The effect of Directive 2013/34/EU on Earnings Management in the EU

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ABSTRACT

This study investigates the consequences of the implementation of Directive 2013/34/EU. This European Directive aims to increase the comparability of financial statements in the EU by providing a set of guidelines to be implemented by the national member states. As a proxy for comparability in this study the discretionary accruals of European firms are analysed. These accruals are calculated by using a modified version of the Jones Model (1991). After calculating this variable, several fixed effects regressions are conducted implementing these discretionary accruals. The variables included in the modified Jones model are incorporated in the subsequent models to overcome bias in the estimates, as suggested by Chen et al. (2018). The first fixed effects model does not provide a significant coefficient on the DA variable, and hence, no meaningful inferences can be made from this analysis. The second and third regression provide significant coefficients; an indirect association between the implementation and the comparability of financial statements can therefore be ascertained. This indirect association is provided by a significant relation between discretionary accruals and audit firm size and between audit firm size and the implementation. Further studies might use a different proxy for comparability or study other aims of the directive.

1. Introduction

On the 26th of June 2013, the European Parliament and the European Council published Directive 2013/34/EU on the annual financial statements, consolidated financial statements and related reports of certain types of undertaking. This directive amends Directive 2006/43/EC which focused on statutory audits of annual accounts and consolidated accounts. Directives are a tool commonly used by the European Union to reach various (legislative) goals. The difference between directives and ordinary European Laws is that a directive will specify the purpose of the legislation but will not provide the means to achieve it. In this case, the European Parliament provides different goals regarding accounting standards, and subsequently, the member states have the freedom of determining how to implement these goals in their national legislation. When issuing a directive, the EU provides a deadline to the Member States, before which they would have to have implemented the new legislation into their national laws; in the case of this directive, issued in June 2013, the Member States had to implement it on 20 July 2015 at the latest (*Art. 53 Directive 2013/34/EU*). In the Netherlands, a minor delay occurred, and the Directive was implemented officially on 3 September 2015.

There are different motives behind the new European Directive. First of all, the Directive aims to assist small- and medium-sized enterprises by lowering their burdens and simplifying the accounting rules. Furthermore, special attention has been given to the payments made by mining and logging industries to governments to disable these industries to commit various unlawful acts. However, the main objective for the legislators writing this Directive is to increase and ensure the comparability of the financial statements by dividing corporations into groups based on their size and accordingly define clear rules and regulations on the reporting of their financial statements. Based on several studies, on which elaboration is provided in the

subsequent section, the definition of comparability used in this context is *the quality of information that enables users to identify similarities and differences between two sets of economic phenomena*. This definition is vital to this study since the main objective is to provide evidence supporting an increase in the quality of information as a consequence of the implementation of Directive 2013/34/EU. Apart from the fact that comparability of financial statements leads to a better understanding for the relevant parties interested in these documents, comparability will also be followed by a decrease in earnings management (Sohn, 2016; Akhgar and Davoodi, 2019; Thanh Liem, 2021). This can be explained by the fact that in identifying differences and similarities with more ease, unexpected changes in these financial statements will be noticed faster. Subsequently, accruals-based earnings management will decline. Therefore, the main question this study investigates is: did the implementation of the Directive into national law lead to a decrease in discretionary accruals caused by an increase in the comparability of financial statements?

Looking into the changes in national legislation that have been made by the separate member states of the European Union, it is important to evaluate if the mandatory changes of the directive have reached the aim of the European Union. In this case, it may be of great assistance to regulators all over the world. Regulators have been trying to increase the comparability of financial statements through legislation for decades. Increasing the informativeness for stakeholders is not their only concern; increasing comparability furthermore provides less opportunity for managers to manage their earnings through disorderly, unclear financial statements. Hiding fraudulent behaviour concerning the financial performance of firms is simpler for managers if financial statements are not subject to strict requirements on layout and disclosure. This is one of the contributions this study aims at: providing evidence that supports the notion that this piece of legislation does indeed increase the comparability of financial statements, and subsequently causes the benefits for both stakeholders and governments mentioned previously. Therefore, this paper will study the implementations of the directive in Europe, and subsequently, compare the before and after period. Since, according to previous studies, an increase in comparability will lead to a decrease in earnings management (Sohn, 2016; Akhgar and Davoodi, 2019; Thanh Liem, 2021) this study will conduct an analysis to see if earnings management has decreased in the European Union.

Four separate regressions are run to achieve this goal, using a timeframe from 2010 up to 2020 to get the chance to capture the before and after behaviour of firms. First, the Jones Model (Jones, 1991) will be transformed based on the alterations Dechow et al. (1995) made. By including the change in revenues in the model, Dechow et al. hope to include earnings management regarding revenues, which has been neglected in the former model. Included in the final model now are total accruals, lagged assets, revenues, receivables, and PPE. After running this regression, the estimates are retracted from the model and used to define the discretionary accruals.

Subsequent to this model, a firm fixed effect regression is used to see whether the implementation of the new directive affected the change in discretionary accruals. This regression leads to mixed results. All control variables included in the regression seem to have

a significant effect on discretionary accruals and, hence, on earnings management. However, the main independent variable of this study, the implementation of the directive, does not produce a significant coefficient. Unfortunately, there is not enough evidence to support the notion that there is a significant change in earnings management due to the implementation of the new directive. These findings are not in line with the expectations that were present before conducting this study, and future researchers could aim to discover if the issue lies with the directive itself or if another approach to measuring comparability should be adopted. Furthermore, increasing comparability is not the solitary aim of the directive. This means that a study can be conducted to see if the additional goals of the directive have been achieved.

Following the same structure as used in the previous firm fixed effects model, two other models are run. The first one being a firm fixed effects model on the discretionary accruals and the choice of audit firm size, which provides significant results on all variables included. This test is conducted to provide evidence of an association between the choice of audit firm size and accruals-based earnings management within firms. To strengthen the relation between audit firm size and comparability, an F test to compare variances is conducted on the discretionary accruals of both Big 4 clients and non-big 4 clients. The results from this test provide additional evidence in favour of a wider dispersion of discretionary accruals for clients of smaller audit firms compared to the clients of larger audit firms. Once this association has been established, the next firm fixed effects model is run. This model regresses the choice of audit firm size on the implementation, and the resulting significant variables provide evidence that supports the shift towards larger audit firms after the implementation of Directive 2013/34/EU. In addition to this firm fixed effects model, a Chi-squared test of independence is conducted on the choice of audit firms before and after the implementation. The result of this test provides evidence in favour of a shift in preference to larger audit firms after the implementation of the directive. The results of these models and additional tests combined do provide some evidence of the association between the implementation of the directive and accruals-based earnings management, through the change in audit firm size after implementation.

This study is structured as follows. The next section explains the theoretical and empirical background of the research topic and elaborates on the most important concepts used in this study, and subsequent an explanation of the data used in this research and an explanation of the tests that are conducted is provided. The fifth section reports the results of the tests and afterwards some concluding remarks, including the limitations of this paper, are presented.

2. Prior literature

Since the directive has been introduced quite recently, and the deadline of national implementation was roughly five years ago, not much research has been conducted on this topic. Nonetheless, some researchers have dived into the topic and tested its meaning, goals and effectiveness. First, some comparable research is mentioned and explained, after which there is an elaboration of prior literature on the main constructs of this research. Finally, a short explanation is provided on the associations used in this study.

Before the directive was introduced, Provasi and Sottoriva (June 2015) conducted their research on the new directive, aiming to establish the consequences on financial reporting. In their work, the authors state that some voluntary implementations will most likely not be implemented since they will differ too significantly from the existing accounting legislation. Their contribution can be regarded as advice to the regulators: divide entities into small and non-small businesses, which will be followed by a larger understanding and applicability of the new laws.

Glaserova et al. (2017) desired to test and evaluate the consequences of implementing the directive into the national accounting laws of the Czech Republic. The authors, however, mainly focused on the new criteria for the small, medium and large enterprises, and they concluded that the thresholds used to categorize these enterprises are not appropriate for all countries within the European Union, but that they should have been decided based on the separate economic climates of the country. Although their study is not focused on earnings management, the conclusion they draw on providing all countries in the Union with the same principles, even though some countries significantly differ in wealth and organization, might be a hazard in studying the consequences of this directive.

A further investigation into the effects of the new directive was conducted by Alvino et al. (2016). The authors conducted comparative research to discover a change in harmonization between selected EU countries. The paper compares the different countries with the I-index developed by van de Tas (1988) and this model finds that the harmonization between France, Germany, Italy, Spain and the UK has seen a minor increase. Furthermore, the research provides evidence regarding the increase in harmonization being the largest for the small and micro undertakings. However, this study was conducted only several months after implementation of the Directive, thus possibly not capturing the entire difference between before and after the implementation, and not many EU countries were included. This leaves the opportunity for the research conducted in this paper.

2.1 Explanation of Comparability

One of the main purposes of the new directive is the increase of comparability of financial statements. Nevertheless, the question remains: what is comparability? Establishing a strong definition of this construct is vital for this research as it is built around his concept.

Extended research has been conducted on this construct and some factors that influence it have been established. However, academia and other interested parties have had a hard time defining the concept of comparability. Simmons (1967) uses the dictionary definition of comparability: capable of being compared. Not much information can be derived from that definition. Additionally, Simmons also states that comparability of financial statements is dependent on the level of sophistication; one can compare two completely different objects and only by one characteristic they may be comparable (e.g., a red table and a red jacket can be regarded as comparable based on colour). When increasing the level of sophistication, however, the

comparability might decrease. Simmons concludes his investigation into comparability by stating that the essence of comparability is the equivalence in reflection of economic circumstances.

Franco, Branson and Breesch (2009) start their description of comparability with a similar description. The authors describe an accounting system as a mapping of economic events that lead to financial statements. When firms produce the same financial statements, given a particular set of economic events, it can be stated that these firms utilize comparable accounting systems. They also recite the definition of comparability by the Financial Accounting Standards Board (FASB), which states that comparability is the quality of information that enables users to identify similarities and differences between two sets of economic phenomena. The FASB additionally underlines the importance of comparability in financial statements. These definitions are useful in constructing a formal definition to utilize in this study.

Another contribution in developing the definition of comparability is the study by Cole, Branson and Breesch (2009), who have made several distinctions within the definition of comparability. First, they distinguish between *de jure* comparability and *de facto* comparability. The first one being the formal comparability or the comparability of the utilized accounting standards, and the second one being the material comparability or the comparability of the accounting practices used by firms. Additionally, they distinguish between comparability over time and comparability between different companies. They conclude their explanation of comparability with the notion that the true definition of the concept depends on the measurement method of comparability. As earnings management is used as a proxy for comparability, the definition of comparability in this study will be structured in a more general way than is done in the study by Cole, Branson and Breesch.

Based on these different studies, a formal definition of comparability is constructed. The definitions provided by the previously mentioned authors range from simple ones, such as presented by Simmons (1967), who merely uses the definition provided by a dictionary, to the more sophisticated definitions, as Cole, Branson and Breesch (2009) specify in their study. In constructing a definition of comparability for this study, many of these previously mentioned definitions have been regarded. Regardless of them all being suitable definitions, for this study the definition by the Financial Accounting Standards Board will be used: *comparability is the quality of information that enables users to identify similarities and differences between two sets of economic phenomena.* Since this study's focus is on earnings management, which has a direct relation with comparability (Sohn, 2016; Akhgar and Davoodi, 2019; Thanh Liem, 2021), it is important to highlight the quality of information used to identify the differences. According to Sohn (2016), increases in comparability, and thus an increase in the quality of the previously mentioned information, is followed by a decrease in earnings management, which is the explanation for using earnings management as a proxy for comparability. In case of identifying differences and similarities with more ease, unexpected changes in these financial statements will be noticed faster. Subsequently, accruals-based earnings management will decline.

