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THE EFFECT OF LIMITING AUDITORS' LIABILITY ON AUDIT QUALITY

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ABSTRACT

The need for uniform financial information has brought about efforts to harmonise accounting and audit regulation in the European Union. The European Commission has recommended that the EU member states should limit the civil liability of statutory auditors. It is argued that limiting auditors' liability could lead to lower audit quality as a result of smaller liability risk. It is also argued that Big 4 auditors produce more consistent audit quality than other auditors regardless of legal environment, meaning that limiting the liability affects the audit quality produced by Big 4 auditors less than other auditors. This study examines the effect of the existence of a liability cap for statutory auditors on audit quality measured by the magnitude of earnings management. Abnormal working capital accruals are used for estimating earnings manipulation. The effect of a liability cap is also examined by comparing companies audited by Big 4 auditors to those that are not. The study examines the financial data from 2008 of 1,174 listed companies in six European countries. The results of univariate and multivariate analyses provide no evidence that the existence of a liability cap affects audit quality as measured by the magnitude of earnings management or that this effect differs between companies audited by Big 4 auditors and non-Big 4 auditors.

KEYWORDS: accounting harmonisation, audit quality, audit regulation, auditor liability, earnings management

1. INTRODUCTION

The academic interest in audit quality has augmented following major accounting scandals, most particularly the Enron and Parmalat cases in the early 2000s. The Enron scandal led to the collapse of Arthur Andersen, one of the largest audit partnerships in the world. This has brought about a general awareness of the fact that such collapses of major accounting companies are possible. Audit quality also is a key issue in international trade. Auditing is facing major challenges associated with international markets as there are significant differences in audit regulation across countries. There is unanimous agreement that an international accounting harmonisation process is needed (López Combarros 2000: 644). There is need for more uniform financial information as wealth crosses national borders. The comparability of financial information regardless of its country of origin is important for financial markets. As accounting regulation in different countries is very heterogeneous at present, comparability poses a problem.

The harmonisation process of accounting regulation in the European Union began in the 1960s as part of its program of Company Law harmonisation. Since then the process has been underway, and harmonisation has been promoted through legal instruments such as Directives. (Gornik-Tomaszewski 2005: 70.) The harmonisation of audit regulation is an essential part of this harmonisation process. Statutory audit is currently regulated by the Audit Directive (2006/43/EC) accompanied by an amending directive (2008/30/EC). Auditor liability as a part of audit regulation is of particular current interest, as the European Commission has in 2008 given a recommendation concerning the limitation of the civil liability of statutory auditors and audit firms (2008/473/EC). In the document the Commission recommends that member states of the European Union should take action to limit auditors' liability.

The effect of auditor's liability on audit quality can be depicted with the concept of auditor's client risk. For the auditor, there always is an element of risk included in audit engagements. Liability risk constitutes a part of an auditor's client risk. The existence and the extent of liability affect client risk, which in turn causes the auditor to react accordingly. From a purely financial standpoint, liability risk can be seen as the expected value of damages to be paid. However, there are other aspects in the matter that need to be considered, for example the effect of possible litigation on the auditor's reputation. It can be assumed that the auditor seeks to react to increased liability risk by increasing audit quality, thus lowering the probability of litigation and the expected value of dam-

ages to be paid. Figure 1 portrays the causal chain of how liability regime affects audit quality through liability risk.

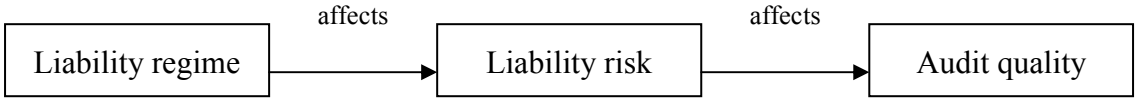

Figure 1. The causal chain from liability regime to audit quality.

The purpose of this study is to examine the effect of limiting statutory auditors' liability on audit quality. However, audit quality cannot be measured directly, so a proxy measure has to be used. In this study the proxy measure used for audit quality is the magnitude of earnings management, i.e. the absolute value of discretionary accruals. At present auditors' liability is limited in five member states of the European Union. In this study it is argued that the existence of a liability cap reduces auditors' liability risk, which in turn might affect the quality of statutory audits. It is also argued that higher liability risk gives auditors extra incentive to produce higher quality audits, as auditors try to decrease the expected value of liability. Thus, an existence of a liability cap is expected to lead to lower audit quality compared to unlimited liability, leading to the following hypothesis:

H_1: Companies in EU member states where statutory auditors' liability is limited by a liability cap report relatively higher absolute values of discretionary accruals compared to companies in EU member states where statutory auditors' liability is not limited by a liability cap.

Furthermore, it is argued that Big 4 auditors produce more consistent audit quality compared to non-Big 4 auditors regardless of legal environment. This is due to Big 4 auditors' bigger incentives for protecting their reputation (see e.g. DeAngelo 1981). In this study it is argued that Big 4 auditors are less affected by the existence of a liability cap than non-Big 4 auditors. In other words, the audit quality that Big 4 auditors produce under a regime of limited liability differs less from the quality they produce under unlimited liability compared to non-Big 4 auditors. The following hypothesis is constructed:

H_2: The magnitude of the absolute value of discretionary accruals is less affected by the existence of a liability cap in the case the company is audited by a Big 4 audit firm compared to a non-Big 4 audit firm.

This study contributes to the discussion on accounting and auditing harmonisation in Europe, particularly concerning limiting of auditors' liability and its effect on audit quality. Six member states of the European Union are examined. Three of them have a liability cap: Belgium, Germany, and Greece. Three countries have a regime of unlimited liability: Finland, France, and Sweden.

The study is organised as follows. In Chapter 2, an overview of liability regulation in the European Union and the main features of the liability regimes in the six countries are presented. Chapter 3 explains the concept of liability risk and its role in how the liability regime presumably affects audit quality. Chapter 4 examines previous research on different factors affecting audit quality and the ways of measuring it. In Chapter 5 the data is described as well as the statistical methods used for testing the hypotheses. Chapter 6 presents the empirical results of the study. In Chapter 7, the results and their implications are discussed.

2. EUROPEAN LIABILITY REGIMES

There is no one common legal system in the European Union. Each member country has its own regime and there are notable differences in the legal systems across member countries. Different commercial laws originate from the countries' different legal traditions. Legal systems are based on either common law or civil law, which is divided further into three families: French, German, and Scandinavian civil law (La Porta, Lopez-de-Silanes, Shleifer & Vishny 1998: 1115). All six countries examined in this study have legal systems based on the civil law tradition.

A country's legal system and legal tradition affect the regulation concerning accounting and auditing in the country in question. In addition to legislation, there are differences in the extent to which accounting practice is determined by formal standards (Ball, Kothari & Robin 2000: 4). In the recent years financial scandals such as the Enron case has lead to changes in these corporate governance and auditing standards (Ojo 2008: 3–4).

Investor protection was an early rationale for audit regulation. This was based on the fact that investors do not have access to as much company information as directors and auditors. According to agency theory this creates a situation of information asymmetry. Audit regulation is needed to ensure the credibility of financial information given to investors (Eilifsen & Willekens 2008). The level of investor protection varies across countries. Legal systems based on civil law give investors weaker rights than common law systems, French civil law countries being the weakest and German and Scandinavian countries falling in between French civil law and common law systems (La Porta et al. 1998: 1116). In international transacting, a common law approach to accounting is prevalent (Ball et al. 2000: 47). Less earnings management has been detected in legal environments with stronger investor protection (Leuz, Nanda & Wysocki 2003). Thus, it could be claimed that presumably more earnings management occurs in French civil law countries than in German and Scandinavian regimes.

In addition to regulation, the level of enforcement can be seen as an important element of the legal environment. According to Ball et al. (2000: 4), the efficiency of accounting standards depend on the level of public enforcement. The incentive to follow the standards varies across countries as it depends on penalties under different enforcement institutions. On the other hand, La Porta, Lopez-de-Silanes and Shleifer (2006: 27–28) found in their study that criminal sanctions have no effect on the efficiency of security

laws. According to them, the effect is rather based on facilitating private contracting. Stronger legal enforcement also leads to less earnings management (Leuz et al. 2003).

Statutory audit is at present regulated at the European Union level by two directives:
(1) *Directive 2006/43/EC of the European Parliament and of the Council on statutory audits of annual accounts and consolidated accounts, amending Council Directives 78/660/EEC and 83/349/EEC and repealing Council Directive 84/253/EEC*, and
(2) *Directive 2008/30/EC of the European Parliament and of the Council amending Directive 2006/43/EC on statutory audits of annual accounts and consolidated accounts, as regards the implementing powers conferred on the Commission*.
The two directives do not regulate auditor liability in any way. The 2006 directive simply states that the member states' liability regimes vary considerably, that unlimited liability may cause problems for auditors to obtain professional insurance, and that these matters will be investigated further. Article 31 of the directive in question states that a report will be published on the impact of national liability rules and, if appropriate, recommendations submitted to the member states. The mentioned report *Consultation on auditors' liability: Summary report* was published in 2007. The European Commission published the *Commission Recommendation concerning the limitation of the civil liability of statutory auditors and audit firms 2008/473/EC* in 2008.

The main content of the Commission Recommendation 2008/473/EC is as follows:

- The civil liability of statutory auditors and of audit firms arising from a breach of their professional duties should be limited expect in cases of intentional breach of duties;
- The limitation should apply against the company audited and any third party;
- The limitation should not prevent injured parties from being fairly compensated;
- The use of any one or more of the following methods for limiting liability is recommended:
    a) A maximum financial amount of a formula allowing the calculation of such an amount;
    b) A set of principles by which a statutory auditor or audit firm is not liable beyond its actual contribution to the loss suffered and is not jointly and severally liable with other wrongdoers;
    c) Allowing the auditee and the auditor to limit liability contractually.

As does audit regulation in general, regulation of auditor liability varies across countries. *Ex ante* regulation and *ex post* liability are two very different approaches to con-

trol for activities (Eilifsen & Willekens 2008: 10). Also the basis for auditor liability is different from country to country. Firstly, liability can be based on special laws concerning auditors, or the same civil liability laws as other professionals or the general public, or a combination of the two. Secondly, liability can be based on a contractual relationship between the auditor and the client, or it can be based on tort. Thirdly, there are liability caps in place in some countries, when in others they do not exist. (European Commission 2001.) Furthermore, in some countries liability can be limited contractually.

Whether liability is based on contract or tort can have a significant impact on various issues. These include liability limitations, the amount and nature of recoverable damages, and the level of the auditor's duty of care (European Commission 2001: 7). Different liability regimes may affect the behaviour of auditors and auditees differently and may result in alternative resource allocations, some of which might not be socially efficient (Eilifsen & Willekens 2008: 11).

Legal liability environment also is an important factor explaining audit fee variation across countries. The strictness of a country's liability regime affects audit fees: the stricter the regime, the higher the fees (Choi, Kim, Liu & Simunic 2008: 56; Liu & Wang 2006: 1055). From the point of view of investor protection, higher auditor liability raises the investor's expected damage compensation and thus the value of the investment. This makes the investment opportunity more attractive and increases the probability of revealing worthless investment opportunities (Liu & Wang 2006: 1067).

The implementation of auditors' liability in the national laws is an important question regarding regulation harmonisation. If general rules of civil liability are applied to auditors, fundamental changes to the civil liability regimes, or the creation of specific rules, are needed. A regime of specific laws concerning auditors would make the harmonisation process easier (European Commission 2001: 6). The European Commission has conducted consultations concerning whether a need to reform the auditor liability regime exists. Different options for a change have been presented; these will be discussed further in Section 2.2. As the EU is pursuing harmonisation of accounting and audit regulation, the Commission Recommendation (2008/473/EC) suggests various ways of liability limitation, as mentioned earlier.

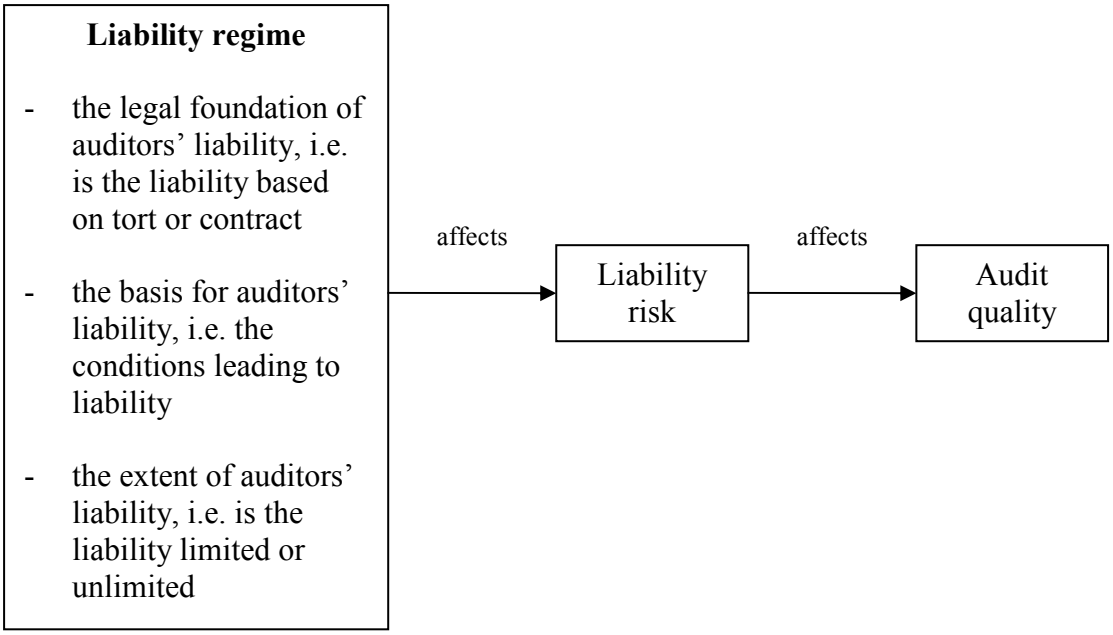

Figure 2. Liability regulation in the causal chain from liability regime to audit quality.

