ERASMUS UNIVERSITEIT ROTTERDAM

# AUDIT FIRM ROTATION AND AUDIT QUALITY

**ABSTRACT:** This study documents evidence on the association between audit firm rotation and audit quality. The study is motivated by the implementation of audit firm rotation for Dutch listed companies. The main reason for this implementation is the enhancement of auditor independence and therefore the quality of audits. Prior research has observed mixed results concerning the effects of mandatory audit firm rotation. However, the theory shows that this kind of rotation should enhance audit quality. The results show that even though audit firm rotation has not significantly influenced audit quality in the chosen model used to estimate audit quality, there is still a significant positive difference between audit quality before and after a rotation of audit firm. Results show as well that auditor independency is positively related to audit quality.
**Keywords**: audit firm rotation, audit quality, audit tenure, auditor independence.
**Data availability:** All data used in this study is publicly available.

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| | |
|---|---|
| AFR | Audit Firm Rotation |
| EC | The European Commission |
| GOA | The U.S. Government Accountability Office |
| IAASB | International Auditing and Assurance Standards Board |
| MAFR | Mandatory Audit Firm Rotation |
| NYSE | New York Stock Exchange |
| PCAOB | Public Company Accounting Oversight Board |
| SEC | Security and Exchange Commission |
| SOX | Sarbanes-Oxley Act |
| WRDS | Wharton Research Data Services |

# 1. INTRODUCTION

## 1.1 Background

Mandatory audit firm rotation (hereafter MAFR) has been a big topic on the agenda of the European Union for many years and has as well become a controversial topic in the rest of the world. After the financial crisis of 2008, audit rotation has been proposed again as a way to enhance the quality of audits. After the crisis, certain stakeholders concluded that there were fundamental problems in the audit profession and its relation with its clients (Dallocchio & Lauri, 2014). Although MAFR can be seen as a way to obtain or enhance the independency of the auditor, the opinions about the importance of this rotation are divided.

In December 2013, MAFR has become more important after the approval of new audit regulations in the European Union. According to these new regulations audit firms are required to rotate engagements with public-interest entities every ten years (Tysiac, 2013). In the United States of America, AFR has not got the majority's attention yet, as the Public Company Accounting Oversight Board (PCAOB) has explored the concept of MAFR, but it has removed it from its active agenda (Tysiac, 2013).

Audit firm rotation (hereafter AFR) is commonly confused with audit partner rotation, though these two are significantly different from each other. AFR is distinguished from audit partner rotation by the fact that the key audit partner is required to rotate off the audit engagement after a given period of time with mandatory partner rotation (EY, 2013). The importance of the rotation of the audit partner is recognised by the most countries in the world. This is seen in the implementation of audit partner rotation in Europe but as well in the United States, China, Brazil, Korea and India. For European Union countries, the 8$^{th}$ EU Company Law Europe has been implemented in 2006. In the 8$^{th}$ EU Company Law directive it is stated that the key audit partner has to rotate from the audit engagement every seven years (The European Parliament and the Council of European Union, 2006). In the United States audit partner rotation was adopted with the introduction of the Sarbanes-Oxley Act (SOX). Among other things, this act required that audit partners must rotate every five years.

## 1.2 Relevance

A few countries have already mandated AFR, whereas Italy can be seen as one of the first. Italy has implemented this rotation in 1974 and is still the only country in the European Union, which has implemented this rule for a long time. It is questioned if MAFR can be viewed as a successful way to establish more independency of the auditor. As observed in Italy, there is often a way around the set rules. One way is when former audit teams follow their client to a new audit firm. Due to these kinds of constructions and the arguments of opponents of AFR, the importance and also the functioning of this rotation is questioned.

Proponents and opponents of AFR have both come with valid arguments on their view on the introduction of this rotation. On the one hand, supporters find that AFR is a perfect way to establish an improvement in the quality of audits. It is argued that longer audit tenure will lead to auditors that are overly familiar with the management, and tend to lose the professional scepticism needed to remain objective. Other arguments of proponents involve fresh eyes in the audit with a new audit firm and a way to open up the audit market (EY, 2013). Big opponents of this concept are the Big Four accounting firms. The accounting firms argue that forced rotation of audit firms will erode the audit quality. Red flags of audit problems tend to arise in the beginning of auditors' tenures and again after fourteen years yet problems in the beginning are more common (The Economist, 2011).

The recent implementation of MAFR in the Netherlands and the controversy around the subject makes it interesting to investigate its effectiveness in the Netherlands. The implementation will be effective from January 2016 in the Netherlands, which makes it impossible to investigate the effects for the Netherlands. Even though the impact of the mandatory rotation of audit firm cannot be investigated, the way that audit firms are voluntary rotated can be measured. However, the availability of financial data for Dutch companies is limited and therefore not representative. Therefore this thesis will use financial data from the United States, where voluntary AFR is set in place. The conclusion from this financial data will likely be applicable for the Dutch setting.

## 1.3 Problem definition

Despite of the many arguments against MAFR, countries are still trying the implement the rotation. A recent example is the Dutch setting, where public-interest companies are mandated to switch audit firm after ten years. With this legislation adjustment, the Dutch government tries to increase the independence of the audit

firm (Nederlandse Beroepsorganisatie van Accountants, 2012). Interesting to know is what the potential effects of the rotation of audit firms are, no matter if it is mandatory or voluntary. It is still unsure if AFR will indeed enhance the quality of audit or if the costs of rotation will outweigh the benefits. Therefore, the research question is formed is follows:

*Is there an association between audit firm rotation and audit quality?*

This research question has been chosen because the independency of an auditor is an important concept in the profession of the auditor. The need for auditor independence is also seen in the recent D.E. Master Blenders 1753 fraud case. In this fraud case, argued can be that fraud would not have been committed if the company had switched audit firm in a timely manner.

### 1.4 Thesis outline

In order to answer this research question, the following sub questions have been defined which aid in understanding the main research question:

1. Why is audit important to a company and what are the underlying relevant theories of auditing?
2. What is audit independence?
3. What is audit quality and how can this quality be measured?
4. How can mandatory audit firm rotation be defined?
5. Does audit partner rotation influence audit firm rotation?
6. Which components influence the implementation of audit firm rotation?
7. What are the findings of prior empirical studies regarding the association between audit firm tenure and audit quality?
8. What are the findings of other empirical studies related to audit quality and audit firm tenure separately?

In this study, chapter two will give an overview of accounting theories relevant to the research question of this study and will answer the first two sub-questions. Earlier conducted research on the importance of doing an audit and the importance of audit independence will be discussed. Chapter three will answer the third sub-question and focus on audit quality and the way this quality can be measured. In chapter four

the focus will be on AFR, where sub-question four until six will be answered. Chapter five will summarize from the theoretical overview.

Chapter six provides a review of the relevant prior research papers regarding the association between audit tenure and audit quality and will answer sub-question seven and eight.

In the seventh chapter a framework of the hypotheses will be made and will provide the two hypotheses. In chapter eight these hypotheses will be operationalized to measurable variables. Moreover, to construct the regression model, the measurements of the variables will be established. Lastly, the sample selection and data collection will be discussed in this chapter.

In chapter nine the results of the regression model will be discussed and the last chapter will give an answer to the research question.

# 2. RELEVANT ACCOUNTING THEORIES

## 2.1 Introduction

In this chapter accounting theories that are relevant to audit quality and audit tenure are discussed. Before looking at the theories underlying the audit quality, the importance of preforming an audit should be explained. With this, the first sub-question will be answered:

*Why is audit important to a company and what are the underlying relevant theories of auditing?*

The independence in mind and appearance is important to determine the quality of an audit and therefore is a concept that is essential in this chapter. Independence is not only essential for determining audit quality but it has also a relation with AFR, which leads to the second sub-question:

*What is audit independence?*

## 2.2 Theories of auditing

An audit has the purpose to promote confidence and reinforce trust in financial information. An audit serves an economic purpose and plays an important role in serving the public interest to strengthen accountability. The objective of an audit can be stated as 'enabling the auditor to express an opinion whether the financial statements are prepared, in all material respects, in accordance with an identified financial reporting framework' (International Federation of Accountants, 2004, p. 174). The demand for an audit as a service can be explained by various theories, which will be set forth in the next chapters.

### 2.2.1 The Policeman and Lending Credibility Theory

The least known and researched theories for the demand of auditing are the Policeman and Lending Credibility Theories. The Policeman Theory explains that an auditor should be responsible for the prevention and detection of fraud, like a policeman. After 1940, this way of thinking changed and shifted to auditing being seen as a way to verify the truth and fairness of financial statements. The relevance of this theory is seen by the fact that the detection of fraud as a responsibility of the auditor is still an often-discussed topic (Hayes, Dassen, Schilder, & Wallage, 2005).

According to the Lending Credibility Theory, the primary function of the audit is to add credibility to the financial statements. Financial statements are used by management to enhance the faith that the stakeholder have in management's

stewardship. If stakeholders have to make their judgments based on the information they receive, they must have faith that this is a fair representation of the economic value of the company. In this way, auditing reduces the information asymmetry between management and stakeholders (Hayes, Dassen, Schilder, & Wallage, 2005).

### 2.2.2 The Theory of Inspired Confidence

The founder of this theory was the Dutch professor Theodore Limperg, as he researched the demand and supply of audit services in 1920. Limperg argued that the presence of inspired confidence is the starting point of the audit function. The demand for audit services is the direct consequence of the participation of outside stakeholders in the company. These stakeholders value an expert and independent view and demand accountability from the management in return for their contribution to the company. Because of biased information provided by management, and conflicts of interest, an audit of the information is required. Limperg also mentioned the level of the assurance this audit should give. The auditor should act in such a way that he does not disappoint the expectations of a rational outsider, while he also should not arouse greater expectations in his audit report than his examination justifies (Hayes, Dassen, Schilder, & Wallage, 2005).

### 2.2.3 Agency Theory

The Agency Theory is important in understanding how an audit has developed and explains what an audit means to stakeholders (International Federation of Accountants, 2004). The Agency Theory is concerned with resolving problems that develop between agents and principals. This relationship is called the agency relationship where a principal engages another person as their agent to perform a service on their behalf. Jensen and Meckling (1976) researched this relationship while explaining the theory of the firm. The agency relationship is describes as ‘a contract under which the principal engages the agent to perform some service on their behalf which involves delegating some decision making authority to the agent’ (Jensen & Meckling, 1976, p. 310). The Agency Theory focuses on the problems that can arise in the agency relationship. These problems arise when the interests of the agent do not match with those of the principal. This means that if both parties want to maximize their utility there is a good reason to believe that the agent will not always act in the best interest of the principal (Jensen & Meckling, 1976). The agent has the ability to act this way because he has a considerable advantage over the principal regarding information about the company, also known as information asymmetry. The principal wishes to limit divergences from his interest by establishing appropriate

incentives for the agent, which will lead to costs, e.g. monitoring costs, bonding costs and residual loss.

In a company the management can be considered as the agent and the stakeholders (bankers, stockholder and employees) as the principals. The big problem with this agent-principal relationship is information asymmetry, where management always knows more than other stakeholders. Management knows more about the company's ability to repay loans than bankers. Management also knows the actual profit better than the stockholders. And lastly the management knows more about the financial condition of the company than its employees (e.g. employment conditions of the employees). An auditor is appointed not only in the interest of third parties, but also in the interest of management. Management needs the principals to look favourably back on them: the management ultimately depends on the principals for the financial structuring of the company, which in itself is supervised by the management. In order for the principals to have faith in the information given by management, this information must be reliable. This shows that there is an incentive for both management and other stakeholders to engage reputable auditors (Hayes, Dassen, Schilder, & Wallage, 2005).

### 2.3 Auditor independence

An audit can only add value to the true and fairness of financial information if the quality of this audit is considered as high. An important element of audit quality is auditor independence. Auditor independence ads credibility to the audit report on which all kinds of stakeholders depend on to make decisions about a company. In theory auditor independence implies the ability and willingness of the auditor to identify a range of deficiencies during the audit process and then to challenge the audited firm on these findings. In practice the auditor has a special relationship with the managers of the audited company, because of the various interactions needed to implement the audit. In this relationship fees are paid to the auditor by the audited firm and not directly by the shareholders (which makes it difficult to observe if the auditor is both independent in mind and appearance and still remains objective). The auditors' ability to maintain an unbiased attitude throughout the audit can be viewed as the independency in mind. Independency in appearance is the result of other' interpretations of this independence (Hayes, Dassen, Schilder, & Wallage, 2005).

The importance of the independence in the work of auditors is well known: especially during the recent financial crisis the question of auditor independence has been brought to the front. For this reason, there are extensive safeguards and

systems in place to protect and enhance this independence (PricewaterhouseCoopers, 2012). Across the world there are different rules and regulations, which address the independence of auditors. The European Commission (EC) has issued independence standards to be applied throughout the European Union. The European Union framework is based on the requirement that an auditor must be independent from his audit client both in mind and appearance. Therefore accountants must not only maintain an independent attitude in fulfilling their responsibilities, but the users of financial statements must have confidence in that independence (Hayes, Dassen, Schilder, & Wallage, 2005).

The independence recommendations of the EC identify five potential threats to the independence of an auditor (The Commission of the European Communities , 2002). The first identified threat is the 'self-interest threat', which may occur when an auditor could benefit from a financial interest or other self-interest conflict with an assurance client. The 'self-review threat' occurs when it is difficult to remain objective in conducting self-review procedures. The third threat mentioned by the EC is the 'advocacy threat', which refrains to the situation where an auditor promotes or seems to promote his client's 8position or opinion and thus sets the judgment of the client before his own judgment. The 'familiarity threat' is also a potential threat to the independence of an auditor. This threat identifies the risk that an auditor may be over-influenced by the client's personality and qualities and becomes too sympathetic to the client's interest, which may result in excessive trust in the client and insufficient objective testing of his representations. The last identified threat is the 'intimidation threat' that covers the possibility that the auditor may be deterred from acting objectively because the client exercises professional scepticism by using threats (The Commission of the European Communities , 2002).

These threats to the independency of the auditor are important for the decision to implement the mandatory auditor firm rotation. Especially the familiarity and the intimidation threat can be used in arguments in favour of the AFR. The EC (2002) argues that the replacement of the engagement partner and other key audit partners is the best way to mitigate the familiarity threat to the independency of an auditor and other safeguards cannot replace this.

### 2.4 Earnings management

The need for AFR follows from the fact it causes the auditor to act both more independent in mind and appearance. Auditor independence is also important for the quality of earnings, because both the company's management and the audit firm

determine the quality of financial reporting. If the auditor independence directly affects the quality of the audit, any change in this independence can be translated in a change in the quality of the financial statements, thus it influences the quality of earnings (Kramer, Georgakopoulos, Sotiropoulos, & Vasileiou, 2011).

