specific audit engagements across staff ranks and how time pressure related to audit assignments may deteriorate audit quality¹. Only few studies explore the workload allocation process in terms of assigning clients to lead auditors and the consequences of this assignment for audit quality.

Our project focuses on a number of factors related to the allocation of lead auditors within the audit firms. We will first focus on the workload allocation strategies – the extent to which clients and lead auditors are properly matched within the audit firms. Particularly, we will explore whether audit firms endorse the principle of assortative matching of client-lead auditor pairs whereby firms try to properly match auditors to clients based on expertise. We further examine whether the construction of proper pairs helps auditors perform better at their future engagements. In addition, we also explore if certain incentives distort this assortative matching and whether this impacts audit quality. Study 1 and study 2 will present anecdotal and archival evidence on these issues. Finally, in study 3, we will investigate gender bias and gender inequity in the workload allocation process. Are female auditors systematically allocated to different clients and how does this bias affect their audit quality? The results of these studies will be of use to professionals and policymakers, helping them to optimize audit allocation processes and thus the quality of auditors’ decision-making and efficiency.

The remainder of this literature review is organized as follows. Section 2 introduces the current literature on the workload allocation process in audit firms. When it comes to workload management, prior literature focuses heavily on the planning of audit hours and the team composition of each audit engagement. Further, client acceptance and continuance decisions at the firm level are often studied, with a particular focus on the client characteristics in relation to these decisions. Section 3 illustrates the missing elements of studies on the

¹ Workload allocation is the process that consists of the auditing hours planning process and auditor assigning process. In this project, the term ‘workload allocation strategy’ refers to the auditors assigning, allocating, or pairing strategy.

workload allocation process. We explore the workload allocation at the individual auditor level, which prior studies did not investigate. These individual assignments are important to study because when constrained auditors are assigned to more clients or when clients and auditors are not matched properly, the level of audit quality provided may be hampered. We will focus on the constitution of the ‘optimal’ client-lead auditor pair and discuss the factors that may impede such optimal allocation. We empirically validate the effects of such allocations on audit quality. Then, we further explore the potential consequences of the audit firms’ allocation models by identifying whether gender biases occur in workload divisions and whether these biases can explain the different performance between male and female auditors and the glass ceiling effect. Section 4 summarizes the key findings of the review and discusses our project on the individual workload allocation process. We conclude with the important contributions to the existing literature and to practice.

2. Literature Review

2.1. The importance of human asset allocation in audit firms

Understanding how audit firms deal with workload allocation among auditors is an essential research topic. From a theoretical viewpoint, the current workload of an auditor should be one of the primary considerations when audit offices make allocation decisions. When an auditor is assigned to an additional new client, two effects operate simultaneously. First, the auditor’s workload in terms of the number of total hours increases. Second, auditors have to work together with an increasing number of clients. Both of these factors can potentially hamper the quality of the audits, in particular when auditors already face a high workload.

Prior studies on these two effects mainly focus on the consequences of high workload on audit quality. For example, several researchers have examined the effect of time pressure on performance in engagements (e.g., Ellen. Cook & Kelley, 1988; Kelley & Seller, 1982; Masihabadi, Rajaei, Amir Shams, & Parsian, 2015). These studies conclude that a heavy workload in terms of working hours- measured by audit hours- can hamper audit quality (e.g., Knechel, Krishnan, Pevzner, Shefchik, & Velury, 2012; López & Peters, 2011). The consequences of multi-tasking, i.e. having many clients assigned to the same lead auditor, are also scrutinized. Prior studies show that audit quality deteriorates with an increasing number of clients as the auditors may not be able to devote sufficient time and effort to all clients when they have ‘too many’ clients in their portfolio (Bhattacharjee, Maletta, & Moreno, 2007; Bhattacharjee, Maletta, & Moreno, 2012; Mullis & Hatfield, 2018). Lindberg and Maletta (2003) remark in their experiment that auditors are more easily misled when they are exposed to multiple audit clients. Similarly, Sundgren and Svanström (2014) show that more multi-tasking reduces the amount of a lead auditor’s sustained attention on each of his/her client

engagements. Given these factors, it should not be surprising that workload allocation among auditors plays a vital role in controlling audit quality within the firms.