2.2 Explanation of Earnings Management

Subsequently, it is important to define a clear definition of earnings management to understand the analysis conducted in this paper. In defining such a definition, the work of multiple academics has been consulted. Firstly, El Diri (2018) states that there is no universal explanation. Many researchers have conducted studies on the topic, and authors came up with different explanations on the subject. The aspect that most academics agree on is that earnings management involves the manipulation of accounting numbers to achieve specific objectives. El Diri provides several definitions given by other authors; the following are the most clearly defined definitions:

Schipper (1989): "*Earnings management means disclosure management in the sense of a purposeful intervention in the external financial reporting process, with the intent of obtaining some private gain as opposed to, say, merely facilitation of the neutral operation of the process.*"

Healy and Wahlen (1999): "*Earnings management occurs when management uses judgment in financial reporting and in structuring transactions to alter financial reports to mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on the reported accounting numbers.*"

Philips et al. (2003): "*Managerial discretion over accounting choices and operating cash flows.*"

El Diri concludes that while many of these descriptions of earnings management are correct, they all emphasize the manipulation of earnings by managers.

Baneish (2001) mentions the same issue as El Diri: there is not a single definition of earnings management. Again, many definitions can be discovered in academic literature, and yet there has not been decided on one universal definition. Baneish considers, as did El Diri, multiple definitions and attempts to discover their common characteristics. He first notices that in the definitions he studies (definitions provided by Davidson et al., 1987; Schipper, 1989; and Healy and Wahlen, 1999), there is the commonality of all considering earnings management concerning actions taken by management in regard to the financial statements. A conclusion Baneish draws from this is that earnings management is something that occurs in relation to financial reporting. The author concludes his definition of earnings management by emphasising that there are two different types of earnings management: the opportunistic type, which entails managers misleading stakeholders of the firm, and the information type, in which managers contort information to emphasize their view of the firm's future performance.

Keeping this main component of managing earnings through financial statements in mind and combining the other definitions, this study will utilize the following definition of earnings management:

"Earnings management involves the use of judgment and specific accounting techniques in financial reporting to present a more positive view of the underlying economic performance of a firm."

Concerning this study, one can regard the use of accruals as a form of using specific accounting techniques to provide a more positive view of the financial situation of the firm. As explained in a later section of this paper, the managerial discretion exercised over accruals is named the discretionary part of accruals measured by the Modified Jones Model.

2.3 Explanation of accruals-based EM

To understand the concept of accruals-based earnings management, it is necessary to separate this analysis into steps. First, a short explanation on the distinction in accruals is provided, after which an explanation is presented on the use of accruals in earnings management.

Naturally, there are numerous ways to manage earnings for management. This study, however, focuses on the use of accruals when managing earnings. In this regard, a distinction between non-discretionary and discretionary accruals can be made. Earnings consist of two different components: the total accruals and the cash flow from operations. Looking at the total accruals, another distinction is established: non-discretionary accruals and discretionary accruals. Non-discretionary accruals can be defined as the part of the total accruals that is imposed on the managers by laws and regulations, and the discretionary part consists of other accruals that are chosen by management within the flexibility of these laws and regulations. When utilizing these discretionary accruals to present a false view of the firm's financial state, management commits earnings management through discretionary accruals or accruals-based earnings management. Many researchers have conducted their research based upon these definitions (Dechow et al., 1995; Francis and Yu, 2009; Doxey, 2021), and hence, this study will likewise use them.

In trying to understand accruals-based earnings management, it is important to the motives behind earnings management. What are incentives for managers to commit earnings management through discretionary accruals? Subramanyam (1996) argues that managers who manage discretionary accruals frequently are merely trying to improve the understandability and informativeness of financial statements. Naturally, if this would be the only incentive, there would be no need to worry. However, other studies have discovered alternative motives for managing earnings through accruals. Kasanen, Kinunen and Niskanen (1996) provide a different motivation; they state that the prior concern of management is not the informativeness of the financial statements, but the need for satisfying the demands for dividends and future expectations of profitability. This is presented as the main incentive for accruals-based earnings management. The work of Bekiris et al. (2011) corresponds with this conclusion: the authors of this study state that meeting certain financial thresholds is the main incentive for accruals-based earnings management. Bergstresser and Philippon (2006) support the notion that in many cases of earnings management the motive is not benign. In their study, the authors compare different types of CEO compensation and on what level this compensation depends

on stock price and performance. Following their analysis, they conclude that in cases of CEO compensation being more related to the stock performance, there is an increased incentive for CEOs to commit earnings management and thus increase their compensation. As can be concluded from these different studies, there are multiple motives for committing earnings management. These motives range from increasing the understandability of financial statements to manipulating them to present a more positive view of firm performance.

2.4 The relation between EM and comparability

After establishing the definitions of earnings management and comparability, the next thing important to understand for this analysis is the relation between these two concepts. Multiple authors have conducted experiments studying this association. Sohn (2016) investigated the question of whether and how earnings management is affected by the level of comparability of firms' financial statements. In measuring comparability, he used the model created by De Franco et al. (2011). These authors state that outcomes for similar economic events at different firms must be comparable in the case of applying comparable accounting standards. In summarizing these economic events and the accounting standards, earnings and stock returns are selected as proxies. De Franco et al. (2011) reach the same conclusion as Sohn: increases in comparability are followed by decreases in accruals-based earnings management. Sohn regresses these two variables and argues that the estimated constant and coefficient reflect the accounting systems of the firms. After estimating both the constant and coefficient, they are implemented in the estimation of the returns, and subsequently, earnings can be estimated. In the case of high comparability between firms, the difference between expected earnings is small. This study provides evidence for the existence of the key association analysed in this paper, the association between earnings management and comparability. Furthermore, in the correlation analysis conducted in his study, there is a significant correlation of -0.0552 between discretionary accruals and comparability. This is confirmed by the regression that is run subsequently, which provides a coefficient on comparability of -0.002 on the 1 per cent significance level. Sohn concludes that an increase in comparability of one standard deviation (0.7709) decreases discretionary accruals by 0.0015, which is a 2.2 per cent decrease. He furthermore studied the motives for increasing comparability and found that there are both beneficial and non-beneficial consequences of increasing comparability for the firm. When increasing comparability, the overall analysts' forecasts will be of higher accuracy and informativeness, which may be reflected in the stock prices. On the other hand, changing your accounting system into a more comparable one can be associated with high costs for the firm, which management might want to prevent. These papers provide evidence supporting the statement that discretionary accruals decrease when comparability is increased. Several other studies have attempted and succeeded to reach the same objective.

Akhgar and Davoodi (2019) support the conclusion drawn by Sohn. They conduct a study in which they attempt to answer the question of what the relation is between accounting comparability and accruals-based earnings. By conducting several multiple regressions and generalized least squares, they conclude their work with the same notion as Sohn (2016): when comparability is increased, accruals-based earnings management decreases.

Following Sohn (2016) in adopting the model by De Franco et al. (2011) as a proxy for comparability, Thanh Liem (2021) investigates the relation between comparability and accruals-based earnings management. For the discretionary accruals, the author adopts two proxies: the first one being the original Jones model to estimate discretionary accruals, and the second one an adaption of this model by Kothari et al. (2005). For both models, a coefficient of -0.002 on the comparability measures on the one per cent significance results from the regressions run. This is the same result Sohn (2016) concluded his work with. These comparability measures are calculated according to De Franco et al. (2011) and Kothari et al. (2005).

Lastly, Martens et al. (2020) examine this same association between accruals-based earnings management and comparability. The difference in their work is however that it is focused on frontier markets. Starting with the model by De Franco et al. (2011), the authors of this study adapt that model by including more country- and industry-specific elements. Nevertheless, the basis remains unchanged: regressing economic outcomes on earnings. Subsequently, multiple regressions are run to support the notion that comparability has a direct effect on discretionary accruals. For the pooled OLS run in this study, the coefficient -0.002 on the comparability measure of De Franco et al. (2011) returns on the highest significance level. For both the fixed and between effects regressions run, the same coefficient returns, however, on the 5 per cent significance level. Hence, the estimates are similar to the ones in the works of Sohn (2016) and Liem (2021).

What can be concluded from these prior studies is that there is enough evidence to support the association between comparability and accruals-based earnings management. The larger part of the studies conducted on this relation returns the coefficient of 0.002 on a significant level, which is the evidence needed to adopt discretionary accruals as an indicator of the change in comparability when investigating the effect of the directive. When studying prior literature to develop a theoretic basis for this research, no literature providing results pointing in the opposite direction was discovered.

2.5 The Jones Model (1991)

Many scholars and other researchers have attempted to research earnings management. Nevertheless, the concept of earnings management requires a solid measure, and a debate has been going on for years on what this measure should be. According to Dechow (2011), there are a few measures that have proven to be appropriate in the context, and the Jones Model (or the modified version) currently is the most used model. The next section provides an explanation of this model, reviews the critiques the model has received and attempts to provide arguments in favour of the utilization of the model in this paper. Analyzing this model is the basis for creating an empirical model used to study the association between comparability and earnings management.

The Jones Model is created by Jennifer J. Jones and was published in 1991 by the Journal of Accounting Research. In an attempt to define and measure earnings management, Jones has decided to use discretionary accruals as an appropriate proxy for earnings management. As opposed to using the discretionary portion of a single accrual, her research uses the discretionary portion of total accruals; Jones assumes that the discretionary portion of the total accruals would better estimate the manager's manipulations. To get to the discretionary part of the total accruals, Jones starts by separating the total accruals into the non-discretionary and discretionary components. Jones attempts to relax the assumption of DeAngelo (1985) that difference in accruals is only caused by the change in discretionary accruals by creating the following model that accounts for changes in economic environments:

$$TA_{it} = \alpha_i \left[\frac{1}{A_{it-1}}\right] + \beta_{1i}[REV_{it}] + \beta_{2i}[PPE_{it}] + \epsilon_{it} \qquad (1)$$

All variables included in this equation are scaled by lagged assets. Assuming that the changes in total accruals could also be attributable to changes in non-discretionary accruals, Jones included gross property, plant and equipment in the model. This variable aims to control for changing conditions that lead to changes in non-discretionary accruals through depreciation and amortization expenses. The change in revenues is included to control for changes in the firm's economic environment since they reflect the operations of a company before earnings management. All the variables in this expectations model are divided by lagged assets (assets from the prior year) to decline the level of heteroscedasticity. Subsequent to completing this model, ordinary least squares is used to estimate the coefficients and defining the prediction error, which entails the discretionary portion of the total accruals.

2.6 The Modified Jones Model (1995)

As previously established by reviewing the literature on the Jones model, one of the major arguments against this model is that it excludes the exercise of discretion exercised by managers on revenues. According to Marquardt and Wiedman (2004), numerous firms manage their earnings through revenues. These firms in particular use discretion over revenues in order to increase their income prior to the issuance of new equity. To eliminate this problem in the Jones model, Dechow et al. (1995) changed the estimation of Jones (1991) slightly. They estimate the total accruals in the event year according to:

$$TA_{it} = \alpha_i \left[\frac{1}{A_{it-1}}\right] + \beta_{1i}[REV - REC]_t + \beta_{2i}[PPE_{it}] + \epsilon_{it} \qquad (2)$$

In this estimation, REC consists of the net receivables in year *t* minus the net receivables in year *t-1* scaled by the total assets in year *t-1*. All other variables in this formula are likewise scaled by the total assets in year *t-1*. The estimates that are used in this modified model are retracted from the original Jones model. The authors of this study assume that all the changes in credit sales are a result of earnings management and this is based on the fact that it is simpler to manage earnings in revenues concerning credit sales than it is to do so concerning cash sales. After estimating these coefficients, the error term is extracted and represents the discretionary

accruals within the corporation. The result of this modified model is that the estimate of earnings management will no longer be biased in samples in which management discretion has been exercised on revenues. As is the case with the original Jones Model, this model developed by Dechow et al. is used in constructing the empirical model used to analyse the association between comparability and earnings management.

