

# Financial crisis and audit firm dismissal behavior

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## Preface

The magnitude of the consequences of the 2007 financial crisis become more visible over the years. That is why I decide to write my thesis about the influence of the financial crisis on a specific topic, namely audit firm dismissal behavior. There are two main lines of reasoning concerning audit firm dismissal behavior in a financial crisis period. First of all, firms compensate the decline in sales due to the limited borrowing ability of their customers by reducing their costs. One way to cut back costs is to reduce the level of audit fees. On the other hand, firms may invest more in audit services during a crisis period. The financial crisis resulted in a decline in investor confidence and by investing in audit services firms are able to provide a more credible signal to stakeholders. Based on the sample used in this paper, I will check which line of reasoning appears more appropriate.

There are a number of people I would like to thank for their support. First of all, I like to thank my supervisor for the support regarding the content of this paper. In times where I found difficulties what to do next or what is the best way to follow, she gave me helpful advice. Further, I thank some of my fellow students for their helpful comments regarding the setting of my hypotheses. For the mental support, I show gratitude towards my parents and my girlfriend. A couple of times I found difficulties motivating myself, but these people kept me going.

## **Abstract**

This study investigates whether firms are more likely to dismiss their audit firm in a financial crisis period as this may contain economic benefits or whether firms retain their audit firm to signal credibility to their stakeholders. The financial crisis affects the economic performance of firms in a negative manner. To compensate this, firms need to determine whether the benefits of saving on audit costs outweigh the benefits of investing in credibility. A comparison is made between dismissal behavior in the pre-crisis period and in the crisis period. This study finds that dismissals are less likely during a crisis period. More specifically, the findings indicate that downward switches are less common in a crisis period where no significant difference is found between lateral-, and upward switches in both periods. This may indicate that the benefits of retaining the audit firm by giving a credible signal to stakeholders are larger than the short-term savings from, among others, the lowballing effect and the elimination of the Big 4 premium. In the second part of this study, I document that when firms decide to dismiss the audit firm, firms experience a sharper decrease in audit fees the first year after the dismissal during the crisis period compared to the non-crisis period. This is consistent with the view that, in order to undertake a switch, the economic benefits of switching must be larger for the firm during the crisis period to outweigh the increased benefits of retaining the audit firm during the crisis period.

## Table of content

Preface.....	3
Abstract.....	4
1. Introduction.....	6
2. Theoretical background & Hypothesis development.....	8
2.1 Audit firm switching & Financial crisis.....	8
2.1.1 Audit firm switching .....	8
2.1.2 Financial crisis.....	12
2.2 Big 4 premium.....	14
2.3 Lowballing .....	16
3. Research method.....	20
3.1 Sample and data .....	20
3.2 Theoretical model and variable measurement .....	21
4. Empirical results.....	26
4.1 Descriptive statistics .....	26
4.2 Regression results .....	32
4.2.1 Crisis and audit firm dismissal .....	32
4.2.2 Crisis and the type of switch.....	34
4.2.3 Crisis and the change in audit fees after a dismissal .....	36
5. Conclusion .....	38
6. References .....	41

## 1. Introduction

This study examines the effect of the 2007 financial crisis on the audit firm dismissal behavior of firms. In 2007, it turned out that banks had initiated loans and mortgages which were far more risky than initially calculated. As a consequence, banks had to do major write-offs on these loans and mortgages, which caused liquidity problems. Due to these issues, banks became more strict in issuing loans and other financing alternatives to firms and households. Consequently, households and firms could not buy and invest as much as before, which resulted in a decline in sales for firms.

On the one hand, (distressed) firms may, because of this financial crisis, reassess their audit package based on the new firm-specific characteristics, such as whether the firm reports a loss or experiences an increase in bankruptcy risk, and therefore firms may be likely to switch to an audit firm which is more aligned with the needs of the firm. Other alternatives may be that firms switch to another audit firm to avoid the costs associated with a qualified audit opinion or to try to save money. Saving money may be of interest because banks and other financial institutions are less likely to issue financing to firms, especially distressed firms (Borensztein and Lee, 2001). Simon and Francis (1988) document that switching firms benefit from the lowballing effect. Therefore, (distressed) firms could benefit from these short-term savings which may have a positive impact on the net result over the year.

On the other hand, it could be the case that, in times of a financial crisis, firms retain the incumbent audit firm to shed a credible signal to stakeholders. Stakeholders are more uncertain about the future (economic) performance of firms because of the financial crisis. An audit report performed by an audit firm with a good reputation may give a credible signal to these stakeholders and, as a consequence, they might be more willing to do business with the firm.

Therefore, this study investigates whether firms, on average, value short-term savings due to the economic benefits of the lowballing effect and/or the avoidance of the qualification costs to a higher or lower extent than a credible signal to stakeholders by retaining the audit firm or by switching to an audit firm with a higher level of audit quality.

Up till now, there is not much known about the relationship between a financial crisis and audit firm dismissal behavior. Schwartz and Menon (1985) investigate the relationship between financial performance of firms and dismissal behavior. They find that failing firms are more likely to dismiss their incumbent audit firm than healthy firms. These failing firms that dismissed their audit firm, on average, moved to an audit firm in a different class. Further, they recommend to control for the financial performance of firms in studies about audit firm switching. Another study which examines audit firm dismissal is Ettredge et al. (2007). They study the relationship between audit fees and audit firm dismissal. Their results demonstrate

that firms paying higher audit fees than predicted and firms experiencing a relative increase in audit fees are more likely to dismiss their audit firm. Additionally, they provide evidence that firms that dismiss their audit firm pay less audit fees the year after the dismissal compared to non-dismissing firms. A third paper which studies dismissal behavior is Landsman et al. (2009). They examine dismissal behavior in relation to the collapse of Enron. This study finds that the relation between audit firm dismissal and firm risk becomes less significant after the fall of Enron. They attribute this finding to the rebalancing of the client portfolios of audit firms after the fall of Arthur Andersen. In conclusion, audit firms dismissal is examined several times, but it is not yet examined in relation to a financial crisis.

Based on a sample of U.S. listed firms, I find that significantly less dismissals take place during the crisis period. To be more precise, I find that significantly less downward switches take place in the crisis period. For lateral switches and upward switches, I do not find a significant difference between the pre-crisis period and the crisis period. If a firm decides to dismiss the audit firm, the results in this paper indicate that, during the crisis period, the change in the audit fees is significantly lower in the year after the dismissal.

The results in this paper might be interesting for several parties. First, firms are able to estimate whether the economic benefits of retaining the audit firm are higher than the benefits of dismissing the audit firm during a financial crisis period. Second, audit firms may profit from the results in this paper. When another financial crisis may arise, they are better able to predict the behavior of their clients. Further, they can use the findings of this paper to adjust the level of audit fees, since this study provides an indication about the lowballing effect in a crisis period. Last, regulators might find the results in this study interesting. When the economy is suffering from a financial crisis, this paper gives an indication whether it is worth the effort for regulators to mitigate the uncertainty of the crisis by stimulating firms to retain their audit firm. This can be done, among others, by mandating extensive disclosure requirements about the dismissal. By retaining the audit firm, stakeholders and investors are more confident about the quality of the audit performed and thus more confident about whether the financial statements provide a true and fair view of the firm.

The second section of this paper gives an overview of prior literature in the fields of audit firm switching, financial crisis, Big 4 premium and lowballing. The research design, the sample data and the empirical models are discussed in the third section. The fourth section contains the empirical results, namely the descriptive statistics and the regression results. Finally, the last section encloses the discussion, limitations and future research possibilities.

## **2. Theoretical background & Hypothesis development**

### **2.1 Audit firm switching & Financial crisis**

#### **2.1.1 Audit firm switching**

Each firm enters in an engagement with an audit firm based on the specified audit package offered by the audit firm. This audit package is supposed to match the characteristics of the firm (Schwartz and Menon, 1985). Audit packages are supposed to be different from audit firm to audit firm and consist, among others, of the following elements: reputation of the audit firm, industry specialization, technical expertise, geographic dispersion of audit offices, responsiveness to client needs and the ability to provide non-auditing services (Schwartz and Menon, 1985). However, firms and their wishes and characteristics change over time. When certain characteristics or wishes change due to internal or external influences, firms have to reassess their need for audit services in order to evaluate whether the current audit package fits the new situation. The firm can decide to switch to another audit firm, because this audit firm offers audit services which fit the new firm-specific characteristics better. However, the firm must make a cost-benefit trade-off for making this decision (Teoh, 1992; Schwartz and Menon, 1985). The benefits are that the client firm can make use of the audit services offered by the new audit firm, that these audit services are more related to the business of the client firm. The switching costs consist of the cost to search new, potentially interested, audit firms and solicit presentations from them, the new audit firms' start-up costs and the new procedures that require extra time of the firm's employees (Teoh, 1992). Schwartz and Menon (1985) argue that each firm should evaluate the benefits and costs of different audit services and select the most appropriate one(s) in correspondence with their needs. In the following section, I will describe a selection of determinants of audit firm dismissal. Hereby, I focus on dismissals initiated by the client firm and not by the audit firm. These determinants can affect the costs and benefits in such a way that the benefits of a switch are significantly larger than the costs or the other way around. This means that these determinants will either have a positive relation with audit firm dismissal or a negative one.

First, audit fees are influencing the decision to switch to another audit firm. Prior studies provide evidence that high audit fees, high relative audit fee increases, a high level of abnormal audit fees and the expectation of limited future fee increases by a new audit firm are factors that increase the likelihood of dismissal (Ettredge et al., 2007; Schwartz and Menon, 1985; Ettredge and Greenberg, 1990). Ettredge et al. (2007) find evidence that firms which dismiss their audit firm experience smaller fee increases in the following year(s) due to, among others, lowballing from the side of the audit firm and the disposal of the Big 4 premium when firms make a downward switch. They do not find a fee drop, because of the fact that the introduction of SOX



resulted in a significant increase in audit fees. Lowballing and the Big 4 premium are discussed in more detail later.

Second, financial risk is significantly related to audit firm dismissal (Ettredge et al., 2007).