Evidence from studies suggest that there might be systematic differences between audit offices in how decisions are made to allocate auditors to different clients (Asare, Hackenbrack, & Knechel, 1994; Gendron, 2001). While there is thus great potential for examining the workload allocation to individual auditors, not many studies focus on what factors help to constitute an appropriate client-lead auditor pair and what factors step in or hamper achieving this pair. Ideally, lead auditors and clients should be matched regarding the auditors' characteristics (e.g., working experience, expertise level, etc.) when audit firms aim at improving the audit firms' overarching priority of audit quality (e.g., Li, McNichols, & Raghunandan, 2018) (see *Section 3.1*). However, audit firms rely on their lead auditors who possess a substantial body of knowledge and experience (Kaiser, Kozica, Swart, & Werr, 2015; Løwendahl, Revang, & Fosstenløkken, 2001; Nordenflycht, 2010). This gives lead auditors considerable bargaining power to intervene in the allocation process (Nordenflycht, 2010). For instance, auditors may extend their client portfolio to earn a higher status within their audit firms (e.g., Myers, Myers, & Omer, 2003). According to one of our interviewees, lead auditors take care of their portfolio in terms of the specification, clients' size, and learning opportunities when it comes to promotion. Similarly, clients may want to be matched with their preferred auditor according to recommendation and reputation (e.g., Gong, Xiao, Xu, & Gong, 2019). These internal and external incentives mean that an appropriate matching may not arise, putting audit quality at stake (see *Section 3.2*).

However, the limited studies on workload allocation do not examine these questions but mainly focus on exploring the determinants of workload allocation measured by audit hours (see *Section 2.2*). Few studies focus on the constitutions of client-lead auditor pairs. This may be caused by the difficulties of getting insight in the full portfolio of lead auditors, which is often difficult with US data (given that we only get insight for publicly listed companies, leading to underestimation of total workload of an auditor). As a result, prior studies often ignore the individual's workload and focus on client characteristics that may affect audit hours planning, team composition, and the audit firms' decisions to accept or reject clients. The key missing element is the level of workload and the type of tasks that create such workload. Thus, while the client-side factors have been examined, the internal allocation of individual auditors to new clients remains a black box. In what follows, we review the current literature that has mainly focused on client characteristics.

2.2. Determinations of audit hours and team members on the audit assignment

Panel A of [Table 1](#) summarizes studies related to audit hours planning. These studies focus on characteristics of clients and how audit firms budget their audit hours for their different

client engagements. Primarily, these studies show that size, risk, and complexity of client have a positive impact on the audit hours allocation (e.g., Bell, Doogar, & Solomon, 2008; Hackenbrack & Knechel, 1997; Johnstone & Bedard, 2001; Mock & Wright, 1993). In other words, the more risk the client represents, the more audit hours an audit firm will budget for that client.

Audit firms can also deploy their human resources according to the clients' behavior. For example, the findings of Johnstone, Bedard, and Ettredge (2004) demonstrate that audit firms deploy more audit hours for clients who are engaged in competitive bidding. Additionally, client industry factors also play a pivotal role in the audit hours allocation process. Stein, Simunic, and O'keefe (1994), for instance, show that the clients' risk vary across industries, potentially influencing the allocation of audit hours. Bell et al. (1994) introduce the concept of audit firms' familiarity with their clients. They, however, do not find evidence indicating that an auditor's familiarity prompts audit firms to reduce the audit planning hours.

A few researchers, such as Kim and Fukukawa (2013) and Che and Svanström (2019), divert their attention from audit hours allocation to the audit team component (see [Table 1, Panel B](#)). While client size is an important determinant of audit team size, Kim and Fukukawa (2013) use data from the big 3 Japanese audit firms and find that audit team composition is affected by the clients' business risk.

Table 1 Review of Selected Prior Workload Allocation Studies

Workload decisions	Variables that are expected to impact the workload decisions
Panel A: Workload decisions measured by audit labor hours	
Mock and Wright (1993)	Audit labor hours (varied by auditing procedure)
O'keefe et al. (1994)	Audit labor hours (varied by staff level)
Stein et al. (1994)	Audit labor hours (varied by staff level)
Bell et al. (1994)	Audit labor hours (varied by staff level)
	Client risk factors: management turnover; change in the information system; private or public entity; management's aggressiveness; internal control reliance; account-specific factors (degree of judgment& number of unusual transactions); total number of prior audit differences.
	Client size; client complexity; client risk.
	Client size; client complexity; client (cash flow) risk; client industry
	Client size; engagement characteristics (client complexity, client control & assistance, risk characteristics, and audit characteristics).

Hackenbrack and Knechel (1997)	Audit labor hours (among activities)	Client size; client risk (public & private); client complexity (subsidiary); client status (financial & nonfinancial entities).
Gist and Davidson (1999)	Audit labor hours (measured by the difference between number of hours reported and number of hours budgeted and varied by staff level)	Client size; client complexity; client risk.
Bell et al. (2001)	Audit labor hours	Client's perceived business risk; client size; client complexity.
Johnstone and Bedard (2001)	Audit labor hours (for all classes of professionals); bid price	Client fraud risk & error risk; additional services; client size; client financial factors (leverage, ROA, and cash flow); client status (public & private clients); client complexity (multiple locations).
Bedard and Johnstone (2004)	Audit labor hours	Client risk (earnings manipulation risk and corporate governance risk); client size; client's financial condition, internal control, and industry membership.
Johnstone et al. (2004)	Planned engagement effort (measured by audit planned hours varied by staff level)	Client choices regarding whether or not to engage in competitive bidding; client size; client complexity; client risk.
Bell et al. (2008)	Audit labor hours (varied by staff level)	Client audit business risk; client size; client complexity, other client relevant risk (business risk and material misstatement); client internal control; other consulting services.
Fukukawa et al. (2011)	Audit labor hours (varied by staff level)	Client size; client status (public or private); refinement client risk (industry, regulatory, and other external factors; objectives and strategies and the related business risks; measurement and review of the entity's financial performance; internal control); client industry variables.