2.7 Criticism on the (Modified) Jones Model

Different authors have written papers and conducted studies on the Jones model, and there are some commonly used arguments on why the Jones Model (1991) will not function properly. These arguments will now be reviewed to provide a solid basis for including (a variant) of this model to conduct the research in this paper. Jackson (2017) states that apart from the variables in the model, there are other influences that affect the coefficient. The most important factor, according to his paper, is the decisions made by peer firms. When these decisions influence the coefficients, the residual will also be influenced and hence will not be an accurate representation of the discretionary accruals. He concludes his study with three issues concerning the Jones model:

1. Discretionary accruals estimates will be affected by the decision that peer firms take.
2. There is no plausible relation between the number of discretionary accruals and the size of a firm's earnings.
3. There is no proven relation between ex-post cases of manipulation (known manipulation) and discretionary accruals.

Concerning the first point, the average earnings management of the industry will be reflected in the non-discretionary accruals, and the firm's unique earnings management will be under-estimated. However, whether this is a bad characteristic of the model is dependent on the model. When considering the second issue mentioned by Jackson, one finds numerous studies proving the opposite. According to Noor et al. (2015), there is a significant association between the size of a firm and earnings management. These authors conducted an experiment on firms in Pakistan and enough evidence was established to confirm their hypothesis. Nalarreason et al. (2019) analysed a similar association, however on Indonesian firms. As did Noor et al., these authors again discovered evidence supporting the positive relation between firm size and earnings management. After analysing these papers, the second issue of Jackson is discarded in the rest of this paper. Concerning the third point, numerous studies provide the opposite to be true. Jones et al. (2008) study the accuracy of discretionary accruals models in detecting fraudulent and restated earnings. They achieve this by comparing separate accrual models (e.g., the Jones Model, the Modified Jones Model and the Modified Jones Model with the inclusion of return on assets as a performance measure by Kothari et al., 2005). Findings indicate that the estimated errors of the previously mentioned accrual models have a strong and significant relation with the ex-post known cases of fraud and restatements. Ahmadi et al. (2013) conduct a similar study and investigate the relation between earnings restatements and discretionary accruals, using the same discretionary accruals models as used by Jones et al. (2008). The authors reach a similar conclusion and conclude that there is a significant relation between the magnitude of discretionary accruals used as a proxy for earnings management and the cases of earnings restatements.

Chen et al. (2018) research the implementation of residuals in new regressions. They state that using these residuals might lead to Type I and Type II errors, being false positives and false negatives respectively. Nonetheless, they provide two simple solutions: either simply estimate the model in one single regression instead of two separate regressions, or include the variables used in the regression that provides the residual into the second regression. This second solution provided by the authors of the study is selected to reduce the bias caused by Type I and Type II errors in this paper.

McNichols and Stubben (2018) agree with the previous authors in that discretionary accruals can be noisy proxies for earnings management which may lead to biased results or Type I and Type II errors. In their paper, the authors review a number of previously written articles on the use of discretionary accruals proxies in research. Stubben (2010) addresses another problem: when using aggregate discretionary accruals, it is hard to determine what specific components of earnings managers manage. According to him, when using specific accruals in your research you will get a clearer picture of where the earnings are managed, and a more specific solution can be provided. This, however, is not relevant for this study, since this paper is not aimed at detecting specific components of earnings management to eliminate them, but merely to answer the question of whether or not total earnings management is affected by the directive. McNichols and Stubben also provide a solution for improving the discretionary accruals proxy: it is crucial to specify how, when and where earnings management is expected and the location in the financial statements where this discretion could be found.

Looking at the previously discussed issues and literature on discretionary accruals models, one model remains that seems to incorporate most solutions and is regarded as the most appropriate model to make inferences about discretionary accruals and, hence, earnings management. This is the Modified Jones model by Dechow et al. (1995).

2.8 Using the DA model

As can be concluded from the prior section, there are several issues regarding the estimation of discretionary accruals. Nevertheless, when comparing different models for estimating earnings management and discretionary accruals, the Modified Jones Model is proven to be the most appropriate model for estimating earnings management through discretionary accruals (Dechow et al, 1995), which is vital to this study. Hence, by including receivables in the model and thus controlling for earnings management in revenues, the Modified Jones Model is most appropriate in starting to create a discretionary accruals model for this study.

Following the previously mentioned studies, this section is concluded with the following hypothesis:

H_1: The implementation of Directive 2013/34/EU will be followed by a decrease in discretionary accruals due to increased comparability of financial statements.

The underlying assumption of this hypothesis is the one made by Sohn (2016), who states that there is evidence to support the negative association between the comparability of financial statements and earnings management. Apart from increasing comparability, the directive does have numerous more aims. However, due to the size of this study, it is not feasible to study all these aims; they might be studied in future research.

2.9 Audit firm size, audit quality and comparability

To confirm the expectations in this study, some additional tests are conducted. The first one includes analysing the association between auditor size and quality to provide evidence regarding the decrease in earnings management followed by the implementation of the directive. To confirm the expectations regarding the directive leading to a decrease in accruals-based earnings management, it is vital to provide evidence of the significant change to better auditors after the implementation of the directive, followed by a decrease in earnings management due to that change.

DeAngelo (1981) contradicted the view of most regulators and smaller audit firms that audit firm size has no association with the quality delivered by those audit firms. By providing evidence that larger audit firms have a smaller incentive to behave opportunistically, DeAngelo establishes the positive relation between audit firm size and audit quality. Lennox (2003) agrees with this assertion, and in conducting his research focusing on the reputations of audit firms, he finds that the larger the audit firm, the more vital it is to retain a positive reputation. To retain this positive reputation, larger audit firms are more accurate in their work leading to a higher quality of the delivered audits.

A comparable study is conducted by Comprix and Huang (2015). They analysed audit firms and the discretionary accruals discovered in the financial statements of their clients. Their findings indicate that the larger the audit firm, the more able these firms are to constrain opportunistic behaviour by management. They conclude their research by providing evidence for the notion that the larger the audit firm is, the fewer discretionary accruals there are present on the financial statements of the clients. Lastly, Wang et al. (2016) compared both large (Big 4) and smaller audit firms and measured the comparability of financial statements based on IFRS. The authors discovered that when auditor quality is increased, the comparability of financial statements is improved.

Considering these studies and the evidence provided, the following hypotheses are established:

H_{2A}: There is a positive association between the size of an audit firm and the comparability of their clients' financial statements.
H_{2B}: The implementation of Directive 2013/34/EU is followed by a shift in the choice of audit firm towards larger audit firms.

These hypotheses, combined with H_1, should provide evidence in favour of the third hypothesis:

H₃: The implementation of Directive 2013/34/EU results in an increase in the comparability of financial statements in the European Union.

2.10 Inclusion of control variables

In the process of preparing the data, prior literature has been employed to create the necessary variables for conducting the analysis in this paper. In the following section, the theories behind these calculations will be explained.

Difference between changes in revenues and receivables [REV – REC]

The inclusion of the difference in change in revenues and receivables in year *t* was based upon the research of Chen et al. (2018). The authors of this study provided a solution to the problem of biased estimates caused by using two separate regressions instead of using one single regression. By including the variables used in the first regression into the second regression, these biases will be reduced. For this reason, the variables [REV- REC], *PPE* and *ROA* have been included in the fixed effects model as well as in the Modified Jones Model.

Return on assets (ROA_t)

This variable has been included based on the theories developed by multiple authors. Watts and Zimmerman (1990) state in their study that firms with higher performance tend to decrease their earnings through earnings management. In line with their theory, Kothari et al. (2005) show that when controlling for firm performance in estimating discretionary accruals, the reliability of the inferences that can be made regarding earnings management will be increased. Based on these theories, the control variable *ROA* has been included to control for firm performance.

Firm size (SIZE)

Based on numerous studies, among which the works of John and Adebayo (2013), Niresh and Velnampy (2014) and Dang et al. (2018), the size variable in this study is calculated as the logarithm of the total assets. Furthermore, two leading theories are used among academics when dealing with a size control variable in research. The first theory argues that there is a negative relation between the size of firms and earnings management. Supporters of this theory state that in general there is a more comprehensive system of internal controls in place in larger firms. The more comprehensive this system is, the lower the possibility for managers to manage their earnings (e.g., Beasley et al., 2000). Another motive for this theory is provided by Gore et al. (2007), who state that larger firms often have a better auditor in place, which again lowers the possibility of managing earnings without being caught. A final argument for this theory is that larger firms are subject to stricter requirements regarding disclosure, and hence, the possibility for earnings management is lowered (Lee and Choi, 2002)

The opposite theory states that there is indeed a positive relation between firm size and earnings management. Richardson et al. (2002) argue that it is more critical for larger firms to meet or beat the analysts' earnings forecasts which incentivises the managers to manage earnings to

increase them. Alternative motives are provided by Watts and Zimmerman (1978, 1986 and 1990), who argue that the increased power of management in large firms increases the possibility for earnings management and that larger firms, in general, have more incentives to avoid political attention and are more often willing to decrease earnings through managing them to avoid this.

Total debt (DEBT)

Rodríguez-Pérez and van Hemmen (2010) have delivered evidence in favour of the relation between the total amount of debt a company holds, and the level of discretionary accruals discovered in their financial statements. Their findings support the negative relation between these two constructs and the authors explain that an increase in debt, in general, leads to an increase in monitoring by lenders. This increase in monitoring is the most probable cause of the decrease in earnings management through discretionary accruals.

3. Methodology

3.1 Data collection

The data for this study has been collected from the COMPUSTAT database, retrieved from WRDS. This database consists of 74920 firm-year observations and includes both the data necessary for the Modified Jones Model and the fixed effects regression. The years 2010 up to 2020 are selected to capture a timespan around the implementation of the Directive that is sizeable enough to capture the economic conditions before and after the implementation in 2015. Twenty-seven countries have been included in this data sample. After removing the firm-years for which values of variables were missing, the database consists of 3,272 unique firm-years. These companies are audited by both Big4 and non-Big4 auditors. Concerning the countries, the United Kingdom has been included, even though they are no longer part of the EU since they did implement this Directive, being a former European Union member. Romania has been excluded from the dataset as a result of missing data for this country. From this dataset, all the necessary variables for the Modified Jones Model were extracted, and in addition the control variables for the second regression. When comparing this sample with other comparable studies, it can be concluded that this sample is large enough to provide satisfactory results: Dechow et al. (1995) use a sample of 1,000 unique firm years, Islam et al. (2011) use a sample of 1,562 unique firm-years and Wells (2002) conducts a study with a sample of 715 unique firm-years.

To conduct both the Modified Jones Model and the fixed effects regression, some additional variables have been created with the use of the COMPUSTAT database. These include:

DEBT	Sum of both short- and long-term liabilities
LEV	Dividing total debt by total equity
GROWTH	The percentage change in revenues from year t-1 to year t
SIZE	Taking the logarithm of total assets

| *LASSETS* | Lagged assets variable |
| *IMP* | Dummy variable which equals 0 in the years before implementation (prior to 2016) and 1 after implementation. |

After the creation of these variables, all firm-year observations with missing values were deleted from the database, and afterwards, the sample consisted of 2,294 firm-year observations. Subsequently, to make the process of conducting the Modified Jones Model easier, a separate database was created with only the variables necessary for this model. Additional variables had to be created to smooth the process:

REV	Change in revenues from year t-1 to year t
REC	Change in receivables from year t-1 to year t
$[REV - REC]$	Difference between REV and REC

Furthermore, the larger part of the variables necessary for the models, apart from the dummy variable *IMP*, was scaled by the lagged assets of the different firms. This approach is according to the original Jones Model (1991) and reduces heteroscedasticity. For the variables that are not included in the Jones model, the Breusch-Pagan test was conducted to establish heteroscedasticity. For *GROWTH,* the p-value was above 0.05 and thus the null hypothesis that the data was homoscedastic was rejected. After scaling this variable, the heteroscedasticity was eliminated. Apart from *SIZE*, the other variables were already scaled by the lagged assets due to their inclusion in the Jones Model. The variable *SIZE* did not prove to be heteroscedastic and was thus not scaled. An explanation of the Breusch-Pagan test can be found in Appendix C. The necessary variables for this model can be found in the Modified Jones Model section of this paper. After creating this database, all the newly created variables were added to the original database. The next tables provide the descriptive statistics of both the unlagged and lagged variables used.

