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The Effect of Culture on Earnings

Management: A COVID-19 Case

Study

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Abstract

Purpose: This thesis investigates the effect the COVID-19 pandemic has on the relationship between Hofstede's cultural dimensions and the magnitude of accrual-based earnings management.

Design/methodology/approach: After the outbreak of the COVID-19 pandemic, numerous companies experienced a significant reduction in demand. Consequently, the performance of these companies were affected by this. This thesis investigates the effect of culture on earnings management during the COVID-19 pandemic for listed companies domiciled in the European Union. To this end, two ordinary least squares (OLS) regressions are run to analyze the effect of Hofstede's two cultural dimensions, uncertainty avoidance and individualism, on accrual-based earnings management during the pre-pandemic period (2018-2019) and the pandemic period (2020-2021).

Findings: This study finds that individualism and uncertainty avoidance are both positively associated with the magnitude of accrual-based earnings management. Moreover, the study concludes that the effect of cultural values during the pandemic is indifferent from the effect of the cultural values individualism and uncertainty avoidance prior to the pandemic.

Keywords: Earnings Management, COVID-19 crisis, pandemic, Hofstede's cultural dimension.

Table of Contents

Abstract.....	2
1 Introduction.....	3
2 Literature Review	6
2.1 Earnings Management.....	6
2.2 Earnings Management During Crisis.....	7
2.3 Earnings Management and Culture	9
2.3.1 Uncertainty avoidance (UAI).....	10
2.3.2 Individualism vs. collectivism (IDV).....	12
3 Research Design	14
3.1 Data and Sample Selection	14
3.2 Basis and Main Model	15
3.3 Estimating Accrual-based Earnings Management	17
3.4 Additional Model	21
4 Results	23
4.1 Descriptive Results.....	23
4.2 Correlation Matrix	26
4.3 Main results and Robustness Tests	26
4.3.1 Basis Model.....	27
4.3.2 Main Model	28
4.3.3 Additional Model	29
5 Discussion and conclusion	35
6 Bibliography.....	39

7	Appendix.....	46
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1 Introduction

With over five hundred million confirmed cases and over six million confirmed deaths world-wide, the COVID-19 pandemic is considered one of, if not the largest, crises of this century (World Health Organization, 2022). Undoubtedly, this has had a huge impact on health and social aspects, and it resulted in the employment of preventive measures to reduce the spread of the virus. Apart from health and social challenges, the COVID-19 pandemic has a significant economic impact on the world, also known as the COVID-19 recession (The World Bank, 2020). During this period of time, governments introduced several measures that slowed down economic activity (Lassoued & Khanchel, 2021). Ultimately, these measures have led to national lockdowns and a halt in international trade. Many prosperous companies experienced a reduction in demand for the products that they offered, and consequently observed a significant reduction in their earnings (Šušak, 2020). In fact, almost every firm has been affected by the pandemic. However, the performance of the companies has varied significantly within countries, and even within industries (The World Bank, 2021). Nevertheless, the assumption can be made that drastic changes in the economic climate might cause companies to manipulate earnings (Filip and Raffournier, 2014). The aim of this research is to explore the influence of these changes in the economic environment by comparing the earnings management practices in listed companies within the European Union during the COVID-19 pandemic with the years prior to the pandemic.

Although the performance of the firm plays a significant role in earnings management (Mostafa & Mukdad, 2019), Desender, Castro and Escamilla de León (2011) concluded that cultural influences also have a significant impact on earnings management. These cultural influences are based on Hofstede's model of national culture which consists of six dimensions. These six dimensions are power distance index; individualism vs. collectivism; masculinity vs. femininity; uncertainty avoidance index; long term orientation vs. short term normative orientation and indulgence vs. restraint (Hofstede Insights, n.d.). More specifically, the results of Desender, Castro and Escamilla de León (2011) show that countries with a high score on individualism tend to have a lower score on earnings management since societies with a high score on individualism put more emphasis on respecting individual rights. In addition, Gray (1988) argues that there is a

negative association between uncertainty avoidance and earnings management as he concluded that strong uncertainty avoidance will encourage the use of accounting techniques. Hence, cultural dimensions influence the employment of accounting techniques such as earnings management. Therefore, it is essential to consider these dimensions when analyzing earnings management (Desender et al., 2011 & Gray, 1998).

National culture is a society construct that has a more permanent characteristic compared to other institutional factors. Therefore, it is expected that Hofstede's cultural dimensions remain constant over the years, but differ between countries (Viana Jr et al., 2021). More precisely, for each country, these dimensions remained fixed even during the pandemic. Nonetheless, the pandemic has had a substantial impact on companies and their earnings management practices (Lassoued & Khanchel, 2021). This study will investigate whether Hofstede's cultural dimensions remain significant in the employment of earnings management during the pandemic in EU-listed firms. Hence, the following research question will be posed:

How does the association between national culture and accrual-based earnings management differ for EU-listed companies during the pre-COVID-19 period and the COVID-19 pandemic?

In this research, the focus will be set at accrual-based earnings management due to the fact that real earnings management is less likely to be detected (Graham et al., 2005). This study focuses on companies that are domiciled in the European Union as Europe has been severely affected by the COVID-19 virus (The World Bank, 2021). The advantage of performing this research for Europe, a larger geographical area, instead of a single country is to neutralize country-specific influences (Filip and Raffournier, 2014). Moreover, there are several reasons why the EU can be considered to be an optimal setting for this research. For example, each member state of the European Union is obliged to adopt the EU regulations and incorporate the EU directives into local law (Gray et al., 2015). In contrast to the rest of the world, numerous aspects of the economic system and regulations governing business transactions are relatively homogeneous in the EU since the EU has a single commercial market (Gray et al., 2015). On the

other hand, each country in the EU appears to have maintained its specific culture and tradition during the harmonization process. Hence, the EU has managed to remain a culturally diversified economy, yet it can also be considered to be a politically, legally, and financially integrated economy (Gray et al., 2015).

The remainder of this paper is structured as follows. In Section 2, the existing literature will be reviewed, where three hypotheses are developed. In Section 3, the methodology of this research will be discussed, which covers the data and sample selection, the variables and method. In Section 4, the main results of the analyses and regressions will be discussed. In Section 5, the hypotheses will be answered, the limitations of the paper will be discussed and a conclusion will be drawn.

2 Literature Review

2.1 Earnings Management

Earnings management can be defined as the deliberate manipulation of earnings in order to enhance the appearance of a firm's financial position and to achieve specific targets. This is done by intentionally employing accounting techniques (El Diri, 2018 & Tuovila, 2022).

There are two types of earnings management activities, namely accrual-based earnings management and real earnings management (Dakhlallah et al., 2020). On the one hand, accrual-based earnings management attempts to conceal true economic performance by altering accounting methods, which will have an influence on the firm's cash flow. On the other hand, real earnings management concerns altering the business transactions or operating activities (Cohen & Zarowin, 2010). In both types of earnings management, managers are attempting to use earnings management in the current period to either increase or decrease their earnings. However, it is important to distinguish between accrual-based and real earnings management as the latter imposes real costs on a firm. This holds because real management activities have a lower probability of being investigated by regulators and auditors. Therefore, there is a high chance that real earnings management will not be detected. On the other hand, the consequences of these real earnings activities are expected to have a substantial economic effect on the firm in case the activities are disclosed (Cohen & Zarowin, 2010).

Based on previous literature, there are several reasons why managers have a tendency to manipulate their earnings such that their earnings reach their desired target numbers (Han et al., 2010). For example, companies might engage in earnings management because of market influences or agency relationships. Regarding the market influence, studies have provided evidence that firms might manage their earnings upward so that they do not have to report earnings declines and losses (Ayers et al., 2006, Burgstahler and Dichev, 1997, Degeorge et al., 1999 as cited in Filip, A., & Raffournier, B., 2014). Additionally, a study conducted by Teoh et al. (1998) has concluded that firms have the incentive to inflate their earnings to facilitate the success of security issues such as seasoned equity offerings and initial public offerings.