Financial risk is the risk that the firm will suffer from decreasing economic performance (Landsman et al., 2009). Increases in financial risk make firms more eager to switch to another audit firm to benefit from, among others, lower fees (Ettredge et al., 2007), better knowledge for the firm-specific situation (Schwartz and Menon, 1985) or to avoid disputes with the incumbent audit firm (Schwartz and Menon, 1985). The latter possibility is discussed in more detail later. Following this reasoning, the financial situation of a firm is to a certain extent related to other variables influencing dismissal. When the financial risk level is low, firms find audit quality more important and they will select an audit firm with, for example, a higher reputation. Though, firms with a high level of financial risk are more focused on the costs the firm makes and they will select an audit firm which, for instance, charges lower audit fees (Schwartz and Menon, 1985). A first proxy for financial risk is financial distress. Prior studies identified some indicators of financial distress, namely an increased bankruptcy risk level (DeFond and Subramanyam, 1998; Landsman et al., 2009) and reporting losses (Ettredge et al., 2007). Schwartz and Menon (1985) argue that studies on audit firm switching should check for financial distress. Distressed firms are more likely to switch to an audit firm which, for instance, charges lower audit fees or possesses more knowledge about distressed firms. A firm must make a trade-off between the different aspects of the audit product offered by audit firms. Schwartz and Menon (1985) argue that this trade-off may vary even among distressed firms. Anyway, they find that the relative importance of aspects of the audit product changes which consequently results in an increased possibility of an audit firm switch. Bankruptcy risk is approximated in prior studies by several bankruptcy models, such as the Zmijewski model (1983) and the Altman model (1968). More proxies for financial risk are the leverage rate and increases in debt over the years (Ettredge et al., 2007; Landsman et al., 2009). These studies document that firms with higher leverage rates and higher increases in debt are more likely to switch to another audit firm. When the leverage rate is high and/or the level of liabilities increases over the year, this results in an increase in risk for the client firm. In turn, increases in risk are associated with an increase in audit firm dismissal (Griffin and Lont, 2005). Related to this, Johnson and Lys (1990) document another significant proxy for financial risk, namely the change in cash flow from financing activities. They document that when there is an increase in this cash flow, firms are more likely to switch to a larger audit firm. The other way around, firms with a declining cash flow from financing activities are more likely to switch to a smaller audit firm. Additionally, Johnson and Lys (1990) find evidence that the change in the operating cash flow is a significant determinant with a

positive coefficient. Increases in operating cash flow increase the likelihood for firms to switch to a larger audit firm and the other way around.

Third, audit risk is significantly positive related to audit firm dismissal (Schwartz and Menon, 1985; Teoh, 1992; Chow and Rice, 1982; Ettredge et al., 2007). Audit risk is the risk that the audit firm issues a wrong audit opinion with respect to the financial statements of the firm (Landsman et al., 2009). Firms are more likely to switch to another audit firm if they believe that this might be the case, since there are costs attached to, for example, receiving a qualified audit opinion. A first proxy for audit risk is a qualified audit opinion. Firms can dismiss the audit firm in the hope of finding an audit firm where the probability of receiving an adverse audit opinion is lower (Teoh, 1992; Chow and Rice, 1982). This phenomenon is often referred to as opinion shopping by the firm. The costs associated with receiving a qualified opinion by the audit firm include the renegotiation costs connected to the qualified opinion, such as the technical default on existing loans (Teoh, 1992). The results of Schwartz and Menon (1985) indicate that qualified audit opinions have no significant effect on audit firm switches. However, they note that the qualified audit opinion might not be significant due to the fact that financial distress is related to both audit qualification and audit firm switching, which could suggest that there is multicollinearity between the variables. From a theoretical point of view, firms must evaluate whether the probability of receiving a qualified audit opinion and the magnitude of the qualification costs are lower for other audit firms than for the incumbent audit firm (Teoh, 1992). If this is not the case, they may retain the incumbent audit firm to avoid the switching costs. Under conditions where firms assess that the probability of receiving a qualified audit opinion is significant, they will search for a new audit firm to avoid the potential qualified audit opinion from the incumbent audit firm and the associated costs. Ettredge et al. (2007) document that different kinds of audit qualifications may have a positive significant influence on audit firm dismissal, since they find that the going concern opinion as well as the SOX-404 report about ineffective internal controls are significant determinants. Next to audit qualifications, Landsman et al. (2009) and Ettredge et al. (2007) document that the variables inventory and receivables relative to the level of assets and audit tenure are significant audit risk determinants. These studies find evidence that increases in inventory and receivables relative to the level of assets result in an increase in audit risk, which increases the probability of audit failure. Because audit failure is positively related to audit firm switching, higher levels of inventory and receivables relative to the level of assets result in a higher probability of dismissal. Further, a high level of audit tenure results in a smaller probability of audit failure, since the incumbent audit firm has more client-specific knowledge (Landsman et al., 2009). Consequently, audit tenure has a negative relation with audit firm dismissal. However, some studies document that high levels of audit tenure result in larger reporting flexibility, which should increase the chance on audit

failure (Davis et al., 2000). Following this reasoning, audit tenure is positively related to dismissal. Finally, Griffin and Lont (2005) find evidence that the number of business segments of the client firm is positively related to audit firm dismissal. The number of segments is an approximation for firm complexity. Firm complexity is, in turn, positively related to audit firm dismissal since firm complexity increases the probability of audit failure for the audit firm (Landsman et al., 2009).

Fourth, disputes between the audit firm and the client firm are another determinant of audit firm dismissal (Schwartz and Menon, 1985; DeFond and Subramanyam, 1998). Disputes between the client firm and the audit firm result in an increase in audit firm dismissal. Firms will dismiss the audit firm in the hope of finding an audit firm that is more aligned with, for example, their accounting methods. Prior studies conclude that when firms experience a decline in economic performance, they are more likely to adapt more income-increasing accounting methods (Schwartz and Menon, 1985; Gul et al., 2002) or other accounting methods to temporarily hide negative information about the firm. This may conflict with the point of view of the audit firm because the firm may not give a true and fair view. If the firm believes that the new accounting methods will not give an untrue view of the financial performance and the audit firm believes the new accounting methods do give an untrue view, the firm can decide to search for another audit firm in the hope of finding an audit firm which agrees on the accounting methods used.

Fifth, firm size plays a significant role concerning the audit firm dismissal decision (Eichenseher and Shield, 1983; Landsman et al., 2009). Larger firms require a wider scope of audit services which cannot be offered by all audit firms and, therefore, large firms are somewhat restricted in terms of audit firm switching. Eichenseher and Shield (1983) and Landsman et al. (2009) find a negative relation between size and audit firm dismissal. Ettredge et al. (2007) use the amount of revenue as an approximation for firm size. In their model, revenue is significantly negatively related to audit firm dismissal. Furthermore, they find that larger revenues are negatively related to switching to a non-Big 4 audit firm. Firms with high levels of revenue need certain audit services which are typically provided by only a limited number of audit firms. This is consistent with the argumentation mentioned on firm size by Eichenseher and Shield (1983).

Sixth, changes in management increase the probability of audit firm dismissal (Carcello and Neal, 2003), suggesting a positive relationship between changes in management and dismissal. For a fresh perspective of the firm and the financial results, the new management is more likely to replace the incumbent audit firm. Another possibility is that the new management has positive past experiences with a specific audit firm, so the new management decides to replace the incumbent audit firm for this audit firm.

Finally, Big 4 audit firms and industry specialists are significantly associated with audit firm dismissal. This is because Big 4 audit firms and industry specialists are associated with higher audit quality (e.g. Landsman et al., 2009). Client firms which have such an audit firm utilize this high audit quality level to give a credible signal to stakeholders. That is why Landsman et al. (2009) and Ettredge et al. (2007) document that the presence of a Big 4 audit firm is negatively related to audit firm dismissal. A Big 4 audit firm is associated with a higher level of audit quality. Retaining this Big 4 audit firm results in a higher level of client-specific knowledge, which results in an increase in audit quality as well. For audit firm industry specialization, Landsman et al. (2009) find a highly significant negative relation, where Ettredge et al. (2007) find a positive relation. The presence of an industry specialist gives a higher level of audit quality, but this high level of audit quality increases the audit costs in the form of a specialist premium. Because of this premium, Ettredge et al. (2007) find a positive relation between dismissal and industry specialization. As cost-saving possibility, firms can dismiss the industry specialist since they do not have to pay the premium then.

### 2.1.2 Financial crisis

In 2007, the so-called credit crunch emerges. As mentioned before, on the housing market in the United States, it appeared that many issued mortgages were far more risky than initially calculated, which resulted in large write-offs for financial institutions such as banks. The problems in the housing market became a national and even global economic problem, because of damaged investor- and public confidence. Banks, hedge funds and insurance firms estimated to have lost 2.8 trillion dollars (Sikka, 2009). Financial institutions, such as banks, suffered from liquidity problems because of the large write-offs on loans, securities and investments and they became more strict in issuing loans to firms and households. The consequence of this change in credit policy was that firms and households could not spend or invest as much as they did before the financial crisis excavated. Consequently, firms experienced a decline in sales and more and more firms filed for bankruptcy (Glater, 2008). Moreover, the share value of publicly listed firms declined significantly because investors were uncertain about the future of these firms. As a result, they were hesitant to invest much money into the stock market. In conclusion, publicly listed firms, but also non-listed firms, suffered from the restricting credit policies of banks and a decreased level of investor confidence. Not only the change in credit policy is disadvantageous for financial institutions, firms and households, but also the gray future prospects contribute to a situation where the global economy suffers from decreased economic performance and a high level of uncertainty which consequently affects investor confidence in a negative manner.

Borensztein and Lee (2001) examine the consequences of the Korean crisis of 1997-1998 on the economy. Using firm-level data, they conclude that there were major differences in the magnitude of credit contraction across different types of firms. Due to the crisis, conglomerate-

affiliated firms appeared to have lost their preferential access to credit that they enjoyed in the pre-crisis period. Korean banks needed to reduce their leverage rates, so these banks became more strict in selecting parties to borrow money to. The most important point from this study is that banks during the pre-crisis period relied upon the reputation of the conglomerate-affiliated firms, where the same banks switched, during and after the crisis, to profitability as the most important determinant of whether or not to borrow money to firms.

When taken into account the findings of this paper and the economic situation in the United States, it can be expected that firms will not recover easily from the economic consequences of the financial crisis. This is because banks will be reluctant to borrow money to unprofitable firms, while these unprofitable firms have difficulties to collect money due to the fact that their customers spend less money. Firms which can borrow less money from banks need to save money in order to compensate for the limited ability to receive credit. The findings of Borensztein and Lee (2001) are consistent with the findings of Campello et al. (2009). In this paper, it is documented that unprofitable firms are more dependent on lines of credit than profitable firms. Unprofitable firms will face difficulties to find new borrowings during the financial crisis. Banks will not borrow money to these firms or they will borrow money but under more strict conditions. Campello et al. (2009) find that firms which experience lower credit levels will start to save money.

Following the reasoning of Borensztein and Lee (2001) and Campello et al. (2009) about the change in credit policy and the reasoning of Schwartz and Menon (1985) about the significance of financial distress, it is possible to hypothesize that more dismissals might take place during a financial crisis period. Firms, in general, experience a decline in sales due to the limited borrowing ability of their customers and, overall, firms will have gray and uncertain future prospects, because there is a high level of uncertainty when the financial situation will improve. Consequently, firms will start cutting costs to improve their short-term financial performance. Good financial performance gives better access to credit facilities of banks (Borensztein and Lee, 2001) and a higher likelihood of increased equity financing via increased share price values, where financially bad performing firms are likely to suffer more severe from the restricting credit policy and hesitant investors. They must save money in order to get some capital, for example, to make necessary investments to survive and to pay suppliers. Saving money can be done by dismissing the incumbent audit firm and hire an audit firm which charges lower levels of audit fees. The corresponding hypothesis is:

- H1a: Firms are more likely to dismiss their audit firm in a crisis period.

