The effect of investor protection on earnings management

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Abstract

This thesis examines the relation between the extent of investor protection and the levels of accrual-based and real earnings management. Prior literature provided evidence of an inverse relationship between investor protection and accrual-based earnings management. Due to an increase in the extent of investor protection companies tend to use less accrual-based earnings management, instead companies tend to switch to use real earnings management. This may indicate an indirect positive relationship between investor protection and real earnings management. Together with the knowledge that real earnings management could destroy firm value an increase in investor protection might destroy firm value. The modified Jones model is used to examine the level of accrual-based earnings management, the models designed by Roychowdhury (2006) are used to examine the level of real earnings management and the period between 1999 and 2010 is studied. Samples from the U.K. and France are used in this study, classified as strong and weak investor protection countries respectively. This study shows that the levels of both types of earnings management are larger for U.K. companies compared to French companies which is not in accordance with the expectations. This may be caused by the fact that two countries are compared while prior literature examined companies from one country after a change in the extent of investor protection within this country. In this research the differences in the levels of the various types of earnings management could be caused by other variables which vary across both countries.

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1 Introduction

When people invest in a company they need to trust the people who they give their money to. They must be able to assume that the managers of the company will return their money including a highest possible return. In reality it is obvious that you cannot always trust everyone. Therefore rules and regulations are necessary to protect investors, both shareholders and creditors, for appropriation by managers of firms in which they invested their money. This phenomenon is called investor protection which is an important subject nowadays. After major scandals around the year 2000 lots of people and authorities around the world argued for more rules and regulations with the purpose to protect investors. These regulations include for example penalties for false disclosures and stricter regulations in the field of inspections by third parties regarding the financial reports.

In the year 2002 a new corporate governance act was implemented in the U.S., the Sarbanes-Oxley Act (SOX), a major component of this act was the increased investor protection. Almost simultaneously several European countries also adopted new and more stringent corporate governance regulations, for example Code Tabaksblat (2003) in the Netherlands and the Cromme Code (2002) in Germany. Those protections were necessary in order to restore the confidence of investors in the market after some major corporate scandals like Enron and Worldcom. In general investor protection is associated with less risk of corporate scandals because it is less likely that managers will manipulate their earnings in a not tolerated manner. This manipulation of earnings is also called earnings management and often associated with corporate scandals. In literature there is evidence of a negative relationship between the level of investor protection and the level of earnings management, therefore it is arguable that earnings management, and hence corporate scandals, will decrease when investor protection will increase. There is an international tendency to increase the amount of investor protection by law in order to decrease the amount of corporate scandals and increase investor confidence.

But earnings management can be divided into two categories, accrual-based and real earnings management. Accrual-based earnings management can be briefly described as manipulation of accruals such as write-offs or provisions, real earnings management can be briefly explained as modification of real activities such as research and development or maintenance expenses. Both categories will be discussed in more detail further on. Research in the past proved that real earnings management is more costly for a firm because it destroys firm value by a not optimal allocation of firm assets (Graham et al. 2005).

Research by Cohen et al. (2008) pointed out that after implementation of SOX, which can be classified as stronger investor protection, there was a switch visible in the kind of earnings management used by companies in the U.S. After implementation of this new law the level of

accrual-based earnings management decreased but on the other hand the level of real earnings management increased. This implies that this increase in investor protection is not necessarily advantageous for stakeholders because real earnings management can actually destroy firm value by a not optimal allocation of resources.

The subject which will be addressed in this thesis is the way in which investor protection influences earnings management. The main research question which will be answered in this thesis will be formulated as follows:

Does the extent of investor protection influence the levels of real and accrual-based earnings management?

The added value of this research consists of the conclusion whether more investor protection can result in less accrual-based earnings management but more real earnings management used by companies. When this is actually the case the international tendency to increase investor protection can lower firm value because real earnings management destroys firm value due to a suboptimal allocation of resources, this will be explained in more detail further on. Based on the results it can be established whether this international tendency to increase investor protection can destroy firm value.

In order to answer the research question chapter 2 will elaborate on several important terms and some theory behind the major terms of this study, earnings management and investor protection. Chapter 3 will give a description of the relationships between those terms and chapter 4 will elaborate on the research design. The results and an analysis of the results will be shown in chapter 5 and chapter 6 will provide a conclusion and some remarks.

2 Background and theory

Before explaining the research design some important general definitions will be elaborated. First of all attention will be paid to the term earnings management, the motivations behind it and the different types of earnings management. After that the term investor protection will be described and in particular the different degrees of investor protection worldwide.

2.1 *Earnings management*

If the word earnings management is used it is often associated with fraud, for example the corporate scandals of Enron (2001), Tyco (2002) and Worldcom (2002). However fraudulent earnings management has to be distinguished from earnings management which is allowed between the boundaries of regulations (Dechow and Skinner 2000). In this section the term earnings management will be clarified, after which various incentives to use earnings management, different tools which can be used and some measurements will be discussed.

2.1.1 Explanation of the term earnings management

The word earnings management is often mentioned in literature, lots of other related words which are also regularly used are income smoothing, creative accounting and window dressing (Stolowy and Breton 2004). But what do these terms actually mean? There is always a probability of an information asymmetry between management and stakeholders of a company. Managers taking advantage of this information asymmetry with stakeholders will lead to earnings management (Dye 1988). This earnings management can result from a conflict of interest between managers of a firm (insiders) and its stakeholders (outsiders) (Leuz et al. 2003).

Several definitions of earnings management can be found in academic literature, Schipper (1989) for example stated that earnings management is "*a purposeful intervention in the external financial reporting process, with the intent of obtaining some private gain (as opposed to, say, merely facilitating the neutral operation of the process)*". Healy and Wahlen (1999) formulated earnings management as follows: *"Earnings management occurs when managers use judgment in financial reporting and in structuring transactions 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"*. But according to Dechow and Skinner (2000) earnings management is a much broader concept, it could also be used to increase the informativeness of reported earnings for investors by the use of accruals in accordance with accounting principles, like matching and revenue recognition. It is important to know at what moment this income smoothing practices become adverse earnings management. This is the case

when earnings reported by management give a biased view of the actual performance of a company due to judgment used by managers (Dechow and Skinner 2000).

According to Brown (1999) the biggest misunderstanding about financial reports is people thinking that it is possible to calculate earnings through an objective method. He argues that because of the necessity of judgement, assessments and estimations made by management it is impossible to measure or report the exact accurate earnings of a firm. This judgment is important because within regulations there are often opportunities for managers for interpretation and alternative options. Brown (1999) also stated that when choices of management to influence earnings are within the boundaries of regulations they can be classified as earnings management, but when those choices are violating regulations, they can be classified as fraud. The border between earnings management and fraud is often open for discussion because regulations can be interpreted in various ways.

But earnings management can also be clarified in a broader context which not only includes managing of earnings but also formulation in reports of the current state of the firm, for example impression management, also known as framing. Kemp et al. (2000) stated in the introduction of their article about self-serving behaviour in the management discussion and analysis (MD&A), that management will declare that positive performances are caused by actions of management and that negative outcomes are caused by effects which they cannot influence, such as the state of the economy. By doing this they are trying to influence the perception people have when they are reading those documents.

Impression management can be defined as influencing the way readers of financial information interpret this information in order to influence the decisions made by those stakeholders. According to Neu (1991) this can be created by selecting data which you want to show and present this data in such a manner creating the image you desire. This can be accomplished for example by selecting financial graphs or diagrams which will be included in financial reports. By managing the information you present and by managing the way you present this information you can influence the impression people will have. This is some kind of earnings management which is much broader than just managing earnings.

There are several motivations for using earnings management which will be discussed later, but the mean underlying reason for managing earnings is to influence earnings per share (EPS). The EPS of a company is calculated by dividing reported earnings by the total amount of outstanding shares of a firm. According to Sloan (1996) investors fixate on earnings, instead of dividing earnings into cash flows and accruals, when they valuate a company. Therefore firms can influence the share price by managing reported earnings.

Concluding, earnings management is a broad term which includes also other things than just managing earnings. In this research the focus will be on the managing of earnings by firms in order to

accomplish the earnings they like to present to the outside world. There are several motivations behind this alteration, they will be discussed next.

2.1.2   Earnings management motivations

It is hard for researchers to detect earnings management, because it is unknown what true earnings are without the possibility of those earnings being managed (Brown 1999). Therefore Healy and Wahlen (1999) stated that it is important to know incentives for earnings management so it would be more feasible to trace earnings management, they divided earnings management motivations into three categories.

The first category named by Healy and Wahlen (1999) is based on capital market motivations. They stated that firms could have an incentive to manage earnings upwards (to increase stock prices) for example surrounding equity offers, and an incentive to manage earnings downwards (to lower stock prices) for instance prior to repurchasing stock on the stock market (Gong et al. 2008). Companies could also have an incentive to overstate earnings when they are just not able to meet analysts' forecasts. Dechow and Skinner (2000) argued that this category of earnings management incentives, capital market motivations, has become increasingly important due to increased importance of stock market valuations combined with increased stock market compensations for managers, which depend on stock prices, since the 1990s.

The second incentive category mentioned by Healy and Wahlen (1999) is based on contracting motivations, Watts and Zimmerman (1978) stated that agreements in debt covenants can encourage to overstate earnings when those agreements are threatened to be broken. Another situation when contracting motivations can cause earnings management is when managers earn an earnings-based bonus award, creating an incentive to manage earnings to maximise their bonuses.

The last incentive category Healy and Wahlen (1999) mentioned is about regulatory motivations, this incentive is divided into two parts, industry regulations and anti-trust regulations. The first part, industry regulations, refers to certain industries where regulatory monitoring is tied to accounting data, for instance in the banking industry. This could create incentives to manage certain accounting variables. The second part of the regulatory incentive is called anti-trust regulations. Watts and Zimmerman (1978) argued that companies which are subject to anti-trust investigation have an incentive to manage earnings downwards to appear less profitable, in order to avoid attention. Another incentive to downward earnings which could be added to this category are tax motivations, firms could have an incentive to decrease reported earnings to produce tax savings (Guenther 1994).

Another incentive to manage earnings downwards which is related to the last incentive category named by Healy and Wahlen (1999) is called the political cost hypothesis. An example of

this incentive is an oil company which does not want to report high profits when fuel prices are high, in order to prevent adverse consumer and regulatory reactions. In those times they want to decrease their political visibility in order to decrease their accountability of the high fuel prices.

Findings of a survey by Graham et al. (2005) indicate that the capital market incentive is more important compared to contracting motivations and industry regulations. Firms are aware of the fact that investors are focussing on earnings when they valuate shares, rather than focussing on cash flows (Sloan 1996). Steady earnings over time are associated with low risk, that is why a lower risk premium is needed which results in a higher stock price. Therefore firms have an incentive to manage earnings in order to present the EPS they desire. The results of this survey showed that managers are even willing to give up economic value of the company in order to report the earnings investors are expecting.

In summary, it is important to know the incentives of managers to manage earnings. There are different types of motivations, some of them give an incentive to manage earnings upwards, and others to manage earnings downwards. There are different tools to manage earnings and there are different methods to measure the level of earnings management used by a firm, those tools and methods will be discussed next.

2.1.3   Earnings management tools

Managers could have different incentives to manage earnings upwards or downwards, but which tools can they use to accomplish the earnings they desire? As explained before firms often prefer to report a particular earnings amount, they can use several tools to manipulate this number. As mentioned before necessity of judgement and estimations made by management causes impossibility of measuring the accurate and reliable earnings of a firm (Brown 1999). Those judgements are classified by Brown (1999) into three categories of earnings management activities which will be discussed in this section.

First he mentions the choice firms have between different reporting options within boundaries of regulations. Examples include the choice between different inventory valuation methods and a number of ways to depreciate fixed assets. Second he mentions estimations and assessment choices made by management, which are subjective. Estimations always include some subjectivity and are exposed to changes, this subjectivity can result in biased numbers reported by management. For instance determining the size of provisions or the amount of losses on outstanding loans.

The final category named by Brown (1999) concerns assets. Companies can use the timing of purchases of assets to manage earnings in a certain reporting period, this also applies to the moment of selling those assets. Those events often lead to profits or losses, by adjusting the moment of those events management can manage earnings reported in certain periods.

Healy and Wahlen (1999) also argued that there are many ways in which managers can use judgement to influence financial reporting. Besides the already mentioned choices between different reporting options and estimations they identified several other categories. First of all they argued that managers can use their judgement to decide about the magnitude of working capital, for example by fluctuating inventory levels and timing of shipments and purchases of inventory. Another category named by Healy and Wahlen (1999) is related to discretionary expenditures, managers have to decide about the level of for example R&D and advertising expenditures in a certain period. Finally they named judgement used by managers to determine the way in which corporate transactions are structured. Leases can for example be structured in several ways resulting in on- or off-balance sheet obligations.

Summarizing, managers can use different tools in order to manage reported earnings of a firm. These earnings management tools can be divided into two categories, accrual-based and real earnings management, there are several methods to measure both types, those methods will be discussed next.

2.1.4   Earnings management measurements

In literature there are different models mentioned to measure the level of earnings management used by companies. Those models can be classified into two categories, accrual-based and real earnings management measurement models. In this section both categories will be explained and several measurements will be discussed.

2.1.4.1 *Accrual-based earnings management*

The first kind of models which can be used are accrual-based earnings management models. Accruals are part of the earnings of a company in an accounting period in addition to the cash flows of that period; they are used in financial reporting to match revenues and expenses to the correct period. They occur when there is a time-lag between the actual receiving/payment moment and the moment of revenue/cost recognition. Examples of accrual manipulation are delaying or accelerating write-offs of assets or changes in provisions (Roychowdhury 2006). Sloan (1996) concluded that investors fixate on earnings when they valuate a company, they do not distinguish between cash flows and accruals. Therefore managers or companies can use the accrual component to manage earnings and hence to influence market valuations.

Total accruals (TA) can be divided into discretionary accruals (DA) and non-discretionary accruals (NDA). According to Ronen and Yaari (2008) the non-discretionary part can be defined as accruals resulting from transactions which are comprehensible with regard to the reporting period

conditions for a specific company. They define the discretionary part of accruals as the amount of accruals arising from transactions or accounting choices in order to manage reported earnings.

According to the explanation by Knoops (2010), elementary models which are used to measure the level of earnings management consist of three parts. First the amount of TA is measured, after that the amount of NDA is defined as the level of TA of the prior period, or the average of prior periods, this method is called time series analysis. Another way to determine NDA is to equate the average amount of TA of comparable firms in the same industry, this is called cross-sectional analysis. The last step is determining the amount of DA which can be calculated by subtracting NDA of TA. All values are scaled by total assets to control for firm size. The two most cited models in literature are the Jones model (Jones 1991) and the modified Jones model (Dechow et al. 1995). Both models will be briefly discussed.

In her study Jones (1991) created a model to measure the level of accrual-based earnings management. She made the assumption that there was no earnings management in the period before the event occurred, so there were no DA present in the period before the event. This means that by adopting this assumption she was able to compute the NDA in the years after the event and therefore she was able to calculate the amount of DA. She assumed that NDA are not constant over time but are subject to changes in firm-specific economic circumstances. Therefore she controlled for changes in revenues and the amount of PPE which affects the amount of depreciation. A regression analysis is used to estimate the amount of NDA;

$$\frac{\text{TA}\tau}{\text{A}\tau - 1} = \alpha 1 \left(\frac{1}{\text{A}\tau - 1}\right) + \alpha 2 \left(\frac{\Delta\text{REV}\tau}{\text{A}\tau - 1}\right) + \alpha 3 \left(\frac{\text{GPPE}\tau}{\text{A}\tau - 1}\right) + \varepsilon\tau$$

NDAτ   *= Non-discretionary accruals at year t*
Aτ − 1   *= Assets at year t-1*
ΔREVτ   *= Revenue at year t – revenue at year t-1*
GPPEτ   *= Gross Property, Plant, Equipment at year t*
ετ   *= error term*

As described above this model can be used in two ways, using time series analysis or using cross-sectional analysis. Both methods can be divided into three stages. The first stage consists of the measurement of the total accruals of a company (TA) which can be measured by subtracting the cash flow from operations from the earnings of a particular year (Cohen and Zarowin 2010). The second stage consists of the estimation of the coefficients of the formula, when using the time series analysis it is assumed that the accruals should be constant over time when there are no changes in PPE or revenue. So the coefficients are estimated by the use of the data of the specific company from earlier years. When the cross-sectional analysis is used in order to estimate the coefficients it is assumed that the accruals of a company should be the same as the average accruals of the companies in the same industry. So therefore the data of other companies which are operating in the same industry for the same year are used to estimate those coefficients. Those coefficients are used to calculate the 'normal' accruals for the specific company in a specific year, those 'normal' accruals are called the non-discretionary accruals (NDA). The last stage is equal for both methods, the level of discretionary accruals (DA) is calculated by subtracting the calculated NDA from the TA of a specific company. Those calculated DA are used as a proxy of the level of accrual-based earnings management.

According to Dechow et al. (1995) the model described by Jones can be biased when revenues are used to manage earnings. For example when managers use their judgment to allocate revenues to a certain period, whereby revenues will be higher (lower) and the accruals will also be higher (lower) for example by credit sales at the end of a reporting period. But the model constructed by Jones (1991) measures accruals relative to revenues, this measure will not increase or decrease in this example. Consequently the level of earnings management calculated by the model invented by Jones (1991) will be biased downwards. Therefore Dechow et al. (1995) constructed another model; the modified Jones model, which is capable of calculating the level of revenue-based earnings management. The model used by Dechow et al. (1995) is composed as follows:

$$\frac{\text{NDA}\tau}{A\tau - 1} = \hat{\alpha}1\left(\frac{1}{A\tau - 1}\right) + \hat{\alpha}2\left(\frac{\Delta\text{REV}\tau - \Delta\text{REC}\tau}{A\tau - 1}\right) + \hat{\alpha}3\left(\frac{\text{GPPE}\tau}{A\tau - 1}\right)$$

NDA τ   = Non-discretionary accruals at year t
A τ-1   = Assets at year t-1
ΔREV τ   = Revenue at year t – revenue at year t-1
ΔREC τ   = Net receivables at year t – net receivables at year t-1
GPPE τ   = Gross Property, Plant, Equipment at year t

Following Cohen et al. (2008) the coefficients for this model are calculated by using the Jones model (Jones 1991). It is assumed that there is no earnings management regarding the recognition of

revenues. But when NDA are calculated revenues are adjusted for the change in account receivables to control for manipulation of earnings by using sales on credit by year end. All other stages of the calculation of DA are equal to the Jones model as described before. Therefore this so called modified Jones model is different than the original model by Jones (1991) because the change of receivables (ΔREC) is also taken into account. In order to calculate NDA with this formula the change in revenue is modified by the difference in the amount of receivables.

In a more recent study Kothari et al. (2005) composed a different kind of model because they argued that the Jones and the modified Jones models are misspecified for samples of firms which are performing very good or very poor because of correlated omitted variables in those samples. They proposed two methods in order to control for this condition, matched pairs or the addition of the variable return on assets (ROA). The first method, matched pairs, implies that companies are divided into pairs with equal return on assets in the past in order to control for the abovementioned effect. The second method based on ROA implies that the variable ROA is included in the formula in order to control for firm performance influences on accruals. This results in another modified regression model:

$$\frac{\text{NDA}\tau}{\text{A}\tau - 1} = \alpha 1 \left(\frac{1}{\text{A}\tau - 1}\right) + \alpha 2 \left(\frac{\Delta \text{REV}\tau - \Delta \text{REC}\tau}{\text{A}\tau - 1}\right) + \alpha 3 \left(\frac{\text{GPPE}\tau}{\text{A}\tau - 1}\right) + \alpha 4 \left(\frac{\text{ROA}\tau}{\text{A}\tau - 1}\right) + \epsilon\tau$$

NDA τ   *= Non-discretionary accruals at year t*
A τ-1   *= Assets at year t-1*
ΔREV τ   *= Revenue at year t – revenue at year t-1*
ΔREC τ   *= Net receivables at year t – net receivables at year t-1*
GPPE τ   *= Gross Property, Plant, Equipment at year t*
ROA τ   *= Return on Assets at year t*

Dechow et al. (2012) criticizes this model in another recent study because the regression model will result in less powerful outcomes and is only effective when matching is done on the correlated omitted variable which will eliminate the influences of this omitted variable. They argue that because accruals are always recurring this assumption can be used to measure the level of accrual-based earnings management which will improve the power of those tests. They propose to use a dummy variable PART which will equal to 1 in years when the earnings management will recur (PART reflects to the word partitioning, it is a dummy variable which divides the sample in two groups). The authors argue that this new model will increase the power of the test and will control for correlating variables. But for this model information is required about the reversal period of different accruals, therefore this model will not be used in this research.

The Jones model (Jones 1991) and the modified Jones model (Dechow et al. 1995) are probably the most cited models in literature, but there is also critique on those models because of biases which could occur. In the remainder of this study the modified Jones model designed by Dechow et al. (1995) will be used to calculate the level of accrual-based earnings management.

2.1.4.2 *Real earnings management*

Another type of earnings management is real earnings management. According to Roychowdhury (2006) real earnings management can be defined as follows: "*departures from normal operational practices, motivated by managers' desire to mislead at least some stakeholders into believing certain financial reporting goals have been met in the normal course of operations*". Gunny (2005) defines several types of real earnings management, namely: modification of discretionary R&D expense and discretionary SG&A expense, adjusting the moment of fixed asset sales, increased production to lower average costs and stimulation of earnings by discounts or lenient credit conditions. She computed formula's in order to compute the normal levels of R&D expenditures, SG&A expenditures, gains on assets and production costs. The differences between the actual levels and the calculated normal levels of those variables are used as a proxy for the level of real earnings management.

It could be that those real earnings management practices are not profitable for the company on the long run, for instance management could decide not to invest in a project with a positive net present value because of costs which would occur in the current period. According to Graham et al. (2005) real earnings management is harder to detect by outsiders compared to accrual-based earnings management, therefore it would be more easily for managers to use this kind of earnings management. But real earnings management is costlier for the firm due to a suboptimal allocation of resources.

Relying on the study of Roychowdhury (2006), Cohen et al. (2008) named three methods which could be used to manipulate earnings. Stimulation of earnings by discounts or lenient credit conditions, increased production to lower average costs and modification of discretionary expenses which consist of R&D, SG&A and advertising expenses. Cohen et al. (2008) computed four different variables in order to measure the level of real earnings management, namely R_CFO (abnormal CFO), R_PROD (abnormal production costs), R_DISX (abnormal discretionary expenses) and RM_PROXY. This last variable depends on the outcomes of the other three variables and is an estimation of the overall level of real earnings management. All variables are scaled by total assets to control for firm size.