A country's liability regime affects auditors' liability risk, which in turn arguably has an effect on audit quality. Figure 2 presents the main features of a country's liability regime affecting liability risk as a part of this causal chain.

2.1 Legal foundation of and the basis for auditors' liability

In any human activity there always is a possibility of damage occurring. The basic principle is that the one facing with damage must suffer the damage. If a person can be shown to be liable for the damage as defined by law, this person has the obligation to compensate the damage he is liable over. Liability can be based on fault or negligence. (Hoppu & Hoppu 2004: 231.) Fault means negligent and intentional conduct (Köhler, Marten, Quick & Ruhnke 2008: 133). For example, an auditor's fault or negligence can cause damage to the audited company. Depending on the degree and gravity of the fault or negligence and the applicable legislation the auditor may be liable for this damage.

Liability in tort works through the effect of possible damage lawsuits after harm has occurred (Eilifsen & Willekens 2008: 11). Tort liability can be further divided into two categories: *negligence liability* and *strict liability*. Hoppu and Hoppu (2004: 232) define

negligence as careless conduct. By this definition a person is considered negligent if he fails to act to avoid harm as a reasonable person in his position would. Liu and Wang (2006: 1054–1055) define negligence as failure to exercise due diligence. They also state that strict liability can be viewed as a special case of negligence liability where an auditor is always judged negligent when a corporate failure occurs. It can be added that this includes cases where the auditor has been acting deliberately (Hoppu & Hoppu 2004: 234).

Liability can also be based on a contractual relationship between parties. Liability based on a breach of contract is called *contractual liability*, as opposed to liability in tort. Contractual liability may or may not be a result of negligent behaviour on the part of the liable party (Hoppu & Hoppu 2004: 245–246).

Liability can reach beyond damages to the audited company. Individual shareholders and creditors among others may suffer damages because they use company information and the auditor's report to make decisions (European Commission 2001: 7). Standards of liability as a means of investor protection are associated with larger stock markets (La Porta et al. 2006: 28). Liability to third parties is generally based on tort, since there is no contractual relationship between the auditor and the third party (European Commission 2001: 8).

Two fundamental questions concerning damages can be raised regardless of the legal foundation of liability (tort or contractual). First, the basis for liability, that is, what are the conditions that result in liability, and second, what is the extent of the liability, that is, what must a person pay or compensate when liable. (Hoppu & Hoppu 2004: 232.) Despite this study's emphasis on the latter, differences between countries in the legal foundation and conditions leading to liability are also briefly discussed.

2.2. Liability caps

A *liability cap* is a means of limiting auditors' liability by instituting a maximum amount for liability. In the European Union, the existence of a liability cap varies across countries and depends on the member states' national regulation. Statutory liability caps are in use in some countries, while in others liability is not limited (European Commission 2001: 102). At present, five EU member countries have a liability cap: Austria, Belgium, Germany, Greece, and Slovenia. There also exists a possibility for the auditor

and the audited company to limit liability contractually in some of the member states. The regulation concerning this is different between countries as well as the possibility of direct actions by shareholders or others (Doralt, Hellgardt, Hopt, Leyens, Roth & Zimmermann 2008: 63). There are different options for implementing a liability cap: (1) a fixed monetary cap, (2) a cap based on the size of the audited company, (3) a cap based on audit fees, and (4) the principle of proportionate liability (Ojo 2008: 4).

According to Koch and Schunk (2008: 1) there are several goals which liability caps are meant to achieve. One goal mentioned also in the Audit Directive (2006/43/EC) is to ensure the insurability of audit services and thus their availability to clients. Other goals are reducing the risk of a Big 4 firm collapse and encouraging middle-sized audit firms to offer their services to listed clients. The Commission Recommendation (2008/473/EC) in theory extends liability caps to all member states, but in practice it does not require the member states to take action (Ojo 2008: 5).

A study by London Economics (2006) proposes that auditors' liability should be limited throughout Europe. The main reasons for this are: (1) the poor availability of auditor insurance especially for higher levels of liability, (2) the increased risk of litigation that would lead to a Big 4 firm collapse, and (3) the increased overall risk of the audit profession. The study does not recommend any particular form of liability cap, but concludes that a relatively high cap is needed for Big 4 firms to promote audit quality, when at the same time middle-tier firms should be encouraged to audit larger firms by keeping the liability limit low enough. Liability should also be limited to keep audit fees reasonable, as increased liability leads to increased fees (Choi et al. 2008). A study by the Swedish justice department (SOU 2008: 79) points out that the company's management is responsible for financial reporting. Despite this, it is the auditor that is held liable for any damages due to negligence. Therefore, in practice liability actualises only on the auditor's part. According to the Swedish study this is highly questionable and should be attended to by limiting auditors' liability.

There is also evidence prompting that auditors' liability should not be limited. For example, Doralt et al. (2008: 63) claim that limiting auditors' liability protects auditors unfairly, as they are treated differently compared to other professions as lawyers or physicians. Köhler et al. (2008: 143) agree with this and add that a liability cap's fairness can be questionable since the relative compensation for the loss suffered increases with the declining extent of damage. Ojo (2008: 3–4) states that in the case of negligence, the auditor should be held accountable for any consequences. From investor protection's

point of view, higher auditor liability also raises investors' expected damage compensation and thus the value of the investment (Liu and Wang 2006). In addition, according to Doralt et al. (2008: 63) a liability cap should never apply in the case of intentional wrongdoing from the part of the auditor. This is the case with the currently existing liability caps in the EU, as they do not apply in case of intentional conduct (European Commission 2008: 77). Finally, unlimited liability can be seen as an incentive for better audit quality, as it would deter auditors who are not experienced in special kinds of audit from performing such audits. It could also increase public confidence in the audit of financial statements. (Köhler et al. 2008: 143.)

2.3. Liability regimes in different European countries

Legal liability regimes vary across member states in the EU. There are differences in the way auditors' liability is implemented in the legislation. Some countries have special laws concerning auditors; while in other countries general civil liability laws are applied to them. Furthermore, the basis for liability varies from contractual to tort. Liability caps restricting auditors' liability are in use in some countries.

Six countries were selected for this study. Three of them have no statutory liability caps: Finland, France, and Sweden. The three other countries have implemented a statutory liability cap: Belgium, Germany, and Greece. From legal system's point of view, Finland and Sweden represent the Scandinavian civil law family, Germany and Greece are from the German civil law family, and Belgium and France have French civil law systems. Both Scandinavian and German civil law systems are considered to have a moderate level of investor protection, that is, weaker than common law countries and stronger than French civil law countries. Both the German and Scandinavian systems are also assumed to have a higher quality of law enforcement than French civil law countries (La Porta et al. 1998: 1116). The main characteristics of the liability regimes of the six countries are presented in Table 1 on page 19.

2.3.1. Belgium

The liability of statutory auditors in Belgium in regulated by the general rules of civil liability accompanied by *the law of 23 December 2005*. In Belgium a system of proportional liability is in use, meaning that liability is placed upon defendants according to their contribution in the damage. Liability towards a client can be based on a contract or

tort, whereas the basis for liability towards third parties is tort. (European Commission 2008: 74; Vanstraelen & Willekens 2008: 29.)

Insurance for auditors covering liability is required in Belgium (London Economics 2006: 94). Since 2006 (the law of 23 December 2005), there has been a liability cap per mandate, and its amount depends on whether the audited company is publicly listed or not. The cap for an audit of an unlisted company is three million euro, and twelve million for an audit of a listed company (European Commission 2008: 77). There is a time limit of five years after the issue of the auditor's report for bringing an action against the auditor (Vanstraelen & Willekens 2008: 29).

2.3.2. Finland

The liability of auditors is based on the *Auditing Act* § 51, which defines when the auditor is deemed liable. Other specific issues related to liability, e.g. calculation of damages, are regulated by general civil liability legislation. Auditor is only liable if negligence is shown (Niemi & Sundgren 2008: 91). This applies to both liability to the client and liability to third parties. Both the individual statutory auditor in charge of the audit and the audit firm are liable, as is the signing person. They are also liable for the damages caused by their employees. Associates may be liable for the breach of a general provision of civil law. If the statutory auditor is an individual who works in an audit firm, the audit firm may be liable only in case of a breach of the contract. (European Commission 2001: 10.)

The risk of litigation in Finland is relatively small, as is the number of complaints against auditors (Niemi & Sundgren 2008: 91). No legal obligation for insurance covering liability exists (London Economics 2006: 94). There is no statutory liability cap in Finland. Contractual limitation to liability is possible in theory, but does not exist. There is a time limit for bringing an action against the auditor. The length of this limit depends on the plaintiff, and is three years if the plaintiff is the audited company, and ten years if the plaintiff is a third party. (European Commission 2001: 11.)

2.3.3. France

Statutory auditors' liability is governed by a specific provision contained in Article 234 of the *Company Law of 24 July 1966*. Liability can only be based on auditors' "negligent acts committed by them in the exercise of their functions". (European Commission

2001: 11; Baker, Bédard & Prat dit Hauret 2008: 108.) This applies to liability towards the auditor's clients as well as towards third parties. The auditor, either an individual or an audit firm, may be liable. In case of an audit firm, the signatory of the report is jointly and severally liable with the firm. The associates cannot be liable under the specific provision of the Company Law. (European Commission 2001: 11–12.)

Auditors are required to have insurance for liability (London Economics 2006: 94). There is no statutory liability cap in France, and the parties cannot limit the amount of damages nor reduce the scope of auditor's liability by contract. There is a time limit of three years from the occurrence of the damage for bringing an action against the auditor. (European Commission 2001: 12.)

A distinctive feature of the French auditing system is the requirement of two auditors for companies with quoted shares. The two auditors are to be engaged in the auditing of the company's accounts at the same time. (Baker et al. 2008: 99.)

2.3.4. Germany

In Germany, statutory auditors' liability arises from specific statutory provisions as contained in Article 323 of the *Handelsgesetzbuch*, which provides for auditors' contractual liability. Auditors are also liable in tort, which is based on the general rules for civil liability. Some of the statutory provisions applicable to auditors' liability are also found in the professional rules contained in the Act on the Profession of Auditors. Liability to the audited company is based primarily on contract and secondarily in tort, and liability to third parties generally in tort. However, there is a possibility of contractual liability to third parties in the case of an implied contract between the auditor and the third party, or of a contract with protective effects towards the third party. Not only the statutory auditor but also all his assistants, as well as the statutory representatives of an auditing company, participating in the audit are directly liable to the injured party. (European Commission 2001: 12.)

Insurance for auditors covering liability is required in Germany (London Economics 2006: 95). There is a liability cap per audit or group audit, and its amount depends on whether the audited company is publicly listed or not. The cap for an audit of an unlisted company is one million euro, and four million for an audit of a listed company (European Commission 2008: 77). There are time limits for bringing an action against

Table 1. Main features of the auditor liability regimes in Belgium, Finland, France, Germany, Greece, and Sweden.

Country	*Legal system*	*Auditors' liability regulated by general civil liability rules*	*Auditors' liability regulated by specific rules*	*Basis for liability towards an auditee*	*Basis for liability towards a third party*	*Liability cap*	*The amount of the liability cap*
Belgium	French civil law	Yes	Yes	Contractual / Tort	Tort	Yes	€3 million (unlisted company) €12 million (listed company)
Finland	Scandinavian civil law	Yes	Yes	Tort	Tort	No	-
France	French civil law	Yes	Yes	Tort	Tort	No	-
Germany	German civil law	Yes	Yes	Contractual / Tort	Contractual / Tort	Yes	€1 million (unlisted company) €4 million (listed company)
Greece	German civil law	Yes	Yes	Contractual	Tort	Yes	Calculated based on total annual fees of the auditor or the salary of the President of the Supreme Court, whichever gives the higher value.
Sweden	Scandinavian civil law	Yes	Yes	Contractual	Tort	No	-

the auditor. The limits are five years for an action in contract and three years for an action in tort (European Commission 2001: 12).

2.3.5. Greece

Auditors' liability in Greece is based on general civil liability and special legislation including the *Codified Law 2190/20*, which sets forth civil liability of auditors towards the company, and Article 19 of the *Presidential Decree 226/1992*, which contains special provisions limiting auditors' liability. The statutory auditor's liability to the audited company arises in contract and to any third parties from a breach of duty in tort. The appointed statutory individual auditor or firm is liable for the damages that he as well as his associates caused. If the appointed auditor is a firm, the signatory of the report is jointly and severally liable with the firm. (European Commission 2001: 13.)