Nevertheless, the findings in some prior studies are not consistent with this line of reasoning. Chia et al. (2007) study the effect of the type of audit firm on the ability to constrain earnings management during the Asian financial crisis. Using observations from service-oriented listed

firms in Singapore, their results suggest that Big 6 audit firms are better able to constrain earnings management during the financial crisis. This means that firms with a Big 6 audit firm adopt more income decreasing earnings management measures during a crisis period. Chia et al. (2007) conclude that, in a financial crisis period, Big 6 audit firms are better able to provide high levels of audit quality compared to non-Big 6 audit firms. They suggest that the competitive advantage of the Big 6 audit firms becomes larger during a crisis period, indicating that audit quality is highly important in such a period. Following this reasoning of Chia et al. (2007), firms may be less inclined to dismiss their incumbent audit firm. The incumbent audit firm has more knowledge about the firm so it is more likely that the audit report is of higher audit quality. In a financial crisis period, where there are gray and uncertain future prospects, it is likely that stakeholders perceive a high level of audit quality as very important compared to a non-crisis period. High audit quality results in a more accurate audit report which may mitigate part of the uncertainty caused by the financial crisis for stakeholders. Besides this argument, Francis (2004) argues that audit fees are a relatively small amount for a firm, namely less than 0.1 percent of annual firm sales. This would suggest that the economic benefits of saving on audit costs are quite small. Consequently, it is not worth the money, time and effort to dismiss the incumbent audit firm for a new audit firm only to benefit from fee savings summing up to such a relative, small amount. The corresponding hypothesis associated with this line of reasoning is:

- H1b: Firms are less likely to dismiss their audit firm in a crisis period.

## 2.2 Big 4 premium

As argued before, the presence of a Big 4 audit firm as the incumbent audit firm is a significant variable for explaining audit firm dismissal. This is largely due to the fact that Big 4 firms are associated with a higher level of audit quality (Simon, 2011). However, prior research on the audit quality difference and corresponding Big 4 premium is inconclusive. The majority of prior studies find that there exist a form of audit quality differentiation between the Big 4 audit firms and the second tier and small audit firms (Francis and Simon, 1987; Ettredge and Greenberg, 1990; Ireland and Lennox, 2000). This audit quality difference is often expressed in higher audit fees, since higher fees indicate either more audit effort or a higher level of expertise (Francis, 2004). The difference between the normal level of audit fees and this higher level of fees is defined as the Big 4 premium. As a consequence, when an audit firm charges higher fees to a client compared to the audit fees charged by other audit firms for comparable clients, this audit firm is assumed to provide higher audit quality. However, Simon (2011) documents that large audit firms cannot be perceived as a homogenous group because some large audit firms provide high audit quality and some of these large audit firms provide an average level of audit quality. As a result, the relation between Big 4 audit firms and audit quality cannot be perceived as perfect, but it can be considered as highly significant. Nevertheless, some prior studies do not

find a quality difference between the Big 4 audit firms and the other audit firms. Jeong and Rho (2004) examine the quality difference of audit firms in Korea. Using discretionary accruals as a proxy for audit quality, they do not find significant differences in the level of accruals between Big 6 audit firms and other audit firms. However, these results are in contrast with results found by other studies in other countries. Francis and Wang (2008) document that the audit quality difference between Big 4 audit firms and smaller audit firms is dependent upon the legal system and the investor protection environment. In countries with a strong legal system and a strict investor protection regime, Big 4 audit firms have more to lose when doing a bad job. This means that there is a higher incentive to achieve a high audit quality level. Therefore, it is likely that there exist a quality difference between Big 4 audit firms and other audit firms, with the exception of countries with a less strict legal system and a less strong investor protection regime, such as Korea.

Some prior studies examine the height of the Big 4 premium. Simon and Francis (1987), Simon and Francis (1988) and Simon (2011) calculate the fee difference between audit fees charged by Big 4 audit firms and audit fees charged by other audit firms by inserting a Big 4 dummy variable in the regression analysis. In these regression analyses, researchers control for client size (Francis and Simon, 1987), audit complexity (Simon, 2011), and audit risk (Simon and Francis, 1988). These studies all find that the Big 4 premium and the control variables are significantly related to the level of audit fees. Simon and Francis (1987) find a premium of 16-17 percent, Simon (2011) finds evidence that the premium is between 15-20 percent, where Ireland and Lennox (2000) find a premium of 53,4 percent by treating the audit firm size dummy as endogenous and not exogenous, since they argue that firms are not randomly assigned to audit firms.

Since firms with a Big 4 audit firm pay a Big 4 premium for the audit services conducted, these firms can avoid this premium by making a downward switch from a Big 4 audit firm to a non-Big 4 audit firm. Ettredge et al. (2007) find that firms will make more downward switches as cost-saving alternative when the audit fees go up. It is possible to hypothesize that firms will make more downward switches during a crisis period, where firms experience a decline in economic performance and have gray and uncertain future prospects. To benefit from short-term savings and improve the financial performance to a certain extent, a downward switch may be beneficial. The corresponding hypothesis is:

- H2a: Firms are more likely to make a downward audit firm switch in a crisis period.

Conversely, it could also be hypothesized that firms will make more upward switches in a crisis period. Chia et al. (2007) find that the Big 6 audit firms are better able to constrain earnings management during the Asian financial crisis. Because of this, they argue that the competitive

advantage of Big 6 audit firms is larger during the crisis period. Thus, audit quality is perceived more important during a financial crisis period. High level of audit quality is associated with a higher chance that the audit firm issues the correct audit opinion for the financial statements of the firm. Stakeholders will feel more confident about the audit opinion of the audit firm and the financial statements of the firm and will be more willing to do business with the firm. This reasoning is consistent with Titman and Trueman (1986). They argue that firms can hire large audit firms for signaling reasons. Here, the economic benefits of giving an accurate, reliable signal to stakeholders are larger than the economic costs of paying a Big 4 premium. Therefore, the hypothesis is:

- H2b: Firms are more likely to make an upward audit firm switch in a crisis period.

### 2.3 Lowballing

One of the reasons why audit fees are such an important determinant for audit firm dismissal is the presence of lowballing practices by audit firms (Ettredge and Greenberg, 1990; Ettredge et al., 2007; Simon and Francis, 1988). Lowballing is defined by DeAngelo (1981) as the setting of the initial audit fee below the sum of audit start-up costs plus the normal profits earned on an audit. In other words, in the first period of auditing the client firm the total costs for the audit firm, which consist of the audit costs plus the start-up costs, outweigh the audit fee charged by the audit firm. However, in the next periods there are no start-up costs anymore, which influences the cost level in such a way that the audit fee may outweigh the audit costs (DeAngelo, 1981). Therefore, the loss occurred in the initial period is offset by the profits earned in future periods, the so-called quasi-rents. Quasi-rents are defined as the excess of revenues over the avoidable costs including the opportunity cost of auditing the next-best alternative client (DeAngelo, 1981). Lowballing is the competitive response for collecting the future quasi rents (DeAngelo, 1981). This stream of expected quasi-rents is the result from sunk costs in the initial period, where a technological advantage is created by the audit firm. The audit firm must make an approximation beforehand to estimate the length of the client-audit firm relation in order to calculate the present value of the expected future quasi-rents. DeAngelo (1981) assumes that the client is retained forever by using the perpetuity formula in the calculations. However, Ettredge and Greenberg (1990) argue that it is more realistic to use the annuity formula in the calculations. Although Kanodia and Mukherji (1994) find that audit firm turnover becomes less likely over time, it is highly unlikely that the client retains the audit firm forever.

Further, it is important to note that the audit firm that performed the audit in the first period possesses an information advantage over the other audit firms in the market. This audit firm knows the exact audit costs of auditing the client and, therefore, the calculations of the present value of the stream of future quasi-rents will be more accurate. The other audit firms in the market will update their calculations based on the audit fees charged by the audit firm and on



whether the audit firm is retained or not, since audit fees are highly related with the audit costs (Ettredge and Greenberg, 1990).

Simon and Francis (1988) report a significant fee reduction in the initial engagement year of 24 percent and an average fee reduction of 15 percent for the next two years. However, in the fourth year the fee levels return to normal fee levels. Ettredge and Greenberg (1990) find a 25 percent fee reduction in the first year after the dismissal, but no fee reductions in the years thereafter. Griffin and Lont (2005) study to what extent lowballing was still present after the introduction of SOX in 2002 as under SOX, the amount of work for the audit firm increased significantly. Since the amount of work is positively related to the level of audit fees, it is expected that the audit fees increase after the introduction of SOX. Nevertheless, they find evidence that lowballing practices continue even after the introduction of SOX. Ettredge et al. (2007) study the change in audit fees after SOX as well and they find that firms that dismiss their audit firm have, on average, a 10 percent fee reduction. In general, the extent of fee-cutting is higher for the succeeding audit firm compared to the incumbent audit firm (Kanodia and Mukherji, 1994). The succeeding audit firm must be able to accomplish a higher level of cost advantage to ensure that the present value of the audit fees of the new audit firm plus the switching costs are less than the present value of the audit fees of the incumbent audit firm. Furthermore, Ettredge and Greenberg (1990) find evidence that the magnitude of fee-cutting is higher when the number of audit firms bidding for the engagement is higher. If the level of competition between the audit firms increases, it is more likely that the firm will find the lowest-cost audit firm. One remark is that the client firm has more costs for evaluating all audit firms' bids when more audit firms are involved in the bidding process, so the client must find the balance between the marginal benefits of receiving more bids from potential audit firms and the costs of evaluating these bid for the optimal number of audit firms bidding for the engagement.

Note that in the text written above, a number of critical assumptions are made. First, it is assumed that the transaction costs, the costs of switching from one audit firm to another, do not equal zero. Second, the assumption is that the start-up costs, investing in technologies for conducting the audit for the client does not equal zero. The last assumption is that the market for audit services is competitive (DeAngelo, 1981). If the transaction costs and the start-up costs would be zero, then an equilibrium is reached when the audit fees equal the audit costs, since, from a theoretical point of view, the client firm would dismiss the audit firm when the audit fee for the client is higher than the audit costs for the audit firm and the audit firm would dismiss the client when the audit fee is less than the audit cost. As a consequence, there would be no lowballing anymore (DeAngelo, 1981). Then, audit fees are set at cost level and not below cost, since this loss cannot be compensated anymore in future periods.