The values of the first three variables (R_CFO, R_PROD and R_DISX) are calculated by the difference between the actual values in a certain period and the normal values, those normal values are obtained by the following regression formulas:

$$\text{Normal CFO} =$$
$$\frac{\text{CFO } \iota\tau}{\text{Assets } \iota,\tau-1} = \alpha1\left(\frac{1}{\text{Assets } \iota,\tau-1}\right) + \alpha2\left(\frac{\text{Sales } \iota\tau}{\text{Assets } \iota,\tau-1}\right) + \alpha3\left(\frac{\Delta \text{ Sales } \iota\tau}{\text{Assets } \iota,\tau-1}\right) + \varepsilon\,\iota\tau$$

$$\text{Normal production costs} =$$
$$\frac{\text{Prod } \iota\tau}{\text{Assets } \iota,\tau-1} = \alpha1\left(\frac{1}{\text{Assets } \iota,\tau-1}\right) + \alpha2\left(\frac{\text{Sales } \iota\tau}{\text{Assets } \iota,\tau-1}\right) + \alpha3\left(\frac{\Delta \text{ Sales } \iota\tau}{\text{Assets } \iota,\tau-1}\right) + \alpha4\left(\frac{\Delta \text{ Sales } \iota\tau-1}{\text{Assets } \iota,\tau-1}\right) + \varepsilon\,\iota\tau$$

$$\text{Normal discretionary expenses} =$$
$$\frac{\text{DiscExp } \iota\tau}{\text{Assets } \iota,\tau-1} = \alpha1\left(\frac{1}{\text{Assets } \iota,\tau-1}\right) + \alpha2\left(\frac{\text{Sales } \iota,\tau-1}{\text{Assets } \iota,\tau-1}\right) + \varepsilon\,\iota\tau$$

CFO   *=Cash flow from operations [compustat item 308 - compustat item 124]*
Prod   *= Production costs [compustat item 41 (COGS)+ compustat item 3 (Change in inventory)]*
DiscExp   *= Discretionary expenditures [compustat item 45 (advertising expenses) + compustat item 46 (R&D expenses) + compustat item 189 (SG&A)]*
$\varepsilon\,\iota\tau$ *= error term*

This calculation consists of three stages, comparable with the stages of the Jones model as described before. The first stage consists of the calculation of the values of CFO, Prod and DiscExp (as indicated above). The second stage includes the estimation of the different coefficients, which can be done by a time series analysis or a cross-sectional analysis as illustrated in section 2.1.4.1. This will result in the estimation of 'normal' values for the three variables. When those normal values are calculated, the difference between the normal and the actual values will be used as a proxy for the level of real earnings management.

In the remaining part of this study these variables, calculated using a cross-sectional analysis, will be used to create an impression of the level of real earnings management used by firms.

2.2 *Investor protection*

Investor protection can be seen as an important element of earnings management (Leuz et al. 2003). As mentioned earlier managers can have motivations to conceal the real performance of their entity by manipulating earnings presented to stakeholders. Those stakeholders, and in particular shareholders and creditors, are protected by legal provisions of a country. Which are laws and regulations concerning withholding of information by firms or the provision of misleading

information to stakeholders. The extent of investor protection is also determined by the severity of sanctions for companies when they do not follow these rules. In general investors are less willing to invest in companies which face weak investor protection compared to companies which are facing stronger investor protection because appropriation by insiders is more likely.

Those investor protection regulations are part of the corporate governance regulations of a country. In this section the theory which explains the necessity of investor protection, the agency theory, will be explained after which various elements and measurements of investor protection will be discussed. But first the term corporate governance will be briefly discussed.

2.2.1   Corporate governance

The term corporate governance is very broad and can be briefly described as the way companies are managed and controlled[1]. More specifically it can be defined as the relationships between all stakeholders which include the Board of Directors, management, shareholders and other stakeholders[2]. An even more specific definition is given by Shleifer and Vishny (1997), they defined corporate governance as the way financers of companies, shareholders and creditors, protect themselves from appropriation by insiders of the company and make sure they will return their invested money, including a highest possible return.

Black et al. (2006) made a distinction between four classes of variables of corporate governance. The first class consists of shareholder rights, this includes several variables relating to the way the company deals with the extent of shareholder voting procedures. This class includes for example whether shareholders are permitted to vote per mail and whether director candidates are disclosed in advance of shareholding meetings. The second class is about board structure, this class deals with the amount of outside directors in the board (more or less than 50%) and whether or not the firm has an audit committee. The third class is called 'board procedure' and covers procedures for example to evaluate and compensate board members. Some examples of variables included in this class are the existence of a system for the evaluation of directors, whether or not outside directors receive retirement payments and the requirement of approval of shareholders for aggregate payments to outside directors. The last class named by Black et al. (2006) is about disclosures. The authors distinguish three variables for this category, namely whether the website includes board members resumes, whether an English disclosure is available and whether or not the firm conducted investor relations activities.

The above mentioned definitions and classification indicate that corporate governance is a broad term, protection of shareholders and creditors is just one component of this broad term. In

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[1] Cadbury Committee, 1992

[2] International Finance Corporation (IFC)

this study there will be a focus on this element, investor protection. This element can be placed in the first category named by Black et al. (2006); shareholder rights, but it is broader than just shareholder rights, investor protection also includes the rights of creditors. Investor protection can be classified as strong when shareholders and creditors are highly protected for appropriation by insiders through rules and regulations. When this protection is not well established in different rules and regulations investor protection can be classified as weak.

2.2.2   Agency theory

The agency problem explained by Jensen and Meckling (1976) can be seen as the reason why investor protection is necessary. The agency problem has not always existed, it started at the moment when companies no longer funded themselves but banks and other financers began to provide funds for those companies resulting in a separation between ownership and control. According to Shleifer and Vishny (1997) the agency problem derives from this separation of ownership and control; ownership belongs to financers of firms but managers of firms are in control. They stated that managers need investors providing capital to run their business, financers in turn need managers to receive a good return. The problem lies in the way investors make sure that their money is allocated optimally and that they are getting their money (and a high return) back from the managers. Persons who control the money, the managers, can choose to allocate some of the money for personal benefits, but in addition they can also take inefficient actions which can cause much more costs for the owners of the money, the investors, than only those personal benefits. Shleifer and Vishny (1997) also argued in their study that this problem can be solved by contracts. But an additional issue which arises is the fact that both parties do not know what will happen in the future so it is impossible to design a contract which includes all possible scenarios. Therefore it is impossible to design complete contracts.

Grossman and Hart (1986) provided a solution for this issue, residual contract rights for unforeseen scenarios. These contracts will include rules about who has the authority to make decisions in circumstances which were unforeseen at the beginning of the collaboration. Those residual contract rights have to be assigned to investors in order to make sure that managers are not using investor's money in a suboptimal manner. However this brings a new issue, investors lack knowledge to make correct decisions about the allocation of resources therefore originally they provided money to the manager of the firm. As a result managers will have most of those residual control rights, in addition corporate governance policies (e.g. investor protection) are necessary to protect investors.

Within the context of a company this means that without investor protection outside investors of a company cannot be sure that insiders of the company will return profits to them instead of using

those profits to benefit themselves (La Porta et al. 1999). Therefore Shleifer and Vishny (1997) argued that investor protection is a major component of earnings management. Davidson et al. (2004) stated that the agency theory and earnings management are related to each other. When opposing interests of management and investors results in a biased presentation of earnings and investors make suboptimal decisions, earnings management can be classified as a type of agency cost. Despite increasing globalisation, the level of investor protection is still not equal over the world, this will be discussed further on in this study.

2.2.3   Elements and measurements

Investor protection exists because of the presence of the agency problem as described above. Outside investors of a company need to protect themselves from not optimal allocation of resources or appropriation by managers (La Porta et al. 1999). According to Shleifer and Vishny (1997) Investors can be divided into two categories, shareholders and creditors, both groups are protected by several legal rights which differ across countries. Shareholders have for example voting rights but management has also the obligation to serve in the best interest of shareholders, this concept is carried out by courts in most countries. On the other hand creditors have for example the right to ask collateral for loans and the right to request for bankruptcy when a company cannot pay his loans anymore (Shleifer and Vishny 1997). Both legal protections, for shareholders and creditors, differ across countries which will be discussed in section 3.1.

The level of investor protection is hard to measure because it does not consist of just one variable which can be easily measured. Investor protection consists of several rights of shareholders and creditors most of which are hard to quantify. Leuz et al (2003) composed an overall measurement of investor protection based on research by La Porta et al. (1997, 1998); the variables used are shown in panel A of appendix I. They examined the differences in the level of investor protection across 31 countries and constructed three clusters of countries with different levels of investor protection. This demonstrates that the amount of investor protection differs significantly over the world.

A more recent article by Djankov et al. (2008) constructed a different kind of investor protection measurement, the anti-self-dealing index. It measures the amount of legal protection of minority shareholders against the self-interest behaviour of insiders. They constructed this measurement by questioning executive employees of a big law firm with representative clients and offices in 102 countries by the use of a survey. This survey contained questions about a certain transaction and the way this transaction is regulated by law in each country. After that the authors constructed quantitative measurements to measure the amount of minority shareholder protection against self-dealing behaviour of insiders and hence investor protection. This anti-self-dealing index

consist of two parts; a private control of self-dealing index and a public enforcement index. The private index is composed of several determinants which measure the amount of private control of a transaction, such as the amount of disclosures or approvals mandatory by law before the transaction is made. The public enforcement is determined by potential fines and prison sentences which may be imposed when the minority shareholder is disadvantaged.

Two different measurements are named above, both are quite different which shows that there are different ways to quantify investor protection. In this study the method of Leuz et al. (2003) will be used, this study will be outlined in section 3.1.

3   Literature review

A considerable amount of literature has been published on earnings management and investor protection. There are also studies which describe relationships between those phenomena. In this chapter previous studies will be described in order to explain the relationship between investor protection and real and accrual-based earnings management. First the differences in the level of investor protection worldwide will be described after which the trade-off between real and accrual-based earnings management will be declared. Finally the relation between investor protection and earnings management will be discussed.

3.1   *Investor protection differences*

As mentioned before investor protection levels differ greatly among the world. This derives from the fact that legal rules are prepared in history and in the past several law families were composed. In this section the institutional setting in Europe will be explored first, after this two important studies by Leuz et al. (2003) and La Porta et al. (1998) will be elaborated to clarify differences in investor protection regulations. Concluding two countries will be discussed in more detail, the U.K. and France.

3.1.1   Institutional setting Europe

As mentioned before investor protection differs across countries because those regulations are constituted in history. From 600 BC the Roman Empire started to expand all over Europe, nowadays several rules and regulations are still based on regulations during this period. Together with the Germanic Empire, the Roman Empire forms the basis of the oldest legal family of the world, the civil law (La Porta 1998). This law family, also known as continental Europe, can be divided into three categories, French civil law, German civil law and Scandinavian civil law.

French civil law was created in France during the time of Napoleon (circa 1807). During attempts to expand the boundaries of the French empire this law was spread over several countries in Europe, including Belgium, The Netherlands and Italy. This law was also distributed to some parts of Africa and to the French Caribbean by colonisation. The laws and regulations from this code were commonly applied in all those regions (La Porta et al. 1998).

A couple of decades after the French civil law was created the German civil law was designed, in the late nineteenth century. These regulations were not as commonly applied in comparison with the regulations from the French civil code because this law was created a number of years later. However this law does influence laws and regulations from several countries nearby the German

Empire such as Hungary and Switzerland but it influences also the Chinese regulations which were based on the German civil law (La Porta et a. 1998).

The last civil law family distinguished by La Porta et al (1998) is the Scandinavian civil law. This law is in contrast with the previously mentioned laws not widely spread across other countries. Only the four Scandinavian countries, Norway, Sweden, Finland and Denmark can be classified as Scandinavian civil law countries.

Together those three law families are called the civil law family or continental Europe family.[3] Besides civil law another category of law exists, namely common law. This law is constituted in England in the Middle Ages and in the past spread over the world by colonialism. Most English-speaking countries are classified as common law countries, for example Canada, Australia and the U.S. Therefore it also called the Anglo-Saxon model (La Porta et a. 1998).

The difference between civil law and common law is present in the structure of the legal systems. Civil law is based on rules and regulations which are established by law. Judges have to consult those rules when making decisions during lawsuits. Common law on the other hand has less stringent rules and regulations, judges are consulting other judicial decision from the past in order to make a decision. Civil law is mainly driven by legislation, common law on the other hand has also legislation, but this legislation can be interpreted different in each case.

Summarizing two different law families can be distinguished, the civil law and common law families. Both groups have another way of development of laws and regulations and a different way of judgement. Another difference between both groups of countries is the amount of protection of shareholders and creditors against appropriation by insiders of a company, investor protection. Civil law countries tend to have a lower degree of investor protection compared to common law countries. Lawyers in the civil law system rely on rules and think about solutions which are in conformity with those rules. On the other hand lawyers in the common law system rely on cases in the past and think about solutions which are in conformity with relationships and rights and duties of both parties (La Porta et al. 1998).

3.1.2   Global differences

Through globalisation different countries worldwide have become more and more related to each other and the differences between countries are gradually fading. But as described before legal systems are constituted in history and are therefore still different over the world. La Porta et al. (1998) studied the differences in legal systems worldwide and concluded that through imperialism of several countries in the past four legal families could be classified. As described before civil law can

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[3] The differences between the three civil law families are not explained in detail because this study will primary focus on the differences between civil law and common law.

be divided into French, German and Scandinavian civil law the opponent of civil law is common law. Investor protection can be measured by several shareholder and creditor regulations. La Porta et al. (1998) concluded that those regulations differ significantly across countries. Common law has stronger investor protection compared to civil law, French civil law has the weakest investor protection and German and Scandinavian civil law are in between.

A more recent study of Leuz et al. (2003) analyzed data from 31 countries to determine the degree of investor protection in those countries. They ranked the countries by comparing the amount of investor protection calculated by comparing several variables (appendix I, panel A). Leuz et al. (2003) concluded that countries can be divided into three clusters, the first one is called 'outsider economies' with high investor protection. The other two clusters are called 'insider economies' and are facing considerably less investor protection compared to the first cluster. This second and third clusters are also different from each other based on this level of investor protection. The countries in the second cluster have stronger investor protection compared to the countries in the third cluster, the composition of the clusters can be found in panel B of appendix I. The authors point out that the difference between the first two clusters is larger compared to the difference between the second and the third cluster.

They also computed an overall earnings management score[4] based on earnings smoothing and earnings discretion measures, this overall earnings management rating scored 10,1 for the first cluster (outsider economies), 16,1 for the second cluster (insider economies with strong investor protection) and 20,6 for the third cluster (insider economies with weak investor protection). The differences between those results are statistically significant, indicating a strong negative association between the amount of investor protection and the overall earnings management variable.

In general the existence of the agency problem made regulation necessary, therefore investor protection has been established. Those regulations are not equal everywhere, through imperialism in the past four legal families can be recognized according to La Porta et al. (1998). A more recent study by Leuz et al. (2003) composed three clusters of countries with different levels of investor protection. In the remainder of this study the results by La Porta et al. (1998) and Leuz et al. (2003) will be used as a proxy of the extend of investor protection.

3.1.3 The United Kingdom and France

According to the conclusions made by La Porta et al. (1998) legal rules, which are protecting investors, differ greatly across countries, those rights are composed by laws and are not the same for securities around the world. As described before common law countries face the highest investor

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[4] This score is included in order to show the relative differences between the scores. Therefore the exact detailed calculation is omitted.

protection regulations while French civil law countries face the lowest investor protection regulations. One of the countries which faces high investor protection is the U.K., France on the other hand is classified by La Porta et al. (1998) as one of the countries with French civil law which has the weakest investor protection.

A study by Leuz et al. (2003) gives further evidence of this contrast, they composed three clusters of countries with different levels of investor protection as described before. The U.K. is situated in the first cluster, outsider economies, France is situated in the second cluster, one of the clusters with inside economies. The third cluster is also called 'inside economies' with the exception that the countries in the second cluster have higher investor protection compared with countries in the third cluster. Leuz et al. (2003) argued that the difference in the level of investor protection between the first two clusters is significantly larger compared to the difference between cluster two and three. This endorses the assumption that the levels of investor protection in the U.K. and in France are different from each other.

Both studies give confidence that the U.K. and France differ in the amount and sort of regulation with the intention to protect investors, both creditors and shareholders from appropriation by managers. Therefore those two countries will be used in this study to compare earnings management levels in countries with high investor protection with those levels in countries with lower investor protection levels.

3.2   *Trade-off between real and accrual-based earnings management*

As described before earnings management can be applied and measured in two ways, by manipulating accruals, referred to as accrual-based earnings management, or by modification of operating activities, referred to as real earnings management. The trade-off between those two earnings management components is described by literature in several studies. The first study which will be addressed is the study by Cohen et al. (2008) about the effect of the implementation of the Sarbanes-Oxley Act (SOX) on earnings management in the U.S. But before discussing this research SOX will be explained in more detail. After this the study by Zang (2012) about relative costs of both earnings management components will be briefly discussed.

3.2.1   Influence of SOX

After a number of major scandals the U.S. government adopted a new law which had to prevent such scandals in the future allowing to restore confidence of investors in the market. On July 30, 2002 G.W. Bush signed a new corporate governance act, SOX, he described the act as follows "the most far-reaching reforms of American business practices since the time of Franklin D.

Roosevelt"[5]. SOX is a corporate governance code which consist of 69 articles which should prevent scandals, like for instance Enron (2001) and Worldcom (2002). All companies listed at a U.S. stock exchange have to comply with these new regulations. Sections 302, corporate responsibility for financial reporters, and 404, management assessment of internal controls, are the most profound parts of the act. This act is far-reaching in the field of the assessment and supervision of internal control over financial reporting in order to decrease fraud and increase investor confidence (Leech 2003). There are also critics of this new corporate governance act, one argument they refer to is the fact that implementation of the law was political driven. Because of major scandals political parties had to respond by doing something to convince public at large they were resolving the problems.[6]

Perhaps the most radical part of SOX is section 404; management assessment of internal controls. This section states that a company should make an assessment about their internal control system and an external auditor should report on the reliability of this assessment made by management.

There is much discussion about the costs of the implementation of this section, especially about the height of the audit fees (Ernst and Young 2005). Raghunandan and Rama (2006) studied the difference between audit fees before and after companies had to comply with this regulation. They concluded that the average audit fee for fiscal year 2004 was 86 percent higher compared to the previous period. According to this research it can be concluded that the implementation of section 404 involved high costs. But this regulation is associated with different kinds of costs, a study by Ernst and Young (2005) revealed that in 2004 only 25 percent of the costs associated with the implementation of section 404 resulted from audit fees for reporting on the internal control part derived from section 404. Another 25 percent derived from advise of third parties to support the firm by implementing the processes required by section 404, the remaining 50 percent can be explained by costs for implementing the internal control requirements within the firm and tracing internal control deficiencies. According to the comments of Ernst and Young (2005) the costs of section 404 will decrease in the years after 2004 because of start-up costs when firms had to comply with these new regulations.

In addition section 404 is also associated with benefits for firms, firstly all financial reports will be more reliable, not only audited financial reports, due to better internal control during the year (Ernst and Young 2005). As a result of this increase in reliability of financial reports investor confidence will grow and their risk will decrease, this reduces the cost of capital which will benefit the firms. The observable indication of the increasing focus on internal controls is the amount of

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[5] Bumiller, Elisabeth (2002-07-31). "Bush Signs Bill Aimed at Fraud in Corporations". *The New York Times.*

[6] Hilzenrath, D., Weisman, J. and Vandehei, J. (2002-07-28), ''How congress rode a 'storm' to corporate reform'', *The Washington Post.*

material weaknesses which are disclosed by firms. Ernst and Young (2005) expected that approximately 10 percent of the SEC issuers which are complying with section 404 will disclose a material weakness in 2004. But according to this review by Ernst and Young (2005) those disclosures are only material weaknesses which are not restored at year end, besides those weaknesses there are also weaknesses which are restored before year end and therefore not disclosed. As a result the overall benefits are much higher than the amount of weaknesses which are disclosed.

Taken together there is no doubt compliance with section 404 involves costs for companies but on the other hand those companies will also benefit in terms of a lower cost of capital due to more reliable financial statements decreasing the risk of investors.

3.2.2   Switch in earnings management

As mentioned in chapter 2, there are two types of earnings management which can be measured by different measurements, accrual-based and real earnings management measurements. Cohen et al. (2008) focused on the evolution of those two measures with regard to implementation of SOX. They calculated the level of accrual-based earnings management using the modified Jones model (Dechow et al. 1995). The method described in chapter 2, based on Roychowdhury (2006) was used to calculate the level of real earnings management activities. The sample composed for the research of Cohen et al. (2008) consisted of all nonfinancial U.S. firms with sufficient data in the period between 1987 and 2005.

After investigating all the data Cohen et al. (2008) constituted several conclusions. During the period following the implementation of SOX they found proof for a switch in the kind of earnings management used by companies in the U.S. In the period prior to the implementation of SOX (1987-2001) they perceived an increase in the level of accrual-based earnings management. Contrary they observed a decrease in this level in the period after implementation of SOX (2001-2005). On the other hand they perceived an increase in the level of real earnings management when this act was implemented. According to Cohen et al. (2008) this was an important conclusion because it indicates that the implementation of SOX did not result in a decline of overall earnings management, which was one of the major purposes of SOX, but there was a substitution effect visible between real and accrual-based earnings management.

In the final part of their review Cohen et al. (2008) argued that these observations are not automatically a result of the implementation of SOX. It is also possible that other events which occurred simultaneously with the implementation of SOX were correlated with the switch in the kind of earnings management used by companies. Therefore it is not completely proven that the observed decline in accrual-based earnings management and increase in real earnings management after implementation of SOX are caused by this implementation.

Zang (2012) supported another view on this trade-off. Her study focused on the trade-off made by managers between real and accrual-based earnings management activities based on the costs of these activities. She determined variables that compute the costs of both earnings management types and she points out that firms measure the relative costs in order to compose the optimal earnings management composition. According to Zang (2012) real earnings management should occur during the year, but after year end managers are still able to conduct accrual-based earnings management by for example changing accounting methods. Therefore there is a direct substitution effect between the two types of earnings management, when for instance at year end real earnings management turns out to be unexpectedly low, accrual-based earning management will be higher and vice versa.