In defining the earnings quality, earnings management is an important concept since it influences this quality. Healy & Wahlen (1999) describe earnings management as the situation where a manager uses his judgement in financial reporting and in structuring transactions. The judgement is used to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company, or to influence contractual outcomes that depend on reported accounting numbers. (Healy & Wahlen, 1999, p. 368).

Kramer et al. (2011) stated that AFR could influence auditor independence positively, because the auditor would be more likely to stand up against attempts of manipulation earnings management. This would reflect in more income decreasing items being recorded. Consequently, this would result in a variation in earnings, which reflect losses on a timelier basis than gains would (Kramer, Georgakopoulos, Sotiropoulos, & Vasileiou, 2011).

However, it is still not sure if audit tenure is positively related with earnings management. Martinez & Reis (2010) investigated this relation in a Brazilian setting and observed no signification effect on earnings management when switching the auditing firm. It is argued that a factor could be that all of the Big Four have internal policies to rotate the staff assigned to specific audited companies. (Martinez & Reis, 2010). Although the focus of the study is not on earnings quality or earnings management, the findings of Martinez & Reis (2010) are still to be considered, because of the proposed relation between audit quality and earnings management. Moreover Becker et al (1998) proved that there is indeed a direct relationship between audit quality and earnings management, as it is observed that high quality auditors are more likely to detect and to object to questionable accounting practices.

## 2.5 Conclusion

In this chapter the importance of auditing is set forth, by looking at the different theories behind the demand for auditing. These theories are united as a whole by the fact that they all explain the need for auditing as a profession. However, auditing can only add value if there is a high level of auditor independence. If there is no significant level of auditor independence, implementing an audit is not of any value to the company or the users of the financial statement. The importance of auditor

independence is also seen in the Agency Theory, where the agency-relationship can only work properly and solve agency problems if the auditor is able to work independent. The importance of auditor independence is seen by the fact that it could potentially influence earnings management. An independent auditor is more likely to stand up against attempts of manipulation earnings management, which would be reflected in more income decreasing items being recorded. This would indicate that the independency of an auditor has a positive effect on audit quality.

# 3. AUDIT QUALITY

## 3.1 Introduction

In this study is researched if AFR is related to audit quality, but before elaborating on this relationship it is important to understand the concept of audit quality and how this can be measured. Audit quality is an important concept to be considered in evaluating the usefulness of AFR. The literature and different organisations provide many definitions of audit quality, therefore there is no single uniform definition of audit quality. After the quality of an audit services is defined, it is important to make this definition more concrete by finding a proper way to measure the quality. In this chapter the different definitions of audit quality are describes. Also, different methods of measuring the audit quality are described. This chapter will answer the third sub-question:

*What is audit quality and how can this quality be measured?*

## 3.2 Definition of audit quality

The different definitions of audit quality can be divided in two schools of thoughts, i.e. the level of compliance with standards and the level of assurance on financial statements. From all the different views on audit quality, the definition by DeAngelo (1981) is most frequently cited.

### 3.2.1 The level of assurance on financial statement

The most cited definition stems from DeAngelo (1981, p. 186), in which the quality of audit services are defined as 'the market-asses joint probability that a given auditor will both (1) discover a breach in the client's accounting system and (2) report the breach'. She explains that the probability that a given auditor will discover a breach depends for example on the auditor's technological capabilities or the audit procedures employed on a given audit. The probability of reporting a discovered breach is a measure of the auditor's independence from a given client (DeAngelo, 1981). This definition connects audit quality one to one with financial reporting quality, which means that a financial report where all accounting breaches have been detected and reported by the auditor represents high audit quality. Audit quality measures based on the definition of DeAngelo are indirect methods of measuring audit quality with the aid of indicators, where the most used proxy in audit quality research studies is the statistical estimation of discretionary accruals in financial

statements. The limitation of this definition is that it defines a quantity, which is unobservable and difficult to measure (Tritschler, 2013).

### 3.2.2 The level of compliance with standards

The other school of thought on audit quality relies on the level of compliance with auditing standards. Indicators for audit quality are here for example peer review findings or lawsuits against auditors. Critics of this approach argue that the overall objective of an audit is to ensure high quality financial reporting and not to comply, as much as possible with relevant standards (Tritschler, 2013).

### 3.2.3 Other definitions of audit quality

Beside the two main schools of thoughts on audit quality, there are different organisations that define audit quality. The U.S. Government Accountability Office (GAO) (2003) argues that there does not have to be one school of thought on audit quality or the other and combines both aspects. The Accountability Office argues that a high quality audit is performed 'in accordance with generally accepted audit standards (GAAS) to provide reasonable assurance that the audited financial statements and related disclosures are (1) presented in accordance with generally accepted accounting principles (GAAP) and (2) are not materially misstated whether due to errors or fraud' (General Accounting Office, 2003, p. 13).

In 2008 The Financial Reporting Council of the United Kingdom tried to explain audit quality by identifying four main drivers of audit quality i.e.: (1) the culture in an audit firm; (2) the skills and personal qualities of audit partners and staff; (3) the effectiveness of the audit process; and (4) the reliability and usefulness of audit reporting. Next to these four main drivers The Council also recognised that there are factors outside the control of the auditor affecting audit quality (Financial Reporting Counsil, 2008). Knechel (2011) criticizes the definition given by The Financial Reporting Council by stating that the four drivers are vague and are subject to interpretation.

The chairman of the International Auditing and Assurance Standards Board (IAASB) (2013) recognises the complexity of defining audit quality, as there is no one definition or analysis that has achieved universal recognition. In 2013 the Board developed a framework for audit quality that describes the input and output factors that contribute to audit quality at the engagement, audit firm and national levels. In this framework, the IAASB considered that a number of factors (inputs, outputs, interactions amongst key stakeholders and contextual factors) influences audit quality (International Auditing and Assurance Standards Board, 2013).

The PCAOB, which also created the Sarbanes-Oxley Act 2002, did not break new conceptual ground, but tried to define audit quality based on widely accepted concepts. The quality of an audit is defined as meeting investors need for independent and reliable audits and robust audit committee communications on: (1) financial statements, (2) assurance about internal control and (3) going concern warnings. Besides these definitions, the PCAOB also developed an audit quality framework based on previous studies is also developed, which include three segments; audit inputs, processes and results. To provide insight into audit quality, a portfolio of approximately ten to twenty audit quality indicators of the audit quality framework is provided (Public Company Accounting Oversight Board, 2013).

## 3.3 Measuring audit quality

After defining audit quality it is important to concertize the concept by finding a method for measuring the quality of audits. However, empirically measuring the audit quality is quite difficult because the 'amount of assurance' auditors can provide is a non-observable measure. By using different proxies that relate to audit quality, it is possible to acquire better understanding of the quality. Research done by DeFond & Zhang (2014) presents different ways of measuring audit quality and divided the audit quality proxies into input-based and output-based measures.

### 3.3.1 Input-based audit quality measures

Using input-based audit quality measures as a way to infer audit quality can be appealing because clients must choose audit quality based on observable inputs. DeFond & Zhang (2014) divided these input-based measures into two categories: (1) auditor-specific characteristic and (2) auditor-client contracting features.

In the category auditor-specific characteristics the proxy auditor size, usually measured as Big-N membership, is used for measuring audit quality. One of the first researchers who supported the importance of this proxy was DeAngelo (1981), where it is stated that auditors with a greater number of audit clients supply a higher level of audit quality because their total collateral is greater. Another commonly used proxy is the auditor industry specialization, which is usually measured by client industry concentration. This is a strong proxy for audit quality because specialist auditors are expected to have greater competency and stronger reputation incentives to provide high audit quality (DeFond & Zhang, 2014).

In the second category, entitled auditor-client contracting features, audit fees are a commonly used proxy for audit quality. Audit fees are expected to measure the auditor's effort level, which is an input to the audit process and therefore related to

audit quality (DeFond & Zhang, A Review of Archival Auditing Research , 2014). DeFond & Zhang (2014) argue that a limitation of using input-based audit quality measures is that they are relatively noisy (inputs may not directly translate into outputs).

### 3.3.2 Output-based audit quality measures

Apart from the input-based audit quality measures, there are some output-based audit quality measures that are commonly used in the literature. These measures are categorized into four groups by DeFond & Zhang (2014): (1) material misstatements, (2) auditor communication, (3) financial reporting quality, and (4) perception-based measures.

In the category material misstatements there are two commonly used proxies i.e. (1) restatements and (2) Accounting and Auditing Enforcement Release (AAERs). AAERs are enforcement actions concerning civil lawsuits brought by the Security and Exchange Commission in a federal court or administrative proceeding. These two proxies give a direct measure of audit quality because they indicate that the auditor incorrectly issued an unqualified opinion on materially misstated financial statements (DeFond & Zhang, 2014).

In the category auditor communication, the proxy commonly used is the going concern audit opinions. This type of audit opinion communicates the auditors' evaluation of whether there is a substantial doubt about the clients' ability to continue as a going concern (DeFond & Zhang, 2014). A going concern opinion can be used as a proxy of audit quality because high quality auditors are more likely to correctly evaluate firms' financial conditions and also resist clients' pressure not to issue a going concern opinion (Fogel-Yaari & Zhang, 2013).

In the category financial reporting quality the most frequent used measure is based on the Jones (1991) model where discretionary accruals are used as a proxy for the quality of audits. Other proxies used in this category are meet or beat earnings targets, accruals quality measure and timely loss recognition. Financial reporting quality proxies are conceptually well-suited proxies for audit quality, where higher audit quality means greater assurance that financial statements faithfully reflect the firm's underlying economic conditions.

In the category perception-based measures the proxies used for audit quality are earnings response coefficients, stock market reaction to audit-related events and the cost of capital. These proxies capture audit quality more comprehensively than actual output measures and can capture the net benefits or costs associated with audit quality. (DeFond & Zhang, 2014).

### 3.4 Audit quality and financial reporting quality

DeFond & Zhang (2014) stated that the quality of financial reporting is positively related with audit quality. In their research it is concluded that audit quality is a continuous construct that assures financial reporting quality, where high audit quality provides greater assurance of high financial reporting quality. On the one hand, financial reporting quality can be seen a function of audit quality, the quality of the firm's financial reporting system and its innate characteristics. One the other hand, audit quality can be seen as a component of financial reporting quality because high audit quality increases the credibility of the financial reports. Audit quality is a component of financial reporting, and therefore there is a clear reason why financial reporting quality proxies, as discretional accruals, are commonly used as proxies for audit quality (DeFond & Zhang, 2014).

### 3.5 Conclusion

To study the influence of AFR on audit quality it is essential to create a framework that defines the quality of audits. In this chapter it is explained that many organisations and researchers have defined audit quality in different ways, which can be divided into two schools of thoughts (i.e. the level of compliance with standards and the level of assurance on financial statements). The most commonly and well-known definition of audit quality was explained by DeAngelo, where audit quality is defined as the probability that an auditor both discovered and reported the breach in the client's accounting system. To concretize the quality of audits it is important to make it measurable, to do this different proxies are used. These proxies can be divided into input-based and output-based audit quality measures. Well-known examples of proxies used for audit quality are discretionary accruals and going concern opinions.

# 4. AUDIT FIRM ROTATION

## 4.1 Introduction

In the recent years MAFR has been receiving increasing attention from policy-makers, because it is believed that this could be a way to enhance auditor independence and increase professional scepticism. This chapter provides an answer to the fourth sub-question:

*How can mandatory audit firm rotation be defined?*

Audit partner rotation is also a concept that could influence audit quality and therefore should be taking into consideration. This study is focused on AFR but audit partner rotation could influence this. Therefore, this chapter also answers to the fifth sub-question:

*Does audit partner rotation influence audit firm rotation?*

Both proponents and opponents of this concept provide valid arguments, because some countries have already adopted MAFR. In this chapter the three components relevant to the implementation of AFR will be set forth, and gives an answer to the sixth sub-question:

*Which components influence the implementation of audit firm rotation?*

## 4.2 Mandatory audit firm rotation

The Sarbanes-Oxley Act of 2002 defined MAFR as 'the imposition of a limit on the period of years in which a particular registered public accounting firm may be the auditor of record for a particular issuer' (The U.S. Government Publishing Office , 2002). The SOX was implemented as a legislation that introduced major changes to the regulation of financial practice and corporate governance (Securities and Exchange Commission, 2002). The Act was implemented to, among others, enhance auditor independence and audit quality and restore investor confidence in the nation's capital markets. An auditor must be the independent link between management and those who rely on the financial statements; therefore it is of great importance that an auditor is independent in mind and independent in appearance.

The financial crisis of 2008 triggered the EC to re-open the discussion on MAFR. In 2011 the Commissions issued different proposals to reform the statutory audit market, of which MAFR was one. The Commission believes it is a proposed option to mitigate the risk of any potential conflict of interest due to a familiarity threat. MAFR has been considered by policy-makers around the world for years and

can be seen as a possible approach to address independence and other audit quality concerns. Even though it is on the agenda of policy-makers for years, not all countries are convinced of its importance. In 2003, around thirty countries required a form of mandatory firm rotation, however some counties have also already reversed the implementation (EY, 2013).

### 4.2.1 Voluntary audit firm rotation

When investigating the components that influence AFR, voluntary firm rotation should be distinguished from mandatory firm rotation. DeFond and Subramanyam (1998) have observed beneficial effects of voluntary rotation, as discretionary accruals are income decreasing during the last year with the predecessor auditor and generally insignificant during the first year with the successor. However, Kim et al. (2004) considers that the level of discretionary accruals is significantly lower for companies with designated auditors than companies that freely select their auditor. This implies that audit quality, measured by discretionary accruals, is higher when AFR is mandated.

## 4.3 The relation between audit partner rotation and audit firm rotation

AFR can be distinguished from audit partner rotation by the fact that the key audit partner is required to rotate off the audit engagement after a given period of time with mandatory partner rotation (EY, 2013). The Sarbanes-Oxley Act is a proponent of the audit partner rotation and stated that it is 'unlawful for a registered public accounting firm to provide audit services to an issuer of the lead audit partner if the audit partner responsible for reviewing the audit has performed audit services for that issuer in each of the five fiscal years of that issuer' (Securities and Exchange Commission, 2002).