However, lowballing is often criticized as the initial audit fee is set below the sum of the total audit costs. This would decrease the level of audit firm independence (Simon and Francis, 1988; Gregory and Collier, 1996; DeAngelo, 1981; Kanodia and Mukherji, 1994). The fact that audit firms can earn quasi-rents in future periods makes them eager to retain the client as long as possible (DeAngelo, 1981). Prior literature is inconclusive on this independence topic. DeAngelo (1981) documents that lowballing in the initial period is a consequence of the ability to collect quasi-rents in future periods. Lowballing in the initial period should be considered as sunk costs and sunk costs are irrelevant for future calculations. Kanodia and Mukherji (1994) document as well that audit firm independence is not at stake, since the exact audit costs are only observable for the audit firm itself. Therefore, for the outside world, the amount of quasi-rents is unknown and, consequently, it is not possible to say whether audit firm independence is at stake or to what extent this is the case. However, some regulators, such as the Commission on Auditors Responsibilities and some researchers (e.g. Simon and Francis, 1988) argue that audit firm independence is impaired because of the quasi-rents that can be earned in the client-audit firm relationship. Both argue that consciously incurring a loss in the initial period makes that the audit firm does not want to lose the client before this loss is at least compensated.

When the combination of lowballing and the financial crisis is considered, it is the prediction that lowballing practices will reduce during the crisis period. Firms, in general, have an increased probability of bankruptcy as well as gray and uncertain future prospects during the crisis period. This means that the length of the engagement between the client firm and the audit firm is harder to estimate. As a consequence, it is more difficult to calculate the present value of the future quasi-rents that can be earned in the client-audit firm relationship (DeAngelo, 1981; Ettredge and Greenberg, 1990). Audit firms may adjust their audit fee level upward to capture the uncertainty about the length of the relationship. Further, prior studies find evidence that, during a financial crisis period, there is an increase in litigation risk (Seetharaman et al., 2002; Krishnan and Krishnan, 1997) and a decrease in reporting conservatism (Gul et al., 2002). In both cases, audit firms need to exert more effort in order to establish whether the financial statements give a true and fair view. An increase in litigation risk and/or a decrease in accounting conservatism may lead to an increase in audit fees.

Though, prior lowballing literature find that the first year after an audit firm dismissal is a special year in terms of audit fees (e.g. Deis and Giroux, 1996; DeAngelo, 1981; Simon and Francis, 1988). Even after the introduction of SOX, lowballing practices continue (Griffin and Lont, 2005). These studies denote that the audit firm incurs more costs in the first period and exerts more effort in performing the audit where the audit fees are, in general, lower than the total costs. The hypothesis is that, due to this uncertainty and the increased bankruptcy risk for

client firms in the crisis period, audit firms are limited in their fee cutting practices, since it is uncertain whether audit firms will compensate this loss incurred in the first period.

- H3: The magnitude of the fee drop after a dismissal is lower during a financial crisis period.

### 3. Research method

#### 3.1 Sample and data

To test the relation between the financial crisis and audit firm dismissal, a sample of publicly held U.S. firms is collected from the databases Audit Analytics and Compustat.

Two different time periods are used, namely one time frame before the financial crisis emerged in 2007 (2005-2006) and one time frame within the financial crisis period (2008-2009). The years 2005-2006 are selected as pre-crisis period, since the results may not be influenced by the SOX implications of 2002 and the economy is not yet suffering from the problems starting on the U.S. housing market in 2007. As within-crisis period, I take the time frame 2008-2009. The TED spread, the difference in interest rate between U.S. treasuries futures and European Eurodollar futures, increased significantly during these years. Since the TED spread is an indicator for the credit risk level, it serves as a proper indication that this credit crunch influenced the economy and, potentially, also the audit firm dismissal behavior. Comparing these two time periods allows me to investigate whether the financial crisis has a significant influence on audit firm dismissal behavior.

For the variables related to the financial statements of the firms, I use the database Compustat. This database contains 43585 observations for both time periods, evenly spread over the years. The pre-crisis period consists of 22203 observations and the crisis period contains 21382 observations. For variables related to the audit firm, such as the audit fees and whether the audit firm is a Big 4 audit firm or not, I collect observations from the Audit Analytics database. In total 40566 observations are gathered; 12863 for the pre-crisis period and 27703 for the crisis period.

However, after removing observations where one or more variable values are missing, the total number of observations for the Compustat sample decrease to 20597 and the new number of observations for the Audit Analytics sample is 29511, respectively 47 percent and 73 percent of the original number of observations.

Since the empirical model in this paper consists of several variables which are available in two different databases, the observations of the different databases must be matched before the final sample is generated. To combine the databases, the observations are matched based on the CIK codes of the firms. After this matching procedure, the total number of observations decrease to 7871 firm-year observations, respectively 18 percent and 19 percent of the initial Compustat and Audit Analytics observations. For the pre-crisis period, the number of firm-year observations equals 3504 where 4367 firm-year observations are available for the crisis period. In the final sample, there are 291 observations where the client firm dismisses the audit firm,

which is 3.7 percent of the total number of observations. To compare, Ettredge et al. (2007) and Landsman et al. (2009) document a dismissal rate of, respectively, 9.5 percent and 9.7 percent. In the pre-crisis period, 164 out of 3504 observations (4.7%) are observations where the audit firm is dismissed and in the crisis period, 127 out of 4367 observations (2.9%) document an audit firm dismissal. These numbers give a first indication is that there exist a negative relation between the financial crisis and audit firm dismissal, which is in contrast with hypothesis 1a but in correspondence with hypothesis 1b.

### 3.2 Theoretical model and variable measurement

To examine the first and second hypotheses, I make use of an empirical model to test the relation between the crisis variable and audit firm dismissal (hypothesis 1) and between the crisis variable and the different types of audit firm dismissals, namely downward-, lateral-, and upward audit firm switches (hypothesis 2).

The empirical model is based on the model described in Ettredge et al. (2007). This paper primarily examines the relation between audit fees and audit firm dismissals. They use a logistic regression model with dismissal as the dependent variable. Audit firm dismissal is measured using a dummy variable indicating 1 if the client firm dismisses the audit firm and 0 if the client firm retains with the incumbent audit firm or if the audit firm dismisses the client firm. They use the abnormal audit fees and the change in audit fees as the independent variables of interest. Further, they insert several control variables in the model as proxies for, among others, audit risk, financial risk and firm complexity. Also, another reason why the model of Ettredge et al. (2007) is suitable here is because the setting they use is similar to the setting used in my paper. Though, I utilize the financial crisis as the independent variable of interest, instead of the audit fee variable in Ettredge et al. (2007). The dismissal model is the following:

$$\begin{aligned} \text{DISMISS} = & \beta_0 + \beta_1 * \text{CRISIS} + \beta_2 * \text{CHGFEE} + \beta_3 * \text{CSIZE} + \beta_4 * \text{LOSS} + \beta_5 * \text{GOCERN} + \beta_6 * \text{LEVERAGE} \\ & + \beta_7 * \text{CHGOFCF} + \beta_8 * \text{CHGDEBT} + \beta_9 * \text{GROWTH} + \beta_{10} * \text{OLDBIG4} + \beta_{11} * \text{SPECIALIST} + \beta_{12} * \text{ICMW} + \\ & \beta_{13} * \text{ALTMAN} \end{aligned}$$

Where:

- DISMISS: dummy variable indicating 1 if audit firm is dismissed; 0 otherwise;
- CRISIS: dummy variable indicating 1 if observation is within the crisis period; 0 otherwise;
- CHGFEE: relative change in audit fees  $((\text{audit fees}_{t+1} - \text{audit fees}_t) / \text{audit fees}_t)$ ;
- CSIZE:  $\ln(\text{firm revenue for the year})$ ;
- LOSS: dummy variable indicating 1 if firm reported negative earnings for the (fiscal) year; 0 otherwise;

- GOCERN: dummy variable indicating 1 if firm received going concern opinion; 0 otherwise;
- LEVERAGE:  $(\text{total liabilities}_t / \text{total assets}_t)$ ;
- CHGOCF:  $(\text{operating cash flow}_{t+1} / \text{assets}_{t+1}) - (\text{operating cash flow}_t / \text{assets}_t)$ ;
- CHGDEBT:  $(\text{debt}_{t+1} / \text{assets}_{t+1}) - (\text{debt}_t / \text{assets}_t)$ ;
- GROWTH:  $(\text{sales}_{t+1} - \text{sales}_t) / \text{sales}_t$ ;
- OLDBIG4: dummy variable indicating 1 if audit firm is a Big-4 audit firm; 0 otherwise;
- SPECIALIST: dummy variable indicating 1 if audit firm audits at least 25 percent of the total revenue in the industry the client firm is evolved in;
- ICMW: dummy variable indicating 1 if internal controls demonstrate to be ineffective over the year; 0 otherwise; and
- ALTMAN: Altman (1968) Z-score.

As mentioned above, the dependent variable, audit firm dismissal, is measured using a dummy variable indicating 1 if the firm dismisses the audit firm and 0 if the firm retains the incumbent audit firm or if the audit firm dismisses the client firm. For audit firm dismissals, I take into account dismissals taking place the year after the year of interest, so dismissals taking place in 2006 for the 2005 observations. In this way, it is captured that firms need some time to make the decision whether or not to dismiss the audit firm. In this paper, I compare firm-year observations where the audit firm is dismissed by the client firm with observations where this is not the case. The independent variable of interest, the financial crisis, is measured by a dummy variable indicating 1 if the observation is in the crisis period (2008-2009) and 0 if the observation is in the pre-crisis period (2005-2006). According to the hypotheses, I expect the crisis variable to either have a significant positive effect (hypothesis 1a) or a significant negative effect (hypothesis 1b) on audit firm dismissal.

For the second hypothesis, the dependent variable dismissal is replaced by the type of audit firm switch, namely upward-, downward-, or lateral switch dismissal. For each type of switch, downward-, upward-, and lateral switches, a dummy variable is created. The dummy variable indicates 1 if the firm makes, respectively, a downward switch, a lateral switch or an upward switch and indicates 0 otherwise. Each dummy variable serves, separately from the other dummy variables, as the dependent variable in the dismissal model. I compare firm-year observations where firms make a downward audit firm switch with firm-year observations where firms make an upward-, or lateral audit firm switch in order to test the second hypothesis of this paper, namely whether firms are more likely to make a downward switch to benefit from eliminating the Big 4 premium or whether they make more lateral and/or upward switches to maintain or improve the level of audit quality. Then, I evaluate the significance levels and the signs of the coefficients of these three switch possibilities and, on the basis of this comparison, I

can conclude what the influence is of the crisis variable on each type of audit firm switch. The results may support that downward switches are associated with losing the Big 4 premium (Ettredge et al., 2007) or they may support that firms make more lateral and/or upward switches to maintain or increase the level of audit quality (Chia et al., 2007).