Table 1. Descriptive Statistics

Statistic	N	Mean	St. Dev.	Min	Pctl (25)	Pctl (75)	Max
YEAR	2,294	2,015.35	2.85	2,011	2,013	2,018	2,020
REC	2,294	1,727.65	8,886.37	0.00	10.58	457.82	138,858.00
ASSETS	2,294	113,545.50	957,164.70	0.13	140.00	18,421.60	23,335,841.00
CASH	2,294	5,847.02	74,906.36	0.00	5.65	484.75	2,003,324.00
DEBT_ST	2,294	6,351.20	40,095.07	-0.001	6.06	588.35	755,283.00
DEBT_LT	2,294	11,595.40	69,196.22	0.003	13.19	1,332.32	1,722,175.00
DEPAMORT	2,294	338.88	3,856.02	-213.00	0.70	37.42	98,385.00
REV	2,294	8,684.01	77,429.85	-8,187.00	43.15	1,264.05	1,391,445.00
EQUITY	2,294	12,495.09	115,332.80	-2,482.94	44.85	2,202.14	2,537,112.00
LEV	2,294	1.43	28.47	-980.64	0.25	2.41	344.79
IMP	2,294	0.48	0.50	0	0	1	1
SIZE	2,294	7.45	3.12	-2.01	4.94	9.82	16.97
[REV – REC]	2,294	-0.05	0.58	-15.10	-0.05	0.02	4.70
TA	2,294	0.04	0.07	0.00	0.004	0.04	1.34
PPE	2,294	2720.30	30,132.09	0.00	3.70	276.00	618,614.00
ROA	2,294	0.32	0.55	-3.97	0.04	0.40	5.52
DEBT	2,294	394.85	652.64	0.03	30.49	778.71	21957.52
NDA	2,294	0.001	0.02	-0.30	0.00	0.00	0.49
DA	2,294	0.03	0.07	-0.47	0.004	0.04	1.29
GROWTH	2,294	2.72	24.35	-40.96	-11.36	17.50	43.52
CAPSTR	2,294	0.75	1.57	0.01	0.52	0.92	74.09
OPINION	2,294	1.77	1.22	1	1	3	4
AU	2,294	4.90	3.09	1	1	7	9
AU_SIZE	2,294	165,128	136,813.7	1,000	1,000	284,000	335,000

Table 2. Descriptive Statistics - Lagged Variables

Statistic	N	Mean	St. Dev.	Min	Pctl (25)	Pctl (75)	Max
REC	2,294	147.59	11,280.89	-378,060.00	-25.34	33.83	256,209.00
REV	2,294	-187.59	6,219.10	-241,924.00	-9.13	17.78	40,425.00
PPE	2,294	0.04	0.03	0.0000	0.01	0.09	0.09
GROWTH	2,294	0.04	7.59	-298.50	-0.002	0.02	90.79
CAPSTR	2,294	0.25	11.46	0.0000	0.0000	0.004	548.82
DEBT	2,294	0.20	0.53	0.0000	0.02	0.29	21.56
ROA	2,294	0.02	0.41	-0.73	0.0000	0.002	17.59
TA	2,294	0.003	0.07	0.00	0.0000	0.0002	2.85

To uncomplicate the process of the analysis, before running the regressions a new variable was created. This variable contains the difference between the lagged change in revenues and the lagged change in receivables. Since they are treated as one variable with a single estimate in the regressions, it is simpler to define that difference beforehand and implement it in the regression as one variable. The outcome will be as expected when this step is not taken.

3.2 Modified Jones Model

As explained in the previous sections, a proxy for earnings management needs to be estimated to conduct the analysis necessary for this research. Building upon the Modified Jones Model by Dechow et al. (1995) appears to be the most appropriate choice for this proxy: it is relatively simple to apply and interpret, and it has been well-used in academic studies (McNichols, 2000; Ebrahim, 2007; Abed et al., 2011). The first step of the analysis is to estimate the coefficients that are used. This is done with the following equation, by estimating the coefficients through ordinary least squares:

$$TA_{it} = \alpha_0 + \alpha_1 \left[\frac{1}{A_{it-1}} \right] + \alpha_2 [REV - REC]_t + \alpha_3 [PPE_t] + \epsilon_{it} \tag{3}$$

Again, all variables in this equation are scaled by the lagged assets. Some adaptions to the original Jones Model have been made in this analysis. First, the change in receivables, scaled by lagged assets, are included in this analysis to control for earnings management in revenues. Furthermore, the return on assets, scaled by lagged assets, is included to control for firm performance. Finally, a constant has been added to the model to eliminate any further bias. After including both variables in the regression, the error term entailing the discretionary accruals is extracted from this model and is added to the database as DA.

[REV – REC] = Difference between REV and REC
PPE   = The gross property, plant and equipment in year t scaled by lagged assets
A_{t-1} = The total amount of assets in year $t-1$
$\alpha_0, \alpha_1, \alpha_2, \alpha_3$ = Estimated parameters retrieved from equation 3
ϵ_{it} = The discretionary accruals (subsequently named DA)

Since total accruals are provided by the COMPUSTAT database, the calculation according to the Jones Model is not used in this study. Rather, these values are retrieved directly from the database and the discretionary accruals can be extracted using the error term. Accordingly, this new variable (DA_t) is implemented in the fixed effects regressions (equations 4 and 5) to determine if there is evidence supporting the association with the implementation of the 2013/34/EU Directive.

3.3 Firm Fixed Effects Regression on DA

This study is working with panel data, which entails data that measures different variables over time. An appropriate choice in analysing panel data is the fixed effects approach. When controlling for firm fixed effects, unobserved firm-level characteristics that might be followed

by changes in the dependent variable are combined into a constant fixed effect per individual firm. In doing this, the model controls for these unobserved firm-specific characteristics and biases are overcome. The first model, presented in equation 4, includes the FirmFE variable, being the constant for every firm to control for the unobservable effects. In introducing fixed effects in this model, the association between the implementation of the directive and the subsequent change in discretionary accruals is studied. In case of a negative significant relation, there is evidence in favour of the implementation leading to a decrease in discretionary accruals. This could entail that the directive did achieve its aim of increasing the comparability of the financial statements. Following the reasoning on including fixed effects in this model, firm fixed effects are implemented in equations 5 and 6 as well. This type of regression can take out the time mean from each variable and subsequently conduct the Ordinary Least Squares (OLS) regression. This procedure is known as a "within" transformation and it mitigates the unobserved component of the data. The unobserved component of the data can relate to changes in the economic environment such as changes in the labour market or growth of the economy as a whole. With this regression, the effect of the variables on the discretionary accruals is analysed, including firm fixed effects to control for changes in the individual firms that are time-invariant to provide evidence supporting the association between the implementation of the directive and accruals-based earnings management within firms.

Beforehand, it is essential to conduct some robustness tests to confirm that the fixed effects test is the most appropriate for the data used in this study. The first test is the F test, which should confirm that a fixed effects approach is more suitable than an individual OLS approach by confirming that there are significant fixed effects and not just individual effects. The p-value of this F test is $2.2e^{-16}$ and thus smaller than 0.05, which means that the null hypothesis indicating individual effects can be rejected and that the fixed effects approach is more suitable than an OLS regression. Subsequently, the Hausman test will be conducted to decide between a fixed effects approach or a random effects approach. The p-value for this test again is $2.2e^{-16}$ and the null hypothesis indicating that a random effects model is appropriate for the data can be rejected. In conclusion, the fixed effect approach is more suitable for this study. Both outcomes of these tests are displayed in the appendix in Table 11 and Table 12 of Appendix B. To conduct the first fixed effects regression, the following empirical model was created:

$$DA_t = \alpha_0 + \alpha_1 IMP_t + \alpha_2 GROWTH_t + \alpha_3 SIZE_t + \alpha_4 DEBT_t + \alpha_5 \left[\frac{1}{A_{it-1}}\right] +$$
$$\alpha_6 [REV - REC]_t + \alpha_7 PPE_t + FirmFE_t + \varepsilon_t \qquad (4)$$

The variables and their measurements included in this model are explained in section 3.7.

3.4 Firm Fixed Effects Regression on Auditor firms

The second hypothesis (**H₂ₐ**) aims to deliver evidence in favour of the positive association between audit firm size and the comparability of their clients' financial statements. The comparability in this model is again measured by the proxy discretionary accruals. In providing this evidence the first stage of providing evidence for the fourth hypothesis (**H₃**), on the association between the implementation of the directive and the subsequent change in

comparability, could be completed. To deliver evidence for the second hypothesis several tests are conducted. First, in order to establish an association between auditor size and discretionary accruals, a firm fixed effects model is run. Again, the Hausmann test and the F test for individual effects delivered evidence in favour of a firm fixed effects approach being the appropriate choice for this test (both returning a p-value of 0.000, as can be seen in the Appendix). Once this association has been established, another analysis on the variance of audit firm size before and after the implementation is conducted to see if the implementation of a directive has led to firms changing to a larger auditor and thus improving their audit quality and comparability. To conclude, if the evidence is established that provides a negative relation between auditor size and discretionary accruals, which acts as a proxy for financial statement comparability in this study, it can be tested if the implementation of the directive was indeed followed by a shift in preference towards larger auditors and hence, improved comparability.

To provide evidence regarding the association between auditor size and accruals-based earnings management, a firm fixed effects regression is conducted. As is the case with the previous regression (equation 4), the variables included in the Modified Jones Model have been included in this model to eliminate bias. Again, GROWTH and DEBT have been included for the same purposes as explained in section 3.5. The following model is created to conduct this analysis:

$$DA_t = \alpha_0 + \alpha_1 AU\_SIZE_t + \alpha_2 GROWTH_t + \alpha_3 DEBT_t + \alpha_4 \left[\frac{1}{A_{it-1}}\right] + \alpha_5 [REV - REC]_t + \alpha_6 PPE_t + FirmFE_t + \varepsilon_t \quad (5)$$

Explanations of the variables can be found in section 3.7.

3.5 Firm Fixed Effects regression on audit firm and implementation

To provide more evidence supporting the association between the implementation of the directive and the preference towards larger audit firms, another firm fixed effects model is created. After implementing several control variables, the reasons for which are presented in section 3.7, the following model is created:

$$AU\_SIZE_t = \alpha_0 + \alpha_1 IMP_t + \alpha_2 ROA_t + \alpha_3 OPINION_t + \alpha_4 SIZE_t + \alpha_5 LEV_t + FirmFE_t + \varepsilon_t \quad (6)$$

To ensure that a firm fixed effects regression is the appropriate choice, both the Hausman Test and the F test for individual effects have been conducted (resulting in a p-value of 0.000 for both tests, as presented in the appendix). This model is aimed at delivering evidence in favour of an association between the implementation of the directive and the choice of audit firm. It is expected that after the implementation, a shift of preference towards larger audit firms occurs. If an association is provided by the previous model (equation 5), there is an indication that the implementation of the directive has been followed by a shift toward larger audit firms increasing the comparability of the financial statements. Providing this link is the main purpose of this study.

3.6 Additional test

In strengthening the associations analysed in this paper, several additional tests are conducted. First, an F-test on the difference in variances of discretionary accruals for both Big 4 and non-Big 4 clients is conducted. This test is directed at providing evidence on the decrease in discretionary accruals for firms having a Big 4 auditor, in addition to equation 5. In this test, the dataset is split, based on audit firm (Big 4 or not), into two separate samples. Consequently, these variances in discretionary (AU) are compared. Expected is that the difference in variances between these two groups is greater than one, meaning that there is a wider variation in discretionary accruals for non-Big 4 clients compared to Big 4 clients. Based on prior literature, it is assumed that there is a wider dispersion of discretionary accruals in non-Big 4 firms (Comprix and Huang, 2015). This test assists in using discretionary accruals as a proxy for comparability to analyse the hypotheses of this study.