AFR audit partner rotation is a preferred alternative to MAFR. The rotation of the key audit partners removes the risk of over-familiarity and self-interest and promotes objectivity without imposing significant cost. An advantage of audit partner rotation can be that the knowledge about the company being audited remains with other audit team members, which helps maintain high audit quality (EY, 2013). Whereas some believe that audit partner rotation is a way to improve the auditor independence, the (EC) does not share this vision. In the EC's Green Paper (2011) it is stated that the rotation of key audit partners does not resolve the threat of familiarity. When only audit partner rotation is mandatory, a new partner will likely feel obliged to live with decisions and agreements made by the previous partner.

The Commission does recognize that the audit partner rotation is also required for MAFR to work. The rotation rules should ensure that not only firms, but also the partners are rotated. This should be done to prevent partners from changing firms while taking certain clients along with them (European Commission, 2011).

## 4.4 Components that influences the choice of audit firm rotation

In this chapter three components that influence AFR will be set forth. The PCAOB (2011) describes that auditor independence, objectivity and professional scepticism are foundational components of a high quality audit. The cost of rotation and the loss of knowledge are also two important components to take into consideration.

### 4.4.1 Auditor independence

The PCAOB links the terms independence, objectivity and professional scepticism together when looking at audit quality. Auditor independence can be characterised by integrity and an objective approach to the audit process and requires the auditor to carry out his work freely and in an objective manner (ICAEW, 2015). Auditor independence is important because it has an impact on the audit quality; if an auditor does not remain independent he will be less likely to report the irregularities. (Myers, Myers, & Omer, 2003).

Professional scepticism can be defined as 'an attitude that includes a questioning mind, being alert to conditions which may indicate possible misstatement due to error or fraud, and a critical assessment of audit evidence' (ICAEW, 2012). The PCAOB argues that professional scepticism is fundamental to the role and performance of auditors and that its application throughout the audit is a foundational aspect of audit quality and the integrity of the audit process (Franzel, 2013).

Auditor objectivity is closely related to the auditor independence, and can be describes as 'the state of mind which has regards to all considerations relevant to the task in hand but no other' (ICAEW, 1997, p. 261). This can also be considered as being independent of mind. The need for objectivity is important in doing an audit, because the professional opinion is likely to affect rights between parties and the decisions they take.

The three abovementioned terms all relate to the auditor's ability to perform an audit in a disinterested manner, which is free from the influence by the client. Therefore, an independent auditor is more likely to exercise appropriate professional scepticism and make objective auditing judgments (Public Company Accounting Oversight Board, 2011).

### 4.4.2 Auditor independence and audit firm rotation

Rotation audit firm can positively influence auditor independence and professional scepticism. In a long-standing relationship, auditors may become overly familiar with the company's management and may risk losing the professional scepticism needed to remain objective. A positive impact of the rotation is the improvement of proper professional scepticism, as the auditor will not tend to identify too closely with management. (European Commission, 2011).

Furthermore Tepalagul & Lin (2015) argued that auditor tenure could lead to the impairment of auditor independence. When an auditor has a long relationship with the client, he may develop a close relationship with the client and become more likely to act in favour of management, which can result in reduced objectivity and audit quality (Tepalagul & Lin, 2015). This fact is also empirically investigated in the study of Bocconi where the experiences of Italy, which mandated AFR since 1974, are shown. The study concludes that 69% of managers of listed companies in Italy approve of the rotation and consider that this mechanism guarantees auditor independence. The study also shows that managers believe that auditors over the years tend to concentrate on routine activities and pay less attention to making suggestions or improvements (European Commission, 2011).

On the other hand, EY (2013) has a strong opinion about this subject by stating that AFR is not an effective way to maintain or enhance auditor independence. The auditing firm strongly advocates against AFR because it has not been proven to increase audit quality, as studies have shown the contrary effect (EY, 2013).

### 4.4.3 Auditors' knowledge

Auditors obtain in-depth knowledge of specific industries during the course of their engagement and invest significant resources to obtain and maintain industry expertise. In addition, the auditor attains significant knowledge and understanding of a company over time and also acquires awareness of the company's risks. With longer audit tenure an auditor can attain significant knowledge and understanding of a company and awareness of its risks over time, which can enhance audit quality (EY, 2013).

### 4.4.4 Auditors' knowledge and firm rotation

After the rotation of the audit firm, the new auditor has the opportunity to act independently and objectively with respect to their clients' business and industry. However, they will have little knowledge of their new client's business and industry. AFR could therefore result in the loss of the audit firm's significant cumulative

knowledge of the company's business, its people, processes, controls and risks. This can have a negative effect on audit quality, because it causes significant and unnecessary risks (PricewaterhouseCoopers, 2013).

However, the EC argues that the threat of loss of knowledge can be minimized. In the beginning of the audit engagement the auditor needs to be familiarised with the special procedures, systems and the recent history of the audited company. The Commission states that most knowledge will be lost in the process in the beginning of the audit engagement, but points out that this can be minimized by ensuring that the new auditor has access to the important information on the company by providing a handover file. The combination of this handover file and other options, such as joint audit, should minimize the loss of knowledge (European Commission, 2011).

#### 4.4.5 Cost of rotation

Due to the learning curve audit firms face with a new audit, these firms can be less efficient at the beginning of their new engagement. This learning curve issue will cause for an increase in costs within audit firms so that personnel can get up to speed on engagement issues. The companies should then take into account an increase in audit fees, which are needed to compensate for the additional audit staff time (Raiborn, Schorg, & Massoud, 2006).

#### 4.4.6 Cost of rotation and audit firm rotation

The Government Accountability Office (GOA) (2003) came to the conclusion that MAFR is not effective when auditor independence and audit quality should be enhanced, because the implementation would lead to additional financial costs and loss of institutional knowledge of the public company's previous auditor of record. (General Accounting Office, 2003).

The EC (2011) also supported this view, as there are a lot of different costs that have to be taking into consideration. It is common for a new auditor to need extra time to become familiar with the company's business, its financial and non-financial procedures, systems and recent history. Besides these costs, there are costs in terms of management time and time needed for the new auditor to become familiar with its client. Important to take into consideration should be the frequency of AFR. This frequency should be not too high because it is more likely that additional costs would appear during the first or second year. The rotation period should not be too short and should include the possibility to renew the contract once, so that the potential additional costs are spread over a certain number of years. (European Commission, 2011).

Opponents of AFR often use as an example the MAFR experience of Italy. From the Bocconi study it was concluded that MAFR has limited effect on the structure of the market and that is has a considerable impact upon the overall costs of audit services. The study concluded that more man-hours were necessary for the incoming audit firm in order to get to know the company's business (European Commission, 2011).

### 4.5 Conclusion

In this chapter the three relevant components to the implementation of AFR are set forth, namely auditor independence, auditors' knowledge and the cost of rotation. In the below table the impact of these components are depicted. From this can be concluded that auditor independence and knowledge are the two components that should be taking into consideration.

| | **Independence** | **Knowledge** | **Costs** |
|---|---|---|---|
| **Audit firm rotation** | Positive impact | Negative impact | Positive impact |

**Table 1: Impact components of audit firm rotation**

# 5. CONCLUSIONS FROM OVERVIEW

Before describing the two main terms of this study, namely audit quality and AFR, a theoretical framework around auditing should be presented. Accounting theories relevant to the AFR, for example the Agency Theory and the Theory of Inspired Confidence can explain the demand for auditing. The most important auditing theory is the Agency Theory; from this theory follows that certain problems related to auditing can only be solved if the auditor is able to work independent. Therefore auditing can only add value if there is a high level of auditor independence. Auditor independence can also potentially influence earnings management because an independent auditor is more likely to stand up against attempts of earnings manipulation.

To be able to answer the main research question the concept of audit quality must be defined. The most commonly used definition defines audit quality, as the probability that an auditor can both discover and report a breach in the client's accounting system. The way this quality is measured is a controversial subject and can vary from input-based audit quality measures (e.g. auditor size), to output-based audit quality measure (e.g. discretionary accruals).

Many countries have mandated AFR because of its possible association with audit quality. On the other hand, there is the concept of voluntary AFR, which is practically implemented in every country, which does not have the mandatory form. Other countries have implemented audit partner rotation because this is seen as a preferred alternative to AFR. However, the EC argues that AFR and partner rotation have to complement each other. This means that audit partner rotation should be required to improve the efficiency of AFR, because this will prevent partners from changing firms and at the same taking certain clients along with them.

Relevant components for the implementation of audit quality are auditor independence, auditors' knowledge and costs. AFR could have a positive impact on auditor independence, as the auditor will not become over-familiar with the audited company. With voluntary AFR, the independence will not improve because the over-familiarity of the auditor will most likely not be a reason for the client to switch author. When looking at auditors' knowledge, AFR will most likely increase the loss of knowledge, because a new auditor will have less knowledge of the audited company's business and industry. A similar effect can be expected with voluntary rotation because the timing of the switch is not of any essence here. At the moment

the audit firm will switch, it does not matter if it is mandatory or voluntary, there will be loss of auditors' knowledge. When taking into account the costs of rotation, the same effect as with the loss auditors' knowledge is expected. When the audit firm will rotate, irrespective of whether the decision is mandatory or voluntary, there will be additional costs that should be taking into consideration.

From the overview can be concluded that auditor independence is the underlying reason for companies to rotate audit firms. Figure 1 illustrates the relationship between the three important variables of this study. With these three variables the prior research review of the next chapter is structured.

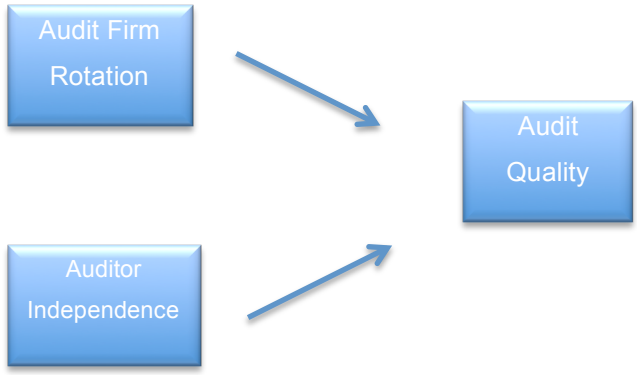


**Figure 1: Relationship between important variables**

# 6. PRIOR RESEARCH REVIEW

## 6.1 Introduction

This chapter provides a review of the relevant prior research papers regarding the association between AFR and audit quality. As seen in previous chapters, potential benefits of AFR are increasing auditor independence and increasing audit quality. The loss of knowledge and additional financial costs can be viewed as disadvantages of the firm rotation. This chapter provides an answer to the seventh sub-question:

*What are the findings of prior empirical studies regarding the association between audit firm tenure and audit quality?*

In addition, the relevant research done on the separate variables audit tenure and audit quality will be reviewed to determine the possible relevant control variables. With this, the chapter will also give an answer to the eighth sub-question: *What are the findings of other empirical studies related to audit quality and audit firm tenure separately?*

## 6.2 Empirical evidence on the relationship between audit tenure and audit quality

Audit tenure can be seen as the length of the auditor-client relationship, which is measured in years. Audit tenure is the direct way in which AFR influence audit quality and therefore plays a significant role in the research about AFR and its relation to audit quality.

Audit quality is an important aspect to be considered when evaluating the usefulness of AFR and thus the audit tenure. Vanstraelen (2000) mentioned the difficulty in measuring the relationship between audit tenure and audit quality, because audit tenure can have a positive or negative impact on the two main determinants of audit quality i.e. the auditors' competence and independence. Yet the following studies make an attempt to investigate the relationship between audit tenure and audit quality in a certain way.

### 6.2.1 Deis & Giroux

Deis & Giroux (1992) analysed the result of quality control reviews of audits of Texas school districts and concluded that audit tenure is positively associated with a quality measure reflecting auditors' failure to comply with professional standards. The first

hypothesis suggests that audit quality decreases as audit tenure increases. Their study provides direct empirical evidence that audit tenure is negatively related to audit quality. This negative relation can be attributed to either opportunistic behaviour or complacency.

In the study audit quality is defined as the probability that the auditor will both discover and report a breach in the client's accounting system, which has been derived from DeAngelo (1981) where it is states that this quality depends on the auditor's independence.

This definition of audit quality is measured by taking the natural log of the weighted quality metric bases on the quality control reviews letters of findings. Audit tenure is measured by the number of years the auditor has audited the independent school district. The variable client, which is measured by the number of independent school district clients audited by the auditor, were also included as an independent variable. The study observed that improved audit quality is expected with increases in the number of audits conducted by the audit firm. This study is limited by the fact that the evidence pertains to a single type of client entity, hence the generalization of the result may be limited (Deis & Giroux, 1992).

### 6.2.2 Copley & Doucet

Among others, Copley & Doucet (1993) tried to provide empirical evidence of the relation between the quality of governmental audit services and auditor tenure. These authors analysed 136 audits of federal financial assistance programs in 1985. Their empirical analysis indicates that the probability of receiving a substandard, low quality, audit increases when the audit tenure increases.

To measure the audit quality a dichotomous measure are used, which indicate whether an Office of Regional Inspector General observed the audit to be of acceptable or unacceptable quality. Audit tenure is measured by developing a five category ordinal level variable indicating the number of previous audits performed by the auditor of the selected financial report. The findings contradict conventional arguments against auditor rotation, which state that there is little evidence supporting the negative association between the quality of audits and audit tenure. This negative effect can be explained by the fact that incumbent, resting, auditor decrease the quality of audit services supplied, either opportunistically or through an erosion if their objectivity. This study is limited by the fact that, even though the analysis documents show a significant relation between substandard audit quality and audit tenure, it does not permit an investigation of the cause of this association (Copley & Doucet, 1993).

### 6.2.3 Vanstraelen

Vanstraelen (2000) tried to analyse the impact of renewable long-term audit mandates on audit quality in a European setting. It was questioned whether renewable long-term audit mandates have an impact on the reporting behaviour of the auditor and on his independence. The results of the study suggest that long audit tenure significantly increases the likelihood of an unqualified opinion or significantly reduces the auditor's willingness to qualify audit reports. The study also observed a significant difference between the auditor's reporting behaviour in the first two years of their mandate versus the last years of their mandate.

To measure audit quality this study uses an unclean audit report as binary variable. The independent variables used are audit tenure, as the length of the auditor-client relationship, and whether or not the auditor is in the last year of his official mandate. The control variables used are fees, the probability of detection of incorrect audit opinion, the fear of loss of the client and the fear of loss of reputation. This study is limited by the fact that it is only focussed on companies from Belgium with scope limitation of the results (Vanstraelen, 2000).

### 6.2.4 Myers et al.

Myers et al. (2003) analysed the relation between audit firm tenure and two measures of accruals, namely discretionary accruals but also current accruals. With a broad cross-sectional study they consider the relation between auditor tenure and earnings quality, by measures of accounting accruals as proxy. This study finds no evidence that a longer audit firm tenure is associated with lower earning quality. Remarkably they find results that suggest that earnings management becomes more limited as the tenure of audits increases. The reasoning behind this is that longer auditor tenure results in auditors placing greater constraints on extreme management decisions in the reporting of financial performance.

