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List of Abbreviations

Art.	Article
Coef.	Coefficient
COD	Cost of Debt
EU	European Union
EY	Ernst & Young
GB	Great Britain
NAS	Non-audit services
Obs.	Observation
SOX	Sarbanes-Oxley Act
US	United States

1. Introduction

Scandals involving accounting firms make it into the headlines of the national and international press time and again. In particular, the spectacular collapses of companies following balance sheet manipulation have plunged the auditing profession into a serious crisis of confidence. Most recently, the German "Wirecard scandal" made international headlines. The consequences are being discussed by the German government and in Brussels, and solutions such as higher liability sums or mandatory joint audits, in which two independent auditors examine annual financial statements according to the "dual control principle" have been proposed (Bert Fröndhoff and Ruth Berschens, 2020). At the time of the Wirecard scandal, in 2021, former German Finance Minister, Olaf Scholz, even questioned the compatibility of auditing and consulting being done by one company. The Green parties and Liberals in the EU Parliament are, likewise, calling for a clearer separation of auditing and consulting tasks, as are academics, who are using the Wirecard scandal as an opportunity to make this call (Kaiser, 2021).

These demands are not new, however. There are also calls for a clearer separation of auditing and advisory functions after the global economic crisis in 2008. The former EU commissioner for internal market and services, Michel Barnier, introduced the *Green Paper* to the EU back in 2010 (European Commission, 2010). Barnier concludes that the function of the auditor should be examined more closely, as it played a crucial role in the 2008 financial crisis. Impeccable audit opinions that had been given to banks involved in the financial crisis, raised concerns about auditor independence. Therefore, the primary objective of the *Green Paper* is to analyze what changes are needed to strengthen the auditor's function and thus increase market stability. The *Green Paper* is the basis for the EU Audit Regulations that became binding in 2016 (Willekens *et al.*, 2019).

Other countries have also experienced various scandals in the past that called into question the independence of auditors. Sweden, in particular, experienced several major tax scandals in the 20th century (Rimmel and Jonäll, 2011). These scandals varied in scale and most involved unethical and illegal conduct or, more generally, misleading or inadequate financial information about complex corporate activities. Four financial scandals that involved Swedish companies, in which good accounting practices are not pursued, concerned the companies Fermenta, Prosolvia, ABB, and Skandia (Rimmel and Jonäll, 2011). Over the last 20 years no new major scandals occurred. However, this does not mean that good accounting practices are used in

Sweden. After all, there are still financial scandals for which auditors also have to take responsibility, which, in turn, leads to calls for increased regulation. Reform of the accounting profession occurs cyclically in the wake of accounting scandals that catch the public's interest and lead to demands for a change in the system (Gong *et al.*, 2016).

There has been a longstanding debate about whether the independence of the auditor is impaired by audit firms providing NAS to clients or not (Zerni, 2012). There is a general suspicion that auditors give up their independence in order to attract or retain clients who are willing to pay high fees for NAS (DeFond *et al.*, 2002). It is argued that auditors who offer lower prices induce companies to stay or switch to that auditor in order to receive fees for NAS. As a result, regulators consistently point out that auditors are too sympathetic to the interests of a client or employer, or too accepting of their work because of a longstanding or close relationship with them (Zerni, 2012). Factors that could help to impair auditor independence are NAS, modified auditor opinions, auditor tenure, and the cost of debt.

All these factors have been analyzed in numerous studies around the world. Scholars have investigated whether there is a link between commissions for NAS and auditor independence. Researchers have focused mainly on English-speaking countries, such as the United Kingdom (UK) and the United States (U.S.) (Tepalagul and Lin, 2015; Frankel et al., 2002; Francis et al., 2005). However, there are some studies from continental Europe in which no evidence is found that NAS have a negative impact on auditor independence (Pucheta-Martínez and Fuentes, 2007; Ianniello, 2012; Krauss and Zulch, 2013; Ratzinger-Sakel, 2013). To extend this line of research and add value to the discussion, the focus of this study is on investigating the relationship between NAS and auditor independence in Sweden.

The aim of the study is to contribute to the current debate by investigating whether there is empirical evidence of threats to auditor independence related to the simultaneous provision of auditing and NAS in Sweden as well as the impact of the new EU Regulation and Directive. The results of the current study do not support the assumption that auditor independence is threatened by to the simultaneous provision of audit and consulting services. However, the introduction of the EU Audit Regulation led to the reduction of NAS fees in Sweden over the 2017 to 2019 time period. Furthermore, no empirical evidence that demonstrates auditor tenure, auditor opinion and the relationship between unexpected fees and the cost of debt are related to NAS. Therefore, this study contributes to the steam of literature of auditor tenure, auditor opinion, and the cost of debt.

The remainder of the study is organized as follows. Chapter 2 consists of a presentation of prior research on auditor independence and the background required to develop the study's hypotheses. Chapter 3 is a description of the research design, sample and model specification. Chapter 4 is a presentation of the empirical results and the robustness check of the results. Chapter 5 comprises a discussion of the results and, finally, conclusions are drawn in Chapter 6.

2. Background and hypothesis development

Sweden is not known for frequent corporate scandals involving fraudulent accounting. However, since the 20th century, the country has had several major corporate scandals that involved varying degrees of unethical and illegal behavior. In particular, the collapse of Ivar Kreuger's financial empire in the 1930s is worth noting because it was one of the best-known Swedish companies to collapse during the global financial crisis of the time due to liquidity problems (Rimmel and Jonäll, 2011). After the collapse, the authorities determined that the company had little substance. At that point, Swedish lawmakers pushed for increased regulation and revised the disclosure of information from corporate balance sheets. In direct response to Kreuger's bankruptcy, the U.S. Congress enacted the Securities Act of 1933 (Rimmel and Jonäll, 2011). However, the introduction of good accounting practices did not result in the absence of accounting scandals in Sweden. Fermenta, Prosolvia, ABB and Skandia are other companies that have experienced financial scandals in the last century, characterized by fraud, misleading statements, and unclear reporting (Rimmel and Jonäll, 2011).

Auditor independence and, in particular, the influence of auditor independence have been the subject of previous studies, but there is no indication that those studies had an effect of the EU Audit Regulation (Ashbaugh-Skaife *et al.*, 2002; Cahan *et al.*, 2008; Chu and Hsu, 2018; Church *et al.*, 2015; DeAngelo, 1981). Doubts regarding the independence of auditors have repeatedly come to the attention of the public and the supervisory authorities in the course of crises and individual financial scandals. For example, the financial crisis of the 2000s prompted U.S. regulators to enact the new Sarbanes-Oxley Act (SOX) in 2002. The SOX Act prohibite the provision of certain types of NAS to audit clients because of concerns about auditor independence. Section 201 of SOX, which became effective on June 30 2002, states that accounting firms are no longer permitted to provide most services outside their area of expertise to their audit clients (Elitzur *et al.,* 2021). In addition, audit and NAS fees must be disclosed annually. Proponents of this measure point out that if the proportion of fees for NAS are too high compared to audit fees, there is a risk that auditors will cave in to clients and lose their independence. Conversely, opponents argue that the demand for NAS is related to multiple developments in the corporate world and that various services improve client understanding (Elitzur *et al.*, 2021).

The global financial crisis of 2008 led EU regulators to implement new regulations. In particular, the EU finance minister, Michelle Barnier, wanted to strengthen auditor

independence across the EU through new regulation. He explained that the influence of auditors had been largely ignored during the financial crisis (European Commission, 2010), which is why he wants to use the *Green Paper* to shine a spotlight on their work and importance. Market stability and strengthening the auditor position is one of the main aims of the *Green Paper*. In this context, the *Green Paper* emphasized the leading role of auditors in society as they are responsible for the events that led to the financial crisis in 2008. Therefore, the *Green Paper* emphasizes, that auditor independence supposed to be the basis of the audit practices (European Commission, 2011a, p. 3).

The *Green Paper* initiated the European audit reform package, consisting of the Audit Directive 2014/56/EU on statutory audits of annual accounts and consolidated accounts (hereafter referred to as "the Directive") and Audit Regulation (EU) No 537/2014 of the European Parliament (hereafter referred to as "the Regulation"), which has finally become applicable across the European Union in 2016 (Willekens *et al.*, 2019). The aim of this regulation is to reform the market for audits. The Regulation is a binding legal act with the quality of law and applies directly in all member states without the national legislator having to order its application separately (Willekens *et al.*, 2019). The Regulation applies to legal audits of public interest entities (Art. 12 of the Regulation).

Unlike the Regulation, which is binding in all parts, the Directive is binding only with respect to the specified objective. The legislative bodies of the member states decides for themselves in what form and by what means the objectives are to be achieved. Directives, however, are a compromise between the harmonization of the legal systems of the member states and the preservation of national characteristics. Therefore, the Commission gives preference to the Regulation whenever possible (Streinz, 2019).

For the audit of undertakings classified as public interest entities, the Regulation provides that a contract between both parties may not exceed 10 years (Art. 17). However, it gives member states the option to require the rotation of audit firms to extend the tenure to 20 years if the contract is a 10 year commitment, and to a further four years if it is a joint audit (Art. 17(4)).

Another provision to strengthen independence is the constraints placed on certain NAS. The term “non-audit services (NAS)” is not defined in the regulation. All NAS are referred to as “Non-Audit Services” in terms of the meaning of Article 5(1) of the Regulation. If these services are not excluded by the blacklist in Article 5(1) of the Regulation, the auditor can, in principle, provide them. According to Article 5(1) of the Regulation, the audit firm may not provide blacklisted services to the audit client, its parent company, or an entity controlled by it

in the year audited or the year before (EU Parliament, 2014b). Some of these blacklisted services may be permitted by member states subject to the following conditions: They must not have a direct or immaterial influence on the audited financial statements and the predicted influence must be documented in an additional report to the audit committee, according to Article 5(3) of Regulation (EU Parliament, 2014b). The services prohibited and permitted by member states are listed in the Table below. Table 1 shows that some prohibitions may be permitted by member states, provided that the following requirements are met:

- "*they have no direct or have immaterial effect, separately or in the aggregate on the audited financial statements*" (EU Parliament, 2014b, p. 30);
- "*the estimation of the effect on the audited financial statements is comprehensively documented and explained in the additional report to the audit committee referred to in Article 11; and"* (ibid.);
- *"the principles of independence laid down in Directive 2006/43/EC are complied with by the statutory auditor or the audit firm"* (ibid.).

Table 1: Blacklisted non-audit services listed from the EU Parliament (2014b)

Service	Subitem	Permission to allow
tax services	"*preparation of tax forms*" (EU Parliament, 2014b, p. 27)	Yes
	"*payroll tax*" (ibid.)	No
	"*customs duties*" (ibid.)	No
	"*identification of public subsidies and tax incentives unless support from the statutory auditor or the audit firm in respect of such services is required by law*" (EU Parliament, 2014b, p. 27)	Yes
	"*support regarding tax inspections by tax authorities unless support from the statutory auditor or the audit firm in respect of such inspections is required by law*" (ibid.)	No
	"*calculation of direct and indirect tax and deferred tax*" (ibid.)	No
	"*provision of tax advice*" (ibid.)	Yes
valuation service	"*Including valuations performed in connection with actuarial services or litigation support services*" (ibid.)	Yes
legal services	"*the provision of general counsel*" (ibid.)	No
	"*negotiating on behalf of the audited entity*" (ibid.)	
	"*acting in an advocacy role in the resolution of litigation*" (ibid.)	
human resources services	"*management in a position to exert significant influence over the preparation of the accounting records or financial statements which are the subject of the statutory audit, where such services involve:* *searching for or seeking out candidates for such position or undertaking reference checks of candidates for such positions*"(EU Parliament, 2014b, p. 28)	No
	"*structuring the organisation design*"(EU Parliament, 2014b, p. 28)	
	"*cost control*" (ibid.)	
"*services that involve playing any part in the management or decision-making of the audited entity*"(EU Parliament, 2014b, p. 28)		No
"*bookkeeping and preparation of accounting records and financial statements*" (ibid.)		No
"*payroll services*" (ibid.)		No

Service	Subitem	Permission to allow
"*services that involve playing any part in the management or decision-making of the audited entity*"(EU Parliament, 2014b, p. 28)		No
"*services related to the audited entity's internal audit function*"(EU Parliament, 2014b, p. 29)		No
"*services linked to the financing, capital structure and allocation, and investmentstrategy of the audited entity, except providing assurance services in relation to the financial statements, such as the issuing of comfort letters in connection withprospectuses issued by the audited entity*" (ibid.)		No
"*promoting, dealing in, or underwriting shares in the audited entity*" (ibid.)		No

In order to strengthen the independence of the auditor independence, the Regulation requires that total fees for allowable NAS not to be higher than 70% of the average audit fees for three years according to Article 4(2) (EU Parliament, 2014a). Exceptions to this rule may be granted by member states if the auditor so requests.

The arguments of both proponents and opponents of the regulations are similar when discussing the EU Regulation and Directive or the previous US SOX regulation. Both sides in the U.S. and the EU cite the same studies. This is because, in the early U.S., before the introduction of SOX, when the authors of these studies examine the relationship between NAS and auditor independence, some authors, such as DeAngelo (1981) and Frankel *et al.* (2002), find confirmation of their suspicion in their studies, whereas other authors failed to find any correlation (DeFond *et al.*, 2002; Ashbaugh-Skaife *et al.*, 2002). Researchers who examine the period after the introduction of SOX also find no evidence that auditor independence are affected by NAS (Kinney *et al.*, 2004). In general, various parameters, such as audit quality, have been studied since the implementation of SOX (Knechel *et al.*, 2012). Knechel *et al.* (2012) conclude that NAS would not lead to less effective examinations. In addition, Griffin and Lont (2007) and Choi *et al.* (2009) find that examination fees increased after the introduction of SOX, but Causholli *et al.* (2010) cannot find a reason for this phenomenon.

More fundamentally, several branches of the debate on auditor independence have emerged to examine the factors that influence this independence more closely and specifically. This debate are triggered by earlier studies that observed U.S. firms and later those in other mainly English-speaking countries, such as the UK and Australia. Tepalagul and Lin (2015), who conduct a meta-study, develop a framework from prior literature to capture the various influences on auditor independence and audit quality. They address the threats mentioned in previous studies, such as client incentives, client importance, NAS, auditor tenure, and client affiliation with an audit firm. The studies used as a basis for the meta-study are almost exclusively from the US or English-speaking countries, which is indicative of the lack of continental European studies.