Furthermore, managers will use earnings management to increase a firm's compensation which is based on the earnings of the firm (Guidry et al., 1999 and Holthausen et al., 1995), and they have the incentive to lower their earnings in case they have failed to meet a debt repayment (Filip and Raffournier, 2014).

There are several factors that could influence a manager's decision to manipulate their earnings. In this paper, two different factors will be analyzed, namely the COVID-19 pandemic and Hofstede's model of national culture.

2.2 Earnings Management During Crisis

Financial crises will provoke significant changes in the economic environment. A decline in the GDP indicates the arrival of a recession and that the economy will be in a financial crisis. Consequently, the number of bankruptcies will increase substantially. In order to survive, companies will implement measures to cut their costs and reduce their losses (Filip and Raffournier, 2014). DeAngelo et al., (1994) concluded that companies with financial problems have large negative accruals in the years prior to their bankruptcy.

Due to the COVID-19 pandemic, most firms have experienced a fall in their profitability, which are caused by, for example, suspension of economic activities and lockdowns. Firms can therefore face different challenges in order to survive. There are several reasons to assume that the magnitude of earning management will be higher during the pandemic. Ahmad-Zaluki et al. (2011) have shown that the employment of income-increasing earnings management is mainly determined by periods of economic stress. For firms that are deeply affected by the financial crisis, Charitou et al. (2007) have shown that managers are expected to manipulate their earnings upward to avoid a large decrease of the stock price of the firm caused by the crisis, which will have a negative impact on their earnings-based compensation (Filip and Raffournier, 2014).

In case a firm is experiencing a substantial loss, managers can decide to manage the earnings upwards in order to avoid reporting an enormous loss compared to their competitors. On the other hand, some firms might have the incentive to manage their earnings downward, especially those that violated a debt covenant, or firms that failed to meet a debt repayment. For these firms, reporting losses might help them obtain concessions from lenders (Filip and Raffournier, 2014). Moreover, Navissi (1999) has previously provided evidence that managers will have an incentive to manipulate their earnings downward in order to benefit from governmental regulations. There is a high probability that governments will support firms that are in financial distress during crisis periods (Peltzman, 1976). Therefore, deflating the earnings will allow the firm to acquire financial aid from the government because this support is dependent on the financial performance of a firm. The probability of receiving this support increases as the firm's performance deteriorates (Filip and Raffournier, 2014).

There is limited literature about earnings management during the COVID-19 pandemic, but based on the literature about earnings management during other financial crises, there is evidence to support the assumption that the magnitude of accrual-based earnings management will increase during the COVID-19 pandemic since previous studies have provided evidence that the magnitude will increase during other financial crises. Consequently, it is expected that managers have an incentive to manage their earnings upward to mitigate their level of losses, so stakeholders will be assured that the firm is not severely affected by the pandemic (Lassoued and Khanchel, 2021). Hence, the hypothesis between earnings management and the pandemic will be formulated as follows:

H1: Listed firms domiciled within the European Union are more inclined to increase their magnitude of accrual-based earnings management during the COVID-19 pandemic

2.3 Earnings Management and Culture

Previously conducted research has shown that there are differences in the earnings management across countries. For example, Leuz et al. (2003) have concluded that firms in Asia have a high tendency in avoiding loss compared to Anglo-American firms. Moreover, the earnings in Continental European Union and Asia are smoother compared to the firms in Anglo-American countries. Existing literature has already investigated the influences of culture on earnings management.

Following Hofstede's (2011) framework, culture is defined as "the collective programming of the mind distinguishing the members of one group or category of people from others". It consists of the six cultural dimensions: uncertainty avoidance, individualism vs. collectivism, power distance index, masculinity vs. femininity, long-term orientation vs. short-term orientation and indulgence vs. restraint. Each of these dimensions are considered systematic differences in culture that are used to understand the culture differences across countries.

Gray et al. (2015) investigated the association between earnings management practices and national culture after the mandatory adoption of International Financial Reporting Standards. In their research, they have examined the behaviors of publicly listed firms in fourteen member countries of the European Union during the period 2000-2010. They focused on two dimensions of national culture, namely uncertainty avoidance and individualism. Gray et al. (2015) confirmed that there is a relationship between earnings management and the individualism and uncertainty avoidance dimensions of national culture in their research as well. More importantly, they concluded that national culture has a significant influence on the reporting decisions of managers post IFRS adoption period. This implies that firms that use a set of principles-based accounting standards to report their earnings are able to continue engaging in culture-driven earnings management. Earnings management varies across countries which can be explained by the national culture's uncertainty avoidance and individualism (Han et al., 2010). Moreover, Doupnik (2008) examined the influence of national culture on earnings management across different countries. In their research, they split earnings management into two categories, which are

earnings smoothing and earnings discretion. Earning smoothing is used to make the income stream less variable, whereas earnings discretion is used to avoid losses or reach targets. The results of this research indicate that out of the six cultural dimensions, uncertainty avoidance and individualism are related to earnings management, even when controlling for investor protection and other legal institutional factors. Douppnik (2008) concluded that the relation between these two dimensions with the aggregate measure of earnings management is the strongest. Moreover, Gray (1988) has argued that uncertainty avoidance and individualism are the only dimensions that can act as proxies for accounting values (Han et al., 2010). Equivalently, Hope (2003) suggested that uncertainty avoidance and individualism are the two dimensions that are most likely to have a straightforward implication for the accounting decisions of managers (Han et al., 2010). As a consequence, in this paper, the only two dimensions that will be considered are uncertainty avoidance and individualism since these two dimensions are shown to have a significant relationship with earnings management (Douppnik, 2008).

2.3.1 Uncertainty avoidance (UAI)

Uncertainty avoidance concerns the society's tolerance for uncertainty and ambiguity (Hofstede 2011). In other words, it refers to the extent to which members of a society feel threatened by unexpected situations. Strong uncertainty avoidance countries are usually inclined to rely on accounting uniformity. They require detailed rules and respect for conformity. As a result, these countries are less likely to manipulate their earnings compared to weak uncertainty avoidance countries. Indeed, Viana Jr et al., (2021) obtained similar results with regards to the influence of culture on earnings management. In fact, the study concluded that firms from countries with a higher level of uncertainty avoidance are less likely to engage in earnings management. Equivalently, Guan et al. (2005) and Han et al. (2010) argue that there exists a negative association between discretionary accruals and earnings management (Gray et al., 2015). However, Douppnik (2008) argues that higher levels of uncertainty avoidance result in more earnings management. Here, avoidance certainty is viewed as an attempt to control the future, which implies that countries that have a large incentive to avoid uncertainties are proactively taking action, while countries that are not uncertainty avoidant are unconcerned of the outcome.

Hence, strong uncertainty avoidance firms are more inclined to manage their earnings in order to avoid the uncertainty associated with potential negative events, especially during a pandemic, compared to weak uncertainty avoidance countries.

Moreover, according to Gray (1988), countries that have a high score on uncertainty avoidance are likely to have more accounting uniformity, more detailed rules and limited self-governance when preparing the financial report. In addition, managers are more likely to adopt a more conservative reporting approach when preparing the report, which results in lower magnitudes of earnings management. These uncertainty avoiding societies are inclined to provide fewer opportunities and incentives for earnings management due to the regulations and uniformity. European firms tend to have higher concentrations of ownership. This implies that the owners of the firm are expected to monitor the managers more closely, and consequently makes earnings management riskier than in a low ownership concentration environment (La Porta et al., 1998 & Gray et al., 2015). Thus, the following hypothesis will be introduced for the relationship between uncertainty avoidance and earnings management:

H2: There is a negative association between uncertainty avoidance and the magnitude of accrual-based earnings management for EU-listed companies.

According to Hofstede (2001), people who live in countries with a high level of uncertainty avoidance feel more anxious with ambiguity and therefore tend to take action as soon as possible to decrease it. Moreover, they prefer a more predictable environment. Uncertainty will be perceived as a signal of continuous threat that needs to be controlled at all times. In case of unavoidable uncertainty, firms tend to follow precautionary principles (Van Asselt and Vos, 2006). Chang and Noorbakhsh (2009), Chen et al. (2015) and Ramirez and Tadesse (2009) conclude that companies in high uncertainty avoidance culture tend to hold more cash in a static environment. Tran (2020) concluded that the effect of uncertainty avoidance on firm cash holdings is stronger in the post-crisis period (financial crisis), meaning that firms save more cash from operating cash flow in the post-crisis period.