Panel B: Workload allocation measured by component of audit team members

Kim and Fukukawa (2013)	Audit effort (measured by the number of CPAs excluding engagement partners, the number of junior accountants, and the number of other staff)	Client size; client complexity; client business risk; degree of audit firm's specialism (measured by the audit fees paid by clients compared with the total audit fees paid by companies in the industry); audit firms' turnover; non-audit services.
Che and Svanström (2019)	The number of team members in teach team; the number of audit labor hours	Client size

(varied by staff level for each engagement)

Panel C: Workload allocation in terms of client acceptance and rejection

Johnstone (2000)	Evaluations of the client-acceptance risks and the likelihood of accepting the client at the partner level	Client business risk (industry average comparisons, financial trends, long-term planning, and industry competition); audit risk (nature of the industry, past client-auditor relationship, degree of valuation judgment required, management attitude to the internal control, internal audit department); auditor's business risk (initial public offering, engagement timing, audit-firm expertise, additional billing opportunities, competitor strategy).
Johnstone and Bedard (2004)	Acceptance and continuation decisions at the firm level (portfolio management decisions at the firm level)	Client financial risk (financial ratios and measure of client strategic position); audit risk (internal controls, financial reporting quality; and management integrity), and auditor business risk (public trading system).
Rama and Read (2006)	Acceptance and continuation decisions at the firm level (measured by the probability of resignation)	Client financial condition; client size; client asset composition.
Khalil, Cohen, and Schwartz (2011)	Auditor resignations (measured by the auditor search period for resignation sample)	Client business risk (financial position, sales growth, size, and stock price volatility); audit risk (accounts receivable and inventory as a percentage of total assets, internal control, and management integrity issues); auditor's business risk (engagement timing, additional billing opportunities, and audit-firms expertise in a certain industry).
López and Pitman (2014)	Local office's decision to make changes to its busy season client portfolio at local office level	Workload compression; client misalignment; audit risk (earnings manipulation risk, financial performance risk, and litigation risk); client size; local office size; big-N firm affiliation.
Brown and Knechel (2016)	Auditor changes and auditor choices	Client-auditor comparability (measured by the similarity score derive from the textual disclosures); client size; audit risk; client financial status; client-audit relationship.
Hsieh and Lin (2016)	Acceptance decisions at the firm level	Degree of expertise (firm- or partner- level industry expertise); audit risk.

2.3. Firm-level client acceptance and continuance decisions

Client characteristics play a vital role, not only in audit hours allocation but also in the client acceptance and continuation process (CAAP)² (e.g., Asare, Cohen, & Trompeter, 2005; Johnstone, 2001). The assignment of new clients to auditors also puts pressure on audit hours. Audit firms should therefore make full use of their human resources to determine the most ‘optimal’ client-lead auditor pairs such that high-level audit quality can be guaranteed at each individual engagement. However, research on what is an optimal allocation is still largely absent. Prior studies (see [Table 1](#), Panel C) focus on the client acceptance and continuation decisions and mainly study how such decisions depend on client-relevant risk characteristics.

In an experimental study, Johnstone (2000) develops a two-stage client-acceptance model that demonstrates how partners evaluate these client-relevant risk characteristics. They show that such factors potentially affect the client-acceptance decisions at the firm level. Using archival data, other studies recognize the important role of client risk assessments when making client acceptance and continuance decisions (Brown & Knechel, 2016; Hsieh & Lin, 2016; Johnstone & Bedard, 2004; Khalil et al., 2011; López & Pitman, 2014; Rama & Read, 2006). For example, Johnstone and Bedard (2004) conclude that audit firms are more likely to accept or continue with clients with a lower audit risk compared to clients with high audit risk. Similarly, by analyzing an auditor resignation sample over 2003-2008, Khalil et al. (2011) provide further evidence that client-relevant risk factors (i.e., client business risk, audit risk, and auditor’s business risk) affects client acceptance and continuation decisions. While prior research examines these risk factors in whether or not to accept clients, the interesting question on which individual auditors get the riskier clients (once accepted) has not yet been addressed.