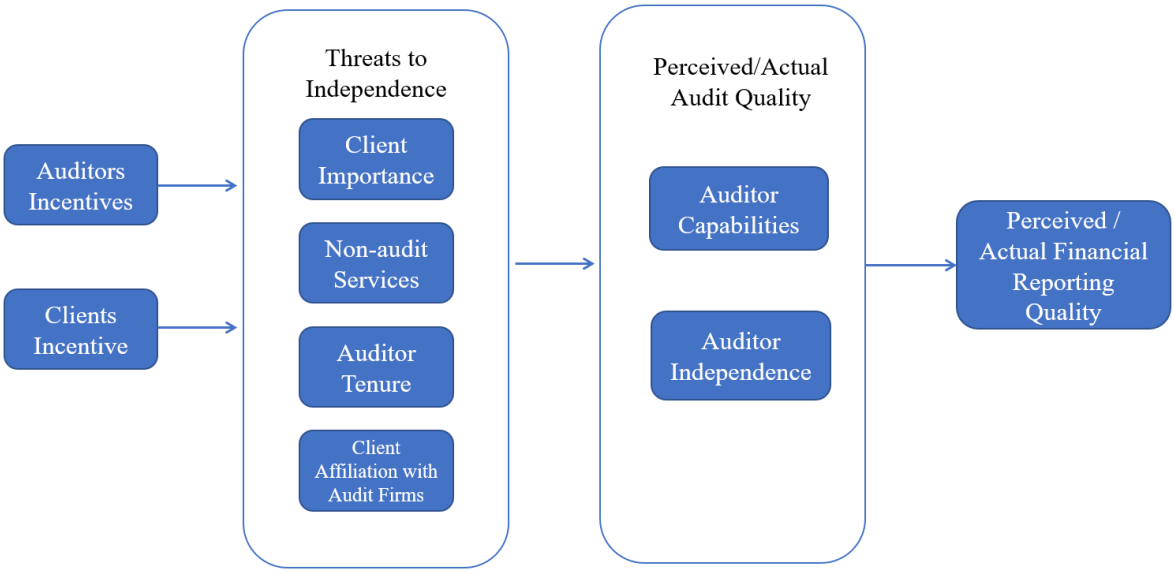

Figure 1: Various influences on auditor independence and audit quality; based on Tepalagul and Lin (2015)

In the European context, there are significantly fewer studies because the study of European countries has a more recent history. Most European studies focus on the larger European countries, such as France, Germany, Spain, or even Italy (Cameran *et al.*, 2016; González-Díaz *et al.*, 2015; Huguet and Gandía, 2014; Hohenfels, 2016; Kyriakou and Dimitras, 2018). Nevertheless, they follow a similar pattern. Threats to auditor independence, often identified as such in the US, are similarly identified and tested in European countries such as Croatia, Norway, or even Sweden (Filipović *et al.*, 2021; Svanberg and Öhman, 2014; Zhang *et al.*, 2016).

As an EU member state, Sweden is subject to the latest EU regulations since they joined the European Union in 1995. As a result, previous national regulations had to be adapted to European Legislation and EU Regulation, and separate laws for auditors and statutory audits had to be introduced, as in the other EU member states.

Among the more recent studies on auditor independence in Sweden is the study by Svanström (2013). Svanström investigates whether the provision of current NAS by incumbent auditors and discretionary accruals in Swedish private companies are related. Accordingly, he identified NAS as a threat to auditor independence. The results suggest that audit quality is positively associated with NAS, and NAS therefore imposes a threat to auditor independence. Another Swedish study by Zerni (2012) investigates whether conflicts between majority and

minority shareholders affect the acquisition of NAS, so Zerni (2012) also identifies NAS as a threat to auditor independence. The results show that representation costs are negatively related to both absolute and relative NAS and both studies, conducted before the EU Regulation, conclude that auditor independence is not impaired.

2.1. Impairment of non-auditing-services and auditor independence

According to Svanström (2013) and Zerni (2012), the independence of auditors in Sweden are not impaired. However, the authors of studies conduct in Europe (Competition and Markets Authority, 2018) and US (Ashbaugh-Skaife *et al.*, 2002; DeFond *et al.*, 2002; Kinney *et al.*, 2004) conclude that providing NAS can impair auditor independence. As noted above, confidence in auditor independence has been shaken by countless scandals, most recently the Wirecard scandal in Germany, and the failure to properly audit auditors. There is also growing concern that the commercial culture in which auditors work is causing them to have a conflict of interests. The UK House of Commons therefore commissioned a study to investigate how the auditing market in the country is developing and what the future might look like. A variety of aspects of auditing are examined, including the relationship between clients and auditors. This is because there is a suspicion that audit firms face a conflict of interest due to the temptation to sell NAS because they audit the same companies they advise and want to be reappoint (Business, Energy and Industrial Strategy Committee, 2019).

The suspicion is investigated by the British Competition and Markets Authority in the year 2018 and it is discovered that the Big 4 non-audit market is four times larger (and growing) in the audit market in the UK (Competition and Markets Authority, 2018). In this context, the relative size of the audit market is declining and, therefore, could no longer be considered the core business of the Big 4 firms in the UK. This is also reflected in the fact that none of the Big 4 audits are led by certified management accountants (Competition and Markets Authority, 2018).This situation indicate that the economic interests of the auditing and non-auditing parts of the companies are not separated. The NAS' share of corporate profits is significantly greater than the share of audit revenue, suggesting that auditing is subsidized by the NAS within the firms (Competition and Markets Authority, 2018). In a statement from KPMG UK on the Competition and Markets Authority (CMA) report, it is stated that audit partner compensation could not be maintained at current levels without cross-funding from NAS fees to attract the talent it needs (Business, Energy and Industrial Strategy Committee, 2019). The EY also issued a response letter to the CMA, stating that the audit practice deserves compensation for making a significant contribution to companies' brands and reputations, as well as to their risk management and compliance frameworks (Business, Energy and Industrial Strategy Committee, 2019). A closer look at this perspective reveals that the EY executives view the audit department as a branding investment that helps attract NAS. In addition, the audit market gives the Big 4 access to potential companies and executives to subsequently secure NAS contracts. Therefore, the

authors of the report concluded that this access is valuable enough for companies to offer audit services at a lower price in order to win non-audit contracts (Business, Energy and Industrial Strategy Committee, 2019).

Previous researchers have referred to the above practice as a "loss-leader strategy" (Zhang *et al.*, 2016). The joint provision of audit services and NAS has long been suspected of undermining an audit firm's economic dependence and increasing client dependence. When NAS and audit services are provided together, the auditor's ability to withstand client-induced biases in financial reporting decreases. Essentially, auditors offer audits at lower prices to induce companies to retain, or switch to, the auditor, so that the auditor can receive fees for NAS. This could pose a threat to auditor independence (Francis *et al.*, 2005). Causholli et al. (2014) also state in their study that there is a relationship between the purchase of future NAS and threats to auditor independence.

Previous researchers have countered the loss-leader argument with the knowledge spillover argument. Proponents of NAS claim that providing NAS facilitates access to relevant information and, thus, enhances audit quality through knowledge spillover (Copeland, 2000). Moreover, they argue that the negative relationship does not lead to a softening of auditor independence (Ashbaugh-Skaife *et al.*, 2002; DeFond *et al.*, 2002; Kinney *et al.*, 2004). Knechel *et al.* (2012) extended this line of research and added that the relationship between NAS and audit effectiveness and efficiency is significantly positively influenced by knowledge spillover, in that a more efficient audit can result from NAS, provided that the services do not compromise the quality of the audit.

Previous researchers have not reached a clear conclusion on this issue. Nevertheless, a number of them have conclude that the joint provision of audit services and NAS have a negative impact on the recognized adequacy of audit quality and the auditors (Hill and Booker, 2007; Krishnan *et al.*, 2005; Cahan *et al.*, 2008). In addition, there are studies, such as that of Zhang *et al.* (2016), that comprised investigations of whether auditor independence is influences by the joint provision of NAS and audit fees. However, Zhang *et al.*(2016), who conducted their study in Norway, did not provide evidence that either the loss-leader argument or the knowledge-spillover argument applies to the Norwegian market because no relationship between NAS and audit fees could be demonstrated.

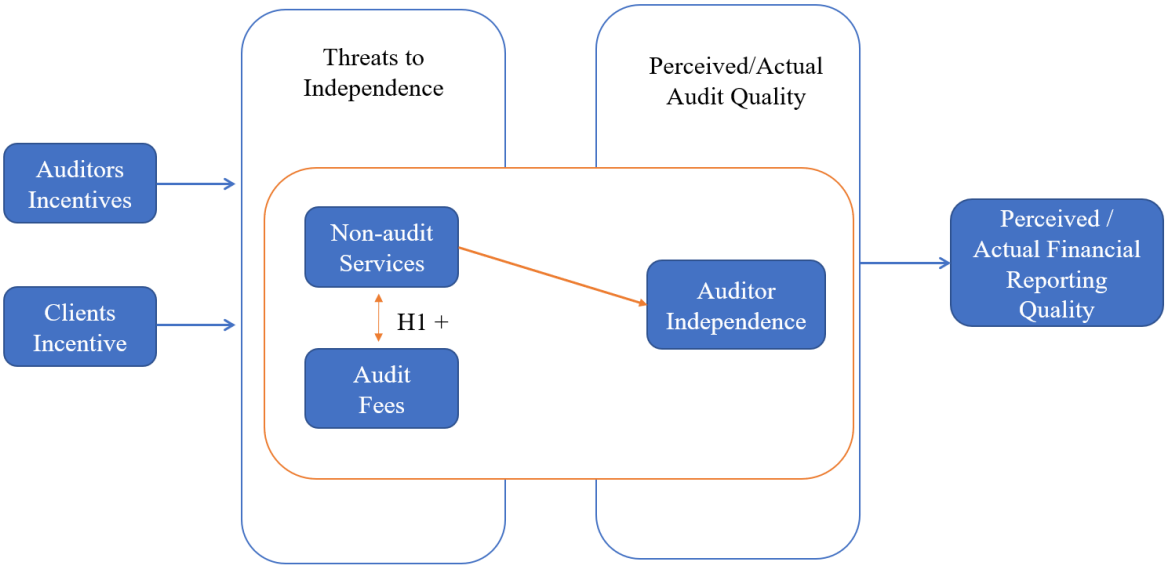

Figure 2: NAS influences on auditor independence based on Tepalagul and Lin (2015)

Looking at previous research, it can be determined that the evidence for a positive relationship between audit fees and NAS is predominant, which is why the following is hypothesized:

H1: Audit fees and NAS influence each other positively.

To illustrate the predicted relationship of NAS and audit fees, the Tepalagul and Lin (2015) framework is utilized and can be seen in Figure 2.

2.2. Auditor's opinion

One of the most important areas of research related to auditor independence is the manipulated issuance of an audit opinion (modified or not). There is a concern that large firms that occupy a large place in an auditor's portfolio might exert immense influence over the auditor, thereby jeopardizing their independence because there might be a high financial incentive to accommodate the wishes of larger clients (Tepalagul and Lin, 2015).

The audit opinion is the most immediately visible outcome of the audit practice because it is under the influence and control of the auditor. The decision to issue a modified audit opinion indicates the auditor's ability to resist the client's attempts to avoid any associated adverse effects and is, thus, an indication of the degree of the auditor's independence (Tepalagul and Lin, 2015).

That financial incentives impair auditor independence has also long been a concern of regulators. As a result, US regulators have already attempted to use regulations to prevent threats to auditor independence among large clients. Interestingly, Li (2009) states in his study that before the introduction of SOX, there is no demonstrable relationship between the importance of the client and the auditor's propensity to issue a modified opinion. However, after its introduction, this exact relationship can be demonstrated. The results suggest that larger clients in the U.S. are more likely to obtain a modified opinion.

Previous researchers also examined the impact of NAS on auditor independence in relation to issuing modified auditor opinions, particularly in the U.S. Sharma and Sidhu (2001) discovered that a qualified audit opinion is less likely for clients with a higher proportion of NAS. Sharma and Sidhu (2001), therefore, concluded that incumbent auditors who facilitate NAS compromise auditor independence. Firth (2002) also spotted a relationship between high NAS and audit reports. He describes two reasons for this: (1) auditor independence is not present or (2) consulting services are purchased to ensure that ambiguities and discrepancies are resolved prior to the audit. However, he concludes that no distinction can be made between the two possibilities, although an impairment of independence by NAS cannot be ruled out. The study of Li (2009) confirms the finding that NAS fees are associated with a higher tendency to issue a modified audit opinion. However, this is not the case in the study by Hope and Langli (2010), who concludes that auditors who receive a greater proportion of NAS special fees are associated with a lower likelihood of modifying the audit opinion. Sangkrista and Fitriany

(2017), who conducted their study in Indonesia, concluded that increased fees affect the audit opinions in that country, which can be attributed to an impairment of auditor independence.

In the European context, a few researchers have addressed this issue as well. The Norwegian study by Zhang *et al.* (2016) investigates whether there is a relationship between auditors' audit opinions and the level of fees. However, their results did not confirm this relation. Furthermore, the Croatian study of Filipović *et al.* (2021) also investigates this issue. The research results show a positive effect of auditor rotation in a fiscal year on the audit opinion. The authors attribute this effect to a lower level of knowledge about a client's business.

Wu *et al.* (2016) investigated the relationship between the threat of NAS and the quality of financial reporting. There is concern that auditor independence and audit committee financial literacy would be compromised. However, they find that only 34% of failed UK companies made going concern changes shortly before their failure. Furthermore, no significant relationship could be found between the auditor's NAS fees and the possibility that the auditor would change the going concern.

Svanberg and Öhman (2014) examines the issuance of amended financial statements in a sample of small Swedish businesses. The results show that the first-time issuance of amended audit opinions among small firms is positively related to a change of auditor. In addition, they conclude that companies that received a modified audit opinion for the first time have a higher failure rate than companies that received the same modified audit opinion. The conclusion is that issuing modified audit opinions to small clients may affect audit firm revenues, at least in the short term.

This Swedish study explores the environment of small, unlisted companies and the impact of changes in auditors' opinions. It joins a number of studies that have found a relationship between the impact of auditor independence and the issuance of adverse audit opinions. However, there are also studies in this line of research that have found no such relationship (Zhang *et al.*, 2016). Moreover there is no consistent picture regarding whether NAS has a specific impact on auditor independence or falsified audit opinion issuance. In the previous Swedish study, in which a sample of small, private companies are examined, it is concluded that there is a positive relationship between influencing small, private companies and auditors. The second hypothesis is formulated in light of this finding to test whether NAS has an specific influence on the independence of Swedish auditors:

H2: There is a positive relationship between issuing more NAS and issuing less modified audit opinions.