According to Leland (1978) and Keynes (1937), people tend to increase their savings when income in the future is uncertain. They will take precautionary actions in order to compensate for uncertain conditions. Hence, countries with a high level of uncertainty avoidance tend to take precautionary motives (Van Asselt and Vos, 2006). Kanagaretnam et al. (2014) confirm that banks in high uncertainty avoidance countries tend to take less risk especially during crises. Overall, the expectation is that countries with a high level of uncertainty avoidance tend to take lower risks, and therefore will engage less in earnings management during crises.

H3: The association between uncertainty avoidance and the magnitude of accrual-based earnings management for EU-listed companies will become less negative during the COVID-19 pandemic.

2.3.2 Individualism vs. collectivism (IDV)

Individualism is defined as the extent to which people from a society feel independent. In high individualism societies, members are expected to make their own choices and decisions (Viana Jr et al., 2021). On the contrary, collectivism refers to the feeling of being interdependent. Han et al. (2010) have reported that there exists a positive relationship between earnings management and individualism in an international context. Countries that have a high score on individualism tend to have more flexibility with respect to self-governance (professionalism) and measurement (flexible or non-uniform) (Gray et al., 2015). They are more likely to report optimistic earnings compared to a conservative approach. As a result, environments with an individualistic culture tend to stimulate incentives to manage earnings more opportunistically (Gray et al., 2015). Hence, individualistic managers or accountants are more inclined to benefit themselves if the regulations permit them to do so (Gray, 1988 & Han et al., 2010). Consequently, the following hypothesis is presented for the relationship between individualism and earnings management:

H4: There is a positive association between individualism and the magnitude of accrual-based earnings management for EU-listed companies.

Kanagaretnam et al. (2014) and Ashraf et al. (2016) conclude that companies, in particular banks, in individualistic societies are not as risk averse as collectivistic societies, especially during crises. Accordingly, it can be expected that companies that operate in these individualistic environments tend to perform worse. Paired with their greedy individualistic behavior and the neglect of stakeholders' welfare, these incentives them to manage their earnings even more during crises.

H5: The association between individualism and the magnitude of accrual-based earnings management for EU-listed companies will become more positive during the COVID-19 pandemic.

Several contributions can be made with this study. At this moment, there is limited research conducted on the effect of the COVID-19 pandemic on earnings management in the European Union as the pandemic is still ongoing and limited data is available. A study conducted by Lassoued and Khanchel (2021) investigated the impact of COVID-19 on earnings management in European Firms. However, they did not take into account the importance of national culture in their analysis. Rather, they focused on the sole impact of COVID for earnings management. This study complements the existing study by taking into account the effects of two dimensions of national culture during crises. Other studies that did take into account the importance of national culture did not apply it to the COVID-19 crises. For instance, the study of Gray et al. (2015) revolved around the cultural influences post-IFRS. Hence, this study contributes also to the existing literature on the consequences of COVID-19 with respect to accounting practices. Furthermore, this study adds to the growing literature regarding earnings management in an international setting with the most recent data available. Lastly, this thesis presents recent empirical findings regarding earnings management pre-COVID-19 and during the COVID-19 pandemic. Noteworthy, this research is the only study so far which combines the three components national culture, earnings management and the COVID-19 pandemic.

3 Research Design

3.1 Data and Sample Selection

In this research, two types of data are considered to address the aforementioned hypotheses, namely financial and national culture data. The national culture data has been gathered from the official website of Geert Hofstede (Hofstede, 2015). The retrieved data consists of six variables and a total of 112 observations. Each variable represents one of the six cultural dimensions of Hofstede, while each observation is a country. In particular, the dimensions of individualism and uncertainty avoidance will be of interest in this study, as well as all the countries, which are part of the European Union. It should be noted that not all countries part of the European Union are present in this data set.

The financial data, used in this research, has been collected using the Refinitiv database. The data contains firm information for 26 European Union countries. More specifically, it consists of listed companies domiciled within the European Union. It should be noted that countries with a lack of financial or cultural data will be excluded from the dataset. For this study, only listed companies that are now active in the market are considered since this data is publicly accessible. Additionally, companies that have gone bankrupt before 2020 will be left out as well. Small-sized companies are also not considered as these companies are not obliged to publish their annual accounts. Consequently, it is difficult to find the financial data and ratios of these firms. This has been intentionally done to avoid biases within the sample selection.

It should be noted that the data gathered from Refinitiv consisted of two separate types. On the one hand, there was panel data. On the other hand, there was fixed information for companies. By using the International Securities Identification Number (ISIN) code, the data from the two distinct data formats have been combined. To combine the financial data with the cultural data the country name has been used. Lastly, any observation containing missing values has been dropped in order to perform the analysis.

On March 11, 2020, the COVID-19 crisis was declared a global pandemic (Šušak, 2020). The pre-COVID-19 period will be set from 2017 until 2019, while the COVID-19 period will be set from 2020 until 2021. Moreover, both periods will be analyzed and compared using ordinary least squares regressions. Therefore, a timespan starting from 2018 to 2019 is used for the pre-COVID-19 period, and the timespan from 2020 till 2021 is considered as the COVID-19 period. All the analyses have been performed using the statistical program STATA.

3.2 Basis and Main Model

The empirical model used in this research is based on the model of Han et al. (2010). The model is specified in (1) and it should be noted that the model does not introduce any COVID-19 related variables. Hence, this model serves as the basis and it will be referred to as basis model.

$$(1) AEM = \beta_0 + \beta_1 IDV + \beta_2 UAI + \beta_3 ROA + \beta_4 SIZE + \beta_5 LEVERAGE + \beta_6 LOSS + FE$$

Here, AEM, the dependent variable, represents earnings discretions, which is a proxy for the magnitude of accrual-based earnings management. The independent variables are IDV and UAI, which represent the individualism and uncertainty avoidance values of one country respectively, according to Hofstede's framework. It is expected that there is a positive relation between individualism and the magnitude of accrual-based earnings management. On the other hand, it is expected that uncertainty avoidance has a negative relation with the magnitude of accrual-based earnings management.

Additionally, the variables SIZE, LEVERAGE, LOSS and ROA are included as control variables. SIZE represents the market monitoring, which is computed by taking the natural logarithm of the total annual sales. It is often used as a proxy for political sensitivity. Large firms that make large profits may have an incentive to avoid government actions by choosing income-decreasing accruals. Moreover, large firms hold more assets and accounting treatments for transactions.

Consequently, a negative relation between firm size and accruals are expected as it is assumed that managers have a higher incentive to manage their earnings downward if the firm is larger. The size of the firm is measured by the log of total assets (Othman & Zeghal, 2006). LEVERAGE is included to capture the leverage of a company, i.e. the amount of debt a company has. According to DeFond and Jiambavo (1994), highly leveraged companies are less inclined to manage their earnings due to higher rate of monitoring from the market compared to lowly leveraged firms. Moreover, LOSS has been included, which serves as an indicator variable. More specifically, LOSS will have the value 1 if a firm-year observation has a negative net income and it will take the value 0 otherwise. It has been expected that firms suffering from losses will reduce their earnings even more with the use of write downs (Healy 1985). ROA will be used to control for the influence of firm performance on unexpected accruals (Filip & Raffournier (2014). It is expected that high numbers of unexpected accruals will result in higher earnings management.

Lastly, given that this study is a cross-sectional study involving data of multiple types, it is crucial to consider the impact of potential country, industry, and year effects. More specifically, this study contains panel data for the financial data with observations of different countries and industries. To address this, the effects will be included in the proposed models. To the end, the variable FE is introduced. FE denotes the fixed effects control variables country, year, and industry and each of these variables have been converted to dummy variables and then passed to the models.

