

**UNIVERSITEIT GENT**

**FACULTEIT ECONOMIE EN BEDRIJFSKUNDE**

**ACADEMIEJAAR 2009 – 2010**

# **DETERMINANTS OF AUDITOR CHOICE**

Masterproef voorgedragen tot het bekomen van de graad van

Master in de Toegepaste Economische Wetenschappen

**Elke Revier  
Ralph Schroé**

**onder leiding van**

**Prof. dr. I. De Beelde**



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Elke Revier  
Ralph Schroé

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May 2010,  
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Ralph Schroé

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## Abbreviations used

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- Big Four:** Refers to the following auditor companies: Deloitte; Ernst & Young (E & Y); Klynveld, Peat, Marwick and Goerdeler (KPMG) and PricewaterhouseCoopers (PwC).
- Big Five:** Refers to the following auditor companies: Arthur Andersen; Deloitte; Ernst & Young (E & Y); Klynveld, Peat, Marwick and Goerdeler (KPMG) and PricewaterhouseCoopers (PwC).
- Big Six:** Refers to the following auditor companies: Arthur Andersen; Coopers & Lybrand; Deloitte; Ernst & Young; Klynveld, Peat, Marwick and Goerdeler and Price Waterhouse.
- Big Eight:** Refers to the following auditor companies: Arthur Andersen; Arthur Young ; Coopers & Lybrand; Deloitte Haskins & Sells; Ernst & Whinney; Klynveld, Peat, Marwick Goerdeler and Price Waterhouse and Touch Ross.
- e.g.:** example given
- IPO:** Initial Public Offering
- OLS:** Ordinary Least Squares
- VIF:** Variance Inflation Factor

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# 1. Introduction

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Due to several scandals of different magnitude, the interest of researchers, companies as well as of the general public in corporate governance has grown during the past few years. Many researchers have tried to investigate the many possibilities a company has to be responsible in its day to day life and business. One of these corporate governance mechanisms available to companies, mentioned by Broye and Weill (2008) and earlier suggested by Watts and Zimmerman (1986), is the hiring of auditors. Having the option to choose from a wide range of audit firms, and because company managers experience several incentives whether or not to choose a particular auditor, this decision has been the subject of many previous studies. However, the debate concerning the factors influencing this company managers' decision is still ongoing.

The main reason proposed in the literature for a company to hire an auditor and to accept the additional monitoring by an external party, is derived from the agency theory. Company managers make this decision with the intention to reduce agency costs caused by several information asymmetries arising in a company's environment. The choice for a specific auditor is linked with these arising agency costs. DeAngelo (1981) suggested that as the agency costs of a firm may vary, for example into time, the need for a certain quality level of the external monitoring might also change. Therefore the selection of an auditor is not a straightforward decision a company manager makes. The auditor choice is a decision where company managers need to outweigh the marginal benefits and marginal costs the hiring of a specific auditor might bring. Elaborate research has been performed on which qualifiers are used by the decision makers when selecting an auditor.

Previous researchers provide us with a solid basis for the determinants of auditor choice. Knechel, Niemi and Sundgren (2008) recently investigated the Finnish auditor choice environment. Although they came to several valuable conclusions, very few can be expanded to other countries because of the specific auditor environment in Finland. Therefore in this master dissertation, we use their research as a basis for our own research and in addition to their investigation we extrapolate their starting point to a number of European countries.

In this master dissertation we try to create an initial framework to investigate which determinants are important in making the auditor choice. We use several determinants proposed by other researchers in the field of the auditor choice and test them in the European environment. In our research we use data from 12 European countries. We test the impact of the country a company is based in, next to the impact of internal firm characteristics and debt on the auditor choice. Next to our main analysis we also perform an additional investigation to see whether our hypotheses hold in a sample containing some of the newest members of the European Union. As our results point out, companies in a country of which the national legislation finds its origin in English law and

Scandinavian law countries are the most likely to hire a Big Four auditor. We also found proof of the positive influence that internal complexity has on the auditor choice. A final conclusion we draw is that in our sample, the way companies are financed has a diverse impact on the decision a company makes concerning the hiring of a certain auditor.

We contribute to prior research by investigating the impact of the country a company is based in, on the auditor choice next to other control variables. In addition to Choi and Wong (2002) and Broye and Weill (2008) we attempt to find evidence of whether national legislation, a proxy used to measure the impact of a country a company is based in, affects the decision of engaging a high-quality auditor. As the determinants already pointed out by other researchers vary from a wide range of characteristics, we want to contribute by combining two categories of determinants suggested in previous literature in a European context. We also contribute by testing a sample containing the Czech Republic, Estonia, Hungary, Latvia, Poland, Slovakia. Few researchers have investigated the auditor choice in these countries.

The remainder of this master dissertation is structured as follows: In the next part, section 2, we give a brief description of the background for the auditor choice and what has previously been suggested and investigated as being determinants of the auditor choice. Then, in section 3 we provide an overview of our hypotheses combined with a explanation of our variables. Section 4 gives an explanation of the data and methodology we use, followed by our results in section 5. Our conclusions and limitations can be found in section 6 and 7.

## 2. Related literature

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### 2.1 The reasons for a company to hire an auditor

A company nowadays is engaged in a complex mixture of (business) relationships. Their stakeholders, being a great variation of people and other companies like investors, creditors,... are all interacting with the company, pursuing their own goals. As the targeted outcomes of these relations differ, the actions to obtain them are also varying. Many of these objected goals and related actions can therefore sometimes cause conflicts in the way a company and its stakeholder wish to obtain their targets. External monitoring to align some of the stakeholders and company managers objectives can therefore be helpful. Consequently, this is one of the various reasons that might motivate an organization to opt freely to hire an external auditor, even when it is not mandatory by the (national) legislative bodies.

In general, Wanda A. Wallace (1982) and other researchers (e.g. De Ketelaere, 2007; De Beelde, 2008) motivated the demand for external monitoring by an auditor in (unregulated) environments by three hypotheses: “The Stewardship (Monitoring) Hypothesis”, “The Information Hypothesis” and “The Insurance Hypothesis”. The general theory that is commonly used in the literature is “The Stewardship (Monitoring) Hypothesis”. It relates the agency theory, provided by Jensen and Meckling (1976) to the auditing environment by hypothesizing that managers will be eager to point out their willingness to provide transparency in their actions towards their stakeholders (Jensen and Meckling 1976; DeFond, 1992). In a company’s environment, DeFond (1992) identified two features of the agency problem namely “[...] (1) the divergence in preferences of the manager and owner with respect to the manager’s actions, and (2), the imperfect observability of the managers’ actions by the owner.” (DeFond, 1992, p. 21). In accordance with Jensen and Meckling (1976), De Ketelaere (2007) proposed the following explanation for the hiring of external monitoring by auditors and for the first feature of DeFond (1992): Owners, trying to protect their interest, might discount the value of their initial investments and reduce management compensation when the proportion of management ownership is low, as a response to the moral hazard problems that become present. The overinvestment problem that arises because managers like to restrain the free cashflows instead of paying out a dividend, is an example of this latter phenomenon. Managers without ownership consequently have an incentive to hire a high-quality auditor in order to increase and ensure their compensation. Next to the use of external monitoring, a solution might be to implement or to use incentive performance contracts for managers, which also reduce agency costs by improving managerial performance compared to pure wage contracts. However, the enforcement of these contracts requires additional monitoring costs. To conclude, external monitoring by an auditor

reduces the occurring information asymmetries between managers and owners therefore ensuring the owners that the company is managed by keeping their interest at heart and ensuring managers that their actions are perceived aligned with the interests of the owners.

As financial statements provide an overview of the well being of a company as well as of its operational and financial position, they carry a valuable amount of information. Many outsiders and especially investors use these financial statements as a basis for their (investment) decisions as they do not fully experience a company in its day to day life. “The Information Hypothesis”, states that auditors might help to upgrade the quality of the information provided, thereby enhancing the quality of the information provided to financial statement users.

The third hypothesis, namely “The Insurance Hypothesis”, states that the auditor acts as an insurer with respect to investors, banks, managers,... These latter base their investment and other decisions upon the financial statements that are corrected and controlled by the auditors. When they make severe mistakes in their decisions, based on financial statements with material errors, they try to hold the auditors responsible (De Beelde, 2008).