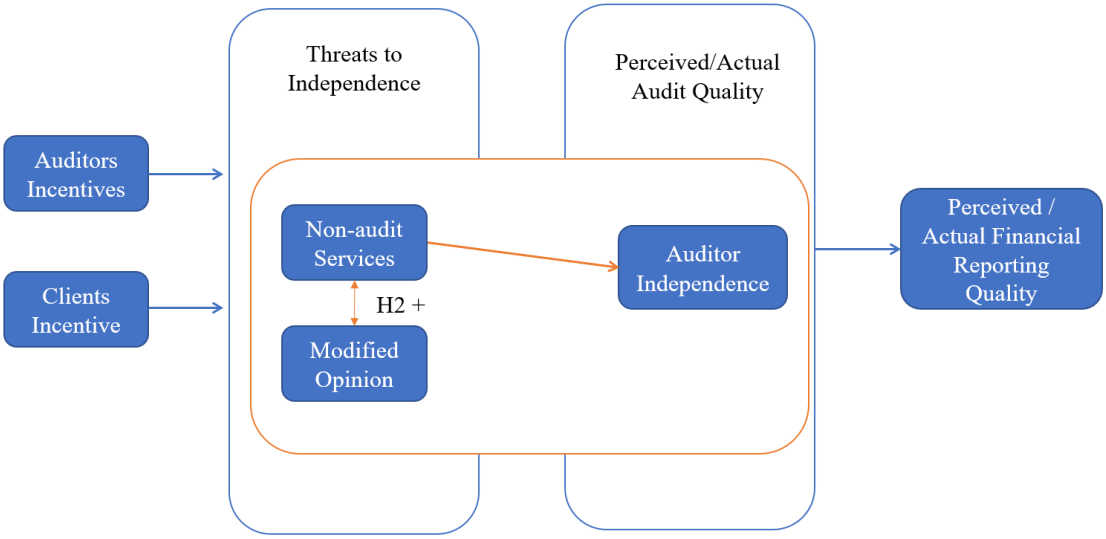

Figure 3: Influence of modified opinion and NAS on auditor independence; based on Tepalagul and Lin (2015)

2.3. Auditor tenure

Numerous academics have examined the consequences of mandatory auditor or accounting firm rotation (Raiborn *et al.*, 2006; Johnson *et al.*, 2002; Gul *et al.*, 2009; Hay *et al.*, 2006a; Cameran *et al.*, 2016; González-Díaz *et al.*, 2015; Kyriakou and Dimitras, 2018; Hohenfels, 2016), but the results have been inconclusive and controversial. Proponents of mandatory rotation point out that it mitigates the risk of familiarity by preventing a close relationship between the audited entity and the auditor. A new auditor reevaluates accounting practices, and the possibility of deception or the exploitation of old relationships thereby diminishes, as does the auditor's desire to satisfy the clients. On the other hand, opponents of mandatory rotation argue that audit quality will decline and audit costs will increase due to the lack of knowledge of client practices and the associated costly learning curve. Moreover, the number of available audit firms or auditors with the necessary size and industry expertise to perform certain client engagements is limited and more auditors would need to be trained (Raiborn *et al.*, 2006).

The first research results on this topic are obtained in the U.S. Johnson *et al.* (2002) concluded that a tenure of less than three years led to the association of auditor tenure with manipulation of corporate profits and the deterioration of audit quality. However, Carcello and Nagy (2004) cannot confirm this. They conclude that audit quality is not affected by auditor tenure. Gul *et al.* (2009) find that auditors gain experience with the audited company over time, which has a positive effect on audit quality. Therefore, long tenure increases auditor independence. Hay *et al.* (2006b) investigates the reason for which former researchers included the tenure of auditors in their analyses and discovered that a frequent change of auditors is used to obtain a lower fee, and that low balling is used to intentionally offer lower audit fees to attract new clients. Another reason for offering lower fees is that auditors can be more efficient and therefore offer lower fees. In both cases, companies are tempted to change audit firms after a short period because of the lower fees.

The study of Geiger and Raghunandan (2002) investigates deficiencies in the audits of financial statements in terms of assets and liabilities, which occur in the first years of operation due to the lack of confidentiality with the client. On the other hand, Knechel and Vanstraelen (2007) conclude following their study, that auditors provide an unbiased report mainly in the first two years of their tenure, in contrast to the last year of their tenure. In addition, Ghosh and Moon (2005) find that auditor independence and audit quality decrease with the years, compared to the auditing performance of auditors with a short tenure (Ghosh and Moon, 2005). In

contrast, Gul *et al.* (2009) believe that auditor independence is enhanced by a long auditor tenure.

The authors of European studies, such as the one conducted by Cameran *et al.* (2016) in Italy, conclude that mandatory auditor replacement does not have a positive impact on audit quality. They also conclude that auditor seniority has a positive effect on audit quality. However, they do not indicate whether auditor independence decreases with seniority. González-Díaz *et al.* (2015) examine this issue in their Spanish study and find that audit quality in Spain decreases with seniority, which supports the argument for regulating auditor tenure. In addition, Kyriakou and Dimitras (2018) examine the influence of factors related to external audits in their study of Germany, France, Italy, and Spain in the context of the 2008 financial crisis. Audit quality and auditor independence are considered in the context of the external audit. Specifically, the effects of auditor seniority on audit quality are examined using discretionary accruals. The results show that the effect of seniority (longer than three years) in Spain on discretionary accruals indirectly affects auditor independence and work. Notably, the relationship between auditor seniority and audit quality is statistically significant only in Spain. Audit quality is related to length of service as in Spain, auditor dependence is found to be greater with increasing length of service. The authors suspect that the Spanish legal system plays a role here because it is more transparent than the German and French legal systems.

Regulators have also joined the academic debate. As a result of the financial crisis of the 2000s, U.S. regulators introduced the Sarbanes-Oxley Act in 2002 (Amir *et al.*, 2010), which stipulates that a mandatory change of lead, coordinating, or reviewing auditor must be introduced every five years. Regulations are also enacted in Europe in response to the 2008 financial crisis (European Commission, 2010).

Hohenfels (2016) investigates at the German market the perception of audit quality and how investors view the length of the auditor's mandate as a factor influencing audit quality. She concludes that investors receive the early and later years of the auditor and client relation lower quality outcomes.

One of the first studies to address the impact of EU regulations is the one conducted by Polychronidou *et al.* (2020) on the Greek market after the introduction of the new regulatory framework under the European audit reform. The results indicate that most audit firms have internal guidelines for mandatory auditor rotation. The respondents assumed the increase of the overall cost of the audit process is due to mandatory rotation and additional work related. Nonetheless, most of the respondents support the requirements and even argue that the maximum

allowable duration of the audit should be four to six years. This is due to the required rotation of audit firms, which ensures that auditors could be more independent and objective in providing their services, thus strengthening auditors' independence.

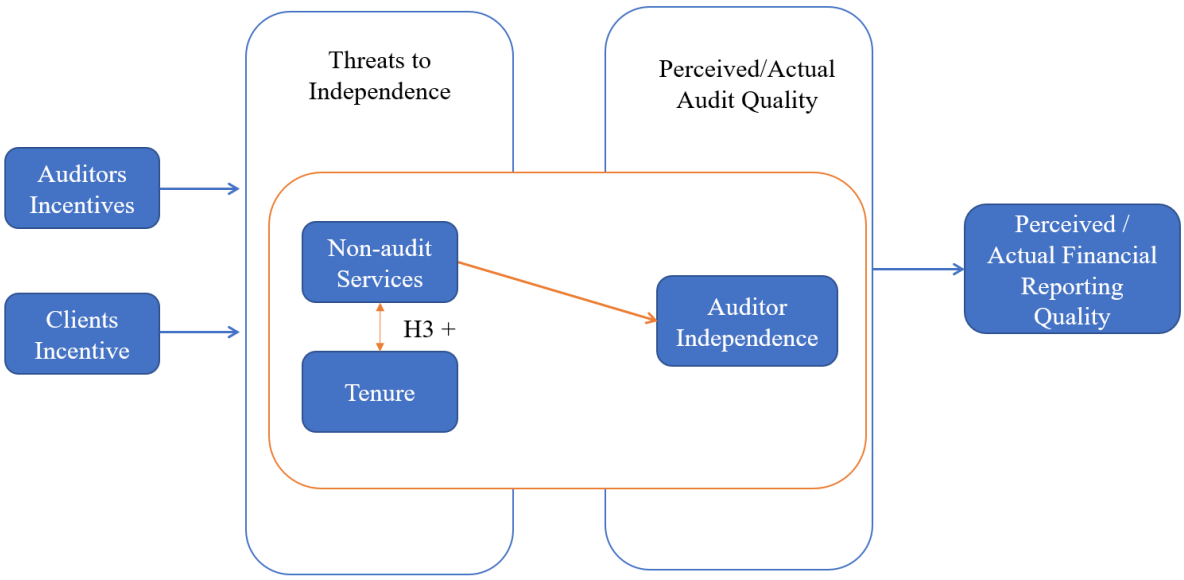

Figure 4: Influence of auditor tenure and NAS on auditor independence; based on Tepalagul and Lin (2015)

Building on these results, the purpose of the introduction of the EU Regulation is to unify the legal systems in the EU. However, EU regulators have expressed concern that NAS and examiner seniority might pose a threat to auditor independence. To test whether this assumption holds true for Sweden, the following hypothesis is formulated:

H3: Auditor tenure and NAS are positively related.

2.4. Excess fees and cost of capital

The fact that auditors receive their fees from their client companies can lead to a issue of independence. According to the Business, Energy and Industrial Strategy Committee study (2019), English accounting firms receive most of their fees from NAS and the current audit market undermines auditor independence and impedes competition. NAS fees are already four times those of audit fees, and audit services are subsidized by NAS (Business, Energy and Industrial Strategy Committee, 2019). This adds new weight to the current global debate about "excessive" audit fees.

Until now, it has always been argued that external auditors play a central role in promoting the quality of financial reporting because they provide credibility. They do this by auditing financial statements prepared by companies (Simunic, 1984), which should mean that external auditing potentially reduces agency costs between companies and external parties. However, this also leads to the dichotomy that outsiders will not trust companies' financial statements or financial information if they do not have confidence in the auditor's independence. As a result, opponents of simultaneals provision of audit services and NAS argue that auditor independence might be compromised by auditor's reliance on non-audit activities and by "excessive" audit fees (Doogar *et al.*, 2015). Doogar *et al.* (2015) conclude that unexpected fees in previous studies are measured by the residuals of audit fees and are largely representative of unobserved audit costs. Hribar et al. (2010) also find that high audit effort reflects a negative relationship between audit quality and fee residuals. In addition, Francis (2011) adds that unexpected fees serve as rents that pose a hazard to auditor independence.

Several other studies also provide evidence of a negative relationship between residual fees and financial reporting quality (Choi *et al.*, 2009; Hribar *et al.*, 2010; Kanagaretnam *et al.*, 2008; Hribar *et al.*, 2014). Srinidhi and Gul (2007) examine the quality of the accrual and concluded that it is difficult to distinguish whether excessive pensions lead to a deterioration in the quality of the accrual. On the other hand, Hribar *et al.* (2014) argue that information on accounting quality should include unexplained costs. These authors find that unpredictable audit fees are related to accounting quality and accrual quality, and help predict subsequent restatements and fraud. In addition, Amir *et al.* (2010) and Hope and Langli (2010) conclude that unexpected or excessive fees and the cost of capital are positively linked to each other.

Auditor independence and financial reporting reliability are positively related, according to Kinney *et al.* (2004). Furthermore, if auditors do not audit properly, this is to the detriment

of third parties (DeAngelo, 1981). Consequently, firms whose auditors are independent have a lower cost of capital (Khurana and Raman, 2006; Dhaliwal *et al.*, 2011). Hope and Langli (2010) also discover a relationship between unexpected fees and the cost of capital. Conversely, this implies that a higher cost of capital is positively associated with lower auditor independence and higher unexpected fees.

Moon *et al.* (2019) examine the relationship between audit fees and audit quality in the US market, and demonstrate that auditor-specific fees are positively associated with audit quality. However, other fees, such as engagement-specific fee premiums, are not associated with better audit quality. The association between fees and audit quality decrease over time as quality differences between audit firms converged.

To date, few studies have been conducted on excessive audit fees in Europe. Huguet and Gandía (2014) examine the relationship between audit fees and the cost of debt in Spain using a sample of mainly SME`s. More specifically, they investigate whether audits help reduce the cost of debt. However, this assumption could not be confirmed empirically. Hohenfels and Quick (2020) sample listed German companies from 2006 to 2013 to investigate whether the level and different types of NAS fees affect audit quality. The results of the study demonstrate that higher NAS fees lead to lower audit quality. Moreover, the positive effects of knowledge spillover cannot offset the negative effects of economic and social ties between the firm and the auditor. In addition, the study shows that the separation of the different NAS types is influenced by audit and consulting services (except tax services). Previous studies yield almost the same picture, which is why the following hypothesis is formulated for the Swedish audit market:

H4: Unexpected fees and the cost of debt are positively related.

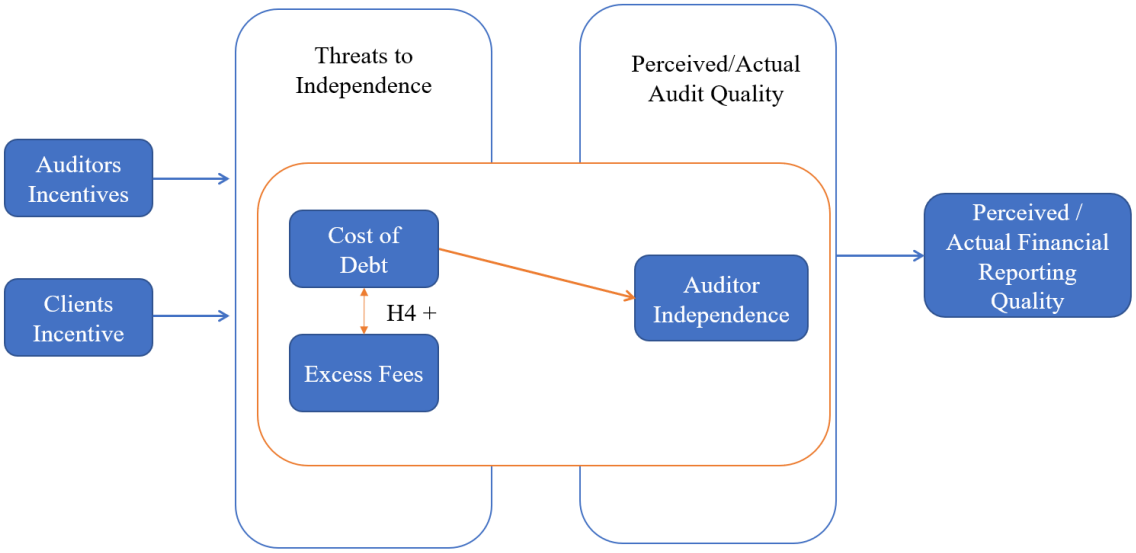

Figure 5: Influence of excess fees and cost and debt and on auditor independence; based on Tepalagul and Lin (2015)

3. Method

3.1. Sample selection

The initial sample consists of 201 Swedish companies listed on Nasdaq OMX Stockholm Stock Exchange. Since some companies are sold or the data in the financial statements are insufficient, 17 companies are removed from the original sample, as shown in Table 2.