3. Individual-level allocation process

As professional services firms, audit firms rely heavily on intelligent human resources to provide high quality to their clients (Kaiser et al., 2015; Løwendahl et al., 2001; Nordenflycht, 2010). Audit firms should thus carefully manage and deploy their employees to make the best use of human resources when the aim is to maintain their reputations and competitive advantages.

Many studies show that the performance of individual auditors is the primary factor for value creation in audit firms. For instance, by analyzing a large archival Chinese dataset, Gul, Wu, and Yang (2013) argue that the individual auditors can influence the audit reporting and clients’ earnings quality. They indicate that clients’ reporting quality varies with an auditors’

² Sofla (2016, p. 10) asserts that “The lead auditor’s client portfolio is the product of the ‘client acceptance and continuation process’ (CACP)”. He indicates that “The CACP usually starts with the ‘practice development’, the objective of which is to cultivate potential clients (Asare, Hackenbrack, & Knechel, 1994). The ‘practice development’ process is followed by the ‘client acceptance analysis’ in which an auditor performs a series of procedures to evaluate whether he or she wants to submit a proposal to a client or stop the process. If an auditor makes such a proposal to a client and the client agrees to the offer, the auditor can start to perform the audit (Asare et al., 1994). The final stage in the CACP is the continuation analysis, in which an auditor decides whether to continue with the current client or not (Asare et al., 1994). Decisions about client acceptance or continuation involve a number of criteria (Johnstone & Bedard, 2003; Simunic & Stein, 1990)”.

individual attributes such as their educational background, their working experience and their status within the audit firm. Knechel, Vanstraelen, and Zerni (2015) show that certain auditors have a greater tolerance for a certain type of reporting (aggressive vs. conservative reporting) and that such tolerance extends to other clients of the same partner. They emphasize that “aggressive or conservative audit reporting is a systematic partner attribute” (Knechel et al., 2015, p. 1444), which can affect audit quality at the various engagement of these audit partners. This individual attribute can affect clients’ auditor selection decisions. For example, while some clients prefer more aggressive audit partners, other clients may avoid aggressive audit partners, because aggressive audit reporting means “higher interest rates, worse credit ratings and the higher likelihood of insolvency” (Knechel et al., 2015, p. 1473).

When assigning clients, it becomes a tedious exercise for audit firms to guarantee audit quality as allocating sufficient time and effort to all clients becomes increasingly difficult when their workload increases (Bhattacharjee et al., 2007; Bhattacharjee et al., 2012; Mullis & Hatfield, 2018). As lead auditors play a pivotal role in controlling audit quality, audit firms should thus carefully determine the client-lead auditor pairs to make full use of their human resources. However, auditors and their clients may intervene in the process such that an ‘optimal’ allocation might not be achieved. This can arise because certain auditors may not want to have certain types of clients, and clients alike may have their preferences for auditors whom they are familiar with or prefer auditors with a certain style. In what follows, we first discuss why allocations should focus on proper matching before discussing other incentives to intervene in the process.

3.1. Assortative matching

From a theoretical perspective, the allocation process needs to consider factors that can have a positive impact on the quality of service when planning human resources to individual assignments (e.g., Goodwin & Wu, 2016; Li et al., 2018; López & Peters, 2011; Wang, Wang, Yu, Zhao, & Zhang, 2015). Practically, audit firms should consider lead auditors’ characteristics and their current and previous performances in the allocation process. The underlying principle here is to realize proper matching based on expertise level, industry specialization and other relevant factors that benefit audit efficiency and quality or the so-called ***assortative matching***. By doing so, a reasonable workload can be guaranteed across the lead auditors. The principle of ***assortative matching*** has been endorsed by the regulatory bodies. For instance, the PCAOB calls audit firms to assign the audit work to the person who has the degree of technical training and proficiency required in the circumstances (*Standing Advisory Group Meeting - Initiatives to Improve Audit Quality - Root Cause Analysis, Audit Quality Indicators, and Quality Control Standards*, 2014). Ideally, if there is a strong compatibility between an auditor and his or her clients, the respective allocations may produce positive effects

on audit quality and efficiency (Abdel-Meguid, 2012; Brown & Knechel, 2016). If matched appropriately, clients might also be less likely to switch auditors (Brown & Knechel, 2016; López & Pitman, 2014).