The second model used in this research is based on the model of Gray (2015), which consists of (1) with the addition of second-order interactions between all independent variables and an indicator variable COVID. The model can be seen in (2) and it will be referred to as the *main model*. It introduces an additional indicator variable COVID, which will be equal to 1 if the firm-year observation is after 2019 and 0 otherwise. It is expected that during COVID there will be a positive change in the magnitude of earnings management compared to the period prior COVID. This

model is specifically designed to test the effect of individualism and uncertainty avoidance prior and during COVID on the magnitude of accrual-based earnings management.

$$(2) AEM = \beta_0 + \beta_1 IDV + \beta_2 UAI + \beta_3 COVID + \beta_4 (IDV * COVID) + \beta_5 (UAI * COVID) + \beta_6 (IDV * UAI) + \beta_7 ROA + \beta_8 SIZE + \beta_9 LEVERAGE + \beta_{10} LOSS + FE$$

A summarized overview of all the variables included in the regression models can be seen in Table 1.

3.3 Estimating Accrual-based Earnings Management

All the variables included in (1) and (2) can be derived using simple arithmetic computations, except for AEM, the proxy of the magnitude of accrual-based earnings management. To estimate this variable, the performance-matched modified Jones model will be used. There are several models developed to identify accrual-based earnings management, but the Jones model, and the modified Jones model, which were developed by Dechow, Sloan and Sweeney (1995), are the most common models for detecting discretionary accruals. The main difference between the models is that the modified model includes changes in accounts receivables. Given the different variants of the modified Jones model, the performance-matched Jones model used in the study of Viana Jr, et al. (2021) will serve as a basis for this research. The model can be seen in (3).

$$(3) ACC_{it} = \beta_0 + \beta_1 \left(\frac{1}{TA_{it-1}} \right) + \beta_2 (\Delta SALES_{it} - \Delta REC_{it}) + \beta_3 GPPE_{it} + \beta_4 ROA_{it-1} + \varepsilon_{it}$$

where ACC_{it} denotes the accruals scaled by the lagged total assets of firm i in year t , TA_{it-1} refers to the lagged total assets of firm i in year $t - 1$, $\Delta Sales_{it}$ concerns the changes in sales scaled by the lagged total assets of firm i in year t , ΔREC_{it} is the change in receivables from clients scaled by the lagged total assets of firm i in year t , $GPPE_{it}$ denotes the net value of property, plant and equipment scaled by the lagged total assets of firm i in year t , and ROA_{it} is the net income scaled by the lagged total assets of firm i in year t .

TABLE 1: SUMMARY OVERVIEW OF THE VARIABLES IN THE MAIN REGRESSION

Type	Variable	Definition and computations
Dependent variables	AEM ₁	Accrual-based earnings management is calculated as the absolute value of discretionary accruals using the cross-sectional modified Jones model with the last-year ROA.
	AEM ₂	Accrual-based earnings management is calculated as the absolute value of discretionary accruals using the cross-sectional modified Jones model with the current-year ROA.
	AEM ₃	Accrual-based earnings management is calculated as the absolute value of discretionary accruals using the cross-sectional Jones model with the last-year ROA.
Independent variables	IDV	Individualism is one of the national cultural dimensions of Hofstede (2008)
	UAI	Uncertainty avoidance is one of the national culture dimensions of Hofstede (2008)
	COVID	Covid-19 period is an indicator variable, which equals 1 for observations after 2019 and 0 otherwise
Control variables	ROA	Return of assets which is computed by dividing the net income with the lagged total assets
	SIZE	Size is computed by taking the natural logarithm of the total assets
	LEV	Leverage is computed by dividing the total liabilities with the total assets
	LOSS	Loss is an indicator variable, which equals 1 when the net income is negative for an observation and 0 otherwise
	FE	Fixed effects control dummy variables for year, industry and country due to the set-up of this cross-sectional research

Before ACC can be predicted using (3), it requires the extraction of ACC. To this end, the formula (4) will be used to derive ACC. ACC_{it} denotes the total accruals for firm i in year t , ΔCA_{it} is the change in current assets for year $t - 1$ to year t for firm i , ΔCL_{it} denotes the change in current liabilities for year $t - 1$ to year t for firm i , $\Delta CASH_{it}$ is defined as the change in total cash for year $t - 1$ to year t for firm i , $\Delta STDEBT_{it}$ is the change in short term debt for year $t - 1$ to year t for firm i , DEP_{it} represents the depreciation expenses for firm i in year t and TA_{it-1} denotes the one year lag of the total assets.

$$(4) \quad ACC_{it} = \frac{(\Delta CA_{it} - \Delta CL_{it} - \Delta CASH_{it} + \Delta STDEBT_{it} - DEP_{it})}{TA_{it-1}}$$

After the total accruals have been estimated using the modified Jones model, the discretionary accruals will be computed using formula (5). This is done by subtracting the predictions of the total accruals $\widehat{ACC}_{it}$ from the ground truth values ACC_{it} and taking the absolute value of this difference. The result will be the magnitude of accrual-based earnings management, denoted by AEM. One of the drawbacks of using the modified Jones model or any other accrual-based approximation model is the fact that they are country-specific. Hence, a performance measure will be included, which groups the observations cross-sectionally by country and by industry. Additionally, there will be a requirement set at a minimum of 20 observations of the same country and industry group before the total accruals will be estimated.

$$(5) \quad AEM_{it} = |ACC_{it} - \widehat{ACC}_{it}|$$

Additionally, two other discretionary models will be used to validate the robustness of the (3). The first additional model is a modified Jones model using the current ROA, instead of the lagged ROA. The second additional model is the Jones model using the lagged ROA. Both models are presented in (6) and (7).

$$(6) \quad ACC_{it} = \beta_0 + \beta_1 \left(\frac{1}{TA_{it-1}} \right) + \beta_2 (\Delta SALES_{it} - \Delta REC_{it}) + \beta_3 GPPE_{it} + \beta_4 ROA_{it} + \varepsilon_{it}$$

$$(7) ACC_{it} = \beta_0 + \beta_1 \left(\frac{1}{TA_{it-1}} \right) + \beta_2 \Delta SALES_{it} + \beta_3 GPPE_{it} + \beta_4 ROA_{it-1} + \varepsilon_{it}$$

TABLE 2: SUMMARY OVERVIEW OF ACCRUAL-BASED EARNINGS MANAGEMENT ESTIMATION VARIABLES

Variable	Definition	Computed
ACC	Total accruals scaled by lagged total assets	Using formula (4)
$\widehat{ACC}$	Predictions of total accruals	Estimated using formula (3), (6) or (7)
TA	Total assets	Obtained directly from Refinitiv
ΔSales	Change in sales scaled by lagged total assets.	Obtained total sales from Refinitiv
ΔREC	Change in receivables scaled by lagged total assets	Obtained receivables from Refinitiv
GPPE	Net value of property, plant and equipment scaled by lagged total assts	Obtained net value of property, plant and equipment from Refinitiv
ROA	Net income scaled by lagged total assets	Obtained net income from Refinitiv
ΔCA	Change in current assets	Obtained current assets from Refinitiv
ΔCL	Change in current liabilities	Obtained current liabilities from Refinitiv
ΔCASH	Change in total cash	Obtained total cash from Refinitiv
ΔSTDEBT	Change in short term debt	Obtained short term debt from Refinitiv
DEP	Depreciation expenses	Obtained directly from Refinitiv

3.4 Additional Model

As mentioned before, Hofstede's model of national culture consists of six dimensions. This study focuses on individualism (IDV) and uncertainty avoidance (UAI). However, other cultural values could potentially correlate with earnings management. Following the framework of Gray et al. (2015), an additional model has been established including masculinity, power distance index and long-term orientation as control variables. It should be noted that these control variables are added on top of the existing control variables in main model. The results of this model will be used to evaluate the robustness of the basis model and main model. The model can be seen in (8) and it will be referred to as additional model.

$$(8) AEM = \beta_0 + \beta_1 IDV + \beta_2 UAI + \beta_3 COVID + \beta_4 (IDV * COVID) + \beta_5 (UAI * COVID) + \beta_6 (IDV * UAI) + \beta_7 ROA + \beta_8 SIZE + \beta_9 LEVERAGE + \beta_{10} LOSS + \beta_{11} MAS + \beta_{12} PDI + \beta_{13} LTO + FE$$

Masculinity versus femininity (MAS) indicates the distribution of emotional roles between the genders. A country with a high score on masculinity focuses more on achievement and material success compared to countries with a high score on femininity. Countries with a feminine culture are more focussed on quality of life instead of ego boosting, recognition and wealth (Hofstede, 1980). Hence, managers who have a high score of MAS are more prone to material success and financial achievement. Gray et al. (2015) argues that MAS might increase the probability of earnings management, because this could help achieve goals. Thus, the expectation is that countries with a high value of MAS will have a positive impact on earnings management.