Table 2: Sampling procedure

Description	Number of firms
Original sample with firms Nasdaq OMX Stockholm Stock Exchange	201
Less: Firms which are sold during the sampled period	5
Less: Firms with small subsidiaries listed on the stock exchange, but the annual report is available only for main company	4
Less: Firms with insufficient published data	8
TOTAL SAMPLE	184

Therefore, 184 companies are examined for this study. The study period covers the years 2012 to 2019. This time period is chosen because it includes observations before the Regulation became binding in the year 2016, as well as observations after the year of 2016 (Willekens *et al.*, 2019). New regulations can lead to potential fluctuations regarding the audit fees (Beck and Mauldin, 2014), which is another reason the time period of eight years is chosen.

Consolidated financial statements and auditor data are collected from the Amadeus database as the platform presents many data more clearly than the financial statements, like net income, which are the base for the variable σ (NIBE). Information such as audit fees, NAS, auditor information, total assets, inventory, number of subsidiaries, current liabilities, auditor's opinion, and information on the company's industry are obtained from the annual reports manually. Some firms in the sample document their financial data in EUR or USD; these are converted to Swedish kronor to be comparable. Therefore, the annual exchange rates published by the Swedish central government is used. In order to standardize the data, all data is rounded to the nearest thousand, as some companies generally round their financial data to the nearest thousand, while others do not.

Furthermore, companies from the banking sector are excluded, because the financial statements banks issue are not easily comparable to other sectors. Table 3 shows the composition of the sample.

Table 3: Industries in sample

Industries	Absolute	%
Basic Materials	9	5%
Consumer Goods	13	7%
Consumer Service	35	19%
Energy	2	1%
Financial	5	3%
Health Care	27	15%
Industrials	49	27%
Real Estate	15	8%
Technology	21	11%
Telecommunications	7	4%
Utilities	1	1%
TOTAL	184	**100%**

Most Swedish companies are active in Industrials (27% of the sample), Consumer Services (19% of the sample) and Health Care (15% of the sample). Health Care is used as a dummy variable to account for industry effects in the model specification.

3.2. Research design

3.2.1. Impairment of non-auditing-services and auditor independence

The first hypothesis examines whether there is a difference between firms that receive NAS and firms that do not. To test this, the regression includes audit fees and the variable NAS, as well as control variables, as shown in the previous studies of Hay *et al.* (2006a), and also used by Zhang *et al.* (2016) the control variables are: Firm size (LN (TA)), risk (ROA, TD/TA, CA/CL, OPINION), and complexity (INVREC, SQRTSUB). The cross-sectional regression model is summarized as follows:

$$Ln(AF) = \alpha + \beta_1 Ln(NAF) + \beta_2 Ln(TA) + \beta_3 INVREC + \beta_4 SQRTSUB + \beta_5 LOSS + \beta_6 ROA + \beta_7 \frac{TD}{TA} + \beta_8 \frac{CA}{CL} + \beta_9 BIG4 + \beta_{10} OPINION + \varepsilon \quad (1)$$

Table 4: Variables and description of H1

Variable	Description
Ln(AF)	Natural log of audit fees.
Ln(NAF)	Natural log of NAS fees.
Ln(TA)	Natural log of total assets.
INVREC	Inventory plus accounts receivable, divided by total assets.
SQRTSUB	Square root of the number of subsidiaries.
ROA	Return on assets, calculated as operating income divided by total assets.
LOSS	Dummy variable equal to 1 if ROA is less than zero and zero otherwise.
TD/TA	Ratio of total debt to total assets.
CA/CL	Ratio of current assets to current liabilities.
BIG 4	Indicator variable equal to 1 if a client company is audited by Big 4 audit firms and zero otherwise.
OPINION	Indicator variable equal to 1 if a client company received a qualified or modified report and zero otherwise.

Notes: The description of the variables are consistent with previous studies of Hay et al. (2006a), and also used by Zhang et al. (2016).

Consistent with previous studies Hay *et al.*, (2006a); and Zhang *et al.*, (2016) include dependent variables in the regression equations, to control for the influence of other variables. LN (TA), calculated as the natural logarithm of total assets is the first used control variable, which is utilized to control various effects of firm size, such as greater bargaining power and

lower probability of bankruptcy of firms (Carey and Simnett, 2006), or differences in accounting conservatism (Myers *et al.*, 2003). Additionally, client profitability is used as a measure by other researchers to determine risk because it gives an indication of the extent to which the auditor could be exposed to lose if a client is not viable (Geiger *et al.*, 2021). It is assumed that the worse the performance of the firm, the greater the risk for the auditor and the higher the audit fee to be expected. The typical variable to measure firm performance is ROA (Hay *et al.*, 2006b). The control variable LOSS indicates client profitability and furthermore it exposes the level of risk the auditor is exposed to by the audited firm. Therefore, the worse the performance of a firm, the more risk to the auditor and the higher are the audit fees (Geiger *et al.*, 2021). LOSS is a dummy variable, which takes the number 1 when ROA is less than zero and zero otherwise.

Inventory is an indicator of the complexity of client's business. If inventory increase, the complexity of the client's business should therefore also increase. Following previous literature, INVREC is used as an indicator of client complexity (Simunic, 1980; Choi et al., 2010). SQRT-SUB indicates the square root of the number of subsidiaries, which is often used by researchers to investigate also the complexity of a firm. If the structures of a company is complex, the audit is considered to be more time consuming (Simunic, 1980). Leverage is an indicator for the risk of the company failing, which can lead to potential losses for auditors (Simunic, 1980). The total debt to total asset ratio (TD/TA) is therefore one of the most effective variables for financial failure estimation. The current liquidity ratio (CA/CL) is used to determine a company's ability to pay its short-term debt obligations. The variable indicates if a company is able to use its current assets to cover its current liabilities (Puncel, 2008).

Furthermore, to capture the effect of audit quality differentiation on audit fees, the control variable BIG 4 is included. BIG 4 is an indicator variable that has a value of 1 if the auditor is a member of the BIG 4 and a value of zero if it is not. Previous researches have used this variable to represent audit quality (Hay *et al.*, 2006b). Finally, the control variable OPINION is included to signal the existence of audit problems. Problems accruing during the audit may also increase the assumed risk by the auditor as well as the amount of work needed and therefore also the audit costs (Simunic, 1980). The indicator variable OPINION has a value of 1 if the company receives a restricted or modified report and a value of zero if it does not (Zhang *et al.*, 2016)

3.2.2. Auditor's opinion

Hypothesis two tests positive relationship between issuing more NAS and issuing less modified audit opinions. These are measured by NAF /(NAF + AF). OPINION is an indicator variable. Therefore, a logistic regression is used. The variable OPINION is binary, i.e., it has two values: equal to 1 if a client company received a qualified or modified report and zero otherwise. Hypothesis two is summarized as follows:

$$OPINION\ (1,0) = \alpha + \beta_1 \frac{NAF}{(NAF + AF)} + \beta_2 FEEDEP + \beta_3 Ln(TA) + \beta_4 INVREC + \beta_5\ LOSS + \beta_6 ROA + \beta_7 \frac{TD}{TA} + \beta_8 BIG4 + \beta_9\ SQRTSUB + \beta_{10}\ HEALTH\ CARE + \varepsilon \quad (2)$$

The variables remain as before, except:

Table 5: Variables and Description of H2

Variable	Description
NAF/(NAF + AF)	The ratio of non-audit fees to non-audit fees plus audit fees.
FEEDEP	Fee dependence is measured as the sum of a specific client's audit fees and non-audit fee payment divided by total audit fees and non-audit fees of the auditor.
HEALTH CARE	Industrial dummy equal to 1 if equity is zero, zero otherwise.

Notes: The description of the variables are consistent with previous studies of Firth (2002), Hay et al. (2006a), and also used by Zhang et al. (2016).

OPINION is calculated as a function of the ratio of Ln(TA), the natural logarithm of total assets and the other variables. These variables can be considered as proxies for different types of risk (Zhang *et al.*, 2016). The level of risk of a client, and hence the engagement, indicates whether the auditor will issue a modified or qualified audit opinion (Zhang *et al.*, 2016). Based on the above control variables, the following variables are also included.

In addition, the dummy variable of Health Care is added. Table 3 shows that 15% of all companies listed on the Nasdaq OMX Stockholm Stock Exchange belong to the healthcare sector. As some industries are more difficult to audit than others, it is important to determine the industry where the auditor is working (Simunic, 1980). In general, companies with large

inventories, receivables or knowledge-based assets are more difficult to audit (Hay *et al.*, 2006b). Because healthcare companies such as BioGaia AB, Biotage AB or Dedicare AB are knowledge-based companies, the audit is also likely to take more time (Yuan *et al.*, 2012). Therefore, the audit is more expensive than in other industries.

Also, when investigating the tie between the level of non-audit fees and the density of audit modification, the variable FEEDEP is added in the model (2). Firth (2002) conclude that auditor independence has a higher chance to be compromised when a client's audit fee is disproportionally represented in the total revenue of the audit firm. Based on the results of Firth (2002), FEEDEP is assumed to be negatively linked with the audit opinion when auditor independence is affected.

3.2.3. Auditor tenure

Previous researchers have suggested that auditor seniority should be considered in audit fee models as it has been noted that a commonly cited reason for changing auditors is to receive a lower fee by a new audit firm (Hay *et al.*, 2006b). González-Díaz *et al.* (2015) conclude in his study that that audit quality in Spain decreases also with more working years. To test hypothesis three, which states that Auditor tenure and NAS are positively related, regarding the previous research of Hay *et al.* (2006b) and Zhang *et al.* (2016), it can be assumed that the relationship between NAS and short auditor tenure is positive, when auditor independence is affected.

To test this assumption, the previously used model by Hay *et al.* (2006b) and Zhang *et al.* (2016) is utilized. The first model uses SHORT TENURE as the dependent variable. SHORT TENURE is a dummy variable used as an indicator variable that can express the length of service of the auditor. Thus, the variable is equal to 1 if there is an auditor switch in the past three years, and zero otherwise. Hypothesis three is tested using a cross-sectional logistic model, as follows:

$$SHORT\ TENURE\ (0,1) = \alpha + \beta_1 \frac{NAF}{(NAF+AF)} + \beta_2 Ln(TA) + \beta_3 OPINION + \beta_4 INVREC + \beta_5 ROA + \beta_6\, LOSS + \beta_7 \frac{TD}{TA} + \beta_8 \frac{CA}{CL} + \beta_9\, SQRTSUB + \beta_{11}\, BIG\ 4 + \beta_{12}\, HEALTH\ CARE + \beta_{13}\, Year\ dummies + \varepsilon \quad (3)$$

The variables remain as before, except:

Table 6: Variables and Description of H3

Variable	Description
SHORT TENURE	Indicator variable equal to 1 if there is an auditor switch in the previous 3 years, and zero otherwise.

Notes: The description of the variables are consistent with previous studies of Hay et al. (2006b), and also used by Zhang et al. (2016).

The second step to test hypothesis three is to test whether there is a relationship between an auditor's short tenure and NAS. The utilized control variables are defined as before, and the model looks as follows:

$$Ln(NAF) = \alpha + \beta_1 TENURE + \beta_2 Ln(TA) + \beta_3 Ln(AF) + \beta_4 INVREC + \beta_5 SQRTSUB + \beta_6 ROA + \beta_7 LOSS + \beta_8 \frac{TD}{TA} + \beta_9 \frac{CA}{CL} + \beta_{10} OPINION + \beta_{11} BIG\ 4 + HEALTH\ CARE + YEAR\ dummies + \varepsilon \quad (4)$$

3.2.4. Excess fees and cost of capital

The fourth hypothesis tests whether there is a positive relationship between the level of contingencies and the cost of debt; a two-step framework is applied, similar to what is used in previous studies of Hope and Langli (2010), Amir *et al.* (2010), Hribar *et al.* (2014), and Zhang *et al.* (2016). First, the unexpected fees need to be determined. Hribar *et al.* (2014) investigate the correlation between unexpected audit fees and other empirical quality measures and find a positive correlation. Reynolds and Picconi (2009) model utilize residual or unexpected audit fees as a measure of financial reporting quality, of which they conclude that larger values of the residual indicating lower financial reporting quality.

Initially, Amir et al. (2010) use two methods to measure auditor independence in their study. First, the ratio of audit fees to total fees (AF/TF) is measured, suggesting that an unexpectedly high level, as measured by the regression residuals, equates to a lower loss of independence. Second, the logarithm of total fees (Ln(TF)) is used to examine independence. In this case, an unexpectedly high level, as measured by the regression residuals, implies low independence. In addition, Hope *et al.* (2009) investigated in their study that models with unexpected audit fees (AF) and unexpected NAS fees (NAF) can be used as alternatives to unexpected total fees (TF) to determine auditor independence. Zhang *et al.* (2016) also followed the approach of Hope *et al.* (2009) and constructed a fee model including the ratio of audit fees to total fees (AF /TF), the logarithm of total fees (Ln(TF)), the logarithm of audit fees (Ln(AF)), and the logarithm of NAS fees (Ln(NAF)). The Fee model of Zhang *et al.* (2016) is also utilized here:

$$Fee = \alpha + \beta_1 LN(TA) + \beta_2\ INVREC + \beta_3\ SQRTSUB + \beta_4\ LOSS + \beta_5\ ROA + \beta_6\ \frac{TD}{TA} + \beta_7 \frac{CA}{CL} + \beta_8\ OPINION + \beta_9\ \ HEALTH\ CARE + \beta_{10}\ YEAR\ dummies + \varepsilon \quad (5)$$

Where FEE represents also alternative fee specifications such as: AF/TF, Ln(AF), Ln(TF), and Ln (NAF).