After running the model in equation 6, the link between the implementation of the directive and the shift towards larger audit firms is further analysed. It is hypothesized that after the implementation, due to factors such as increased difficulty of adhering to the new rules and guidelines, there is a shift in preference towards larger audit firms. To provide additional evidence on the association, a Person's Chi-Squared test of independence is conducted. This test aims to test the independence between two variables, in this case, the implementation (dummy) variable and the frequency of chosen audit firms in this dataset. For this test, the variable *AU* is used. This categorical variable provides the audit firm for every company as a number, for which the meaning of those numbers is explained in the next section. The test aims to provide evidence for a shift in audit firm preference after the implementation of the directive. If this lack of independence has been provided by the chi-squared test, it can be assumed that the implementation of the directive has caused a shift in preference toward larger audit firms.

3.7 Variables

The next section will provide a short overview and explanation of the variables included in the models used in this research. See tables 1 and 2 for an overview of the descriptive statistics.

3.7.1 Variables used in the Modified Jones Model

Total accruals (ACC_t) – Dependent variable

This is the sum of both income increasing and decreasing accruals for a firm in year *t*. These accruals can be extracted from the financial statements of the firms. For this study, the variable ACC is scaled to the lagged assets of firms.

Lagged assets (A_{t-1})

To conduct a study that provides an accurate description of the firm and its characteristics, the lagged assets are used in this estimation. The assets from the prior year provide a clearer picture since they might prevent auto-correlational effects.

Difference between changes in revenues and receivables [REV – REC]
This variable is calculated as the change in revenue from year *t-1* to year *t*, scaled by lagged assets, minus the change in receivables from year *t-1* to year *t*, similarly scaled by lagged assets.

Gross property, plant and equipment (PPE$_t$)
This variable is extracted from the COMPUTSTAT database and has been scaled by lagged assets. It has been included for the reason mention in the description of the previous variable and because PPE is directly related to depreciation and amortization which are income-decreasing accruals.

Return on assets (ROA$_t$)
The return on assets in this study is calculated by dividing revenues by the total assets. This variable is included to control for firm performance, and the expectation concerning this variable is that there is a positive association between performance and earnings management. As is the case with the other variables in the Jones Model, ROA has been scaled by lagged assets.

3.7.2 Variables used in the other analyses
Earnings management (discretionary accruals) – Dependent variable
As explained in the previous sections, discretionary accruals calculated by the Modified Jones Model will be utilized as a proxy for earnings management in this study. More explanation on the calculation of this variable is provided in the separate section on the model.

Implementation of Directive 2013/34/EU – Independent variable
The implementation of the directive will be transformed into a dummy variable with a value of 0 for the years prior to the implementation and the year of implementation and 1 for the years after implementation. Since significant changes will not be expected in the first few months after implementation and the combination of prior- and post-implementation in one financial year might lead to retorted financial numbers, the year of implementation will also have a value of 0 for this variable. As a rule of thumb, the implementation date set by the European Commission (20th July 2015) will be used as the cut-off, and thus all years prior to 2016 will have a value of 0 for this variable. Even though some countries incorporated the law slightly after the deadline, all countries had implemented the legislation on January 1st, 2016.

Growth opportunities (GROWTH) – Control variable
One of the major consequences of growth opportunities for firms is the attraction of capital. Investments are needed to continue growing and for these investments' funds are necessary. To decrease the cost of capital in acquiring these funds, managers tend to manage their earnings and thus present a more positive view of the firm. The growth opportunities in year *t* in this study are measured as the percentage change in revenue from year *t-1* to year *t* and are scaled by the firm's lagged assets to eliminate heteroscedasticity.

Firm size (SIZE) – Control variable
Firm size in this experiment is calculated with the use of assets. Due to the highly skewed sizes of firms, firm size is defined as the natural logarithm of assets.

Return on assets (ROA) – Control variable
See previous section.

Difference between revenues and receivables [REV – REC] – Control variable
See previous section.

Gross PPE (PPEG) – Control variable
See previous section.

Total debt (DEBT) – Control variable
The debt variable in this analysis is calculated by adding both the short- and long-term liabilities and scaling this sum by the firm's last year's assets.

Auditor size (AU_SIZE)
The size of the current auditor for the company. There are eight large auditors in this database and some smaller audit firms. This variable is a numerical variable of audit firm size, measured by the number of employees. For the smaller firms, an average of 1,000 employees has been selected.

Auditor firm (AU)
The current auditor for the company. There are eight large auditors in this database and some smaller audit firms (denoted as *other*). This variable is a numerical variable of audit firm size, based on the number of employees (for which the larger the number, the larger the audit firm):

9. Deloitte
8. EY
7. PWC
6. KPMG
5. BDO Seidman
4. Grant Thornton
3. Moore Stephens
2. Pannell Kerr Foster
1. Other (smaller) audit firms

4. Results

This study attempts to prove a significant relation between the implementation of Directive 2013/34/EU and the comparability of financial statements between firms. To provide evidence supporting this, earnings management has been selected as a proxy for comparability, based on the work of different academics (Sohn, 2016; Akhgar and Davoodi, 2019; Thanh Liem, 2021). Table 3 provides an overview of all the variables included in the models.

Table 3. Descriptive Statistics

Statistic	N	Mean	St. Dev.	Min	Pctl (25)	Pctl (75)	Max
YEAR	2,294	2,015.35	2.85	2,011	2,013	2,018	2,020
REC*	2,294	147.59	11,280.89	-378,060.00	-25.34	33.83	256,209.00
ASSETS	2,294	113,545.50	957,164.70	0.13	140.00	18,421.60	23,335,841.00
CASH	2,294	5,847.02	74,906.36	0.00	5.65	484.75	2,003,324.00
DEBT_ST	2,294	6,351.20	40,095.07	-0.001	6.06	588.35	755,283.00
DEBT_LT	2,294	11,595.40	69,196.22	0.003	13.19	1,332.32	1,722,175.00
DEPAMORT	2,294	338.88	3,856.02	-213.00	0.70	37.42	98,385.00
REV*	2,294	-187.59	6,219.10	-241,924.00	-9.13	17.78	40,425.00
EQUITY	2,294	12,495.09	115,332.80	-2,482.94	44.85	2,202.14	2,537,112.00
LEV	2,294	1.43	28.47	-980.64	0.25	2.41	344.79
IMP	2,294	0.48	0.50	0	0	1	1
SIZE	2,294	7.45	3.12	-2.01	4.94	9.82	16.97
[REV – REC]*	2,294	-0.05	0.58	-15.10	-0.05	0.02	4.70
TA*	2,294	0.003	0.07	0.00	0.0000	0.0002	2.85
PPE*	2,294	0.04	0.03	0.0000	0.01	0.09	0.09
ROA*	2,294	0.02	0.41	-0.73	0.0000	0.002	17.59
DEBT*	2,294	0.20	0.53	0.0000	0.02	0.29	21.56
NDA	2,294	0.001	0.02	-0.30	0.00	0.00	0.49
DA	2,294	0.03	0.07	-0.47	0.004	0.04	1.29
GROWTH*	2,294	0.04	7.59	-298.50	-0.002	0.02	90.79
CAPSTR	2,294	0.75	1.57	0.01	0.52	0.92	74.09
OPINION	2,294	1.77	1.22	1	1	3	4
AU_SIZE	2,294	165,128	136,813.7	1,000	1,000	284,000	335,000

The variables with the asterisk (*) are scaled by lagged assets.

4.1 Correlation analysis

The tables below report the correlation coefficients of the different variables used in the analyses; the unscaled variables are not included in these correlation matrices. The correlation coefficients in bold have a significance on the five-per cent level. Some interesting observations can be found in these tables. For instance, in table 4, the discretionary accruals variable (*DA*) has highly significant coefficients in relation to the other variables, with the exception of the implementation dummy variable (*IMP*). Furthermore, the variables *[REV – REC]* and *DEBT* turn out to be significantly correlated with most of the other variables, with the peculiarity of the non-significant correlation coefficient of *[REV – REC]* in relation to *SIZE*. The variables *GROWTH*, *CAPSTR* and *SIZE* are significantly correlated with approximately half of the other variables. The p-values determining significance can be found in Appendix B in table 9.

Table 4. Correlation Matrix

	DA	IMP	GROWTH	CAPSTR	SIZE	ROA	R-R*	PPE	DEBT	AU
DA	1	0.022	**0.131**	**0.169**	**-0.168**	**0.141**	**-0.171**	**0.274**	**0.164**	-0.024
IMP	0.022	1	0.023	-0.022	**0.047**	-0.023	0.022	-0.001	-0.036	0.027
GROWTH	**0.131**	0.023	1	**-0.055**	**-0.064**	-0.008	**-0.246**	**0.145**	-0.040	-0.002
CAPSTR	**0.169**	-0.022	**-0.055**	1	0.009	0.879	0.166	-0.022	**0.872**	-0.005
SIZE	**-0.168**	**0.047**	**-0.064**	0.009	1	**-0.119**	0.029	**-0.384**	**-0.287**	**0.404**
ROA	**0.141**	-0.023	-0.008	**0.879**	**-0.119**	1	**0.125**	0.057	**0.775**	-0.035
[REV – REC]	**-0.171**	0.022	**-0.246**	**0.166**	0.029	**0.125**	1	**-0.092**	**0.136**	0.010
PPE	**0.274**	-0.001	**0.145**	-0.022	**-0.384**	0.057	**-0.092**	1	**0.102**	**-0.078**
DEBT	**0.164**	-0.036	-0.040	**0.872**	**-0.287**	**0.775**	**0.136**	**0.102**	1	**-0.099**
AU	-0.024	0.027	-0.002	-0.005	**0.404**	-0.035	0.010	**-0.078**	**-0.099**	1

*Correlation values in **bold** are significant on the 5% level (See Table 9 in Appendix B)*
*[REV – REC] is abbreviated to R-R to fit in this table.

4.2 The Modified Jones Model

In attempting to capture earnings management within firms, a modified version of the Jones Model (1991) has been created. This model is built upon the changes Dechow et al. (1995) made to the original Jones Model. The Ordinary Least Square (OLS) regression presented in equation 3 was run and all coefficients turned out to be highly significant, as presented in table 13 in Appendix D.

After running this OLS, the estimated coefficients from this model were extracted and incorporated in the model to estimate the discretionary accruals to be used in the fixed effects regression.

4.3 Firm Fixed Effects Regression on DA

After conducting the two robustness tests described in the previous section to confirm that the fixed effects regression is the most appropriate test for this analysis, the actual regression was run. In this regression, the variables included in the Modified Jones Model were also implemented based on the work of Chen et al. (2018), who provided a solution to biased estimates when using residuals in a regression. The results from this regression show mostly significant results, except for the main independent variable implementation, as presented in table 5.