According to Hofstede et al. (2010) power distance index (PDI) argues that the less powerful members within an institution or organization expect and accept that power is distributed unequally. Countries that have a high score of PD accept that there is a hierarchy between subordinates and superiors. In these countries, power is concentrated in the hands of a few individuals and the exchange of ideas is inhibited. Waldman et al. (2016) mentioned that countries with a high score of PD are more prone to manipulative use of power for the pursuit of

personal benefit, lack of equal opportunities for women and minorities, and shortcoming of professional and/ or personal development. A large power distance is expected to increase the tendency for earnings management due to the fact that management care less about the shareholder's interest and community benefit and tend to abuse their power. This will lead to information asymmetry. Under the control of executives, excessive earnings management will give a false impression of financial condition and create a better picture of corporate performance (Gray et al., 2015). Hence, a positive association between PD and earnings management is expected.

According to Hofstede et al. (2010), low score of long-term orientation (LTO) focusses on the bottom line and current results. Moreover, they tend to spend money quickly. In contrast, high LTO focusses on long-term reputations and relationships to achieve more sustainable performance. They are more likely to defer gratification and save funds to invest later (Freedman and Jaggi, 2010). Therefore, a negative association between LTO and earnings management is expected.

4 Results

4.1 Descriptive Results

The descriptive statistics regarding the sample prior and during the pandemic can be seen in Tables 3 and 4 respectively. For each of the variables, a difference in means test has been performed to evaluate the difference prior and during COVID. The results of these tests have been denoted with *, ** and ***, which represent the significance level at 10%, 5% and 1% respectively.

The sample consists of 3765 and 3772 firm-year observations for the period 2018-2019 and 2020-2021 respectively. As expected, the mean values of IDV, UAI and their interaction remain the same in both time periods. The means of COVID and its second-order interactions with IDV and UAI are all statistically different between the two time periods. This is also expected, as COVID serves as an indicator variable. Moreover, the means of SIZE and LOSS appear to be statistically different before the pandemic and during the pandemic at a significance level of 1% and 10% respectively. It should be noted that the means of AEM1 and AEM3 are slightly higher during COVID, whereas the mean of AEM2 is slightly lower during COVID. Nonetheless, the difference in means of all the accrual-based earnings management proxies AEM1, AEM2 and AEM3 are all statistically indifferent.

TABLE 3: DESCRIPTIVE STATISTICS PRIOR COVID (2018-2019)

Variables	count	mean	std	min	max
IDV	3772	0.642	0.118	0.3	0.8
UAI	3772	0.731	0.233	0.23	1.12
COVID	3772	0***	0	0	0
IDV*COVID	3772	0***	0	0	0
UAI*COVID	3772	0***	0	0	0
SIZE	3772	12.379***	2.488	3.258	19.968
ROA	3772	-0.009	0.354	-13.567	4.375
LEV	3772	0.585	0.728	-0.338	32.847
LOSS	3772	0.282*	0.45	0	1
AEM1	3772	0.081	0.161	0	5.364
AEM2	3772	0.077	0.118	0	2.283
AEM3	3772	0.08	0.159	0	5.374

*, **, *** denote the significance at the 10%, 5% and 1% level respectively

TABLE 4: DESCRIPTIVE STATISTICS DURING COVID (2020-2021)

Variables	count	mean	std	min	max
IDV	3765	0.642	0.118	0.3	0.8
UAI	3765	0.731	0.233	0.23	1.12
COVID	3765	1***	0	1	1
IDV*COVID	3765	0.642***	0.118	0.3	0.8
UAI*COVID	3765	0.731***	0.233	0.23	1.12
SIZE	3765	12.538***	2.466	4.06	20.069
ROA	3765	-0.023	1.882	-114.385	4.45
LEV	3765	0.615	1.265	-0.364	64.919
LOSS	3765	0.301*	0.459	0	1
AEM1	3765	0.087	0.317	0	16.86
AEM2	3765	0.074	0.094	0	1.292
AEM3	3765	0.086	0.319	0	16.916

*, **, *** denote the significance at the 10%, 5% and 1% level respectively

Table 5 presents an overview of all the countries considered in the study as well as their respective values for IDV and UAI. Note that IDV and UAI are computed by dividing the original cultural values with 100 for the sake of interpretability.

In this study, seventeen countries are considered which are part of the European Union. From Table 5, it can be concluded that the Netherlands has the highest individualism score at 80, while Romania has the lowest individualism score at 30. In terms of uncertainty avoidance, Greece scored the highest and Denmark scored the lowest, having a value of 112 and 23 respectively. Moreover, it should be mentioned that Poland, Germany, and France have the most firm-year observations with over a thousand observations in total. Conversely, Lithuania, Luxembourg and Austria have the lowest firm-year observations, having under one hundred firm-year observations in total. This due to the data availability of the features of interest of these firms as well as the country-industry grouping which resulted in the removal of observations with less than 20 firm-year observations per group.

TABLE 5: OVERVIEW OF COUNTRY STATISTICS

Country	IDV*	UAI*	Pre-COVID (2018-2019)	During- COVID (2020- 2021)	Total firm- year observations
Austria	0.55	0.7	48	48	96
Belgium	0.75	0.94	90	90	180
Croatia	0.33	0.8	74	74	148
Denmark	0.74	0.23	82	83	165
Finland	0.63	0.59	124	122	246
France	0.71	0.86	597	597	1194
Germany	0.67	0.65	670	671	1341
Greece	0.35	1.12	232	232	464
Ireland	0.7	0.35	64	64	128
Italy	0.76	0.75	344	344	688
Lithuania	0.6	0.65	18	18	36
Luxembourg	0.6	0.7	22	22	44
Poland	0.6	0.93	624	621	1245
Romania	0.3	0.9	50	50	100
Spain	0.51	0.86	189	188	377
Sweden	0.71	0.29	438	435	873
The Netherlands	0.8	0.53	106	106	212

* The original values of the cultural dimensions have been divided by 100 for the ease of readability

4.2 Correlation Matrix

In Table 6, an overview of all the Pearson correlation coefficients of the variables of the main regressions can be seen. The statistically significant results are denoted with *, ** and ***, indicating the significance at a 10%, 5% and 1% respectively. It can be concluded that IDV is negatively correlated with UAI. Moreover, it can be seen that SIZE is also positively (negatively) correlated with IDV (UAI). With respect to the interaction variables, it can be seen that the interactions are of course correlated with the main effects used to build these interaction terms. With regards to the proxy of accrual-based earnings management, it can be concluded that AEM1 and AEM3 are negatively correlated with IDV, while AEM2 is positively correlated with IDV. Nonetheless, these correlations are insignificant. UAI, on the other hand, is positively correlated with AEM1 and AEM3. However, it is negatively correlated with AEM2. Note that the correlation between UAI and AEM1 and AEM3 are statistically significant at a significance level of 10%. Furthermore, it can be seen that all proxies for accrual-based earnings management are positively correlated with each other, which is as expected. However, it can be seen that the proxies AEM1 and AEM3 have a higher positive correlation than AEM1 with AEM2 or AEM2 with AEM3. This can be explained by the fact that proxies AEM1 and AEM3 are both using the last-year ROA for the computation, while AEM2 uses the current-year ROA.