Once the excessive fees or unexpected fees are determined from the residuals in Model (5) and captured in the variable EXESSFEE, the second step is to construct a debt cost model for Excess NAF/(NAF+AF), Excess Ln(AF), Excess Ln(TF) and Excess Ln(NAF). A simple measure is used, which has been shown to be effective in the studies of Simunic (1984), Francis

et al. and Zhang *et al.* (2016). In model (6), the impact of the additional variables used on the cost of debt is as follows:

$$COD = \alpha + \beta_1 EXCESSFEE + \beta_2 Ln(TA) + \beta_3 LEV + \beta_4 ROA + \beta_5 IntCov + \beta_6 \sigma(NIBE) + \beta_7 TANGIBLEtoTA + \beta_8 SALESGROWTH + \beta_9 NEGEQUITY + \varepsilon \quad (6)$$

Where:

Table 7: Variables and Description of H4

Variable	Description
COD	Cost of debt is measured as interest expense divided by the average total debt.
EXCESSFEE	Excess auditor remuneration computed as the residual from equation (5).
LEV	Leverage; total debt divided by total assets.
IntCov	Interest Cover; the ratio of operating income to interest expense.
σ (NIBE)	Standard deviation of net income before extraordinary items, scaled by average assets, over the past eight-years.
TANGIBLEtoTA	Tangible assets to total assets.
SALESGROWTH	Growth in sales on most recent year.
NEGEQUITY	Dummy variable equal to 1 if equity is zero, zero otherwise.

Notes: The description of the variables are consistent with previous studies of Hope and Langli (2010), Amir et al. (2010), Hribar et al. (2014), and Zhang et al. (2016).

The additional variables control for the possible impact on the cost of debt variable. The firm's leverage ratio (LEV), which is calculated as the ratio of total liabilities divided by total assets, is also a control variable. The leverage ratio (LEV) needs to be controlled because it could be an incentive for firms to manage their profits, for example, in case of violations of credit covenants (Carey and Simnett, 2006). IntCov is the ratio of operating income to interest expense; this variable describes the ability of a company to make regular interest payments. Therefore, a higher coverage ratio is expected to have a positive effect on the company's creditworthiness (Amir *et al.*, 2010). The standard deviation of net income before extraordinary items scaled by average assets over the last eight years (σ(NIBE)). TANGIBLEtoTA is the ratio of property, plant, and equipment to total assets, and SALESGROWTH is the sales growth over the last year. Also, NEGEQUITY is a dummy variable that equals 1 if equity is zero and zero if not (Zhang *et al.*, 2016).

4. Results

4.1. Descriptive statistics

Table 8 shows the descriptive statistics (mean, median, standard deviation, minimum and maximum) of the sample for the 2012-2019 period. It can be seen that both the mean (from SEK 5,993,000 to SEK 7,466,000) of the audit fees paid and the median (from SEK 1,584,000 to SEK 2,200,000) have steadily increased over the years.

A contrasting picture emerges for “Other non-audit fees" where the mean has decreased from SEK 2,528.10 to SEK 1,633.00, and the median from SEK 395.00 to SEK 200.00. The "Audit-related and non-audit fees" do not give a consistent picture, similar to the "Total audit and non-audit fees", which on average have sometimes increased and sometimes decreased over the years. Although the mean and median of audit-related non-audit fees and total audit non-audit fees have decreased from 2016 to 2017, there is no indication that this is an effect of the EU Regulation that came into force in 2016, as there are sometimes greater fluctuations in the years before and after. In addition, the two categories ("non-audit fees” and “other non-audit fees") are combined as non-audit fees in the following research.

The ratio between NAS and the bulk of audit fees and fees for NAS declined following a peak of 30.3% in 2012 and almost halved to 17.5% the following year. In the next years, the ratio increased again until 2016, reaching 27.5%, only to fall again to 12.7% in 2017, the lowest level. This drop could also be a result of the EU regulations that had to be implemented by 2016. Next to the ratio increased and reached 21.8% in 2019. The mean of “total assets” increased from SEK 9,667,000 in 2012 to SEK 9,548,000 in 2019. The ROA ratios remained positive throughout the period 2012-2019, indicating that the companies are in a good financial position.

Panel B contains the indicator variables used here. The number of modified or qualified audit opinions is vanishingly small. In 2015 and 2017, no modified or qualified audit opinion is issued at all. In the other years, only one or two companies received a modified or qualified audit opinion. In 2016, as many as six firms received a modified or qualified audit opinion, but this represents only 3% of the sample. It is also evident that each year at least 95% of the firms in the sample are BIG 4 clients. Interestingly, the 2014 Regulation does not seem to have had any impact on the short audit duration (of three years or less). In 2012-2018, the percentage is

just over 30%. In 2019, it is only 25%. The dummy industry variable for healthcare remains the same throughout the period.

Table 8: Descriptive statistics

Panel A: Continuous variables

	Year	Obs.	Mean	Std. Dev.	Median	Min	Max
Audit Fess	2012	184	5,993	13,729	1,584	70	102,000
(SEK´000)	2013	184	6,014	13,997	1,581	79	120,000
	2014	184	6,222	139,152	1,768	50	100,000
	2015	184	6,628	15,001	2,000	40	105,000
	2016	184	6,598	14,506	2,000	100	104,000
	2017	184	6,745	14,616	2,000	45	103,000
	2018	184	7,370	16,749	2,000	100	120,000
	2019	184	7,466	15,544	2,200	100	108,000
Audit-related	2012	184	498	1,524	100	0	15,000
and non-audit fees	2013	184	406	1,139	100	0	12,000
	2014	184	533	1,189	120	0	11,000
	2015	184	551	1,235	100	0	11,000
	2016	184	518	1,080	130	0	10,000
	2017	184	467	1,203	100	0	11,000
	2018	184	496	1,154	100	0	11,000
	2019	184	568	1,514	100	0	12,000
Other non-audit fees	2012	184	2,528	7,465	395	0	71,000
	2013	184	2,237	5,932	395	0	53,000
	2014	184	2,335	6,054	301	0	36,000
	2015	184	2,573	6,003	310	0	41,000
	2016	184	2,321	5,581	321	0	42,300
	2017	184	1,877	5,297	219	0	42,000
	2018	184	1,682	4,533	300	0	35,000
	2019	184	1,634	4,736	200	0	38,600
Total audit	2012	184	9,019	21,163	2,402	101	156,000
and non-audit fees	2013	184	7,435	17,951	2,012	95	156,000
	2014	184	9,090	20,011	2,665	50	140,000
	2015	184	9,752	20,961	2,558	100	13,700
	2016	184	9,437	19,725	2,792	100	126,000
	2017	184	8,009	17,109	2,278	57	117,000
	2018	184	9,548	20,752	2,932	100	127,000
	2019	184	9,667	19,788	3,080	100	124,000
Total asset	2012	184	8,230	21,163	2,402	101	156,000
	2013	184	7,435	18,000	2,012	95	156,000
	2014	184	9,090	20,066	2,665	50	140,000
	2015	184	9,753	21,018	2,558	100	137,000
	2016	184	9,437	19,779	2,792	100	126,000
	2017	184	8,009	17,156	2,278	57	117,000
	2018	184	9,548	20,808	2,932	100	127,000

Table 8: Descriptive statistics

Panel A: Continuous variables

	Year	Obs.	Mean	Std. Dev.	Median	Min	Max
	2019	184	9,668	19,842	3,080	100	124,000
FEEDEP	2012	184	0.003	0.007	0.000	0.000	0.048
	2013	184	0.000	0.005	0.002	0.000	0.037
	2014	184	0.000	0.007	0.003	0.000	0.051
	2015	184	0.002	0.007	0.000	0.000	0.049
	2016	184	0.000	0.006	0.003	0.000	0.047
	2017	184	0.002	0.005	0.000	0.000	0.037
	2018	184	0.003	0.006	0.001	0.000	0.047
	2019	184	0.003	0.006	0.001	0.000	0.046
NAF/(NAF+AF)	2012	184	0.303	0.181	0.275	0.000	0.844
	2013	184	0.175	0.189	0.100	0.000	0.769
	2014	184	0.281	0.184	0.258	0.000	0.921
	2015	184	0.299	0.179	0.293	0.000	0.750
	2016	184	0.275	0.187	0.259	0.000	0.875
	2017	184	0.127	0.151	0.063	0.000	0.833
	2018	184	0.234	0.167	0.202	0.000	0.760
	2019	184	0.218	0.169	0.189	0.000	0.895
Ln(TA)	2012	184	6.299	0.911	6.230	4.176	8.530
	2013	184	6.324	0.903	6.260	4.491	8.538
	2014	184	6.389	0.886	6.321	4.633	8.583
	2015	184	6.434	0.869	6.329	4.732	8.573
	2016	184	6.512	0.862	6.470	4.672	8.601
	2017	184	6.521	0.872	6.485	4.479	8.615
	2018	184	6.571	0.895	6.529	4.447	8.768
	2019	184	6.633	0.882	6.593	4.544	8.740
INVREC	2012	184	0.2811	0.256	0.262	0.000	2.645
	2013	184	0.2676	0.190	0.260	0.000	0.880
	2014	184	0.2618	0.190	0.255	0.000	0.911
	2015	184	0.2710	0.195	0.263	0.000	0.928
	2016	184	0.2841	0.314	0.245	0.000	3.637
	2017	184	0.3201	0.513	0.260	0.000	5.727
	2018	184	0.3532	0.262	0.514	0.000	2.767
	2019	184	0.2952	0.138	0.308	0.170	0.445
ROA	2012	184	0.033	0.225	0.058	-1,632	0.828
	2013	184	0.035	0.134	0.060	-0.550	0.360
	2014	184	0.055	0.162	0.070	-0.967	0.544
	2015	184	0.068	0.184	0.077	-1,759	0.476
	2016	184	0.072	0.155	0.080	-1,033	0.746
	2017	184	0.117	0.474	0.081	-0.656	5,377
	2018	184	0.399	4,610	0.071	-1,273	62,535
	2019	184	0.479	5,429	0.060	-1,190	73,556
TD/TA	2012	184	0.0573	0.588	0.532	0.045	6,133
	2013	184	0.524	0.344	0.513	0.050	4,258
	2014	184	0.515	0.294	0.516	0.034	3,172

Table 8: Descriptive statistics

Panel A: Continuous variables

	Year	Obs.	Mean	Std. Dev.	Median	Min	Max
	2015	184	0.505	0.237	0.501	0.012	2,008
	2016	184	0.498	0.231	0.508	0.018	2,435
	2017	184	0.541	0.597	0.511	0.016	6,814
	2018	184	0.527	0.331	0.512	0.012	4,000
	2019	184	0.545	0.297	0.528	0.006	2,661
CA/CL	2012	184	15.444	47.696	1.856	0.000	362.000
	2013	184	10.117	37.629	1.680	0.000	346.000
	2014	184	9.809	27.982	1.614	0.000	262.800
	2015	184	10.259	35.874	1.789	0.000	391.000
	2016	184	16.763	68.812	1.706	0.000	654.833
	2017	184	12.903	4.489	2.024	0.000	454.000
	2018	184	9.139	26.590	2.041	0.000	283.000
	2019	184	6.707	16.851	1.748	0.000	133.679
SQRTSUB	2012	184	6.060	4.424	4.472	0.000	22.694
	2013	184	6.085	4.435	4.472	0.000	22.716
	2014	184	6.124	4.450	4.527	0.000	22.782
	2015	184	6.155	4.476	4.583	0.000	22.804
	2016	184	6.197	4.503	4.636	0.000	22.847
	2017	184	6.261	4.545	4.690	0.000	22.781
	2018	184	6.358	4.552	4.743	0.000	22.956
	2019	184	6.434	4.575	4.796	0.000	23.087

Table 8: (Continued)

Panel B: Indicator Variables

	2012		2013		2014		2015	
	No.	%	No.	%	No.	%	No.	%
Opinions	2	1%	2	1%	2	1%	0	0%
Big 4	175	95.1%	175	95.1%	176	95.6%	177	96.2%
Tenure	61	33.1%	61	33.1%	61	33.1%	31	33.1%
Dummy Health Care	158	85.8%	158	85.8%	158	85.8%	158	85.8%

Panel B: Indicator Variables (Continued)

	2016		2017		2018		2019	
	No.	%	No.	%	No.	%	No.	%
Opinions	6	3%	0	0%	1	0.50%	1	0.50%
Big 4	177	96.2%	179	97.2%	177	96.2%	175	95.1%
Tenure	58	31.5%	59	32%	64	34.8%	46	25%
Dummy Health Care	158	85.8%	158	85.8%	158	85.8%	158	85.8%

4.2. Results of the main tests

4.2.1. Impairment of non-auditing-services and auditor independence

Hypothesis one indicates that audit fees (expressed in the national log) and non-audit fees (expressed in the national log) are positively related. An OLS model is run to examine the relationships between audit fees, NAS, and the control variables for 184 firms from 2012 to 2019. A clustered model is used for the pooled data.

The t-statistics are calculated with robust standard errors and are included for comparability. The result shows that a high degree of dispersion. The R^2 (78%) and adjusted R^2 (78 %) indicate that this model has a great ability to predict the relationship between audit fees and NAS. The variance inflation factor is reported to identify multicollinearity issues. A greater value than 10 for VIF can indicate multicollinearity issues and suggests that further investigation is needed (Zhang et al., 2016). In this model, none of the independent variables have a greater VIF then 10, which suggest that multicollinearity do not apply here.

The results of Table 9 show that non-audit fees are significantly associated with audit fees (β = 0.10; P-value = 0.00). An increase in the NAF increases the odds of a client company to pay higher audit fees. The same applies to independent variables: Ln(TA) INVREC, SQRTSUB, LOSS, ROA as well as TD/TA, who are also statistically significant.

The highest impact on the audit fees have natural log of total assets. The natural log of total assets (β = 1.03 /p-value= 0.00) indicates the size of the company (Carey and Simnett, 2006). Therefore, an increase of the size of an audited company results in an increase of audit fees. The variable SQRTSUB also indicates the size of a firm and confirms that audit fees increase as the size of a firm increases (β = 0.07 /p-value= 0.00).

The INVREC variable is used as an indicator of client complexity (Simunic, 1980; Choi *et al.*, 2009).The results of Table 9 also show that as client complexity increases, auditor fees also increase (β = 0.34 /p-value= 0.00).

The independent variable LOSS predicts the profitability of the client and shows the degree of risk that the auditor is exposed to by the audited company. Hence, there is a positive correlation between LOSS and audit fees (Simunic, 1980). Therefore, it can be assumed that the more complex the situation of the audited companies is, the greater the audit fees are (β = 0.23 /p-value= 0.00). This result is supported by the positive correlation between the ratio of

total debt to total assets (TD / TA) and audit fees (β = 0.12 /p-value= 0.02). The independent variable TD / TA is one of the most effective variables for estimating financial failure (Puncel, 2008), which also increases the complexity of cases.

Moreover, the result display that there is a positive correlation between ROA and examination fees (β = 0.05 /p-value= 0.00). ROA is a typical variable for measuring organizational performance. However, the correlation is quite low (Hay et al., 2006b).