Graham et al. (2005) investigated which important factors executives take into account when deciding about the earnings reported to outsiders and voluntary disclosures; 401 executives responded to their survey. The results suggest that the most important motivations for earnings management are stock price compensations and besides that they concluded that managers are willing to sacrifice economic value in order to achieve short-term expectations. In addition they stated that real earnings management is harder to detect by outsiders compared to accrual-based earnings management, accrual manipulations will attract more attention from auditors and regulators. This is due to the fact that outsiders are never sure that this behaviour is due to earnings management instead of just normal business operations. As explained before SOX increased the potential liability of CEOs and CFOs because they have to sign the financial reports. Therefore they are more cautious in managing earnings and they will more and more prefer methods which will attract less attention.

A study by Lobo and Zhou (2006) showed a similar effect of SOX on conservatism in financial reporting. They investigated the change in conservatism after implementation of SOX and used data of over 4000 firms available from the COMPUSTAT database. After measuring the level of conservatism and the level of discretionary accruals they concluded that the level of conservatism increased after implementation of SOX, risk averse CEOs and CFOs tended to be more conservative in estimating earnings and in reporting profits and losses. This demonstrates the fact that the potential liability of CEO's and CFO's increased when they had to certificate financial statements.

Another research by Chang et al. (2009) discussed the effects of SOX on earnings quality, which is a broader concept than just earnings management. They investigated the cost of capital of firms and the value of reported earnings to the market by comparing data of 2001 with data of 2003. They stated that due to implementation of the act more attention was drawn to internal controls resulting in improving quantity and quality of financial reporting. They concluded that the market was aware of this higher quality and valued this extra quality higher compared to the extra costs of complying

with SOX resulting in a lower cost of capital. After implementation of SOX investors even value non-audited information as more valuable because of the improved internal controls.

Summarizing this section it can be concluded that several changes occurred after the year 2002, for instance a switch from accrual-based to real earnings management (Cohen et al. 2008), increasing conservatism in financial reporting (Lobo and Zhou 2006) and increasing earnings quality (Chang et al. 2009). Those changes are associated with the implementation of SOX but there is a possibility that also other factors are associated with those changes.

3.2.3   Conclusion

As mentioned in section 2.2.1 corporate governance is a broad term and covers more than just investor protection. Nevertheless investor protection is an important part of corporate governance regulations. Leuz et al. (2003) found proof of an inverse relationship between investor protection and accrual-based earnings management therefore it is assumed that stronger investor protection regulations will result in less accrual-based earnings management.

As documented by Cohen et al. (2008) there is a trade-off between real and accrual-based earnings management. Their results suggest that after implementation of SOX the potential costs of accrual-based earnings management became too high and therefore companies switched to real earnings management. Costs of earnings management include the potential liability of CFOs and CEOs which increased as a consequence of SOX, because accrual-based earnings management is easier to detect (Graham et al. 2005) the costs of this type of earnings management increased.

All those changes were attributed to the implementation of SOX, and hence to stronger corporate governance regulations. Because investor protection is an important part of corporate governance the assumption is made that those changes are correlated with stronger investor protection regulations.

Summarizing, Cohen et al. (2008) stated that in the past firms were applying more accrual-based earnings management and less real earnings management compared to the period after SOX. Zang (2012) argued that real earnings management should occur during the year and that depending on the result obtained from these techniques accrual-based earnings management can be used after year-end to report the desired earnings. These two concepts together indicate that after introduction of SOX managers were already aware of the higher costs of accrual-based earnings management at the beginning of the year. As a consequence firms could respond to this knowledge by using more real earnings management during the year, resulting in a switch from accrual-based to real earnings management.

3.3   *Relationship between investor protection and earnings management*

Another relationship which is important to understand is the relation between investor protection and earnings management. As described in chapter 2 the level of investor protection differs worldwide, these amounts can also change over time for example due to the introduction of new regulations

3.3.1   Inverse relationship

According to Leuz et al. (2003) the degree of investor protection is an important explanatory factor for the level of earnings management. The authors claim that an important incentive for managers to use earnings management, and hence to hide real performance of the company, is the ability to gain private benefits. This is just one of the incentives of earnings management defined by Healy and Wahlen (1999) mentioned in chapter 2. Other incentives include capital market motivations, regulatory motivations and other contracting motivations such as debt covenants.

Leuz et al. (2003) stated that when private benefits are restricted due to strong investor protection this incentive will decrease and therefore less earnings management will be used by the company. The empirical results of this study confirm this reasoning and therefore they concluded that earnings management and investor protection have an inverse relationship with each other. Other researchers shared this view about the relation between investor protection and earnings management. Burgstahler et al. (2006) showed for example a negative relationship between strength of legal systems and the level of earnings management. They investigated data from private and public EU companies and concluded that private firms use more earnings management compared to public firms but also that all firms, private and public, operating in strong legal systems use less earnings management compared to firms which are operating in weak legal systems. So there is a negative relation between the strength of legal systems and earnings management.

A different study by Wright et al. (2006) criticizes the study by Leuz et al. (2003). They investigated the level of earnings management after a management buyout (MBO) in the U.K. and the U.S. Both countries are allocated to the same cluster by Leuz et al. (2003), the first cluster of outsider economies. Due to this allocation it would be expected that companies in the U.K. and the U.S. have the same level of earnings management. Wright et al. (2006) choose to study the level of earnings management after a MBO because according to Leuz et al. (2003) the possibility of private benefits is the most important incentive of earnings management. Managers have an incentive to lower reported earnings prior to a MBO because of the lower share price which decreases the costs of the MBO. The results of the study indicated that earnings management used by U.S. companies prior to a MBO is larger compared to U.K. companies, therefore the researchers concluded that de

clusters composed by Leuz et al. (2003) might be too broad because there could be still much variation within the composed clusters.

According to Nabar and Boonlert-U-Thai (2007) earnings management is not only related to investor protection but also to the culture of a country because national culture determines to a large extent corporate governance systems. Therefore the researchers investigated whether culture is, in addition to investor protection, also related to earnings management. They used four different culture variables, namely the degree of avoidance of uncertainty, individualism, power distance and masculinity, data collected from other studies was used to test their expectations. One of their conclusions was a positive relationship between the level of earnings management and uncertainty avoidance, indicating that besides the level of investor protection also cultural variables will determine the level of earnings management.

3.3.2   Compliance with IAS

Another study by Barth et al. (2007) examined whether companies which comply with IAS (International Accounting Standards) experience a higher accounting quality compared to companies which comply with non-U.S. national regulations. In their study they assume that quality of earnings is negatively associated with the level of earnings management used by a firm. When managers are restricted in the amount of judgement they can use when preparing financial reports, earnings management may decrease and hence accounting quality may increase. The researchers concluded that firms which comply with IAS have indeed higher accounting quality compared to firms complying with national regulations. This research endorses the research by Leuz et al. (2003) because IAS regulations are comparable with regulations faced by common-law countries (Barth et al. 2007) which are also classified as countries with strong investor protection.

3.3.3   Conclusion relationship investor protection and earnings management

According to prior literature there is a negative relationship between investor protection and earnings management. Companies in countries with high investor protection will use less earnings management compared to similar companies in countries with lower investor protection due to stricter regulations which for example reduced the possibility of private benefits (Leuz et al. 2003).

4   Research design

After elaborating on the relationship between investor protection and earnings management a research design will be structured. In this chapter first the hypotheses development will be described after which the sample and the methodology will be elaborated.

4.1   *Hypotheses development*

Based on prior research investor protection and earnings management have an inverse relationship with each other (Leuz et al. 2003 and Burgstahler et al. 2006). This implies that companies in countries with high investor protection will manage their earnings less compared to companies in countries with low investor protection. As mentioned before earnings management is often associated with corporate fraud and in order to restore investor confidence several countries adopted stringent laws in the recent past.

A study by Cohen et al. (2008) investigated data from U.S. companies before and after implementation of the corporate governance act SOX in 2002. The authors stated that this corporate governance act involved more stringent rules on investor protection. They confirmed the inverse relationship between investor protection and earnings management because after implementation of SOX earnings management indeed decreased. But this earnings management measurement was an accrual-based measurement, Cohen et al. (2008) also calculated the level of real earnings management in the period before and after SOX. They concluded that the real earnings management measurement on the other hand increased after SOX which may indicate an indirect positive relationship between investor protection and real earnings management.

According to Graham et al. (2005) real earnings management is harder to detect by outsiders compared to accrual-based earnings management. This is in accordance with the observations by Cohen et al. (2008) because after implementation of SOX the potential liability of managers increased (Lobo and Zhou 2006). But Graham et al. (2005) argue that real earnings management is costlier for a firm compared to accrual-based earnings management due to a suboptimal allocation of resources.

Summarizing there is a negative relationship between investor protection and accrual-based earnings management (Leuz et al. 2003 and Burgstahler et al. 2006). Managers still want to manage their earnings when the extent of investor protection increases, but due to the fact that accrual-based earnings management becomes costlier when it is detected a substitution effect is visible. Due to the absence of the possibility to use accrual-based earnings management managers tend to switch towards real earnings management. This type of earnings management is harder to detect (Graham et al. 2005) and therefore easier to apply for managers. This substitution effect which derives from

more stringent investor protection regulations is demonstrated by Cohen et al. (2008) for U.S. companies after implementation of SOX. Combined with the assumption that real earnings management is costlier for a firm (Graham et al. 2005) this will result in the conclusion that more investor protection will lead to a substitution effect of accrual-based earnings management by real earnings management which results in a suboptimal allocation of resources.

The research question which was already introduced in chapter 1 is defined as:

Does the extent of investor protection influence the levels of real and accrual-based earnings management?

Data from companies located in the U.K. and France are used in order to study the effect of investor protection on earnings management. The U.K. can be classified as a country with strong investor protection, France on the other hand can be classified as a country with less protection of investors, this will be explained in more detail in the next section. In order to answer the research question two hypotheses will be tested. The first hypothesis is designed to test whether the level of accrual-based earnings management differs significantly between the U.K. and France.

The following hypothesis is formulated:

H1: The level of accrual-based earnings management in the U.K. is lower compared to this level in France.

It is expected that the level of accrual-based earnings management in the U.K. is lower because investor protection is higher compared to France. As previously described there is an inverse relationship between investor protection and accrual-based earnings management. Because of more regulations and stricter sanctions companies which are operating in a country with strong investor protection will be more restrained in the use of accrual-based earnings management. As a result it is expected that the level of accrual-based earnings management used by companies in the U.K. is lower compared to this level for French companies.

The second hypothesis which will be examined in this study is defined as follows:

H2: The level of real earnings management in the U.K. is higher compared to this level in France.

Relying on the previous analysis it is expected that the level of real earnings management in the U.K. is higher compared to this level in France because the extent of investor protection in the U.K. is also higher. This results from the fact that managers are restrained in the use of accrual-based earnings management due to stricter regulations and more severe sanctions which are associated with high investor protection. Due to the more stringent investor protection regulations managers are expected to avoid the use of accrual-based earnings management. But when managers still have the incentive to manipulate earnings they will look for another method to manipulate the figures. Therefore the level of real earnings management is expected to increase when a company is operating in a country with stronger investor protection regulations.

This substitution effect between real and accrual-based earnings management is demonstrated by Cohen et al. (2008) and is the foundation of the main research question of this study; the effect of investor protection on earnings management. Summarizing the extent of investor protection influences the level of accrual-based earnings management used by companies, but the incentives to manipulate earnings are not changing therefore managers will use a different method which is called real earnings management.

When both hypotheses are tested an answer can be given on the question whether the amount of investor protection influences the levels of accrual-based and real earnings management. The sample of firms, the period and the measurement methods used to test the hypotheses will be discussed next.

4.2   *Sample*

The sample used for this study consists of companies from two different countries, from the U.K. and from France. Why those countries are chosen will be described below. After that the period which will be investigated will be declared.

4.2.1   Countries and companies

The U.K. and France are chosen in this research because of the difference in investor protection between both countries. Both Leuz et al. (2003) and La Porta et al. (1998) showed that the level of investor protection differs between those countries. For both countries all listed companies with available data for the years between 1999 and 2010 are selected. The data is obtained from the Thomson One Banker database. It is not a requirement that a single company has available data for all years, this in order to avoid a survivorship bias. The sample is restricted to all non-financial companies with available data in the database which is used. Financial companies are excluded from the sample because those companies differ from other companies in several ways. Those financial companies have for example different government supervision compared to other firms, another

example is the procedure of profit measurement which differs from non-financial companies. The firms are sorted by the first digit of their SIC code[7], an overview of the different SIC-codes is displayed in Appendix III. On average, data of 1172 U.K. firms were studied each year in order to compute the level of accrual-based earnings management, for France on average 427 firms are studied. In order to examine the level of real earnings management 965 U.K. firms were on average studied for the three equations, for France this amount equals to 352 firms.

4.2.2   Period

The period which will be studied is between 1999 and 2010. First of all it is a long time period in which several events occurred. This long time period enables to study the level of real and accrual-based earnings management over a number of years in order to draw a conclusion about the substitution effect of both earnings management types in different years.

Several events occurred during this period which could have had an impact on the levels of real and accrual-based earnings management, in 2000 the EURO was introduced in a number of European countries (only France introduced this currency, the U.K. retained their own currency), in 2005 all listed European companies had to comply with the new rules of IFRS and in 2008 a worldwide financial crisis started. In the early 2000s there was also a worldwide recession caused by the internet bubble in the late 20th century. When analysing the results of this study attention should be paid to those phenomena because they could have influenced the levels of both earnings management methods.

4.3   *Methodology*

The methodology used in this research consists of two different components, a measurement for accrual-based earnings management and a measurement for real earnings management. Those measurements are used in order to conclude whether the level of both earnings management methods differ between both countries.

4.3.1   Accrual-based earnings management

As described in section 2.1.4.1 there are different models to measure the level of accrual-based earnings management. Following prior literature (e.g. Cohen et al. 2008, Zang 2012 and Lobo and Zhou 2006) the modified Jones model constructed by Dechow et al. (1995) will be used in this research to calculate the level of accrual-based earnings management. Discretionary accruals (DA) are calculated by subtracting non-discretionary accruals (NDA) from the total accruals (TA) in a

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[7] Standard Industrial Classification (SIC); a code of four numbers used for a classification of industries developed by the U.S. government.

period. The coefficients α_1, α_2, α_3 of this model will be calculated cross-sectional for each industry. The industries are sorted by the SIC codes of all companies, the companies are grouped by the first SIC code-digit which classifies their general industry.

By calculating the coefficients separately for every industry there is a control for industry-wide differences and economic changes in specific industries. Following Cohen and Zarowin (2010) TA will be calculated by subtracting CFO (operating cash flow from continuing operations) from EBXI (earnings before extraordinary items and discontinued operations). Finally discretionary accruals will be computed by the difference between the calculated NDA and the TA of a particular company (Cohen and Zarowin 2010). This DA obtained from subtracting NDA from TA will be used as a proxy for the level of accrual-based earnings management used by the firm.

4.3.2   Real earnings management

The second earnings management measurement method is used to calculate the level of real earnings management. Following Roychowdhury (2006) the level of real earnings management activities can be calculated using the three different variables described before, R_CFO (abnormal CFO), R_PROD (abnormal production costs) and R_DISX (abnormal discretionary expenses). Cohen et al. (2008) provide evidence that those measurements are a good procedure to examine the level of real activities manipulation. Zang (2012) also uses R_PROD and R_DISX as tools to assess the level of real earnings management. To compute the variables first the normal values will be computed by the equations outlined in section 2.1.4.2. One adjustment is made to the equation R_DISX, due to a lack of available data only advertising expenses and selling, general and administrative expenses are included, research and development expenses are not included caused by a lack of sufficient data. All coefficients which are needed for these models will be calculated cross-sectional for each industry. The industries are grouped by the first SIC code-digit as used by the calculation of the coefficients for the modified Jones model (Dechow et al. 2005). One thing that should be addressed is the fact that a regression analysis can only be performed when there are at least two observations. This means that when there are less than two firms in a sample from a specific industry no coefficients can be estimated. When this is the case the estimated parameters in the tables in appendix VI show n.a. (not available) and the companies from those industries are removed from the sample.

When the normal values are estimated the abnormal values will be calculated by subtracting the normal values from the actual values for each company. Those three computed values will be used to examine the level of real earnings manipulations by firms.

4.4   *Descriptive statistics*

Appendix IV (table 5 and table 6) shows a summary of the main variables which are studied in this research. I use different samples for each year, each country and each measurement variable. In order to examine the level of accrual-based earnings management the main variable which is studied is discretionary accruals (panel A from table 5 and 6). To estimate the level of real earnings management three variables are studied; cash flow from operations, production costs and discretionary expenses (panel B, C and D respectively). The variable 'total assets' is displayed in the native currency, French values are therefore displayed in Euro's and U.K. values are displayed in Pounds. The earnings management variables are displayed in relation to the total assets of a firm from the previous year. Further on those variables will be explained, but first the sample composition will be briefly clarified (appendix V provides a more detailed representation of the sample composition).

As described earlier different samples are used in order to study the levels of the different types of earnings management. Table 1 displays an overview of the composition of the different samples which are used. A distinction is made between the samples used to calculate the level of accrual-based earnings management and the samples used to calculate the level of real earnings management. The table shows the average sample composition of all the studied years, firms are sorted by the first digit of the SIC code[8]. The composition of the sample used to examine the level of real earnings management is based on the average sample size of the three individual measurement methods based on cash flow from operations, production costs and discretionary expenses.

SIC codes	Accrual-based		Real (average)	
	U.K.	France	U.K.	France
0000-0999	1%	1%	1%	1%
1000-1999	12%	4%	12%	3%
2000-2999	14%	20%	14%	20%
3000-3999	19%	25%	21%	27%
4000-4999	8%	9%	7%	8%
5000-5999	13%	12%	12%	12%
7000-7999	24%	23%	24%	24%
8000-8999	8%	5%	8%	5%

Table 1. The average sample compositions used to calculate the levels of accrual-based and real earnings management for the U.K. and France sorted by the SIC codes of companies.

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[8] An overview of the different industries based on the first digit of the SIC-code is illustrated in appendix III.

The sample compositions of the accrual-based measurement of the U.K. and France do look more or less the same indicating more or less similar sample compositions but there are some differences. The major difference between the two countries concentrates on the industries with first digit SIC codes 1, 2 and 3. Remarkably the U.K. sample consist of relatively more firms from industry 1 (mining and construction products) and relatively less from industry 2 (light manufactured products) and 3 (heavy manufactured products) compared to the French sample.

The last column of table 1 shows the average sample composition of all real earnings management measurements, the proportions are quite similar to the proportions of the samples used to estimate the level of accrual-based earnings management. Something which also should be noted is the fact that the numbers demonstrate larger concentrations of firms from industry 2, 3 and 7 (light manufactured products, heavy manufactured products and other services respectively) compared to the other industries and a very low amount of firms from industry 0 (agricultural, forestry and fishery products).

Appendix IV describes the characteristics of the main variables which are studied. The first variable which is described is the measurement for accrual-based earnings management; discretionary accruals. Panel A from table 5 (appendix IV) shows this value for companies included in the U.K. sample. As shown in the table the mean level of discretionary accruals between the years 1999 and 2010 for U.K. companies fluctuates between -0,196 (2003) and 0,277 (2001). The values of discretionary accruals used by French companies are displayed in panel A of table 6 (appendix IV). The mean level of discretionary accruals between the years 1999 and 2010 used by French companies fluctuates less compared to U.K. companies. The lowest average level is -0,015 (2005) and the highest average level of discretionary accruals is 0,011 (2002). Noteworthy is the standard deviation of discretionary accruals, this standard deviation is considerably higher for the U.K. sample compared to the French sample for all years included in this study.

Panel B, C and D (appendix IV, table 5 and 6) display the values for the samples used to calculate the level of real earnings management by using cash flow from operations, production costs and discretionary expenses respectively. The mean value of the first measurement, cash flow from operations, for the French sample is negative for all years. This is however not the case for the U.K. sample. The average real earnings management based on cash flow from operations for the U.K. sample reports a positive amount in 7 out of the 12 examined years. Again the standard deviation of this variable is much higher for the U.K. sample compared to the French sample. The average values of the other two measurements, based on production costs and discretionary expenses are more uniform. The mean value of the real earnings management based on production costs is mainly positive while this value based on discretionary expenses is mainly negative for the studied years.

The amount of firm observations differs across the various measurements. The samples used to calculate real earnings management by the use of discretionary expenses are considerably smaller compared to the other samples for both the U.K. and France. This is due to the fact that this data was not available for all firms. Another noteworthy observation is the average firm size in the different samples. It is remarkable that the average firm size of the sample used to calculate real earnings management by the use of discretionary expenses is considerably higher compared to the other samples. This comment applies to both the U.K. and France, which illustrates that only the larger firms are included in this calculation. This could have occurred a bias in the results of this measurement.

Summarizing different samples are used in this study; for each year, each country and each measurement variable. In general more U.K. companies are included in the different samples compared to French companies. The third measurement method to measure real earnings management, based on discretionary expenses, is based on a considerably smaller sample size compared to the other measurements.

4.5   *Conclusion*

In this section two hypotheses are established in order to answer the main research question, whether the extent of investor protection influences the levels of real and accrual-based earnings management. Two countries will be studied, the U.K which has strong investor protection and France which has weak investor protection. For both earnings management methods a measurement, real and accrual-based earnings management, is described.

5   Results

In this section the results of the study will be outlined and clarified. First the findings about the accrual-based earnings management measurement will be showed in order to prepare a conclusion about the first hypothesis, after that the results from the different real earnings management measurements will be outlined to enable a conclusion about the second hypothesis. At the end of this chapter the ratio between the two types of earnings management will be studied.

5.1   *Accrual-based earnings management*

As previously mentioned the modified Jones model (Dechow et al. 1995) is used to examine the levels of accrual-based earnings management for both countries. The estimated parameters are calculated for each industry separately by the use of a linear regression in SPSS, those parameters are shown in appendix VI (table 9).