Based on the above discussion, questions that deserve particular attention are a) what the compatible client-audit pairs are, and b) how the audit firms determine these pairs? On the one hand, better human resources are more likely to be assigned to the larger value clients (Becker, 1974; Chatain & Meyer-Doyle, 2012; Durlauf & Seshadri, 2003). This principle can be applied to the audit context to determine the compatible pairs when audit firms aim at efficiency and effectiveness (Brown & Knechel, 2016; Hackenbrack & Knechel, 1997). Asare et al. (2005), for instance, support the view for the importance of experienced auditors. Their findings illustrate that “more experienced staff play a greater role in the audits of riskier clients” (Asare et al., 2005, p. 493). On the other hand, to increase the future compatibility between lead auditors and clients, audit firms might allocate lead auditors to a certain type of client in order to gain additional knowledge, which may not directly improve current audit quality (e.g., Beck & Wu, 2006; Brown & Knechel, 2016; Løwendahl et al., 2001; Westermann, Bedard, & Earley, 2015). For instance, in a qualitative case study, Fosstenløkken, Løwendahl, and Revang (2003) observe that clients can be used as a crucial source of knowledge development in knowledge-intensive firms. While such allocations may not directly benefit current audit quality, audit firms may focus on such allocations to help auditors to develop expertise that they can use for their future engagements.

3.2. Other incentives in matching

The determination of client-auditor pairs is not only a product of the audit firms' allocation decisions. Other factors than the audit firms' interests may also influence the matching of client-auditor pairs. Client requests are one of the factors that can impact these allocation processes (Jonathan Cook, Kowaleski, Minnis, Sutherland, & Zehms, 2020; Skinner & Srinivasan, 2012). For example, large commercial and industrial clients may demand audit firms to allocate them to reputable lead auditors for reputation purposes (Gong et al., 2019; Kacanski et al., 2020). Similarly, in the market for IPO firms, Li et al. (2018) find that firms with higher reporting quality prefer to select auditors with more experience; firms with higher quality financial reporting are willing to select auditors with a local presence. Other clients may not always prefer high audit quality; on the contrary, they may prefer auditors that are more tolerant of aggressive reporting and try to find partners that match their reporting style (Hurley & Mayhew, 2019). As a result, these client-orientated decisions driven by clients' pressure and incentives may intervene in the workload allocation process.

Moreover, lead auditors can also intervene in the allocation process. Audit firms' reliance on their skilled auditors gives auditors bargaining power to intervene in the allocation

processes to select their preferred clients (Nordenflycht, 2010). Furthermore, allocation can be of great importance for lead auditors. In practice, the lead auditor's client portfolio plays a vital role in the process of his or her career development as it may boost their promotion opportunities, reputation. Both factors stimulate lead auditors to intervene in the workload allocation process and use tactics to be assigned to their preferred clients. Individual auditors can intentionally control their portfolio by engaging in or rejecting certain engagements (Pittman, Qi, Zhang, & Zhao, 2021; Pittman, Wang, & Wu, 2017; Xue et al., 2013). Moreover, when auditors prioritize their compensation, they are more likely to extend their client portfolio despite already having a high workload since the client portfolio size can boost an individual auditor's compensation (Dekeyser, Gaeremynck, Knechel, & Willekens, 2021; Knechel, Niemi, & Zerni, 2013). To augment their reputation as high-quality service suppliers, lead auditors can intervene in the allocation process to avoid riskier clients (e.g., Krishnan & Krishnan, 1997) or accept large commercial and industrial clients who offer them status (Myers et al., 2003).

In addition, the governance strategies may also influence the workload allocation process. In a given audit firm, the patterns of allocation might be different across its audit offices due to the semi-autonomous nature of audit offices (Bell, Bedard, Johnstone, & Smith, 2002; Johnstone & Bedard, 2003) or the type of access to resources (e.g., Summers, 1972). This can trigger variation in the determination of auditor-client pairs across audit firms. The variation of the allocation decisions might be caused by the differences in the audit firms' decision-making approaches (e.g., Asare & Knechel, 1995; Johnstone & Bedard, 2003) or by the accounting firms' emphases on the profitability of the engagement (Gendron, 2001; Knechel et al., 2013).

All in all, auditors play an important role in providing audit services effectively and efficiently to maintain audit firms' reputations and competitive advantages. Audit firms should thus carefully determine the 'optimal' client-lead auditor pairs. However, relevant factors and incentives can prompt auditors or clients to intervene in these allocation processes. These interventions may disturb the audit firms' allocation decisions and lead to more 'improper' matching in audit firms, all of which potentially hamper the audit quality.

3.3. Gender issues in auditing context

The individual workload allocation process and potential biases that may arise herein can also explain some of the gender differences in audit firms. The underlying principle is that the allocation process plays a vital role in auditors' skill and knowledge development. For example, lead auditors can be matched with a client that allows him or her to develop knowledge, which will increase the quality of audit professions for the reason of the knowledge overlap (e.g., Beck & Wu, 2006; Brown & Knechel, 2016; Løwendahl et al., 2001; Westermann et al., 2015) and offer a greater opportunity for an individual to improve his or her managerial skills (Abdolmohammadi, Searfoss, & Shanteau, 2004). Thus, we argue that when gender bias

or gender inequality exists in the workload allocation process, female auditors may not obtain sufficient and comparable opportunities compared with male auditors to develop their skill set, which further impacts the performance of female auditors.