Table 9: Results of model (1); OLS model; detecting link between audit fees, NAS, and the control variables

$$Ln(AF) = \alpha + \beta_1 Ln(NAF) + \beta_2 Ln(TA) + \beta_3 INVREC + \beta_4 SQRTSUB + \beta_5 LOSS + \beta_6 ROA + \beta_7 \frac{TD}{TA} + \beta_8 \frac{CA}{CL} + \beta_9 BIG4 + \beta_{10} OPINION + \varepsilon$$

Independent Variables	Coef.	t statistic	p-value	VIF
Ln(NAF)	0.10 ***	11.64	0.00	1.25
Ln(TA)	1.03 ***	33.37	0.00	2.35
INVREC	0.34 ***	5.59	0.00	1.33
ROA	0.23 ***	4.37	0.00	1.14
LOSS	0.05 **	7.14	0.01	1.04
TD/TA	0.12 ***	2.37	0.00	1.22
CA/CL	0.01**	0.51	0.02	1.03
SQRTSUB	0.07	13.74	0.61	1.81
BIG 4	0.02	0.26	0.80	1.05
OPINION	-0.08	-0.42	0.67	1.01
Constant	-0.26	-1.39	0.17	
R^2	0.77			
Adjusted R^2	0.77			
F- statistics	487.10 ***		0.00	
Number of Observation	1472			

Notes: Table 9 display the results from model (1) which tests whether there is a difference between firms that receive NAS and firms that do not. In order to test model (1) the model of Hay *et al.* (2006a) and Zhang *et al.* (2016) are utilized for the sample period 2012 to 2019. Definition of variables are in Table 4.

VIF: Inflation variation factor; used to detect multicollinearity problems indicates multicollinearity and suggests further investigation is required, if VIF <= 10 (Zhang *et al.*, 2016).

*, **, *** represent significance at a level of 10 percent, 5 percent, and 1 percent, respectively.

4.2.2. Auditor’s opinion

As shown in Table 10, the effect of the ratio of non-audit fees to total fees (total fees are the sum of non-audit fees and audit fees) on the audit opinion changes over time in terms of the magnitude of the coefficient and the direction of the relationship, but is never significant.

In general, no single significant relationship can be identified between the variables studied: NAF /(NAF + AF) , FEEDEP, Ln(TA), INVREC, LOSS, ROA, TD / TA, BIG 4, SQRTSUB, Health Care Dummy and the issuance of a qualified or modified audit opinion. Therefore, hypothesis two cannot be confirmed.

Table 10: Results of model (2); Logistic regression; ratio of non-audit fees to total fees and audit opinion changes over time

$$Opinion\ (0,1) = \alpha + \beta_1 \frac{NAF}{(NAF+AF)} + \beta_2 FEEDEP + \beta_3 Ln(TA) + \beta_4\, INVREC + \beta_5\, LOSS + \beta_6 ROA + \beta_7 \frac{TD}{TA} + \beta_8 BIG4 + \beta_9\, SQRTSUB + \beta_{10}\, HEALTH\ CARE + \varepsilon$$

Independent Variables	2012			2013			2014			2015		
	Coef.	Std. err	p>|z|	Coef.	Std. err	p>|z|	Coef.	Std. err	p>|z|	Coef.	Std. err	p>|z|
NAF/(NAF+AF)	-88.55	39082.98	1.00	-9.54	23.92	0.27	-8.11	12.00	0.50	-11.11	150742.1	0.43
FEEDEP	-1201.46	13370641.91	0.99	190.71	584.96	0.34	-1739.34	9593.74	0.86	-1203.84	5020328.2	0.87
Ln(TA)	196.43	35199.17	1.00	3.51	4.26	0.31	-6.31	12.89	0.62	192.31	51600.4	0.92
INVREC	462.09	116531.82	1.00	13.09	52.83	0.41	13.27	25.01	0.60	121.31	152992.6	1.00
LOSS	245.76	67701.31	1.00	5.59	20.69	0.38	-15.34	10809.24	1.00	313.52	102155.4	0.99
ROA	-339.29	73256.83	1.00	3.80	33.66	0.48	7.05	24.08	0.77	-218.62	184113.3	0.45
TD/TA	-63.61	30674.17	1.00	-12.65	9.75	0.34	-9.41	20.72	0.65	-67.27	121761.2	0.33
BIG 4	-334.29	91942.00	1.00	12.94	11267.70	1.00	16.74	10890.87	1.00	-327.82	142226.1	0.67
SQRTSUB	2.46	1708.04	0.99	-0.35	0.68	0.38	-2.34	4.40	0.59	2.45	8741.8	0.82
Health Care Dummy	-234.04	50416.46	1.00	-14,37	6013.56	1.00	-20.74	10732.49	1.00	-434.13	84958.7	0.18
Constant	-1169.55	246559.33	1.00	-42.83	11267.74	1.00	19.35	10891.14	1.00	-121.11	326947.2	0.39
Model x^2	22.07		0.01	13.48		0.20	5.75		0.84	32.74		0.61
Pseudo R^2	1.00			0.61			0.46			0.02		
Number of Observation	184			184			184			184		

Notes: Table 10 presents the results of model (2) witch tests for the linkage between the frequency of amended audit reports and the scope of non-audit performance utilizing a logistic regression model and a sample period from 2012 to 2019. Definition of variables are in Table 4 and Table 5.

*, **, *** represent significance at a level of 10 percent, 5 percent, and 1 percent, respectively.

Table 10: Results of model (2); Logistic regression; ratio of non-audit fees to total fees and audit opinion changes over time (Continued)

$$Opinion\ (0,1) = \alpha + \beta_1 \frac{NAF}{(NAF+AF)} + \beta_2 FEEDEP + \beta_3 Ln(TA) + \beta_4 INVREC + \beta_5 LOSS + \beta_6 ROA + \beta_7 \frac{TD}{TA} + \beta_8 BIG4 + \beta_9 SQRTSUB + \beta_{10} HEALTH\ CARE + \varepsilon$$

Independent Variables	2016			2017			2018			2019		
	Coef.	Std. err	p>|z|	Coef.	Std. err	p>|z|	Coef.	Std. err	p>|z|	Coef.	Std. err	p>|z|
NAF/(NAF+AF)	-4.79	3.38	0.16	-64.52	178943.82	0.73	45.89	103.73	0.66	-142.06	171198.05	0.42
FEEDEP	-811.18	1087.10	0.46	-2456.46	7533569.72	0.48	-23412.51	48436.98	0.63	-11608.40	952390.09	0.22
Ln(TA)	0.57	1.07	0.59	156.34	50232.16	0.32	5.33	15.24	0.73	34.10	37087.57	0.34
INVREC	2.60	2.15	0.23	137.99	139067.80	0.27	8.88	22.64	0.69	35.28	24824.71	1.00
LOSS	-0.75	2.06	0.72	128.39	91926.45	0.18	-125.49	12185.18	0.99	6.01	34528.30	0.32
ROA	-1.76	3.50	0.61	-312.29	108921.05	0.74	-123.49	327.16	0.71	-32.94	70205.84	0.64
TD/TA	2.33	1.88	0.22	-82.11	76485.44	0.21	-2.14	14.46	0.88	25.99	9197.00	0.99
BIG 4	15.57	3806.99	1.00	-246.52	169016.14	0.29	-11.99	102930.16	1.00	-5.02	67209.20	0.34
SQRTSUB	-0.43	0.31	0.17	-3.34	8716.71	0.39	-0.78	2.29	0.73	-25.65	7703.56	0.98
Health Care Dummy	-16.82	2757.24	1.00	-34.34	81859.98	1.00	-35.98	9499.93	1.00	-62.52	49695.23	0.64
Constant	-20.66	3806.99	1.00	-26.57	329918.37	0.57	-27.92	12930.13	1.00	-179.88	227110.08	0.49
Model x^2	14.50		0.15	13.21		0.18	6.42		0.78	12.42		0.11
Pseudo R^2	0.27			0.32			0.52			1.00		
Number of Observation	184			184			184			184		

Notes: Table 10 presents the results of model (2) witch tests for the linkage between the frequency of amended audit reports and the scope of non-audit performance utilizing a logistic regression model and a sample period from 2012 to 2019. Definition of variables are in Table 4 and Table 5.

*, **, *** represent significance at a level of 10 percent, 5 percent, and 1 percent, respectively.

4.2.3. Auditor tenure

As shown in Table 11, the direction of the relationship between the ratio of non-audit fees (ratio of non-audit fees to the sum of non-audit fees and audit fees) and auditor tenure is initially negative in the first year of the sample. In the following years, however, the sign reverses, only to change again in 2014 and to change direction again in the next years. Interestingly, the fee ratio has no significant effect on auditor tenure throughout the sample period.

Regarding the relationship between total assets and auditor tenure, it can be observed that the coefficient of the logit model generally changes sign frequently in each year. But again, from 2012 to 2019, there is not a single year in which the relationship between total assets and length of tenure is statistically significant. Only in 2018 the INVREC variable and the HEALTH dummy variable appear to decrease auditor tenure and be significant. However, all other variables listed in Table 12 have no effect on length of the tenure of an auditor.

Furthermore, the second step is to test hypothesis three whether there is a relationship between an auditor's short tenure and NAS. The results can be seen in Table 12 and they show that the F-statistic of overall significance indicates that at least one of the variables is related to Ln(NAF). However, SHORT TENURE is not statistically significant to Ln(NAF), meaning there is no relationship between the level of NAS fees and auditor received fees from client companies. Therefore, there is no evidence to support hypothesis three.

Furthermore, the results of Table12 demonstrate that NAS fees are not statistically associated with the independent variables Ln (TA), ROA, LOSS, and BIG 4. However, the independent variable Ln(AF) ($\beta = 1.00$; p-value = 0.00), INVREC ($\beta = 0.36$; P-value = 0.04), SQRTSUB ($\beta = -0,04$; P-value = 0.02), TD/TA ($\beta = -0,27$; P-value = 0.06), CA/ CL ($\beta = 0$; P-value = 0.05), OPINION ($\beta = -1.31$; P-value = 0.02), Year 2013 ($\beta = -1.43$; P-value = 0.00), Year 2016 ($\beta = -0.34$; P-value = 0.19), Year 2017 ($\beta = -1.96$; P-value = 0.00), Year 2018 ($\beta = -0.54$; p-value = 0.01), and Year 2019 ($\beta = -0.76$; P-value = 0.00) are statistically significant. The years 2013 as well as the years 2016 to 2019 have a negative correlation to the dependent variable (Ln(NAF)), which means, when the independent variable increases (here Years 2013, 2017, 2018, 2019, Ln(TA), Ln(AF)), the dependent variable (non-audit fees) tends to decrease.

Table 11: Results of model (3); Logistic regression; auditor's tenure, NAS fees, and control variables

$$SHORT\ TENURE\ (0,1) = \alpha + \beta_1 \frac{NAF}{(NAF+AF)} + \beta_2 Ln(TA) + \beta_3 OPINION + \beta_4 INVREC + \beta_5 ROA + \beta_6\ LOSS + \beta_7 \frac{TD}{TA} + \beta_8 \frac{CA}{CL} + \beta_9 SQRTSUB + \beta_{11}\ BIG\ 4 + \beta_{12}\ HEALTH\ CARE + \beta_{13}\ Year\ dummies + \varepsilon$$

Independent Variables	2012			2013			2014		
	Coef.	Std. err	p>|z|	Coef.	Std. err	p>|z|	Coef.	Std. err	p>|z|
NAF/(NAF+AF)	0.31	0.22	0.15	-0.24	0.21	0.26	0.12	0.21	0.57
Ln(TA)	-0.40	0.37	0.28	0.04	0.37	0.91	0.61	0.49	0.21
OPINION	0.04	0.07	0.60	0.02	0.07	0.74	0.00	0.07	0.95
INVREC	0.03	0.19	0.88	0.26	0.23	0.26	0.05	0.23	0.82
ROA	-0.00	0.21	0.98	-0.00	0.44	1.00	0.21	0.31	0.50
LOSS	0.02	0.12	0.86	0.05	0.15	0.73	0.09	0.15	0.54
TD/TA	-0.06	0.07	0.37	-0.16	0.11	0.16	-0.14	0.13	0.27
CA/CL	0.00	0.00	0.21	0.00	0.00	0.91	0.00	0.00	0.10
SQRTSUB	-0.00	0.01	0.70	-0.00	0.01	0.84	-0.01	0.01	0.40
BIG 4	-0.02	0.18	0.93	-0.14	0.18	0.42	0.11	0.18	0.55
Health Care Dummy	0.03	0.20	0.90	0.05	0.21	0.81	-0.10	0.20	0.61
Constant	-0.39	0.45	0.81	0.31	0.50	0.53	0.35	0.48	0.47
Model x^2	0.11		0.96	2.83		0.91	3.70		0.70
Pseudo R^2	2.41			0.05			0.07		
Number of Observation	0.05			184			184		

Notes: Table 11 presents the results of model (3) witch tests whether NAS and short auditor tenure are linked, following previous models of Hay et al. (2006b) and Zhang et al. (2016). The sample period is from 2012 to 2019. Definition of variables are in Table 4, Table 5 and Table 6.

*, **, *** represent significance at a level of 10 percent, 5 percent, and 1 percent, respectively.

Table 11: Results of model (3); Logistic regression; auditor's tenure, NAS fees, and control variables (Continued)

$$SHORT\ TENURE\ (0,1) = \alpha + \beta_1 \frac{NAF}{(NAF+AF)} + \beta_2 Ln(TA) + \beta_3 OPINION + \beta_4 INVREC + \beta_5 ROA + \beta_6 LOSS + \beta_7 \frac{TD}{TA} + \beta_8 \frac{CA}{CL} + \beta_9 SQRTSUB + \beta_{11} BIG\ 4 + \beta_{12} HEALTH\ CARE + \beta_{13} Year\ dummies + \varepsilon$$

Independent Variables	2015			2016			2017		
	Coef.	Std. err	p>|z|	Coef.	Std. err	p>|z|	Coef.	Std. err	p>|z|
NAF/(NAF+AF)	-0.16	0.17	0.35	-0.25	0.19	0.19	0.09	0.24	0.72
Ln(TA)	0.02	0.05	0.70	0.00	0.21	0.90	0.10	0.07	0.15
OPINION	0.00	0.12	0.79	0.00	0.07	0.80	0.09	0.22	0.63
INVREC	-0.17	0.17	0.33	0.15	0.12	0.24	0.33	0.20	0.11
ROA	-0.36	0.20	0.07	-0.05	0.31	0.88	-0.20	0.16	0.21
LOSS	-0.23	0.11	0.05	-0.09	0.16	0.59	0.18	0.14	0.19
TD/TA	0.05	0.13	0.73	-0.07	0.17	0.67	-0.18	0.11	0.09
CA/CL	-0.00	0.00	0.44	0.00	0.00	0.39	-0.00	0.00	0.19
SQRTSUB	-0.01	0.01	0.18	0.01	0.01	0.44	-0.00	0.01	0.75
BIG 4	0.09	0.15	0.57	-0.10	0.19	0.61	0.10	0.22	0.65
Health Care Dummy	0.28*	0.16	0.08	0.08	0.20	0.70	1.12	0.20	0.54
Constant	0.03	0.38	0.93	0.42	0.47	0.38	-0.47	0.50	0.35
Model x^2	22.93		0.14	3.71		0.67	3.40		0.71
Pseudo R^2	0.08			0.08			0.07		
Number of Observation	184			184			184		

Notes: Table 11 presents the results of model (3) which determines short auditor tenure, following previous models of Hay et al. (2006b) and Zhang et al. (2016). The sample period is from 2012 to 2019. Definition of variables are in Table 4, Table 5 and Table 6.