Today companies do not only feel the growing complexity due to the expansion of their relationships with external stakeholders. Nowadays, they become more and more internationally oriented as globalization increases. Consequently companies also feel their internal complexity increase. Kinney and McDaniel (1989) additionally suggest that as the size of a company increases, the ability of managers to control the company and its processes is reduced. Without additional monitoring and communication, company managers lose their grip on the internal functioning of the company and internal information asymmetries arise. Engaging an auditor helps to restore the internal balance as they upgrade the efficiency in the audited company and reduce the divergence in alignment between the hierarchical levels (Knechel et al., 2008). The international expansions of a company can also cause compliance problems as different taxation rules and others exist in every different country. This benefit might persuade a company to use a certain auditor (Knechel et al., 2008).

Next to the potential obligation by law, a company might also be obliged to use a certain auditor by its mother company (De Ketelaere, 2007). We wish to note that in the remainder of this master dissertation, we do not distinguish between companies that make the auditor choice themselves and companies and subsidiaries that are obliged to use the auditor the mother company has chosen.

## **2.2 The reasons for a company to hire a high-quality auditor**

When looking at the choice company managers make concerning engaging an auditor, elaborate research has been performed on which specific auditor they hire. In their selection of an auditor, companies primarily take their need for a certain quality level in these external monitoring services

into consideration. Klein and Leffler (1981) provided the following definition for quality: “[...] quality refers to the level of some desirable characteristic contained in the good.” (Klein and Leffler, 1981, p. 618). Throughout the further development of this master dissertation we use the word quality as it is defined by Klein and Leffler (1981). When referring to audit quality in this master dissertation, we use the definition provided by DeAngelo (1981): “The quality of audit services is defined to be the market-assessed joint probability that a given auditor will both (a) discover a breach in the client’s accounting system, and (b) report the breach.” (DeAngelo, 1981, p. 186).

In the literature, the main distinction between audit firms used, is the one between high-quality auditors and non-high-quality auditors. Several attempts have been made to determine what qualifies a certain auditor to be a high-quality auditor and how to proxy for this in research. The most cited work that has provided previous researchers with a potential determinant, is the work of DeAngelo (1981). In her work she argued that many firms have a changing amount of agency costs to deal with, which vary over time and place. This latter cause the incentive for company managers to look at ways to lower these changing agency costs by engaging an auditor who provides adequate services appropriate for the company’s needed level of quality. However, when one would make an attempt to measure the quality of an auditor and his provided services, this would become too costly in accordance with the benefits of having adequate external monitoring. Therefore, DeAngelo has tried to provide company managers and co-researchers an alternative to measure the quality of audit services. In her research she argued that larger audit firms have less incentives to provide a low-quality audit as they earn more client-specific quasi-rents due to their larger clientele basis. Because of this latter, larger audit firms are less dependent on one specific client and therefore less eager to make mistakes. A first proxy used in literature for the quality of an audit firm is accordingly, size.

Another proxy provided by the literature, as proposed by Klein and Leffler (1981), is price. They indicated that price is another measure for quality. Although the research of Klein and Leffler (1981) mainly focused on quality in general, their proxy has been used by many other researchers investigating the auditor choice. The research by Thornton and Moore (1993) investigated how audit fees are determined and what their influences are on the auditor choice. In accordance with previous research on what determines the audit fees (e.g. Simunic, 1980 and 1984), they have focused on three of the four generally suggested audit fee determinants, namely, weakness of internal control, business risk and audit complexity. One of their main findings is that: “The marginal cost of auditor quality varies inversely with the companies’ internal control strength.” (Thornton and Moore, 1993, p. 346). Different other studies (e.g. Simunic, 1980; and Francis and Simon, 1987, Gul, 1999), across different international settings, have investigated whether there is a relation between Big Four auditors and higher audit fees charged. Although previously there was many inconsistent evidence for this relation, Choi, Kim, Liu and Simunic (2008) discovered that the fees charged by Big Four

auditors in accordance with the fees charged by non-Big Four auditors are higher in the 13 countries they investigated. In addition to this primary finding and in contrast, they found that the premiums are positively related to the strictness of the legal regime. Therefore, following Choi et al. (2008) and Francis and Wang (2008) we conclude that the auditor fees are, in the strict legal regimes, an indication for the higher quality a Big Four auditor offers compared to the non-Big Four auditors.

Klein and Leffler (1981) also found evidence that brand-name reputation generates quasi-rents and stimulates audit companies to develop and maintain brand-name reputation. Accordingly they suggested that quality is also determined by reputation. In addition, Simunic and Stein (1987) found evidence that Big Four firms have high brand-name reputations. Auditors with a certain reputation are assumed to have less incentives to decrease their quality because of the quasi-rents they are able to generate with their reputation and their brand-name. The study of Moizer (1997) investigating auditor reputation, revealed that company managers experience a Big Four auditor as different from others. They are expected to provide higher quality services in accordance with their other peers. A third determinant for being a high-quality auditor is therefore brand-name reputation.

Due to these characteristics and determinants of auditor-quality investigated and proven to be applicable, most researchers define Big Four auditors as high-quality auditors. In the further development of this master dissertation we use the terms Big Four auditor and high-quality auditor as synonyms.

Note that in the literature, one mostly finds the distinction between Big Four auditors and Non-Big Four auditors. However, due to the fact that some of the research has been performed prior to several fusions between the major audit firms, one comes across the Big Five, Big Six, Big Eight audit firms. To optimize the consistency in this master dissertation, we opt to solely use the term Big Four auditor. Therefore when referring to papers that have for example examined the Big Eight auditor environment we have referred to it as Big Four.

## **2.3 The auditor choice framework**

As there are a number of previous papers and articles looking at the auditor choice and its determinants, a great number of approaches were used to investigate this relation. There are the articles that focused on the selection criteria for an auditor concerning the audit firm itself and there are researchers focusing on the criteria related to the firm that needs to be audited. A third group investigated the impact of investor protection. To conclude, one could say that there are three groups of variables that can explain the auditor choice. There are the audit firm variables, the institutional variables and the firm variables. Therefore a complete framework explaining the auditor choice should include these three groups of variables. As including all three groups would take our

research beyond the intended scope of this master dissertation, we only focus on parts of the last two groups. However, in this section we discuss some of the other variable groups to offer the reader a more complete overview of the other potential determinants of the auditor choice as well as some of the firm variables and institutional variables we do not include in our investigation.

### 2.3.1 Ownership variables

As the capital markets in continental Europe are less developed (LaPorta, Lopez-De-Silanes, Schleifer and Vishny, 1997, 1998), most companies are family owned businesses. Combined with the fact that civil law countries also provide a less protective environment to investors, Schleifer and Vishny (1997) and LaPorta et al. (2000) suggested that conflicts of interest can arise between the minority investors and the controlling shareholders, replacing the initial agency conflict between managers and owners. In the light of compensating the weaker legal protection they have, due to national legislation, controlling shareholders will try to monitor the managers they appoint more closely themselves. By doing so, they are in fact replacing the legal constraints on managers by their own (El Ghoul, Guedhami, Lennox and Pittman, 2007). This latter might induce the conflict with minority investors because these controlling shareholders have the potential to use the firms resources to secure their own interest while neglecting or even damaging the interest of the minority investors. Nonetheless, these controlling shareholders are still dependent on these minority investors to raise capital. Consequently “[...]recent research highlights the incentives for controlling shareholders to develop effective corporate governance mechanisms to reduce the potential extraction of private benefits of control.” (El Ghoul et al., 2007, p. 5). Engaging a high-quality auditor is suggested by research to be such a mechanism because of the greater transparency in financial statements they offer.