Prior studies have found evidence that the risk perceptions, audit quality, and audit fees differ across gender (Khelif & Achek, 2017). For example, in an experimental study with 40 auditors, Breesch and Branson (2009) explored the gender-risk perception relationship. While female auditors are more likely to discover more potential misstatements than male auditors (indicating female auditors are more risk-averse than males), they also find that the misstatements discovered by females are less accurate than those discovered by male auditors. In terms of audit quality, the effect of female auditors on audit quality is debatable. The positive effect of female auditors on audit quality only occurs under certain conditions. For example, Harymawan, Nasih, and Noeraini (2019) find that female audit engagement partners are more likely to provide higher audit quality only for high-growth companies. When the clients have a low audit risk, the audit quality of female auditors is lower than that of male auditors (Yang, Liu, & Mai, 2018). However, female auditors tend to issue more going-concern audit opinions than their male counterparts (Chin & Chi, 2008). The tendency increases when clients become more important (Hardies, Breesch, & Branson, 2016).

We argue that biases in the workload allocation can explain some of these performance differences. We speculate that female auditors might not always be able to develop sufficient and comparable capabilities due to the potential biases in the workload allocation. Suppose the allocation process is biased to certain types of clients. In that case, female auditors may only develop specific capabilities towards certain types of clients (e.g., riskier clients), which can affect the audit quality. For instance, when female auditors may face barriers in the workload allocation process, because audit firms may assign them to clients with high audit risks, they might be good at assignments that involve high-risk clients. Yet, because of lack of experience at other engagements, their audit quality may suffer.

Gender differences also occur in audit firms' price setting (audit fees). In the study of Ittonen and Peni (2012), firms with female audit engagement partners are more likely to have higher audit fees. In a similar vein, Hardies, Breesch, and Branson (2015) and Liu (2017) confirm the existence of female audit fee premium, which can be explained by the different capabilities between male and female auditors (e.g., skills, preferences, etc.). We again speculate that some of these female pricing differences may also be explained by the workload allocation. For example, an audit fee premium for female auditors might arise when audit offices systematically assign female auditors to clients with higher audit risk and these risks are insufficiently controlled for in audit fee models.

The client intervention in workload allocation may also prompt the gender-biased workload allocation, which further impacts female auditors' performance. For example, clients

with female auditors are more likely to have lower discretionary accruals (Chin & Chi, 2008) or lower abnormal accruals (Ittonen, Vähämaa, & Vähämaa, 2013), which indicates that female auditors can better constrain the earnings management. Clients may therefore prefer female auditors (Nasution & Jonnergård, 2017). Similarly, because the female engagement auditors positively impact the reliability of clients' earnings and are more likely to report high relevant equity book value (Al-Dhamari & Chandren, 2018; Niskanen, Karjalainen, Niskanen, & Karjalainen, 2011), clients that focus on higher reporting quality may demand such female auditors. Nevertheless, for the same reason, other clients may tend to avoid them.

Differences in gender-related performance in audit offices (due to differences in allocation) may further impact auditors' career development and prompt the glass ceiling problem. Accounting firms explain the glass ceiling problem by the 'pipeline' problem (Berg, 1998). That is, women have not been in auditing or accounting professions long enough to work their way to the top. While in recent years, this gap has been addressed as the effect of women's representation has largely increased in auditing contexts (e.g., Baldo, Tiron Tudor, & Faragalla, 2018; Crompton & Sanderson, 1986; Davies, 1996; Pollert, 2005), the glass ceiling problem did not fully disappear. Females are still underrepresented in the higher-level positions in audit firms, according to 2020 Accounting MOVE Project Reports. While females make up 52% of full-time U.S. employees at accounting and consulting firms in 2020, only 29% of females perform a top-level role (*2020 Accounting Move Project Reports*, 2020, p. 13). By interviewing male and female auditors about their auditing experience and career development in their audit firms in France, Dambrin and Lambert (2008) conclude that female auditors are excluded or exclude themselves from the partner groups. In general, the opportunities for promotion seem to differ for female auditors (Dambrin & Lambert, 2008; Herbohn, 2005), and discriminations in salaries still exist (Hardies, Lennox, & Li, 2020).

However, the drivers to the different performance between male and female auditors and the glass ceiling problem are still contestable. Although the allocation process is important for skill development in auditing contexts, little is known about the role of allocation in gender bias or gender inequity. Systematic biases in the allocation across gender can contribute to these differences. Next to differences in audit performance, career development for females might be at stake when males would typically conduct audits for the more reputable clients and females systematically receive more challenging and riskier clients. This study, therefore, explores the gender biases in workload allocation and the consequences such biases have on auditors' performance and career development.