It should be noted that these correlations contradict our initial hypothesis. It was expected that all proxies for accrual-based earnings management would be positively correlated with IDV and negatively correlated with UAI. These unexpected findings regarding the correlations between cultural variables UAI and IDV and AEM1, AEM2 and AEM3 can be explained by the fact that this is a univariate analysis. This means that the current analysis does not account for other confounding influences such as the control variables.

4.3 Main results and Robustness Tests

This subsection will address the three models, *basis model*, *main model*, *additional model*, proposed in Section 3. The primary analysis revolves around AEM1 as dependent variable and an

OLS regression as regression method. For the sake of validity, two additional proxies have been analyzed as well, namely AEM2 and AEM3. Moreover, robust regression will be used as a secondary regression method and robustness check to mitigate the effect of outliers present in the data.

4.3.1 Basis Model

The concise summary of the main results of the initial empirical model can be seen in Table 7. For each of the accrual-based earnings management proxies AEM1, AEM2 and AEM3, an OLS regression and a robust regression have been performed according to (1). I and II denote the OLS and robust regression results respectively. Robust regression has been intentionally used to mitigate the effect of outliers. Hence, a total of six models have been presented. The coefficients are represented next to the variables, whereas the standard errors are presented in brackets underneath the coefficients. It should be noted that statistically significant variables are denoted by *, ** and ***, indicating the significance level at 10%, 5% and 1% respectively. A more extensive results, including the fixed effects, can be seen in the Appendix in Table 11.

As hypothesized, IDV is positively associated with AEM1. The effect is statistically significant at a 1% level for the OLS regression and 1% for the robust regression. Surprisingly, similar conclusions can also be drawn for UAI. More specifically, the effect of UAI is also statistically significant at a 1% level for both regressions. It should be noted that the coefficient for IDV is higher than UAI in both models. Moreover, it should be noted that the same conclusions can be drawn for the other four models. Hence, there is sufficient evidence to conclude that UAI and IDV remain statistically significant even during the pandemic, according to the basis model.

The control variables SIZE, ROA, LEVERAGE, LOSS are all statistically significant for AEM1. In fact, SIZE, ROA and LOSS are all negatively associated with AEM1, while LEVERAGE is positively associated with AEM1. Similar inferences can be made for the robust regression, except for LOSS. Indeed, for the robust regression for AEM1, LOSS is insignificant. With respect to the other proxies, ROA appears to be not significant for the AEM2 models. This can be explained due to the

fact that AEM2 is estimated using the current-year ROA, instead of the lagged ROA used to estimate AEM1 and AEM3.

Further robustness tests revolve around the variance inflation factors, also known as VIF values, which have been reported in Table 8. The VIF values are numerical values used to quantify the severity of multicollinearity. A common threshold for considering severe multicollinearity is a VIF value larger than 20. Clearly, none of the VIF values presented in Table 8 exceeded the value 20. Hence, it can be concluded that there is no severe multicollinearity present in the data. Still, it should be noted that SIZE and IDV and UAI do have relatively high VIF values compared to the other control variables present, especially SIZE. Hence, there might be some collinearity present in the current data.

4.3.2 Main Model

In Table 9, the regression overview of the main model as specified in (2) is presented, the entire result output can be seen in Table 12 of the Appendix. Again, for each of the estimates AEM1, AEM2 and AEM3, an OLS and a robust regression have been performed. I and II denote the OLS and robust regression results respectively. The coefficients are presented in the table, and the standard errors are presented in brackets underneath the coefficients. Similar to the results of the basis model, the statistically significant coefficients are denoted by *, ** and ***, representing the significance level at 10%, 5% and 1% respectively.

Similar to the regression results of the basis model, IDV appears to be positively associated with AEM1 at a significance level of 1%. In fact, IDV is statistically significant in all six models and the coefficients are positive, indicating a positive association between IDV and the magnitude of accrual-based earnings management. Hence, this supports the existing evidence that higher values of IDV result in higher values of AEM.

UAI exhibit similar results as in the basic model. Again, it can be seen that UAI is statistically significant in all six models and the effect is positive. Note that this occurs at a 1% significance

level in all models. Hence, there is sufficient evidence to conclude that the coefficients are positively associated to the magnitude of accrual-based earnings management.

Surprisingly, the addition of COVID and the interactions of COVID*IDV and COVID*UAI resulted in very interesting findings. First, COVID has a positive coefficient in all models. It is statistically significant in all six model, and the significance is twice at a 5% level and four times at a 1% level. With respect to the interaction variables, IDV*COVID has a negative coefficient in all models. However, it has only been statistically significant in two out of six models at a 10% significance level. Similarly, UAI*COVID has a negative coefficient in all models. However, it is only once statistically significant at a 10% significance level. Hence, there is insufficient evidence to conclude that the effect of culture during the pandemic on the magnitude of accrual-based earnings management is different from the period prior to the pandemic. Nonetheless, there is a positive association between the magnitude of accrual-based earnings management during COVID-19. With regards to the control variables, they exhibit similar behavior as in the basic model.

4.3.3 Additional Model

To validate the aforementioned results even further, the additional model results will be discussed, which can be seen in Table 10. Similar to the previous set-ups, six models have been run. The coefficients can be seen in the table, and the standard errors are presented in brackets underneath the coefficients. The statistically significant variables are denoted by *, ** and ***, indicating the significance level at 10%, 5% and 1% respectively and a more extensive version can be seen in the Appendix in Table 13.

Consistent with the results of main model and basis model, IDV and UAI are statistically significant at a 1% significance level in all six models. Compared to the results of the other models, it can be seen that the coefficients are slightly lower. Nonetheless, the effect of both cultural dimensions are still positive. Similar inferences can also be made for the indicator variable COVID. To be precise, the indicator variable is statistically significant in all six models and this occurs at a significance level of 1% four times and 5% two times. Regarding the interaction variables, it can

be seen that UAI*COVID and IDV*COVID are not statistically significant in any of the six models, even though the coefficient is negative. Again, this is consistent with the results of the main model. In terms of the additional cultural control variables, it can be concluded that MAS, PDI and LTO are all statistically significant in all models. In fact, these three cultural dimensions are also positively associated with earnings management. For MAS and PDI, this was as expected. However, for LTO, this result was surprising. This finding can be backed up by the fact some managers might use earnings management for long-term goals, instead of short-term goals (Gray et al., 2015).

TABLE 6: CORRELATION MATRIX OF ALL VARIABLES OF THE MAIN REGRESSIONS

Variable	IDV	UAI	COVID	IDV*UAI	IDV*COVID	UAI*COVID	SIZE	ROA	LEV	LOSS	AEM1	AEM2	AEM3
IDV	1.0***												
UAI	0.523***	1.0***											
COVID	0.0	0.0	1.0***										
IDV*UAI	0.193***	0.726***	0.0	1.0***									
IDV*COVID	0.178***	0.093***	0.968***	0.035**	1.0***								
UAI*COVID	0.152***	0.291***	0.912***	0.211***	0.828***	1.0***							
SIZE	0.177***	0.096***	0.032**	0.034**	0.064***	-0.002	1.0***						
ROA	-0.005	0.003	-0.005	-0.0	-0.005	-0.006	0.059***	1.0***					
LEV	-0.016	0.028*	0.015	0.019	0.011	0.022	0.041***	-0.006	1.0***				
LOSS	-0.035**	-0.015	0.021	-0.05***	0.014	0.018	0.276***	0.114***	0.08***	1.0***			
AEM1	-0.009	0.025*	0.012	0.026*	0.008	0.02	0.151***	0.746***	0.063***	0.078***	1.0***		
AEM2	0.006	-0.005	-0.012	0.008	-0.013	-0.015	0.253***	-0.023	0.06***	0.16***	0.405***	1.0***	
AEM3	-0.01	0.026*	0.013	0.027*	0.009	0.022	-0.15***	0.747***	0.062***	0.079***	0.996***	0.398***	1.0***