El Ghoul et al. (2007) investigated in addition to Fan and Wong (2005) and Lennox (2005) “[...]whether the superior external monitoring brought by Big Four auditors helps reduce the agency problems that stem from concentrated ownership.” (El Ghoul et al., 2007, p. 1). Consistent with controlling owners having an incentive to maximize the level of their firm value, El Ghoul et al. (2007) found evidence that there is a negative relation between the level of ownership rights of the controlling shareholders and the demand for a Big Four auditor. In addition, when the ownership structure consists out of multiple shareholders, El Ghoul et al. (2007) found a decrease in the demand of high-quality auditors. Consistent with Laeven and Levine (2005) suggesting that when multiple controlling owners are present, the internal monitoring is stronger, and therefore, according to Thornton and Moore (1993) the incentives to hire a Big Four auditor are lower. A final feature of ownership structure investigated by El Ghoul et al. (2007) was the impact of the identity of the

controlling shareholder. As the majority of continental European companies are under family control, El. Ghoul et al. (2007) hypothesized that the quality of reporting would not increase in the presence of a Big Four auditor as family owners want to reflect the firms' true performance. In accordance with their hypothesis, they found evidence that when a company is family controlled, this latter will lower the incentive to hiring a Big Four auditor in these companies. Next to these three ownership-based variables determining the auditor choice, Beasley and Petroni (2001) found that the number of independent, outside members in the board of directors has a positive influence on the selection of a Big Four auditor. According to Fama (1980) and Fama and Jensen (1983) boards of directors are used as a mechanism to control the conflict between the owners and the managers as they perform a monitoring role. In their research, Beasley and Petroni (2001) provided evidence that independent, outside directors will be more eager than inside directors to provide the stakeholders with qualitative and correct information, therefore increasing the quality of their monitoring role. In earlier research Beasley (1996) had already provided evidence that outside directors have a positive influence on the reduction of management fraud, confirming the earlier assumptions.

To conclude, in this section we provide four ownership variables to include in a more elaborate auditor choice framework: the level of ownership rights, multiple shareholders, family control and in addition the number of outside directors. The former three are suggested by literature to have a negative impact on the auditor choice, in contrast to the latter. However, these four variables might be completed with other ownership variables and one should keep in mind that these are not the only variables concerning the ownership structure that are influencing the auditor choice.

### **2.3.2 Audit firm variables**

When a company is looking to start a business relationship with another company, one will examine the features of the potential future partner in order to verify the degree of alignment and whether the relation has constructive potential. The business relation between a certain company and its auditor is not any different. As an audit firm is a regular company, it possesses criteria and characteristics as any other. Before selecting a certain auditor, a company in the need for external monitoring, will outweigh all the potential advantages and disadvantages it could receive and experience when entering in a business relationship. When considering the marginal costs of engaging a Big Four auditor, company managers will take the potential increase in price into consideration as prior research suggests that Big Four auditors (e.g. Simunic, 1980; and Francis and Simon, 1987; Gul, 1999; Choi, et al. 2008) sometimes charge higher auditor fees than their peers. A second item to include in the calculation of the marginal costs when engaging a Big Four auditor is as suggested by El Ghoul et al. (2007) the "[...] greater capacity to conceal the extraction of private



benefits.” (El Ghoul et al., 2007, p. 8). Companies having the incentive to smooth their earnings downwards, might also see a disadvantage in hiring a Big Four auditor. Vander Bauwhede, Willekens and Gaeremuyndck (2003) found evidence that a Big Four auditor helps to reduce earnings smoothening in companies that have earnings above target. However, when a company tends to enhance its disclosure quality, as a signal to its (minority) shareholders and overall stakeholders, the company managers will be more eager to hire a Big Four auditor. When taking the institutional environment into account, the related research by Francis and Wang (2008) provided evidence that in a strong investor protective environments, Big Four auditors will demand a higher earnings quality of their clients. Additionally, in strong investor protective environments, they also found that the abnormal accruals are smaller for Big Four clients. A third finding in strict legal regimes was that there is a higher likelihood that firms report losses when they are audited by a Big Four company. Contrarily, in weaker legal environments, neither of these relations could be found. According to Moizer (1997) when making the auditor choice, directors requiring qualitative external monitoring, perceive Big Four auditors as different from their peers. Beatty (1989) suggested that by hiring a Big Four auditor there will be less under pricing for an IPO carried out by a company. Due to the positive perception by investors and other stakeholders of quality, company managers might therefore consider audit quality as a marginal benefit. To make an initial conclusion, we can say that price and quality are, next to being the qualifiers of high-quality audit firms, also two determinants used by company managers.

A third variable is the size of the audit firm. The consideration of audit firm size can be explained by several points of view. First, as quality is one of the determinants company managers take into account and audit firm size is considered a proxy for audit quality, the size of an audit firm is also a determinant of the auditor choice. Secondly, DeAngelo (1981) stated that the stock markets are more favorable towards a change to a bigger auditor company therefore suggesting that the market has a greater confidence in larger audit firms (DeKetaere, 2007). Thirdly, larger audit companies are considered to be more insured when a damage claim has been filled by their clients. As Simunic and Stein (1996) suggested, “[...] the higher the honorarium, the higher the paid insurance premium, and therefore the higher the chance to a higher repayment in case of a damage claim.”(DeKetaere, 2007, p. 60).

In a more elaborate audit framework one should therefore also include the price an audit firm charges for its services, the size of the audit firm and the quality of the auditor services.

## 3. Hypothesis development

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### 3.1 Determinants related to the internal characteristics and relations of a firm

#### 3.1.1 The impact of complexity on the auditor choice

When starting the investigation for the most important determinants of the auditor choice, one first has to consider the potential internally-driven determinants. In the literature the choice of a particular auditor is partially seen as a measure taken by the company manager to reduce the agency problems that occur within the company itself. Therefore it is important one takes into account what might cause these internal agency problems and their related costs.

The general assumption in the literature is that the agency problems increase in accordance with the growth in size and complexity of the firm that needs to be audited. Therefore another general assumption is that the likelihood of hiring a high-quality auditor will increase when the complexity and the size of the company that needs to make the auditor choice becomes bigger. Chow (1982) made a cost benefit-analysis of monitoring contracts performed by external auditing. He assumed that the total amount of potential wealth transfer increased with firm size for a given manager ownership share and debt/equity ratio. This results in growing relating benefits of undertaking monitoring. Furthermore, costs of establishing a monitoring system are mainly fixed as external auditors face three major startup costs when performing their first audit, even for small firms (Arens and Loebbecke, 1976), they have to verify the details of the balance sheet that are of permanent nature and the beginning balances. They also have to become familiar with the client's operations. The marginal cost of maintaining the monitoring system will decrease as size increases, due to the fact that variable costs are not proportionally increasing with firm's size. Abdel-khalik (1989) provided another argument and found evidence that it becomes more difficult for owners of private companies to oversee the enterprise when firm size increases. As the length of the chain of control increases, delegation becomes necessary. Authority is then delegated down the chain, resulting in a lack of observability between existing hierarchies and less effective communication. This causes a higher risk for moral hazard problems and opportunism. Internal control cannot always compensate this loss of control (Abdel-khalik, 1989), that is why companies demand monitoring systems in the form of external audits in order to enhance the owners' confidence in reducing the moral hazard risk. They state that the size of tangible assets (total assets) employed by the organization can be considered as the maximum amount of wealth at risk. This also confirms the need for external auditing as firm size increases as well as the need for high-quality monitoring. Simunic and Stein (1987); Abdel-khalik (1989); Hay and Davis (2004) and Knechel et al. (2008) are other researchers

that have found evidence for the relation of the auditor choice and the complexity of the company. In accordance with Knechel et al. (2008) we test the following hypothesis:

H<sub>1</sub>: The likelihood of hiring a Big Four auditor is positively related to the internal complexity of the company.

In accordance with Knechel et al. (2008), we opt to use measures for the internal complexity of the firm that needs to make the auditor choice. Knechel et al. (2008) suggested that there is a relation between the number of transactions performed and fulfilled by a company and its complexity, consistent with Stice (1991) and Hay, Knechel and Wong (2006). Therefore we include their determinant of INVREC, which is the ratio of inventories and receivables to total assets and previously introduced by Abdel-khalik (1989) and Hay and Davis (2004).

A second variable proposed by Knechel et al. (2004) and used in our regression is the dummy variable GROUP, which becomes 1 when the company has subsidiaries. According to the research by Ge and Mc. Vay (2005) problems in subsidiaries are often the reason for a weaker control of a company. Hay and Knechel (2005) also found evidence that a group of companies is most likely to use the same auditor, hereby a company tries to reduce the complexity and the possible information asymmetries. The variable GROUP is therefore suggested to be positively related to the choice of a high-quality auditor.