Insurance covering auditor liability is required (London Economics 2006: 95). There is a liability cap of either the quintuple of the annual salary of the President of the Supreme Court or the total amount of fees received by the Chartered Auditor during the previous fiscal year, whichever is higher. The parties cannot limit the legal liability of the auditor by contract. There is a time limit for bringing an action against the auditor. If the plaintiff is the audited company, the limit is two years. If the plaintiff is a third party, the limit is five years. (European Commission 2001: 13.)

2.3.6. Sweden

Civil liability for statutory auditors in Sweden is specifically regulated in Chapter 15, Section 230 of the *Swedish Companies Act*, but a statutory auditor may also be liable under the general damage rules of the *Tort Liability Act*. The liability to the audited company is based on contract between the auditor and the client, and hence is contractual in nature. Liability to any third parties results from a breach of duty in tort. The auditor is also liable for the damages caused by the associates. (European Commission 2001: 18.)

Insurance or guarantee for auditors covering liability is required in Sweden (Kaisanlahti & Timonen 2006: 202; London Economics 2006: 96). There is no statutory liability cap, and the amount of damages or the scope of auditor's liability cannot be limited by contract. There is a time limit for bringing an action against the auditor. The length of this

limit depends on the plaintiff, and is five years if the plaintiff is the audited company, and ten years if the plaintiff is a third party. (European Commission 2001: 18.)

3. LIABILITY RISK

As any type of business, auditing includes risks. Auditors' risk associated with audit engagements includes different components. One of these components is *liability risk*. It consists firstly of the risk of an occurrence of an audit failure, and secondly the risk that the auditor would be found liable for the audit failure, which depends on the legal regime. The economical aspect of liability risk is the expected value of damages the company has to pay. This value affects auditors' decision making, which in turn is expected to affect audit quality. The decisions auditor make and actions they take correspondingly affect the expected value of the damages. One important way to control the expected economical value of liability risk is insurance. The lack of availability of adequate insurance coverage poses a threat to individual auditors as well as audit companies (e.g. London Economics 2006). Figure 3 presents the main features of auditors' liability risk affected by a country's liability regime and affecting audit quality as a part of the causal chain from liability regime to audit quality.

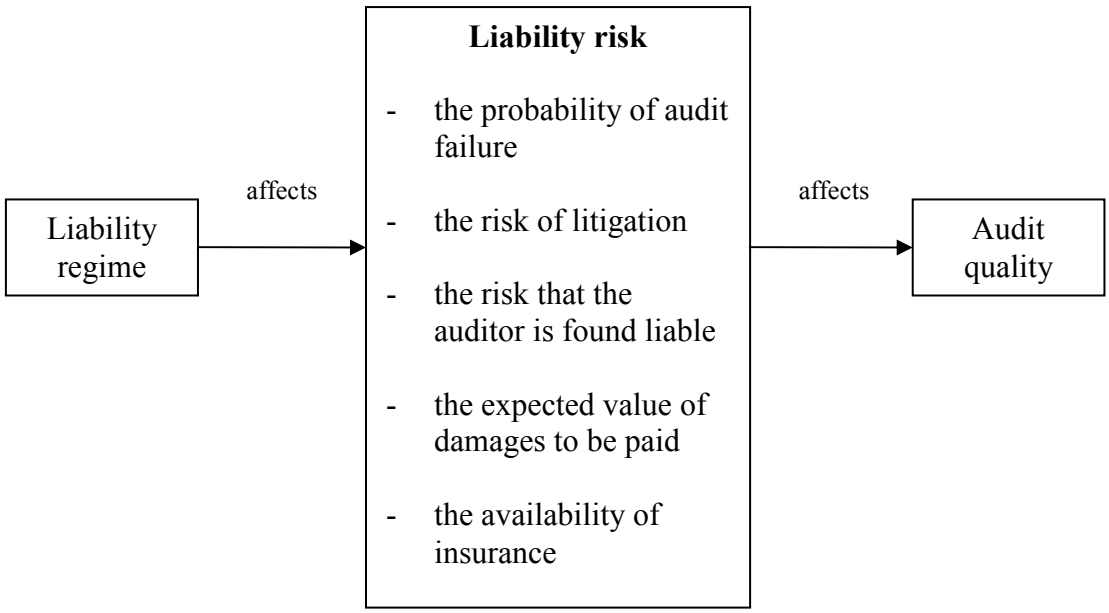

Figure 3. Liability risk in the causal chain from liability regime to audit quality.

As one function of liability rules is to ensure that plaintiffs are reimbursed for damages caused by auditors (Gietzmann, Ncube & Selby 1997: 24), the existence of liability

leads logically to the conclusion that in the presence of a risk of an audit failure occurring, there always is a risk that an auditor has to pay damages. An audit engagement never is without risk, as it is practically impossible for an auditor to reach full certainty that financial reports are free of material error. According to Liu and Wang (2006: 1055), since audit procedures are not perfect in detecting error and an auditor's effort is not easily observable, it is possible that, in practice, the court tends to judge an auditor with hindsight and conclude that an auditor did not perform enough audit procedures.

3.1. Liability risk and decision making

Liability risk affects the decisions auditors make regarding audit effort and client acceptance. The logical outcome of a higher risk would be that auditors expend audit effort to lower the probability of audit failure, thus achieving a smaller liability risk. This would lead to higher audit quality. Litigation risk is an important factor that motivates auditors to expend their effort in the performance of audits (Choi et al. 2008: 56). According to Gietzmann et al. (1997: 24) auditors' incentives to commit to independence and high degree of care, i.e. produce high quality audits, could weaken if liability is less strict. Hence, the risk of litigation should lead to higher audit quality. Laux and Newman (2010) have found that audit quality does increase with the auditor's expected litigation losses from audit failures.

In his study, Heninger (2001) examines the relation between earnings management and auditor litigation. Auditor litigation increases with the extent to which client firms report higher (i.e. income-increasing) abnormal accruals. This is because external stakeholders hold auditors responsible for letting their clients to release false information about their financial situation. The study's results also indicate that litigation risk is greater for clients in weaker financial condition and for larger clients.

Koch and Schunk (2008) studied how the extent of liability affects auditors' decision making. Examining decisions under an environment of limited and unlimited liability, they found that unlimited liability has deterrence effects that can lead to an inefficiently high level of auditors' effort, or even auditors stopping their activity entirely.

Audit fees increase with the auditor's expected litigation losses from audit failures (Laux & Newman 2010). As the fees grow with the risk, a country's litigation environment plays a crucial role in audit pricing (Choi et al. 2008: 56). Expected losses must be

incorporated into audit fees because the fee cannot be adjusted retrospectively (Zerni 2009: 21). Nevertheless, the risk may not be fully transferred to the audit fees charged from the client. A study by London Economics (2006) found that in the case of Big 4 firms this is because of competition. A part of the risk premiums are also passed on to non-audit clients (London Economics 2006: 97).

Client acceptance decisions are affected by litigation risk. When making these decisions, auditors evaluate the client's risk and the potential fee and determine whether the risk and return already are at an acceptable level. If the client's risk and return are not acceptable, the auditor can consider whether additional audit investment or charging a higher fee would result in an acceptable risk and return rate. (Johnstone & Bedard 2003: 1006.) It could be assumed that increased litigation risk would lead to higher client rejection rate, since the clients' willingness to pay a higher audit fee would not compensate for the high risk. Laux and Newman (2010) found that rising litigation risk can either increase or decrease the probability of client rejection. For both weak and strong legal liability regimes, rejection rates are high compared to more moderate legal liability regimes.

Auditor switching becomes more costly when litigation risk increases, as the new auditor wants to become familiar with the new client firm in greater detail. In countries with strict liability regimes, this leads to underpricing of auditing services in the initial audit engagement year as auditors compete for clients. (Kallunki, Sahlström & Zerni 2007.)

3.2. Liability insurance

Audit firms manage statutory audit risks by implementing internal risk management and by insurance (London Economics 2006: 91). An auditor can obtain insurance covering liability risks to bring the risk to a more reasonable level. The trust in auditors is not only based on the possibility to sue auditors for suffered economic losses, but also on a certain security that auditors are actually capable of paying for them (Holm & Warming-Rasmussen 2008: 70). Insurance is a way of not only ensuring the auditor's ability to pay damages, but a way of communicating this ability to clients and third parties.

In the case of an audit failure, an individual auditor and the management of the audit firm can be jointly liable for damages. In practice demands for compensation may be directed at the auditor alone, when the auditor is known to be insured (Andersson 2010:

61–62). At the same time, commercial insurers and reinsurers do not provide much cover, since insuring auditor liability is not a profitable business from their point of view (London Economics 2006: 112). This is mainly due to large losses sustained by the insurance industry in the underwriting of auditor professional insurance in the eighties and nineties (London Economics 2006: 116).

The availability of insurance is important for ensuring the continuing supply for audit services. Auditing always contains an element or risk, and it is necessary for auditors to be able to perform in their risky profession. Liability risk normally rises as the auditee size grows. If the auditee is a large company, liability can reach large amounts. This affects auditors' possibility to insure themselves by removing this possibility entirely or by extremely high insurance charges (Andersson 2010: 61–62).

Insurance for liability is mandatory in most European Union member states. The availability for this legally required insurance for low level liability normally is not a problem. This has in many cases been taken care of by agreements between national auditor organisations and insurance companies. The availability of insurance poses a bigger problem with larger domestic and international risks. (London Economics 2006.) The requirements for insurance in the six countries of this study are presented in Table 2.

Obtaining comprehensive insurance coverage for large liability risks is difficult. The availability of commercial insurance for large domestic and international risks has fallen sharply, and is now at a level which would cover less than five percent of the large claims some audit firms face. Insurance premiums have at the same time doubled for Big 4 companies during the first five years of the century. The difficult obtainability of insurance brings about the risk of audit firm collapse in the event that liability turns out to be too burdensome for the company to bear. The collapse of a Big 4 audit firm would lead to a situation where the audit market would be more centralised and arguably less competitive. This risk of a company collapse is growing with the reduction in commercial insurance coverage combined with the risk that a case is pursued by a plaintiff interested only in maximising recovery. (London Economics 2006: 115–116.)

Auditor liability is not only designed to offer compensation for those suffering losses but also to act as an incentive to avoid professional malpractice. In other words, liability risk is meant to lead to better audit quality. For this reason it is reasonable that the auditor bears a part of the liability risk and that insurance does not cover liability completely (London Economics 2006: 100). If insurance would cover all of the risk, there

would be no incentive to produce better quality audits as the auditor would not bear a risk at all.

Table 2. Mandatory insurance for audit firms (London Economics 2006: 94–96).

Country	*Mandatory insurance required by law / others*	*Minimum coverage*
Belgium	By the professional association	€619,733 per event
Finland	In practice, in Finland all auditors cover their work with voluntary insurance protection provided by the group insurance policy of the Authorised Public Accountants' Institute	-
France	By law	€2,500,000 minimum per claim
Germany	By law	Minimum coverage of €1 million for unlisted companies and €4 million for listed companies
Greece	By law	Insurance must not be less than the 150% of the total fees which the Certified Auditors received in the previous financial year and in no case less than 10 times the total annual remuneration of the President of the Supreme Court
Sweden	By law	Depends above all on the number of auditors in the practice. The amount varies between €440,000 per claim and up to €880,000 per claim or €2.65 million per year

4. AUDIT QUALITY

The major accounting scandals in the beginning of the century have led to growing interest on audit quality. These scandals have proven that poor quality can lead to disastrous consequences and has brought the matter's importance to public knowledge. Audit quality is the basis for credibility of auditors and the audit industry as a whole.

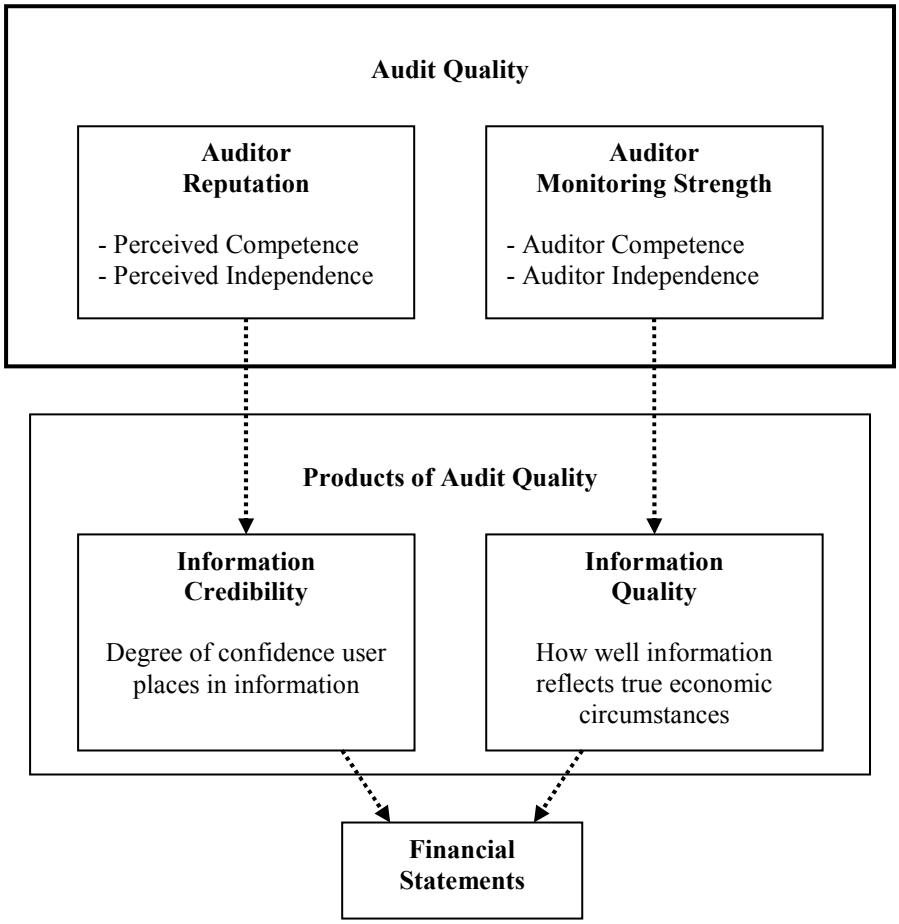

Figure 4. Audit quality framework (Watkins et al. 2004: 155).