*, **, *** denote the significance at the 10%, 5% and 1% level respectively

TABLE 7: REGRESSION SUMMARY OF THE BASIS MODEL

Variables	AEM1 I	AEM1 II	AEM2 I	AEM2 II	AEM3 I	AEM3 II
IDV	0.057*** (0.006)	0.033*** (0.002)	0.056*** (0.004)	0.036*** (0.002)	0.055*** (0.006)	0.032*** (0.002)
UAI	0.044*** (0.005)	0.024*** (0.002)	0.034*** (0.003)	0.021*** (0.002)	0.042*** (0.005)	0.023*** (0.002)
SIZE	-0.010*** (0.001)	-0.005*** (0.000)	-0.010*** (0.001)	-0.006*** (0.000)	-0.010*** (0.001)	-0.005*** (0.000)
ROA	-0.137*** (0.001)	-0.063*** (0.000)	0.000 (0.001)	0.001 (0.000)	-0.138*** (0.001)	-0.067*** (0.000)
LEVERAGE	0.014*** (0.002)	0.008*** (0.001)	0.004*** (0.001)	0.004*** (0.001)	0.014*** (0.002)	0.008*** (0.001)
LOSS	-0.020*** (0.004)	-0.002 (0.001)	0.022*** (0.003)	0.011*** (0.001)	-0.019*** (0.004)	-0.003* (0.001)
CONST	0.105*** (0.007)	0.061*** (0.002)	0.094*** (0.004)	0.064*** (0.002)	0.104*** (0.007)	0.061*** (0.002)
Industry fixed effects	Y	Y	Y	Y	Y	Y
Country fixed effects	Y	Y	Y	Y	Y	Y
Year fixed effects	Y	Y	Y	Y	Y	Y
R-squared	0.590		0.109		0.592	
R-squared Adj.	0.588		0.105		0.590	

The heteroscedasticity consistent standard errors are presented within parenthesis underneath the coefficient

*, **, *** denote the significance level at 10%, 5% and 1% level respectively

I represents OLS regression and II represents the robust regression

TABLE 8: VIF VALUES OF THE VARIABLES

Variables	VIF
IDV	8.954
UAI	7.643
COVID	1.991
SIZE	18.366
ROA	1.014
LOSS	1.48
LEVERAGE	1.345

VIF value > 20 indicates severe multicollinearity

TABLE 9: REGRESSION SUMMARY OF THE MAIN MODEL

Variables	AEM1 I	AEM1 II	AEM2 I	AEM2 II	AEM3 I	AEM3 II
IDV	0.058*** (0.008)	0.033*** (0.003)	0.058*** (0.005)	0.035*** (0.003)	0.057*** (0.008)	0.032*** (0.003)
UAI	0.040*** (0.006)	0.023*** (0.002)	0.035*** (0.004)	0.020*** (0.002)	0.039*** (0.006)	0.023*** (0.002)
COVID	0.041** (0.017)	0.025*** (0.006)	0.043*** (0.011)	0.024*** (0.005)	0.042** (0.017)	0.027*** (0.005)
IDV*COVID	-0.035 (0.037)	-0.017 (0.012)	-0.040* (0.023)	-0.013 (0.011)	-0.038 (0.037)	-0.021* (0.012)
UAI*COVID	-0.005 (0.019)	-0.009 (0.006)	-0.021* (0.012)	-0.009 (0.006)	-0.005 (0.019)	-0.009 (0.006)
SIZE	-0.010*** (0.001)	-0.005*** (0.000)	-0.010*** (0.001)	-0.006*** (0.000)	-0.010*** (0.001)	-0.005*** (0.000)
ROA	-0.137*** (0.001)	-0.063*** (0.000)	0.000 (0.001)	0.001 (0.000)	-0.138*** (0.001)	-0.067*** (0.000)
LEVERAGE	0.014*** (0.002)	0.008*** (0.001)	0.004*** (0.001)	0.004*** (0.001)	0.014*** (0.002)	0.008*** (0.001)
LOSS	-0.020*** (0.004)	-0.002 (0.001)	0.023*** (0.003)	0.011*** (0.001)	-0.019*** (0.004)	-0.003* (0.001)
CONST	0.100*** (0.007)	0.058*** (0.002)	0.091*** (0.004)	0.061*** (0.002)	0.099*** (0.007)	0.058*** (0.002)
Industry fixed effects	Y	Y	Y	Y	Y	Y
Country fixed effects	Y	Y	Y	Y	Y	Y
Year fixed effects	Y	Y	Y	Y	Y	Y
R-squared	0.590		0.110		0.593	
R-squared Adj.	0.588		0.105		0.590	

The heteroscedasticity consistent standard errors are presented within parenthesis underneath the coefficient
 *, **, *** denote the significance level at 10%, 5% and 1% level respectively

I represents OLS regression and II represents the robust regression

TABLE 10: REGRESSION SUMMARY OF THE ADDITIONAL MODEL

Variables	AEM1 I	AEM1 II	AEM2 I	AEM2 II	AEM3 I	AEM3 II
IDV	0.052*** (0.008)	0.029*** (0.002)	0.051*** (0.005)	0.031*** (0.002)	0.051*** (0.008)	0.029*** (0.002)
UAI	0.019*** (0.005)	0.012*** (0.002)	0.016*** (0.003)	0.010*** (0.001)	0.018*** (0.005)	0.011*** (0.002)
COVID	0.038** (0.017)	0.024*** (0.005)	0.040*** (0.011)	0.022*** (0.005)	0.039** (0.017)	0.025*** (0.005)
IDV*COVID	-0.035 (0.037)	-0.017 (0.012)	-0.040* (0.023)	-0.013 (0.011)	-0.038 (0.037)	-0.021* (0.012)
UAI*COVID	-0.005 (0.019)	-0.009 (0.006)	-0.021* (0.012)	-0.009 (0.006)	-0.005 (0.019)	-0.009 (0.006)
SIZE	-0.010*** (0.001)	-0.005*** (0.000)	-0.010*** (0.001)	-0.006*** (0.000)	-0.010*** (0.001)	-0.005*** (0.000)
ROA	-0.137*** (0.001)	-0.063*** (0.000)	0.000 (0.001)	0.001 (0.000)	-0.138*** (0.001)	-0.067*** (0.000)
LEVERAGE	0.014*** (0.002)	0.008*** (0.001)	0.004*** (0.001)	0.004*** (0.001)	0.014*** (0.002)	0.008*** (0.001)
LOSS	-0.020*** (0.004)	-0.002 (0.001)	0.023*** (0.003)	0.011*** (0.001)	-0.019*** (0.004)	-0.003* (0.001)
MAS	0.040*** (0.007)	0.019*** (0.002)	0.038*** (0.004)	0.023*** (0.002)	0.040*** (0.007)	0.019*** (0.002)
PDI	0.018*** (0.006)	0.010*** (0.002)	0.008** (0.004)	0.004** (0.002)	0.017*** (0.006)	0.010*** (0.002)
LTO	0.021*** (0.007)	0.014*** (0.002)	0.027*** (0.004)	0.016*** (0.002)	0.020*** (0.007)	0.013*** (0.002)
CONST	0.087*** (0.006)	0.051*** (0.002)	0.079*** (0.004)	0.054*** (0.002)	0.086*** (0.006)	0.051*** (0.002)
Industry fixed effects	Y	Y	Y	Y	Y	Y
Country fixed effects	Y	Y	Y	Y	Y	Y
Year fixed effects	Y	Y	Y	Y	Y	Y
R-squared	0.590		0.110		0.593	
R-squared Adj.	0.588		0.105		0.590	

The heteroscedasticity consistent standard errors are presented within parenthesis underneath the coefficient

*, **, *** denote the significance level at 10%, 5% and 1% level respectively

I represents OLS regression and II represents the robust regression

5 Discussion and conclusion

Recently, there has been an increasing interest in national culture, and how it impacts managerial behavior with respect to managing earnings (Grey et al., 2015). This study adds to the existing literature regarding this topic by analyzing the shift in the economic paradigm caused by the COVID-19 recession in EU-listed companies.