In addition to various research, we include SIZE in our regression. SIZE is a variable determined by the natural logarithm of total assets of a company and is suggested to be controlled for by many other researchers in the literature (e.g. Chow, 1982; DeFond, 1992; Broye and Weill, 2008; Knechel et al. (2008) as it is a proxy for the increase of internal complexity and the related agency costs. Due to this latter SIZE is considered to be positively associated with the hiring of a high-quality auditor.

## **3.2 Determinants related to the external characteristics and relations of a firm**

### **3.2.1 The impact of external financing on the auditor choice**

There are several relations occurring in a firms' day to day life that create agency costs. When considering the agency theory, Jensen and Meckling (1976) suggested that there exists an owner-debtholder conflict. The agency theory posits that debtholders pay special attention to the possible wealth transfers to shareholders (Smith and Warner, 1979). Managers are supposed to favor the interests of the stockholders as written debt covenants restrict managers in their decision making. For example, shareholders sometimes prefer high dividends as the financial resources where

debtholders can take possession on, decrease. Payment of liquidating dividends is another example of a wealth transfer mechanism that could harm debtholders (Chow, 1982). Finally, stockholders are willing to increase the risk of investment projects when the organization performs bad as the potential loss for shareholders is so little and the consequences of bankruptcy are far more heavily for debtholders than for shareholders (Deloof, Manigart, Ooghe and Van Hulle, 2008). Jensen and Meckling (1976) argued that potential bondholders will anticipate those wealth transfers in an efficient capital market after the bonds have been issued. They estimated the expected loss and correspondingly priced the bonds. However, the expected loss of the bondholders is not equal to the expected gain of the shareholders. This negative-sum game implies that shareholders can transfer wealth from the bondholders to themselves by making suboptimal investment decisions. With risky debt outstanding, shareholders will possibly reject positive net present value projects whose benefits accrue to bondholders and accept negative net present value projects with a high return variance. This enables shareholders to pay dividends at the expense of bondholders as long as the benefits of the wealth transfers exceeds the decline in firm value. By defining various debt covenants, shareholders would receive a higher price for the bonds. Shareholders have to weigh the benefits of obtaining a higher price and an increase in firm value thanks to optimal investment decisions against the cost of negotiation. Previous research (e.g. Fama and Miller, 1972; Jensen and Meckling, 1976) found that the severity of the preceding agency conflict increases as the proportion of debt in a firm's capital structure increases. Monitoring contracts by an external auditor and especially a high-quality auditor might limit the shareholder-bondholder conflict of interests. Furthermore, the increase of debt deteriorates the financial situation of the organization as the probability of non-payment increases due to diluting coverage of existing debt. Previous literature (e.g. Chow, 1982; Beasley et al., 2001) found evidence that companies engage in a relation with financial institutions to assess external capital. This relation can be, according to e.g. Blackwell, Noland and Winters, 1998; Pitman and Fortin, 2004; Mansi, Maxwell and Miller, 2004; Causholli and Knechel, 2007, influenced positively when the company demanding financial assistance, hires a Big Four auditor. This latter decision is proven to reduce the effective interest rate. In our research we integrate this by testing the following hypothesis:

H<sub>2</sub>: The likelihood of hiring a Big Four auditor is positively related to the level of external financing in a company.

In addition to Knechel et al. (2008) we use the ratio total liabilities to total assets (DEBT\_ASSETS) as a variable to measure the proportion of debt in a company. Several other previous studies (e.g. Sundgren, 1998; Broye and Weill, 2008), using different definitions of leverage, have investigated the

impact of leverage on the choice of an auditor. Although the relation generally is hypothesized to be positive, the results however have been inconclusive. In addition to this prior research and our own focus on European countries, the research performed by Broye and Weill (2008) provided us with a clearer view. According to their research, the use of leverage as a criterion in the auditor selection process is significantly different across the European landscape. In their study, they investigated this relation in 10 European countries and found evidence that the variation of the criterion leverage is related to the different levels of auditor liability exposure. This latter is proven to have a negative impact on the relation between leverage and auditor choice. Although this finding gives proof of a variance in the impact of leverage, we include it as a single variable without accounting for the influence of the legal system in a country which would take the research farther than projected for this master thesis.

A second variable is a dummy variable, namely LISTED (Broye and Weill, 2008). When a company is listed, Broye and Weill (2008) suggested that the likelihood of having a Big Four auditor increases. They argued that it is likely that companies, listed on a stock exchange choose Big Four auditors as they are more experienced in complex operations. Furthermore, Big Four auditors have a large international network at their disposal and have the ability to signal private information on the market. However, they did not find empirical support for Europe. This can be explained through the limited fraction of listed companies in their sample. O’Keefe, Simunic and Stein (1994) argued in their study of auditor services that: “Managers of public firms are generally viewed as having greater incentives to overstate financial positions and results of operations to maximize their compensation and maintain their employment.” (O’Keefe, Simunic and Stein, 1994, p. 249). This latter supports our prediction that listed companies have the incentive to hire Big Four auditors to signal their intention to provide correct financial statements. In our research, we will conduct the analysis of Broye and Weill (2008) again. It should be noted that the proportion of listed companies in our sample is still limited due to data availability.

### **3.2.2 The impact of the country a company is based in on the auditor choice**

During the recent years, and especially after the latest two expansions in 2004 and 2007, the European Union has tried to optimize harmonization amongst its members. Several actions have been undertaken to create a united front out of the different communities. Incentives have been created to improve the harmonization of the economy, the labor market and other facets of the European life. One of these latter is the attempt to harmonize the audit profession and to control the quality of the auditor profession and the services auditors provide. Next to the introduction of the

Eight Directive, there have been two Recommendations by the European Commission to impose a quality guarantee on the professions of the auditors. However, as Recommendations do not have a binding power and Directives are only binding for countries in relation to the objected result, there is a lot of freedom left to the individual governments of the countries for the way of implementation. Because the actions of an auditor affect the public interest and therefore the economic life and market of a country and in general the European Union, the European Commission has tried to create a framework for the statutory audit profession and the licensing of an auditor, trying to form and maintain good audit quality. "Good audit quality contributes to the orderly functioning of markets by enhancing the integrity and efficiency of financial statements." (European Parliament and Council, 2006, OJ 157, 17.05.2006, p. 88). Despite these harmonization attempts, there are still some differences between the European countries. "The role of a statutory auditor, the process of becoming a certified auditor, and the status of the profession reflect transnational differences that are deeply rooted in the political, historical and economic differences among Member States (European Commission, 1996, 1998, 2000, 2003; Baker, Mikol and Quick, 2001)." (Knechel et al., 2008, p. 67). The basis of these differences is the variation in national culture of every European Union member. According to Margerison and Moizer (1996), these cultural differences, affecting the national legislations, cause the inter-European differences in the licensing of auditors. Broye and Weill (2008) also stated that: "As differences in liability systems become crucial in the context of progressive harmonization, it seems very relevant to study how the severity of audit regulatory affects the demand for audit quality." (Broye and Weill, 2008, p. 716).

Despite the influence of culture on national legislation, the general assumption in the literature is that one can make a primary distinction. Civil or code law countries are countries that "are part of the scholar and legislator-made civil law tradition, which dates back to Roman law [...]" (LaPorta et al., 1997, p.1131). In the remainder of this master dissertation we use the term 'civil law countries' to refer to these civil or code law countries in order to maintain consistency. These civil law countries can be subdivided into French law, German law and Scandinavian law countries. English law or common law countries their legislation "[...] is formed by judges' decisions on specific disputes." (Jaggi and Low, 2000, p. 500). In the European Union, one can find the four different kind of law origin countries. In their studies concerning investor protection, LaPorta et al. (1997, 1998) have investigated the impact of the differences between these civil and common law countries. Their primary finding was that shareholders and creditors know the best protection in English common law countries. However, they found that the enforcement of law is lower in English common law countries than in Scandinavian and German civil law countries. These latter take the middle position in the ranking of investor protection. The weakest investor protective environment was found in French civil law countries. LaPorta et al. (1997, 1998) also found evidence of weak law enforcement

in these French civil law countries. In their additional study (LaPorta et al., 1997) they found that countries that offer a better protected legal environment also have a more elaborate capital market. Consistent with their earlier findings they found “[...] that civil law, and particularly French civil law, countries, have both the weakest investor protections and the least developed capital markets, especially as compared to common law countries.” (LaPorta et al., 1997, p. 1149). The study of Jaggi et al. (2000) found evidence that the impact of cultural values on financial disclosure of multinationals also varies across the common law and civil law countries. No statistical significant influence has been found on the financial disclosures of multinationals in English common law countries. However, they did document that one can find a greater fragmentation in the ownership structure and a higher debt level in the multinationals in common law countries, consistent with the higher developed capital market documented by LaPorta et al. (1997). They concluded that especially this latter feeds the need for more qualitative financial disclosures as the investors and creditors are more eager to obtain information in the English common law countries.