4. Project on Auditors' Workload Allocation and Expected Contribution

4.1. Project on auditors' workload allocation

As discussed above, audit firms face several challenges in allocating their workload across auditors. This project thus aims to gather detailed insights on how audit firms match their clients to lead audit partners. In doing so, we will shed light on how audit firms tackle challenges in the allocation processes and how such allocations and potential biases herein affect audit quality. In the following, we indicate how we will provide evidence on the workload allocation problem in three different but interrelated studies.

Study 1: The workload allocation process in audit firms

This study takes the initial step towards developing a systematic understanding of how audit firms deal with their lead auditors' workload in the allocation process. The importance of lead auditors' workload has been articulated in recent initiatives aiming to improve audit quality and efficiency. However, prior studies on the allocation mainly focus on exploring the audit hours allocation process using client-relevant characteristics as explanatory variables (see *Section 2.2*). Systematic research on how audit firms allocate their lead auditors to certain clients is largely absent. Audit firms can determine the 'optimal' client-lead auditor pairs following the rule that better human resources are more likely to be assigned to the higher-value clients. However, unique incentives and demands from clients and lead auditors can motivate them to intervene in the workload allocation process (see *Section 3*), which may hamper the audit quality. As systematic research on the topic is largely absent, we plan to conduct the exploratory analyses using a qualitative study (Yin, 2016).

Therefore, we will first conduct semi-structured interviews and survey to gather information about the workload allocation process based on the responses from lead auditors and planning team staff members. The idea is to gather evidence on assortative matching, other incentives, and biases that may intervene in the allocation process. The following research questions are developed for the interview and the survey:

S1_RQ1: *Do audit firms consider the best fit between the client (and their needs) and lead auditors? If so, how do the audit firms determine the 'optimal' pairs?*

S1_RQ2: *What factors (e.g., expertise, workload balance, client risk, etc.) does workload planning consider when determining the lead auditor-client pair?*

S1_RQ3: *Who is the primary decision-maker in the allocation process?*

S1_RQ4: *Do the lead auditors intervene in the workload allocation process? If yes, how? and what is the bargaining power of lead auditors in selecting clients?*

S1_RQ5: *What factors drive the conflicts between the pursuit of lead auditors and the allocation decisions that audit firms like to pursue?*

S1_RQ6: *What are the demands or preferences of clients for the lead auditors, and how do these demands and preferences affect the allocation process?*

Study 2: Assortative Matching and Other Incentives in Matching: Archival Evidence from Lead Auditors

This study extends our findings in Study 1 by empirically validating the matching strategies within audit firms. We will focus on data stemming from the Belgian audit market (or other jurisdictions). In the Belgian market, the public disclosure of the auditor signing the audit opinion is mandatory for all firms that need to have an auditor (including listed and non-listed private firms). This disclosure allows us to have a complete picture of the lead auditor's client portfolio and how new clients (up for renewal) are assigned to each auditor. In doing so, we can investigate workload allocation at the lead auditor level and are able to discern which clients are allocated to which particular auditors when the engagement is up for renewal.

Firstly, as discussed in previous sections, an increased workload can reduce the quality of audits because a lead auditor cannot increase their working hours indefinitely. As a result, the auditor may not be able to allocate sufficient time and effort to all his or her clients. Therefore, under ideal conditions, a busy lead audit partner is less likely to be assigned to a 'new' client because audit firms may respond to a high workload problem by diverting clients away from already busy lead auditors to less busy lead auditors. In doing so, audit firms can mitigate the potentially adverse consequences of high workloads on audit quality. In other words, new clients will be assigned to an auditor only when there is a sufficient degree of capability. This leads to the following research question:

S2_R1: *[Balance matching] Are the lead auditors' client portfolios being balanced among lead auditors within the audit firm? If so, how do the audit firms make it balanced?*

Ideally, balancing lead auditors' client portfolios would be an optimal strategy if lead auditors were homogenous in terms of their attributes, which is not the case. Therefore, we argue that the individual differences between lead auditors should be considered when making allocation decisions; the audit firms will rely on the **assortative matching** model to make full use of their human resources. That is, audit efficiency likely improves when the 'optimal' client-lead auditor pairs are determined according to client's and lead auditor's characteristics. The above discussion implies that higher-quality auditors should be allocated to higher value clients, even if they spend less time on each client on average, which attenuates the effect of **balancing matching** in an audit firm. This leads to the following research questions:

S2_R2: *[Assortative matching] Is the size of the client portfolio being bigger for higher quality lead auditors? If so, what is the component of these lead auditors' client portfolios?*

S2_R3: *[Assortative matching] Who is the one that gets more clients, especially get more riskier clients?*