In implementing the selected variables into the fixed effects regression, the results were mainly as expected. As was predicted by the main takeaway from the correlation analysis, the variable *IMP* did not prove significant evidence in favour of an association to discretionary accruals. Since there was no correlation established in the previous section (section 4.1), this result did not come unexpectedly. Concluding, this regression provides no significant evidence that the implementation of the Directive 2013/34/EU was followed by a decrease in accruals-based earnings management. Nonetheless, some conclusions can be drawn from the results of the

regression. Apart from the main independent variable *IMP*, all other variables have turned out to have a highly significant relation with the dependent variable *DA*. When interpreting the results, it can be stated that growth, size of the firm and the total amount of debt have a significant effect on the discretionary accruals within a firm, which might entail that faster-growing firms are under more scrutiny by audit firms or governments and accordingly indulge less in accruals-based earnings management. The other variables included are mere statistical properties included based on the paper by Chen et al. (2018). The negative coefficient of *DEBT* (-0.041) supports the works of Jensen (1986), Williamson (1988) and Rodríguez-Pérez and van Hemmen (2010), who all conducted studies showing that an increase in debt is most likely followed by a decrease in (accruals-based) earnings management. This can be explained by the increased scrutiny exercised by debtholders which increases the difficulty of committing accruals-based earnings management. Concerning firm size, it can be concluded that there is a negative association with discretionary accruals. This is in line with Beasley et al. (2000) and Gore et al. (2007). From this analysis, it cannot yet be concluded if that might be the case due to a more comprehensive system of internal controls or perhaps due to better and stricter auditors when increasing firm size. In conclusion, concerning most of the research reviewed for this study, most coefficients and associations discovered by the fixed effect regression have proven significant. Nevertheless, this analysis was not able to answer its main research question and deliver evidence that is consistent with the association between the implementation of the directive and discretionary accruals used to manage earnings by firms. In regard to the other control variables included in this model, GROWTH produces a slightly negative coefficient, significant on the highest level,

Table 5. Firm Fixed Effects Regression on DA

	Dependent variable:	
	DA	
	(1)	(2)
IMP	-0.001	
	(0.002)	
AU_SIZE		-0.001**
		(0.0002)
GROWTH	-0.002***	-0.001***
	(0.0003)	(0.0003)
SIZE	-0.018***	
	(0.003)	
DEBT	-0.046***	-0.037***
	(0.006)	(0.006)
$1/A_{t-1}$	-0.085***	-0.055***
	(0.012)	(0.012)
[REV – REC]	-0.022***	-0.022***
	(0.002)	(0.002)
PPE	0.832***	0.803***
	(0.087)	(0.087)
Firm Fixed effects	Yes	Yes
Observations	2,294	2,294
R^2	0.169	0.148
Adjusted R^2	-0.066	-0.092
F Statistic	52.062*** (df = 7; 1787)	51.856*** (df = 6; 1788)

Presented are the coefficients and their significance levels.
The values in brackets are the standard errors of the coefficients.
$^*p < 0.10$ $^{**}p < 0.05$ $^{***}p < 0.01$

4.4 Combining H$_{2A}$, H$_{2B}$ and H$_3$

In the previous section, the firm fixed effects model run on discretionary accruals and the implementation of the directive does not provide a significant result on the implementation variable. This entails that **H$_1$** on the association between the implementation of the directive and discretionary accruals cannot be accepted and this analysis is unable to provide enough evidence to confirm that the implementation of Directive 2013/34/EU is followed by a decrease in discretionary accruals directly. Nonetheless, both **H$_{2A}$,** on the association between audit firm size and comparability, and **H$_{2B}$,** on the association between the implementation and the shift towards larger audit firms, combined with **H$_3$** on the link between the implementation and comparability of financial statements provide evidence to confirm an indirect link between the

implementation and the increase in the comparability of financial statements. Explanations on the acceptance of these hypotheses are presented next.

An analysis of the discretionary accruals of companies and their preference regarding audit firm size has been conducted to confirm the association between audit firm size and discretionary accruals. The model used for this analysis is firm fixed effects (equation 5), for which the results are presented in table 5. A negative relation on the 5 per cent level has been established, and this presents evidence of the notion that opting for a larger auditor decreases the discretionary accruals and, hence, accruals-based earnings management. When the IMP variable is increased from 0 to 1 (from before to after implementation), the value of audit firm employees increases. This entails that after implementation the number of employees of audit firms used is higher than before. Since every audit firm in this sample has a fixed number of employees which does not change significantly over time, it delivers evidence in favour of larger audit firms being chosen after the implementation. This is in line with the expectation that selecting a larger audit firm increases the quality of the audit and reducing incentives by management to engage in opportunistic behaviour concerning discretionary accruals, based on the studies by DeAngelo (1981), Lennox (2003) and Comprix and Huang (2015). This association contributes to the evidence in favour of the implementation of the directive being followed by an increase in the comparability of financial statements. The coefficients on GROWTH and DEBT are explained in section 4.3.

With the (slightly) significant coefficients provided by this analysis, the link between the audit firm size and discretionary accruals can be accepted on the 5 per cent significance level. The next step is to confirm the association between the implementation being followed by an increase in audit firm size, which is a proxy for comparability. These tests together provide indirect evidence to the negative association between the implementation and comparability of financial statements.

After establishing a significant association on the five per cent level between discretionary accruals and auditor choice, it is confirmed that choosing a larger audit firm decreases discretionary accruals due to reasons explained in section 2.9. In using discretionary accruals as a proxy for comparability, it can be argued that selecting a larger audit firm increases the comparability of clients' financial statements. The next step was to confirm that the implementation of the directive has led to a shift in choice of audit firm towards larger audit firms, and hence be followed by an increase in financial statement comparability. First, a Pearson's Chi-Squared test on audit firm size and the implementation of the directive is conducted. The result of this test is presented in table 6, and from this table, it can be concluded that the implementation and the shift in preference towards larger audit firms are not independent of each other. For this analysis the AU variable is used, which is a categorical variable defined as the audit firm used by the companies (see section 3.7). This test is regarded as additional evidence in favour of the shift in preference as a consequence of the implementation of the directive.

Table 6. Pearson's Chi-squared Test

data: IMP and AU

χ-squared = 15.287, df = 8, p-value is 0.052

alternative hypothesis: there is an association between the two variables.

To strengthen the association between audit firms and comparability, an F-test to compare variances was conducted on the discretionary accruals for both Big 4 and non-big 4 clients. As can be seen from the table above, the true ratio of variances is greater than 1. Since this comparing of variances is dividing the variance of DA for non-Big 4 clients by the variance of DA for Big 4 clients, a ratio greater than 1 means that the dispersion of variance in discretionary accruals is smaller for Big 4 clients relative to non-Big 4 clients. This could entail that Big 4 clients exercise higher scrutiny on the audit and hereby reduce the dispersion of variance of DA. The results of this test are additional evidence in favour of the association between audit firm size and comparability of financial statements, which is used to accept **H$_{2A}$**.

Table 7. F Test to compare two variances

data: NonBIG4$DA and BIG4$DA

F = 2.2604, num df = 999, denom df = 999, p-value < 2.2e-16

alternative hypothesis: true ratio of variances is greater than 1

Subsequently, to strengthen the association between audit firm choice and the implementation, the model in equation 6 is run. As can be derived from the results in table 8, there is a significant positive association between audit choice and the implementation. From these results, inferences can be made regarding the shift toward larger audit firms following the implementation. This can be explained by several reasons. First of all, it is a difficult and costly task to implement new legislation into the operations of a company, large audit firms are more used to this and have a more effective way to implement these new rules. Furthermore, larger audit firms exercise more scrutiny in their work as they have a reputation to maintain (Lennox, 2003). As explained in the study by Wang et al. (2016), larger audit firms provide increased comparability of financial statements compared to smaller audit firms. In line with this argument, it can be stated that, regarding audit firm choice, comparability has increased after the implementation of Directive 2013/34/EU. Better performing firms often prefer a larger audit firm to ensure that operations are run as smooth as conceivable, which possibly explains the positive coefficient on the ROA variable. As for SIZE, from the positive coefficient could be deduced that larger firms prefer larger audit firms. The results of this analysis provide enough evidence to conclude that the implementation of the directive does have a direct positive effect on the choice for larger audit firms and, hence, that **H$_{2B}$** on the association between audit firm size and the implementation can be accepted. The acceptance of this hypothesis contributes to the overall aim of this study to provide evidence in favour of the increase in comparability of financial statements as a consequence of the implementation of Directive 2013/34/EU.

Table 8. Firm FE Regression on AU

	Dependent variable:
	AU_SIZE
IMP	8,041.83**
	(3,537.95)
ROA	54,604.67***
	(12,198.02)
SIZE	9,943.10***
	(3,608.82)
OPINION	-26,899.67***
	(2,197.30)
Firm Fixed effects	Yes
Observations	2,294
R^2	0.09
Adjusted R^2	-0.16
F Statistic	45.16*** (df = 4; 1790)

Presented are the coefficients and their significance levels.
The values in brackets are the standard errors of the coefficients.
*p < 0.10 **p < 0.05 ***p < 0.01

In conclusion, **H2A**, **H2B** and **H3** can be accepted, and an indirect link between the implementation of the directive and an increase of comparability, measured as the level of discretionary accruals within firms, is established. Despite the lack of evidence to confirm the first hypothesis, through these alternative steps enough evidence is delivered to be able to state that the implementation of the directive is indeed followed by an increase in comparability. However, future research may provide more consistent evidence on the fourth hypothesis, perhaps by using another proxy for comparability.

4.5 Power of tests

In analysing the results of these tests, it is vital to discuss the power of the models. Only in case of sufficient power inferences can be made regarding the results. There are multiple ways to analyse the power of the models. First, Hox (2010), concludes his research that in the case of a sample of 50 companies with at least 5 observations for each company, the power of a fixed effects model is sufficient. The sample used in this study meets this threshold and, hence, based on this author, it can be concluded that the power of the models in this analysis is sufficient. An alternative to analyse power is to calculate it statistically, with the help of degrees of freedom, the f^2 statistic (computed with R^2) and the significance level. When statistically computing the power of the firm fixed effects model in this study, the value of power for each model included is above 90 per cent. Concluding on the power of models 4, 5 and 6, it can be stated that each model had sufficient power to make inferences on the results and that the results of the models are not due to a lack of power.

5. Conclusion

In the previous decades, numerous attempts have been made trying to increase comparability in the field of accounting. Not merely the users of financial statements might benefit from a higher level of comparability; the managers who compose these statements will benefit as well when financial statements will be constructed in the same way across different firms and industries. One of those attempts to increase comparability is the implementation of European Directive 2013/34/EU, implemented in 2015. The main aim of this directive is indeed increasing comparability, and this study attempts to measure the change in comparability caused by the directive. Nonetheless, comparability is one of the constructs in the academic literature that is relatively difficult to measure, and academics have not yet decided on a suitable approach to do so. Several academics (Sohn, 2016; Akhgar and Davoodi, 2019; Thanh Liem, 2021) have proven that there is a significant negative association between the comparability of financial statements and accruals-based earnings management. For that reason, this study utilizes accruals-based earnings management as a proxy for comparability. Therefore, the main question this study addresses is: did the implementation of Directive 2013/34/EU affect the comparability of financial statements? To answer this question, both accrual-based earnings management and audit firm choice have been used as a proxy for comparability.

For this study, data has been selected from the years 2010 up to 2020 in order to capture the full before and after situation of these firms. All the data necessary was found in the COMPUSTAT database, and the variables included in this database have been employed to create additional control variables.

In estimating the discretionary part of the total accruals, a modified version of the Jones Model has been adopted. The original model provides the estimates necessary for extracting the error term, which is the representation of discretionary accruals within firms. Subsequently, this discretionary part of the accruals has been implemented as the dependent variable in a firm fixed effect regression to possibly detect an association between earnings management and the implementation of the directive. To prevent biased estimates caused by using a two-regression approach, the variables incorporated in the initial regression have been implemented in the second regression as well, based on the theory of Chen et al. (2018).

Nevertheless, a significant association between the level of discretionary accruals and the implementation of Directive 2013/34/EU has not been established. This could have several underlying causes. One reason might be the possibility that the association found in the work of the before mentioned academics between comparability and earnings management does not hold in this situation. This might entail that overall comparability has increased in the EU; however, this then might not be discovered when studying accruals-based earnings management as a proxy. Another possible cause is the possibility that earnings management is largely dependent on the government structure and the level of monitoring within specific countries or industries, leading to a possible change in earnings management caused by the implementation in some countries, and not in others.

Aside from the independent variable, all the additional variables in this analysis have proven to be significant in association with the dependent variable. This entails that the theories for including these variables explained in the second part of this paper have proven to be correct, once again. The control variables in this regression do not merely have a significant association with the dependent variable; apart from the return on assets, all variables have an association that has been proven significant on the highest level. The return on assets has not returned a significant coefficient.