Myers et al. stated that earnings quality could be used to draw inferences about audit quality and claimed that a high audit quality constrains auditors in extreme choices that management would like to make in presenting the financial position of the company. Taking the absolute, signed, and raw values of both discretionary and current accruals measures the earnings quality. As control variables they used firm age, size, industry growth, cash flow, auditor type, industry and year. This study is limited by the fact that it does not address all instances of earnings management and does not condition on managers' incentives to manage earnings (Myers, Myers, & Omer, 2003).

### 6.2.5 Ruiz-Barbadillo et al.

Ruiz-Barbadillo et al. (2009) analysed the impact of MAFR on auditor independence using Spanish archival data. These authors investigated AFR during a period when AFR was mandatory in Spain, followed by a period when the requirement to chance audit firms was lifted. The study observed no evidence to suggest that mandatory rotation is associated with a higher likelihood of issuing going-concern opinions.

In this study auditor independence was measured by taking the auditor's tendency to issue a going-concern opinion to a financially stressed company. The independent variables were AFR, influence of audit firm and the reputation. As control variables the probability of bankruptcy, the existence of loss, leverage and client size are used. The study is limited by the fact that the results may be affected by other potential going-concern determinants and there is a scope limitation (Ruiz-Barbadillo, Gómez-Aguilar, & Carrera, 2009)

### 6.2.6 Siregar et al.

Siregar et al. (2012) analysed the effect of auditor rotation and audit tenure of the public accountant and the public accounting firm on audit quality, before and after the implementation of MAFR. The study shows that auditor rotation before regulation increased audit quality, whereas mandatory auditor rotation does not show positive effects on audit quality. However, no strong evidence is observed to support the notion that MAFR is an effective measure to increase the quality of audits.

To measure audit quality discretionary accruals are used. Audit tenure is used as independent variable in two components i.e. audit partner and audit firm tenure. As independent variable audit partner and AFR are also used and are measured using a dummy variable. This study is limited because it only used discretionary accruals as a proxy to measure the quality of audits. In addition, the study did not investigate the relation between audit tenure on audit quality for each industry and did not consider corporate governance variables. Another limitation of this study is the fact that quasi rotation could occur in Indonesia because of the low enforcement regime. Quasi rotation companies may seem to have changed their audit firms, but this did not occur: audit firms can only change the local name of their audit firms by changing 50% of its audit partners, but their foreign affiliated did not change. (Siregar, Amarullah, Wibowo, & Anggraita, 2012).

### 6.2.7 González-Díaz et al.

González-Díaz et al. (2015) analysed the impact of auditor tenure on audit quality for Spanish state-owned foundations. These authors concluded that audit quality, measured as the likelihood that an auditor will submit a qualified opinion, increases

over the first five years of the relationship and then decreases. The results indicate that long audit tenure increases the likelihood of the auditor issuing a clean report.

These authors define audit quality as the likelihood that an auditor will submit a qualified opinion. The independent variable is the audit tenure and is measured in two ways: as a continuous or as a dummy variable. As a continuous variable, tenure is calculated as the number of consecutive years a foundation has been audited by the same auditor. For the dummy variable three measurements for every sample were used, obtained by calculating tenure quartiles. The following control variables were used: type of auditor, size, previous year's opinion, if the foundation's revenue exceeds its expenses, the sector and the year. This study is limited by the fact that the research is conducted in an environment where there is no MAFR and in a sector where further empirical research is very limited (González-Díaz, García-Fernández, & López-Díaz, 2015).

## 6.3 Prior research matrix

| Authors | Year | Sample | Country of research | Proxy Audit Quality | Proxy audit firm rotation | Outcome |
|---|---|---|---|---|---|---|
| Deis & Giroux | 1992 | 32 Quality Control Review on CPA audits of Texas Independent School District (ISD) | United States | Natural log of the weighted quality metric based on the QCRs letters of findings | Number of years the auditor has audited the ISD | Negative relation |
| Copley & Doucet | 1993 | 136 questionnaires and audit quality assessments | United States | Substandard Audit | The number of previous audits performed by auditor categorized in 5 levels | Negative relation |
| Vanstraelen | 2000 | 796 Belgian financial companies | Belgium | Issuing a qualified audit opinion | Length of the auditor-client relationship in years | Positive relation |
| Myers, Myers & Omer | 2003 | All firms-years with sufficient data on the 2001 COMPUSTAT annual industrial (42,302 firm-years) | United States | Accounting accruals | The number of consecutive years that the firm has retained the auditor | No relation |
| Ruiz-Barbadillo Gómez-Aguilar & Carrera | 2009 | 1,326 financially stressed-company years of companies extracted from the database of the Spanish Securities and Exchange Commission | Spain | Issuing an going concern opinion | Binary variable for identifying the time periods with and without mandatory rotation | No relation |
| Siregar, Amarullah, Wibowo & Anggraita | 2012 | Indonesian companies | Indonesia | Absolute discretionary accruals | The length of the time the Public Accounting Firm has been the auditor of a company in a given year | No relation |
| González-Díaz, García-Fernández & López-Díaz | 2015 | 254 audits carried out on Spanish state-owned foundations | Spain | Issuing a qualified audit opinion | The number of consecutive years that the firm has retained the auditor or tenure quartiles | Negative relation |

**Table 2: Prior research matrix**

### 6.4 Empirical evidence on audit quality

Audit quality is an important aspect to be considered in evaluating the usefulness of AFR. The most recognized definition of audit quality is provided by DeAngelo (1981, p. 186), as: 'the market-asses joint probability that a given auditor will both (1) discover a breach in the client's accounting system and (2) report the breach'. DeAngelo states that the greater the incentive for the auditor to tell the truth, the greater the value of the auditor's opinion. DeAngelo states that audit quality depends on auditor competence and independence. Competence is associated with an auditor's professional skills. In this study the concept of low-balling and its relation to auditor independence are explained. With low-balling the initial audit fees is set less than current total cost because auditors compete for the advantages of incumbency. DeAngelo shows that these initial reductions are sunk in future periods and therefore do not impair auditor independence (DeAngelo, 1981).

Deis & Giroux (1992) tested different factors that could influence audit quality. These authors concluded that factors related to both reputation and power conflicts are significant determinants of audit quality. Also client-specific quasi-rents have a negative relation with audit quality, but the number of audit clients can mitigate this. Jackson et al. (2008) uses two measures of audit quality to investigate the effect of audit tenure. The results show that when audit quality is measured by the propensity to issue a going-concern opinion, it has a positive relation with audit firm tenure. No relation with audit firm tenure is observed when measuring audit quality as the level of discretionary expenses. The study concludes that there are minimal benefits of MAFR.

### 6.5 Empirical evidence on audit tenure

Lim & Tan (2010) investigated whether the relation between auditor tenure and audit quality is conditional on auditor specialization and fee dependence. These authors argue that auditor tenure is associated with two related construct: auditor expertise and economic incentives. Lim & Tan also state that in assessing the effects of auditor tenure on audit quality, it is important to consider the joint consideration of the two related constructs and not ether the effects of expertise or incentives alone. In the study it is shown that increased auditor tenure is associated with increased expertise factors to protect reputational capital, which increases audit quality. Also concluded is the fact that increased auditor tenure is associated with increased incentives to please the client, which reduces audit quality. The authors show that extended auditor tenure does not necessarily decrease audit quality. In fact, the authors

believe that audit quality can be improved with extended tenure when two conditions are met: the auditor is a specialist and has low fee dependence (Lim & Tan, 2010).

Nasser et al. (2006) investigated audit tenure and switching behaviour in the Malaysian audit environment. Malaysian listed companies were exanimated using logistic regression. Results show that retention of audit firms depends on the size of clients based on total assets, level of financial risk and type of audit firm but not by changes in operating income and market value. The study also indicates that auditors with distressed large clients fear losing their tenure and being switched, hence their independence and objectivity may be impaired (Nasser, Wahid, Nazri, & Hudaib, 2006).

### 6.6 Empirical evidence on auditor independence

From the theoretical overview it can be concluded that the auditor independence is an important component when looking at the relationship between AFR and the quality of audits. The Security and Exchange Commission (SEC) (2000) stated that independent auditors are considered the 'gatekeepers' of the public security markets. Auditor independence could be affected by the length of time the auditor works for a particular client. Nasser et al. (2006) investigated the relation between auditor independence and audit tenure and have observed some interesting results. It is observed that audit tenure in fact can impair auditor independence and therefore weakens the audit quality. Nasser et al. (2006) argued that financially distressed clients are more likely to switch audit firms, therefore smaller auditors would be more reluctant to quality their reports or show disagreement with their client for fear of losing a client or being dismissed (Nasser, Wahid, Nazri, & Hudaib, 2006). Tepalagul & Lin (2015) made a literature review about the studies done on auditor independence in combination with audit tenure. This is in comparison with Nasser et al. (2006), where it is concluded that long audit tenure does not impair auditor independence. It is mentioned that some studies conclude that long audit tenure actually improves audit quality and that short tenure is associated with lower audit quality (Tepalagul & Lin, 2015).

To measure auditor independence, different proxies can be used, for example absolute value of discretionary accruals. Nasution (2013) argues that there is a negative relationship between absolute discretionary accruals and auditor independence. The reasoning behind this is that higher absolute discretionary accruals are consistent with the conclusion that an auditor allows the client to exercise a greater accounting flexibility to conceal poor performance or save current

earnings for future use (Krishnan, 2003). Prior research has shown that high fees paid by a company to its auditor increase the economic bond between the auditor and the client. This signifies that audit fees may impair an auditor's independence (Okolie, 2014).

The relationship between auditor independence and audit quality is also an important relationship to be investigated. Saputra (2015) investigated the impact of auditor independence on audit quality in a theoretical way and proved that audit quality does indeed have a positive relationship with auditor independence. Enofe et al. (2013) investigated this relationship in a non-theoretical way, by empirically evaluating the relationship between auditor independence and audit quality. Their results indicated that as the auditor independence increased, audit quality also improved.

### 6.7 Other prior research matrix

Prior research concerning audit quality, audit tenure and auditor independence separately are summarized in the following matrix. In this matrix the relevant control variables from the studies are also set forth.

| Authors | Year | Dependent variable | Independent variable | Findings | Relevant control variables |
|---|---|---|---|---|---|
| DeAngelo | 1981 | Audit quality | Audit firm size | Positive relation | Auditor competence<br>Auditor independence |
| Deis & Giroux | 1992 | Audit quality | Audit tenure<br>Number of clients | Negative relation | Reputation<br>Power conflicts |
| Myers, Myers & Omer | 2003 | Earnings quality | Audit tenure | Positive relation | Age, size, industry growth, cash flow, auditor type, industry and year |
| Lim & Tan | 2010 | Audit quality | Audit tenure | Positive relation | Auditor expertise<br>Economic incentives |
| Nasser, Wahid, Nazri & Hudaib | 2006 | Auditor independence | Audit tenure<br>Switching behaviour | Positive relation | Size of client<br>Level of financial risk<br>Type of audit firm |
| Tepalagul & Lin | 2015 | Audit quality | Auditor independence | Inconclusive evidence | Auditor and clients incentives |
| Nasution | 2013 | Discretionary accruals | Auditor independence | No relation | Social pressures |
| Saputra | 2015 | Audit quality | Auditor independence | Positive relation | Different dimensions of independence (programming, investigative and reporting independence) |
| Enofe, Nbgame, Okunega & Ediae | 2013 | Audit quality | Auditor independence | Positive relation | Audit tenure<br>Board independence<br>Ownership structure |

**Table 3: Other prior research matrix**

## 6.8 Conclusion

The majority of the conclusions of prior empirical show that audit tenure is negatively related with audit quality. Some authors have not observed a relation between the two and an insignificant amount observed a positive relation. Noticeable is that a range of different proxies are used to measure audit quality. Discretionary accruals and the issuance of a going concern opinion are the most common measures used for audit quality. In order to measure audit tenure, most studies used some type of method for measuring the duration the auditors are connected to their client company. Empirical evidence on audit quality shows that the quality should be divided in competence and independence: this could be a factor to take into consideration when looking at proxies for audit quality. Empirical evidence on audit tenure shows that auditor expertise and economic incentives are two components that are inseparably linked to audit tenure, to the extent that audit quality can improve if the auditor is a specialist and has low fee dependence. These components could be used as independent variables if the influence of audit tenure on audit quality is studied

These results show that audit tenure, and thus AFR, does not affect the quality of audits in a significant way. Nevertheless, different countries are starting to mandate AFR. From this review, a general conclusion from theory and previous studies can be made and well-supported hypotheses will be developed in the next chapter.

# 7. HYPOTHESES DEVELOPMENT

## 7.1 Introduction

In this study the relation between AFR and audit quality is analysed. In the beginning of this study it was assumed that there could be a direct link between AFR and audit quality, where AFR is the explanatory variable for audit quality. The overview and prior research review describes auditor independence as an important variable, which could entail that there are two explanatory variables. These variables are auditor independence and AFR. In this chapter the effect of auditor independence on the research question is set forth.

## 7.2 Hypotheses framework

The research question of this thesis tried to investigate the following relationship:


**Figure 2: Relationship research question**

From the chapter 5 of this study, entitled Conclusions of the Overview, it can be concluded that auditor independence plays an important role in the relationship between AFR and audit quality. This is observed by the fact that legislators use the improvement of auditor independence as an argument to implement MAFR. To develop the hypothesis it is important to determine which kind of relationship auditor independence has on AFR and audit quality. In this setting, auditor independence could have a mediating or moderating effect. But if it represents a moderating effect, it would mean that auditor independence only influences the relation between AFR and audit quality. If auditor independence represents a mediating effect, auditor independence should explain the association between AFR and audit quality.