*, **, *** represent significance at a level of 10 percent, 5 percent, and 1 percent, respectively.

Table 11: Results of model (3); Logistic regression; auditor's tenure, NAS fees, and control variables (Continued)

$$SHORT\ TENURE\ (0,1) = \alpha + \beta_1 \frac{NAF}{(NAF+AF)} + \beta_2 Ln(TA) + \beta_3 OPINION + \beta_4 INVREC + \beta_5 ROA + \beta_6 LOSS + \beta_7 \frac{TD}{TA} + \beta_8 \frac{CA}{CL} + \beta_9 SQRTSUB + \beta_{11} BIG\ 4 + \beta_{12} HEALTH\ CARE + \beta_{13} Year\ dummies + \varepsilon$$

Independent Variables	2018			2019			Pooled		
	Coef.	Std. err	p>|z|	Coef.	Std. err	p>|z|	Coef.	Std. err	p>|z|
NAF/(NAF+AF)	0.22	0.22	0.33	0.09	0.20	0.66	0.05	0.16	0.47
Ln(TA)	-0.10	0.07	0.12	-0.02	0.06	0.74	-0.00	0.07	0.90
OPINION	0.51	0.52	0.32	-0.11	0.57	0.85	0.03	0.02	0.82
INVREC	-0.23***	0.09	0.01	-0.08	0.10	0.42	-0.03	0.13	0.41
ROA	0.01	0.01	0.38	-0.00	0.01	0.68	0.00	0.04	0.68
LOSS	-0.04	0.10	0.70	0.04	0.10	0.66	0.01	0.00	0.72
TD/TA	0.16	0.12	0.18	0.13	0.12	0.27	-0.04	0.04	0.18
CA/CL	-0.00	0.00	0.40	-0.00	0.00	0.46	0.00	0.03	0.72
SQRTSUB	-0.01	0.01	0.57	-0.01	0.01	0.38	0.00	0.00	0.38
BIG 4	0.09	0.19	0.65	0.17	0.16	0.28	0.05	0.16	0.47
Health Care Dummy	-0.44***	0.19	0.02	0.04	0.18	0.84	-0.01	0.07	0.93
Year 2013							0.00	0.06	0.93
Year 2014							0.00	0.05	0.99
Year 2015							-0.16	0.05	0.94
Year 2016							-0.02	0.05	0.72
Year 2017							0.00	0.05	0.99
Year 2018							0.02	0.05	0.65
Year 2019							-0.08	0.05	0.12
Constant	1.31	0.48	0.01	0.10	0.45	0.66	0.37	0.16	0.02
Model x^2	5.56		0.20	2.74		0.83	1.52		0.04
Pseudo R^2	0.11			0.07			0.03		
Number of Observation	184			184			184		

Notes: Table 11 presents the results of model (3) which determines short auditor tenure, following previous models of Hay et al. (2006b) and Zhang et al. (2016). The sample period is from 2012 to 2019. Definition of variables are in Table 4, Table 5 and Table 6.

*, **, *** represent significance at a level of 10 percent, 5 percent, and 1 percent, respectively.

Table 12: Results of model (4); OLS regression of short auditor tenure, non-audit fees, and control variables

$$Ln(NAF) = \alpha + \beta_1 SHORT\ TENURE + \beta_2 Ln(TA) + \beta_3 Ln(AF) + \beta_4 INVREC + \beta_5\ SQRTSUB + \beta_6\ ROA + \beta_7 LOSS + \beta_8\ \frac{TD}{TA} + \beta_9\ \frac{CA}{CL} + \beta_{10} OPINION + \beta_{11}\ BIG\ 4 + \beta_{12}\ HEALTH\ CARE + \beta_{13}\ YEAR\ dummies + \varepsilon$$

Independent Variables	Coef.	t-statistic	p-value
SHORT TENURE	0.14	0.11	0.21
Ln(TA)	0.25	0.12	0.04
Ln(AF)	0.86***	0.07	0.00
INVREC	0.36***	0.18	0.04
SQRTSUB	-0.04***	0.02	0.02
ROA	0.02	0.15	0.27
LOSS	-0.04	0.15	0.80
TD/TA	-0.27**	0.00	0.06
CA/CL	0.00**	0.56	0.05
OPINION	-1.31***	0.27	0.02
BIG 4	0.29	0.21	0.28
Year 2013	-1.43***	0.21	0.00
Year 2014	-0.26	0.21	0.20
Year 2015	-0.12	0.21	0.57
Year 2016	-0.34*	0.21	0.10
Year 2017	-1.96***	0.21	0.00
Year 2018	-0.54*	0.21	0.01
Year 2019	-0.76***	0.21	0.00
R^2	0.34		
Adjusted R^2	0.12		
F- statistic	19.34		0.00
Number of Observation	40.14		

Notes: Table 12 presents the results of model (4) witch tests whether NAS and short auditor tenure are linked, following previous models of Hay et al. (2006b) and Zhang et al. (2016). The sample period is from 2012 to 2019. Definition of variables are in Table 4, Table 5 and Table 6.

*, **, *** represent significance at a level of 10 percent, 5 percent, and 1 percent, respectively.

4.2.4. Excess fees and cost of capital

Model (6) is tested with the help of an OLS model and examines the relationships among audit fees, NAS, and control variables for 184 companies from 2012 to 2019. Hypothesis four argues that audit fees and non-audit fees are positively related. In order to test that a two-step framework is applied, similar to what is used in previous studies of Hope and Langli (2010), Amir *et al.* (2010), Hribar *et al.* (2014), and Zhang *et al.* (2016). The first step is to identify the unexpected charges or excess fees auditors charge to client companies. Zhang *et al.* 's (2016) model excessive fees or unexpected fees are identified by using the regression residuals from the fee-model (5) to measure auditor independence and capture the variable EXESSFEE. The second step is to construct a debt cost model, which results can be seen in Table 13.

The COD model utilizes a two-stage least squares regression to investigate whether excessive fees and the cost of debt are positively associated. The F-statistic are for all four models significant in Table 13. However, The R squared (6% and 5,5%) indicate that all four models with independent variables have a low ability to predict the dependent variable. Furthermore, Table 13 shows that the variable EXCESS FEE of the independent variables are not statistically significant. Therefore, also hypothesis four cannot be confirmed and no dependence between auditor and client can be detected.

However, the independent variables σ (NIBE), SALESGROWTH and NEGEQUITY are statistically significant in Table 13. σ (NIBE) shows in all four models a positive corelation: Excess NAF/(NAF+AF) (β = 7.87; p-value = 0.00), Excess Ln(AF) (β = 7.87/ p-value 0.00), Excess Ln(TF) (β = 7.81/ p-value 0.00), Excess Ln(NAF) (β = 7.87/ p-value 0.00), suggesting that higher net income as a client increases audit fees, NAS fees, and total fees. In contrast, the independent variable SALES GROWTH is negatively correlated with Excess NAF/(NAF+AF) (β = -4.19; p-value = 0.02), Excess Ln(TF) (β = -4.11/ p-value 0.02), Excess Ln(NAF) (β = -4.22/ p-value 0.02), which means that with higher sales in the last year, both total fees and NAS fees decrease. But audit fees are not correlated. The independent variable NEGEQUITY is also negatively correlated with Excess NAF/(NAF+AF) (β = -0.04; p-value = 0.04), Excess Ln(AF) (β = -0.04/ p-value 0.04), Excess Ln(TF) (β = -0.04/ p-value 0.03), Excess Ln(NAF) (β = -0.04/ p-value 0.04), suggesting that with negative equity, both audit fees and NAS fess decrease.

Table 13: Results of model (6); regression model of cost of debt on excess fee measures

$$COD = \alpha + \beta_1 EXCESSFEE + \beta_2 Ln(TA) + \beta_3 LEV + \beta_4 ROA + \beta_5 IntCov + \beta_6 \sigma(NIBE) + \beta_7 TANGIBLEtoTA + \beta_8 SALESGROWTH + \beta_9 NEGEQUITY + \varepsilon$$

COD	Excess NAF/(NAF+AF)			Excess Ln(AF)			Excess Ln(TF)			Excess Ln(NAF)		
	Coef.	t	p	Coef.	t	p	Coef.	t	p	Coef.	t	p
EXCESS FEE	0.02	1.08	0.28	0.01	0.76	0.44	0.00	-1.29	0.20	0.00	0.212	0.83
Ln(TA)	0.01	4.71	0.34	0.01	4.71	0.16	0.01	4.73	0.39	0.01	4.71	0.98
LEV	0.00	-0.38	0.70	0.00	-0.38	0.70	-0.01	-0.46	0.65	-0.03	-0.38	0.69
ROA	-0.01	-1.33	0.19	-0.01	-1.34	0.18	-0.01	-1.31	0.19	-0.08	-1.32	0.19
IntCov	0.00	0.132	0.90	0.00	0.15	0.88	0.00	0.14	0.89	0.00	0.15	0.88
Sigma(NIBE)	7.87***	5.63	0.00	7.87***	5.63	0.00	7.81***	5.59	0.00	7.87***	5.63	0.00
TANGIBLEtoTA	0.00	1.56	0.12	0.01	1.58	0.11	0.00	1.55	0.12	0.01	1.55	0.12
SALES-GROWTH	-4.19**	-2.34	0.02	-4.26	-2.38	0.18	-4.11**	-2.29	0.02	-4.22**	-2.35	0.02
NEGEQUITY	-0.04**	-2.07	0.04	-0.04**	-2.02	0.04	-0.04**	-2.12	0.03	-0.04**	-2.06	0.04
Constant	-0.04	-2.54	0.01	-0.04	-2.54	0.01	-0.04	-2.54	0.01	-0.04	0.02	0.11
R^2	0.06			0.06			0.06			0.055		
F-statistic	9.60		0.00	9.53		0.00	9.66		0.00	9.46		0.00
Number of Obser-vation	1472			1472			1472			1472		

Notes: Table 13 presents the results of model (6). A two-step framework is applied, similar to what is used in previous studies of Hope and Langli (2010), Amir et al. (2010), Hribar et al. (2014), and Zhang et al. (2016) to test whether there is a positive relationship between the level of contingencies and the cost of debt. The second step is to identify excessive fees or unexpected fees by using the regression residuals from the fee model (6). The sample period is from 2012 to 2019. Definition of variables are in Table 4, Table 5 and Table 7.

*, **, *** represent significance at a level of 10 percent, 5 percent, and 1 percent, respectively.

4.3. Robustness tests

To test whether the reported results are robust, further test is performed. In order to determine if audit fees and NAS fees are simultaneously determined, a two-stage least squares model is used instead of the OLS-regression model and the results of which can be seen in Table 14. This method is also used in previous studies such as in Whisenant et al., (2003), Krishnan and Yu, (2011) and Zhang et al. (2016).The sample period used is from 2012 to 2019.

The results are consistent with the results of model (1). Accordingly, audit fees and NAS fees are jointly determined, because Ln(NAF) is statistically significant (β = 0.10 /p-value= 0.00). Furthermore, the independent variables Ln(TA) (β = 1.03 /p-value= 0.00), INVREC(β = 0.34 /p-value= 0.00), SQRTSUB(β = 0.07 /p-value= 0.00), LOSS(β = 0.23 /p-value= 0.00), ROA(β = 0.05 /p-value= 0.00) as well as TD/TA (β = 0.12 /p-value= 0.02) are also statistically significant, which is also consistent with the results of Table 9.

Table 12 shows that the largest effect can be seen between total assets and audit fees, where the coefficient is the greatest, whereas the other independent variables coefficients demonstrate only small effects. This is also consistent with the results of Table 9.

Table 14: Results of Robustness test; pooled 2SLS model of audit fees, NAS and control variables

$$Ln(AF) = \alpha + \beta_1 Ln(NAF) + \beta_2 Ln(TA) + \beta_3 INVREC + \beta_4 SQRTSUB + \beta_5 ROA + \beta_6 LOSS + \beta_7 \frac{TD}{TA} + \beta_8 \frac{CA}{CL} + \beta_9 OPINION + \beta_{10} BIG\,4 + \varepsilon$$

Independent Variables	Coef.	t-statistic	p-value
Ln(NAF)	0.10***	0.01	0.00
Ln(TA)	1.03***	0.03	0.00
INVREC	0.34***	0.06	0.00
SQRTSUB	0.07***	0.01	0.00
LOSS	0.23***	0.05	0.00
ROA	0.05***	0.01	0.00
TD/TA	0.12**	0.05	0.02
CA/CL	0.00	0.00	0.61
OPINION	-0.08	0.19	0.67
BIG 4	0.02	0.09	0.80
Constant	-0.26	0.19	0.17
R^2	0.08		
Adjusted R^2	0.08		
F- statistics	487.1		0.00
Number of Observation	1472		

Notes: Table 14 display the results of the robustness test. The sample period is from 2012 to 2019. Definition of variables are in Table 4.

*, **, *** represent significance at a level of 10 percent, 5 percent, and 1 percent, respectively.

4. Discussion

The results of Table 9 support the hypothesis that audit fees and non-audit fees are positively related. This finding underpins the concern that auditor independence may be compromised. The EU initiated the European Audit Reform Package, consisting of the Directive and the Regulation, which came into force in 2016 (Willekens *et al.*, 2019). The aim of this regulation is to strengthen the position of the auditor. For this purpose, regulators are introduced that prohibit certain NAS services listed in Table 1. The results of model (1) show that NAS are positively associated and statistically significant with audit fees. However, this does not directly imply that auditor independence is limited. From the literature review, it appears that there are two theories that explain the relation between NAS and audit fees. The "loss leader" argument is based on a negative relationship between audit fees and NAS (Zhang et al., 2016). This argument states that auditors offer their services at lower prices in order to obtain future NAS contracts. This might suggest that auditors are no longer independent, and further investigation of audit quality could be envisioned. However, the results of model (1) do not support this theory, so a further investigation has to been conducted.