Finally, lead auditors may have considerable bargaining power to intervene in the allocation process in order to pursue their own interests (Kaiser et al., 2015; Løwendahl et al., 2001; Nordenflycht, 2010). Prior research suggests that lead auditors' portfolio size and composition is among the main determinants of lead auditor's compensation (Knechel et al., 2013). As a result, lead auditors may have strong incentives to expand their client portfolios by intervening in the allocation process. Furthermore, auditors may prefer clients they know from their network (Pittman et al., 2021; Pittman et al., 2017; Xue et al., 2013), clients that are bigger and that offer the lead auditor a strong reputation (Myers et al., 2003), and clients with less audit or financial reporting risk (Krishnan & Krishnan, 1997). This leads to the following research questions:

S2_R4: *[Other incentives in matching] Is the size of reputable clients or clients being known to the auditor bigger for more powerful lead auditors? If so, what is the component of these lead auditors' client portfolios?*

S2_R5: *[Other incentives in matching] Is the size of riskier clients being smaller for more powerful lead auditors? If so, what is the component of these lead auditors' client portfolios?*

Study 3: Gender bias and inequity in workload allocation process

In this study, we will explore the consequences of the allocation models by exploring the effect of gender issues in workload allocation on lead auditor's performance and career development. We will still focus on the Belgian audit market by checking lead auditors' gender manually. Prior studies indicate that female auditors are different from males in risk perceptions, audit quality (under certain conditions), and audit fees due to individual capabilities. These individual capabilities are related to the auditing practices (Gul et al., 2013; Knechel et al., 2013). In other words, lead auditors can develop their individual capabilities by auditing clients (e.g., Beck & Wu, 2006; Brown & Knechel, 2016; Løwendahl et al., 2001; Westermann et al., 2015). When the workload allocation is biased and inequality in gender arises, we argue that barriers for female auditors to develop their individual capabilities may occur. Such biased allocations can further impact female auditors' career development within the audit firms. Thus, we speculate that the biased allocation can be at play for different performance between male and female auditors and gender-biased promotion opportunities. Based on individual audit assignments to clients in the market, we can explore whether female auditors receive different types of clients than their male counterparts and whether systematic biases exist (e.g., males conducting the more reputable clients, females performing riskier audits, etc.). Given the factors, we derive the following research questions:

S3_R1: *What is gender bias or what represents a gender inequity in the allocation process?*

S3_R2: *What are the factors that trigger gender bias or gender inequity in the allocation process?*

S3_R3: *What is the effect of the biased allocation on the performance of female auditors and their career development?*

S3_R4: *What are the consequences of the biased allocation for female auditors (i.e., female auditors' career development and the status within audit firms)?*

4.2. Expected contribution

By answering the research questions for each study, we will present the first large-scale evidence on how audit firms allocate lead auditors to their clients. We further examine whether such decisions affect the performance of lead auditors. In doing so, we provide several contributions to academia and practice.

Firstly, our research responds to the call to open the ‘black box’ of audit firms’ human resources management by exploring the allocation processes that determine the workload and specialization of lead auditors in audit firms (Defond & Zhang, 2014; Francis, 2011). We examine how client and lead auditor are being matched with different matching strategies and focus on the important role of client-to-auditor matches in auditors’ career development. In particular, our project explores how client-auditor matches early on in auditors’ careers may facilitate or hamper auditors’ career development, and further examine the effect of the matches on audit quality. Our results will benefit audit firms for developing audit controls and audit training regarding workload management in practice.

Secondly, our research findings are expected to fuel interests in research on lead auditors’ and clients’ preferences and incentives that drive them to intervene in the workload allocation process. We argue that workload decision is not only a product based on the audit firms’ overarching goal of delivering high audit quality at every engagement, but a product of compromises and negotiations among audit firms, lead auditors, and clients. Given the factors, this project offers an important first step in answering how the audit firms solve challenges in allocating processes when balancing auditor wishes and client preferences in terms of audit efficiency and effectiveness. Such research is important, as systematic allocation biases may hamper the delivered audit quality, in particular when such biased allocations deviate strongly from the ‘optimal’ client-lead auditor.

Lastly, our project also contributes to the literature on gender differences in the auditing context. While female auditors play a critical role in providing high-level audit service (Harymawan et al., 2019; Menezes Montenegro & Bras, 2015) and audit fees (Hardies et al., 2015; Ittonen & Peni, 2012; Liu, 2017), audit firms face challenges to retain their female auditors. Little is known whether this high-level turnover is caused by gender bias and inequity

in the workload allocation process. Thus, our project aims to explore the gender bias or gender inequity in the workload allocation process within audit firms and potentially discover the effect of such bias and inequity on audit quality. Our findings can bring insights to audit firms and regulators about the effect of workload allocation on female auditors' career development. A greater understanding of biases in the workload allocation can help retain female auditors by potentially changing how allocations are done within audit offices.

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