The constructed accruals are categorized as the non-discretionary part of the total accruals (TA), those non-discretionary accruals (NDA) are classified as normal accruals which are not used in order to manipulate earnings. The remaining part is categorized as discretionary accruals (DA) which are classified as earnings management. These DA are calculated by deducting NDA from TA for every company, after that the absolute values are taken in order to calculate the average level of earnings management for each year regardless the direction of the manipulation. The results of this calculation are shown in the graphs below. Those graphs display the level of discretionary accruals (which are classified as accrual-based earnings management) divided by total assets in order to control for firm size.

As can be seen from figure 1 the level of discretionary accruals and hence accrual-based earnings management in the U.K. fluctuates over time. The figure illustrates some extremes around the years 2001, 2003 and 2008.
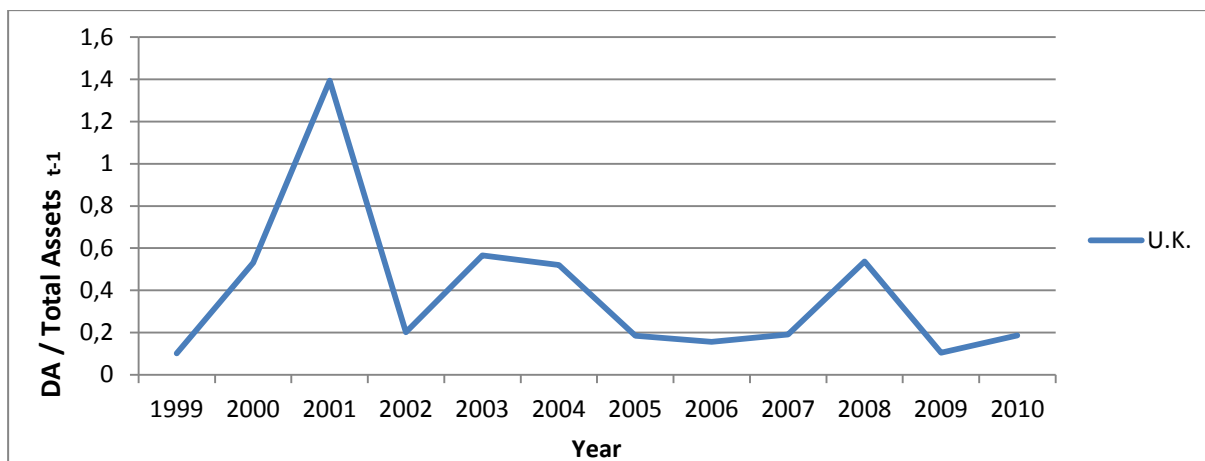
Figure 1: Level of discretionary accruals lagged by total assets for the U.K.
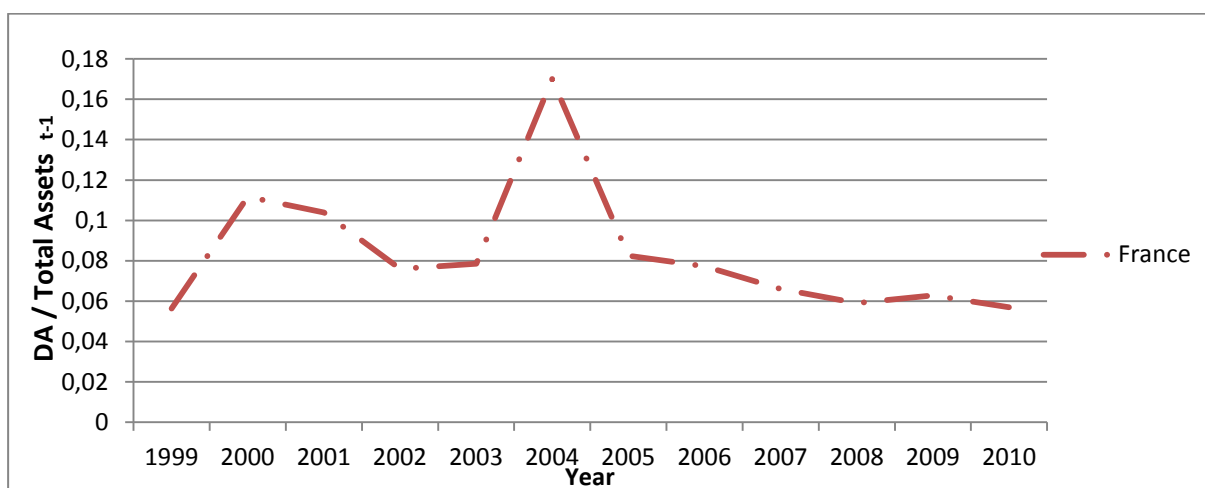
Figure 2: Level of discretionary accruals lagged by total assets for France.

The findings for France companies, displayed in figure 2, illustrate more or less the same extremes. Around the years 2000, 2004 and 2009 peaks are visible in the level of accrual-based earnings management used by French firms. As mentioned before in the early 2000s there was a worldwide recession caused by the internet bubble in the late 20th century which can be explanation for the first peak. In 2008 a worldwide financial crisis started after the collapse of the U.S. housing market, this may be also an explanation for the last peak. Interestingly there is also a peak visible around the year 2004, which cannot be explained that easily.

What is remarkable is that the figures of the U.K. and France do look more or less the same but are not exactly equal. The first peak which is observable might be correlated with the internet bubble in the early 2000s as discussed before but the peak in the graph of France is somewhat earlier (start and highest amount in 2000) compared to this peak in the U.K. (the highest amount in 2001). The second peak is also somewhat different, in the U.K. this peak started in 2003 but in France the

highest amount is observed in the year 2004. Another dissimilarity between those countries is the fact that the first peak is in the U.K. much larger compared to the second peak, but for France this is the other way around. So for companies in the U.K. the first event had the highest impact while for France this was the second event around the year 2004. The final peak in the figures is observable around the year 2008, the year in which the latest worldwide financial crisis has begun. Again both countries show different responses to this event, the response in the U.K. is somewhat earlier compared to the response in France and it is more severe. So the progress of the figures of the level of accrual-based earnings management of both countries is quite similar but not exactly the same.

If we combine both figures to compare the levels of accrual-based earnings management of both countries it can be concluded that firms in the U.K. manipulate their earnings more by using accruals compared to companies in France after controlling for firm size. This observation is applicable to all years between 1999 and 2010 as can been seen in figure 3 in which figure 1 and 2 are combined.
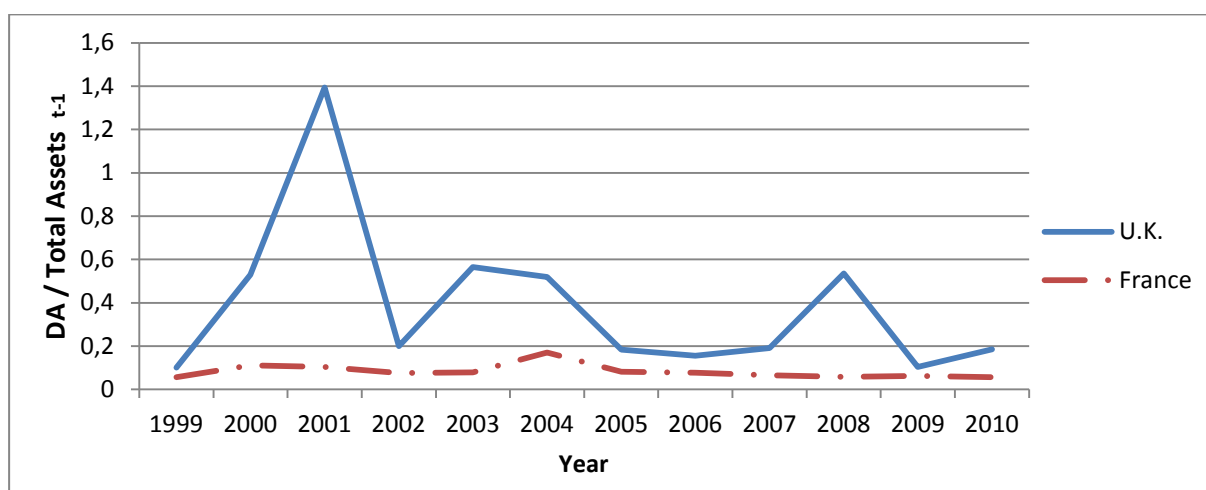
Figure 3: Levels of discretionary accruals lagged by total assets for France and the U.K.

After conducting an independent-samples T-test using SPSS the conclusion can be made that most of the years which are included in this study contain a significant difference between the means of accrual-based earnings management of the U.K. and France. The results of this test are displayed in appendix VII, table 11, only the years 2002, 2005 and 2008 do not show a significant result (significant at 5%).

The results about the levels of accrual-based earnings management as shown above prove that accrual-based earnings management is higher for U.K. firms compared to this level of French firms. This is in contrast with the first hypothesis; *the level of accrual-based earnings management in the U.K. is lower compared to this level in France.*

5.2   *Real earnings management*

Following Cohen et al (2008) this study relies on the study of Roychowdhury (2006) in order to study the level of real earnings management. The level of normal production costs, normal cash flow from operations and normal discretionary expenses are calculated by the use of estimated parameters, shown in appendix VI (table 10, panel A-F).

By the use of the three equations mentioned in chapter 2 the normal levels of those items are calculated, in order to measure the level of real earnings management the actual levels are deducted from the normal levels. Just like the calculation for accrual-based earnings management the absolute values are taken to calculate the average level of real earnings management regardless the direction of the manipulation. Figures 4 – 6 present the results from the level of real earnings management measured using cash flow from investments, production costs and discretionary expenses respectively.

The first graph shows the level of real earnings management based on cash flow from operations used by companies of both countries (figure 4), in every single year the level of the U.K. exceeds the level of France. From these results it is clear that U.K. firms use more real earnings management compared to companies from France.

Figure 5 presents the levels of real earnings management based on production costs. This figure shows the level of this kind of earnings management for the years between 1999 and 2010. The figure demonstrates that the relation between the levels of real earnings management based on cash flow from operations of both companies is not unilateral. For the years 1999, 2000 and 2008 the level of earnings management of French companies is higher while for the intervening years this level of earnings management is higher for U.K. companies.

The results on the formula based on discretionary expenses are shown in figure 6. The outcome of this measurement is for most of the years higher for U.K. companies compared to French companies (except for the year 2009). This indicates likewise that U.K. companies tend to use more real earnings management compared to French companies.
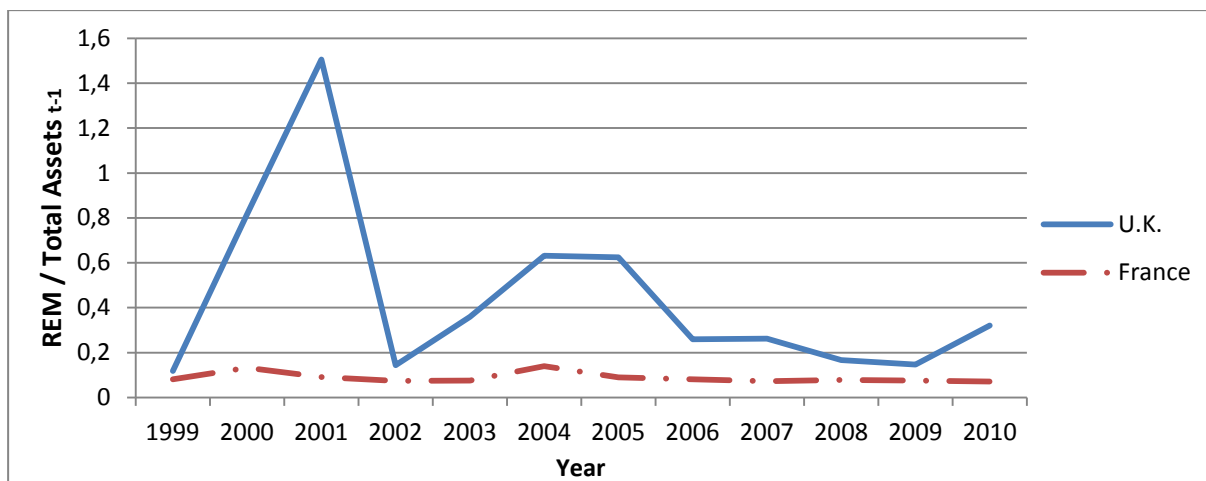
Figure 4: Levels of real earnings management based on cash flow from operations lagged by total assets for France and the U.K.
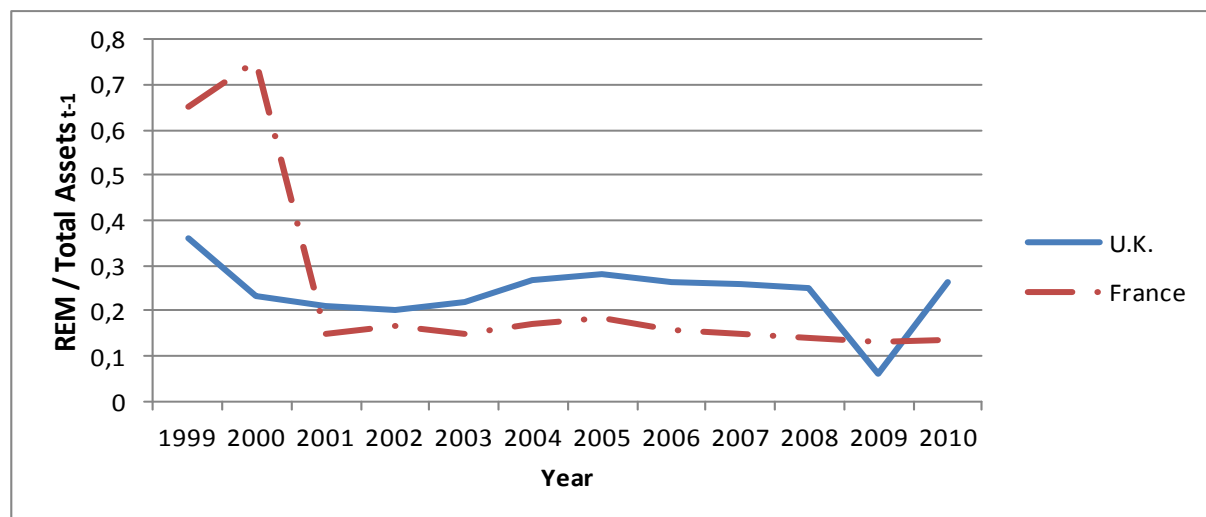
Figure 5: Levels of real earnings management based on production costs lagged by total assets for France and the U.K.
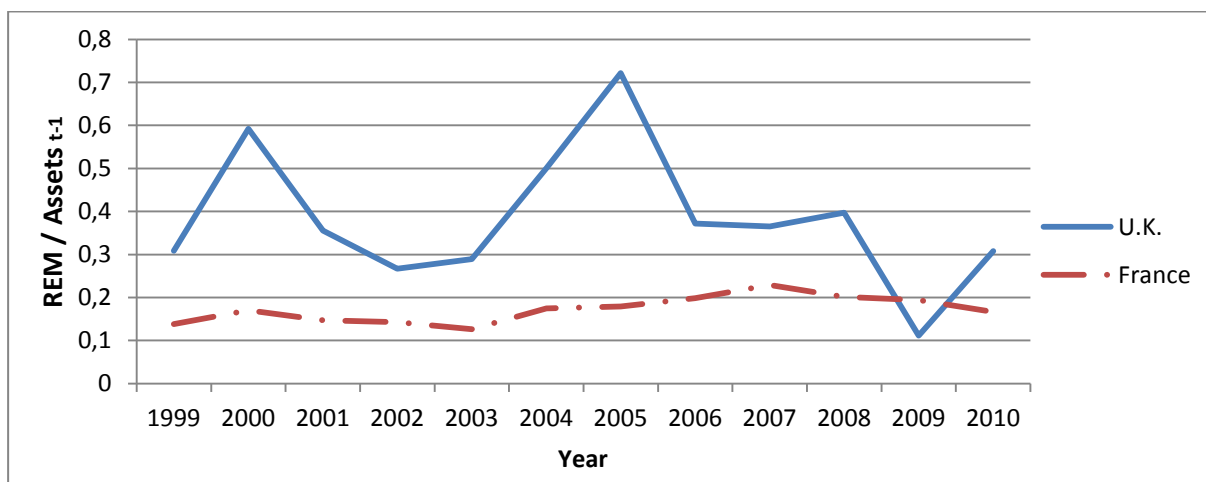

Figure 6: Levels of real earnings management based on discretionary expenses lagged by total assets for France and the U.K.

After conducting an independent-samples T-test using SPSS the conclusion can be made that most of the years which are included in this study contain a significant difference between the means of the real earnings management measurements of the U.K. and France. The results of this test are displayed in appendix VII, table 12, panel A-C. Almost all observations show a significant difference in the means of both countries (significant at 10%). For the measurement based on cash flow from operations only the year 2003 does not shows a significant difference in means (all other years are significant at 0,1%), for the measurement based on production costs even all years show a significant difference (significant at 1%). For the last real earnings management measurement method, based on discretionary expenses, only the years 2004 and 2005 do not show a significant difference. From this observations the conclusion can be made that the level of real earnings management based on the three different methods differ significantly between the U.K. and France.

The shapes of the three graphs are quite different from each other. In order to examine the overall level of real earnings management the average of the three values is computed which resulted in the graph shown in figure 7. It is clear from this graph that the level of real earnings management is higher in the U.K. compared to France for almost all years (except for the years 1999 and 2009).

Figure 7: Levels of real earnings management based on the average of the above mentioned items for France and the U.K.

For these results also an independent-samples T-test is carried out, the results of this test are displayed in appendix VII, table 12, panel D. Those results show that the difference in means for the years 2000 until 2008 and 2010 (the years in which the U.K. scores higher than France) are all significant at 10%, eight of the ten years are even significant at 0,1%.

These results provide evidence for the second hypothesis; *the level of real earnings management in the U.K. is higher compared to this level in France.* For all three measures, cash flow from operations, production costs and discretionary expenses, companies in the U.K. tend to use more real earnings management compared to companies in France. So by using the three formulas designed by Roychowdhury (2006) it seems that real earnings management is indeed higher in the U.K. compared to France. Therefore the second hypothesis is confirmed by this analysis.

5.3   *Ratio between two types of earnings management*

The results so far do not provide proof for both the hypotheses of this research, it provides only proof for the second hypothesis but not for the first one. As explained in the previous section both types of earnings management are larger in the U.K. compared to France, therefore it is interesting to look at the ratio between the two types of earnings management. This ratio is calculated by dividing the level of real earnings management (REM), the computed average level, by the level of accrual-based earnings management (DA), figure 8 shows the results. When the level of REM exceeds the level of DA the result of this calculation will be higher than 1, when REM is lower compared to the level of DA the result will be lower than 1. This figure shows that in France REM exceeds DA for almost every year. In the U.K. on the other hand this ratio fluctuates around 1.
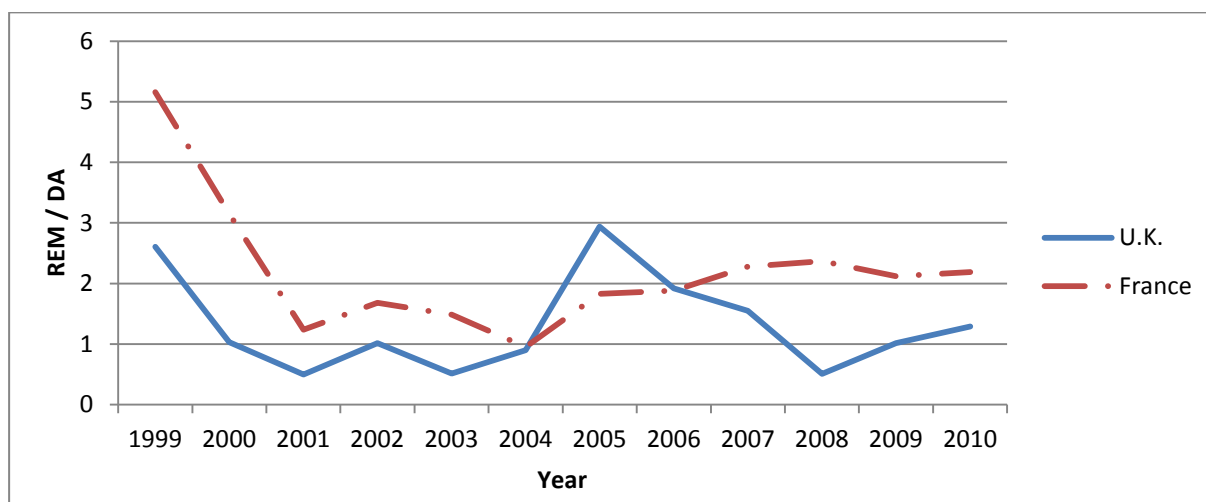
Figure 8: Ratio calculated by dividing the average real earnings management measurement (REM) by the accrual-based earnings management measurement (DA) for France and the U.K.

Figure 8 also illustrates that the ratio in France is higher compared to the U.K. (except for the year 2005), which means that REM is higher in comparison to DA in France compared with the U.K. This is contrary to the expectations of this research which predicted higher REM in the U.K. and higher DA in France. Earnings can be manipulated into two directions, upwards and downwards. As explained in section 2.1.2 there are several motivations for the manipulation of earnings, some of

them give an incentive to manage earnings upwards, others an incentive to manage earnings downwards. The manipulation of earnings upwards will result in reporting higher profits than actually earned by the company. It may be possible that only this upwards earnings management, accrual-based and real, is associated with the level of investor protection. Upwards earnings management could be often associated with fraudulent behaviour while downwards earnings management is often caused by reversals of upwards earnings management. As described earlier the reduction of political visibility could also be an incentive to decrease reported earnings but this is in practice only applicable to a few companies. Therefore it may be possible that only upwards earnings manipulation is associated with the level of investor protection.