Audit quality consists of two components: audit quality in fact and market perceived audit quality (Zerni 2009: 17). Watkins, Hillison and Morecroft (2004) presented an audit quality framework (see Figure 4) that divides audit quality into actual and perceived quality, and used auditor monitoring strength and auditor reputation to depict these components. In the framework auditor monitoring strength includes two compo-

nents: auditor competence and auditor independence. Competence refers to auditor finding existing material errors and independence to auditor reporting those errors (see e.g. DeAngelo 1981). Auditor reputation consists of perceived competence and perceived independence. The framework also defines the products of audit quality as information quality and information credibility. The former refers to how well the audited financial statements reflect true economic circumstances and the latter to the degree of confidence a user of this information places in it.

Audit quality has been the focus of several studies and the interest in the topic has grown especially after the accounting scandals of the early 2000s. The field of audit quality research has been reviewed comprehensively in articles by Francis (2004) and Watkins et al. (2004). The research has concentrated on different elements affecting audit quality, as legal environment (e.g. Ball et al. 2000; DeFond & Francis 2005; Francis & Wang 2004; Francis & Wang 2008; Heninger 2001; La Porta et al. 1998; Leuz et al. 2003; London Economics 2006; Maijoor & Vanstraelen 2006), auditor size (e.g. Becker, Defond, Jiambalvo & Subramanyam 1998; DeAngelo 1981; Francis et al. 1999; Francis & Wang 2004; Francis & Wang 2008), audit effort (e.g. Caramanis & Lennox 2008), and auditor independence (e.g. Chung & Kallapur 2003; Frankel, Johnson & Nelson 2002).

Francis (2004) listed the most important findings of audit quality research so far. These findings are:

- Auditing is relative inexpensive, less than 0.1 per cent of aggregate client sales;
- Outright audit failures with material economic consequences are very infrequent;
- Audit reports are informative, despite the presence of false positives and negatives;
- Audit quality is positively associated with earnings quality;
- Audit quality is affected by legal regimes and the incentives they create;
- There is evidence of differential audit quality by Big 4 firms and industry experts, and differential audit quality across individual offices of Big 4 firms and across different legal regimes;
- Academic research has had little impact on regulations and policy-making in the US, although it may have had more influence in other countries such as the United Kingdom.

(Francis 2004: 360.)

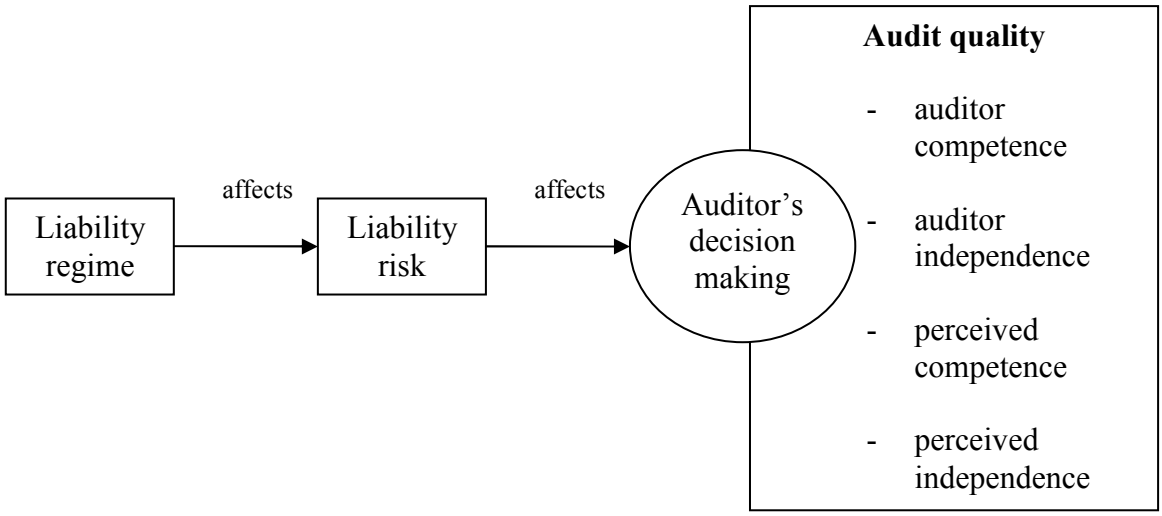

Figure 5. Audit quality in the causal chain from liability regime to audit quality.

As the purpose of this study is to find out if the existence of a liability cap affects audit quality, the most interesting of the findings Francis (2004) listed is that audit quality is affected by legal regimes and the incentives they create. There is evidence of such an effect, and it can be assumed that there is a chance of a connection between limiting liability and audit quality. Another important finding is that audit quality is positively associated with earnings quality, as earnings quality is the proxy used for measuring audit quality in this study. Figure 5 presents audit quality as a part of the causal relationship leading from liability regime to liability risk to audit quality. Auditor's decision making links liability risk and audit quality together. Liability risk affects auditors' decisions concerning e.g. client acceptance and audit effort. These decisions affect the different components of audit quality.

4.1. Measuring audit quality

Audit quality is largely unobservable and difficult to measure. As audit working papers and the data generated in the audit process are usually not accessible for research purposes, other ways to measure audit quality are needed. Typically this is done by using proxy measures. There are different proxies that have been used; European research has concentrated on audit fees, earnings management, and audit reporting. (Eilifsen & Willekens 2008: 3–4.)

In this study earnings management is used as the proxy measure for audit quality. Higher quality auditing leads to less earnings management. Managers have incentives to adjust earnings to maximise firm or manager wealth, which is due to contracts that have their outcome depend on reported earnings (Becker et al. 1998: 5–6). There is evidence that earnings management is frequent in the case of earnings decreases or losses. In a study by Burgstahler and Dichev (1997), evidence was found that 8–12 percent of the firms that had small pre-managed earnings decreases, managed earnings to report earnings increases. In the case of negative pre-managed earnings, 30–44 percent of the firms exercised discretion to report positive earnings.

Detection of earnings management is a key objective of an audit (London Economics 2006: 156). Since earnings management is a factor that reduces the accuracy and thus the quality of financial reporting, it can be argued that better audit quality should reduce the amount of earnings management. High quality auditing acts as a deterrent to earnings management because management's reputation is likely to be damaged and firm value reduced if misreporting is detected and revealed (Becker at al. 1998: 6).

Earnings management is in practice conducted by manipulating accounting accruals. Accruals are temporary adjustments that resolve timing problems in cash flows by making assumptions and estimates, and their quality is defined as the extent to which accruals project into cash flow realisations (London Economics 2006: 156). Since managers have limited ability to manipulate accruals attributable to normal business operations, any such earnings manipulations should manifest as abnormal accruals (Heninger 2001: 124). In this study, earnings management is measured by the magnitude of discretionary accruals, and the concepts of abnormal and discretionary accruals are used interchangeably.

4.2. Factors affecting audit quality and earnings management

Earlier research has studied various factors affecting audit quality. These factors are presented in the following sections.

4.2.1. Legal system

In the European Union the existence of a liability cap is a matter of national regulation of the member states. Thus the legal system an auditor operates in is most relevant for

this study, especially regulation concerning auditor liability. However, there are other approaches to the question of legal system effect of audit quality besides limiting liability. Some of these approaches and related earlier research are discussed in this section.

One approach of interest has been the difference in audit quality between legal systems based on civil law and common law. Different legal traditions have given the national regulatory systems their contemporary form, including legislation concerning auditing. Since audit regulation depends partly on a country's legal tradition, it is reasonable to assume that it affects audit quality. There is evidence that managers have greater discretion in reporting earnings in code law countries than in common law countries (Ball et al. 2000: 3). The Big 4 auditors are more *conservative*, i.e. more restrictive concerning accruals reporting, in common law countries. The legal regime and investor protection environment seem to directly affect Big 4 auditor incentives. The conservatism varies across countries and is stronger in stronger investor protection environments. (Francis & Wang 2004.) These results are explained by the differences in the level of investor protection; higher levels of investor protection are usually associated with common law countries. In this study all six countries are civil law countries, two from each of the civil law subfamilies: French, German, and Scandinavian. Belgium and France have French civil law systems, Germany and Greece German civil law, and Finland and Sweden Scandinavian civil law tradition. The level of investor protection is considered to be average in German and Scandinavian systems, French civil law countries having the weakest protection (La Porta et al. 1998: 1116).

In a study by Leuz et al. (2003) the results were that stronger investor protection leads to less earnings management. The factors the study found out to lower the amount of earnings management were strong minority shareholder rights and legal enforcement. These characteristics are typical for countries with high level of investor protection, dispersed ownership and large stock markets (Leuz et al. 2003). Francis and Wang (2008) argue that earnings quality varies across countries mainly due to differences in enforcement by Big 4 auditors. In countries with stronger investor protection, Big 4 auditors apply a more conservative approach than in countries with weaker investor protection. There is no such difference in the case of non-Big 4 auditors. The incentives for Big 4 auditors seem to be affected by legal consequences on auditors from a failure to detect client misreporting (Francis & Wang 2008).

The ability to sue auditors is one element of investor protection environment (Francis & Wang 2004: 22). This ability shows itself to auditors as litigation risk, thus increasing

the expected value of liability costs. Litigation risk is considerably lower in civil law countries when compared to common law countries due to differences in investor protection regimes. In his study, Heninger (2001) examines the relation between earnings management and auditor litigation. Auditor litigation increases with the extent to which client firms report higher (i.e. income-increasing) abnormal accruals. The study's results also indicate that litigation risk is greater for clients in weaker financial condition and for larger clients.

Maijoor and Vanstraelen (2006) report evidence that the amount of earnings management is not uniform across countries. They studied three European countries, namely France, Germany, and the United Kingdom. These countries all have different legal environments and subsequently different levels of investor protection. France has a French civil law system, Germany represents the German civil law family, and the UK is a common law country. The results of the study were that a stricter audit environment reduces earnings management, as companies in countries with flexible audit quality regimes report significantly higher absolute values of discretionary accruals compared to companies in countries with strict audit quality regimes. Thus national differences in earnings management are dominant and are not removed by the presence of a Big 4 audit firm. (Maijoor & Vanstraelen 2006.) These results support the findings of Francis and Wang (2004) on legal regime effect on Big 4 auditor conservatism.

Limiting auditors' liability was examined as a part of a study by London Economics (2006). The study found no evidence that the existence of a liability cap significantly affects audit quality as proxied by earnings management, i.e. accruals. The London Economics (2006) study ended up recommending a liability cap for reasons such as ensuring auditor insurability and the risk of an audit firm collapse. Results from a study by Koch and Schunk (2008) suggest that limiting liability affects auditors' decision making, thus it could affect audit quality.

A large selection of research confirms that legal environment really does affect audit quality. Differences in legal systems and regulation give auditors incentives to act differently across legal regimes. Despite the evidence that legal system and regulation matters, the question of an optimal legal environment producing optimal audit quality remains unanswered (DeFond and Francis 2005: 13).

4.2.2. Auditor size

Audit quality can be argued to vary from auditor to auditor. The effectiveness of auditing is expected to vary with the quality of the auditor, as high quality auditors are more likely to detect errors and report them (Becker at al. 1998: 6). Big 4 auditors are often assumed to be of higher quality than other auditors. This assumption is supported by earlier research (e.g. Becker et al. 1998; Francis et al. 1999). However, it is not conclusive that the linkage is causal from auditor size to audit quality. Clients with better pre-audit financial information quality may more likely choose Big 4 auditors, in which case selection bias may explain outcomes instead of audit quality (Zerni 2009: 18). If non-Big 4 auditors have clients with high levels of earnings management, they may be preventing a higher proportion of it than Big 4 auditors, thus detecting more errors and producing higher audit quality (Becker at al. 1998: 19).