The control variables are similar as in Ettredge et al. (2007). This paper controls for audit-, and financial risk effects, firm complexity effects, audit firm type and audit firm specialization (Landsman et al., 2009; Johnson and Lys, 1990; DeFond and Subramanyam, 1998; Ettredge et al., 2007). Following Ettredge et al. (2007), I use the audit fees as they are presented in the Audit Analytics database, as reported by the firms in the year after the fiscal year of interest. So, for the 2005 firm observations, the 2005 audit fees are utilized, as reported in 2006 by the firms. Next to that, I insert an extra control variable for the financial condition of firms, the Altman Z-score (Altman, 1968). Many firms went bankrupt during the financial crisis (Glaser, 2008). If it holds that firms save on audit costs to improve their financial position, then firms are more induced to save money when their financial performance is worse. This means that they are more likely to dismiss the audit firm to profit from the economic benefits of switching, namely lower audit fees (Ettredge et al., 2007) and/or the expertise of another audit firm when it comes to financially distressed firms (Schwartz and Menon, 1985). The opposite might also hold here, since the incumbent audit firm has more client-specific knowledge and is therefore assumed to have a higher level of expertise (audit quality) when it comes to that specific firm (Chia et al., 2007). By including the Altman Z-score as a proxy for financial distress, I follow up the recommendation of Schwartz and Menon (1985) that studies on audit firm switching should control for financial distress. The Altman Z-score is an attempt to predict financial distress by using variables measuring liquidity, profitability, productivity, equity and sales generating ability. A high Z-score is an approximation for an increased level of bankruptcy risk for the firm. The Z-score formula is defined the following:

$$\text{➤ } Z = 0.012 \cdot X_1 + 0.014 \cdot X_2 + 0.033 \cdot X_3 + 0.006 \cdot X_4 + 0.999 \cdot X_5$$

Where:

- $X_1$ : working capital<sub>t</sub> / total assets<sub>t</sub>
- $X_2$ : retained earnings<sub>t</sub> / total assets<sub>t</sub>
- $X_3$ : earnings before interest and taxes<sub>t</sub> / total assets<sub>t</sub>
- $X_4$ : market value of equity<sub>t</sub> / book value of debt<sub>t</sub>
- $X_5$ : sales<sub>t</sub> / total assets<sub>t</sub>

To examine the third hypothesis, the relation between the crisis variable and the change in audit fees after a dismissal, I use an empirical model which is similar to the audit fee model described in Ettredge et al. (2007). In this paper, a model is created where audit firm dismissal is the

independent variable of interest and the change in audit fee is the dependent variable. Change in audit fee is defined as the natural logarithm of the absolute difference between the audit fees over a two year time period. In the fee model used here in this paper, the same definition of the change in audit fee is applied. Here, the audit fee change is between the year before the dismissal takes place and the year after the dismissal. In this way, this change may capture the audit fee decrease reported by prior literature (e.g. Simon and Francis, 1988). However, the independent variable of interest is not similar to the model of Ettredge et al. (2007), since I use the crisis variable as variable of interest instead of using audit firm dismissal. The audit fee model is defined as:

$$\begin{aligned} \Delta FEE = & \beta_0 + \beta_1 * CRISIS + \beta_2 * \Delta LNASSETS + \beta_3 * \Delta ADJSALES + \beta_4 * \Delta INVAR + \beta_5 * \Delta DTRATIO + \\ & \beta_6 * LOSS + \beta_7 * GOCERN + \beta_8 * AUDITOR + \beta_9 * \Delta DELAY + \beta_{10} * BUSY + \beta_{11} * LNASSETS + \\ & \beta_{12} * LNFEET + \beta_{13} * ICMW \end{aligned}$$

Where:

- $\Delta FEE$ :  $\ln(\text{audit fee}_{\text{after}}) - \ln(\text{audit fee}_{\text{before}})$ ;
- $CRISIS$ : dummy variable indicating 1 if observation is in within-crisis period; 0 otherwise;
- $\Delta LNASSETS$ :  $\ln(\text{total assets}_{\text{after}}) - \ln(\text{total assets}_{\text{before}})$ ;
- $\Delta ADJSALES$ :  $(\text{sales}_{\text{after}} / \text{total assets}_{\text{after}}) - (\text{sales}_{\text{before}} / \text{total assets}_{\text{before}})$ ;
- $\Delta INVAR$ :  $((\text{total inventory}_{\text{after}} + \text{total accounts receivables}_{\text{after}}) / \text{total assets}_{\text{after}}) - ((\text{total inventory}_{\text{before}} + \text{total accounts receivables}_{\text{before}}) / \text{total assets}_{\text{before}})$ ;
- $\Delta DTRATIO$ :  $(\text{total debt}_{\text{after}} / \text{total assets}_{\text{after}}) - (\text{total debt}_{\text{before}} / \text{total assets}_{\text{before}})$ ;
- $LOSS$ : dummy variable indicating 1 if firm reports a loss in (fiscal) year after dismissal; 0 otherwise;
- $GOCERN$ : dummy variable indicating 1 if firm received a going concern opinion in (fiscal) year after dismissal; 0 otherwise;
- $AUDITOR$ : dummy variable indicating 1 if incumbent audit firm is Big 4 audit firm; 0 otherwise;
- $\Delta DELAY$ : number of days between fiscal year end date and sign date audit report after dismissal – number of days between fiscal year end date and sign date audit report before dismissal;
- $BUSY$ : dummy variable indicating 1 if, for the firm, the fiscal year end is between December 1<sup>st</sup> and March 31<sup>st</sup>; 0 otherwise;
- $LNASSETS$ :  $\ln(\text{total assets}_{\text{before}})$ ;
- $LNFEET$ :  $\ln(\text{audit fee}_{\text{before}})$ ; and
- $ICMW$ : dummy variable indicating 1 if firm reports internal control weaknesses in (fiscal) year after dismissal; 0 otherwise.



The expected sign of the crisis-coefficient and the significance level of the crisis variable may then indicate whether the financial crisis potentially causes a larger change in audit fees, a smaller change in audit fees or no significant change on the change in audit fees. According to the hypothesis, the magnitude of fee cutting will be lower. Therefore, the expectation is that the crisis coefficient will have a negative sign. Uncertainty and a higher bankruptcy level may influence audit fees such that lowballing practices are reduced. To test this hypothesis, I compare firm-year observations where the audit firm is dismissed during the pre-crisis period with dismissal observations during the crisis period. In this way, it is possible to make a statement about whether the financial crisis influences the change in fee or not.

For the control variables included in the empirical model, variables are inserted that control for firm size, firm complexity and firm risk factors (Francis, 1984; Simon and Francis, 1988; Craswell et al., 1995; Ireland and Lennox, 2002). The variable number of segments is not included in the model, which is a limitation of this study.

## 4. Empirical results

### 4.1 Descriptive statistics

For the descriptive statistics, I start with discussing the descriptives for the dismissal model and, after that, the descriptives for the fee model are examined.

Table 1 contains the descriptive statistics for the dismissal model. Here, all observations are taken into account, since I am interested in the effect of the crisis variable on the dismissal variables, which can be tested for all observations in the sample. The original dataset contains some outliers, which might affect the results of the statistical tests performed later in this paper. To eliminate these outliers, I winsorize the data observations by setting all observations for the continuous variables CHGFEE, CSIZE, LEVERAGE, CHGOCF, CHGDEBT, GROWTH and ALTMAN in the 1<sup>st</sup> percentile equal to the border value of the 1<sup>st</sup> percentile and by setting all the observations for the same variables in the 99<sup>th</sup> percentile equal to the border value of the 99<sup>th</sup> percentile. In this way, the outliers have a smaller impact on the means and standard deviations of these variables. Table 1 presents the descriptive statistics for all data observations after winsorizing the data observations.

Table 1; Descriptive statistics of the dismissal model.

	Mean	Std. Deviation	Median	Minimum	Maximum
DISMISS	0.037	0.189	0.000	0.000	1.000
DOWNWARD	0.011	0.103	0.000	0.000	1.000
LATERAL	0.021	0.145	0.000	0.000	1.000
UPWARD	0.005	0.069	0.000	0.000	1.000
CRISIS	0.555	0.497	1.000	0.000	1.000
CHGFEE	0.049	0.320	0.000	-0.537	1.745
CSIZE	15.670	2.474	15.825	0.000	20.169
LOSS	0.263	0.440	0.000	0.000	1.000
GOCERN	0.018	0.131	0.000	0.000	1.000
LEVERAGE	0.511	0.269	0.500	0.062	1.381
CHGOCF	0.000	0.094	0.001	-0.365	0.337
CHGDEBT	0.012	0.361	0.001	-0.953	3.739
GROWTH	0.104	0.360	0.067	-0.642	2.295
OLDBIG4	0.873	0.333	1.000	0.000	1.000
SPECIALIST	0.462	0.499	0.000	0.000	1.000
ICMW	0.062	0.242	0.000	0.000	1.000
ALTMAN	0.981	0.685	0.845	0.007	3.654
—————	—————	—————	—————	—————	—————
N =	7871	7871	7871	7871	7871

Variable definitions can be found in section 3.2.

The results in Table 1 demonstrate that lateral switches are the most common type of audit firm switch for the sampling period used in this paper, where upward switches are the least common type of switch. Examining the means of the variables, the values appear to be quite realistic. The fact that 26 percent of all firms report a loss seems like a large percentage at first instance, but this percentage is quite similar to the percentage of firms reporting a loss in Ettredge et al. (2007). Also, the fact that 87 percent of the firms have a Big 4 audit firm as incumbent audit firm is not much higher than the percentage in Ettredge et al. (2007). Further, I want to point out the highly deviating values for CHGFEE and ICMW when comparing Table 1 with the results of Ettredge et al. (2007). However, these numbers cannot be properly compared. For the CHGFEE variable, the value is much larger in Ettredge et al. (2007). This large value is likely to be caused by the incorporation of the introduction of SOX in CHGFEE. For the ICMW variable, the large difference can be explained by arguing that firms were not as familiar with the legislation about internal controls in 2003 and 2004 as they were in the time periods used in this paper (2005-2006 and 2008-2009).

To examine the differences in means between the pre-crisis and the crisis period, I compute the descriptive statistics for the pre-crisis period and the crisis period separately and then compare the results of both periods with each other. This gives a first impression with respect to the relation between the crisis variable and the other variables in the model. These results, presented in Table 2, indicate that, on average, fewer audit firm dismissals occur in the crisis period ( $t = 4.145$ ). This finding is in correspondence with hypothesis 1b. For the type of audit firm switch, Table 2 provides preliminary evidence that fewer downward switches take place during the crisis period ( $t = 7.666$ ). For lateral switches and upward switches, I do not find a significant difference between the means of both time periods ( $t = 0.433$  and  $t = -0.954$ , respectively). This result is consistent with neither hypothesis 2a nor hypothesis 2b, where I find a rejection of hypothesis 2a and insignificant evidence for hypothesis 2b.

For the control variables, Table 2 indicates that in the crisis period firms, on average, have smaller audit fee increases ( $t = 13.595$ ), tend to be larger ( $t = -2.862$ ), report more losses ( $t = -1.933$ ), receive more going-concern opinions ( $t = -1.803$ ), have a lower change in debt ( $t = 2.224$ ), have a lower growth level ( $t = 16.492$ ), are less likely to have a Big 4 audit firm ( $t = 2.552$ ) and document less internal control weaknesses ( $t = 11.823$ ). Ettredge et al. (2007) document significant results for the same control variables, except GROWTH. However, they find significant results for LEVERAGE and SPECIALIST where I do not find significant results for these variables. Therefore, the control variables appear to be worse controls in the setting used in this paper than in the setting used in Ettredge et al. (2007). However, Ettredge et al. (2007) separate the sample between dismissal-, and non-dismissal observations where I separate the sample between pre-crisis-, and crisis observations.