However, in prior chapters have shown that auditor independence is a significant important variable that could separately explain audit quality. Thus auditor independence can be considered as an explanatory independent variable.
To following figure depicts the relationship between the three important variables:

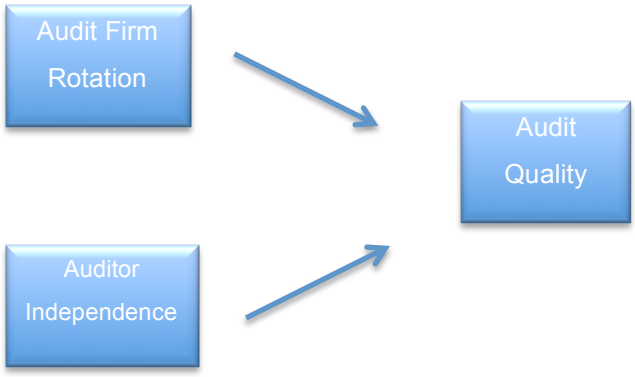


**Figure 1: Relationship between important variables**

### 7.3 Hypotheses development

The conclusions from the overview given in Chapter 5, indicates that high audit quality is of great importance for the audit profession. In theory, AFR assumes that an auditor acts more independent because the familiarity threat will be prevented. An auditor should be independent because audit quality can be described as the probability that an auditor will both discover and report the breach in the client's accounting system. When an audit firm rotates, his independence can be preserved. From this it can be concluded that the theory assumes a positive relation between AFR and audit quality. However, the research review given in Chapter 6 follows that AFR would rather have a negative effect on audit quality than a positive effect. In order to investigate if this negative relation also holds, the following hypothesis is formed:

Hypothesis 1*: Audit firm rotation will not enhance audit quality*

The theoretical overview has concluded that auditor independence is an important concept in this setting, as auditor independence could lead to higher audit quality. Regulators in different countries have tried to push for AFR with the underlining thought that this would improve the auditor independence and therefore also the audit quality. The next hypothesis will therefore be related to the auditor independence and the relation with the quality of audits.

This hypothesis can be supported by prior research done by Saputra (2015) and Enofe et al. (2013), where a positive relation between auditor independence and audit quality has been observed. The second hypothesis is formulated as follows:

Hypothesis 2*: Auditor independence will enhance audit quality*

# 8. RESEARCH DESIGN

## 8.1 Introduction

This chapter describes the proxies and methods that will be used to test the hypotheses, which were established in Chapter 7. These measure the dependent and independent variables are explained by making a Libby boxes framework. The model of measuring audit quality, audit tenure and auditor independence will be described in detail. Thereafter, the regression model is set forth and the sample selection and sample period is described.

## 8.2 Operationalization of hypotheses

The previous chapter shows that AFR, auditor independence and audit quality are the important variables in the research question. To measure these variables, they have to be transformed to operational variables. In the following figures the Libby boxes are depicted and the control variables are shown:

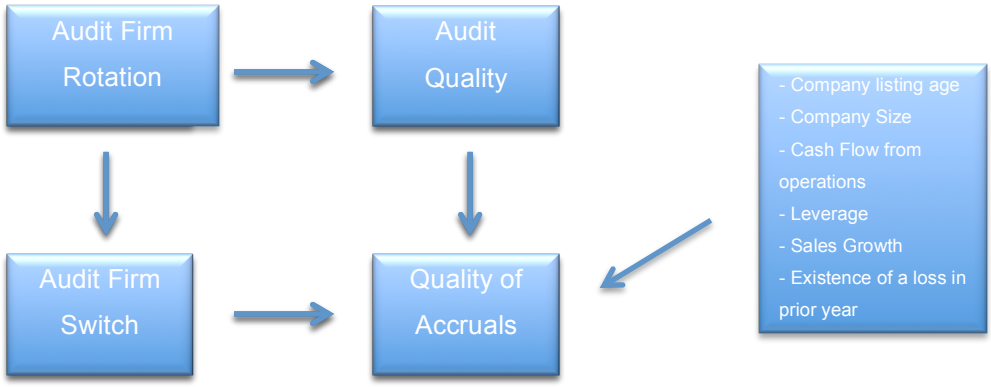


**Figure 3: Hypothesis 1**

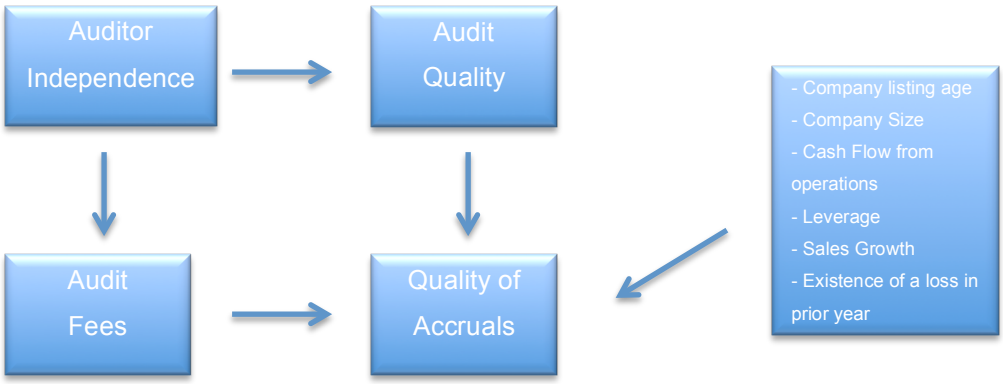


**Figure 4: Hypothesis 2**

### 8.2.1 Measurement of audit quality

To measure the dependent variable of the first hypothesis, audit quality, the quality of accruals (ACQ) is used as a proxy. The important characteristic of accruals is that they can modify the timing of reported earnings. Discretionary accruals are subjective and reflect a higher degree of managerial judgment: these types of accruals can be described as adjustments to cash flows selected by the manager. Therefore, discretionary accruals enable the manager to transfer earnings between periods (Healy, 1985). Thus when audit quality is high, auditors constrain management's opportunistic income increasing or opportunistic income-decreasing accruals, resulting in reported earnings that are of high quality (Myers, Myers, & Omer, 2003).

Many studies have investigated the quality of accruals, for example the Jones model (Jones, 1991), the Modified Jones model (Dechow, Sloan, & Sweeney, 1995), the Dechow & Dichev approach (Dechow & Dichev, 2002) and the Modified Dechow and Dichev model (McNichols, 2002). In this study the approach of McNichols will be used because she combines the Jones model (1991) with the Dechow & Dichev (2002) model. The Jones model separates discretionary accruals from nondiscretionary accruals while Dechow & Dichev assessed accruals as a whole. With the combination of the two approaches, the explanatory power increased. McNichols estimated the following equation for accruals, where the standard deviation of residuals is the proxy of working capital accrual quality:

$$\Delta WC_t = \beta_0 + \beta_1 CFO_{t-1} + \beta_2 CFO_t + \beta_3 CFO_{t+1} + \beta_4 \Delta Sales_t + \beta_5 PPE_t + \varepsilon_t \quad (1)$$

Where:

| | |
|---|---|
| ∆ WC = | the change in account receivable, inventory, accounts payable, taxes payable, and other assets |
| CFO = | cash from operations |
| ∆ Sales = | the change in sales |
| PPE = | the level of property, plant and equipment. |

The residuals (ε) from the regression are important because this reflects the accruals that not related to cash flow realizations: the standard deviation of these residuals is a company-level measure of an accrual quality. This suggests that higher standard deviation denotes lower accrual quality (McNichols, 2002).

### 8.2.2 Measurement of audit tenure

The independent variable of the first hypothesis, i.e. AFR, is the primarily concern of this study. This variable can be measured by using audit tenure, defined as the amount of years one audit firm remains with the same client. With the implementation of MAFR in the Netherlands, long audit tenure will be avoided, as it can lead to a decrease in audit quality. Audit tenure can be measured in two different ways, namely as a continuous variable (Myers, Myers, & Omer, 2003) or as a dichotomous variable (Johnson, Khurana, & Reynolds, 2002; Ghosh & Moon, 2005; Davis, Soo, & Trompeter, 2009). However companies do not regularly change audit firm, which can lead abnormal large audit tenure. As an example the British bank Barclays is given: in 2015 Barclays switched audit firm for the first time in 119 years (Nederlandse Beroepsorganisatie van Accountants, 2015). Because one company does not regularly change audit firm, the use of audit tenure as a measure would require a lot of historical data, which is difficult to gather especially for the Netherlands. Therefore, in this study the binary variable SWITCH is used to measure AFR. This variable will indicate whether or not the audit firm was switched. With the use of this variable, the audit quality from three years after the switch is expected to be higher than the audit quality three years prior to the switch.

SWITCH = 1 if company has switched audit firm in time t; = 0 otherwise SWITCH = 0. **(2)**

### 8.2.3 Measurement of auditor independence

The other important independent variable is auditor independence, which will be measured by audit fees (AF). Frankel et al. (2002) consider that high fees paid by a company to its auditor increase the economic bond between the auditor and the

client. Therefore, audit fees may impair the auditor's independence and thus the changes over time of audit fees for a particular client should be measured. Similar to Okolie (2014), audit fees are chosen as proxy to measure auditor independence. The audit fees are defined as follows:

LNAF = Natural log of the audit fees paid by the company.
**(3)**

### 8.2.4 Measurements of control variables

To overcome other related effects, additional control variables should be incorporated into the regression. These control variables are chosen for the sake of consistency with prior related studies, which have tested audit quality measured by accruals.

The company's listing age (AGE) is chosen as a control variable because this captures the fact the younger companies are less stable and more likely to encounter financial distress and thus more likely to use accruals to achieve a better profitability level (Cameran, Prencipe, & Trombetta, 2006). The company size (SIZE) is used as a control variable because larger firms tend to have lower levels of accruals then smaller firms (Dechow & Dichev, 2002). Cash from operations (CFO) is used because of the negative relationship between such variables and accruals (Dechow, 1994). Also, companies with higher cash from operations are more likely to be better performers (Frankel, Johnson, & Nelson, 2002). Leverage (LEV) is used as a control variable because this represents a proxy for the possibility of debt covenant violations that may create an incentive to increase earnings through higher abnormal accruals (Cameran, Prencipe, & Trombetta, 2006). Sales growth (SALESGR) is also used as a control variable, because accruals are likely to be correlated with the company's growth opportunities (Johnson, Khurana, & Reynolds, 2002). The existence of a loss in the prior year (LAGLOSS) is a control variable because this represents a proxy for financial distress and is an incentive to increase reported earnings in the following year.

## 8.3 Regression model

The Libby boxes shown in

**Figure 3** and **Figure 4** have operationalized the hypotheses, allowing the regression model to be constructed. To empirically test the hypotheses established in Chapter 7, the underlying regression model is set up. In the first place the model is set up to test the association between AFR and audit quality. This association is tested by using

the following regression model, where the subscripts i and t respectively indicate company and year:

$$ACQ_{i,t} = \beta_0 + \beta_1 SWITCH_{i,t} + \beta_2 LNAF_{i,t} + \beta_3 AGE_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 CFO_{i,t} + \beta_6 LEV_{i,t} + \beta_7 SALESGR_{i,t} + \beta_8 LAGLOSS_{i,t} + \varepsilon_{i,t} \quad \textbf{(4)}$$

### 8.3.1 Measurement of variables

In Table 4 the measurement variables used in Equation (4) are explained.

| VARIABLES | DEFINITION | TYPE | MEASUREMENT |
|---|---|---|---|
| ACQ | Accrual Quality | Dependent | Standard deviation of residuals |
| SWITCH | Audit Firm Switch | Independent | Dummy variable = 1 if company has switched audit firm in time t; = 0 otherwise Dummy variable = 0 |
| LNAF | Audit Fees | Independent | Natural log of the audit fees paid by the company |
| AGE | Company listing age | Control | Number of years since the company's IPO |
| SIZE | Company Size | Control | Natural log of total sales |
| CFO | Cash Flow from Operations | Control | Operating cash flow |
| LEV | Leverage | Control | Financial leverage ratio (estimated as ratio of total liabilities / total assets) |
| SALESGR | Sales Growth | Control | Ratio between sales in year t to sales in year t-1 minus 1 |
| LAGLOSS | Existence of a loss in prior year | Control | Dummy variable = 1 if the company reported negative income in year t-1, = 0 otherwise. |

**Table 4: Measurement of variables**

## 8.4 Sample selection and data collection

The focus of this study was initially supposed to be concentrated on the current Dutch situation, where all public interest entities (PIEs) are required to rotate audit firm after ten years starting January 1, 2016. These entities include listed companies, banks and insurers. After this audit firm tenure of ten years, a so called 'cooling off'

period of two years is mandatory. Companies that will have the same auditor for ten consecutive years prior to January 1, 2016 will need to change audit firms before this date (BDO, 2014).

### 8.4.1 Sample country

After exploring different databases for the availability of data, it was discovered that the required regression data for Dutch listed companies was not available. Because of the unavailability of important variables in databases for publicly listed Dutch companies, this study will focus on listed companies from the United States. Even though audit partner rotation after five years is mandatory in the United States, they do not have regulations mandating AFR yet. This subject has been on the agenda of the PCAOB for a long time, but in 2014 it was taken from the active agenda. Assumed is that requiring companies to rotate their auditors would not provide any additional audit quality, which was not already provided by having the audit partners to rotate (Ryan, 2014).

The fact that the United States does not have MAFR in place does not limit this current study and does not influence the sample choice. The implementation date of MAFR in the Netherlands is set for January 2016. For this reason the current study cannot investigate the effect before and after the implementation of MAFR. To study the influence of switching audit firms, MAFR does not have to be in place. This study considers the situation before MAFR was implemented: therefore the situation in the Netherlands and the United States are comparable. This study will focus on (1) the moment that an audit firm switched and (2) the change between the audit quality before and after the switch.

### 8.4.2 Sample companies

The initial search for a sample was focussed on U.S. companies listed on the New York Stock Exchange (NYSE), which is the largest stock exchange in the world by both market capitalization and trade value. This chosen sample consisted of 2604 companies, from which inactive and financial services companies were already excluded. Financial services companies were excluded because the nature of the items in their financial statements is not comparable to those of other type of firms (Becker, Defond, Jiambalvo, & Subramanyam, 1998). In the sample companies were counted by looking at their unique CIK number, which is a number given to an individual or company by the Securities and Exchange Commission (SEC). Looking at the availability of the data, the following three exclusions are made: companies without a CIK number, companies that are unaudited and companies for which the auditor is not defined.

To retrieve data on the segments and audit fees, different databases within the Wharton Research Data Services (WRDS) were used. This led to the creation of two separate datasets, which include the audit fees of U.S. companies and a dataset, which includes the segments. The data for audit fees and for segment was only available for the period 1997-2015 and 1996-2015 respectively.

### 8.4.3 Sample period

Due to the fact that most companies do not switch audit firm often, the initial sample consisted of the biggest sample period possible, i.e. for the period 1976-2015. When combining the dataset from COMPUSTAT with the data from Audit Analytics, the sample period was reduced to 1999-2015 because of the availability of the audit fees data.

### 8.4.4 Data collection

In order to construct the sample, the database COMPUSTAT North America is used for most variables. This database is part of WRDS. To collect the data on audit fees, the Audit Analytics database is used (this database is also part of WRDS). Lastly the Historical Segments dataset within COMPUSTAT via WRDS was used; from this database the data on the business and geographic segments for U.S. companies was gathered.