Big 4 auditors are often referred to being more conservative that non-Big 4 auditors. Auditor conservatism is a term used to describe the restraining effect of an auditor on clients' accruals. It is a consequence of Big 4 firms having incentives to protect their brand name reputations. Clients are aware of this and try to convey the credibility of their reported earnings by hiring a more conservative auditor. (Francis et al. 1999: 17; Francis & Wang 2008: 1.)

In summary, auditor size is widely assumed to affect audit quality, and there is empirical evidence to support this. If audit quality is defined to consist of actual and perceived quality, auditor credibility is an important factor. If Big 4 auditors are perceived to be more conservative and audits conducted by them more credible than other auditors, the perceived quality component of audit quality certainly is higher for Big 4 auditors.

4.2.3. Other factors

This section briefly discusses the factors affecting audit quality besides legal environment and auditor size. For example, audit effort and auditor independence directly affect the probability of an auditor detecting and reporting a problem, hence affecting audit quality (Caramanis & Lennox 2008: 116).

Audit effort is a factor that implicitly affects audit quality, as it affects the probability that the auditor detects an existing problem. Audit effort can be measured by audit hours, i.e. the time the auditor uses for the audit. A study by Caramanis and Lennox

(2008) examined the effect of audit hours on reported earnings. They found out that audited companies report more income-increasing accruals when auditors work fewer hours. Lower audit hours lead to more income-increasing than income-decreasing accruals and higher likelihood of managing earnings upwards to just meet or beat zero earnings (Caramanis & Lennox 2008). Thus it can be argued that higher audit effort decreases earnings management.

Auditor independence affects the probability that the auditor reports a detected problem (DeAngelo 1981). Higher level of independence arguably leads to higher audit quality. Non-audit fees are a factor claimed to compromise auditor independence (e.g. Chung & Kallapur 2003; Frankel et al. 2002). The evidence from these studies is controversial.

According to Francis (2004), other factors affecting audit quality include cross-office quality differences, industry expertise, auditor tenure, audit committees, and accounting firm alumni. Research on cross-office quality differences is based on the presumption that the audit industry should rather be studied on the office level instead of national or international level. Industry expertise studies lean on the facts that Big 4 accounting firms actively promote their industry expertise and industry market shares are not evenly distributed among the large accounting firms. Audit tenure research is motivated by the requirement of auditor rotation. The effect of existence or independence of audit committees on audit quality is studied in audit committee research. Another line of research investigates if accounting firm alumni in senior management positions of audit clients can potentially compromise audit quality. (Francis 2004: 354–358.)

There exists research on yet other factors affecting audit quality than the ones mentioned here. An example of such is the study on how audit quality in initial public offerings (IPO) differs from post-IPO audits by Venkataraman, Weber and Willenborg (2008).

5. DATA AND METHODOLOGY

The data collected for the study, the method for calculating discretionary accruals, and the univariate and multivariate methods used for testing the hypotheses are presented in this chapter.

5.1. Sample selection and descriptive statistics

The data are collected from the Amadeus database, which contains data on over 15 million companies in 43 countries across Europe. The countries selected for this study are Belgium, Finland, France, Germany, Greece, and Sweden. Three of these countries, namely Belgium, Germany, and Greece, have limited statutory auditors' liability by the means of a liability cap. The three other countries, Finland, France, and Sweden, have a regime of unlimited liability. The sample consists of listed companies with their financial year ending during the year 2008.

To acquire the data needed for this study, a search from the Amadeus database was conducted using suitable search criteria. The search included all listed companies in aforementioned countries with available financial data from 2008, and data from 2007 needed for analysis and calculating abnormal working capital accruals, which is the measure for earnings management in this study. Consistent with earlier research (Becker et al. 1998; Maijoor & Vanstraelen 2006), financial institutions (US SIC industry codes 6000–6999) and utility companies (US SIC 4000–4999) were excluded from the search. This is due to these industries' specific accounting requirements, high degree of complexity, and different accrual generating process (Maijoor & Vanstraelen 2006: 37).

The initial search returned 1,287 observations, of which 21 companies were missing the information on auditors, and further nine companies were missing a US SIC industry code. These 30 companies were excluded from the sample. The effect of outliers on the results was reduced by excluding all observations in the top and bottom 1% of all the continuous variables included in the regression model presented in Section 5.2.2.: abnormal working capital accruals scaled by sales, natural logarithm of total assets, ratio on long term debt and common equity, and operational cash flow scaled by total assets. Further 83 observations were removed from the sample for having outlier values, resulting in final sample size of 1,174 companies in total. The number of observations by country is presented in Table 3 and is as follows: Belgium 53 companies, Finland 60,

Table 3. Sample size by country.

Liability cap	*Country*	*N*	*%*	*Cumulative %*
Yes	Belgium	53	4.5	4.5
	Germany	330	28.1	32.6
	Greece	175	14.9	47.5
	Total / Liability cap	558	47.5	47.5
No	Finland	60	5.1	52.6
	France	367	31.3	83.9
	Sweden	189	16.1	100.0
	Total / No liability cap	616	52.5	100.0
	Total	1,174	100.0	

Table 4. Sample size by industry.

		*US SIC industry codes**				
Liability cap	*Country*	*SIC 01-09*	*SIC 10-17*	*SIC 20-39*	*SIC 50-59*	*SIC 70-89*
Yes	Belgium	0	3	18	12	20
	Germany	0	11	136	42	141
	Greece	7	14	90	42	22
	Total / Liability cap	7	28	244	96	183
No	Finland	0	2	34	5	19
	France	2	13	142	57	153
	Sweden	0	10	46	30	103
	Total / No liability cap	2	25	222	92	275
	Total	9	53	466	188	458

* SIC 01–09: Agriculture, forestry and fishing; SIC 10–17: Mining & Construction; SIC 20–39: Manufacturing; SIC 50–59: Wholesale trade; SIC 70–89: Services

Table 5. Descriptive statistics of the sample.

			Natural logarithm of total assets	Earnings after tax / Total assets	Operating cash flow / Total assets	Long-term debt / Common equity	Total accruals / Lagged total assets	Absolute value of (Total accruals / Lagged total assets)
Section A	Pooled sample (N = 1,174)	*Mean*	11.009	-0.030	0.024	0.409	-0.041	0.105
		Median	10.915	0.022	0.052	0.186	-0.038	0.069
		Std. Deviation	1.905	0.207	0.183	0.654	0.159	0.126
Section B	Observations with a liability cap (N = 558)	*Mean*	11.463	-0.022	0.030	0.494	-0.033	0.102
		Median	11.334	0.022	0.049	0.283	-0.039	0.065
		Std. Deviation	1.671	0.190	0.155	0.680	0.163	0.125
Section C	Observations without a liability cap (N = 616)	*Mean*	10.598	-0.037	0.019	0.331	-0.048	0.103
		Median	10.459	0.022	0.055	0.123	-0.037	0.065
		Std. Deviation	2.008	0.220	0.205	0.620	0.154	0.125
Section D	Tests of null* (B = C)	*t-statistic (p-value)*	-8.055 (0.000)	-1.309 (0.191)	-0.985 (0.325)	-4.285 (0.000)	-1.641 (0.101)	-0.677 (0.499)
		Z-statistic (p-value)	-8.525 (0.000)	-0.321 (0.748)	-0.711 (0.477)	-6.220 (0.000)	-0.372 (0.710)	-1.035 (0.300)

* T-statistics are from t-tests of the differences in the means and Z-statistics from Mann Whitney U-tests. The tests are two-tailed.

France 367, Germany 330, Greece 175, and Sweden 189. Total number of observations is 558 from countries with a liability cap and 616 from countries without a liability cap. Table 4 presents the number of observations per industry and per country.

Table 5 contains financial variables describing the sample. The pooled sample is presented in section A, and the samples from countries with and without a liability cap in sections B and C, respectively. The results of parametric and nonparametric tests comparing the two groups are found in section D. The variables presented in Table 5 are the following. Natural logarithm of total assets is a measure of company size, and earnings after tax scaled by total assets measures profitability. Operating cash flow is calculated by subtracting total accruals from earnings after tax and scaled by total assets as well. Long-term debt per common equity is used to measure leverage. The "direction" of total accruals and companies' accruals-generating potential is measured by total accruals and their absolute value, both scaled with total assets. Following Dechow, Sloan and Sweeney (1995), total accruals are calculated as (Δ current assets during the fiscal year - Δ cash) - (Δ current liabilities - Δ short-term debt) - depreciation expense, where Δ denotes change during the fiscal year.

In general, companies from countries with a liability cap seem to be larger, slightly more profitable, and substantially more leveraged than companies from countries with unlimited auditor liability. Specifically, the natural logarithm of total assets and the ratio of long-term debt to common equity are significantly larger in the capped liability sample ($p < 0.001$). There are no statistically significant differences in the operational cash flows or direction of total accruals or the accrual-generating potential between the groups.

In conclusion, there are differences between the samples with and without a liability cap with respect to size and leverage. These differences have to be taken into account in the construction of the model for multivariate tests by including control variables for size and leverage in the model.

5.2. Research design

In this study the proxy measure for audit quality is earnings management, which will be measured as the amount of abnormal accruals in audited financial statements. This requires a means for estimating the discretionary component of reported income. The op-

tions for this range from simple models in which discretionary accruals are measured as total accruals, to more sophisticated models that attempt to separate total accruals into discretionary and nondiscretionary components (Dechow et al. 1995: 194). The most popular choices for estimating discretionary accruals are the Jones model (Jones 1991) and modified Jones model (Dechow et al. 1995). However, they require either large time-series of observations or a large number of industry-specific observations (Maijoor & Vanstraelen 2006: 35). Thus, the Jones model and the modified Jones model are not suitable for the data used in this study, as it is cross-sectional and some industries have only a small number of observations.

Following Defond and Park (2001) and Maijoor and Vanstraelen (2006) discretionary accruals will be measured as abnormal working capital accruals. Working capital accruals are seen as more susceptible to manipulation than non-working capital accruals (Maijoor & Vanstraelen 2006: 37). Discretionary accruals are calculated as:

(1) $DA_t = WC_t - [(WC_{t-1} / S_{t-1}) * S_t]$,

where:

DA_t = discretionary accruals, i.e. abnormal working capital accruals in year t;

WC_t = non-cash working capital in year t calculated as (current assets - cash and cash equivalents) - (current liabilities - short-term debt);

WC_{t-1} = non-cash working capital in year t-1;

S_t = sales in year t;

S_{t-1} = sales in year t-1.

The abnormal working capital accruals are then scaled by the sales of that year to acquire the variable AWCA and its absolute value ABSAWCA used in the univariate and multivariate analyses.

The purpose of this study is to examine the effect of limiting auditors' liability on audit quality. For this purpose, the magnitudes of earnings management in liability regimes with and without a liability cap are compared. The empirical analysis will focus on the absolute value of discretionary accruals, as direction of the incentives to manage earnings may vary across countries, as suggested by Maijoor and Vanstraelen (2006: 39). The main company variables of interest in this study are: (1) whether the company is operating in a country with a regime of capped liability or unlimited liability; and (2) whether the company is audited by a Big 4 or a non-Big 4 audit firm. Univariate tests

presented in Section 5.2.2. are conducted to examine the effects of these variables on discretionary accruals. However, the primary emphasis of this study is on multivariate analysis. The method used for multivariate analysis is OLS regression, and the regression model presented in Section 5.2.2. is used to test the hypotheses.

5.2.1. Univariate analysis

A number of univariate tests are conducted to compare the magnitude of abnormal working capital accruals across the samples from regimes with and without a liability cap. First, the magnitude of absolute value of discretionary accruals, and second, the income-increasing and income-decreasing discretionary accruals are compared. Third, the effect of Big 4 auditor on the absolute value of discretionary accruals is examined. Fourth, the Big 4 auditor effect on income-increasing and income-decreasing discretionary accruals is tested respectively. The analysis is conducted by comparing the means and medians of the samples using t-test and nonparametric tests. The tests are two-tailed.

5.2.2. Multivariate analysis

The model used in this study for multivariate analysis and its variables are, where applicable, similar to the model used by Maijoor and Vanstraelen (2006) in their article on earnings management, audit environment, audit firm quality, and international capital markets. The model's dependent variable is the absolute value of discretionary accruals. The independent variables of interest in this study are the existence of a liability cap and the auditor type. In addition, consistent with previous studies and due to differences between the samples with and without a liability cap (see Table 5), control variables are included in the model. The regression model used is of the following form:

(2) $$ABSAWCA = \beta_0 + \beta_1 LCAP + \beta_2 BIG4 + \beta_3 LNASSETS + \beta_4 GEAR + \beta_5 OPCF + \beta_6 IND_i + \varepsilon,$$

where:

ABSAWCA = the absolute value of abnormal working capital accruals scaled by sales;

LCAP = dummy variable for the existence of a liability cap (1 = liability cap, 0 = no liability cap);

BIG4 = dummy variable for Big 4/non-Big 4 auditor (1 = company is audited by a Big 4 auditor, 0 = company is not audited by a Big 4 auditor);

LNASSETS = control variable for company size, natural logarithm of total assets;
GEAR = control variable for gearing/leverage, the ratio of long-term debt and common equity;
OPCF = control variable for company performance, operational cash flow scaled by total assets;
IND_i = dummy variables for industries (SIC10-17: Mining & Construction; SIC20-39: Manufacturing; SIC50-59: Wholesale trade; SIC70-89: Services). The industry of reference is SIC01-09: Agriculture, forestry and fishing.