In order to examine this assumption the levels of accrual-based and real earnings management are calculated by restricting earnings management to upwards earnings manipulation (at company level). The results of this study are shown in figure 9, this graph also shows that the ratio in France is higher compared to the U.K. which indicates that accrual-based earnings management in the U.K. is more severe and real earnings management is smaller compared to France.
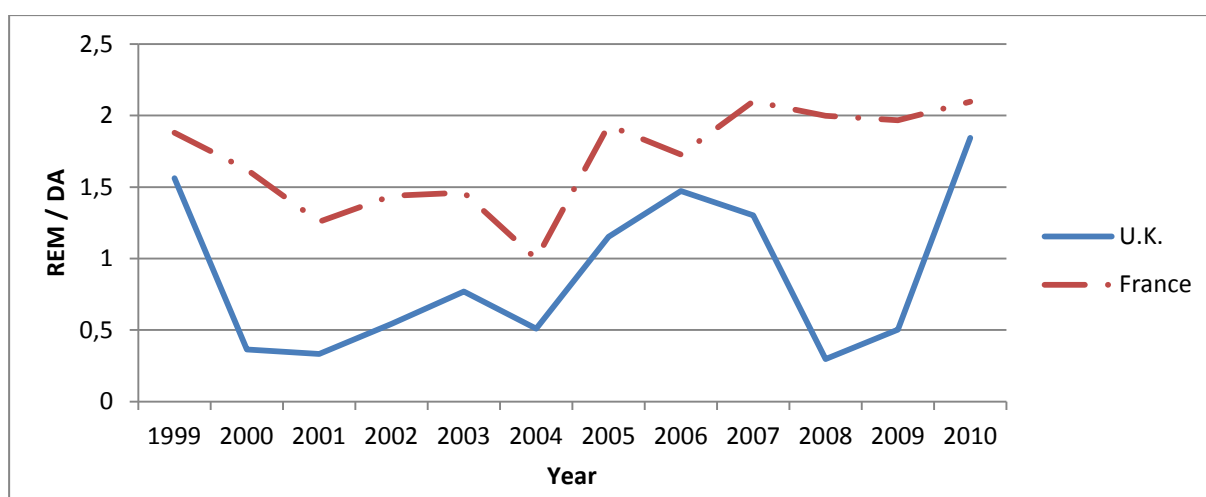

Figure 9: Ratio calculated by dividing the average real earnings management measurement (REM) by the accrual-based earnings management measurement (DA) for France and the U.K. Earnings management is restricted to upwards earnings manipulation.

In line with the test before the ratio between real and accrual-based earnings management is higher for France compared to the U.K. When restricting earnings management to positive earnings manipulation this conclusion is even more severe, the ratio is higher for France in all tested years. This indicates that the relation between real and accrual-based earnings management is different for both countries. French companies use relatively more real earnings management contrarily U.K. companies use relatively more accrual-based earnings management. The graphs of figure 8 and figure 9 fluctuate over time which indicates that the ratio is not equal over time, both figures show

that the ratio in France is more stable compared to the ratio in the U.K. This suggests that not only the overall level of earnings management is higher in the U.K. but also that the ratio between accrual-based and real earnings management is less constant compare to France.

5.4 *Analysis*

In section 5.3 the results of the different earnings management measurements are described. The results indicate that the overall level of earnings management in the U.K. is higher compared to this level in France. The data show that U.K. firms use more accrual-based and more real earnings management compared to French firms after controlling for firm size.

Chapter 3 provided an overview of prior literature about the relationship between investor protection and accrual-based and real earnings management. A study by Cohen et al. (2008) demonstrated an inverse relationship between investor protection and the level of accrual-based earnings management. After an increased extent of investor protection companies switched from accrual-based to real earnings management, this may indicate an indirect positive relationship between the extent of investor protection and the level of real earnings management.

The authors made use of the data of U.S. companies between 1987 and 2005. They argued that after implementation of SOX the extent of investor protection increased and as a result firms switched from accrual-based to real earnings management. These results are in accordance with the results of the study by Lobo and Zhou (2006), they provided evidence of an increase in conservatism over financial reporting for U.S. companies after implementation of SOX. For their study they used data of U.S. companies between 2000 and 2004.

The results presented in this study are not in accordance with the results of the above mentioned studies. It provides no evidence for a positive relationship between investor protection and real earnings management and a negative relationship between investor protection and accrual-based earnings management. There could be different causes for this discrepancy, besides the fact that a different sample is used, those will be discussed next.

Something which could not have caused the discrepancy are the methods used to calculate the different levels of earnings management. The formulas used in this study are derived from the study by Cohen et al. (2008) and are therefore exactly equal. But it could be that those measurement methods are more suitable for accounting practices which are applied in the U.S. This could be caused by the fact that reporting and accounting regulations are not the same in all countries, enabling or restricting certain earnings management methods. U.S. companies had to comply with the regulations of US-GAAP while the European companies had to comply with local GAAP policies or IFRS.

The studies mentioned above describe the effect of a change in investor protection within a country while this study compares two different countries with each other. It is possible that the substitution effect described by Cohen et al. (2008) is only visible when the extent of investor protection changes in a specific country. This could happen because there are also other variables, in addition to investor protection, which impact the levels of the different kinds of earnings management. Those other variables are to a great extent eliminated when the research concentrates on one country. Due to the design of this study, two different countries are studied, the elimination of those variables is not possible which could have had an impact on the results.

5.4.1   Detailed study of 2006 and 2007

The analysis described above does not enable an explanation why the outcomes of this study were not in line with the expectations. Therefore some data will be studied in more detail to get a better understanding of the different levels of earnings management in different industries. The years 2006 and 2007 are selected for this detailed study because both years do not show extremes in the levels of accrual-based and real earnings management (figure 3 and 7). Again the absolute values are taken in order to calculate the levels of earnings management regardless the direction of the manipulation. The purpose of this detailed study is to compare the levels of earnings management of the different industries of both countries. This is useful because the results of this research could be biased by a very high or low level of earnings management for a particular industry when a large portion of the firms which are studied are concentrated in this industry.

First the level of accruals-based earnings management is studied in more detail by calculating the level of discretionary accruals separately for each industry group (all companies are again grouped by the first digit of their SIC code). This amount is displayed relative to total assets of the previous year. Next to this variable also the distribution of the sample over the different industry groups is shown. Figure 10-13 show the data of those variables for both years separately.

The outcomes of the accrual-based variables for U.K. firms are displayed by figure 10 and 11. The composition of the sample is similar for both years but the level of accrual-based earnings management differs considerably for several industries. Especially industry 0 and 2 differ considerably between both years.
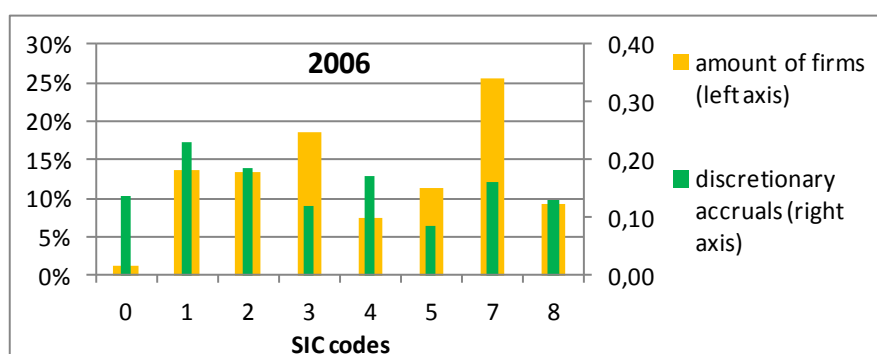
Figure 10. Composition of the sample used to measure the level of accrual-based earnings management and the level of discretionary accruals for U.K. companies in 2006.
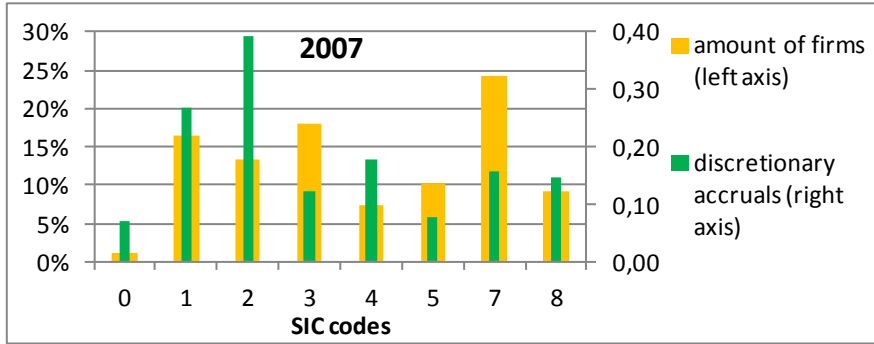
Figure 11. Composition of the sample used to measure the level of accrual-based earnings management and the level of discretionary accruals for U.K. companies in 2007.

The outcomes for the accrual-based variables for French firms are displayed by figure 12 and 13. Remarkably in France industry 3 and 8 changed considerably between 2006 and 2007. Another noteworthy observation which was already mentioned before is the fact that the level of discretionary accruals is much lower for French firms compared to U.K. firms.
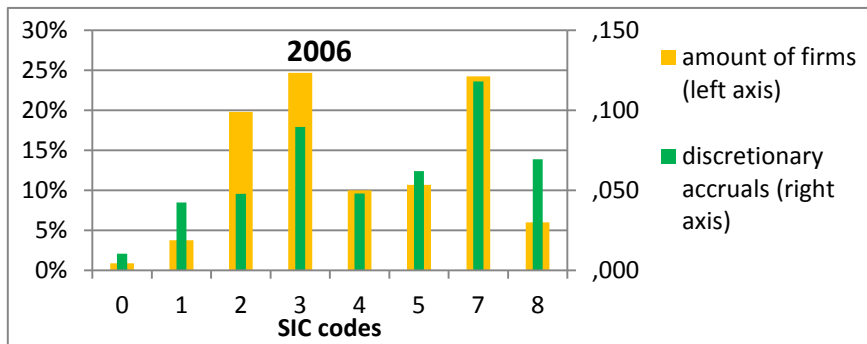
Figure 12. Composition of the sample used to measure the level of accrual-based earnings management and the level of discretionary accruals for French companies in 2006.
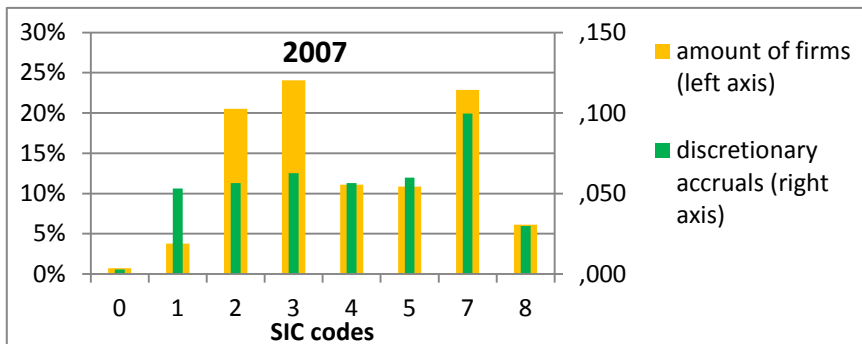
Figure 13. Composition of the sample used to measure the level of accrual-based earnings management and the level of discretionary accruals for French companies in 2007.

When looking at the overall picture of accrual-based earnings management it can be noted that for all industries individually the level of accrual-based earnings management of U.K. firms exceeds this level of French firms. It is also remarkable that the level of discretionary accruals and hence accrual-based earnings management varies considerably between the different industries.

Figures 14-17 display the same as the figures before but it shows the level of real earnings management instead of accrual-based earnings management. Just as the results from the accrual-based measurement these outcomes illustrate that the level of real earnings management is higher for U.K. companies compared to French companies for all industries and the industry composition

does look more or less the same. Just as the level of accrual-based earnings management also the level of real earnings management varies considerably between the different industries.
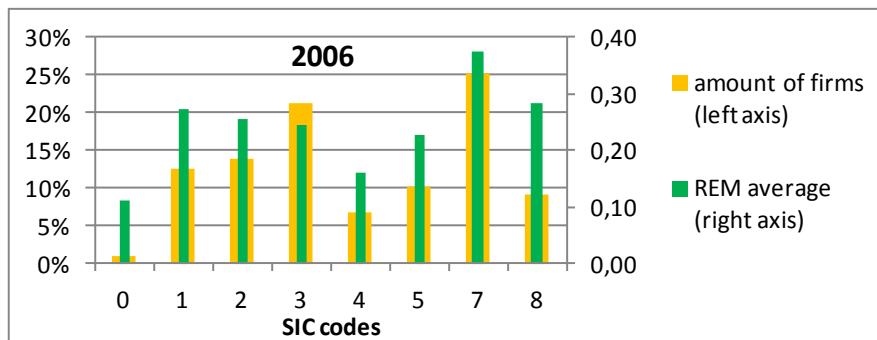
Figure 14. Composition of the sample used to measure the level of real earnings management and the average level of real earnings management for U.K. companies in 2006.
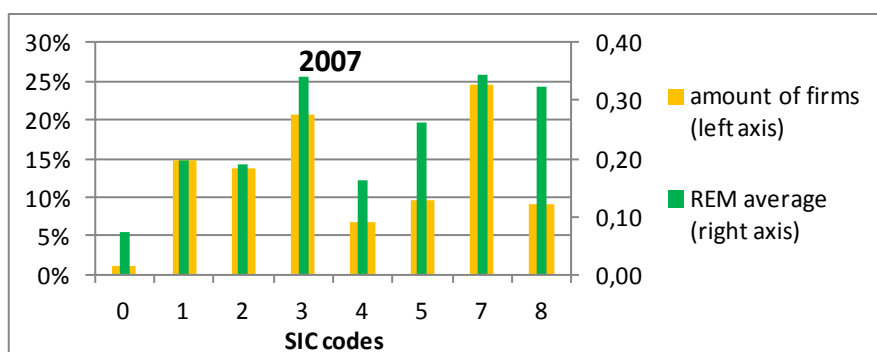
Figure 15. Composition of the sample used to measure the level of real earnings management and the average level of real earnings management for U.K. companies in 2007.
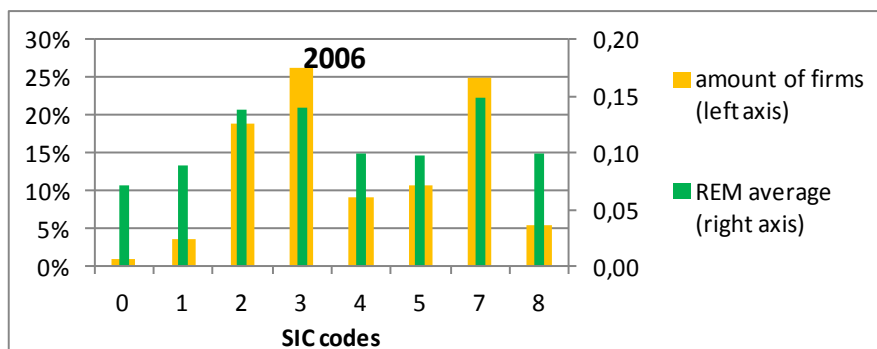
Figure 16. Composition of the sample used to measure the level of real earnings management and the average level of real earnings management for French companies in 2006.
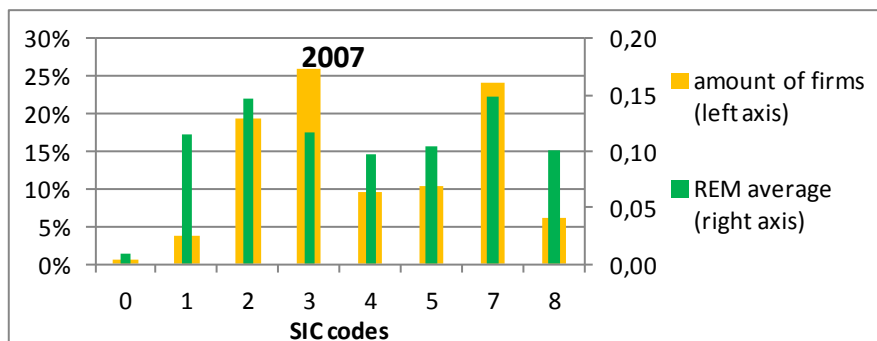
Figure 17. Composition of the sample used to measure the level of real earnings management and the average level of real earnings management for French companies in 2007.

Summarizing the levels of accrual-based and real earnings management are higher for U.K. firms compared to French firms for all industries in the years 2006 and 2007. This indicates that the results are not biased by an extreme level of earnings management for a particular industry for one

of the countries. These outcomes provide further evidence on the assumption that the overall level of earnings management used by U.K. companies is larger compared to this level used by French companies.

5.5   *Conclusion*

This chapter provided the results of this study. There was no supporting evidence found for the first hypothesis, but the results did provide proof for the second hypothesis. The amount of accrual-based and the amount of real earnings management for U.K. companies are higher compared to these amounts for French companies. This implies that the overall level of earnings management used by U.K. companies is higher compared to this level used by French companies. The ratio between REM and DA does suggest that the level of REM is higher in comparison to DA in France compared to the U.K. When restricting earnings management to positive earnings manipulation the same results are shown. Those results are contrarily to the expectations of this study.

6 Conclusions

The final chapter of this study will consist of an answer on the research question and the conclusions about the hypotheses formulated in chapter 4. After that the limitations of this study will be described and finally a couple of suggestions for further research will be outlined.

6.1 *Main findings*

The aim of this study was to provide an answer on the research question as explained in chapter 3; *does the extent of investor protection influence the levels of real and accrual-based earnings management?* This assumption mainly derived from the study by Cohen et al. (2008) who describe a change in the kind of earnings management in the U.S. after implementation of SOX which has resulted in stronger investor protection. U.S. companies used less accrual-based and more real earnings management after the year 2002, the year in which SOX was implemented. Cohen et al. (2008) concluded that there could be an association between the stronger investor protection and the switch in the kind of earnings management used by companies.

Relying on this research by Cohen et al. (2008) this study concentrated on the differences in the kind of earnings management used by companies in different countries with different levels of investor protection. The first hypothesis which was analysed was formulated as follows; *the level of accrual-based earnings management in the U.K. is lower compared to this level in France.* The results provided evidence that the level of accrual-based earnings management in the U.K. was higher compared to this level in France for all the investigated years (figure 3). This difference in means was significant at 1% for 10 of the 13 investigated years (appendix VII, table 11). Therefore the conclusion can be made that the level of accrual-based earnings management in the U.K. is higher instead of lower compared to this level in France, so the first hypothesis is rejected based on the data used in this study.

The second hypothesis which was tested was formulated as follows; *the level of real earnings management in the U.K. is higher compared to this level in France.* The three values which were used to study the level of real earnings management showed that companies in the U.K. indeed used more real earnings management compared to French companies. Between 1999 and 2010 the majority of the years showed a higher level of real earnings management for the U.K. compared to France. Therefore this study provides evidence for the second hypothesis and it can be concluded that the level of real earnings management in the U.K. is higher compared to this level in France for the majority of the investigated years.

The main research question of this study was whether or not the level of investor protection influences the levels of accrual-based and real earnings management. As explained before the U.K. is

classified as strong investor protection and France as a country with weak investor protection. The observations demonstrate that the levels of both types of earnings management are higher in the U.K. compared to France. This is contrary to the first hypothesis but it confirms the second hypothesis, real earnings management is indeed higher in the U.K. compared to France. But this observation cannot be associated with the higher level of investor protection because there could be omitted variables which are causing this higher degree of real earnings management. Examples of those variables which could affect the level of earnings management are the economic situation in a country or the extent and type of regulations. Further research is necessary about the extent of the impact of those variables on the level of real and accrual-based earnings management. There is even more proof for this reasoning because of the rejection of the first hypothesis, accrual-based earnings management is also higher in the U.K. compared to France. Both types of earnings management are higher for companies in the U.K. this indicates the presence of another variable which causes this higher level of overall earnings management.

When the overall level of earnings management in the U.K. is significant larger compared with France it could be interesting to look at the ratio between the two types of earnings management to examine the relation between those two types. The results from this data suggest that the level of real earnings management in France is higher than the level of accrual-based earnings management compared with those levels in the U.K. This indicates that U.K. companies use relatively more accrual-based earnings management and French companies use relatively more real earnings management (also when earnings management is restricted to positive earnings manipulation). Those findings are contrary to the prediction which was made in chapter 4. The ratio's between real and accrual-based earnings management of both countries are not the same for the different years which are examined. This implies that the relationship between the two types of earnings management changes over time.

Based on the results presented in this study it can be concluded that a higher level of investor protection does not lead to lower accrual-based and higher real earnings management. But despite the results on the ratio between accrual-based and real earnings management the opposite cannot be concluded as well. The fact that U.K. companies use relatively more real and less accrual-based earnings management cannot be automatically attributed to the higher level of investor protection. There are probably other omitted variables which are associated with this observation.

As mentioned in the introduction of this study real earnings management can destroy firm value by a not optimal allocation of firm assets (Graham et al. 2005). The conclusion of this study is important because it provides evidence that a higher extent of investor protection is not automatically associated with a higher level of real earnings management used by companies. If both hypotheses were confirmed this association between investor protection and real earnings

management could exists which should enforced regulators to keep this in mind when they are changing regulations. But this study does not provide evidence of a positive association between the extent of investor protection and the level of real earnings management used by companies.

6.2   *Limitations*

One of the limitations of this research concerns the third method to calculate the level of real earnings management, by the use of discretionary expenses. This method is created by Roychowdhury (2006) by studying several discretionary expenditures, namely advertising expenses, research and development expenses and selling, general and administrative expenses. Due to a lack of data the variable 'research and development expenses' was excluded from the formula used in this study. This causes a bias in the results of this formula because it is probable that companies in the U.K. and France will use this kind of expenditure to influence the amount of expenditures and therefore the level of earnings.

In this research two countries are studied, the U.K. and France. Those countries are selected because they belong to different clusters based on the amount of investor protection composed by Leuz et al. (2003). It could be possible that the data of those countries is not representative for the other countries in their cluster because of national circumstances. If there are other factors which influence for example the level of (accrual-based or real) earnings management present in the U.K. which are different from the other countries in this cluster the data of U.K. companies is not representative anymore. The same applies to France, which could have biased the results of this study.

In order to study the levels of accrual-based and real earnings management the absolute values are taken. This method is used to study the level of earnings manipulation regardless the direction of this manipulation. Due to these absolute values it is hard to examine the development of the different earnings management types over time, because there is no distinction made between positive and negative earnings manipulation.

Another limitation of this study is the design of the research. In this study two different countries are compared with each other making the assumption that the level of investor protection in the U.K. is higher compared to this level in France. This study is based on previous studies which have another kind of research design (Cohen et al. 2008 and Lobo and Zhou 2006). Those studies concentrate on one country, the U.S., and an event, implementation of SOX, which changed the level of investor protection within this country. As mentioned earlier the differences between the levels of earnings management between the U.K. and France could also be caused by other variables due to the fact that two countries with different characteristics are compared with each other instead of one country with different levels of investor protection over time.