Next to a direct relationship between the culture of a country and its national legislation, culture has also been proven to have an effect on the choice of an auditor (e.g. Baker, Mikol and Quick, 2001). An assumption in previous literature is that managers let their decisions and way of handling be influenced by national cultural values. Hope et al. (2008), who based their investigation on this assumption, investigated the impact of national legislation and culture on the auditor choice. In their study they analyzed whether companies in more secretive environments have more incentives to avoid hiring a Big Four auditor. As managers, induced by more secretive cultural values, may have incentives to make their financial statements less transparent, the likelihood of hiring a high-quality auditor will be reduced. In addition they have found that the being international of companies might mitigate the impact of secretive cultural values on managerial decisions.

Although this section provides proof for the fact that some research has touched the differences in auditing and accounting standards across the countries of the European Union (e. g. Hope et al., 2008) and the influence of national legislation on the auditor choice (e.g. Choi and Wong, 2002; Broye and Weill, 2008) there has been little research that has also included several of the latest entrants of the European Union. Therefore in addition to e.g. Choi and Wong (2002) and Broye and Weill (2008) we investigate whether the impact of a country the company has its basis in, influences the auditor choice and therefore whether the impact of the national legislation also holds when investigating some of the latest members of the European Union. We test this with the following regression:

H<sub>3</sub>: The likelihood of hiring a Big Four auditor will be higher in English common law countries than in other civil law countries.

Because one of our primary intentions is to know the impact of the country where a company is based, on the auditor choice, we include three dummies in our main regression. Including a different dummy variable for each country would reduce the value of our regression, therefore we opt to use the categorization presented by LaPorta et al. (1997, 1998) according to a countries law origin. The criteria used to make the distinction can be found in the research of Glendon, Gordon and Osakwe (1994) or in LaPorta et al. (1998). Table 1 presents the countries collected in our sample and their categorization according to the origin of their national legislation.

In addition to the four categories provided by Glendon et al. (1994) and LaPorta et al. (1997, 1998) we have created a fifth arbitrary dummy. This group consists out of some of the latest European members and is arbitrarily put together because these countries were not included in the investigation of Glendon et al. (1994) and LaPorta et al. (1997).

We tend to believe the English common law countries will contain the most Big four clients because of their greater investor protective environment. Since their capital markets are the most developed we tend to believe that this latter will also positively affect the behavior of companies in choosing a Big Four auditor. In contrast we tend to hypothesize that French civil law countries will have the lowest number of Big Four clients. As German civil law countries do not stand out in law enforcement or in the development of their capital market, we do not make any predictions about the sign of LAW3. In addition, due to the arbitrary composition of our LAW5 group and the brief previous literature covering these countries, we cannot make any hypothesis about the impact of this group on the auditor choice. Table 2 contains our predictive signs according to the variables used in our regression

English origin (LAW1)
Ireland, UK
French origin (LAW2)
Belgium, France, Greece, Italy, the Netherlands, Portugal, Spain
German origin (LAW3)
Germany
Scandinavian origin (LAW4)
Denmark, Finland, Sweden
Latest entrants (LAW5)
Czech Republic, Estonia, Hungary, Latvia, Poland, Slovakia

**Table 1 – Classification of countries by legal origin**



Variables	Predicted sign	Source of the variable	Explanation
INVREC	+	Knechel, et al., 2008	The ratio of inventories and receivables to total assets.
GROUP	+	Knechel et al., 2008	Dummy variable which indicates whether a company has subsidiaries.
LIST	+	Broye and Weill, 2008; O'Keefe et al., 1994	Dummy variable which indicates whether a company is listed.
SIZE	+	e. g. Knechel et al., 2008; Broye and Weill, 2008; DeFond, 1992; Chow, 1982	The natural logarithm of total assets.
DEBT_ASSETS	+	Knechel, et al., 2008; Carey, Simnett and Tanewski, 2000	The ratio of total debt to total assets.
ROA	-	Broye and Weill, 2008; Guedhami, Lennox and Pittman, 2007	The ratio of profit and loss to total assets.
LAW1	+	LaPorta et al., 1997	Dummy variable which indicates whether a company is based in English law origin countries.
LAW2	?	LaPorta et al., 1997	Dummy variable which indicates whether a company is based in French law origin countries.
LAW3	?	LaPorta et al., 1997	Dummy variable which indicates whether a company is based in German law origin countries.
LAW5	?		Dummy variable which indicates whether a company is based in Czech Republic, Estonia, Hungary, Latvia, Poland or Slovakia.

**Table 2 – Description of variables**

## 4. Data and methodology

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### 4.1 Data collection and sample selection

In our sample we use 35559 companies based in 12 European countries, out of which 5559 are listed companies. We use 2656 companies from Belgium, 2653 from Denmark, 2562 from Ireland, 2622 from Finland, 3339 from France, 3372 from Germany, 2749 from Greece, 2659 from the Netherlands, 3222 from Spain, 2948 from Sweden, 4217 from the UK and 2560 from Portugal. For our extended analysis we introduce another 13239 companies. 2508 from the Czech Republic, 2514 from Estonia, 2529 from Hungary, 2792 from Poland, 273 from Latvia and 2623 from Slovakia. The countries investigated in our main analysis result from the data-availability needed to perform our intended investigation combined with the classification provided by LaPorta (1997). Italy and Austria are excluded from the analysis as neither of both countries have reported their auditor in the Amadeus database. Luxemburg is also not taken into account as LaPorta et al. (1997) do not classify this country by the origin of its national legislation.

We use consolidated balance sheets of the companies investigated for the year 2007 when available. Since we investigate the latest entrants in our additional analysis, we need recent data. As the last entrants of the European Union, meeting our required information criteria for our analysis entered in 2004, we have chosen to work with more recent data from 2007. This year satisfies data availability for our analysis and is at the same time of a recent date. To obtain our data we worked with the database Amadeus provided by Bureau Van Dijk.

The Amadeus database contains very large companies, large companies, medium sized companies and even small companies. Banks and insurance companies are not included in the database. Furthermore, companies without recent financials (not older than five years), are excluded from the database. We also decided to drop membership organizations; private households; executive, legislative and general government except finance; justice, public finance, taxation and monetary policy and non-classifiable establishments from our analysis given the specific characteristics of their financial statements.

### 4.2 The regression model

To perform our main analysis in our search for the determinants of the auditor choice and which client characteristics one should include in a framework we test our three hypotheses by running the following regression on our collected data:

$$\text{BIG4} = C + a_1 * \text{INVREC} + a_2 * \text{DEBT\_ASSETS} + a_3 * \text{LAW1} + a_4 * \text{LAW2} + a_5 * \text{LAW3} + a_7 * \text{LISTED} + a_8 * \text{ROA} + a_9 * \text{SIZE} + a_{10} * \text{GROUP}.$$

In this regression BIG4 is a dummy variable which is one when the company uses a Big Four auditor and 0 otherwise. In order to test our first hypothesis we use the variable INVREC which is the ratio of inventories and receivables to total assets. GROUP is the second variable included to test the first hypothesis and is a dummy variable which takes the value 1 if the company examined has subsidiaries and takes the value 0 otherwise. A third and last variable for this hypothesis is SIZE. It is the natural logarithm of the total assets of a company.

To test our second hypothesis we include the variables DEBT\_ASSETS and LISTED. DEBT\_ASSETS is measured as the ratio of non-current and current liabilities to total assets. A dummy variable LISTED is included which becomes 1 when a company is listed on a stock exchange and 0 otherwise.

Our third hypothesis is tested by including three dummy variables (LAW1, LAW2 and LAW3) that become 1 when the company investigated is based in a country that is respectively an English, French or German law origin country as suggested by LaPorta et al. (1997).

Following former empirical studies on auditor choice (e.g. Broye and Weill, 2008; El Ghouli et al. 2008), we include return on assets as a proxy for profitability and also risk as a control variable. We measure ROA as profit and loss divided by total assets.