The first company variable of interest in this study is whether the company is operating in a country with a regime of capped liability or unlimited liability. It is included in the model as the dummy variable LCAP, which gets the value 1 if the company is from a country which has adopted a liability cap, and value 0 if the company is from a country which has not adopted a liability cap. In other words, Belgian, German, and Greek companies get the value 1, and Finnish, French, and Swedish companies get the value 0.

The second company variable of interest is whether the company is audited or not by a Big 4 auditor. The dummy variable BIG4 gets the value 1, if the company is audited by a Big 4 audit firm, and the value 0, if it is not audited by a Big 4 audit firm.

Consistent with previous studies on earnings management, the following control variables are included in the model to control for earnings management incentives. First, the control variable LNASSETS for company size is included. Company size is proxied by the natural logarithm of total assets in the year in question. There is a substantial difference between the liability cap and unlimited liability samples with respect to company size. Larger companies are argued to prefer income-decreasing earnings management due to political costs (see Watts & Zimmermann 1990; Young 1999).

Second, the control variable GEAR for leverage is included in the model. GEAR is calculated as the ratio of long-term debt and common equity. The values of leverage differ significantly between the samples with and without a liability cap. Highly leveraged companies have incentives for income-increasing earning management because of debt covenants (e.g. Beatty & Weber 2003; Dichev & Skinner 2002). High leverage is also associated with financial distress, with distress leading to contractual renegotiations which provide incentives for income-decreasing earnings management (Becker et al.

1998: 17). The direction of the effect of leverage on discretionary accruals is therefore unclear.

Third, OPCF is a variable controlling for company performance. Following Leuz et al. (2003) and Maijoor and Vanstraelen (2006), operational cash flow is calculated by subtracting total accruals from net income after tax. The result is then scaled by total assets to obtain the value of the variable. Higher values of operational cash flow are expected to result in lower values of absolute discretionary accruals.

Fourth, industry dummy variables are included in the model to control for industry effects on earnings management. Discretionary accruals are likely to vary by industry (Becker et al. 1998: 9). In the formal model (2) IND_i denotes the following dummy variables: SIC10-17: Mining & Construction; SIC20-39: Manufacturing; SIC50-59: Wholesale trade; SIC70-89: Services. The industry of reference is SIC01-09: Agriculture, forestry and fishing.

6. EMPIRICAL RESULTS

The empirical results of the univariate and multivariate analyses used to test the hypotheses are presented in Sections 6.1. and 6.2. As stated in Chapter 5, the main variables of interest in the analyses are: (1) whether the company is operating in a country with a regime of capped liability or unlimited liability, and (2) whether the company is audited by a Big 4 or a non-Big 4 audit firm. Table 6 contains the Pearson correlation matrix of these variables accompanied by the control variables of the regression model. Furthermore, absolute value of working capital accruals scaled by sales and absolute value of total accruals scaled by lagged assets are found in the matrix. Table 6 shows that there is statistically significant correlation between several of the variables. However, the correlation coefficients are low, meaning the explanatory variables are not highly correlated.

6.1. Univariate results

Table 7 presents the univariate analysis of abnormal working capital accruals scaled by sales (AWCA). The mean and median values for the pooled sample are presented in section A. Sections B and C have the mean and median values for the samples from countries with and without a liability cap. Section D presents the differences between the mean and median values of sections B and C. Results of t-tests and nonparametric tests of these differences are also presented in section D.

The mean of absolute value of abnormal working capital accruals reported by companies in the six countries of our pooled sample is 19.7% of sales, and the median 5.2% of sales. The first hypothesis of this study suggests that the absolute values of discretionary accruals reported by companies in countries with a liability cap should be higher than the absolute values of discretionary accruals reported by companies in countries without a liability cap. Companies in the three countries with a liability cap report mean absolute discretionary accruals of 17.5% of sales, the median value being 5.2%. In the countries without a liability cap the mean of absolute value of discretionary accruals is 21.7% of total accruals and the median 5.2%. Section D indicates that companies in countries with a liability cap report on average 4.2% lower absolute discretionary accruals the companies in countries without a liability cap. In the medians of absolute discretionary accruals the difference is small, just 0.01%. The direction of the difference in the means is in the opposite direction than predicted by the hypothesis. Furthermore,

Table 6. Pearson correlation matrix.

Pearson correlation
(Significance, 2-tailed)

	ABSAWCA	ABSTACC	LCAP	BIG4	LNASSETS	GEAR	OPCF	SIC01-09	SIC10-17	SIC20-39	SIC50-59	SIC70-89
ABSAWCA	1											
ABSTACC	0.233 (0.000)	1										
LCAP	0.035 (0.231)	0.020 (0.499)	1									
BIG4	0.055 (0.058)	-0.082 (0.005)	-0.073 (0.013)	1								
LNASSETS	-0.198 (0.000)	-0.184 (0.000)	0.227 (0.000)	0.296 (0.000)	1							
GEAR	0.056 (0.055)	-0.035 (0.226)	0.125 (0.000)	-0.061 (0.037)	0.136 (0.000)	1						
OPCF	-0.252 (0.000)	-0.023 (0.425)	0.028 (0.331)	0.064 (0.028)	0.247 (0.000)	-0.014 (0.641)	1					
SIC01-09	0.006 (0.830)	0.013 (0.645)	0.053 (0.068)	-0.081 (0.005)	0.013 (0.655)	0.045 (0.126)	-0.052 (0.075)	1				
SIC10-17	0.058 (0.049)	0.040 (0.174)	0.023 (0.430)	-0.011 (0.707)	0.100 (0.001)	0.059 (0.044)	-0.004 (0.901)	-0.019 (0.513)	1			
SIC20-39	-0.089 (0.002)	-0.069 (0.018)	0.078 (0.007)	0.084 (0.004)	0.171 (0.000)	-0.017 (0.569)	0.042 (0.150)	-0.071 (0.015)	-0.176 (0.000)	1		
SIC50-59	-0.048 (0.099)	-0.021 (0.479)	0.031 (0.290)	-0.118 (0.000)	-0.019 (0.519)	0.017 (0.567)	0.016 (0.589)	-0.038 (0.189)	-0.095 (0.001)	-0.354 (0.000)	1	
SIC70-89	0.100 (0.001)	0.066 (0.024)	-0.121 (0.000)	0.024 (0.420)	-0.202 (0.000)	-0.029 (0.323)	-0.043 (0.139)	-0.070 (0.016)	-0.174 (0.000)	-0.649 (0.000)	-0.349 (0.000)	1

Variable definitions for Table 6 (page 45):
ABSAWCA = Absolute value of abnormal working capital accruals
ABSTACC = Absolute value of total accruals
LCAP = Dummy variable (company from country with a liability cap = 1, else = 0)
BIG4 = Dummy variable (company audited by a Big 4 auditor = 1, else = 0)
LNASSETS = Natural logarithm of total assets
GEAR = Ratio of long-term debt to common equity
OPCF = Cash flow from operating activities scaled by total assets
SIC01-09 = Agriculture, Forestry & Fishing
SIC10-17 = Mining & Construction
SIC20-39 = Manufacturing
SIC50-59 = Wholesale trade
SIC70-89 = Services

neither one of the differences is statistically significant. This suggests that there is no statistically significant difference in the absolute value of discretionary accruals between the samples from countries with and without a liability cap.

When examining the mean and median abnormal working capital accruals instead of the absolute value, the results still do not indicate statistically significant differences between the two samples. In the pooled sample mean discretionary accruals are 3.2% of sales, the median value being close to zero at -0.01%. Companies in the countries with a liability cap report mean discretionary accruals of 3.9%. The median reported discretionary accruals are -0.4%. In the countries where auditors' liability is not limited by a liability cap companies the mean reported discretionary accruals are 2.6%, and the median value is 0.4%. Section D indicates that companies in countries with a liability cap report on average 1.3% higher discretionary accruals than companies in countries without a liability cap. The difference of medians is in the opposite direction; the median of the unlimited liability sample is 0.8% higher than the capped liability sample. The differences are not statistically significant.

Table 7 also presents univariate results separately for income-decreasing (negative) and income-increasing (positive) abnormal working capital accruals. The 588 companies reporting negative abnormal working capital accruals reported on average -16.5% of sales. Median accruals are -5.1%. In countries with capped liability there are 291 observations with negative AWCA, with a mean of -13.1% and a median of -5.4%. Respectively, in countries with unlimited liability negative abnormal accruals are reported by 297 companies; mean being -19.9% and median -5.0%. The average negative discretionary accruals reported in countries without a liability cap are 6.8% larger than in countries with a cap. This difference is statistically significant ($p = 0.047$).

Table 7. Univariate results for discretionary accruals.

			AWCA	ABSAWCA	AWCA < 0: income-decreasing	AWCA ≥ 0: income-increasing
A	Pooled sample	*N*	1,174	1,174	588	586
		Mean	0.032	0.197	-0.165	0.229
		Median	-0.0001	0.052	-0.051	0.052
B	Observations with a liability cap	*N*	558	558	291	267
		Mean	0.039	0.175	-0.131	0.223
		Median	-0.004	0.052	-0.054	0.051
C	Observations without a liability cap	*N*	616	616	297	319
		Mean	0.026	0.217	-0.199	0.234
		Median	0.004	0.052	-0.050	0.053
D	Differences across samples B and C	*Mean (p-value)**	0.013 (0.721)	0.042 (0.225)	0.068 (0.047)	0.011 (0.854)
		*Median (p-value)**	0.008 (0.100)	0.0001 (0.900)	0.004 (0.550)	0.003 (0.448)

* In section D the p-values for means are from t-tests and the p-values for medians from Mann-Whitney U-tests. The tests are two-tailed.

The difference of medians is 0.4% in the opposite direction and is not statistically significant. As to the income-increasing abnormal working capital accruals, there are 586 companies reporting an average of 22.9% of sales in the pooled sample. The median is

5.2%. In the capped liability sample the mean is 22.3% and the median 5.1%. In the countries without a liability cap the mean is 23.4% and the median 5.3%. The unlimited liability sample has a mean that is 1.1% and a median that is 0.3% higher than the capped liability sample. The differences are not statistically significant.

In conclusion, Table 7 indicates that the only difference statistically significant at the 0.05 level between the samples is the 6.8 percentage points larger mean of income-decreasing abnormal working capital accruals in the sample without a liability cap. There also is a small difference between the medians of AWCA significant at the 0.10 level.

Although this study concentrates on the absolute value of abnormal accruals, negative and positive accruals are compared to find possible differences in their magnitudes. Table 8 presents the univariate analysis of income-decreasing and income-increasing abnormal working capital accruals scaled by sales. In the pooled sample, there are 588 companies reporting income-decreasing and 586 companies reporting income-increasing accruals. The mean of negative accruals is -16.5% of sales and the median -5.1%. Respectively, the mean of positive accruals is 22.9%, the median being 5.2%. Mean absolute income-increasing discretionary accruals are 6.4% higher than absolute income-decreasing accruals. The difference between the medians is 0.1%. The p-values for the differences (0.069 and 0.638) indicate that the difference between the means is significant at the 0.10 level and there is no statistically significant difference between the medians in the pooled sample.

In countries with a liability cap the 291 companies reporting income-decreasing discretionary accruals report mean accruals of -13.1% of sales. The median is -5.4%. The 267 companies that report income-increasing accruals report on average 22.3% of sales, the median being 5.1%. The difference of means is 9.2%, the magnitude of income-increasing accruals being larger, and the difference of medians 0.3% in the opposite direction. The p-value for the means is 0.042, which indicates that the companies reporting positive abnormal working capital accruals in countries with a capped liability the magnitude of them is significantly larger than the magnitude of abnormal working capital accruals reported by companies that report income-decreasing accruals. Between the medians the difference is not statistically significant. In the sample of companies from unlimited liability regimes 297 companies report income-decreasing discretionary accruals, while 319 report income-increasing discretionary accruals. The mean of reported negative accruals is -19.9% and the median -5.0% of sales. For positive reported accruals the mean is 23.4% and the median 5.3%.

Table 8. The magnitude of income-decreasing and income-increasing discretionary accruals.

	Pooled sample			Liability cap			No liability cap		
	N	*Mean*	*Median*	*N*	*Mean*	*Median*	*N*	*Mean*	*Median*
AWCA < 0: income-decreasing	588	-0.165	-0.051	291	-0.131	-0.054	297	-0.199	-0.050
AWCA ≥ 0: income-increasing	586	0.229	0.052	267	0.223	0.051	319	0.234	0.053
Difference of absolute values (p-value)*		0.064 (0.069)	0.001 (0.638)		0.092 (0.042)	0.003 (0.706)		0.036 (0.506)	0.004 (0.314)

* The p-values for means are from t-tests and the p-values for medians from Mann-Whitney U-tests. The tests are two-tailed.

Mean difference between negative and positive accruals is 3.6%, while the difference of the medians is 0.4%. The magnitude of positive accruals is higher according to both the difference in means and the difference in medians. However, with p-values of 0.506 and 0.314 the differences are not statistically significant.