From evaluating the three firm-fixed effects models and the additional tests conducted in this study, different conclusions can be drawn. The first fixed effects model (equation 4) did not provide any significant evidence in favour of our first hypothesis (a decrease in discretionary accruals followed by the implementation of the directive). Based on these results it cannot be concluded that there has been no change in comparability after the directive, merely that discretionary accruals might not be the most effective choice as a proxy for comparability. Nonetheless, the second fixed effects model on discretionary accruals and auditor choice (equation 5) provided evidence to make inferences about audit firm choice and discretionary accruals. On the five per cent significance level, it can be concluded that there is a negative association between audit firm size, measured by the number of employees, and discretionary accruals, meaning that when selecting a larger audit firm to audit financial statements, discretionary accruals slightly decrease. Choosing discretionary accruals as a proxy for comparability, this evidence can be used to accept the second hypothesis (an increase in the comparability of financial statements when selecting a larger audit firm). Subsequently, several additional tests are conducted to strengthen different associations in this study. Firstly, the F-test confirmed that there is a difference in the dispersion of variances of discretionary accruals for Big 4 clients compared to non-Big 4 clients. This result strengthens the association between larger audit firms delivering higher comparability of financial statements. The chi-squared test of independence furthermore deliver evidence in favour of the implementation having affected the shift towards larger audit firms. The model in equation 6 confirmed this association with a highly significant coefficient on the implementation variable on audit firm choice. The positive coefficient (0.229) combined with the previously mentioned tests provide evidence that after implementation, the choice for audit firms moved towards larger firms compared to before the implementation. Based on this evidence, **H2B** on the association between audit firm size and the implementation is accepted. In using both audit firm size and discretionary accruals as measures of comparability, additional tests have been conducted to confirm that there is an association between the two variables.

Even though there was not enough evidence delivered by the first regression (equation 4) in favour of the expected association, in combining the results of the second and third fixed effects regressions (equation 5 and 6) and the additional tests conducted, the third hypothesis can be accepted (with some caution). In providing evidence for the association between audit firm size and comparability of financial statements, measured by discretionary accruals, and the association between the implementation of the directive and the shifting trend towards larger audit firms, it can be stated that the implementation of Directive 2013/34/EU has been followed by an increase in the comparability of the financial statements. Nevertheless, both discretionary
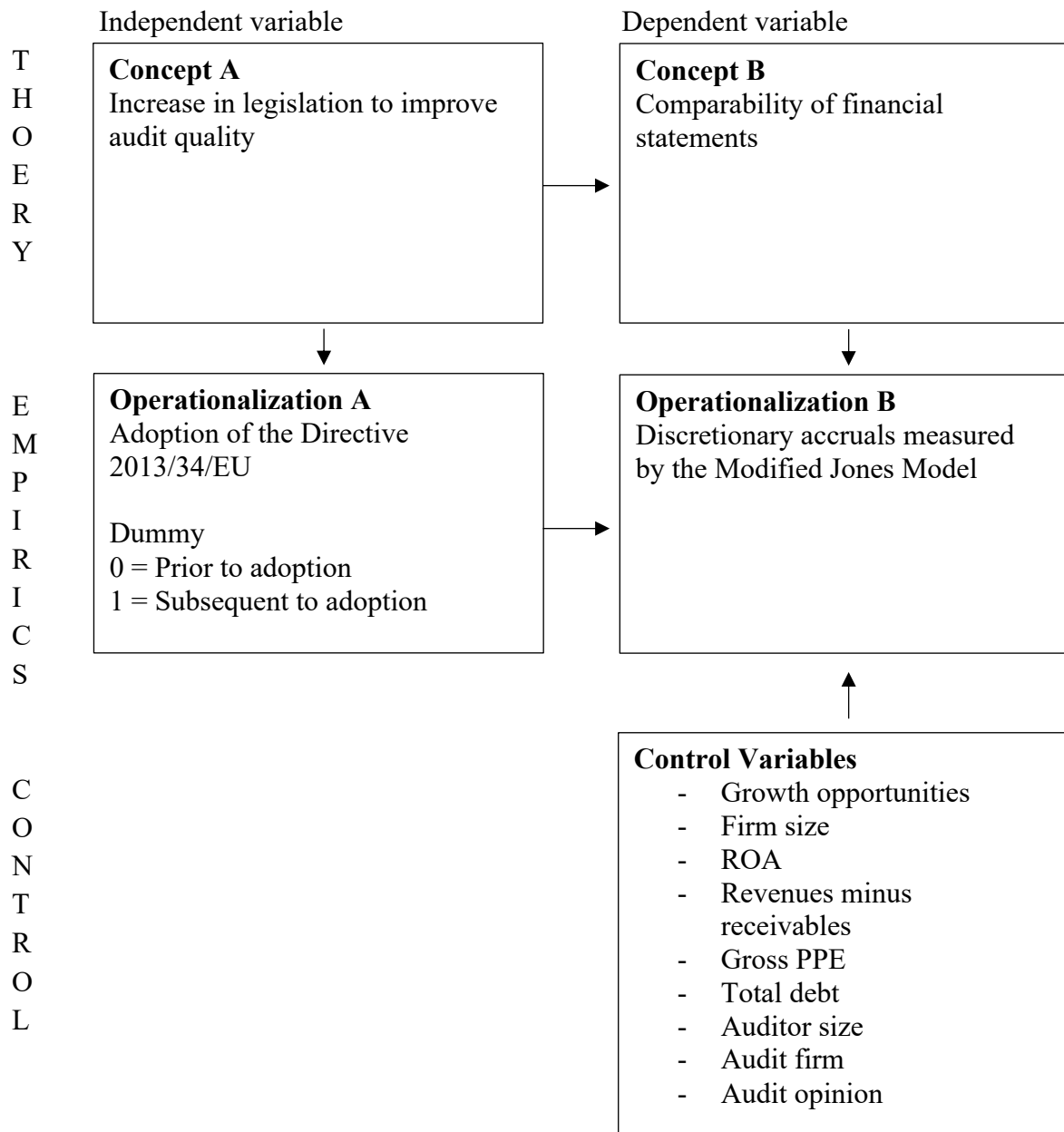
accruals and audit firm size do not have a one-on-one association with comparability and hence, the associations discovered in this study should be studied with caution.

6. Limitations

There are some limitations to this study. The first limitation is the directive being implemented on the European level. This is not an issue as such, however, there is significantly fewer data available on European firms compared to available data on American firms, making it more challenging to assess if the directive has had a significant effect on comparability and thus achieved its main aim. Second, the measurement of earnings management has been widely debated among academics, and no approach has yet been discovered that is completely free of bias. As illustrated in previous sections, all models designed to measure accruals-based earnings management are subject to bias and critiques. Third, a clear and precise measure of comparability has not yet been developed in the accounting literature, hence, the use of proxies is widely used in academic studies. An attempt to develop such a measure or discover a more precise proxy could be made in future studies. Finally, it cannot be stated that the directive missed its target in the situation that comparability has not increased. Comparability is one of the main points of focus for legislators in the EU, however, the directive is aimed at numerous objectives such as assisting in composing the financial statements for small and medium-sized enterprises. It is nonetheless a difficult task to measure all the changes one piece of legislation has caused. Future research might address these limitations and attempt to capture the consequences of the directive more completely.

7. Appendices

Appendix A: Libby Boxes

<table>
<tr><td></td><td>Independent variable</td><td>Dependent variable</td></tr>
<tr>
<td>T
H
O
E
R
Y</td>
<td>**Concept A**
Increase in legislation to improve audit quality</td>
<td>**Concept B**
Comparability of financial statements</td>
</tr>
<tr>
<td>E
M
P
I
R
I
C
S</td>
<td>**Operationalization A**
Adoption of the Directive 2013/34/EU

Dummy
0 = Prior to adoption
1 = Subsequent to adoption</td>
<td>**Operationalization B**
Discretionary accruals measured by the Modified Jones Model</td>
</tr>
<tr>
<td>C
O
N
T
R
O
L</td>
<td></td>
<td>**Control Variables**
- Growth opportunities
- Firm size
- ROA
- Revenues minus receivables
- Gross PPE
- Total debt
- Auditor size
- Audit firm
- Audit opinion</td>
</tr>
</table>

Appendix B: Tables

Table 9. P-values Correlation Matrix

	DA	IMP	GROWTH	CAPSTR	SIZE	ROA	R-R*	PPE	DEBT	AU
DA										
IMP	0.301									
GROWTH	0.000	0.276								
CAPSTR	0.000	0.299	0.001							
SIZE	0.000	0.026	0.002	0.658						
ROA	0.000	0.276	0.688	0.000	0.000					
(REV – REC)	0.000	0.283	0.000	0.000	0.160	0.000				
PPE	0.000	0.944	0.000	0.283	0.000	0.006	0.000			
DEBT	0.000	0.087	0.056	0.000	0.000	0.000	0.000	0.000		
AU_SIZE	0.242	0.195	0.941	0.797	0.000	0.097	0.625	0.002	0.000	

(REV – REC) is abbreviated to R-R to fit in this table.

Table 10. P-values Correlation Matrix

	BIG4	IMP	ROA	OPINION	SIZE	LEV
BIG4						
IMP	0.317					
ROA	0.084	0.276				
OPINION	0.000	0.127	0.961			
SIZE	0.000	0.029	0.000	0.003		
LEV	0.605	0.199	0.797	0.061	0.216	

Table 11. Hausman tests

Hausman Test – Regression 4

data: form
chisq = 352.65, df = 7, p-value < 2.2e-16
alternative hypothesis: one model is inconsistent

Hausman Test – Regression 5

data: form
chisq = 93.494, df = 6, p-value = 1.067e-05
alternative hypothesis: one model is inconsistent

data: form

chisq = 41.611, df = 4, p-value = 2.008e-08

alternative hypothesis: one model is inconsistent

Table 12. F Test for individual effects

F Test for individual effects – Regression 4

data: DA ~ IMP + GROWTH + SIZE + DEBT + 1/At-1 + (REV – REC) + ...

F = 5.6431, df1 = 497, df2 = 1787, p-value < 2.2e-16

alternative hypothesis: significant effects

F Test for individual effects – Regression 5

data: DA ~ AU_SIZE + GROWTH + DEBT + 1/At-1 + (REV – REC) + ...

F = 5.4378, df1 = 501, df2 = 1786, p-value < 2.2e-16

alternative hypothesis: significant effects

F Test for individual effects – Regression 6

data: AU_SIZE ~ IMP + ROA + SIZE + OPINION

F = 8.6085, df1 = 501, df2 = 1788, p-value < 2.2e-16

alternative hypothesis: significant effects

Appendix C: Breusch-Pagan test

In order to estimate the heteroskedasticity of a variable in relation to the dependent variable, the Breusch-Pagan test has been conducted. The test starts with calculating the Chi-Square test statistic X^2:

$$\chi^2 = nR^2$$

There are two hypotheses for this test:

H_0: There is homoscedasticity present
H_1: There is heteroscedasticity present

In case of a p-value, corresponding with this chi-square statistic, lower than the level of significance (0.05 in this study), the null hypothesis (H_0) can be rejected, and heteroscedasticity is assumed. A p-value lower than the level of significance leads to the conclusion that heteroscedasticity is absent. For *GROWTH*, the heteroscedasticity present disappeared after scaling the variable by lagged assets.

Appendix D: The Modified Jones Model

The results from the Modified Jones Model are presented in the next table:

Table 13. Modified Jones Model

	Dependent variable:
	TA
Constant	0.011^{***}
	(0.002)
$1/A_{t-1}$	0.060^{***}
	(0.007)
(REV - REC)	-0.025^{***}
	(0.002)
PPE	0.557^{***}
	(0.043)
Observations	2,294
R^2	0. 143
Adjusted R^2	0. 141
Residual Std. Error	0.067 (df = 2290)
F Statistic	124.826^{***} (df = 3; 2290)

Presented are the coefficients and their significance levels.
The values in brackets are the standard errors of the coefficients.
$^*p < 0.10$ $^{**}p < 0.05$ $^{***}p < 0.01$

After running this OLS, the estimated coefficients from this model were extracted and incorporated in the model to estimate the discretionary accruals, in order to be used in the fixed effects regression.