Table 2; Univariate statistics of the dismissal model for the pre-crisis-, and crisis period.

	Pre-crisis		Crisis		
	Mean	Std. Dev.	Mean	Std. Dev.	T-stat.
DISMISS	0.047	0.211	0.029	0.168	4.145***
DOWNWARD	0.021	0.142	0.003	0.052	7.666***
LATERAL	0.022	0.148	0.021	0.143	0.433
UPWARD	0.004	0.063	0.005	0.074	-0.954
CHGFEE	0.103	0.378	0.006	0.256	13.595***
CSIZE	15.581	2.543	15.741	2.416	-2.862***
LOSS	0.252	0.434	0.272	0.445	-1.933*
GOCERN	0.015	0.120	0.020	0.140	-1.803*
LEVERAGE	0.511	0.268	0.511	0.269	0.019
CHGOFCF	0.001	0.088	0.000	0.099	0.279
CHGDEBT	0.022	0.320	0.003	0.391	2.224**
GROWTH	0.177	0.361	0.045	0.349	16.492***
OLDBIG4	0.883	0.321	0.864	0.343	2.552**
SPECIALIST	0.457	0.498	0.467	0.499	-0.839
ICMW	0.098	0.297	0.034	0.180	11.823***
ALTMAN	0.990	0.684	0.973	0.686	1.104
N =	3504	3504	4367	4367	

\*, \*\*, \*\*\* significant at 0.1, 0.05, 0.01 levels, respectively.

Variable definitions can be found section 3.2.

Next, I examine the correlations between the variables included in the dismissal model. These correlations coefficients are presented in Table 3. First, I investigate the correlations between the variables of interest and then I examine the correlations of all the variables in the model in order to check for multicollinearity effects.

When taken into account the correlation coefficients between CRISIS and respectively DISMISS, UPWARD, LATERAL and UPWARD, the results demonstrate that CRISIS is significantly negative related to DISMISS ( $p = 0.000$ ) and DOWNWARD ( $p = 0.000$ ). LATERAL is negatively related to CRISIS and UPWARD is positively related to CRISIS, but these correlations are not significant ( $p = 0.665$  and  $p = 0.340$ , respectively). These findings are consistent with the results of Table 2. The variables UPWARD, LATERAL and DOWNWARD are all significantly positive related to DISMISS ( $p = 0.000$ ). UPWARD, LATERAL and DOWNWARD are all negatively related to each other, but not at a significant level ( $p = 0.360$ ,  $p = 0.521$  and  $p = 0.172$ , respectively). Further, I do not find any high correlations coefficients in Table 3, so it can be concluded that there is no multicollinearity problem.

The descriptive statistics for the variables of the fee model are presented in Table 4. Here, only the dismissal observations are taken into consideration, because I am interested in the difference in audit fee difference before and after a dismissal.

Table 3; Correlation matrix of the dismissal model

ALTMAN	ICMW	SPECIALIST	OLDBIG4	GROWTH	CHGDEBT	CHGOCF	LEVERAGE	GOCERN	LOSS	CSIZE	CHGFEE	CRISIS	UPWARD	LATERAL	DOWNWARD	DISMISS	
-0.024**	0.111***	-0.016	-0.062***	0.001	0.013	0.006	0.024**	0.030***	0.005	-0.035***	0.049***	-0.047***	0.355***	0.756***	0.530***	1.000	DISMISS
0.004	0.065***	0.008	0.040***	-0.014	0.005	0.004	-0.002	0.014	-0.014	-0.012	0.029***	-0.086***	-0.007	-0.015	1.000	0.530***	DOWNWARD
-0.032***	0.078***	0.001	-0.038***	0.007	0.004	0.010	0.028**	0.034***	0.021*	-0.025**	0.026**	-0.005	-0.010	1.000	-0.015	0.756***	LATERAL
-0.005	0.043***	-0.057***	-0.149***	0.009	0.021*	-0.011	0.010	-0.009	-0.008	-0.025**	0.036***	0.011	1.000	-0.010	-0.007	0.355***	UPWARD
-0.012	-0.132***	0.009	-0.029**	-0.183***	-0.025**	-0.003	0.000	0.020*	0.022*	0.032***	-0.151***	1.000	0.011	-0.005	-0.086***	-0.047***	CRISIS
-0.003	0.171***	-0.046***	-0.030***	0.173***	0.066***	-0.030***	0.019*	0.036***	0.008	-0.054***	1.000	-0.151***	0.036***	0.026**	0.029***	0.049***	CHGFEE
0.065***	-0.068***	0.237***	0.301***	-0.073***	-0.187***	0.061***	0.042***	-0.120***	-0.094***	1.000	-0.054***	0.032***	-0.025**	-0.025**	-0.012	-0.035***	CSIZE
-0.239***	0.019*	-0.024**	-0.021*	-0.002	0.111***	0.002	0.119***	0.013	1.000	-0.094***	0.008	0.022*	-0.008	0.021*	-0.014	0.005	LOSS
-0.006	0.058***	-0.021*	-0.030***	-0.004	-0.090***	-0.035***	0.026**	1.000	0.013 (0.266)	-0.120***	0.036***	0.020*	-0.009	0.034***	0.014	0.030***	GOCERN
-0.001	0.017	-0.006	0.005	0.013	0.673***	0.014	1.000	0.026**	0.119***	0.042***	0.019*	0.000	0.010	0.028**	-0.002	0.024**	LEVERAGE
0.018	0.007	-0.004	0.000	0.146***	-0.031***	1.000	0.014	-0.035***	0.002	0.061***	-0.030***	-0.003	-0.011	0.010	0.004	0.006	CHGOCF
0.005	-0.002	-0.066***	-0.113***	0.035***	1.000	-0.031***	0.673***	-0.090***	0.111***	-0.187***	0.066***	-0.025**	0.021*	0.004	0.005	0.013	CHGDEBT
-0.012	-0.006	-0.046***	-0.034***	1.000	0.035***	0.146***	0.013	-0.004	-0.002	-0.073***	0.173***	-0.183***	0.009	0.007	-0.014	0.001	GROWTH
-0.009	-0.075***	0.350***	1.000	-0.034***	-0.113***	0.000	0.005	-0.030***	-0.021*	0.301***	-0.030***	-0.029**	-0.149***	-0.038***	0.040***	-0.062***	OLDBIG4
0.005	-0.050***	1.000	0.350***	-0.046***	-0.066***	-0.004	-0.006	-0.021*	-0.024**	0.237***	-0.046***	0.009	-0.057***	0.001	0.008	-0.016	SPECIALIST
0.018	1.000	-0.050***	-0.075***	-0.006	-0.002	0.007	0.017	0.058***	0.019*	-0.068***	0.171***	-0.132***	0.043***	0.078***	0.065***	0.111***	ICMW
1.000	0.018	0.005	-0.009	-0.012	0.005	0.018	-0.001	-0.006	-0.239***	0.065***	-0.003	-0.012	-0.005	-0.032***	0.004	-0.024**	ALTMAN

\*\*\*, \*\* significant at 0.1, 0.05, 0.01 levels, respectively

Variable definitions can be found section 3.2.

The initial dataset contained some minimum and maximum values which were quite large for several variables, such as  $\Delta\text{DELAY}$ . To handle this issue, I winsorize the dismissal observations in such a way that I set all observations for the continuous variables in the 1<sup>st</sup> percentile equal to the border value of the 1<sup>st</sup> percentile and all observations for the same variables in the 99<sup>th</sup> percentile equal to the border value of the 99<sup>th</sup> percentile.

Table 4; Descriptive statistics of the fee model after winsorizing the dismissal observations.

	Mean	Std. Deviation	Median	Minimum	Maximum
$\Delta\text{FEE}$	-0.147	0.424	-0.067	-1.380	0.892
$\Delta\text{LNASSETS}$	0.103	0.295	0.047	-0.444	1.429
CRISIS	0.436	0.497	0.000	0.000	1.000
$\Delta\text{ADJSALES}$	0.020	0.780	0.018	-2.082	2.846
$\Delta\text{INVAR}$	-0.010	0.057	-0.003	-0.276	0.147
$\Delta\text{DTRATIO}$	-0.018	0.353	-0.002	-1.015	1.016
LOSS	0.375	0.485	0.000	0.000	1.000
GOCERN	0.031	0.173	0.000	0.000	1.000
AUDITOR	0.766	0.424	1.000	0.000	1.000
$\Delta\text{DELAY}$	-6.979	31.833	-1.000	-208.000	85.000
BUSY	0.863	0.345	1.000	0.000	1.000
LNASSETS	15.704	1.680	15.560	11.414	20.038
LNFEES	14.105	1.035	14.083	11.808	16.916
ICMW	0.103	0.305	0.000	0.000	1.000
N =	291	291	291	291	291

Variable definitions can be found section 3.2.

When investigating Table 4, I find that the change in fee is negative after a dismissal, indicating that lowballing practices occur in the sample used in this paper, which is consistent with the findings of the majority of the studies on lowballing (e.g. Simon and Francis, 1988). Further, 43.6 percent of the firms that dismiss the audit firm in my sample did so during the crisis period, which suggests that the absolute difference between the number of firms that dismiss the audit firm in both time periods is not that large. Further, Table 4 provides evidence that the number of firms that have a Big 4 audit firm is lower when only the observations are considered where the client firm dismissed the audit firm. In the total sample, 87.3 percent of the firms employed a Big 4 audit firm. However, when only the dismissal observations are taken into account, 76.6 percent of the firms employed a Big 4 audit firm prior to the dismissal, suggesting that

dismissals is more common for firms with a non-Big 4 audit firm. Last, Table 4 demonstrates that the outliers for, among others,  $\Delta$ ADJSALES and  $\Delta$ DELAY are still quite large. Nevertheless, these values do not influence the means in a way that the means become unrealistic values. When a comparison is made between the two time periods of this paper, it is possible to get a first insight in the relation between the change in audit fees after a dismissal and the financial crisis variable, the third hypothesis of this paper. The results give a first indication whether the change in audit fees after a dismissal becomes less negative or even positive, in accordance with the hypothesis. These univariate statistics are presented in Table 5.

Table 5; Univariate statistics of the fee model for the pre-crisis-, and crisis period.