In conclusion, t-tests indicate significant differences in the mean magnitudes of income-decreasing and income-increasing abnormal working capital accruals in the pooled sample and the sample from the countries with a capped liability. However, the non-parametric tests do not indicate any statistically significant differences between negative and positive AWCA.

Univariate tests were also conducted to further examine negative and positive abnormal working capital accruals and the effect of auditor type (Big 4 or non-Big 4 audit firm) on them. The results are presented in Table 9, which indicates that regardless of the existence of a liability cap the mean and median abnormal working capital accruals are larger for the clients of non-Big 4 auditors than Big 4 auditors. This applies to absolute value of AWCA as well as income-decreasing and income-increasing accruals. In the

Table 9. Univariate results of discretionary accruals, differences between auditor types.

	Pooled sample			Liability cap			No liability cap		
	N	*Mean*	*Median*	*N*	*Mean*	*Median*	*N*	*Mean*	*Median*
ABSAWCA									
Big 4	539	0.161	0.044	235	0.132	0.042	304	0.183	0.047
Non-Big 4	635	0.228	0.062	323	0.206	0.062	312	0.250	0.062
Difference (p-value)*		0.067 (0.053)	0.017 (0.001)		0.075 (0.071)	0.020 (0.004)		0.067 (0.216)	0.015 (0.057)
AWCA < 0: income-decreasing									
Big 4	263	-0.131	-0.043	123	-0.097	-0.043	140	-0.162	-0.044
Non-Big 4	325	-0.192	-0.062	168	-0.155	-0.063	157	-0.231	-0.062
Difference (p-value)*		0.061 (0.074)	0.019 (0.005)		0.059 (0.012)	0.021 (0.019)		0.069 (0.271)	0.018 (0.086)
AWCA ≥ 0: income-increasing									
Big 4	276	0.189	0.046	112	0.170	0.041	164	0.201	0.050
Non-Big 4	310	0.265	0.060	155	0.261	0.058	155	0.269	0.062
Difference (p-value)*		0.077 (0.206)	0.014 (0.053)		0.092 (0.267)	0.017 (0.065)		0.068 (0.435)	0.012 (0.285)

* The p-values for means are from t-tests and the p-values for medians from Mann-Whitney U-tests. The tests are two-tailed.

pooled sample the mean and the median absolute values of AWCA of non-Big 4 auditors' clients are 6.7% and 1.7% larger than those of clients of Big 4 auditors. The differences are significant at 0.10 and 0.01 levels ($p = 0.053$ and $p = 0.001$). In the case of

negative values of AWCA, the non-Big 4 accruals are 6.1% (mean) and 1.9% (median) larger than Big 4 accruals. These differences are also significant at 0.10 and 0.01 levels ($p = 0.074$ and $p = 0.005$). As to positive values of AWCA, the difference of means is 7.7% ($p = 0.206$) and the difference of medians 1.4% ($p = 0.053$).

In the liability cap sample the differences of absolute AWCA are 7.5% for the means ($p = 0.071$) and 2.0% for the medians ($p = 0.004$). Average negative accruals are 5.9% larger in the case of non-Big 4 auditors ($p = 0.012$), and the median difference is 2.1% ($p = 0.019$). Difference in positive accruals are 9.2% (means, $p = 0.267$) and 1.7% (medians, $p = 0.065$). As to the countries without a liability cap, mean absolute AWCA is 6.7% higher for non-Big 4 auditors ($p = 0.216$) and median 1.5% higher ($p = 0.057$). Negative accruals show differences of 6.9% (mean, $p = 0.271$) and 1.8% (median, $p = 0.086$). Positive mean accruals are 6.8% ($p = 0.435$) and median accruals 1.2% ($p = 0.285$) higher with non-Big 4 auditors.

T-tests show that there are statistically significant (at least at the 0.10 level) differences in the means of absolute value of abnormal working capital accruals and negative AWCA in the pooled sample and the sample from countries with a liability cap. The nonparametric tests indicate that there are statistically significant differences in the absolute value of AWCA and negative accruals in all the samples and in the positive AWCA in the pooled and liability cap samples. In conclusion, according to the results of the nonparametric tests, the magnitude of abnormal working capital accruals reported by clients of Big 4 auditors is significantly smaller than by clients of non-Big 4 auditors. This applies to the absolute value of AWCA and negative AWCA regardless of the existence of a liability cap, and to positive AWCA when liability is limited. This is consistent with the assumption that Big 4 auditors generally produce higher audit quality than non-Big 4 auditors.

Table 10 presents the results of univariate tests used to test the differences in AWCA under liability regimes of limited and unlimited liability separately for Big 4 and non-Big 4 auditors. The magnitude of abnormal working capital accruals seems to be generally larger under unlimited liability for both auditor types. However, the t-tests and nonparametric tests conducted to test the differences indicate no statistical significance.

The clients of Big 4 auditors report average absolute abnormal working capital accruals of 13.2% of sales under limited liability and 18.3% under limited liability. The result of the t-test indicates that this difference of 5.2% is not statistically significant. The median

accruals are 4.2% and 4.7% of sales, the latter being 0.5% larger. This difference is not statistically significant either. Respectively, the companies that are not audited by Big 4 auditors report mean absolute AWCA of 20.6% under a regime of limited liability and 25.0% under unlimited liability, the difference being 4.4% (p = 0.409) . The median absolute abnormal accruals scaled by sales are approximately 6.2% for both samples.

Table 10. Univariate results of discretionary accruals, differences between samples by auditor type.

	Liability cap			No liability cap			Difference	
	N	*Mean*	*Median*	*N*	*Mean*	*Median*	*Mean (p-value)**	*Median (p-value)**
ABSAWCA								
Big 4	235	0.132	0.042	304	0.183	0.047	0.052 (0.226)	0.005 (0.422)
Non-Big 4	323	0.206	0.062	312	0.250	0.062	0.044 (0.409)	0.0003 (0.787)
AWCA < 0: income-decreasing								
Big 4	123	-0.097	-0.043	140	-0.162	-0.044	0.065 (0.124)	0.001 (0.259)
Non-Big 4	168	-0.155	-0.063	157	-0.231	-0.062	0.076 (0.146)	0.001 (0.809)
AWCA ≥ 0: income-increasing								
Big 4	112	0.170	0.041	164	0.201	0.050	0.031 (0.670)	0.008 (0.893)
Non-Big 4	155	0.261	0.058	155	0.269	0.062	0.008 (0.934)	0.004 (0.564)

* The p-values for means are from t-tests and the p-values for medians from Mann-Whitney U-tests. The tests are two-tailed.

As to income-decreasing AWCA, the means for Big 4 auditors are -9.7% in the sample with a liability cap and -16.2% without a liability cap, the difference being 6.5%. The

medians are -4.3% and -4.4% and the difference 0.1%. For non-Big 4 auditors the corresponding figures are means of -15.5% and -23.1% (difference of 7.6%) and medians of -6.3 and -6.2% (difference of 0.1%). The p-values of t-tests and nonparametric tests indicate that none of the differences are statistically significant.

Income-increasing abnormal working capital accruals of clients of Big 4 auditors are on average 17.0% (median 4.1%) in countries with a liability cap and 20.1% (median 5.0%) in countries with no liability cap. The difference is 3.1% (0.8%). The mean abnormal accruals of non-Big 4 audit clients are 26.1% (median 5.8%) and 26.9% (median 6.2%), the difference being 0.8% (0.4%). None of the differences are statistically significant.

The second hypothesis of this study suggests that the magnitude of abnormal working capital accruals of clients of Big 4 auditors should be less affected by the existence of a liability cap than the abnormal working capital accruals of clients of non-Big 4 auditors. The results presented in Table 10 indicate no statistically significant differences whatsoever in the magnitude of income-decreasing or income-increasing abnormal accruals or the absolute value of AWCA. This indicates that the existence of a liability cap does not significantly affect the magnitude of abnormal working capital accruals of either auditor type.

In conclusion, the univariate tests have given the following statistically significant (at least at the 0.05 level) results:

- The mean income-decreasing abnormal working capital accruals in the sample without a liability cap is larger than in the sample with a liability cap;
- The mean magnitude of income-increasing abnormal working capital accruals is larger than the mean magnitude of income-decreasing accruals in the pooled sample and the sample from the countries with a capped liability;
- The mean magnitude of income-decreasing abnormal working capital accruals is lower for companies audited by Big 4 auditors when liability is capped;
- The median absolute abnormal working capital accruals and income-decreasing abnormal accruals are lower for companies audited by Big 4 auditors in the pooled sample and in the sample with a liability cap.

As for the hypotheses of this study, the univariate results provide no evidence supporting neither one of the two hypotheses.

The first hypothesis states that the absolute values of abnormal working capital accruals should be higher in the sample with a liability cap than in the unlimited liability sample. According to the t-tests and nonparametric tests there are no statistically significant differences whatsoever in any direction in the absolute values of abnormal working capital accruals between the samples with and without a liability cap. Therefore the null hypothesis cannot be rejected. According to the second hypothesis the difference between the values of abnormal working capital accruals in the samples with and without a liability cap should be smaller in the case of a Big 4 auditor than a non-Big 4 auditor. According to the t-tests and nonparametric tests there are no statistically significant differences in the magnitude of abnormal accruals between the samples with and without a liability cap regardless of auditor type, and the null hypothesis cannot be rejected.

6.2. Multivariate results

The primary method of analysis in this study is OLS regression. The model used in the regression is presented in Chapter 5. The dependent variable in the model is ABSAWCA, which is the absolute value of abnormal working capital accruals scaled by sales. The independent variables of interest are the first two dummy variables: the liability cap variable LCAP and the Big 4 auditor variable BIG4. There also are seven control variables in the model.

Table 11 presents the results of the OLS regression for the pooled sample including all observations. The results show no significant difference in the magnitude of earnings management between countries with and without a liability cap in the sample. The estimate for the variable LCAP is 0.005 with a significance value of $p = 0.883$. This is consistent with the univariate results presented earlier. As for the variable BIG4, the estimate is 0.006 ($p = 0.861$), which indicates no significant effect of auditor type on earnings management. Although some differences of significance were found between the Big 4 and non-Big 4 samples in the univariate analysis, the regression results do not confirm this effect.

The control variables LNASSETS, GEAR, and OPCF are all significant ($p < 0.05$) as expected. The control variable for company size (LNASSETS) gets an estimate of -0.048, which indicates that the magnitude of earnings management gets smaller as company size increases. The estimate for the control variable for leverage (GEAR) has a positive value of 0.066, which is consistent with earlier research (e.g. Beatty & Weber

Table 11. OLS regression results for pooled sample.

Dependent variable: ABSAWCA = Absolute value of abnormal working capital accruals scaled by sales

Independent variable	*Parameter estimate*	*t-value*	*Significance*
Constant	0.675	3.036	0.002
LCAP	0.005	0.147	0.883
BIG4	0.006	0.175	0.861
LNASSETS	-0.048	-4.749	0.000
GEAR	0.066	2.515	0.012
OPCF	-0.695	-7.309	0.000
SIC10-17	0.227	1.090	0.276
SIC20-39	-0.001	-0.005	0.996
SIC50-59	-0.028	-0.143	0.887
SIC70-89	0.086	0.438	0.661
Adjusted R^2	9.2%		
F-value	14.259		0.000
N	1,174		

Variable definitions:

LCAP = Dummy variable (company from country with a liability cap = 1, else = 0)

BIG4 = Dummy variable (company audited by a Big 4 auditor = 1, else = 0)

LNASSETS = Natural logarithm of total assets

GEAR = Ratio of long-term debt to common equity

OPCF = Cash flow from operating activities scaled by total assets

SIC10-17 = Mining & Construction

SIC20-39 = Manufacturing

SIC50-59 = Wholesale trade

SIC70-89 = Services

2003; Becker et al. 1998; Dichev & Skinner 2002) as higher leverage leads to greater magnitude of abnormal accruals.

The OPCF variable controlling for company performance gets an estimate of -0.695, which is negative as expected. Higher operational cash flows lead to less discretionary accruals, which is consistent with the results of e.g. Becker et al. (1998) and Maijoor and Vanstraelen (2006).

The model has an adjusted R squared value of 9.2%, which is relatively low. However, low R squared values are not unusual for this kind of studies, as the purpose of the study is not to develop a model to explain earnings management but rather to examine the impact of the liability environment on it (e.g. Becker et al. 1998; Maijoor and Vanstraelen 2006). The adjusted R squared value is low in every regression in Tables 11–16 varying between 3.8% and 13.2%.

In conclusion, Table 11 indicates no evidence that the existence if a liability cap has a significant effect on the absolute value of abnormal working capital accruals in the pooled sample. Thus there is no evidence to support the hypothesis that such an effect exists. As for the second hypothesis concerning the effect of a company being audited by a Big 4 auditor, no significant effect of auditor type on abnormal accruals is found in the pooled sample.

In Table 12 the OLS regression results for samples with and without liability cap are presented separately. Consistent with the regression run on the pooled sample, the BIG4 variable has no statistically significant impact on abnormal accruals in either sample. In the sample with a liability cap the only estimate with statistical significance is that of the OPCF variable. The value of the estimate is -1.017, being negative as expected. The regression for the sample without a liability cap has again three significant variables (estimate), LNASSETS (-0.069), GEAR (0.122), and OPCF (-0.492). The directions of the estimates remain the same as for the pooled sample.