8. References

Abed, S., Al-Attar, A., & Suwaidan, M. (2011). Corporate Governance and Earnings Management: Jordanian Evidence. *International Business Research*, *5*(1). doi: 10.5539/ibr.v5n1p216

Alexander, D. (2015). Directive 2013/34/EU, Article 6 An Analysis and some Implications. A Research Note. *FINANCIAL REPORTING*, (1), 5-22. https://doi.org/10.3280/fr2015-001001

Ali Ahmadi, S., Soroushyar, A., & Naseri, H. (2013). A study on the effect of earnings management on restatement and the changes on information content of earnings following restatements: Evidence from Tehran Stock Exchange. *Management Science Letters*, 2867-2876. doi: 10.5267/j.msl.2013.11.011

Ali, U., Noor, M., Khurshid, M., & Mahmood, A. (2015). Impact of Firm Size on Earnings Management: A Study of Textile Sector of Pakistan. *SSRN Electronic Journal*, *7*(29). doi: 10.2139/ssrn.2698317

Barber, B., & Lyon, J. (1996). Detecting abnormal operating performance: The empirical power and specification of test statistics. *Journal Of Financial Economics*, *41*(3), 359-399. doi: 10.1016/0304-405x(96)84701-5

Bekiris, F., & Doukakis, L. (2011). Corporate Governance and Accruals Earnings Management. *Managerial And Decision Economics*, *32*(7), 439-456. doi: 10.1002/mde.1541

Beneish, M. (2001). Earnings management: a perspective. *Managerial Finance*, *27*(12), 3-17. doi: 10.1108/03074350110767411

Bergstresser, D., & Philippon, T. (2006). CEO incentives and earnings management. *Journal Of Financial Economics*, *80*(3), 511-529. doi: 10.1016/j.jfineco.2004.10.011

Chen, W., Hribar, P., & Melessa, S. (2018). Incorrect Inferences When Using Residuals as Dependent Variables. *Journal Of Accounting Research*, *56*(3), 751-796. doi: 10.1111/1475-679x.12195

Cole, V., Branson, J., & Breesch, D. (2009). How to measure the comparability of financial statements?. *International Journal Of Managerial And Financial Accounting*, *1*(4), 379. doi: 10.1504/ijmfa.2009.025363

Comprix, J., & Huang, H. (2015). Does auditor size matter? Evidence from small audit firms. *Advances In Accounting*, *31*(1), 11-20. doi: 10.1016/j.adiac.2015.03.007

Dang, C., (Frank) Li, Z., & Yang, C. (2018). Measuring firm size in empirical corporate finance. *Journal Of Banking & Finance*, *86*, 159-176. doi: 10.1016/j.jbankfin.2017.09.006

Davoodi, S., & Akhgar, M. (2019). Relationship between Accounting Comparability and Accrual-based and Real Earnings Management. *Journal Of Accounting Knowledge*, *10*(1), 91-113. doi: https://dx.doi.org/10.22103/jak.2019.11398.2570

De France, G., Kothari, S., & Verdi, R. (2011). The Benefits of Financial Statement Comparability. *Journal Of Accounting Research*, *49*(4), 895-931. doi: 10.1111/j.1475-679x.2011.00415.x

DeAngelo, L. (1981). Auditor size and audit quality. *Journal Of Accounting And Economics*, *3*(3), 183-199. doi: 10.1016/0165-4101(81)90002-1

DeAngelo, L. (1988). Discussion of Evidence of Earnings Management from the Provision for Bad Debts. *Journal Of Accounting Research*, *26*, 32. doi: 10.2307/2491177

Dechow, P. (1994). Accounting earnings and cash flows as measures of firm performance. *Journal Of Accounting And Economics*, *18*(1), 3-42. doi: 10.1016/0165-4101(94)90016-7

Dechow, P., Hutton, A., Kim, J., & Sloan, R. (2012). Detecting Earnings Management: A New Approach. *Journal Of Accounting Research*, *50*(2), 275-334. doi: 10.1111/j.1475-679x.2012.00449.x

Dechow, P., Kothari, S., & L. Watts, R. (1998). The relation between earnings and cash flows. *Journal Of Accounting And Economics*, *25*(2), 133-168. doi: 10.1016/s0165-4101(98)00020-2

Dechow, P., Sloan, R., & Sweeney, A. (1995). Detecting Earnings Management. *The Accounting Review*, *70*(2), 193-225.

Ebrahim, A. (2007). Earnings management and board activity: an additional evidence. *Review Of Accounting And Finance*, *6*(1), 42-58. doi: 10.1108/14757700710725458

El Diri, M. (2018). *Introduction to Earnings Management* (pp. 5-8). Cham: Springer International Publishing.

EUR-Lex — Access to European Union law. Eur-lex.europa.eu. (2021). Retrieved 27 March 2021, from https://eur-lex.europa.eu/.

Fang Li, S., McDowell, E., & Moore, E. (2009). Accrual Based Earnings Management, Real Transactions Manipulation and Expectations Management: U.S. and International Evidence.

Francis, J., Pinnuck, M., & Watanabe, O. (2013). Auditor Style and Financial Statement Comparability. *The Accounting Review*, *89*(2), 605-633. doi: 10.2308/accr-50642

Gláserová, J., Otavová, M., Bušovová, A., & Dřínovská, E. (2017). Impact of Transposition of the Directive 2013/34/EU into the National Laws of EU Member States Emphatically V4. *Acta Universitatis Agriculturae Et Silviculturae Mendelianae Brunensis*, *65*(2), 631-639. https://doi.org/10.11118/actaun201765020631

Gösser, N., & Moshgbar, N. (2020). Smoothing time fixed effects. *Econstor*.

Islam, M., Ali, R., & Ahmad, Z. (2011). Is Modified Jones Model Effective in Detecting Earnings Management? Evidence from A Developing Economy. *International Journal Of Economics And Finance*, *3*(2). doi: 10.5539/ijef.v3n2p116

Jackson, A. (2017). Discretionary Accruals: Earnings Management ... or Not?. *Abacus*, *54*(2), 136-153. doi: 10.1111/abac.12117

John, A., & Adebayo, O. (2013). Effect of firm size on profitability: Evidence from Nigerian manufacturing sector. *Prime Journal Of Business Administration And Management*, *3*(9), 1171-1175.

Jones, J. (1991). Earnings Management During Import Relief Investigations. *Journal Of Accounting Research*, *29*(2), 193. doi: 10.2307/2491047

Jones, K., Krishnan, G., & Melendrez, K. (2006). Do Models of Discretionary Accruals Detect Actual Cases of Fraudulent and Restated Earnings? An Empirical Evaluation. *SSRN Electronic Journal*. doi: 10.2139/ssrn.895541

Kasanen, E., Kinnunen, J., & Niskanen, J. (1996). Dividend-based earnings management: Empirical evidence from Finland. *Journal Of Accounting And Economics*, *22*(1-3), 283-312. doi: 10.1016/s0165-4101(96)00435-1

Kim, S., & Lim, S. (2016). Earnings comparability and informed trading. *Finance Research Letters*. doi: http://dx.doi.org/10.1016/j.frl.2016.09.013

Kothari, S., Leone, A., & Wasley, C. (2005). Performance matched discretionary accrual measures. *Journal Of Accounting And Economics*, *39*(1), 163-197. doi: 10.1016/j.jacceco.2004.11.002

Lennox, C. (1999). Audit Quality and Auditor Size: An Evaluation of Reputation and Deep Pockets Hypotheses. *Journal Of Business Finance <Html_Ent Glyph="@Amp;" Ascii="&Amp;"/> Accounting*, *26*(7&8), 779-805. doi: 10.1111/1468-5957.00275

Lepore, L., Paolone, F., Pisano, S., & Alvino, F. (2016). The harmonization of the European Accounting Models After the Implementation of Directive 2013/34/EU.

Marquardt, C., & Wiedman, C. (2004). How Are Earnings Managed? An Examination of Specific Accruals*. *Contemporary Accounting Research*, *21*(2), 461-491. doi: 10.1506/g4yr-43k8-lgg2-f0xk

Martens, W., Yapa, P., & Safari, M. (2020). The Impact of Financial Statement Comparability on Earnings Management: Evidence from Frontier Markets. *International Journal Of Financial Studies*, *8*(4), 73. doi: 10.3390/ijfs8040073

McNichols, M. (2000). Research design issues in earnings management studies. *Journal Of Accounting And Public Policy*, *19*(4-5), 313-345. doi: 10.1016/s0278-4254(00)00018-1

McNichols, M., & Stubben, S. (2018). Research Design Issues in Studies Using Discretionary Accruals. *Abacus*, *54*(2), 227-246. doi: 10.1111/abac.12128

Nalarreason, K., Mardiati, E., & Sutrisno, T. (2019). Impact of Leverage and Firm Size on Earnings Management in Indonesia. *International Journal Of Multicultural And Multireligious Understanding*, *6*(19). doi: http://dx.doi.org/10.18415/ijmmu.v6i1.473

Niresh, J., & Velnampy, T. (2021). Firm Size and Profitability: A Study of Listed Manufacturing Firms ed Manufacturing Firms in Sri Lanka. Retrieved 3 June 2021, from

Roberta Provasi, & Claudio Sottoriva. (2015). Preliminary Considerations About the Transposition of Directive 2013/34/EU Into Italian Accounting System. *Journal Of Modern Accounting And Auditing*, *11*(6). https://doi.org/10.17265/1548-6583/2015.06.002

Rodríguez-Pérez, G., & van Hemmen, S. (2010). Debt, diversification and earnings management. *Journal Of Accounting And Public Policy*, *29*(2), 138-159. doi: 10.1016/j.jaccpubpol.2009.10.005

Saleh, S. (2021). The Moderating Effect of Firm Characteristics on the Relationship between the Audit Style and Firm-pair Earnings Comparability. *Scientific Journal For Financial And Commercial Studies And Researches (SJFCSR)*, *2*(2), 413-462.

Siekelova, A., Androniceanu, A., Durana, P., & Michalikova, K. (2020). Earnings Management (EM), Initiatives and Company Size: An Empirical Study. *Acta Polytechnica Hungarica*, *17*(9), 41-56. doi: 10.12700/aph.17.9.2020.9.3

Simmons, J. (1967). A Concept of Comparability in Financial Reporting. *The Accounting Review*, *42*(4), 680-692.

Sohn, B. (2016). The effect of accounting comparability on the accrual-based and real earnings management. *Journal Of Accounting And Public Policy*, *35*(5), 513-539. https://doi.org/10.1016/j.jaccpubpol.2016.06.003

Stubben, S. (2010). Discretionary Revenues as a Measure of Earnings Management. *The Accounting Review*, *85*(2), 695-717. doi: 10.2308/accr.2010.85.2.695

Subramanyam, K. (1996). The pricing of discretionary accruals. *Journal Of Accounting And Economics*, *22*(1-3), 249-281. doi: 10.1016/s0165-4101(96)00434-x

Thanh Liem, N. (2021). Accounting comparability and accruals-based earnings management: Evidence on listed firms in an emerging market. *Cogent Business & Management*, *8*(1), 1923356. doi: 10.1080/23311975.2021.1923356

Wang, Z., Tan, J., Lin, Z., & Dong, C. (2016). Auditor Quality and IFRS Information Comparability. *Academy Of Accounting And Financial Studies Journal*, *20*(1), 114-129.

Wells, P. (2002). Earnings management surrounding CEO changes. *Accounting And Finance*, *42*(2), 169-193. doi: 10.1111/1467-629x.00073