	Pre-crisis		Crisis		
	Mean	St. Dev.	Mean	St. Dev.	T-stat.
$\Delta$ FEE	-0.112	0.404	-0.192	0.446	1.604
$\Delta$ LNASSETS	0.102	0.294	0.104	0.297	-0.077
$\Delta$ ADJSALES	0.050	0.751	-0.020	0.817	0.761
$\Delta$ INVAR	-0.005	0.048	-0.016	0.067	1.696*
$\Delta$ DTRATIO	-0.006	0.312	-0.034	0.401	0.683
LOSS	0.348	0.478	0.409	0.494	-1.080
GOCERN	0.018	0.134	0.047	0.213	-1.415
AUDITOR	0.878	0.328	0.622	0.487	5.347***
$\Delta$ DELAY	-11.195	39.898	-1.535	14.832	-2.592***
BUSY	0.878	0.328	0.843	0.366	0.871
LNASSETS	15.949	1.733	15.387	1.560	2.862***
LNFEES	14.334	1.033	13.809	0.964	4.423***
ICMW	0.116	0.321	0.087	0.282	0.812
N =	164	164	127	127	

\*, \*\*, \*\*\* significant at 0.1, 0.05, 0.01 levels, respectively.

Variable definitions can be found section 3.2.

Examining the univariate statistics in Table 5, I find that, on average, the audit fee change is more negative during the crisis period compared to the pre-crisis period. This means that in the year after the dismissal, the audit fees are lower relative to the audit fees charged before the dismissal during the crisis period. Nevertheless, the difference between the means of the pre-crisis period and the crisis period is insignificant ( $t = 1.604$ ). Therefore, the fact that the change in audit fee becomes more negative during the crisis period is in contrast with hypothesis 3.

For the control variables, it is possible to conclude that, during the crisis period, firms have a larger decrease in the level of inventory plus receivables relative to the total assets ( $t = 1.696$ ), are less likely to have a Big 4 audit firm prior to the dismissal ( $t = 5.347$ ), experience a smaller decrease in time the audit firm needs before they issue an audit opinion ( $t = -2.592$ ), have less assets in the year prior to the dismissal ( $t = 2.862$ ) and are paying less audit fees in the year

prior to the dismissal ( $t = 4.423$ ). I cannot compare the results with the descriptive results for this model in Ettredge et al. (2007), since they do not report the descriptive statistics for this model.

Then, I examine the correlation matrix for the fee model. These correlation coefficients are projected in Table 6. First, I investigate the correlation coefficients for the variables of interest and after that I examine the correlation coefficients of all the variables to check for potential multicollinearity effects.

Table 6 documents a negative correlation coefficient between the variables  $\Delta FEE$  and  $CRISIS$ , indicating a negative relation. However, this correlation coefficient is not significant ( $p = 0.110$ ). So, the sign of the relation between  $\Delta FEE$  and  $CRISIS$  is in contrast with the original hypothesis, but I found insignificant evidence to support this finding. Further, I do not find any correlations between the variables larger than 0.8 in Table 6, so there is no multicollinearity problem.

## **4.2 Regression results**

The second step in gathering evidence regarding the testing of my hypotheses is conducting a couple of regression analyses. Since the dependent variable for the first and second hypothesis is a binary one, either  $DISMISS$ ,  $UPWARD$ ,  $LATERAL$  or  $DOWNWARD$ , logistic regression analysis is used. However, for the examination of the third hypothesis I use a linear regression analysis, because the dependent variable  $\Delta FEE$  is a continuous variable.

### **4.2.1 Crisis and audit firm dismissal**

Interpreting the results of the regression analysis for the dismissal model, I can make a statement whether the relation between the variables  $CRISIS$  and  $DISMISS$  is, in accordance with my hypotheses, significantly positive or negative. The regression results can be found in Table 7. This table provides evidence that the dismissal model used in this paper is an appropriate model for explaining  $DISMISS$ , since the p-value of the Chi-squared test equals 0.000. This significance level of the model is consistent with the significance level of the model used in Ettredge et al. (2007). Also, the pseudo  $R^2$  of 0.052 is quite similar to the pseudo  $R^2$  of 0.078 documented in Ettredge et al. (2007).

The independent variable of interest,  $CRISIS$ , is significantly negative related to audit firm dismissal ( $p = 0.003$ ). In a crisis period, firms are less likely to dismiss their audit firm. This significantly negative relationship may indicate that audit quality is considered more important during a financial crisis. This is in correspondence with Chia et al. (2007). In times of uncertainty, retaining the audit firm may give a credible signal to stakeholders. This credible signal is valued higher than switching audit firm to benefit from short-term savings, such as the lowballing effect (Ettredge et al., 2007).



Table 6: Correlation matrix of the fee model

ICMW	LNFEES	LNASSETS	BUSY	ΔDELAY	AUDITOR	GOCERN	LOSS	ΔTRATIO	ΔINVAR	ΔADJSALES	CRISIS	ΔLNASSETS	ΔFEE	
0.104*	-0.087	0.174***	-0.039	0.195***	-0.152***	-0.097*	-0.111*	0.021	-0.032	-0.034	-0.094	0.305***	1.000	ΔFEE
-0.055	0.006	0.050	0.077	0.031	-0.047	-0.103*	-0.231***	-0.073	-0.181***	-0.112*	0.005	1.000	0.305***	ΔLNASSETS
-0.048	-0.252***	-0.166***	-0.051	0.151***	-0.300***	0.083	0.063	-0.040	-0.099*	-0.045	1.000	0.005	-0.094	CRISIS
-0.004	0.045	-0.051	0.027	0.052	0.024	-0.034	0.005	0.075	0.030	1.000	-0.045	-0.112*	-0.034	ΔADJSALES
-0.121**	0.001	0.029	0.035	-0.036	0.076	-0.058	0.107*	-0.064	1.000	0.030	-0.099*	-0.181***	-0.032	ΔINVAR
0.127**	0.211***	0.180***	0.063	-0.057	0.156***	0.276***	0.091	1.000	-0.064	0.075	-0.040	-0.073	0.021	ΔTRATIO
0.205***	-0.077	-0.197***	0.062	-0.047	-0.059	0.190***	1.000	0.091	0.107*	0.005	0.063	-0.231***	-0.111*	LOSS
0.135**	-0.013	-0.136**	0.071	0.039	0.005	1.000	0.190***	0.276***	-0.058	-0.034	0.083	-0.103*	-0.097*	GOCERN
-0.026	0.483***	0.402***	-0.032	-0.086	1.000	0.005	-0.059	0.156***	0.076	0.024	-0.300***	-0.047	-0.152***	AUDITOR
-0.235***	-0.240***	-0.054	-0.030	1.000	-0.086	0.039	-0.047	-0.057	-0.036	0.052	0.151***	0.031	0.195***	ΔDELAY
-0.029	-0.019	-0.003	1.000	-0.030	-0.032	0.071	0.062	0.063	0.035	0.027	-0.051	0.077	-0.039	BUSY
-0.035	0.753***	1.000	-0.003	-0.054	0.402***	-0.136**	-0.197***	0.180***	0.029	-0.051	-0.166***	0.050	0.174***	LNASSETS
0.113*	1.000	0.753***	-0.019	-0.240***	0.483***	-0.013	-0.077	0.211***	0.001	0.045	-0.252***	0.006	-0.087	LNFEES
1.000	0.113*	-0.035	-0.029	-0.235***	-0.026	0.135**	0.205***	0.127**	-0.121**	-0.004	-0.048	-0.055	0.104*	ICMW

\*\*\*, \*\*, \* significant at 0.1, 0.05, 0.01 levels, respectively.

Variable definitions can be found section 3.2.

Table 7; Logistic regression results of the dismissal model with dismissal as dependent variable.

	Expected sign	Coefficient	Significance level (p-value)
CONSTANT		-2.400	0.000***
CRISIS	+/-	-0.381	0.003***
CHGFEE	+	0.287	0.060*
CSIZE	-	-0.022	0.367
LOSS	+	-0.107	0.451
GOCERN	+	0.473	0.176
LEVERAGE	+	0.609	0.042**
CHGOFC	+	0.491	0.432
CHGDEBT	+	-0.190	0.414
GROWTH	-	-0.153	0.369
OLDBIG4	-	-0.743	0.000***
SPECIALIST	+	0.150	0.279
ICMW	+	1.148	0.000***
ALTMAN	+/-	-0.232	0.020**
<hr/>			
Pseudo R <sup>2</sup>		0.052	
Model Chi-Square		112.774	0.000***
N =		7871	

\*, \*\*, \*\*\* significant at 0.1, 0.05, 0.01 levels, respectively.

Variable definitions can be found section 3.2.

The findings for the control variables indicate that audit firm dismissal is more likely when the firm has an increase in the change in audit fees ( $p = 0.060$ ), has a high leverage rate ( $p = 0.042$ ), has a non-Big 4 audit firm ( $p = 0.000$ ), has ineffective internal controls ( $p = 0.000$ ) and has a low level of bankruptcy risk ( $p = 0.020$ ). These findings are, in general, consistent with the results found in Ettredge et al. (2007). The only variable I find contradictory results for compared to Ettredge et al. (2007) is OLDBIG4. However, this variable is insignificant in the regression analysis of Ettredge et al. (2007). For the bankruptcy variable, the Altman (1968) Z-score, I find that bankruptcy risk is negatively related to audit firm dismissal. This negative relation suggests that retaining the incumbent audit firm is the best option to handle with an increased level of bankruptcy risk. As a result, it might be that, due to the fact that the firm retains the audit firm, stakeholders are more willing to do business with the firm, because they perceive retaining the audit firm as a signal of credibility.

#### 4.2.2 Crisis and the type of switch

In order to draw a conclusion about the relation between the crisis variable and the different kinds of switch, downward-, lateral-, and upward, I plug in these variables one by one in the dismissal model instead of the dismissal variable. The expectation of my hypotheses is that

CRISIS plays a significant role on these variables UPWARD, LATERAL and DOWNWARD, either positive or negative. The findings for this regression analysis are presented in Table 8.

As expressed in Table 8, all three models are significant for explaining the different kind of audit firm switches ( $p = 0.000$  for all three models). The model explaining upward switches clarifies the most of the variation of the variables (Pseudo  $R^2 = 0.258$ ) where the model explaining lateral switches explains the least of the variation of the variables (Pseudo  $R^2 = 0.045$ ). The results tabulated here cannot be properly compared with the results of Ettredge et al. (2007) when it comes to the model significance levels, since the dependent variable is not the same.

Further, Table 8 shows that, after controlling for firm and audit firm effects, significantly less downward switches take place during the crisis period compared to the pre-crisis period ( $p = 0.000$ ), but the crisis variable is insignificant in relation with lateral switches and upward switches ( $p = 0.648$  and  $p = 0.194$ ). Based on this finding, hypothesis 2a is rejected. Nonetheless, it cannot be concluded that hypothesis 2b holds, since I find insignificant evidence for this hypothesis. It can be concluded from Table 8 that the negative relation that is documented in Table 7 between DISMISS and CRISIS is mainly due to the effect of CRISIS on DOWNWARD. The fact that downward switches are less likely in a crisis period may suggest that a high level of audit quality becomes more important during a crisis period (Chia et al., 2007). With a lateral or upward switch, the audit quality remains the same or increases, where the level of audit quality becomes lower when the firm makes a downward switch.

Table 8; Logistic regression results of the dismissal model with the type of switch as dependent variable.