### 8.4.5 Data cleaning

After taking into account these considerations, it was noticed that the data contained multiple conflicts; the data was 'unclean' and these conflicts needed to be filtered out. Conflict1: some companies had switched audit firm twice in one year. For these companies, the first was deleted. Conflict 2: other companies had multiple audit firms in one year, resulting in multiple sets of audit fees within one year for one company. This phenomenon can be explained by the new regulations where audit firms should avoid combining audit services with other services to one client. These 'Chinese Walls' were introduced to enhance auditor independence. To solve this problem, the audit fees were summed up as one amount.

Next, only companies with a full set of firm-year observations were included which implies that per company, seventeen years (1999-2015) of information should be available. Because working capital (a proxy for audit quality) is the most important data from this research, only the companies with a full set of working capital data were included. Finally, all the data from 1999 were removed, because those firm-years observations did not include relevant data. These filtering steps resulted in a final sample that consists of 745 companies and 12.665 firm-year observations.

## 8.5 Conclusion

In this chapter the research methodology that will be used to test the hypotheses was established. This study contains two main independent variable i.e. SWITCH and LNAF, respectively to measure AFR and auditor independence. A sample consisting of U.S. companies listed on the NYSE was used for the period 1999-2015. The sample that will be used in the regression model contains 12.665 firm-year observations.

# 9. RESULTS

## 9.1 Introduction

In this chapter, statistical procedures are used to test the hypotheses put forward in Chapter 7. Firstly, accrual quality is estimated by doing the regression on the differences in working capital. Before preforming the regression analyses, the four assumptions of a regression are tested i.e. multicollinearity, reliability of measurement, homoscedasticity and normality. Next, the two hypotheses will be examined and analysed in order to conclude whether the hypothesis will be accepted or rejected.

## 9.2 Accrual quality estimation

To estimate audit quality, the proxy of accrual quality is used and is determined with the following regression:

$$\Delta WC_t = \beta_0 + \beta_1 CFO_{t-1} + \beta_2 CFO_t + \beta_3 CFO_{t+1} + \beta_4 \Delta Sales_t + \beta_5 PPE_t + \varepsilon_t$$

**(1)**

The results of the regression, displayed in Table 8, show that all the independent variables are statistically significant (as the p-values < 0.05; the p-values are indicated by 'Sig' in Table 8). From the ANAVO model, displayed in Table 7, it can be concluded that the overall regression model is a good fit for the data.

From this model the accrual quality must be calculate, by measuring the standard deviation of the residuals. This standard deviation of these residuals will indicate the firm-specific measure of quality: higher standard deviations indicate a lower quality of audits.

## 9.3 The conditions of regression

Before preforming the main multiple regression of this study, four assumptions should be tested for the results to be trustworthy; tests are performed on the normality, multicollinearity, homoscedasticity and reliability of measurement (Osborne & Waters, 2002).

### 9.3.1 Check for normality

Before performing the regression analyses, it should be tested if the errors are normally distributed. If these are not normally distributed the relationship and significance test can be distorted. The Kolmogorov-Smirnov and Shapiro-Wilk test, displayed in Table 9, shows that the null hypothesis of the dependent variable being normally distributed can be rejected (as the p-values 0.000 < 0.005). Here is shown that there are probably outliers in the sample, which disturb the normality. Another approach for determining the normality is the Normal Q-Q Plot, as shown in Figure 6. This plot shows a distribution that is nearly normal, as most of the observations are aligned. There are some outliers observed that should be taken into account. With the boxplot, displayed in Figure 7, the outliers that cause non-normality are detected and should be deleted. In the data there a few missing and extreme values, which can be identified as outliers. For determining which outliers should be removed, a critical z score of |3.29| was used. After removing these outliers, the data has an improved normal distribution as is shown in Figure 9 and Figure 10.

### 9.3.2 Check for multicollinearity

To check whether the independent variables are multi-correlated, a correlations table for all variables was constructed, as displayed in Table 10. Multicollinearity decrease the power of the statistics tests and cause the interpretation of the regression coefficient estimates to be problematic. In this study the two explanatory variables in the multiple regression model are AFR and auditor independence. It is essential to investigate if MAFR is not severely correlated with auditor independence. Table 10 indicates that most independent variables do not have the problem of multicollinearity (as the correlation values < 0.700). The exception is the correlation between LNAF and SIZE (as the correlation value is 0.785 > 0.700), which indicates that larger companies pay higher fees to the auditor. If the multicollinearity between LNAF and SIZE causes a problem, one of the two variables should be omitted from the model.

To double-check this multicollinearity, the VIF-values of each independent variable are calculated and depicted in Table 10. A VIF-value above 10 can indicate multicollinearity, while values above 4 or 5 could suggest a probable case of multicollinearity. In Table 11 is shown that the VIF-values of LNAF and SIZE are the highest in the model, but these values are lower than 4. From these two tests it can be determined that the multicollinearity between LNAF and SIZE is not significant enough for the variable to be omitted from the model.

### 9.3.3 Check for homoscedasticity and reliability of measurement.

The last two tests are shown in Appendix 4. To test for homoscedasticity the residuals are predicted and plotted to check for a certain pattern. In Appendix 4 the plots show that there is no clear observed pattern, which indicates that the condition for homoscedasticity is met. To test the reliability of the measurement, the serial correlation in the errors should be tested. This can be done by plotting the residual time series and creating a table or plot of residual autocorrelations, as shown in the different tables and figures in Appendix 4. The observations are scattered more or less in an inclined rectangular shape, which indicates the independents of residuals and thus reliable measurements.

## 9.4 Regression results

To measure the research question of this thesis, the following regression model is estimated:

$$ACQ_{i,t} = \beta_0 + \beta_1 SWITCH_{i,t} + \beta_2 LNAF_{i,t} + \beta_3 AGE_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 CFO_{i,t} + \beta_6 LEV_{i,t} + \beta_7 SALESGR_{i,t} + \beta_8 LAGLOSS_{i,t} + \varepsilon_{i,t} \quad \textbf{(4)}$$

To interpret the regression results, two important assumptions of the study should be considered. Firstly this study suggests, as mentioned by McNichols (2002), that higher standard deviation denotes lower accrual quality. Because of the latter, this study assumes a negative relation between the standard deviation of the residuals and accrual quality. Secondly, is a positive relation between accrual quality and audit quality is assumed, as accrual quality is a proper proxy for audit quality. In the sequel of this chapter, the above-mentioned steps will be skipped.

**Descriptive Statistics**

| | Mean | Std. Deviation | N |
|---|---|---|---|
| SD_ZRES | 1419.4127 | 3.00650 | 3888 |
| SWITCH | .05 | .220 | 3888 |
| LNAF | 14.3011 | 1.17385 | 3888 |
| AGE | 13.4964 | 7.70814 | 3888 |
| SIZE | 7.5079 | 1.58431 | 3888 |
| CFO | 973.0013 | 3041.49575 | 3888 |
| LEV | .6048 | .58161 | 3888 |
| SALES_GR | 407.0720 | 2975.13197 | 3888 |
| LAGLOSS | .1672 | .37319 | 3888 |

**Table 5: Descriptive statistics table**

The descriptive statistics table shows that the firm-year observations are drastically decreased compared with the final sample. For the regression model different data was necessary, therefore the final dataset had still some missing values. The average accrual quality (SZ_ZRES) is a number that cannot be interpreted solely, but can be used as a benchmark. When testing the first hypothesis, the means of switched and not switched companies will be compared. The standard deviation of accrual quality shows that the values are concentrated around the mean. This indicates that there is no large difference between accrual quality of companies in the sample. In the model summary of the results, as shown in Table 12, the $R^2$ of this model is estimated at 0.413, which is an accepted level for a model. The $R^2$ indicates that 41.3% of the total variance in accrual quality is explained by the independent variables of the model. The ANOVA table, shown in Table 13, indicates that the model can predict the outcome of the regression (as p-value < 0.000).
Table 14 shows the results of the regression coefficients. The standardized coefficients of this table show that AGE (Beta = 0.459) and LNAF (Beta = 0.456) have the strongest contribution to explaining the outcome of the model. This implies that the age of a company has a large influence on the audit quality. Moreover the variable LNAF, which is a proxy for audit independence, also largely influence the quality of audits.

When looking at the significance level of the coefficients, it can be concluded that some variables do not make a significant unique contribution to the prediction of the outcome (when |t| < 2). This is the case for the variable SWITCH and LAGLOSS. Although the variables CFO and SALESGR are significant, the coefficients are closed to zero which indicates that these variables do not influence the outcome significantly.

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 1402.798 | .565 | | 2481.391 | .000 |
| | SWITCH | -.233 | .168 | -.017 | -1.386 | .166 |
| | LNAF | 1.166 | .054 | .456 | 21.618 | .000 |
| | AGE | .186 | .005 | .459 | 35.429 | .000 |
| | SIZE | -.314 | .041 | -.166 | -7.717 | .000 |
| | CFO | -4.868E-5 | .000 | -.049 | -3.343 | .001 |
| | LEV | -.155 | .064 | -.030 | -2.422 | .015 |
| | SALES_GR | -2.839E-5 | .000 | -.028 | -2.151 | .032 |
| | LAGLOSS | -.067 | .102 | -.008 | -.654 | .513 |

a. Dependent Variable: SD_ZRES

**Table 14: Regression coefficients table**

## 9.5 Test of hypothesis 1

As mentioned in the hypotheses development, the first hypothesis that should be tested is given as:

Hypothesis 1: *Audit firm rotation will not enhance audit quality.*

The results of the regression show a negative relation between the measurement of accrual quality and the dummy variable SWITCH. For interpreting the regression it is important to keep in mind the negative relation between accrual quality and the standard deviation of the residuals, this relation indicates lower accrual quality if the standard deviations are high. The beta of -0.233 implies that when a company switches (as SWITCH = 1), the standard deviation decreases with 23%, shown in Table 14. When looking at the accrual quality, the model estimates that switched companies have a higher accrual quality, and thus a higher audit quality, than non-switched companies. However, when estimating the regression model the significance level of this coefficient is not high (as p-value > 0.05) which indicates that SWITCH does not make a signification unique contribution to the prediction of audit quality.

It can be concluded that the AFR does not have a significant influence on audit quality, which proves that the first hypothesis cannot be rejected nor accepted.

### 9.5.1 Comparing means

To get significant results concerning the first hypothesis, the variable SWITCH needs to be excluded from the model. When using the variable SWITCH to divide the sample into two, a comparison of means can be performed. All the companies without a complete set of data were excluded, allowing the estimation to be as accurate as possible. When looking at the complete sample, the overall means of standard deviations of the residuals were compared between the firm-year observations with and without a switch, shown in Table 16. In this table is observed that there are 10.527 firm-year observations that do not include a switch and 546 that do include a switch. The table shows that the years where there was no switch (SWITCH = 0) have a slightly higher mean, than the years where there was a switch (SWTICH = 1). This fact indicates that the audit quality for the years without a switch was lower than the years with a switch. From these results no conclusion of interest for the study is achieved, because the focus of this study is on the improvement of audit quality after a switch. To obtain this knowledge, the audit quality must be

measured during the period, which spans three years before and three years after the switch.

To get to the results that are of interest for his study, two new variables were computed: the standard deviation of the residuals with a lag of t-3 (SD_ZRES_t-3) and one with a lag of t+3 (SD_ZRES_t+3). As shown in Table 16, 546 firm-year observations include a switch. When calculating the lags, some observations were excluded because of the fact that either t-3 or t+3 could not be calculated as a result of the fixed sample range. Because of this, only 516 firm-year observations were included in the comparison of means, as shown in Table 17 and Table 18. When combining Table 17 and Table 18, it is seen that the differences in means without a switch (SWITCH = 0) is much smaller than the differences in means with a switch (SWITCH = 1). For firm-year observations without a switch, a small decrease is seen in the means, whereas for firm-year observations with a switch a significant decrease in means is observed. This implies that accrual quality three years before the switch was lower than three years after the switch, for companies who have switched audit firm. For companies that did not switch audit firm, it can be stated that the accrual quality does change significantly in those years.

These obtained results prove that the first hypothesis, which states that AFR will not enhance audit quality, can be rejected.

### 9.6 Test of hypothesis 2

As mentioned in the hypotheses development, the second and last hypothesis that should be tested is given as:

Hypothesis 2*: Auditor independence will enhance audit quality*

To test this hypothesis the variable LNAF from the regression coefficient table should be interpreted (see Table 14). As mentioned in Chapter 8, entitled Research design, the LNAF is used as a proxy of auditor independence. Frankel et al. (2002) concluded that audit fees might impair auditor independence; higher audit fees indicate impairment of independence.

Firstly, the results of the regression indicate that auditor independence strongly contributes to the explanation of accrual quality; the estimated standardized coefficient is significantly high in the model. Moreover, the beta of LNAF (Beta =1.166) indicates a positive relation between the standard deviation of the residuals and audit fees. To further study these results, two relations should be

considered, namely the negative relation between audit fees and auditor independence and the negative relation between the standard deviation of the residuals and the accrual quality. When considering the latter, it can be concluded that there is a positive relation between auditor independence and audit quality. With this obtained results the second hypothesis, which states that auditor independence will enhance audit quality, can be accepted.

## 9.7 Conclusion

When looking at the results of the study, firstly is seen that a switch does not have a significant influence on audit quality in the estimated regression. However, when the calculated averages between switched and non-switched firms are compared, a significantly result is observed: audit quality after an AFR is higher than before a rotation. With these findings the first hypothesis can be rejected. Shown as well is the finding that the age of a company has a significantly large influence on audit quality, which indicates a negative relation with audit quality. Audit quality thus decreases as the number of years the company is listed increases. Although this is not the focus of the study, it is still a noteworthy outcome, since this could be associated with audit tenure.

More important are the obtained results, which show that auditor independence has a significant influence on audit quality, as audit fees are negatively related to audit quality. This indicates that the choice of an independent auditor will lead to enhanced audit quality, which shows again that the second hypothesis can be accepted.

# 10. CONCLUSION

## 10.1 Main conclusion

In this thesis the relation between AFR and audit quality is researched by giving an answer to the following research question:

*Is there an association between audit firm rotation and audit quality?*

The main results of this study, using accrual quality as a measure of audit quality, shows that companies that switched audit firms have higher audit quality after the switch. The results of the study as well show that auditor independence is positively related to audit quality, which indicates that legislators have supported reasoning for the implementation. These results indicate that AFR, as a way to enhance auditor independence, is indeed associated with audit quality.