6.3   *Suggestions for further research*

The main finding of this research is the fact that the level of earnings management in the U.K. is significant higher compared to this level in France. It might be interesting to examine why earnings management used by U.K. companies is higher than earnings management used by French companies. Which factor could cause this difference?

For the methods to measure the level of real and accrual-based earnings management this study relied on the research of Cohen et al. (2008). The level of real earnings management was measured by three models which were designed by Roychowdhury (2006), on the other hand the level of accrual-based earnings management was measured by using the modified Jones model (Dechow et al. 1995). Recently there is more and more critique on this modified Jones model, it could be interesting to recalculate the level of accrual-based earnings management by a newer technique. The study by Dechow et al (2012) suggests adding a dummy variable to the modified Jones model (Dechow et al. 1995) which will equal to 1 in years when the earnings management will recur. The authors claim that this model will increase the power of the test and will control for correlating variables. It might be interesting to add this dummy variable and to study the impact on the results.

It could also be interesting to investigate the level or real and accrual-based earnings management of other countries which are mentioned in the three clusters composed by Leuz et al. (2003). This could demonstrate whether or not there is an association between the level of investor protection in a country and the kind of earnings management used by companies. Based on this research there cannot be made a conclusion about this question because the results cannot be generalized due to the fact that those result could be associated with other omitted variables.

The development of investor protection over time is an interesting subject as well. In this study there is not made use of a benchmark of investor protection which could allow a comparison of the extent of investor protection within a country over time. If such a benchmark is created the development of the extent of investor protection could be compared with the development of the levels of earnings management within a country.

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Appendix I   Investor protection

Table 2. Investor protection measurements and clusters based on the study by Leuz et al. (2003)

Panel A. Variables used by Leuz et al. (2003) in order to compute the amount of investor protection.

Legal origin	German / French / English / Scandinavian (La Porta et al. 1998)
Legal tradition	Code-law (CD) / Common-law (CM) (La Porta et al. 1998)
Outside investor rights	Anti-directors rights index (La Porta et al. 1998)
Legal enforcement	The combined score of: efficiency of the juridical system, assessment of rule law and corruption index (La Porta et al. 1998)
Important of equity market	The combined score of: ratio of aggregate stock market capitalization held by minorities to gross national product, number of listed domestic firms relative to the population and the number of IPOs relative to the population (La Porta et al. 1997)
Ownership concentration	Median percentage of common shares owned by the largest three shareholders in the ten largest privately owned non-financial firms (La Porta et al. 1998)
Disclosure index	Inclusion or omission of 90 items in the 1990 annual reports (La Porta et al. 1998)

Panel B. Clusters of countries based on the degree of investor protection produced by Leuz et al. (2003).

Cluster 1: *Outsider economies*	*Cluster 2:* *Insider economies* *Stronger investor protection*	*Cluster 3:* *Insider economies* *Weaker investor protection*
Singapore	Austria	Greece
Hong Kong	Taiwan	Korea
Malaysia	Switzerland	Portugal
United Kingdom	Germany	Italy
Norway	Japan	India
Canada	Belgium	Spain
Australia	Netherlands	Indonesia
USA	Denmark	Thailand
	France	Pakistan
	Finland	Philippines
	Sweden	
	South Africa	
	Ireland	

Appendix II   Literature overview

Table 3. Literature overview section 3: Literature review

Panel A. Literature overview 3.1 investor protection differences.

Author(s) (year)	Objective of study	Sample	Methodology	Conclusion(s)
La Porta, R., F. Lopez-de-Silanes, A. Schleifer, and R. Vishny (1998)	Describing the differences in investor protection in the different countries over the world.	49 countries over the world.	Different measurements of investor protection.	Investor protection values of different countries can be divided into four categories; Common law and French, German and Scandinavian civil law.
Leuz, C., D. Nanda, and P.D. Wysocki (2003)	Study different levels of investor protection and earnings management worldwide.	31 countries	Cluster analysis, multiple regression analysis.	There is a relationship between corporate governance and the quality of reported earnings.

Panel B. Literature overview 3.2 Trade-off between real and accrual-based earnings management.

Author(s) (year)	Objective of study	Sample	Methodology	Conclusion(s)
Cohen, D.A., A. Dey and T.Z. Lys (2008)	Investigate how SOX affected the level of real and accrual-based earnings management.	All nonfinancial U.S. firms with available data in COMPUSTAT for the period 1987-2005.	Modified Jones Model and the model developed by Dechow, Kothari and Watts (1998).	After passage of SOX firms switched from accrual-based to real earnings management.
Zang, A.Y. (2012)	Are real and accrual-based earnings management used as substitutes?	Companies with sufficient available data in the CRSP / COMPUSTAT database, excluding financial and regulatory industries.	Empirical model in which the costs of both earnings management methods are incorporated.	There is a tradeoff between real and accrual-based earnings management based on the costs of both methods.
Leech, T. J. (2003)	Presenting the requirements of section 302 and 404 of the Sarbanes-Oxley Act.	-	-	Provide different strategies to prepare for the requirements of SOX section 302 and 404.
Ernst and Young (2005).	Share experience with section 404 of SOX and discuss advantages and disadvantages of this regulation.	-	Own experience.	SOX 404 involved high costs but also advantages such as more reliable information, also non-audited information is more reliable.

Raghunandan, K., and D. V. Rama (2006)	Examine the relationship between audit fees and disclosures as a result of SOX 404.	731 U.S. companies which filled a section 404 report in May and a fiscal year ending in December.	A regression model based on Simunic (1980).	There is no relationship between audit fees and disclosures as a result of SOX 404.
Leuz, C., D. Nanda, and P.D. Wysocki (2003)	Study different levels of investor protection and earnings management worldwide.	31 countries	Cluster analysis, multiple regression analysis.	There is a relationship between corporate governance and the quality of reported earnings.
Graham, J.R., C.R. Harvey, and S. Rajgopal (2005)	Identify important factors executives take into account when deciding about the earnings reported to outsiders and voluntary disclosures.	401 financial executives	Survey	The most important motivations for earnings management are stock price motivations and managers are willing to sacrifice economic value to achieve short term expectations.
Dechow, P.M., R.G. Sloan, and A.P. Sweeney (1995)	Review of alternative models for measuring accrual-based earnings management.	1000 random firm years/ 1000 firm years of extreme financial performance / 1000 firm years subject to accrual manipulation / 32 firms which overstate their earnings.	Empirical analysis using the following models; Healy, DeAngelo, Jones, Modified Jones and the Industry model.	A modified version of the model developed by Jones (1991) appears to be most suitable for measuring earnings management.
Roychowdhury, S. (2006)	Examine whether managers use real operational activities because they do not want to report losses.	4252 firms which do have sufficient data available in the COMPUSTAT database for the period between 1987 and 2001.	Cross-sectional analysis.	Management is manipulating real operational activities to avoid reporting of losses.
Lobo, G., and J. Zhou (2006)	Examine the change in conservatism after introduction of SOX.	4,441 firms listed on the COMPUSTAT database with equal amounts of observations before and after implementation of SOX.	The Basu (1997) approach in order to measure conservatism and the Modified Jones model (Dechow et al. 1995) to measure discretionary accruals.	On average firms are more conservative after the implementation of SOX.
Chang, H., G.D. Fernando, and W. Liao (2009)	Investigate the effect of SOX on the cost of capital of firms and the value of earnings quality to the market.	-	Empirical data analysis (comparison between 2001 and 2003).	After SOX the cost of capital for firms decreased and the quality of earnings to the market increased.

Panel C. Literature overview 3.3 Relationship between investor protection and earnings management.

Author(s) (year)	Objective of study	Sample	Methodology	Conclusion(s)
Leuz, C., D. Nanda, and P.D. Wysocki (2003)	Study different levels of investor protection and earnings management worldwide.	31 countries	Cluster analysis, multiple regression analysis.	There is a relationship between corporate governance and the quality of reported earnings.
Healy, P.M., and J.M. Wahlen (1999)	Assessment of the existing evidence on earnings management.	-	Review of empirical evidence.	Earnings management motivations can be divided into three groups; capital market, contracting and regulatory motivations.
Burgstahler, D., L. Hail, and C. Leuz (2006)	Examine the impact of capital markets and institutional factors on the reliability of reported earnings.	Private and public EU companies with sufficient data in de AMADEUS database.	Four different proxies for earnings management are composed.	Private firms use more earnings management compared to public firms and strong legal systems reduce the level of earnings management.
Wright, C.J., J. R. Shaw and L. Guan (2006)	Examine the level of earnings management in countries with high investor protection.	U.S. and U.K. companies which are involved in a management buyout.	The Modified Jones model constructed by Dechow et al. (1995).	The level of earnings management prior to a MBO differs between U.K. and U.S. firms.
Nabar, S. and K.K. Boonlert-U-Thai (2007)	Examine the relationship between culture investor protection and earnings management.	Data from 30 countries obtained from other studies.	The regression to measure the aggregate earnings management score based on the research by Leuz et al. (2003).	Earnings management is negatively related with investor protection and also related to certain cultural variables.
Barth, M.E., W. Landsman, and M.H. Lang (2007)	To examine whether accounting quality will increase when companies apply IAS	327 U.S. firms which adopted IAS between 1994 and 2003 for which DataStream data was available between 1990 and 2003.	Accounting quality was measured by; earnings management, timely loss recognition and value relevance metrics.	Firms applying IAS do have better accounting quality.

Appendix III SIC codes

Table 4. An overview of the different industries based on the first digit of the Standard Industry Code (SIC-code)

First digit SIC-code	Industry description
0	Agricultural, forestry and fishery products
1	Mining and construction products
2	Light manufactured products
3	Heavy manufactured products
4	Transportation, communication, electric, gas and sanitary services
5	Wholesale and retail trade
6	Financial firms
7	Other services
8	Social, security, education and health services
9	Unclassifiable establishments and public administration

Appendix IV   Descriptive statistics

Table 5. Characteristics of the variables regarding the different earnings management measurements for U.K. companies.

Panel A. The sample used to examine the level of accrual-based earnings management for U.K. companies with the use of discretionary accruals. (Total assets are displayed in the local currency, discretionary accruals are displayed in relation to total assets of the previous year.)

	Total Obser-vations	Total assets					Discretionary Accruals				
		25th Percentile	Mean	Median	75th Percentile	Standard Deviation	25th Percentile	Mean	Median	75th Percentile	Standard Deviation
1999	1083	13,818	678,357	49,413	187,031	3393,576	-0,064	-0,007	-0,010	0,047	0,184
2000	1078	14,292	882,820	54,042	199,347	6267,636	-0,160	0,140	-0,030	0,100	3,531
2001	1161	11,178	913,839	47,135	206,002	6605,002	-0,109	0,277	0,006	0,111	13,953
2002	1219	7,951	856,516	34,700	172,207	6320,349	-0,043	0,111	0,015	0,098	2,368
2003	1281	6,098	830,280	27,868	149,800	6171,219	-0,064	-0,196	0,005	0,087	4,347
2004	1371	37,208	2042,392	137,968	792,700	9924,337	-0,140	-0,036	-0,004	0,148	2,263
2005	463	6,390	917,668	27,339	143,781	6993,802	-0,050	0,110	-0,007	0,034	2,463
2006	1444	7,284	1000,791	28,817	135,500	7942,494	-0,068	0,013	0,006	0,091	0,343
2007	1407	9,091	1143,507	40,328	179,939	8332,486	-0,092	-0,034	-0,007	0,079	0,423
2008	1287	11,370	1625,862	48,244	250,343	12759,475	-0,064	0,360	0,002	0,101	12,520
2009	1180	11,430	1513,757	49,523	289,722	9547,167	-0,046	0,029	0,008	0,073	0,188
2010	1084	13,616	1652,148	55,355	313,427	10650,642	-0,075	-0,062	-0,008	0,047	0,812

Panel B. The sample used to examine the level of real earnings management for U.K. companies with the use of cash flow from operations (CFO). (Total assets are displayed in the local currency, real earnings management; CFO is displayed in relation to total assets of the previous year.)

	Total Obser-vations	Total assets					Real Earnings Management; CFO				
		25th Percentile	Mean	Median	75th Percentile	Standard Deviation	25th Percentile	Mean	Median	75th Percentile	Standard Deviation
1999	935	13,19	670,30	48,59	183,62	3366,06	-0,074	-0,004	-0,014	0,057	0,209
2000	1097	13,68	861,17	51,14	191,92	6172,36	-0,335	-0,217	-0,084	0,102	3,408
2001	1198	10,23	-0,11	44,83	199,52	6510,39	-0,113	-0,403	-0,014	0,097	13,565
2002	1257	6,94	849,28	32,22	165,40	6254,22	-0,079	0,023	-0,014	0,077	0,303
2003	1321	5,19	804,26	25,24	141,14	6069,87	-0,103	0,126	-0,033	0,065	5,023
2004	1418	5,26	778,90	25,11	133,88	5742,80	-0,156	0,017	-0,001	0,207	2,820
2005	1474	5,85	888,65	25,25	133,28	6877,66	-0,106	-0,011	0,003	0,166	3,065
2006	1494	6,73	972,25	27,11	127,16	7817,55	-0,139	0,007	-0,039	0,078	0,789
2007	1453	8,55	1104,20	37,46	171,40	8180,81	-0,109	0,035	-0,010	0,113	0,826
2008	1336	10,67	1554,97	43,27	220,67	12471,22	-0,080	0,042	0,002	0,101	0,357
2009	1236	10,46	1458,31	46,37	271,25	9363,21	-0,086	0,011	-0,019	0,059	0,342
2010	1128	11,91	1536,99	49,62	282,83	10247,40	-0,147	-0,080	-0,050	0,039	1,496

Panel C. The sample used to examine the level of real earnings management for U.K. companies with the use of production costs. (Total assets are displayed in the local currency, real earnings management; production costs are displayed in relation to total assets of the previous year.)

	Total Obser-vations	Total assets					Real Earnings Management; Production Costs				
		25th Percentile	Mean	Median	75th Percentile	Standard Deviation	25th Percentile	Mean	Median	75th Percentile	Standard Deviation
1999	918	17,84	697,73	59,35	203,10	3463,00	-0,173	-0,101	0,015	0,153	0,822
2000	1011	18,56	966,40	66,97	231,49	6588,35	-0,105	0,051	0,038	0,192	0,350
2001	1047	14,61	985,03	58,52	226,95	6926,09	-0,088	0,045	0,038	0,164	0,309
2002	1098	10,40	947,36	44,15	204,85	6678,27	-0,053	0,073	0,067	0,199	0,284
2003	1145	7,54	933,39	34,98	180,82	6580,45	-0,074	0,057	0,056	0,200	0,317
2004	1203	7,06	873,97	31,11	159,45	6149,02	-0,069	0,086	0,064	0,232	0,485
2005	1281	7,72	1000,62	31,06	161,55	7360,39	0,062	0,281	0,168	0,362	0,376
2006	1300	8,19	1026,54	32,77	160,06	8061,97	-0,070	0,071	0,055	0,224	0,431
2007	1284	9,09	1171,46	40,30	178,95	8511,89	-0,057	0,096	0,058	0,245	0,435
2008	1231	10,37	1563,67	43,35	217,19	12516,38	-0,031	0,120	0,068	0,284	0,391
2009	1226	11,07	1502,18	48,90	281,69	9522,55	-0,031	-0,018	0,000	0,018	0,117
2010	1089	13,14	1641,02	54,30	309,24	10632,19	-0,053	0,089	0,053	0,211	0,550

Panel D. The sample used to examine the level of real earnings management for U.K. companies with the use of discretionary expenses. (Total assets are displayed in the local currency, real earnings management; discretionary expenses are displayed in relation to total assets of the previous year.)

	Total Obser-vations	Total assets					Real Earnings Management; Discretionary Expenses				
		25th Percentile	Mean	Median	75th Percentile	Standard Deviation	25th Percentile	Mean	Median	75th Percentile	Standard Deviation
1999	310	12,22	1045,91	44,94	211,26	5283,93	-0,236	-0,109	0,010	0,121	0,608
2000	339	13,37	1655,86	50,45	224,90	10611,75	-0,225	-0,174	0,031	0,183	1,714
2001	371	11,72	1646,74	47,08	210,19	11177,98	-0,281	-0,102	-0,066	0,065	0,780
2002	376	8,64	1602,91	30,92	156,71	11033,79	-0,280	-0,122	-0,078	0,065	0,400
2003	388	6,16	1509,77	23,34	138,55	10765,00	-0,252	0,000	-0,031	0,112	0,567
2004	407	5,29	1398,64	22,50	125,27	10066,15	-0,243	-0,159	0,043	0,279	1,758
2005	428	6,31	1471,17	21,45	125,29	10751,91	-0,263	-0,106	-0,007	0,176	4,092
2006	438	5,59	1501,55	19,32	100,05	10461,91	-0,316	-0,112	-0,068	0,095	0,638
2007	413	8,29	1732,07	26,92	172,85	11232,49	-0,327	-0,143	-0,051	0,103	0,563
2008	376	9,69	1444,75	40,76	198,74	11879,55	-0,364	-0,115	-0,134	0,086	0,951
2009	1369	8,04	2530,12	29,54	224,92	15760,67	-0,107	-0,063	-0,022	0,016	0,299
2010	334	9,05	2813,61	35,78	229,54	17628,90	-0,298	-0,107	-0,081	0,071	0,509

Table 6. Characteristics of the variables regarding the different earnings management measurements for French companies.

Panel A. The sample used to examine the level of accrual-based earnings management for French companies with the use of discretionary accruals. (Total assets are displayed in the local currency, discretionary accruals are displayed in relation to total assets of the previous year.)

	Total Obser-vations	Total assets					Discretionary Accruals				
		25th Percentile	Mean	Median	75th Percentile	Standard Deviation	25th Percentile	Mean	Median	75th Percentile	Standard Deviation
1999	212	37,458	2832,007	158,261	724,054	10438,611	-0,052	-0,014	-0,018	0,024	0,080
2000	438	48,263	3380,493	142,933	584,351	13621,866	-0,077	-0,008	-0,020	0,040	0,241
2001	484	48,349	3286,697	154,076	596,505	12492,263	-0,061	0,002	0,000	0,065	0,194
2002	480	46,054	3139,977	154,653	637,040	12080,324	-0,046	0,011	0,002	0,056	0,113
2003	474	40,731	3138,515	144,001	640,550	11904,488	-0,055	-0,002	-0,004	0,040	0,128
2004	466	41,536	3113,210	150,873	654,000	12071,969	-0,043	0,003	0,002	0,044	1,063
2005	455	46,931	3882,787	163,014	890,875	14536,238	-0,072	-0,015	-0,019	0,033	0,147
2006	450	60,239	4312,580	211,735	1088,996	15202,440	-0,043	0,002	-0,009	0,033	0,157
2007	424	63,478	4491,897	219,780	1184,831	15815,404	-0,044	0,002	0,001	0,044	0,113
2008	426	69,535	4762,484	227,630	1368,231	17184,297	-0,043	0,002	-0,004	0,036	0,090
2009	413	68,534	4923,921	230,923	1439,655	18773,212	-0,030	0,008	0,009	0,047	0,093
2010	404	39,027	4122,707	132,059	935,417	16861,233	-0,035	0,005	0,001	0,038	0,089

Panel B. The sample used to examine the level of real earnings management for French companies with the use of cash flow from operations (CFO). (Total assets are displayed in the local currency, real earnings management; CFO is displayed in relation to total assets of the previous year.)

	Total Obser-vations	Total assets					Real Earnings Management; CFO				
		25th Percentile	Mean	Median	75th Percentile	Standard Deviation	25th Percentile	Mean	Median	75th Percentile	Standard Deviation
1999	225	34,14	2699,25	138,72	659,12	10121,82	-0,085	-0,028	-0,033	0,005	0,123
2000	472	43,54	3210,52	135,00	525,75	13252,32	-0,114	-0,032	-0,047	0,019	0,241
2001	513	45,34	-0,06	148,94	578,52	13603,30	-0,072	-0,004	-0,021	0,043	0,141
2002	503	44,75	3166,97	152,72	638,65	12181,52	-0,062	-0,008	-0,015	0,033	0,113
2003	497	39,34	3033,16	140,30	664,40	11647,83	-0,054	-0,007	-0,011	0,044	0,119
2004	488	37,72	3027,85	144,86	654,00	11875,82	-0,090	-0,012	-0,035	0,041	0,262
2005	471	46,16	3798,40	167,10	866,83	14312,63	-0,074	-0,013	-0,022	0,041	0,143
2006	465	57,57	4219,16	207,98	1033,90	15022,09	-0,059	-0,014	-0,015	0,038	0,128
2007	435	62,43	4382,93	218,76	1158,56	15594,20	-0,062	-0,010	-0,010	0,044	0,100
2008	439	63,43	4570,28	221,76	1260,01	16846,06	-0,054	-0,008	-0,007	0,044	0,122
2009	431	63,12	4764,27	221,76	1344,82	18453,75	-0,060	-0,007	-0,013	0,034	0,116
2010	419	32,97	3896,66	125,43	793,86	16877,52	-0,058	-0,011	-0,014	0,033	0,106

Panel C. The sample used to examine the level of real earnings management for French companies with the use of production costs. (Total assets are displayed in the local currency, real earnings management; production costs are displayed in relation to total assets of the previous year.)

	Total Obser-vations	Total assets					Real Earnings Management; Production Costs				
		25th Percentile	Mean	Median	75th Percentile	Standard Deviation	25th Percentile	Mean	Median	75th Percentile	Standard Deviation
1999	349	33,03	2394,16	118,90	507,81	9482,04	-0,873	-0,447	-0,447	-0,045	0,715
2000	536	44,55	2262,78	128,72	604,92	8112,03	-1,017	-0,606	-0,580	-0,143	0,798
2001	559	34,57	2903,29	113,49	463,00	12348,03	-0,102	0,021	0,010	0,122	0,207
2002	577	33,46	2665,98	112,67	453,96	11004,75	-0,093	0,021	0,011	0,121	0,292
2003	566	28,44	2463,77	96,16	442,41	10324,07	-0,074	0,029	0,015	0,127	0,274
2004	577	23,98	2634,05	88,57	452,69	11104,46	-0,096	0,027	0,017	0,131	0,259
2005	587	26,33	3107,34	96,69	540,07	13050,33	-0,098	0,037	0,014	0,146	0,273
2006	576	28,09	3370,06	112,49	633,85	13440,63	-0,091	0,030	0,006	0,118	0,240
2007	565	33,91	3604,53	128,13	750,65	14169,33	-0,089	0,033	0,004	0,127	0,218
2008	553	34,80	3626,90	124,98	770,89	15103,71	-0,094	0,025	0,003	0,105	0,205
2009	544	32,92	3874,06	123,15	736,28	16658,73	-0,072	0,026	0,009	0,104	0,192
2010	528	32,97	3770,68	127,92	792,52	16733,02	-0,076	0,031	0,007	0,113	0,207

Panel D. The sample used to examine the level of real earnings management for French companies with the use of discretionary expenses. (Total assets are displayed in the local currency, real earnings management; discretionary expenses are displayed in relation to total assets of the previous year.)