On the other hand, there is Simunic's (1984) "knowledge spillover" argument that providing NAS improves access to relevant information and thus audit quality through knowledge spillover (Ashbaugh-Skaife *et al.*, 2002; Copeland, 2000; Knechel *et al.*, 2012). Model (1) also includes Ln(TA) (measure for firm size and bargaining power), ROA (measure for firm performance), CA/CL (current liquidity ratio) and TD/TA (measure for financial failure estimation), LOSS (a measure for client profitability) as measures of problems firms could face. The results of the first regression analyses also shows that audit fees are positively associated and statistically significantly with these measures, suggesting that auditors charge more for their services once firms might face problems as these audits are more time intense. Looking here also at the results of following models (5) and (6), it can be seen that there is no evidence that auditor independence has been compromised. An impact of the EU reform is also not found in model (1).

Furthermore, a different way to jeopardize auditor independence is the manipulated issuance of an audit opinion. It the most immediately visible outcome of the audit process and the decision to issue a modified audit opinion. Therefore, it indicates the auditor's ability to resist the client's attempts to avoid the associated adverse effects (Tepalagul and Lin, 2015). For this reason, US regulators have adopted rules to strengthen auditor independence when

implementing SOX, as some studies have found a link between client and NAS size and a decline in audit quality (Sharma and Sidhu, 2001; Firth, 2002; Li, 2009). To investigate whether this is also the case in EU member states, hypothesis two states that there is a positive relationship between issuing more NAS and issuing fewer modified audit opinions.

Therefore, the association of the frequency of amended audit reports and the level of NAS performance is as measured by NAF /(NAF + AF). For this purpose, the independent variable FEEDEP is included. Prior research indicates the view that if a client's audit fees represent a large portion of the audit firm's total fee revenue, the likelihood that the auditor's independence will be compromised increases (Firth, 2002). The FEEDEP variable summarizes the fee dependence of auditors. Based on previous studies, hypothesis two states that there is a positive relationship between issuing more NAS and issuing fewer modified audit opinions (Firth, 2002).

However, the results of the logistic regression model (table 10) show that the independent variable FEEDEP is not statistically significant, while the coefficient are constantly negative. Following previous studies by Firth (2002) and Li (2009), they argue that a negative coefficient on FEEDEP is less likely to maintain independence. Hence, the independent variable NAF/(NAF + AF) is also not statistically significant in any year. A general impression from the logistic regression models is that the coefficients of most variables change direction, indicating a lack of stability in the estimated coefficients, which suggests that further testing should be done.

One possible reason for this result could be in the data set itself, which shows that qualified or modified opinions are issued very infrequently. Wu *et al.* (2016) discovered that only 34% of failed UK companies issued qualified or modified audit opinions shortly before their failure. Following the study by Li (2009), which examined the adoption of SOX and the post-adoption period in the US, it is found that in the pre-adoption period, there is no demonstrable relationship between the auditor's tendency and client importance to issue a modified audit opinion. However, after implementation, this exact relationship is demonstrated, confirming that larger clients in the US are more likely to request a modified audit opinion. In conducting this study in Sweden, it is noticeable that comparatively few modified audit opinions are issued both before and after the introduction of the EU Regulation and Directive. It would be advisable to investigate the reason for this matter in a following study.

In drafting the EU regulation, EU regulators assumed that the relationship between auditor and client plays a crucial role in the question of independence and limited the length of time an auditor or firm may act for a client (Kyriakou and Dimitras, 2018). In the EU Regulation, the maximum duration of the auditor-client relationship has been set at 10 years (Article 17), but there is also the possibility to extend the maximum duration to 20 years if the audit is publicly announced (Article 17(4a)) or to 24 years if more than one auditor is engaged at the same time (joint audit) (Article 17(4b)) (EU Parliament, 2014b). One of the first studies to look at the impact of the EU regulation is the study by Polychronidou *et al.* (2020), in which the Greek market is studied. The respondents, to the questionnaire used in the study, believe that the maximum permissible duration of the audit should not exceed four to six years. They also believe that mandatory rotation will lead to an increase in the overall cost of the audit process, as it will increase the workload for auditors and managers.

To further explore this question, this study measured the impact of the EU regulation and supplemented it with the question of whether tenure and NAS interact. The results are presented in Table 11. If the result yields a substantially negative coefficient for NAF /(NAF + AF), this would mean that a client paying a high proportion of NAS is less likely to substitute auditors than another client (Zhang *et al.*, 2016). But the result of this variable of the logistic regression, is that the coefficient is not significant . However, after the variable SHORT TENURE is determined in model (3), model (4) tests whether a relationship between an auditor's short tenure and NAS exists. The results can be seen in table 12. This shows that the independent variable SHORT TENURE does not have a statistically significant effect on the amount of fees paid to NAS and the fees received by client companies for the auditor. There is no relationship between NAS and audit duration, either before or after the EU regulation came into force. The assumption of the EU regulators that the duration of the audit could influence the relationship between auditor and client could not be confirmed. However, González-Díaz *et al.* (2015) concluded that mandatory auditor replacement does not have a positive impact on audit quality, and audit quality also decreases with seniority. Further investigations in Sweden could examine how seniority effects the relationship between auditor tenure and NAS.

However, Table 12 shows that when the independent variables year 2013, 2017, 2018, 2019, total assets and audit fees increases, the dependent variable (non-audit fees) tends to decrease. The negative coefficient suggests that as the independent variable increases, the dependent variable, NAS, tends to decrease. This can be seen as a direct effect of the EU regulations, which became binding in the year 2016 (Hohenfels, 2016). This could be subject to further

investigation to determine if there are other factors, which influenced this outcome or the decrease of NAS are entirely the consequence of the EU regulations.

In addition, in adopting the new rules, EU regulators have emphasized that external auditors play a central role in promoting the quality of financial reporting by providing credibility by reviewing financial statements prepared by auditors and attesting to their accuracy (Simunic, 1984). However, this also means that outsiders will only trust financial reports if they have confidence in the independence of auditors. NAS have been targeted by regulators in part because they are suspected of compromising auditor independence by charging "excessive" audit fees (Doogar *et al.*, 2015).

Hypothesis four uses a two-step process to test whether the cost of debt and excessive audit fees are positively related. First, excessive fees are identified using the regression residuals of a fee model (Model (5)). This approach has been used in other studies by Hope and Langli (2010) and in the study by Zhang *et al.* (2016). The next step is to create a model COD (Table 13) that uses the extensive robustness test to check whether exam fees and NAS can be determined simultaneously, as indicated in the earlier work by Whisenant *et al*. (2003). The results of the COD model are presented in Table 13 and show that there is no significant relationship between examination fees and NAS. Thus, there is no evidence of a loss of independence because the results of model 6 do not imply any significant relationship between audit fees and NAS. This is in contrast to most previous studies that have examined this issue. Hohenfels and Quick (2020) show in their study in Germany that higher NAS fees lead to lower audit quality, which is consistent with previous studies in the US (Doogar et al., 2015; Hribar *et al*., 2014; Francis, 2011; Choi *et al.*, 2009; Kanagaretnam *et al*., 2008). Since it is not possible to directly measure auditor independence, standardized residuals are used as a proxy for unexpected or inflated fees, which may be subject to measurement error. In addition, Table 13 shows that higher corporate net income leads to higher audit fees, higher NAS, and higher total fees. In contrast, higher final year revenue leads to a decrease in NAS fees and total fees, but has no effect on audit fees. Further research is needed to understand why this effect occurs. When the firm's balance sheet shows negative equity, NAS fees and total fees also decrease, as do total fees. This effect also leaves room for further investigation and study to explain this effect.

5. Conclusion

This paper examines the impact of the new EU Regulation and Directive on auditor independence, assessing as well the influence of NAS. For this purpose, 185 companies listed on the Nasdaq OMX Stockholm Stock Exchange during the period 2012-2019 are studied.

Due to some previous accounting scandals, be it Fermenta or Skandia in Sweden (Rimmel and Jonaell, 2011) or the 2008 financial crisis, it is often assumed that auditors do not act independently. This is due to the fact that impeccable audit opinions are distributed to leading banks in Europe before the financial crises in the year 2008. In order to strengthen the independence of auditors, the former EU Commissioner for Internal Market and Services, Michel Barnier, initiated the *Green Paper* that forms the basis for the EU Regulation and Directive, which became binding in 2016.

For years, researchers have suspected that auditing firms are corrupted by NAS because they can charge higher payments for NAS than for audit fees (Zerni, 2012). For this reason, some NAS have been banned by EU Regulation (s. Table 1). Auditors are suspected to lower prices to induce firms to stay with or switch to that auditing firm in order to receive greater fees for NAS (DeFond *et al.*, 2002). To investigate this further, this study examined influences such as tenure, modified audit opinion, and cost of debt in addition to NAS with regard to the new EU Audit Regulation and Directive and its impact.

The results of the study indicate that there is no evidence of threats to auditor independence in the context of the simultaneous provision of audit and advisory services in Sweden before, during and after the EU Regulation and Directive became binding. While the result of model one as well as the robustness test show that NAS are positively associated with audit fees, further tests (s. model (5) and (6)) demonstrate that the simultaneous provision of audit fees and NAS does not impair auditor independence. The same applies to modified audit opinion and auditor tenure.

However, the results of this study underscore previous research finding that offering audit services and NAS simultaneously leads to a knowledge spillover effect that mutually supports the work of auditors (Copeland, 2000). However, since the EU Regulation is still new, it would be interesting to see to what extent the redacted NAS have been influenced. Since all NAS revenues are combined as a single item in this study, it would be interesting to see if the composition of NAS revenues have changed due to the introduction of the EU Regulation and

Directive. Especially since the result of Table 12 shows that NAS revenues have decreased due to the introduction of the EU Regulation and Directive, it is necessary to determine if other factors have influenced the reduction of NAS fees, or this effect is only due to the new EU regulation and Directive.

This study contributes to the discussion on the restriction of accounting firms providing NAS by showing that a threat to auditor independence do not exist either before or after the introduction of the EU Regulation, as demonstrated by the tests conducted. Furthermore, this study is subject to some limitations that suggest further research. First, this study does not include banks, so a later study could examine how the regulations affect the banking system. Second, the EU regulation has blacklisted some NAS because they allegedly compromise auditor independence. However, no studies have yet been conducted in Sweden to investigate whether these blacklisted services actually pose a threat to auditor independence and if there is a change in the composition of NAS before or after the EU Regulation became binding. Future studies could investigate the impact of blacklisted NAS. Third, the results only apply to the sample period and the existing regulatory environment. Fourth, the results of Table 13 show that higher revenues in the last year lead to a decrease in NAS fees and total fees, but have no effect on audit fees, and if the firm's balance sheet has negative equity, NAS fees and total fees also decrease. Again, this leaves room for further investigation and study to explain this effect.

The results of this study provide insight into the impact of the EU Regulation and Directive on the NAS in Sweden. After the introduction of the EU Regulation, NAS fees decreased while audit fees remained at the same level. The results show that auditor independence is present at all times during the study.

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Appendices

Appendix A: Abstract

Purpose – The purpose of this study is to examine the impact of non-audit services (NAS) on auditor independence in Sweden before, during, and after the EU Audit Regulation and Directive came into force in order to strengthen auditor independence. To attain this objective, 185 companies listed on the Nasdaq OMX Stockholm Stock Exchange during the period 2012 to 2019 are examined.

Design/methodology/approach – Multivariate regression analysis is performed, using four developed hypotheses, to test whether NAS and further determinations have an impact on auditor independence during, before, and after the EU Audit Regulation and Directive became mandatory.

Findings – The empirical results suggest that NAS fees decreased with the introduction of the EU Audit Regulation and Directives. Furthermore, this study supports the "knowledge spillover" argument of previous researchers.

Research limitations/implications – The results reported in this study are limited to listed companies from Sweden for the 2012-2019 period, excluding companies with limited information and banks. As this is a single country study, the results have limited applicability to other EU countries.

Practical implications – The results of this study contribute to the academic and policy debate on whether there are sufficient reasons to assume that auditor independence is strengthened by the EU Statutory Audit Regulation and Directive in Sweden.

Originality/value – This study constitutes the first examination of whether the EU Audit Regulation and Directive indeed strengthen the position of auditors in Sweden, and provides a basis for subsequent studies.

Appendix B: Abstrakt

Forschungszweck - Ziel dieser Studie ist es, die Auswirkungen von Nichtprüfungsleistungen (NAS) auf die Unabhängigkeit des Abschlussprüfers in Schweden vor, während und nach dem Inkrafttreten der EU-Abschlussprüfungsverordnung und -Richtlinie zu untersuchen, um die Unabhängigkeit des Abschlussprüfers zu stärken. Um dieses Ziel zu erreichen, werden 185 an der Nasdaq OMX Stockholm Stock Exchange notierte Unternehmen im Zeitraum von 2012 bis 2019 untersucht.

Design/Methodik/Ansatz - Anhand von vier entwickelten Hypothesen wird eine multivariate Regressionsanalyse durchgeführt, um zu prüfen, ob NAS und weitere Bestimmungen einen Einfluss auf die Unabhängigkeit des Abschlussprüfers während, vor und nach der Einführung der EU-Abschlussprüferverordnung und -richtlinie haben.

Ergebnisse - Die empirischen Ergebnisse deuten darauf hin, dass die NAS-Gebühren mit der Einführung der EU-Abschlussprüfungsverordnung und -Richtlinien gesunken sind. Darüber hinaus unterstützt diese Studie das Argument des "Knowledge-Spillover" früherer Forscher.

Einschränkungen/Implikationen der Forschung - Die in dieser Studie berichteten Ergebnisse beschränken sich auf börsennotierte Unternehmen aus Schweden für den Zeitraum 2012-2019, wobei Unternehmen mit begrenzten Informationen und Banken ausgeschlossen sind. Da es sich um eine Studie für ein einzelnes Land handelt, sind die Ergebnisse nur begrenzt auf andere EU-Länder übertragbar.

Praktische Implikationen - Die Ergebnisse dieser Studie leisten einen Beitrag zur wissenschaftlichen und politischen Debatte über die Frage, ob es hinreichende Gründe für die Annahme gibt, dass die Unabhängigkeit des Abschlussprüfers in Schweden durch die EU-Abschlussprüferverordnung und -richtlinie gestärkt wird.

Originalität/Wert - In dieser Studie wird erstmals untersucht, ob die EU-Abschlussprüfungsverordnung und -Richtlinie die Position von Abschlussprüfern tatsächlich stärken, und sie bietet eine Grundlage für nachfolgende Studien.