If these findings can be generalised to the Dutch setting, where AFR is mandatory starting January 2016, the implementation could enhance the audit quality for Dutch companies.

## 10.2 Limitations

The biggest limitations of this study concerns the sample used. Firstly, sample contains not all U.S. companies listed on the NYSE, because of the unavailability of the data. In addition, the sample contains non-randomly assigned data, which decreases the possibility to generalise the obtained results.

Secondly, the sample used is generalised to the Dutch setting, with the assumption that the two countries can be compared. This method is used because of the complexity of the regression model, and therefore the unavailability of the data for Dutch companies. Although there are similarities between the United States and the Netherlands, these two countries cannot be perfectly compared to each other and therefore these conclusions cannot be perfectly generalized for the Dutch setting.

Thirdly, limitations exist concerning the data period used. The sample period used in this study spans form 1999 until 2015. In selecting the sample period the years of the financial banking crisis (2008 until 2012) were not excluded from the sample. Previous studies have shown that audit quality during the years of the crisis

could be influenced by the risk of litigation. A higher litigation risk leads to problems in the relationship between companies and their auditors, e.g. companies blaming their auditor for possible losses. This has led to auditors increasing the audit quality to avoid litigation. The effects of the crisis years, which were not exclude from the sample, could influence the results obtained in this research, as is described above.

### 10.3 Recommendations for future research

Future research could examine Dutch companies with the same regression model and implications used in this study. Here the focus should be on a period of three years before and three years after the implementation of MAFR in order to observe the impact on audit quality.

In theory there should be additional financial costs association with the switch, e.g. for the extra time needed to become familiar with the company's business. However, an investigation of top Dutch listed companies indicates that switching audit firm pays off. These findings show that the auditing costs were reduced for companies, which had already switched audit firm because of the new legislation (Het Financieele Dagblad, 2016). Therefore it would be interesting to study the cost associated with AFR, as this is an important component of AFR.

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# APPENDICES

## Appendix 1: Result ACQ regression

**Model Summary[b]**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|---|---|---|---|---|---|
| 1 | .138[a] | .019 | .019 | 1403.40705 | 1.027 |

a. Predictors: (Constant), PPE, SALES_D, CFO_t_plus_1, CFO_t_min_1, CFO

b. Dependent Variable: WC_D

**Table 6: Model Summary WC_D**

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 421075808.1 | 5 | 84215161.61 | 42.759 | .000[b] |
| | Residual | 2.180E+10 | 11067 | 1969551.359 | | |
| | Total | 2.222E+10 | 11072 | | | |

a. Dependent Variable: WC_D

b. Predictors: (Constant), PPE, SALES_D, CFO_t_plus_1, CFO_t_min_1, CFO

**Table 7: ANOVA table WC_D**

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | -27.415 | 14.194 | | -1.931 | .053 |
| | CFO_t_min_1 | .177 | .018 | .453 | 10.015 | .000 |
| | CFO | -.184 | .019 | -.492 | -9.915 | .000 |
| | CFO_t_plus_1 | -.048 | .013 | -.133 | -3.695 | .000 |
| | SALES_D | -.014 | .003 | -.056 | -4.726 | .000 |
| | PPE | .006 | .001 | .107 | 4.645 | .000 |

a. Dependent Variable: WC_D

**Table 8: Coefficients table WC_D**

## Appendix 2: Normality

**Tests of Normality**

| | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|
| | Statistic | df | Sig. | Statistic | df | Sig. |
| Standardized Residual | .022 | 3888 | .000 | .990 | 3888 | .000 |