	Total Obser-vations	Total assets					Real Earnings Management; Discretionary Expenses				
		25th Percentile	Mean	Median	75th Percentile	Standard Deviation	25th Percentile	Mean	Median	75th Percentile	Standard Deviation
1999	29	89,22	8581,82	1874,20	14037,73	12408,94	-0,138	-0,051	0,000	0,060	0,204
2000	36	120,58	13167,29	1375,83	17251,88	27007,24	-0,206	-0,104	-0,079	0,034	0,223
2001	62	109,95	13986,24	1685,56	19351,40	26085,36	-0,137	-0,036	-0,032	0,051	0,210
2002	59	132,29	10805,68	1123,11	14587,25	19442,32	-0,107	-0,026	0,000	0,092	0,198
2003	61	103,37	9424,53	1088,45	12008,10	17627,99	-0,102	0,000	0,000	0,088	0,173
2004	63	100,20	8681,21	1014,24	8525,00	17288,35	-0,106	-0,007	0,001	0,124	0,295
2005	79	98,28	9232,61	967,71	7401,50	19033,50	-0,115	-0,004	-0,021	0,159	0,246
2006	82	105,53	9311,93	983,59	7290,30	18650,65	-0,100	-0,012	0,000	0,148	0,344
2007	84	92,02	8500,02	782,60	6267,00	16204,24	-0,151	-0,043	0,000	0,132	0,374
2008	83	77,50	8074,33	775,51	5628,00	15800,46	-0,129	-0,026	0,001	0,118	0,312
2009	86	93,03	8470,09	1157,64	5449,73	16534,13	-0,165	-0,044	0,001	0,128	0,288
2010	84	81,10	8561,21	1118,23	6233,60	16519,67	-0,087	-0,018	0,001	0,146	0,279

Appendix V   Sample composition

Table 7. Composition of the different samples used to calculate the level of accrual-based earnings management. For each year the absolute and relative amount of firms per first SIC code-digit class are displayed.

Panel A. Sample used to calculate the level of accrual-based earnings management consisting of U.K. companies.

SIC codes	1999 #	1999 %	2000 #	2000 %	2001 #	2001 %	2002 #	2002 %	2003 #	2003 %	2004 #	2004 %
0000-0999	14	1%	14	1%	12	1%	13	1%	14	1%	15	1%
1000-1999	89	8%	82	8%	94	8%	106	9%	118	9%	146	11%
2000-2999	183	17%	164	15%	168	14%	178	15%	185	14%	196	14%
3000-3999	226	21%	214	20%	216	19%	228	19%	243	19%	253	18%
4000-4999	85	8%	90	8%	101	9%	106	9%	113	9%	112	8%
5000-5999	190	18%	182	17%	181	16%	175	14%	167	13%	172	13%
7000-7999	227	21%	256	24%	300	26%	314	26%	328	26%	355	26%
8000-8999	69	6%	76	7%	89	8%	99	8%	113	9%	122	9%

SIC codes	2005 #	2005 %	2006 #	2006 %	2007 #	2007 %	2008 #	2008 %	2009 #	2009 %	2010 #	2010 %
0000-0999	8	2%	17	1%	16	1%	17	1%	14	1%	13	1%
1000-1999	42	9%	197	14%	230	16%	225	17%	213	18%	210	19%
2000-2999	82	18%	192	13%	187	13%	161	13%	148	13%	130	12%
3000-3999	112	24%	268	19%	255	18%	234	18%	218	18%	201	19%
4000-4999	42	9%	108	7%	105	7%	102	8%	98	8%	90	8%
5000-5999	76	16%	162	11%	145	10%	132	10%	119	10%	105	10%
7000-7999	70	15%	368	25%	340	24%	303	24%	266	23%	250	23%
8000-8999	31	7%	132	9%	129	9%	113	9%	104	9%	85	8%

Panel B. Sample used to calculate the level of accrual-based earnings management consisting of French companies.

SIC codes	1999 #	1999 %	2000 #	2000 %	2001 #	2001 %	2002 #	2002 %	2003 #	2003 %	2004 #	2004 %
0000-0999	3	1%	5	1%	5	1%	4	1%	4	1%	4	1%
1000-1999	9	4%	18	4%	17	4%	13	3%	16	3%	16	3%
2000-2999	55	26%	88	20%	95	20%	97	20%	90	19%	89	19%
3000-3999	54	25%	112	26%	126	26%	131	27%	124	26%	118	25%
4000-4999	17	8%	32	7%	32	7%	34	7%	43	9%	44	9%
5000-5999	33	16%	59	13%	73	15%	68	14%	63	13%	61	13%
7000-7999	37	17%	105	24%	116	24%	114	24%	112	24%	105	23%
8000-8999	4	2%	19	4%	20	4%	19	4%	22	5%	29	6%

SIC codes	2005 #	2005 %	2006 #	2006 %	2007 #	2007 %	2008 #	2008 %	2009 #	2009 %	2010 #	2010 %
0000-0999	4	1%	4	1%	3	1%	2	0%	2	0%	2	0%
1000-1999	16	4%	17	4%	16	4%	15	4%	15	4%	16	4%
2000-2999	92	20%	89	20%	87	21%	87	20%	77	19%	80	20%
3000-3999	119	26%	111	25%	102	24%	104	24%	103	25%	101	25%
4000-4999	44	10%	45	10%	47	11%	44	10%	42	10%	40	10%
5000-5999	52	11%	48	11%	46	11%	47	11%	44	11%	44	11%
7000-7999	104	23%	109	24%	97	23%	99	23%	102	25%	95	24%
8000-8999	24	5%	27	6%	26	6%	28	7%	28	7%	26	6%

Table 8. Composition of the different samples used to calculate the level of real earnings management. For each year the absolute and relative amount of firms per first SIC code-digit class are displayed.

Panel A. The average sample used to calculate the level of real earnings management consisting of U.K. companies.

SIC codes	1999 #	1999 %	2000 #	2000 %	2001 #	2001 %	2002 #	2002 %	2003 #	2003 %	2004 #	2004 %
0000-0999	9	1%	10	1%	9	1%	9	1%	9	1%	10	1%
1000-1999	52	7%	61	7%	65	7%	69	8%	81	9%	96	10%
2000-2999	130	18%	129	16%	132	15%	137	15%	139	15%	149	15%
3000-3999	176	24%	184	23%	188	22%	197	22%	209	22%	216	21%
4000-4999	51	7%	61	7%	67	8%	74	8%	78	8%	77	8%
5000-5999	121	17%	129	16%	129	15%	121	13%	114	12%	116	11%
7000-7999	144	20%	189	23%	222	25%	234	26%	245	26%	260	26%
8000-8999	38	5%	53	6%	61	7%	70	8%	77	8%	85	8%

SIC codes	2005 #	2005 %	2006 #	2006 %	2007 #	2007 %	2008 #	2008 %	2009 #	2009 %	2010 #	2010 %
0000-0999	10	1%	11	1%	11	1%	12	1%	16	1%	10	1%
1000-1999	112	11%	136	13%	156	15%	164	17%	245	19%	159	19%
2000-2999	154	15%	150	14%	145	14%	127	13%	156	12%	106	12%
3000-3999	226	21%	229	21%	216	21%	199	20%	229	18%	177	21%
4000-4999	74	7%	73	7%	70	7%	70	7%	101	8%	63	7%
5000-5999	115	11%	110	10%	100	10%	93	9%	125	10%	75	9%
7000-7999	272	26%	271	25%	257	24%	231	24%	291	23%	195	23%
8000-8999	97	9%	97	9%	95	9%	86	9%	112	9%	66	8%

Panel B. The average sample used to calculate the level of accrual-based earnings management consisting of French companies.

SIC codes	1999 #	1999 %	2000 #	2000 %	2001 #	2001 %	2002 #	2002 %	2003 #	2003 %	2004 #	2004 %
0000-0999	3	1%	4	1%	4	1%	4	1%	4	1%	4	1%
1000-1999	9	5%	12	3%	12	3%	10	3%	12	3%	4	1%
2000-2999	50	25%	71	20%	74	20%	74	20%	71	19%	70	19%
3000-3999	58	29%	94	27%	103	27%	105	28%	102	27%	100	27%
4000-4999	17	8%	23	7%	27	7%	29	8%	33	9%	34	9%
5000-5999	29	14%	48	14%	52	14%	50	13%	47	13%	47	13%
7000-7999	30	15%	81	23%	90	24%	92	24%	89	24%	89	24%
8000-8999	5	2%	15	4%	16	4%	16	4%	17	4%	20	5%

SIC codes	2005 #	2005 %	2006 #	2006 %	2007 #	2007 %	2008 #	2008 %	2009 #	2009 %	2010 #	2010 %
0000-0999	3	1%	4	1%	3	1%	2	1%	2	0%	2	0%
1000-1999	13	4%	14	4%	13	4%	12	3%	12	3%	12	3%
2000-2999	73	19%	71	19%	70	19%	70	20%	68	19%	65	19%
3000-3999	103	27%	99	26%	94	26%	94	26%	93	26%	93	27%
4000-4999	34	9%	34	9%	34	10%	32	9%	31	9%	30	9%
5000-5999	43	11%	40	11%	37	10%	38	11%	36	10%	36	10%
7000-7999	89	23%	93	25%	87	24%	85	24%	86	24%	82	24%
8000-8999	21	5%	21	6%	23	6%	25	7%	26	7%	24	7%

Appendix VI   Estimated parameters

Table 9. Estimated parameters Modified Jones model (Dechow et al. 1995).

Panel A. Estimated parameters U.K.

SIC codes	0000-0999			1000-1999			2000-2999			3000-3999		
Year	α1	α2	α3	α1	α2	α3	α1	α2	α3	α1	α2	α3
1999	-0,218	-0,153	0,064	0,055	-0,241	0,004	-0,070	0,095	-0,019	-0,190	0,055	-0,004
2000	-0,720	0,085	0,036	0,282	0,164	-0,033	-0,183	0,006	-0,025	-7,591	0,214	-0,001
2001	-0,988	-0,038	0,050	61,695	-14,653	2,955	0,183	0,040	-0,039	0,254	0,051	0,084
2002	-0,535	0,319	-0,026	0,005	0,218	0,027	-0,327	0,064	-0,003	0,052	0,058	-0,075
2003	-0,024	0,035	-0,006	-0,011	2,261	-5,491	-0,069	0,035	-0,016	0,009	0,134	-0,093
2004	0,140	0,483	0,019	-0,072	-0,147	0,109	-0,032	0,021	-0,035	0,764	-0,639	0,625
2005	-0,495	-0,552	0,029	-1,001	0,026	0,007	-0,281	0,073	-0,028	-0,646	0,059	-0,012
2006	0,158	-0,111	0,065	0,011	0,112	0,001	-0,262	0,033	-0,152	0,228	0,032	-0,016
2007	-0,257	-0,126	0,057	-0,585	0,164	-0,011	-4,608	0,357	0,254	0,041	0,090	-0,008
2008	-0,248	0,090	0,039	-0,310	-0,069	0,030	-0,119	-0,249	0,028	-0,468	-1,436	0,271
2009	0,519	-0,264	0,081	-0,013	0,006	-0,103	-0,129	0,030	-0,043	-0,186	0,044	-0,050
2010	0,114	0,061	0,064	-1,358	-0,341	-0,159	0,208	-0,070	-0,020	-0,248	0,181	-0,040

SIC codes	4000-4999			5000-5999			7000-7999			8000-8999		
Year	α1	α2	α3	α1	α2	α3	α1	α2	α3	α1	α2	α3
1999	0,085	0,148	-0,018	0,041	0,046	-0,005	-0,093	0,092	-0,027	0,152	-0,004	0,052
2000	-0,113	0,050	-0,066	0,016	-0,618	-0,063	0,320	-0,199	0,666	-0,555	0,155	-0,038
2001	-0,210	-0,048	-0,023	-0,593	-0,248	-0,288	-0,039	-0,011	-0,093	-1,632	-0,187	0,359
2002	-0,257	0,058	0,016	-0,545	0,062	-0,019	-0,095	-0,012	-0,052	0,296	-0,297	-0,118
2003	0,060	-0,080	-0,069	-0,112	0,001	-0,028	-0,063	-0,035	-0,010	0,059	-0,023	0,036
2004	-0,100	-0,206	0,006	0,004	-0,015	-0,041	0,401	0,022	-1,449	0,097	-0,179	0,004
2005	-0,071	0,054	-0,041	-0,468	0,011	0,012	-0,454	-0,006	-0,026	-0,160	-0,025	0,000
2006	-0,142	0,080	0,079	0,029	-0,022	-0,043	0,006	0,023	0,027	-0,029	0,025	-0,002
2007	-1,020	-0,047	-0,085	-0,059	-0,037	-0,014	-0,186	0,023	0,049	-0,129	-0,025	0,122
2008	2,095	0,006	-0,050	-0,269	-0,013	-0,027	0,028	-0,066	-0,009	-0,247	0,089	0,001
2009	-0,628	-0,048	-0,026	-0,596	0,042	-0,049	0,046	0,003	-0,063	-0,068	0,096	-0,155
2010	-0,266	0,063	-0,037	-0,287	0,021	-0,021	-0,587	0,076	0,063	0,129	0,008	-0,091

Panel B. Estimated parameters France.

SIC codes	0000-0999			1000-1999			2000-2999			3000-3999		
Year	α1	α2	α3	α1	α2	α3	α1	α2	α3	α1	α2	α3
1999	65,450	-1,524	-0,228	-15,371	0,186	-0,045	1,151	0,146	-0,035	2,043	0,090	-0,038
2000	-2,973	5,328	-0,445	5,947	0,170	-0,049	-0,253	0,086	0,001	-0,294	0,082	-0,009
2001	1,237	0,615	-0,046	4,671	-0,016	-0,049	1,388	0,077	-0,093	-0,058	0,103	0,033
2002	3,369	1,434	-0,206	3,657	0,021	-0,075	0,786	0,125	-0,024	0,271	0,254	-0,067
2003	2,283	0,173	-0,040	0,913	0,255	-0,048	-0,564	0,110	-0,025	-0,745	0,003	-0,054
2004	1,352	0,220	-0,133	0,094	-0,361	0,001	-0,397	-0,076	-0,014	-0,287	0,084	-0,026
2005	2,159	0,047	-0,088	0,074	-0,060	-0,081	0,159	0,110	-0,004	0,138	0,203	-0,121
2006	-2,364	0,790	0,039	-3,820	0,047	-0,014	-0,208	0,163	0,000	-0,106	0,157	-0,019
2007	-11,075	-0,028	0,024	-5,086	0,122	-0,029	-1,538	0,132	0,020	0,273	0,152	-0,018
2008	1,323	0,180	0,000	-3,348	0,349	-0,062	1,373	0,057	-0,021	-0,350	0,142	-0,027
2009	-0,235	-0,053	0,000	-1,808	-0,042	-0,061	-1,697	0,044	-0,048	-0,159	0,113	-0,061
2010	-0,243	-0,055	0,000	16,735	-0,022	-0,048	-0,639	0,040	-0,023	-0,695	0,071	-0,015

SIC codes	4000-4999			5000-5999			7000-7999			8000-8999		
Year	α1	α2	α3	α1	α2	α3	α1	α2	α3	α1	α2	α3
1999	0,419	-0,026	-0,026	0,087	0,082	-0,029	0,289	0,064	-0,041	0,537	0,012	-0,003
2000	-0,130	0,486	-0,077	-1,421	-0,083	0,040	0,780	0,074	-0,051	-1,449	0,185	-0,073
2001	-0,351	-0,124	0,007	-0,003	0,028	0,029	-0,559	0,162	-0,102	3,097	0,256	-0,161
2002	0,438	-0,082	-0,043	1,651	0,229	-0,082	-1,568	0,032	-0,043	-0,518	0,142	-0,093
2003	-0,648	0,030	-0,055	5,417	-0,137	-0,329	-1,134	0,175	-0,076	0,326	0,227	-0,078
2004	-0,144	-0,126	0,008	-30,167	0,538	0,116	-1,040	0,066	-0,026	-1,124	-0,022	-0,031
2005	0,417	-0,128	0,037	0,395	0,049	-0,027	-0,191	0,083	-0,055	-1,373	0,010	-0,027
2006	-0,330	0,088	-0,036	1,544	0,133	-0,048	2,034	-0,030	-0,050	0,289	-0,032	0,019
2007	-1,348	-0,045	0,022	-0,595	0,041	0,048	1,390	0,128	-0,058	-0,521	0,060	0,004
2008	-0,745	0,075	-0,012	0,556	0,266	-0,044	-0,422	0,036	-0,067	-0,478	0,039	-0,027
2009	1,076	-0,268	-0,048	-0,996	0,209	-0,017	-0,867	-0,027	-0,037	-1,664	-0,051	-0,047
2010	-1,352	0,003	-0,028	1,892	0,208	-0,067	-0,974	0,211	-0,070	-1,941	0,093	0,001

Table 10. Estimated parameters real earnings management measurements.

Panel A. Estimated parameters U.K. to calculate normal CFO.

SIC codes	0000-0999			1000-1999			2000-2999			3000-3999		
Year	α_1	α_2	α_3	α_1	α_2	α_3	α_1	α_2	α_3	α_1	α_2	α_3
1999	0,672	-0,021	0,109	-0,412	0,040	0,004	-0,774	0,095	0,000	-1,142	0,089	0,001
2000	0,630	0,036	-0,243	-0,338	0,031	0,065	-0,379	0,062	0,134	1,116	0,301	-1,129
2001	0,224	0,067	0,085	-58,802	-7,039	29,184	-0,878	0,087	0,036	-3,091	0,193	-0,140
2002	0,225	0,050	0,051	-0,260	0,060	-0,141	-0,259	0,067	-0,096	-0,262	0,047	-0,106
2003	-0,512	0,055	-0,025	-0,104	0,040	0,041	-0,240	0,063	-0,044	-0,075	0,044	-0,217
2004	-3,104	0,377	1,234	-3,53E-05	-0,051	0,479	-0,116	0,088	-0,304	-0,109	-0,141	0,160
2005	-0,545	0,050	-0,118	8,50E-05	-0,005	0,270	-0,136	0,116	-0,768	-0,983	0,115	-0,082
2006	-1,121	0,093	0,012	-0,211	-0,064	0,097	-0,824	0,099	-0,256	-0,413	-0,018	0,077
2007	-0,056	0,049	0,136	-0,259	0,064	0,094	-0,682	0,068	-0,008	-0,351	0,180	-1,152
2008	-0,182	0,008	0,122	-0,190	0,049	0,106	-0,699	0,064	0,048	-0,431	0,131	-0,247
2009	-1,193	0,053	0,399	-0,244	0,039	0,049	-0,232	0,071	0,253	-0,218	0,036	0,330
2010	-1,786	0,092	0,138	-2,140	0,431	-1,109	-0,436	0,079	0,137	-0,045	-0,024	-0,401

SIC codes	4000-4999			5000-5999			7000-7999			8000-8999		
Year	α_1	α_2	α_3	α_1	α_2	α_3	α_1	α_2	α_3	α_1	α_2	α_3
1999	0,198	0,028	0,000	-0,153	0,041	0,004	-0,357	0,077	-0,004	-0,779	0,074	-0,001
2000	-2,326	0,069	-0,333	0,025	-0,063	-0,119	0,124	-1,246	1,715	-1,158	-0,008	0,066
2001	-0,512	0,076	-0,290	-0,920	0,063	-0,188	-0,199	0,030	-0,052	-0,927	0,049	-0,068
2002	-0,541	0,035	0,014	-0,485	0,053	-0,055	-0,400	0,027	0,004	-0,141	0,015	0,416
2003	-0,570	0,012	0,135	-0,588	0,045	-0,021	-0,305	0,011	0,023	-0,083	0,006	0,145
2004	-0,478	0,104	-0,222	-0,498	0,057	-0,082	-1,883	0,458	-0,259	-0,028	-0,085	0,436
2005	-0,697	0,088	-0,012	0,049	0,043	-0,073	-0,948	0,464	-1,775	-0,202	0,023	-0,056
2006	-0,272	0,023	0,000	-0,531	0,046	0,013	-0,195	0,001	-0,006	-0,470	0,069	0,022
2007	-1,904	0,091	0,049	-0,338	0,036	0,092	-0,416	0,038	-0,117	0,027	0,023	-0,016
2008	-0,689	0,080	-0,033	0,027	0,031	0,017	-0,010	0,016	-0,040	-0,285	0,060	-0,071
2009	-0,979	0,083	-0,119	0,041	0,045	-0,010	-0,449	0,048	-0,209	-0,040	0,032	0,138
2010	-0,819	0,059	0,135	-0,230	0,030	0,060	-0,597	0,025	0,046	-0,103	-0,023	0,398

Panel B. Estimated parameters France to calculate normal CFO.