Table 13 presents the OLS regression results for samples with and without a Big 4 auditor. The results indicate that the existence of a liability cap has no significant effect when examining the Big 4 and non-Big 4 samples separately. The second hypothesis of this study states that the effect of a liability cap on abnormal accruals is smaller in the case that a company is audited by a Big 4 auditor compared to a non-Big 4 auditor. As no significant effect is present in either one of the samples, no evidence supporting the

Table 12. OLS regression results for samples with and without a liability cap.

Panel A: Liability cap sample

Dependent variable: ABSAWCA = Absolute value of abnormal working capital accruals scaled by sales

Independent variable	*Parameter estimate*	*t-value*	*Significance*
Constant	0.483	1.975	0.049
BIG4	-0.010	-0.217	0.828
LNASSETS	-0.019	-1.38	0.168
GEAR	0.017	0.565	0.572
OPCF	-1.017	-7.578	0.000
SIC10-17	0.261	1.281	0.201
SIC20-39	-0.128	-0.690	0.491
SIC50-59	-0.086	-0.454	0.650
SIC70-89	-0.006	-0.033	0.974
Adjusted R^2	13.2%		
F-value	11.621		0.000
N	558		

Panel B: No liability cap sample

Dependent variable: ABSAWCA = Absolute value of abnormal working capital accruals scaled by sales

Independent variable	*Parameter estimate*	*t-value*	*Significance*
Constant	0.506	1.050	0.294
BIG4	0.010	0.188	0.851
LNASSETS	-0.069	-4.804	0.000
GEAR	0.122	2.879	0.004
OPCF	-0,492	-3.696	0.000
SIC10-17	0.420	0.882	0.378
SIC20-39	0.402	0.872	0.383
SIC50-59	0.303	0.654	0.513
SIC70-89	0.452	0.983	0.326
Adjusted R^2	8.6%		
F-value	8.218		0.000
N	616		

For variable definitions, see Table 11.

Table 13. OLS regression results for samples with and without a Big 4 auditor.

Panel A: Big 4 auditor sample

Dependent variable: ABSAWCA = Absolute value of abnormal working capital accruals scaled by sales

*Independent variable**	*Parameter estimate*	*t-value*	*Significance*
Constant	0.487	3.350	0.001
LCAP	-0.008	-0.167	0.867
LNASSETS	-0.028	-2.247	0.025
GEAR	-0.013	-0.338	0.736
OPCF	-0.692	-5.449	0.000
SIC10-17	0.334	3.054	0.002
SIC50-59	-0.051	-0.713	0.476
SIC70-89	0.053	1.088	0.277
Adjusted R^2	8.6%		
F-value	8.262		0.000
N	539		

* SIC20-39 was removed from the model due to a tolerance value of 0.000

Panel B: Non-Big 4 auditor sample

Dependent variable: ABSAWCA = Absolute value of abnormal working capital accruals scaled by sales

Independent variable	*Parameter estimate*	*t-value*	*Significance*
Constant	0.877	3.156	0.002
LCAP	0.010	0.182	0.856
LNASSETS	-0.069	-4.270	0.000
GEAR	0.108	2.958	0.003
OPCF	-0.694	-5.039	0.000
SIC10-17	0.154	0.638	0.523
SIC20-39	-0.021	-0.099	0.922
SIC50-59	-0.025	-0.112	0.911
SIC70-89	0.104	0.479	0.632
Adjusted R^2	9.8%		
F-value	9.606		0.000
N	635		

For variable definitions, see Table 11.

Table 14. OLS regression results for pooled sample with an independent variable for the combined effect of a liability cap and a Big 4 auditor.

Dependent variable: ABSAWCA = Absolute value of abnormal working capital accruals scaled by sales

Independent variable	*Parameter estimate*	*t-value*	*Significance*
Constant	0.683	3.043	0.002
LCAP	-0.003	-0.063	0.950
BIG4	-0.002	-0.035	0.972
LCAP*BIG4	0.018	0.259	0.795
LNASSETS	-0.049	-4.755	0.000
GEAR	0.067	2.527	0.012
OPCF	-0.695	-7.301	0.000
SIC10-17	0.226	1.084	0.278
SIC20-39	-0.003	-0.016	0.987
SIC50-59	-0.030	-0.150	0.881
SIC70-89	0.083	0.425	0.671
Adjusted R^2	9.2%		
F-value	12.829		0.000
N	1,174		

Variable definitions:
LCAP = Dummy variable (company from country with a liability cap = 1, else = 0)
BIG4 = Dummy variable (company audited by a Big 4 auditor = 1, else = 0)
LCAP*BIG4 = Dummy variable (company from a country with a liability cap and audited by a Big 4 auditor = 1, else = 0)
LNASSETS = Natural logarithm of total assets
GEAR = Ratio of long-term debt to common equity
OPCF = Cash flow from operating activities scaled by total assets
SIC10-17 = Mining & Construction
SIC20-39 = Manufacturing
SIC50-59 = Wholesale trade
SIC70-89 = Services

hypothesis is obtained from the regression. In the Big 4 auditor sample the company size control variable LNASSETS and company performance control variable OPCF get statistically significant estimates of -0.028 and -0.692. In the non-Big 4 auditor sample the estimates are -0.069 and -0.694, respectively. The leverage variable GEAR also is statistically significant in the non-Big 4 sample with an estimate of positive value (0.108). The estimates of all of the three variables remain in the same direction as in the pooled sample regression.

Finally, an interaction variable LCAP*BIG4 was introduced to the model to take into account the possible effect of the combination of an existing liability cap and a Big 4 auditor. The regression results with this variable are presented in Table 14. The addition of the interaction variable does not change the results, as the only statistically significant variables in the regression remain to be LNASSETS, GEAR, and OPCF. According to the results the combined effect of a liability cap and a Big 4 auditor is not statistically significant.

To conclude the results from the multivariate analysis conducted by OLS regression, the limiting of auditors' liability by a liability cap has no significant effect on the magnitude of earnings management as measured by the absolute value of abnormal working capital accruals. This is consistent with the results of the univariate analysis presented in Section 6.1. Therefore, there is no evidence supporting the first hypothesis of this study, and the null hypothesis stands. These results are consistent with earlier research finding no evidence of such an effect, such as the London Economics (2006) study. As for the second hypothesis, the regression analysis does not provide evidence supporting the assumption that the effect of the existence of a liability cap is smaller in the sample of companies audited by Big 4 auditors compared to the sample of companies not audited by Big 4 auditors. These results are also consistent with the univariate results, and the null hypothesis stands in this case as well.

6.3. Sensitivity analyses

To test the robustness of the results, the following sensitivity analyses have been performed. First, another measure of earnings management is used in the regression model. Following Maijoor and Vanstraelen (2006), total accruals are used as an alternative earnings management measure. Total accruals are calculated following Dechow et al. (1995) as (change in current assets during the fiscal year - change in cash) - (change in

Table 15. OLS regression results for pooled sample with absolute value of total accruals as the dependent variable.

Dependent variable: ABSTACC = Absolute value of total accruals

Independent variable	*Parameter estimate*	*t-value*	*Significance*
Constant	0.260	5.457	0.000
LCAP	0.017	2.251	0.025
BIG4	-0.006	-0.733	0.464
LNASSETS	-0.013	-5.853	0.000
GEAR	-0.004	-0.740	0.460
OPCF	0.019	0.912	0.362
SIC10-17	0.015	0.344	0.731
SIC20-39	-0.025	-0.595	0.552
SIC50-59	-0.027	-0.636	0.525
SIC70-89	-0.013	-0.307	0.759
Adjusted R^2	3.8%		
F-value	6.088		0.000
N	1,174		

Variable definitions:
LCAP = Dummy variable (company from country with a liability cap = 1, else = 0)
BIG4 = Dummy variable (company audited by a Big 4 auditor = 1, else = 0)
LNASSETS = Natural logarithm of total assets
GEAR = Ratio of long-term debt to common equity
OPCF = Cash flow from operating activities scaled by total assets
SIC10-17 = Mining & Construction
SIC20-39 = Manufacturing
SIC50-59 = Wholesale trade
SIC70-89 = Services

current liabilities - change in short-term debt) - depreciation expense, and then scaled by total assets from previous fiscal year. Table 15 presents the OLS regression results with total accruals as the dependent variable. Second, OLS regression is run without observations from France to remove the possible effects of French observations on the results. French legislation demands publicly traded companies to appoint two auditors, who are both engaged in auditing the company at the same time (Baker et al. 2008: 99). Table 16 presents the results of the OLS regression without French companies and with abnormal working capital accruals as the dependent variable.

When using total accruals scaled by lagged total assets as the dependent variable, the results of the OLS regression differ from those obtained earlier. Table 15 indicates that the LCAP variable is statistically significant ($p = 0.025$) and when auditors' liability is limited by a liability cap, total accruals are higher than in the case of unlimited liability. The absolute value of total accruals is 1.7% of the sales higher with a liability cap than without it. This indicates that the existence of a liability cap increases the magnitude of earnings management as measured by total accruals in the pooled sample, as predicted by the first hypothesis. Thus the univariate and multivariate results finding no significant effect of the existence of a liability cap or a Big 4 auditor presented previously may be dependent on the method used for measuring discretionary accruals and earnings management. To further examine the effect of the selected measure on the results compared to other measures, a more comprehensive analysis using alternative methods of measuring earnings management would be needed.

When observations from France are removed from the regression model, the statistically significant variables remain the same as in the pooled sample regression, as do their direction. Parameter estimates for these variables LNASSETS, GEAR, and OPCF are -0.050 (pooled sample -0.048), 0.089 (0.066), and -0.865 (-0.695). The regression without French companies was also run separately for the Big 4 auditor and non-Big4 auditor samples. The LCAP variable did not turn out to be statistically significant in this regression either. The results of this regression are not reported.

Table 16. OLS regression results without observations from France.

Dependent variable: ABSAWCA = Absolute value of abnormal working capital accruals scaled by sales

Independent variable	*Parameter estimate*	*t-value*	*Significance*
Constant	0.857	3.005	0.003
LCAP	-0.058	-1.057	0.291
BIG4	-0.007	-0.126	0.899
LNASSETS	-0.050	-3.526	0.000
GEAR	0.089	2.684	0.007
OPCF	-0.865	-7.020	0.000
SIC10-17	0.154	0.590	0.556
SIC20-39	-0.099	-0.406	0.685
SIC50-59	-0.118	-0.475	0.635
SIC70-89	-0.016	-0.066	0.947
Adjusted R^2	11.8%		
F-value	12.930		0.000
N	807		

Variable definitions:
LCAP = Dummy variable (company from country with a liability cap = 1, else = 0)
BIG4 = Dummy variable (company audited by a Big 4 auditor = 1, else = 0)
LNASSETS = Natural logarithm of total assets
GEAR = Ratio of long-term debt to common equity
OPCF = Cash flow from operating activities scaled by total assets
SIC10-17 = Mining & Construction
SIC20-39 = Manufacturing
SIC50-59 = Wholesale trade
SIC70-89 = Services

7. CONCLUSIONS

The purpose of this study was to examine the effect of limiting auditors' liability by a liability cap on audit quality. It was also studied whether auditor size affects this effect. Samples consisting of company observations from countries with and without a liability cap were compared.

The results of this study provide no evidence that the existence of a liability cap affects audit quality as measured by the magnitude of earnings management. This is consistent with earlier research finding no such effect (e.g. London Economics 2006). In light of these research results, the European Commission's recommendation that auditors' liability should be limited in all EU member countries does not involve a threat to audit quality, and the introduction of liability limitation, at least by means of a liability cap, should be a step towards harmonisation of accounting and audit regulation, that does not lead to lower quality audits. Rather it could be argued to promote audit quality through better insurability, availability of audit services, and competition in the audit market.

As for auditor size and audit quality produced by Big 4 and non-Big 4 auditors, no evidence of an effect of liability caps on audit quality was found. Despite this, Big 4 auditors were found to produce higher audit quality (i.e. less earnings management) than non-Big 4 auditors.

However, the conducted sensitivity analyses indicate that the aforementioned results could be dependent on the used earnings management measure. In this study earnings management was measured as abnormal working capital accruals. The limitations of working capital accruals as earnings management measure have been acknowledged earlier (see e.g. Maijoor & Vanstraelen 2006: 51). By changing the measure to total accruals, the results of the OLS regression change essentially. This should be taken into account when assessing the results of this study.

The following limitations of this study should also be considered. As always with studies comparing several countries, it is possible that underlying factors other than those already taken into account either cause differences in results between countries or diminish them. The effects of earnings management incentives such as company size, leverage and performance have been taken into account by controlling for them, but there may be many other incentives that are not considered. Finally, as the data consists of financial information for only one year (fiscal years ending in 2008), and just five

countries out of twenty-seven in the European Union have introduced an auditors' liability cap at the moment, the sample examined in this study was relatively small in size.

As for future research, the statutory audit is not a matter that only concerns listed companies. The examination of the effect of limiting auditors' liability on audit quality should be widened to unlisted companies as well.

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