Next to our main analysis we also perform a second regression where we include some of the latest European members. Next to including these additional countries, we run the following regression:

$$\text{BIG4} = C + a_1 * \text{INVREC} + a_2 * \text{DEBT\_ASSETS} + a_3 * \text{LAW1} + a_4 * \text{LAW2} + a_5 * \text{LAW3} + a_6 * \text{LAW5} + a_7 * \text{LISTED} + a_8 * \text{ROA} + a_9 * \text{SIZE} + a_{10} * \text{GROUP}.$$

The only variable added is LAW5. LAW5 is an arbitrary group consisting out of the following countries: Czech Republic, Estonia, Hungary, Latvia, Poland and Slovakia. LAW5 is a dummy variable that becomes 1 when the company investigated is based in Poland, Czech Republic, Estonia, Latvia, Slovakia or Hungary and 0 otherwise.

### 4.3 Methodology

In our regression, our dependent variable is qualitative in nature. This means we cannot use Ordinary Least Squares as this would violate various Ordinary Least Squares assumptions. Firstly, the disturbance terms are not normally distributed. As our sample size is considerably large and point estimates still remain unbiased, this is not a crucial problem. Secondly, the disturbance terms are no

longer homoscedastic. However, estimation is still possible as the estimators remain unbiased and consistent in the presence of heteroscedasticity. By conducting Weighted Least Squares or using robust standard errors, we could overcome this estimation problem. Thirdly, the probability of something happening does not necessarily lie between 0 and 1. However, using a linear response function, the mean responses may fall outside these constraint limits, resulting in impossible estimation of the dependent variable (Gujarati and Porter, 2009).

We solve this fundamental weakness by using the logistic regression model. Following Francis and Wilson (1988), we perform both the OLS and logit model to test whether the performed statistical procedure has a significant impact on the significance levels and signs of our coefficients. We conclude that the results of the OLS and logit model are very similar, nonetheless, we only include our findings of the logit model. Compared to the OLS model, the signs of the coefficients and significance levels are the same as for the logit model, except for INVREC.

#### **4.4 Model fitness**

Before analyzing the significance and meaning of the regression coefficients, we determine the suitability of the model in this section. To test the overall fit of our binary logistic regression model, we used the Hosmer and Lemeshow chi-square test for goodness of fit. Given a test statistic greater than .05, we fail to reject the null hypothesis that there is no difference between observed and model-predicted values. The LR-Statistic with a p-value < .01 indicates that the alternative-model is significantly better than the null-model and that at least one of the regression coefficients differs from zero. Our model possesses a Nagelkerke R square of .319.

Looking at the residuals of our model, we notice that, as expected, they are not normally distributed. Plotting a histogram of the standardized residuals confirms our suspicion. We also test formally the normality of the residuals by performing a Kolmogorov-Smirnov test (with Lilliefors correction) on the standardized residuals. Based on this test, we can reject the null hypothesis which corresponds with a normal distribution of the variable, as the p-value is less than 0.01.

The fact that we are working with a large sample, allows us to report the Huber-White standard errors to adjust for heteroscedasticity. Note however that both reported standard errors are nearly the same. By analyzing our bivariate correlation coefficients (table 7), we can observe that only the Pearson correlation coefficient of 0.61 between GROUP and SIZE could indicate a collinearity problem. Calculation of the variance inflation factors quantifies the severity of multicollinearity. We can conclude that the variance of our estimated regression coefficients does not substantially increase because of collinearity as the Variance Inflation Factors (table 8) are low and the Tolerance

does not drop beneath 0.4, indicating that most of the proportion of the variance in the variables is independent of each of the other independent variables.

In addition, we investigate the outliers by analyzing the Leverage statistic and Cook's Distance. The included Leverage statistic lies between 0 and 1 and gives an indication of the observations which have a major impact on the predicted value. The Cook's Distance is another measure of the influence of an observation. It measures the effect on the residuals for all other observations of deleting a given observation. The higher the Cook's Distance value, the greater the unusual influence of that particular observation. After examining many boxplots of our independent variables, the distribution of the leverage values and plotting graphically the observations with a large Cook's Distance value, we decide to delete observations with a negative equity in order to eliminate influential outliers. Broye and Weill (2008) made a similar decision, by keeping only those observations with a leverage ratio (defined as total assets minus equity and trade payables divided by total assets) between 0 and 1. Jaggi and Low (2000) also removed companies with a negative equity. Furthermore, we only keep observations with a return on assets ratio ranging between minus two and two. This results in an a corresponding Cook's Distance of less than 0.02 and a leverage value for all observations beneath 0.01. This way, our sample size consists of 32985 observations across 12 different countries. By introducing these restrictions, INVREC and DEBT\_ASSETS become significant. As we rerun the regressions without the restrictions on the return on assets ratio, we can not notice any significant differences. The coefficients, standard errors as well as the classification accuracy rates are generally the same. Also the inclusion of other restrictions on variables as INVREC and DEBT\_ASSETS do not change anything. This way, we can conclude our model is now free from influential outliers, as any further attempt to delete outliers does not result in a considerable change of the estimates. Even the impact of excluding other outliers on the efficiency and overall fit of the model is very limited.

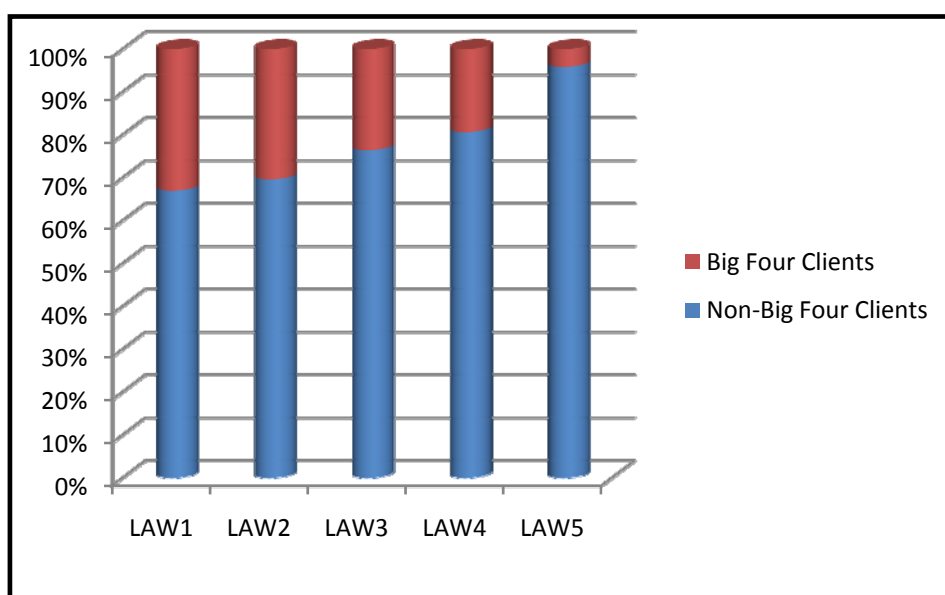


Figure 1 – Market share of Big Four auditors

## 5. Descriptive statistics and results

### 5.1 Descriptive statistics

The first descriptives of our sample, shown in table 3 and figure 1, give us a first overview of the market share of the Big Four auditors in our sample. In our sample 33,04% of the companies in English common law origin countries are Big Four auditor customers. In the German civil law countries about 23,59% of the companies hire a Big Four auditor, 30,39 % in the French civil law origin countries and 19,37% in the Scandinavian law countries. Next to the countries in our main research, we also include an additional category consisting out of some of the new European entrants. For this category we can conclude that the great majority of the companies in our sample does not hire a Big Four auditor.

BIG4	LAW1	LAW2	LAW3	LAW4	LAW5	Total
0	4175	11320	2322	6005	11836	35658
	66,96%	69,61%	76,41%	80,63%	95,85%	78,66%
1	2060	4943	717	1443	513	9676
	33,04%	30,39%	23,59%	19,37%	4,15%	21,34%
Total	6235	16263	3039	7448	12349	45334

**Table 3 – Market share of Big Four auditors**

BIG4: a dummy variable which is one when the company uses a Big Four auditor and 0 otherwise, LAW1, LAW2, LAW3, LAW4, LAW5: become 1 when the company is based in a country that is respectively an English, French, German or Scandinavian law origin country or is one of the following countries: Czech Republic, Estonia, Hungary, Latvia, Poland and Slovakia.