SIC codes	0000-0999			1000-1999			2000-2999			3000-3999		
Year	α_1	α_2	α_3	α_1	α_2	α_3	α_1	α_2	α_3	α_1	α_2	α_3
1999	36,534	-9,63E-06	-0,538	16,505	5,42E-06	0,155	4,786	4,82E-06	0,079	3,207	4,34E-06	0,13
2000	-0,108	-7,15E-05	1,944	-0,886	7,52E-05	0,041	0,351	4,43E-06	0,073	-0,745	2,93E-06	0,083
2001	2,09	0,016	0,315	-2,912	0,098	-0,165	-2,643	0,063	0,029	-0,596	0,033	0,03
2002	0,57	0,02	0,883	-3,191	0,066	-0,059	-1,378	0,052	-0,07	-0,842	0,069	-0,051
2003	0,461	0,060	0,669	-2,195	0,069	-0,136	-0,275	0,056	0,000	0,029	0,076	0,246
2004	-1,980	0,110	-0,154	-0,010	0,057	0,752	-2,739	0,067	0,073	1,232	0,006	0,199
2005	-4,657	0,118	2,511	-0,008	0,042	0,504	-0,757	0,065	-0,030	-0,346	0,043	-0,009
2006	1,333	0,028	0,458	1,375	0,036	0,227	-0,700	0,060	-0,077	-0,605	0,045	0,063
2007	-0,293	0,030	0,190	-1,538	0,067	0,105	-0,496	0,062	-0,140	-0,953	0,061	0,166
2008	-149,653	0,000	-7,584	-5,834	0,119	-0,052	-2,627	0,054	-0,004	-1,493	0,063	0,135
2009	0,000	0,103	0,506	-1,259	0,079	0,112	-2,680	0,112	0,119	-1,702	0,101	0,059
2010	0,000	0,108	0,469	-0,857	0,053	0,160	-2,036	0,078	0,028	-2,968	0,097	0,070

SIC codes	4000-4999			5000-5999			7000-7999			8000-8999		
Year	α_1	α_2	α_3	α_1	α_2	α_3	α_1	α_2	α_3	α_1	α_2	α_3
1999	-0,109	3,19E-06	0,184	1,125	3,10E-06	0,179	-0,098	4,49E-05	0,11	0,894	9,14E-05	0,047
2000	-0,022	3,36E-06	-0,241	-1,944	1,79E-06	0,109	-1,697	2,64E-05	0,05	1,594	1,64E-05	0,03
2001	-1,331	0,034	0,194	-0,711	0,031	0,006	-0,511	0,059	-0,047	-0,72	0,092	-0,244
2002	-0,054	0,091	0,204	-0,211	0,057	-0,046	-0,932	0,059	0,119	-0,928	0,073	-0,013
2003	-0,010	0,085	0,157	-1,515	0,060	0,150	-0,539	0,070	0,162	-1,069	0,052	0,459
2004	2,078	0,035	-0,199	31,031	-0,195	-0,152	-0,029	0,042	0,214	-0,722	0,059	0,081
2005	-2,215	0,103	-0,098	1,603	0,028	-0,039	-0,660	0,044	0,100	-0,701	0,058	0,137
2006	-2,497	0,092	-0,035	-0,227	0,029	-0,027	-1,464	0,065	0,145	-1,741	0,017	0,253
2007	0,015	0,090	-0,087	1,791	0,019	0,054	-0,013	0,047	0,071	-3,960	0,088	-0,020
2008	-0,441	0,069	0,001	-8,363	0,094	-0,273	-0,441	0,073	0,041	-0,838	0,039	0,205
2009	-2,396	0,129	0,406	-0,654	0,051	-0,017	-0,257	0,084	0,065	-1,239	0,060	0,178
2010	0,097	0,102	-0,119	-0,721	0,047	-0,174	-1,394	0,086	0,047	-7,978	0,076	0,383

Panel C. Estimated parameters U.K. to calculate normal production costs.

SIC codes	0000-0999				1000-1999				2000-2999				3000-3999			
Year	α_1	α_2	α_3	α_4	α_1	α_2	α_3	α_4	α_1	α_2	α_3	α_4	α_1	α_2	α_3	α_4
1999	-0,519	0,755	-0,081	-0,005	-0,124	0,826	-0,001	-0,028	-0,363	0,668	0,001	-0,074	-0,890	0,696	0,002	-0,033
2000	-0,333	0,711	0,086	-0,180	-0,060	0,837	0,007	0,007	-0,038	0,634	0,361	-0,178	-0,521	0,690	0,030	-0,058
2001	-0,935	0,749	0,290	-0,529	0,081	0,823	0,182	0,187	-0,214	0,658	-0,006	-0,054	-0,678	0,712	0,094	-0,071
2002	-0,259	0,723	0,008	0,208	-0,158	0,845	-0,041	-0,169	0,041	0,653	0,205	-0,024	-0,176	0,684	-0,009	-0,016
2003	-0,361	0,741	0,070	-0,083	-0,067	0,829	-0,044	-0,081	0,047	0,655	0,148	0,187	0,003	0,659	-0,149	0,014
2004	-0,030	0,805	0,213	0,134	-9,36E-06	0,798	-0,091	-0,013	-0,073	0,620	0,160	-0,034	-0,073	0,662	0,149	-0,290
2005	-0,246	0,835	0,951	0,339	-2,85E-10	0,877	-0,402	-0,209	0,011	0,632	0,036	-0,025	0,020	0,667	0,255	0,060
2006	0,021	0,716	0,967	-0,558	-2,81E-08	0,820	0,146	-0,187	0,000	0,611	-0,126	0,123	-0,116	0,693	0,118	-0,278
2007	0,891	0,723	-0,481	0,627	0,010	0,866	-0,160	0,079	-0,384	0,649	-0,018	0,091	-0,008	0,657	0,243	-0,033
2008	-0,313	0,860	-0,396	-0,263	0,022	0,831	-0,160	0,005	-0,455	0,693	0,008	-0,137	-0,015	0,689	0,101	0,057
2009	2,369	-0,023	0,040	0,193	-0,001	0,081	0,014	-0,045	-0,093	0,093	-0,022	-0,003	0,026	0,132	-0,076	0,002
2010	-1,590	0,614	0,257	0,135	0,574	0,690	0,324	0,068	-0,562	0,662	-0,204	-0,201	-0,001	0,663	0,046	-0,165

SIC codes	4000-4999				5000-5999				7000-7999				8000-8999			
Year	α_1	α_2	α_3	α_4	α_1	α_2	α_3	α_4	α_1	α_2	α_3	α_4	α_1	α_2	α_3	α_4
1999	-0,915	-0,788	2,92E-05	0,084	-0,547	0,786	-0,005	0,126	-0,371	0,703	0,025	-0,215	-0,944	0,765	-0,001	-0,128
2000	0,142	0,746	-0,009	0,140	-2,273	0,812	-0,161	0,062	-0,180	0,701	0,032	-0,024	-0,391	0,675	0,199	-0,108
2001	-0,711	0,863	-0,193	0,032	-0,263	0,783	0,022	-0,198	-1,091	0,726	0,188	-0,031	-0,362	0,687	-0,081	0,032
2002	-0,590	0,846	0,020	-0,086	-0,552	0,798	-0,140	-0,322	-0,128	0,763	0,018	0,197	-0,022	0,739	-0,021	-0,003
2003	-0,649	0,765	0,020	0,133	-0,890	0,797	-0,178	-0,399	-0,188	0,734	-0,089	0,094	0,011	0,682	0,235	0,000
2004	-0,215	0,768	0,064	-0,102	-0,142	0,774	0,063	-0,117	-0,094	0,756	0,188	-0,037	-0,001	0,668	-0,029	0,043
2005	-0,031	0,731	-0,041	-0,006	-0,563	0,755	0,090	-0,192	0,035	0,778	0,157	-0,314	-0,052	0,644	-0,056	-0,059
2006	-0,215	0,761	-0,123	-0,021	-0,636	0,758	0,227	-0,306	-0,023	0,746	-0,107	0,180	-0,015	0,662	-0,150	0,022
2007	-0,586	0,789	0,058	-0,198	-0,651	0,806	-0,139	-0,022	-0,314	0,845	0,093	-0,193	-0,049	0,644	-0,038	0,064
2008	-0,620	0,762	0,291	-0,052	-0,997	0,818	-0,079	-0,033	0,039	0,873	0,203	0,005	0,009	0,654	-0,008	0,002
2009	-0,002	0,021	-0,021	-0,023	-0,083	0,079	0,070	0,029	0,000	0,000	0,026	-0,009	0,002	0,014	-0,012	0,022
2010	-0,740	0,736	0,035	0,037	-0,237	0,761	0,152	-0,030	0,029	0,751	-0,543	0,392	0,000	0,706	-0,208	-0,138

Panel D. Estimated parameters France to calculate normal production costs.

SIC codes	0000-0999				1000-1999				2000-2999				3000-3999			
Year	α_1	α_2	α_3	α_4	α_1	α_2	α_3	α_4	α_1	α_2	α_3	α_4	α_1	α_2	α_3	α_4
1999	49,853	0,002	-6,162	-3,461	53,227	0	1,258	-0,264	37,57	6,21E-05	0,647	2,681	17,978	5,58E-05	0,269	1,101
2000	31,588	0	0,949	-2,553	57,831	6,95E-05	0,788	1,377	19,078	-1,1E-05	3,069	-0,684	0,871	3,15E-05	0,1697	1,102
2001	1,747	0,67	-2,348	5,393	2,536	0,911	-0,639	0,106	1,58	0,858	0,012	-0,222	0,501	0,834	-0,092	0,143
2002	3,701	0,745	2,995	-0,963	0,145	0,866	0,026	0,204	0,684	0,811	-0,203	0,028	0,444	0,837	0,106	-0,072
2003	1,416	0,76	-1,558	0,288	-1,426	0,884	0,35	0,07	5,985	0,791	-0,115	0,054	0,988	0,811	0,262	-0,104
2004	-9,105	0,898	-0,797	-3,191	2,528	0,972	-0,644	-0,481	1,798	0,797	-0,503	-0,297	-0,391	0,882	-0,211	-0,008
2005	1,906	0,836	-1,027	0,07	-0,038	0,9	-0,047	-0,24	-0,158	0,826	-0,247	-0,251	-0,5	0,846	0,576	-0,053
2006	0,969	0,893	-2,529	1,259	-0,307	0,883	0,036	-0,124	0,164	0,826	-0,072	-0,16	0,608	0,859	-0,08	-0,204
2007	-0,329	0,959	-0,798	0,133	2,17	0,879	-0,193	0,253	1,038	0,83	0,193	-0,431	1,103	0,827	-0,064	-0,063
2008	0,215	0,958	-1,111	-1,277	0,857	0,833	0,154	0,18	-0,501	0,809	0,159	0,181	1,263	0,817	-0,017	-0,134
2009	0,517	0	-1,805	-16,832	3,537	0,827	0,035	0,168	0,932	0,772	0,049	0,195	0,964	0,795	-0,051	-0,087
2010	0,731	0,755	0	-1,811	0,876	0,86	0,12	-0,036	1,206	0,808	-0,156	-0,049	1,029	0,816	0,043	-0,021

SIC codes	4000-4999				5000-5999				7000-7999				8000-8999			
Year	α_1	α_2	α_3	α_4	α_1	α_2	α_3	α_4	α_1	α_2	α_3	α_4	α_1	α_2	α_3	α_4
1999	6,288	1,11E-05	1,088	2,373	25,826	3,06E-05	0,629	1,549	1,715	0	0,952	2,272	6,363	0	3,525	-1,131
2000	10,452	7,79E-06	3,342	-0,296	2,536	3,60E-05	1,717	-0,156	3,655	0	0,896	1,232	1,519	0	1,135	1,999
2001	2,008	0,738	0,139	0,005	1,639	0,865	0,134	-0,066	0,756	0,803	0,065	-0,004	0,525	0,872	0,005	-0,009
2002	1,325	0,793	0,1	-0,105	0,827	0,881	0,134	-0,018	0,806	0,833	0,1	0,056	-29,999	1,647	3,76	-3,805
2003	0,656	0,804	-0,112	0,045	2,094	0,855	0,124	-0,025	0,863	0,853	-0,2	0,091	0,043	0,908	0,032	-0,077
2004	-2,654	0,878	0,156	0,036	5,676	0,854	-0,202	-0,303	0,249	0,849	-0,067	-0,071	0,349	0,871	0,062	-0,169
2005	2,84	0,804	0,243	0,024	0,897	0,853	0,313	-0,044	0,016	0,853	0,016	-0,034	0,987	0,823	0,02	-0,003
2006	1,809	0,814	0,084	-0,002	-0,08	0,896	0,038	0,119	-0,037	0,866	-0,101	-0,01	0,642	0,844	0,043	0,023
2007	1,695	0,773	0,297	-0,039	0,348	0,918	0,062	-0,102	-0,522	0,85	0,206	-0,174	-0,356	0,918	0,109	-0,287
2008	1,611	0,823	-0,165	0,097	0,425	0,907	-0,014	0,001	0,515	0,824	0,104	-0,128	-0,017	0,867	0,087	-0,02
2009	3,115	0,741	-0,226	0,137	1,14	0,882	0,065	0,095	0,444	0,833	0,06	0,005	0,63	0,844	-0,034	0,148
2010	2,13	0,765	0,212	-0,162	0,551	0,909	-0,044	5,66E-05	0,434	0,845	-0,259	0,06	2,882	0,823	-0,231	-0,002

Panel E. Estimated parameters U.K. to calculate normal discretionary expenses.

SIC codes	0000-0999		1000-1999		2000-2999		3000-3999	
Year	α_1	α_2	α_1	α_2	α_1	α_2	α_1	α_2
1999	n.a.	n.a.	0,092	0,104	1,86	0,248	2,504	0,244
2000	n.a.	n.a.	1,076	0,117	2,098	0,254	2,93	0,266
2001	n.a.	n.a.	1,61	0,101	3,001	0,17	2,483	0,208
2002	n.a.	n.a.	5,526	0,068	2,654	0,197	0,929	0,273
2003	n.a.	n.a.	1,6	0,098	2,583	0,24	1,445	0,291
2004	n.a.	n.a.	1,544	0,112	2,282	0,266	0,699	0,547
2005	8,664	36,731	0,668	0,18	2,296	0,31	1,743	0,274
2006	-1,828	15,254	1,065	0,131	4,204	0,218	2,097	0,22
2007	1,656	0,808	2,910	0,056	2,638	0,297	0,650	0,320
2008	-5,335	1,292	0,595	0,140	4,340	0,289	2,991	-0,015
2009	0,472	0,148	0,04	0,16	0,15	0,143	0,277	0,135
2010	3,202	0,171	2,805	0,299	2,752	0,112	0,917	0,278

SIC codes	4000-4999		5000-5999		7000-7999		8000-8999	
Year	α_1	α_2	α_1	α_2	α_1	α_2	α_1	α_2
1999	1,288	0,196	1,414	0,184	0,645	0,569	4,612	0,035
2000	3,595	0,137	2,614	0,102	1,62	0,868	1,879	0,434
2001	5,326	0,198	4,318	0,111	2,888	0,403	4,127	0,138
2002	2,657	0,211	1,259	0,177	1,51	0,415	0,94	0,458
2003	1,948	0,291	3,22	0,164	1,053	0,543	0,125	0,387
2004	2,12	0,317	1,677	0,199	0,969	0,577	1,463	0,346
2005	2,337	0,246	5,924	0,124	0,224	0,882	0,454	0,696
2006	1,217	0,292	6,91	0,133	1,002	0,46	1,296	0,436
2007	1,518	0,191	4,379	0,213	1,419	0,492	0,798	0,415
2008	0,627	0,239	2,067	0,178	0,723	0,627	1,991	0,397
2009	0,371	0,102	0,465	0,054	0,109	0,031	0,029	0,188
2010	2,106	0,284	0,664	0,235	3,438	0,164	1,332	0,512

Panel F. Estimated parameters France to calculate normal discretionary expenses.

SIC codes	0000-0999		1000-1999		2000-2999		3000-3999	
Year	α_1	α_2	α_1	α_2	α_1	α_2	α_1	α_2
1999	n.a.	n.a.	n.a.	n.a.	-10,537	0,137	22,915	0,196
2000	n.a.	n.a.	n.a.	n.a.	17,869	0,139	7,093	0,153
2001	n.a.	n.a.	214,537	-0,085	15,55	0,437	13,483	0,184
2002	n.a.	n.a.	n.a.	n.a.	35,332	0,388	8,929	0,259
2003	n.a.	n.a.	-23,139	0,222	27,361	0,421	12,892	0,254
2004	n.a.	n.a.	-33,555	0,294	24,950	0,575	16,022	0,252
2005	n.a.	n.a.	1,060	0,117	30,308	0,314	3,117	0,304
2006	-12,653	0,495	8,483	0,105	8,786	0,393	3,665	0,345
2007	n.a.	n.a.	1,951	0,147	14,248	0,370	15,237	0,249
2008	n.a.	n.a.	8,292	0,087	29,273	0,326	10,886	0,266
2009	n.a.	n.a.	15,515	0,087	3,612	0,365	10,584	0,237
2010	n.a.	n.a.	78,575	0,090	28,599	0,357	7,698	0,321

SIC codes	4000-4999		5000-5999		7000-7999		8000-8999	
Year	α_1	α_2	α_1	α_2	α_1	α_2	α_1	α_2
1999	552,762	0,174	36849,2	-0,852	1,991	0,127	n.a.	n.a.
2000	n.a.	n.a.	38010,01	-0,862	13,642	0,062	n.a.	n.a.
2001	37,243	0,268	-3296,51	0,291	25,663	0,42	n.a.	n.a.
2002	76,026	0,272	-3267,6	0,273	18,035	0,399	n.a.	n.a.
2003	48,538	0,211	-5103,91	0,332	13,378	0,524	n.a.	n.a.
2004	50,122	0,183	28,692	0,182	10,327	0,595	n.a.	n.a.
2005	56,335	0,115	19,033	0,199	5,543	0,672	n.a.	n.a.
2006	55,697	0,129	-3581,933	0,303	1,993	0,655	-141,604	131,749
2007	45,419	0,175	0,000	0,179	-0,631	0,583	-8,830	8,264
2008	-145,250	0,225	6,588	0,174	2,435	0,583	5,888	0,310
2009	-113,053	0,181	2367,909	0,109	2,594	0,434	3,881	2,408
2010	-269,485	0,218	1637,400	0,151	11,268	0,313	17,718	0,245

Appendix VII   Comparison of means

Table 11. Means and standard deviations of accrual-based earnings management.

	U.K.		France		
	Mean	Std. Deviation	Mean	Std. Deviation	
1999	0,1009	0,1543	0,0563	0,0577	*
2000	0,5303	3,4940	0,1117	0,2137	*
2001	1,3939	13,8857	0,1039	0,1640	**
2002	0,2008	2,3622	0,0760	0,0842	
2003	0,5651	4,3147	0,0786	0,1004	*
2004	0,5197	2,2028	0,1701	1,0489	*
2005	0,1844	2,4581	0,0826	0,1223	
2006	0,1555	0,3065	0,0773	0,1363	*
2007	0,1912	0,3790	0,0661	0,0045	*
2008	0,5360	12,5138	0,0590	0,0679	
2009	0,1047	0,1583	0,0628	0,0684	*
2010	0,1855	0,7924	0,0570	0,0688	*

*, **, ***, and **** indicate significance difference of means at 0,1%, 1%, 5% and 10% respectively

Table 12. Means and standard deviations of real earnings management.

Panel A. Means and standard deviations of real earnings management measurement of abnormal cash flow of operations.

	U.K.		France		
	Mean	Std. Deviation	Mean	Std. Deviation	
1999	0,1185	0,1720	0,0814	0,0957	*
2000	0,8173	3,3156	0,1330	0,2033	*
2001	1,4971	13,4883	0,0917	0,1066	*
2002	0,1439	0,2680	0,0737	0,0866	*
2003	0,3593	5,0114	0,0757	0,0922	
2004	0,6305	2,7459	0,1409	0,2219	*
2005	0,6243	3,0011	0,0899	0,1115	*
2006	0,2595	0,7447	0,0810	0,0998	*
2007	0,2626	0,7836	0,0720	0,0707	*
2008	0,1672	0,3179	0,0790	0,0935	*
2009	0,1465	0,3089	0,0751	0,0880	*
2010	0,3215	1,4631	0,0709	0,0800	*

*, **, ***, and **** indicate significance difference of means at 0,1%, 1%, 5% and 10% respectively

Panel B. Means and standard deviations of real earnings management measurement of abnormal production costs.

	U.K.		France		
	Mean	Std. Deviation	Mean	Std. Deviation	
1999	0,3618	0,7448	0,6518	0,5345	*
2000	0,2342	0,2650	0,7518	0,6624	*
2001	0,2094	0,2317	0,1477	0,1467	*
2002	0,2019	0,2124	0,1676	0,2399	**
2003	0,2182	0,2364	0,1482	0,2322	*
2004	0,2669	0,4134	0,1716	0,1953	*
2005	0,2810	0,3763	0,1842	0,2045	*
2006	0,2636	0,3484	0,1576	0,1836	*
2007	0,2612	0,3609	0,1506	0,1604	*
2008	0,2508	0,3233	0,1390	0,1523	*
2009	0,0603	0,1012	0,1302	0,1440	*
2010	0,2623	0,4910	0,1366	0,5820	*

*, **, ***, and **** indicate significance difference of means at 0,1%, 1%, 5% and 10% respectively

Panel C. Means and standard deviations of real earnings management measurement of abnormal discretionary expenses.

	U.K.		France		
	Mean	Std. Deviation	Mean	Std. Deviation	
1999	0,3086	0,5352	0,1385	0,1569	****
2000	0,5923	1,6177	0,1705	0,1754	*
2001	0,3557	0,7013	0,1468	0,1528	*
2002	0,2670	0,3221	0,1424	0,1393	*
2003	0,2891	0,5009	0,1260	0,1173	*
2004	0,5003	1,6921	0,1743	0,2374	
2005	0,7212	4,0295	0,1792	0,1675	
2006	0,3718	0,5298	0,1983	0,2808	*
2007	0,3652	0,4510	0,2291	0,2983	**
2008	0,3973	0,8715	0,2012	0,2382	***
2009	0,1117	0,2844	0,1939	0,2169	**
2010	0,3078	0,4194	0,1787	0,2142	*

*, **, ***, and **** indicate significance difference of means at 0,1%, 1%, 5% and 10% respectively

Panel D. Means and standard deviations of the average real earnings management measurement.

	U.K.		France		
	Mean	Std. Deviation	Mean	Std. Deviation	
1999	0,2491	0,5499	0,4143	0,4975	*
2000	0,5451	2,3211	0,4520	0,5828	****
2001	0,8196	9,1500	0,1223	0,1333	*
2002	0,1842	0,2593	0,1248	0,1885	*
2003	0,2931	3,4169	0,1150	0,1813	**
2004	0,4691	2,0041	0,1631	0,2062	*
2005	0,4991	2,5372	0,1448	0,1754	*
2006	0,2763	0,5869	0,1289	0,1697	*
2007	0,2755	0,6033	0,1252	0,1566	*
2008	0,2316	0,4381	0,1193	0,1456	*
2009	0,1065	0,2532	0,1130	0,1371	*
2010	0,2944	1,0355	0,1133	0,1429	*

*, **, ***, and **** indicate significance difference of means at 0,1%, 1%, 5% and 10% respectively