a. Lilliefors Significance Correction

**Table 9: Test of Normality of residuals**

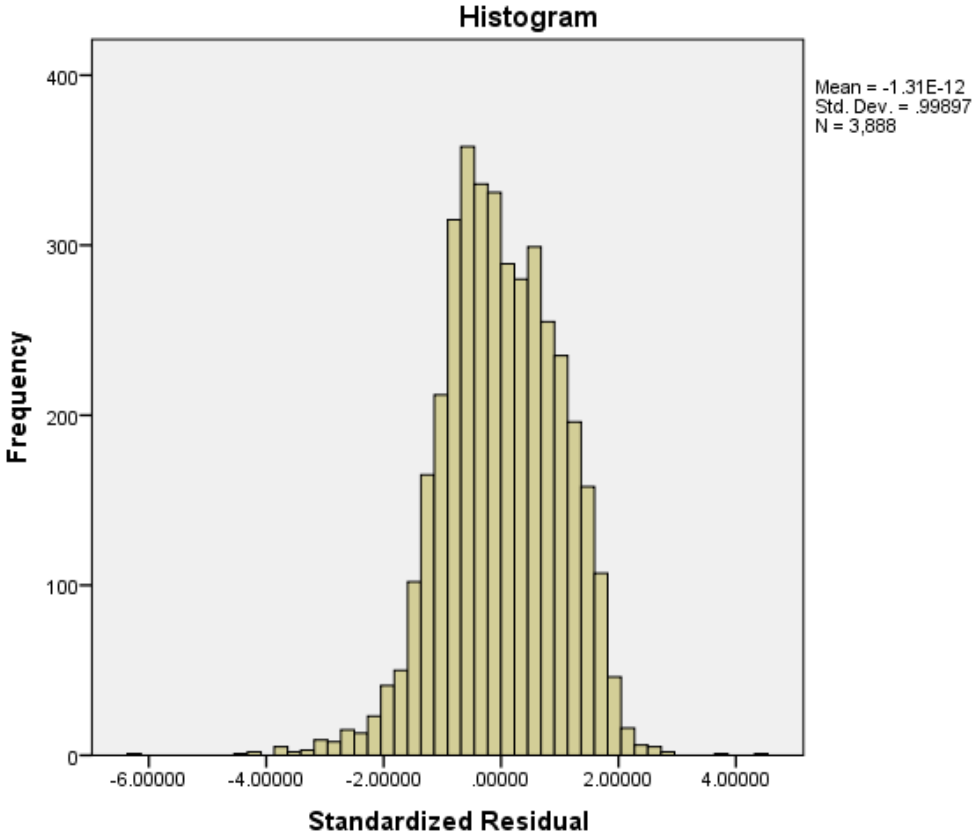


**Figure 5: Histogram of residuals**

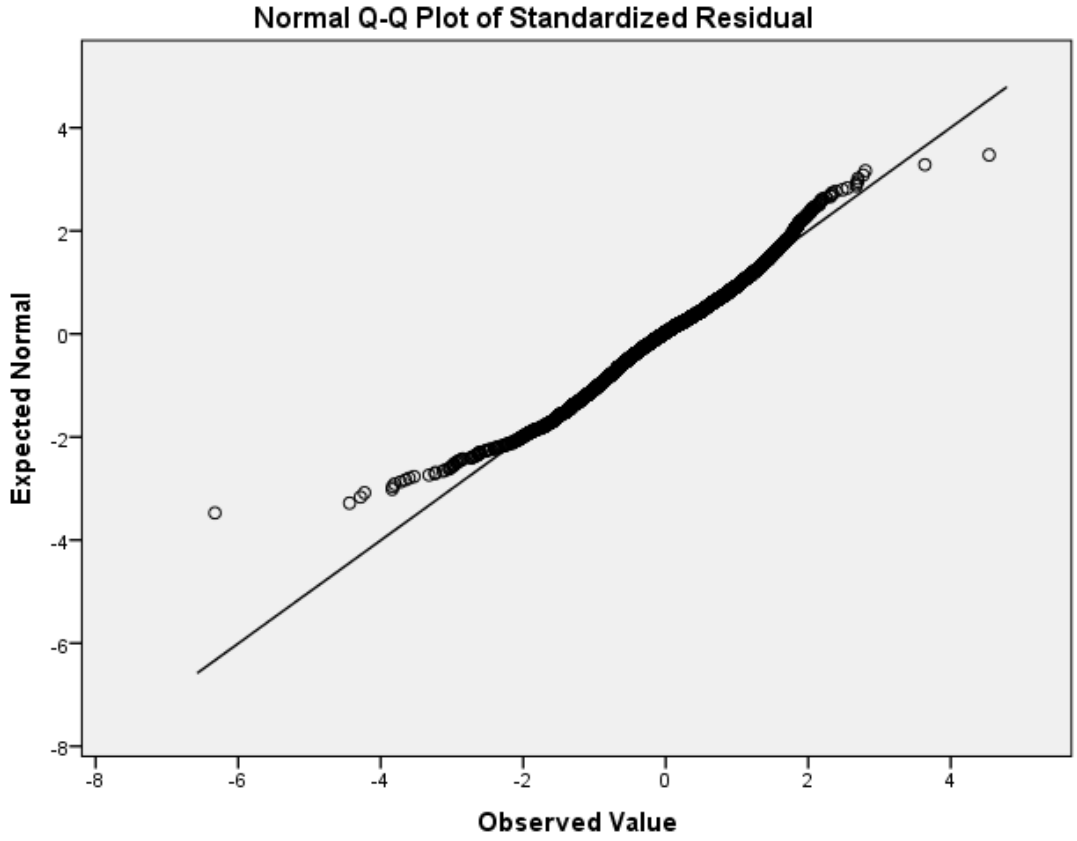


**Figure 6: Normal Q-Q Plot of residuals**

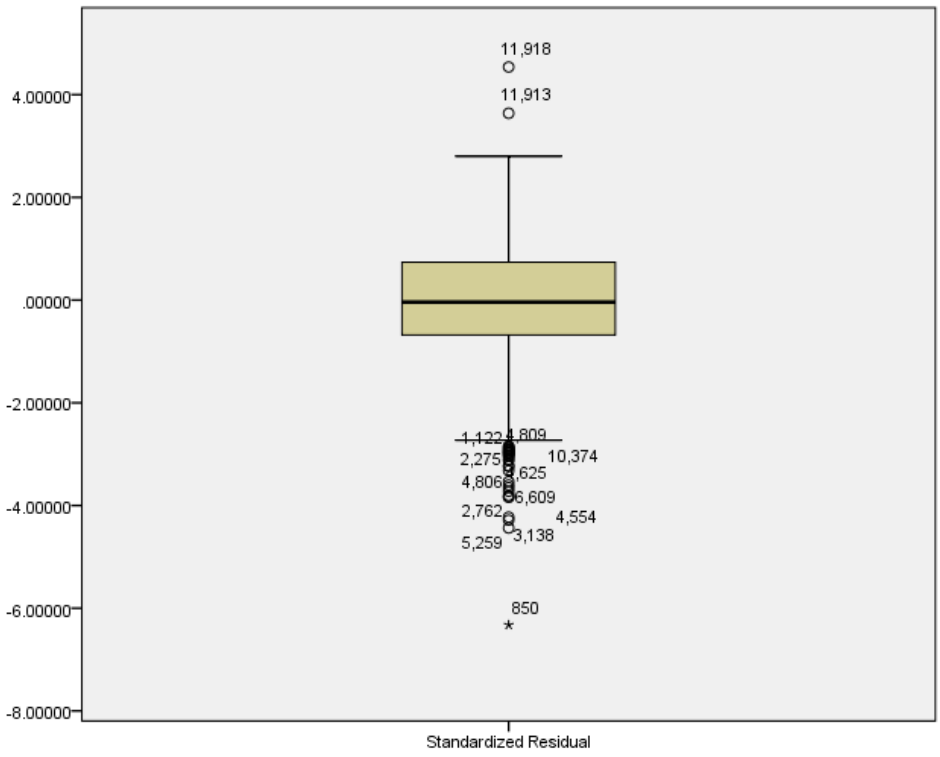


**Figure 7: Boxplot of residuals**

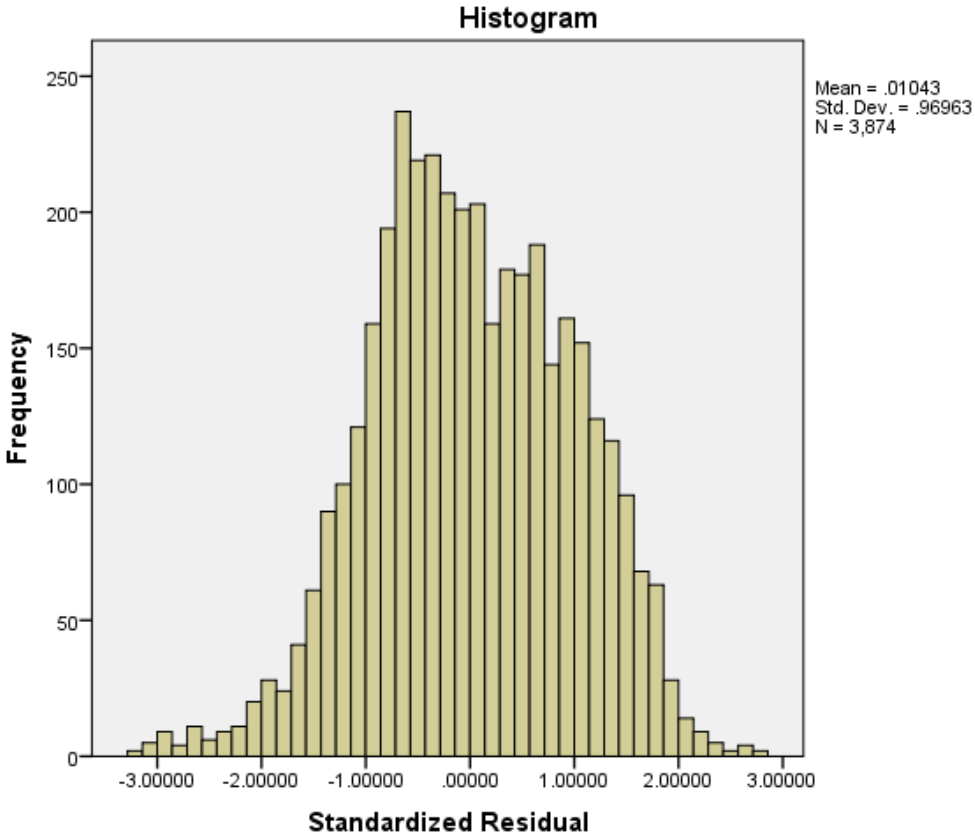


**Figure 8: Histogram of residuals without outliers**

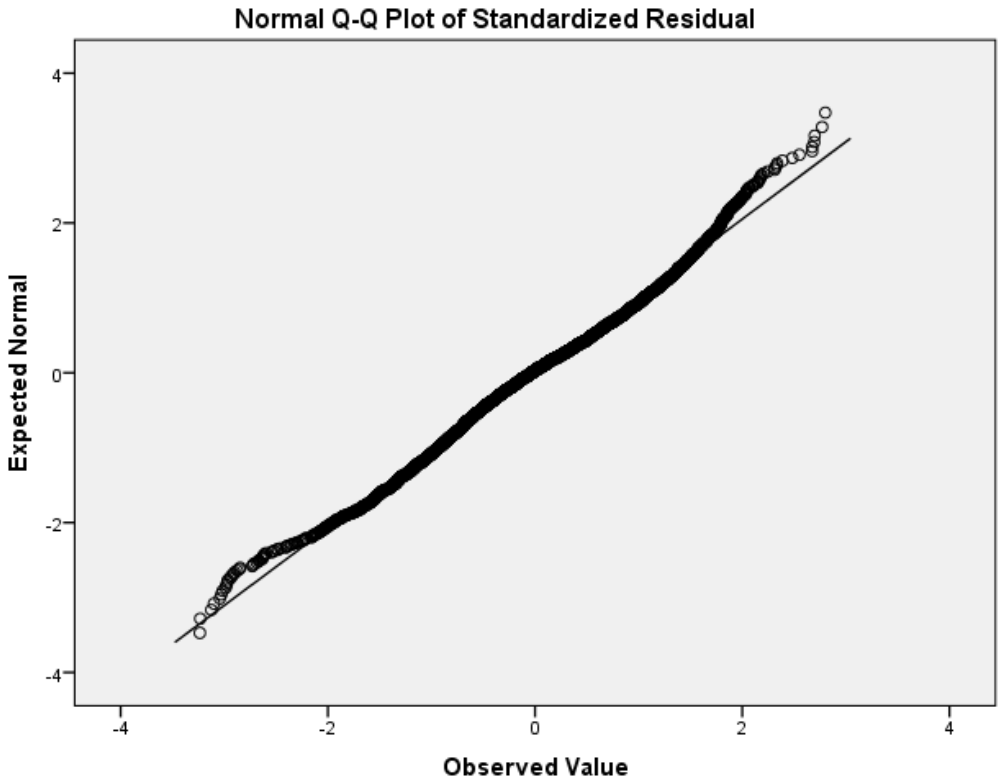


**Figure 9: Normal Q-Q Plot of residuals without outliers**

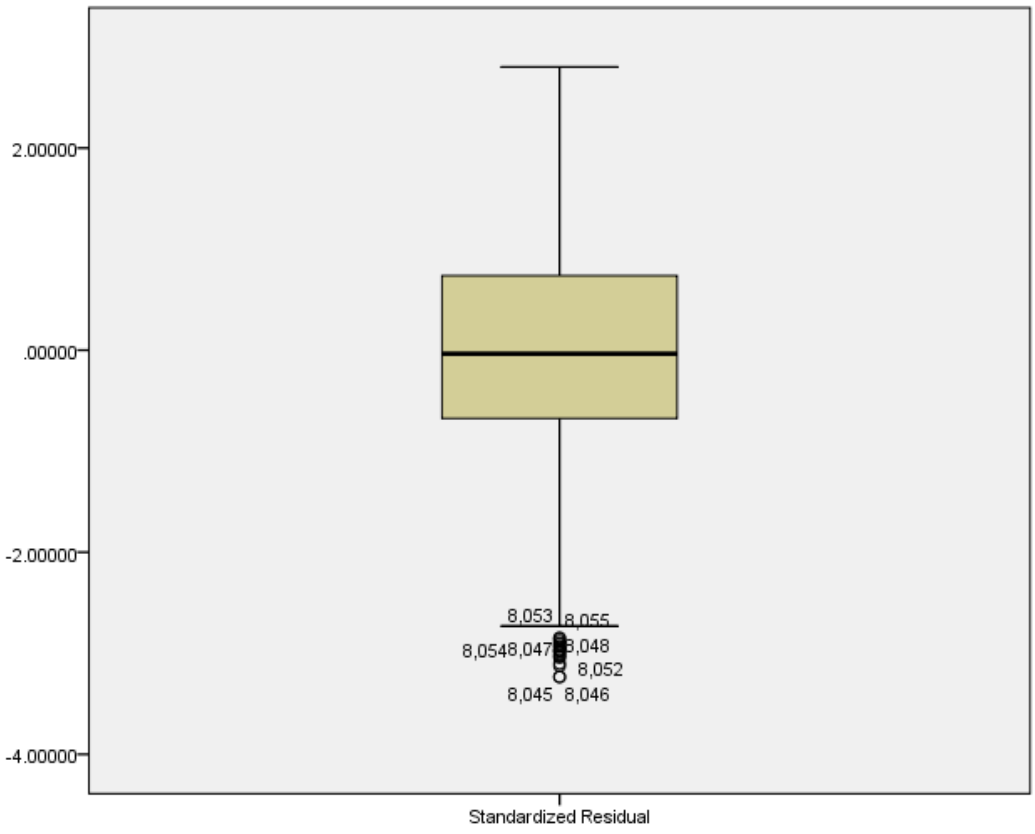


**Figure 10: Boxplot of residuals without outliers**

## Appendix 3: Multicollinearity

**Correlations**

| | | SD_ZRES | SWITCH | LNAF | AGE | SIZE | CFO | LEV | SALES_GR | LAGLOSS |
|---|---|---|---|---|---|---|---|---|---|---|
| Pearson Correlation | SD_ZRES | 1.000 | -.079 | .429 | .533 | .239 | .107 | -.021 | -.022 | -.015 |
| | SWITCH | -.079 | 1.000 | -.102 | -.063 | -.082 | -.013 | .047 | -.001 | .027 |
| | LNAF | .429 | -.102 | 1.000 | .295 | .785 | .444 | -.003 | .133 | -.050 |
| | AGE | .533 | -.063 | .295 | 1.000 | .179 | .107 | -.016 | -.016 | -.039 |
| | SIZE | .239 | -.082 | .785 | .179 | 1.000 | .503 | -.086 | .203 | -.177 |
| | CFO | .107 | -.013 | .444 | .107 | .503 | 1.000 | -.036 | .291 | -.100 |
| | LEV | -.021 | .047 | -.003 | -.016 | -.086 | -.036 | 1.000 | -.011 | .087 |
| | SALES_GR | -.022 | -.001 | .133 | -.016 | .203 | .291 | -.011 | 1.000 | -.062 |
| | LAGLOSS | -.015 | .027 | -.050 | -.039 | -.177 | -.100 | .087 | -.062 | 1.000 |
| Sig. (1-tailed) | SD_ZRES | . | .000 | .000 | .000 | .000 | .000 | .094 | .087 | .179 |
| | SWITCH | .000 | . | .000 | .000 | .000 | .213 | .002 | .473 | .044 |
| | LNAF | .000 | .000 | . | .000 | .000 | .000 | .430 | .000 | .001 |
| | AGE | .000 | .000 | .000 | . | .000 | .000 | .160 | .161 | .007 |
| | SIZE | .000 | .000 | .000 | .000 | . | .000 | .000 | .000 | .000 |
| | CFO | .000 | .213 | .000 | .000 | .000 | . | .012 | .000 | .000 |
| | LEV | .094 | .002 | .430 | .160 | .000 | .012 | . | .244 | .000 |
| | SALES_GR | .087 | .473 | .000 | .161 | .000 | .000 | .244 | . | .000 |
| | LAGLOSS | .179 | .044 | .001 | .007 | .000 | .000 | .000 | .000 | . |
| N | SD_ZRES | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 |
| | SWITCH | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 |
| | LNAF | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 |
| | AGE | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 |
| | SIZE | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 |
| | CFO | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 |
| | LEV | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 |
| | SALES_GR | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 |
| | LAGLOSS | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 | 3886 |

**Table 10: Correlations between variables**

**Coefficients[a]**

| Model | | Collinearity Statistics | |
|---|---|---|---|
| | | Tolerance | VIF |
| 1 | SWITCH | .984 | 1.016 |
| | LNAF | .342 | 2.927 |
| | AGE | .900 | 1.111 |
| | SIZE | .328 | 3.046 |
| | CFO | .701 | 1.427 |
| | LEV | .976 | 1.025 |
| | SALES_GR | .905 | 1.105 |
| | LAGLOSS | .941 | 1.063 |

a. Dependent Variable: SD_ZRES

**Table 11: VIF-values independent variables**

## Appendix 4: Homoscedasticity and reliability of measurements

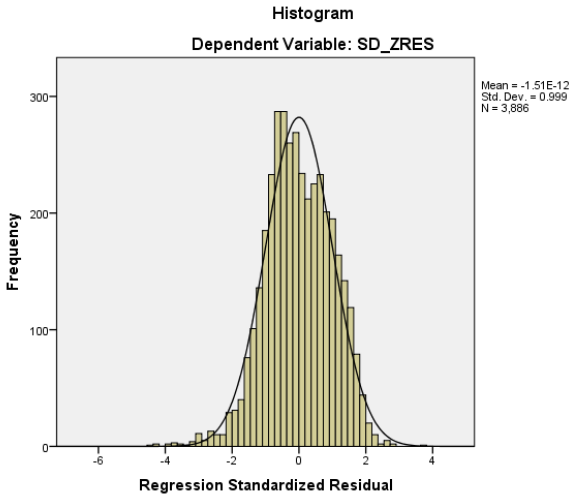


**Figure 11: Histogram residuals**

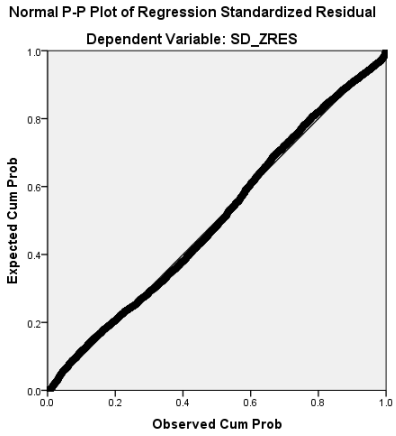


**Figure 12: Normal P-P plot residuals**

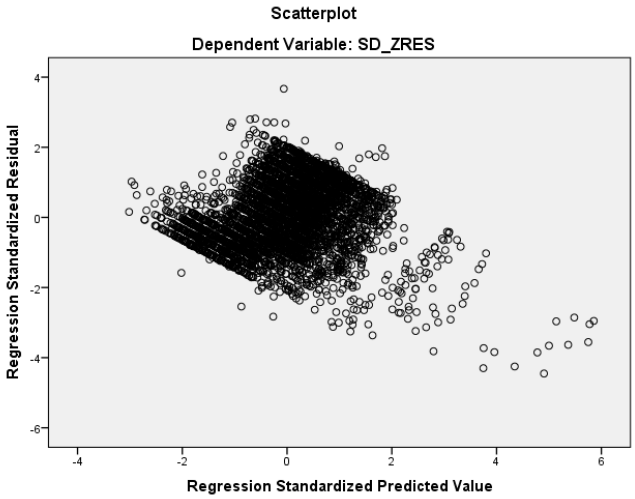

**Figure 13: Scatterplot residuals**

## Appendix 5: Regression results

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .642[a] | .413 | .411 | 2.29366 |

a. Predictors: (Constant), LAGLOSS, SWITCH, SALES_GR, AGE, LEV, CFO, LNAF, SIZE

**Table 12: Model summary regression**

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 14281.508 | 8 | 1785.188 | 339.331 | .000[b] |
| | Residual | 20333.374 | 3865 | 5.261 | | |
| | Total | 34614.881 | 3873 | | | |

a. Dependent Variable: SD_ZRES

b. Predictors: (Constant), LAGLOSS, SWITCH, SALES_GR, AGE, LEV, CFO, LNAF, SIZE

**Table 13: ANAVO table regression**

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 1402.798 | .565 | | 2481.391 | .000 |
| | SWITCH | -.233 | .168 | -.017 | -1.386 | .166 |
| | LNAF | 1.166 | .054 | .456 | 21.618 | .000 |
| | AGE | .186 | .005 | .459 | 35.429 | .000 |
| | SIZE | -.314 | .041 | -.166 | -7.717 | .000 |
| | CFO | -4.868E-5 | .000 | -.049 | -3.343 | .001 |
| | LEV | -.155 | .064 | -.030 | -2.422 | .015 |
| | SALES_GR | -2.839E-5 | .000 | -.028 | -2.151 | .032 |
| | LAGLOSS | -.067 | .102 | -.008 | -.654 | .513 |

a. Dependent Variable: SD_ZRES

**Table 14: Regression coefficients table**

**Residuals Statistics[a]**

| | Minimum | Maximum | Mean | Std. Deviation | N |
|---|---|---|---|---|---|
| Predicted Value | 1413.4647 | 1431.2661 | 1419.4151 | 1.92027 | 3874 |
| Residual | -8.34363 | 6.55315 | .00000 | 2.29129 | 3874 |
| Std. Predicted Value | -3.099 | 6.172 | .000 | 1.000 | 3874 |
| Std. Residual | -3.638 | 2.857 | .000 | .999 | 3874 |

a. Dependent Variable: SD_ZRES

**Table 15: Regression residuals statistics table**

**Descriptive Statistics**

| | Mean | Std. Deviation | N |
|---|---|---|---|
| SD_ZRES | 1419.4127 | 3.00650 | 3888 |
| SWITCH | .05 | .220 | 3888 |
| LNAF | 14.3011 | 1.17385 | 3888 |
| AGE | 13.4964 | 7.70814 | 3888 |
| SIZE | 7.5079 | 1.58431 | 3888 |
| CFO | 973.0013 | 3041.49575 | 3888 |
| LEV | .6048 | .58161 | 3888 |
| SALES_GR | 407.0720 | 2975.13197 | 3888 |
| LAGLOSS | .1672 | .37319 | 3888 |

**Table 5: Descriptive statistics table**

## Appendix 6: Comparison of means

**Report**

SD_ZRES

| SWITCH | Mean | N | Std. Deviation |
|---|---|---|---|
| 0 | 1419.2368 | 10527 | 3.12874 |
| 1 | 1418.1005 | 546 | 2.91501 |
| Total | 1419.1808 | 11073 | 3.12811 |

**Table 16: Comparison of means**

**Report**

SD_ZRES_t-3

| SWITCH | Mean | N | Std. Deviation |
|---|---|---|---|
| 0 | 1418.8435 | 10269 | 20.04422 |
| 1 | 1417.2574 | 516 | 62.62092 |
| Total | 1418.7676 | 10785 | 23.87321 |

**Table 17: Comparison of means with lag t-3**

**Report**

SD_ZRES_t+3

| SWITCH | Mean | N | Std. Deviation |
|---|---|---|---|
| 0 | 1418.4987 | 10269 | 31.46882 |
| 1 | 1415.9301 | 516 | 62.49937 |
| Total | 1418.3758 | 10785 | 33.61170 |

**Table 18: Comparison of means with lag t+3**