Table 4 provides us with an overview of the descriptive statistics, but as we investigate the behavior of a binary dependent variable, we provide the categorical descriptive statistics for the explanatory variables. To test whether or not these means given in table 4 are (significantly) different for companies engaging a Big Four auditor and companies engaging a non-Big Four auditor, we test this by using the independent samples t-test. We use the data obtained where equal variances are not assumed as the Levene's Test for Equality of Variances provided us with data by which we conclude that all explanatory variables have different variances at the .05 significance level, except for ROA. From this table (table 4) we can conclude that, on average, Big Four audited companies have a lower transactional complexity than non-Big Four audited companies. This is in contrast with the significant positively relation in our regression between complexity and the choice of a Big Four auditor. A second observation is that companies engaging a Big Four auditor on average have a lower DEBT\_ASSETS ratio, which is consistent with our findings in our main regression. A third statistically

relevant relation can be found for the size of a company. Firms audited by a high-quality auditor are on average significantly bigger than firms that are audited by a low-quality auditor.

	BIG4	N	Mean	Median	Minimum	Maximum	Std. Deviation	Std. Error Mean	Sig.
INVREC	0	23822	,388	,369	-2,442	1,0434	,288	,002	,000
	1	9163	,366	,340	-,740	1,000	,280	,003	
DEBT_ASSETS	0	23822	,6123	,657	-,712	1,000	,256	,002	,000
	1	9163	,586	,630	-,740	1,000	,264	,003	
LAW1	0	23822	,18	,00	0	1	,380	,002	,000
	1	9163	,22	,00	0	1	,417	,004	
LAW2	0	23822	,48	,00	0	1	,499	,003	,000
	1	9163	,54	,00	0	1	,498	,005	
LAW3	0	23822	,10	,00	0	1	,297	,002	,000
	1	9163	,08	,00	0	1	,269	,003	
LISTED	0	23822	,11	,00	0	1	,318	,002	,000
	1	9163	,29	,00	0	1	,453	,005	
ROA	0	23822	,054	,038	-1,960	1,9857	,163	,001	,056
	1	9163	,050	,044	-1,978	1,7730	,143	,001	
SIZE	0	23822	8,256	8,333	,42	19,04	2,577	,017	,000
	1	9163	11,069	11,217	1,87	19,28	2,342	,024	
GROUP	0	23822	,34	,00	0	1	,474	,003	,000
	1	9163	,64	,00	0	1	,479	,005	

INVREC: the ratio of inventories and receivables to total assets, DEBT\_ASSETS: the ratio of non-current and current liabilities to total assets, LAW1, LAW2, LAW3: become 1 when the company is based in a country that is respectively an English, French or German law origin country, LISTED: a dummy variable which becomes 1 when a company is listed and 0 otherwise, ROA: profit and loss divided by total assets, SIZE: the natural logarithm of the assets of a company (in thousand euro), GROUP: a dummy variable which takes the value 1 if the company examined has subsidiaries and takes the value 0 otherwise.

**Table 4 – Descriptive statistics**

## 5.2 Regression results

	B	S.E.	Huber/White S.E.	Wald	Sig.	Exp(B)
INVREC	,243	,057	,057	17,978	,000	1,276
DEBT_ASSETS	-,715	,064	,065	124,192	,000	,489
LAW1	-,762	,050	,050	234,087	,000	,467
LAW2	-1,084	,047	,047	522,346	,000	,338
LAW3	-1,130	,063	,063	323,558	,000	,323
LISTED	,279	,042	,043	44,769	,000	1,322
ROA	,045	,108	,072	,171	,679	1,046
SIZE	,540	,009	,008	3870,993	,000	1,716
GROUP	-,199	,035	,036	32,837	,000	,820
CONSTANT	-4,987	,075		4372,394	,000	,007

INVREC: the ratio of inventories and receivables to total assets, DEBT\_ASSETS: the ratio of non-current and current liabilities to total assets, LAW1, LAW2, LAW3: become 1 when the company is based in a country that is respectively an English, French or German law origin country, LISTED: a dummy variable which becomes 1 when a company is listed and 0 otherwise, ROA: profit and loss divided by total assets, SIZE: the natural logarithm of the assets of a company, GROUP: a dummy variable which takes the value 1 if the company examined has subsidiaries and takes the value 0 otherwise.

**Table 5 – Logistic regression results of the main regression**

	B	S.E.	Wald	Sig.	Exp(B)
INVREC	,192	,055	12,170	,000	1,212
DEBT_ASSETS	-,582	,061	91,314	,000	,559
LAW1	-,740	,049	225,532	,000	,477
LAW2	-1,049	,047	508,472	,000	,350
LAW3	-1,118	,062	321,430	,000	,327
LAW5	-2,438	,061	1575,834	,000	,087
LISTED	,327	,040	66,737	,000	1,386
ROA	,137	,103	1,762	,184	1,147
SIZE	,524	,008	4218,962	,000	1,688
GROUP	-,141	,033	18,256	,000	,869
CONSTANT	-4,954	,072	4706,627	,000	,007

INVREC: the ratio of inventories and receivables to total assets, DEBT\_ASSETS: the ratio of non-current and current liabilities to total assets, LAW1, LAW2, LAW3, LAW5: become 1 when the company is based in a country that is respectively an English, French or German law origin country or is one of the following countries: Czech Republic, Estonia, Hungary, Latvia, Poland and Slovakia, LISTED: a dummy variable which becomes 1 when a company is listed and 0 otherwise, ROA: profit and loss divided by total assets, SIZE: the natural logarithm of the assets of a company, GROUP: a dummy variable which takes the value 1 if the company examined has subsidiaries and takes the value 0 otherwise.

**Table 6 – Logistic regression results of the additional regression**



In this section, we will discuss the logistic regression output. Table 5 shows the logit results for our sample of civil and common law countries. The LAW4 dummy variable was left out of our regression to avoid the dummy trap. The statistically significant coefficients for INVREC and SIZE support our first hypothesis. More complex and bigger firms are more likely to hire a Big Four auditor. This result fits our assumptions. Contrary to prediction, the sign of GROUP turns out to be negative for our sample, suggesting that companies with subsidiaries are less eager to hire a Big Four auditor.

Our second hypothesis is tested by the included variables DEBT\_ASSETS and LISTED. In our investigation, both are significant at the .001 level. However, the sign of DEBT\_ASSETS is negative. A possible reason for this can be found in previous literature. Broye and Weill (2008) found evidence that the use of leverage as a criterion in the auditor selection process is significantly different across European countries. These intra-European differences could influence the reliability of our coefficient for DEBT\_ASSETS.

The control variable ROA turned out to be positive but statistically insignificant. This is inconsistent with prior research (e.g. El Ghouli et al., 2008). A plausible explanation can be found in Knechel et al. (2008). They used a firm's return on assets to measure profitability and use this as a proxy for competition. They assumed that more profitable firms operate in a less competitive environment and link this with the cost of disclosing proprietary information. This latter is assumed to be higher in more competitive markets. Consequently, more profitable firms have stronger incentives to hide proprietary information. They concluded their reasoning by stating that more profitable firms would have an incentive to hire low-quality auditors, in order to conceal proprietary information. However, Berger and Hann (2007), explained that managers will withhold information of poor performing companies. This can be done by hiring a low quality auditor. This ambiguous relation between proprietary cost motives and agency cost motives could explain the insignificant coefficient.

When looking at the auditor choice and solely investigating the impact of the legislations origin (hypothesis 3), we can conclude that a company based in a Scandinavian civil law country has the largest probability of choosing a Big Four auditor. LaPorta et al. (1998) suggested that Scandinavian civil law countries have the greatest law enforcement power. This might explain why companies in these countries are more likely to hire a high-quality auditor. Companies in English common law countries tend to have the second largest likelihood of hiring a Big Four auditor. Given the fact that these countries have the greatest developed financial market, their ownership structure tends to be more scattered than the ones in civil law countries (e.g. LaPorta et al., 1998; El. Ghouli et al., 2007). As investors and creditors tend to ask a more qualitative representation of the financial statements, the demand for Big Four auditors will increase. As shown in our results, we cannot provide a conclusion concerning the ranking of auditor choice in French and German civil law countries compared to Scandinavian civil law countries and common law countries.