Dependent variable	DOWNWARD		LATERAL		UPWARD	
	Coefficient	Significance level (p-value)	Coefficient	Significance level (p-value)	Coefficient	Significance level (p-value)
CONSTANT	-19.865	0.986	-3.389	0.000***	-6.498	0.000***
CRISIS	-2.044	0.000***	0.075	0.648	0.488	0.194
CHGFEE	0.277	0.330	0.203	0.323	0.733	0.040**
CSIZE	-0.034	0.443	-0.031	0.305	0.176	0.118
LOSS	-0.377	0.192	0.102	0.564	-0.519	0.217
GOCERN	0.640	0.319	0.554	0.176	-15.936	0.996
LEVERAGE	-0.457	0.433	1.038	0.006***	0.708	0.445
CHGOCF	1.205	0.335	0.679	0.387	-1.656	0.312
CHGDEBT	0.466	0.318	-0.514	0.076*	-0.149	0.835
GROWTH	-1.339	0.006***	0.072	0.716	-0.200	0.613
OLDBIG4	16.901	0.988	-0.680	0.003***	-3.511	0.000***
SPECIALIST	0.010	0.965	0.331	0.066*	-0.962	0.257
ICMW	1.101	0.000***	1.182	0.000***	0.974	0.029**
ALTMAN	-0.011	0.945	-0.358	0.010***	-0.212	0.447
Pseudo $R^2$	0.131		0.045		0.258	
Model Chi-square	115.814	0.000***	66.346	0.000***	121.558	0.000***
N =	7871		7871		7871	

\*, \*\*, \*\*\* significant at 0.1, 0.05, 0.01 levels, respectively.

Variable definitions can be found section 3.2.

For the control variables, I find that firms are more likely to make a downward switch when the firm has a low growth level ( $p = 0.006$ ) and has ineffective internal controls ( $p = 0.000$ ). Second, the results indicate that a lateral switch is more plausible when the firm has a high leverage rate ( $p = 0.006$ ), has a negative change in debt ( $p = 0.076$ ), has a non-Big 4 audit firm as incumbent audit firm ( $p = 0.003$ ), has an industry specialist as audit firm ( $p = 0.066$ ), has ineffective internal controls ( $p = 0.000$ ) and has a low level of bankruptcy risk ( $p = 0.010$ ). Last, Table 8 provides evidence that an upward switch is more likely when the firm experiences an increase in audit fees ( $p = 0.040$ ), has a non-Big 4 audit firm as incumbent audit firm ( $p = 0.000$ ) and has ineffective internal controls ( $p = 0.029$ ).

### 4.2.3 Crisis and the change in audit fees after a dismissal

For the relation between crisis and the change in audit fees, it is expected by the third hypothesis that the financial crisis plays a significant positive role. To test this hypothesis, I only take dismissal observations into account, since I am interested in the change in fees between the year before the dismissal and the year after the dismissal. The results are tabulated in Table 9. The first conclusion that can be drawn from Table 9 is that the overall model is highly significant ( $p = 0.000$ ). This is consistent with the results in Ettredge et al. (2007). The adjusted  $R^2$  of my model ( $R^2 = 0.302$ ) is quite similar to the  $R^2$  ( $R^2 = 0.373$ ) of the model in Ettredge et al. (2007).

The results in Table 9 indicate that, after controlling for firm effects and audit firm effects, the magnitude of fee cutting after a dismissal is significantly larger during a crisis period ( $p = 0.001$ ). Since the original hypothesis was that the lowballing effect would be significantly positively affected by the crisis variable, that hypothesis is rejected by this finding. A potential answer why this alternative relation is found is because of the cost-benefit trade-off firms have to make when they are considering to dismiss the audit firm. Teoh (1992) and Chow and Rice (1982) document that an audit firm switch takes place when the benefits are larger than the costs associated with the switch. During a financial crisis period, Chia et al. (2007) argue that audit quality becomes more important and I might have found support for this finding as described in section 4.2.1 and 4.2.2. Therefore, if a firm wants to make an audit firm switch, the economic benefits of switching must be larger than the benefits of retaining the incumbent audit firm. Since the benefits of retaining become larger during the crisis period, the economic benefits of switching must be larger as well in order to undertake the switch.

Concerning the control variables, it is possible to conclude that the change in audit fees after a dismissal is more positive when there is a positive change in assets ( $p = 0.000$ ), the audit firm before the dismissal was a non-Big 4 audit firm ( $p = 0.001$ ), the change in time that the audit firm needs before issuing the audit opinion is long ( $p = 0.002$ ), the level of assets before the dismissal is high ( $p = 0.000$ ), the level of audit fees prior to the dismissal is low ( $p = 0.000$ )

Table 9; Linear regression results of the fee model with change in fee as dependent variable.

	Expected sign	Coefficient	Significance level (p-value)	VIF-score
CONSTANT		0.563	0.096*	
CRISIS	+	-0.158	0.001***	1.161
$\Delta$ LNASSETS	+	0.426	0.000***	1.124
$\Delta$ ADJSALES	-	0.018	0.520	1.061
$\Delta$ INVAR	-	0.286	0.457	1.098
$\Delta$ DTRATIO	-	0.067	0.300	1.190
LOSS	+	-0.005	0.921	1.196
GOCERN	+	-0.055	0.677	1.203
AUDITOR	-	-0.188	0.001***	1.406
$\Delta$ DELAY	+	0.002	0.002***	1.184
BUSY	+	-0.094	0.127	1.037
LNASSETS	+	0.140	0.000***	2.742
LNFEES	-	-0.189	0.000***	3.021
ICMW	+	0.302	0.000***	1.176
<hr/>				
Adjusted R <sup>2</sup>		0.302		
Model F-test		10.634	0.000***	
N =		291		

\*, \*\*, \*\*\* significant at 0.1, 0.05, 0.01 levels, respectively.

Variable definitions can be found section 3.2.

and the firm has ineffective internal controls ( $p = 0.000$ ). These results are similar to the results that Ettredge et al. (2007) find when performing the regression analysis.

## 5. Conclusion

This paper investigates whether the financial crisis influences the audit firm dismissal behavior of firms. The financial crisis causes a situation where firms suffer from a decrease in sales due to limited borrowing ability of their customers. Firms are restricted in their borrowing ability and, in general, there is a high level of uncertainty about the future. Firms may decide to cut back audit costs in order to improve the financial situation or they may decide to invest more in audit costs to mitigate the uncertainty. This paper tests whether firms switch to another audit firm more often during a financial crisis period to benefit from the lowballing effect and from the audit services offered by the new audit firm or that firms dismiss the audit firm less often, because they need a credible signal to outside stakeholders, especially during a financial crisis.

Comparing firm observations between the pre-crisis period (2005-2006) and the crisis period (2008-2009), I find that audit firm dismissal is less likely to occur during a financial crisis period. This suggests that firms are more eager to retain the incumbent audit firm, which may be motivated by the fact that the incumbent audit firm possesses specific knowledge of the client firm. This means that the audit report is more accurate and an accurate audit report is a credible signal to stakeholders. Further, dismissal is positively associated with an increase in audit fees, a high level of leverage, a non-Big 4 audit firm, ineffective internal controls and a low level of bankruptcy risk.

When the dismissals are examined in more detail, I find that the decrease in dismissals documented when testing the first hypothesis is due to a decline in downward switches. Downward switches take place significantly less during the crisis period, while the financial crisis does not significantly affect the number of lateral switches and upward switches. The reasoning here is that smaller audit firms may be associated with a lower audit quality level, because they have less to lose from performing a bad job compared to Big 4 audit firms. A high level of audit quality may mitigate the increased uncertainty caused by the financial crisis. For the control variables, the results are not consistent across the different types of switch. The only variable that is significantly positive in all three models is the variable indicating that the firm has ineffective internal controls. Further, the results indicate that firms making a downward switch are more related to small growth levels. Firms making lateral switches are associated with a high leverage level, a decrease in debt, having a non-Big 4 audit firm, having an industry specialist as audit firm and a low level of bankruptcy risk. Last, firms making upward switches are connected to an increase in audit fees and a non-Big 4 audit firm.

If a firm decides to switch to another audit firm, the results suggest that firms experience a larger decline in audit fees during the financial crisis period compared to the pre-crisis period. This is in contrast with the third hypothesis of this paper which argues that these lowballing

practices would be reduced in the crisis period. It is documented by prior literature that firms must make a cost-benefit trade-off prior to an audit firm switch. The findings indicate that the benefits of retaining the audit firm are significantly larger during a crisis period because audit quality becomes more important. This means that the fee reduction must be significantly larger as well during a crisis period in order to undertake the switch. Only if this condition has been met, the economic benefits of dismissing the audit firm might be larger than retaining the incumbent audit firm and the dismissals will take place. This change in fee is also significantly influenced by some of the control variables. An increase in assets, whether the audit firm is a Big 4 audit firm, the change in time the audit firm needs before they issue their audit opinion, the level of assets before the dismissal, the level of audit fees before the dismissal and whether the firm has ineffective internal controls all demonstrate to have a significant impact on change in fee and these variables have the same sign compared to the findings of Ettredge et al. (2007).

A number of parties can benefit from the results documented in this paper. First, firms will be more likely to retain their incumbent audit firm if another financial crisis might occur, since this paper documents that the economic benefits from retaining the audit firm are, in general, larger than the benefits of dismissing the audit firm. Further, they will be less likely to make a downward switch, since a downward switch is related to a decrease in audit quality where audit quality becomes more important during a crisis period. Second, audit firms profit from the findings of this paper, because they are better able to forecast the actions of the client firms. Also, if audit firms want to attract new clients during a financial crisis period, they have to offer lower audit fees for the first period of the engagement compared to a non-financial crisis period. Last, the results of this paper might be interesting for regulators. The results of this paper indicate that it is worth the effort for regulators to stimulate firms to retain their audit firm. Retaining the audit firm may mitigate the uncertainty caused by the financial crisis. For example, one way to stimulate firms is by mandating extensive disclosure requirements about the dismissal.

There are a number of limitations of this paper. First of all, this paper excludes the number of business segments from the original fee model described in Ettredge et al. (2007). A related point here is that the models used in this paper only use a limited amount of variables, considering the  $R^2$  values of the dismissal model and the fee model ( $R^2 = 0.052$  for the dismissal model and  $R^2 = 0.302$  for the fee model, respectively). There are some other variables which may influence the decision to dismiss the audit firm and the height of the audit fees. Thus, a lot of variation of the model is not explained by the variables, so other variables might give a model which is better able to explain the variation.

Secondly, this paper focuses on a specific country, namely the United States of America. This means that the result hold for U.S. firms, but they not necessarily hold in other countries. For example, Francis and Wang (2008) find differences in audit quality levels among different countries. The legal environment plays a significant role in the level of audit quality. In the U.S., audit quality, based on the results of this paper, appears to be more important. Therefore, as a topic for future research, it might be interesting to test whether different results are found when performing the same set of tests in countries with different legal systems.



## 6. References

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