In our additional analysis, we also run an additional regression with the arbitrary fifth group of companies based in countries consisting of some of the latest entrants of the European Union, namely Poland, Estonia, Latvia, Czech Republic, Slovakia and Hungary. This leads to an increase of our sample size from 32985 to 45334 companies. The integration of this dummy variable does not lead to any major changes on the independent variables of our initial model. The coefficient of this additional dummy variable is strongly and significantly negative. We can conclude that the transition from a common law or civil law country to this group of latest entrants results in a decreasing likelihood of hiring a Big Four auditor. To assess the consistency of this arbitrary group of countries and the individual impact of each country on our initial sample, we ran the regression again on other samples, consisting of the initial 32985 countries and respectively Poland, Czech Republic, Estonia, Latvia and Hungary. We could conclude that only companies in Hungary show a deviating result, as Hungary alone is classified after the English common law countries but before French and German civil law countries, indicating the need for further research.

As noticed earlier, we exclude companies with a negative equity. Controlling for companies with a negative equity by including a dummy variable that equals 1 if the company has negative equity and equals 0 otherwise, results in a negative statistically significant coefficient. The inclusion of this variable does not result in a substantial change of our initial model. The coefficients, significance levels, classification accuracy rate and model fit indicators are generally the same. However, following Jaggi and Low (2000) and given the fact that previous literature does not include a control variable for this possible confounding effect, we decide to drop those observations instead of including an extra variable.

## 5.3 Correlation analysis

	INVREC	DEBT_ASSETS	LAW1	LAW2	LAW3	LISTED	ROA	SIZE	GROUP
INVREC	1								
DEBT_ASSETS	,341*	1							
LAW1	-,166*	-,104*	1						
LAW2	,276*	,118*	-,476*	1					
LAW3	-,074*	,027*	-,154*	-,314*	1				
LISTED	-,259*	-,326*	,142*	-,084*	,095*	1			
ROA	,036*	-,111*	-,016*	-,015*	-,001	-,143*	1		
SIZE	,046*	,059*	,102*	,306*	,021*	,312*	-,052*	1	
GROUP	-,022*	-,018*	,096*	,120*	,026*	,341*	-,089*	,610*	1

\*Correlation is significant at the 0.01 level (2-tailed). INVREC: the ratio of inventories and receivables to total assets, DEBT\_ASSETS: the ratio of non-current and current liabilities to total assets, LAW1, LAW2, LAW3: become 1 when the company is based in a country that is respectively an English, French or German law origin country, LISTED: a dummy variable which becomes 1 when a company is listed and 0 otherwise, ROA: profit and loss divided by total assets, SIZE: the natural logarithm of the assets of a company, GROUP: a dummy variable which takes the value 1 if the company examined has subsidiaries and takes the value 0 otherwise.

**Table 7 – Pearson correlations among the independent variables**

Collinearity Statistics		
	Tolerance	VIF
INVREC	,804	1,244
DEBT_ASSETS	,774	1,292
LAW1	,577	1,733
LAW2	,459	2,179
LAW3	,723	1,384
LISTED	,697	1,434
ROA	,946	1,057
SIZE	,489	2,047
GROUP	,599	1,669

INVREC: the ratio of inventories and receivables to total assets, DEBT\_ASSETS: the ratio of non-current and current liabilities to total assets, LAW1, LAW2, LAW3: become 1 when the company is based in a country that is respectively an English, French or German law origin country, LISTED: a dummy variable which becomes 1 when a company is listed and 0 otherwise, ROA: profit and loss divided by total assets, SIZE: the natural logarithm of the assets of a company, GROUP: a dummy variable which takes the value 1 if the company examined has subsidiaries and takes the value 0 otherwise.

**Table 8 – Tolerance and VIF**

The Pairwise Pearson correlation of our variables is contained in table 7. The results indicate that GROUP is significantly positively associated with SIZE. This fairly high correlation is not surprising since the assets of a controlled entity are incorporated in the assets of a parent company and we are working with consolidated balance sheets. SIZE and GROUP are also significantly and positively correlated with LISTED. This relationship appears to be reasonable since the size of listed companies is generally larger than the size of non listed companies. The statistically significant negative correlation coefficient between listed and DEBT\_ASSETS can be explained by the fact that listed companies can easier attract share capital, resulting in a decreasing amount of total liabilities. Descriptive statistics (not reported) reveal that the proportion of debt of listed companies is smaller than for non-listed companies. Although some independent variables are correlated, the examination of the collinearity diagnostics indicates that there is no serious bias due to collinearity of the data.

## 6. Conclusions

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This master dissertation has the intention to provide several determinants that one should include in its framework when investigating the auditor choice of companies. We investigate this potential framework on a sample of 35559 companies in 12 European Countries and perform an additional analysis on a sample that also includes 13239 companies out of Czech Republic, Estonia, Hungary, Latvia, Poland and Slovakia .

Firstly we test the hypothesis whether internal complexity has an influence on the auditor a company manager appoints. Assuming that external monitoring has a positive influence on diluting control due to company growth, we opt the relation to be positive. Consistent with our hypothesis and prior research by e.g. Knechel et al. (2007) we find evidence that the bigger a company becomes in size and the bigger a company's transactional complexity, the decision to hire a Big Four auditor becomes more likely. We do however find no proof that the same positive relation holds when looking at the fact whether companies with subsidiaries are more likely to opt for a Big Four auditor.

When looking at the way a company is financed, the testing of our second hypothesis provides us with evidence that companies relying on external investors by being listed, are more favorable to hiring a Big Four auditor. Our ratio DEBT\_ASSETS however is negative. Considering the paper of Broye and Weill (2008) this latter might be due to the influence of national legislation on the impact of leverage on the auditor choice.

When testing our final hypothesis about the impact of the legislations origin (hypothesis 3), we can conclude that companies in English common law countries and Scandinavian civil law countries tend to have the largest likelihood of hiring a Big Four auditor. Considering the fact that these two groups of countries have the largest law enforcement possibility and the greatest developed capital markets, one can conclude that the greater demand of qualitative information by the investors creates an incentive for companies to choose for a more qualitative auditor.

Our results from our main regression still hold when adding companies from Poland, Estonia, Latvia, Czech Republic, Slovakia and Hungary to our sample and when we rerun our analysis. However, potentially due to the lesser development of their capital markets, companies in these countries are the least eager to hire a Big Four auditor.

## 7. Limitations

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- 1) We classify all companies not reporting their auditor as companies not using a Big Four auditor. In addition, it is possible that the Amadeus database is not fully reliable. Especially for Portugal and Czech Republic we have our doubts about the consistency of the reporting of the auditors. It is possible that the database sometimes contains the name of the auditor instead of the company he works for. If this is true, we are underestimating the proportion of Big Four audited firms.
- 2) The proportion of listed companies in our sample is rather limited. We only have 156 observations for Belgium, 153 for Denmark, 159 for the Netherlands, 62 for Ireland, 1717 for UK, 722 for Spain, 122 for Finland, 872 for Germany, 249 for Greece, 60 for Portugal, 448 for Sweden, 839 for France, 292 for Poland, 14 for Estonia, 31 for Latvia, 8 for Czech Republic, 123 for Slovakia and 29 for Hungary. More observations would increase the reliability of our conclusions about the LISTED variable adopted in our regression.
- 3) We have used the categorization presented by LaPorta et al. (1997, 1998) to subdivide the European countries by law origin. In addition to the four categories provided by Glendon et al. (1994) and LaPorta et al. (1997, 1998) we have created a fifth arbitrary group of countries. This group consists out of some of the latest European members and is arbitrarily put together because these countries were not included in the investigation of Glendon et al. and LaPorta et al. (1997). One could question the homogeneity of this fifth group as no research has been done to categorize these countries to the origin of their national legislation. Our additional regression analysis on the several particular countries confirms our suspicions for Hungary. Further research could give us a final answer about the classification of these latest entrants.
- 4) We use consolidated balance sheet data for 2007. Rajan and Zingales (2005) pointed out that the choice of using consolidated data leads to an increase of the indebtedness ratio in the year when a firm moves to consolidate accounts. However, thanks to our large sample, we believe this effect is negligible.

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