Hypothesis 1 states that Listed firms domiciled within the European Union are more inclined to increase their magnitude of accrual-based earnings management during the COVID-19 pandemic. The results of this study are in line with this hypothesis. In fact, in all models the indicator variable COVID appears to be statistically significant with a positive coefficient. This result is consistent with the existing literature on earnings management during other financial crises such as the studies conducted by Ahmad-Zaluki et al. (2011), Charitou et al. (2007), and Navissi (1999). They concluded that managers are more likely to increase their earnings during financial crises.

Hypothesis 2 states There is a negative association between uncertainty avoidance and the magnitude of accrual-based earnings management for EU-listed companies. This study, however, finds that the association between uncertainty avoidance and the magnitude of accrual-based earnings management is significantly positive as opposed to Hypothesis 2. This contradicts the research conducted by Viana Jr et al. (2021) and Guan et al. (2005). Similarly, Han et al. (2010) concluded that uncertainty avoidance is negatively related to the magnitude of earnings discretion for factors that are known to influence the manager's decisions to engage in earnings management. However, they state that the negative relationship can become positive in strong investor protection regimes (Han et al., 2010). In addition, Douppnik (2008) argued that higher levels of uncertainty avoidance will lead to more earnings management as uncertainty avoidance is viewed as an attempt to influence the future. Therefore, firms that have a large incentive to avoid uncertainty are likely to manage their earnings (Douppnik, 2008).

Moreover, Hypothesis 3 is regarding the association between uncertainty avoidance and the magnitude of accrual-based earnings management during COVID-19. This study finds that the relationship between uncertainty avoidance and the magnitude of accrual-based earnings management will become less positive. However, this finding is not significant, which implies that COVID-19 does not have a significant effect on the relationship between uncertainty avoidance and the magnitude of accrual-based earnings management. Hence, this finding opposes Hypothesis 3

Hypothesis 4 entails that there is a positive association between individualism and the magnitude of accrual-based earnings management for EU-listed companies. This study provides evidence that there is a positive association between individualism and the magnitude of accrual-based earnings management. This result is in line with Hypothesis 4 and with the existing literature as well. For example, Gray et al. (2015) and Han et al. (2010) have both stated that there exists a positive relationship between individualism and the magnitude of earnings management. In individualistic cultures, managers tend to have more flexibility in self-governance and measurement (Gray et al., 2015). These managers are therefore more inclined to manage their earnings.

Finally, Hypothesis 5 addresses the association between individualism and the magnitude of accrual-based earnings management. This study provides insufficient evidence to prove that the relationship between individualism and the magnitude of accrual-based earnings management will become more positive during the pandemic. In fact, the results show that the relationship becomes less positive, however, the results are not significant.

It is of importance to mention that, currently, for Hypothesis 3 and Hypothesis 5, there is no literature available to compare the results of this study with. It is expected that this is caused due to the limited data available which did not capture the impact of COVID-19 recession yet.

This study concludes that the employment of earnings management will be positively affected by COVID-19 for EU-listed firms. This implies that managers are more inclined to manage their earnings during the pandemic. Moreover, for these firms, the effect of the cultural dimensions, uncertainty avoidance and individualism, are both significantly positively associated with the magnitude of accrual-based earnings management as well. Hence, managers of firms that are domiciled in EU-countries that have a high level of uncertainty avoidance and/or individualism are more likely to engage in accrual-based earnings management. On the other hand, this study suggests that there is no significant evidence to state that the association between the magnitude of accrual-based earnings management and Hofstede's cultural dimensions will be amplified during the COVID-19 pandemic for EU-listed firms.

To validate the results of this study, several robustness tests and additional tests have been included. First, three proxies of accrual-based earnings management have been used. More specifically, these are the performance-matched modified Jones model using current-year and last-year ROA and the Jones model using last-year ROA. For each of the models, similar results have been obtained, verifying the correctness of earnings management proxies. Second, a robust regression has been used in addition to the OLS regression to mitigate the effect of outliers present in the data. Although the results are largely the same for both models, it ensures that the inferences made by OLS are not influenced by outliers. Third, an additional model has been used to control the effect of other cultural dimensions. Again, the results of this model are consistent with the results of the main model. Lastly, the VIF values, presented in Table 8 show no severe multicollinearity present in the data.

The generalizability of this research is limited by the fact that the COVID-19 pandemic is still ongoing. Therefore, the data is incomplete which affects the reliability of the results. In order to investigate the effect of culture on earnings management during the COVID-19 pandemic, it is necessary to acquire the data from before, during and preferably after the pandemic to obtain a more accurate result. Moreover, not all countries are included in the sample. On the one hand, financial and cultural data can be lacking for several countries. On the other hand, during the

computation of the discretionary accruals, firm year observations with less than twenty observations per industry are removed from the sample. By continuously combining data and removing observations with missing values, this can lead to underrepresented countries and overrepresented countries. All these aforementioned can lead to sampling biases, which can invalidate the results of this research. In order to mitigate this, a larger sample size should be selected when more data becomes available.

Another limitation is the exclusion of the remaining cultural dimensions. In this research, only uncertainty avoidance and individualism were analyzed thoroughly as these were the dimensions that were previously shown to have a strong positive association with earnings management. Even though the other cultural variables masculinity, power distance index and long-term orientation are considered, their effect during the pandemic has not been analyzed during the study. Moreover, the recently added cultural variable indulgence has not been considered at all in this study, due to the limited research available regarding this cultural dimension. Nonetheless, it should be mentioned that a study performed by Viana Jr et al. (2021) has shown the connection between indulgence and earnings management. Moreover, it should be mentioned that Hofstede's cultural framework is not the only existing cultural framework. In fact, GLOBE cultural values are also an important cultural framework (Gray, 2015). To validate the results of this research even further, the cultural values of GLOBE could be taken into account as well. These values could, for example, be used as a robustness check since this provides alternative but relatively comparable proxies.

Future research, which should include the effect of the other four cultural dimensions, is required to establish a more accurate relationship between Hofstede's cultural dimensions and earnings management during the COVID-19 pandemic. Additionally, the effect of real earnings management should be considered as well since accrual-based earnings management is not the only technique to manage earnings. Hence, examining the effect of culture on real earnings management is of valuable importance.

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7 Appendix

TABLE 11: FULL BASIS MODEL RESULTS

Variables	AEM1 I	AEM1 II	AEM2 I	AEM2 II	AEM3 I	AEM3 II
IDV	0.057*** (0.006)	0.033*** (0.002)	0.056*** (0.004)	0.036*** (0.002)	0.055*** (0.006)	0.032*** (0.002)
UAI	0.044*** (0.005)	0.024*** (0.002)	0.034*** (0.003)	0.021*** (0.002)	0.042*** (0.005)	0.023*** (0.002)
SIZE	-0.010*** (0.001)	-0.005*** (0.000)	-0.010*** (0.001)	-0.006*** (0.000)	-0.010*** (0.001)	-0.005*** (0.000)
ROA	-0.137*** (0.001)	-0.063*** (0.000)	0.000 (0.001)	0.001 (0.000)	-0.138*** (0.001)	-0.067*** (0.000)
LEVERAGE	0.014*** (0.002)	0.008*** (0.001)	0.004*** (0.001)	0.004*** (0.001)	0.014*** (0.002)	0.008*** (0.001)
LOSS	-0.020*** (0.004)	-0.002 (0.001)	0.022*** (0.003)	0.011*** (0.001)	-0.019*** (0.004)	-0.003* (0.001)
ACCOMMODATION AND FOOD SERVICES	-0.056*** (0.018)	-0.027*** (0.006)	-0.045*** (0.011)	-0.026*** (0.006)	-0.058*** (0.018)	-0.028*** (0.006)
ADMINISTRATIVE AND SUPPORT AND WASTE MANAGEMENT AND REMEDIATION SERVICES	-0.010 (0.012)	0.001 (0.004)	0.004 (0.008)	0.005 (0.004)	-0.009 (0.012)	0.001 (0.004)
ARTS, ENTERTAINMENT, AND RECREATION	0.023 (0.023)	0.028*** (0.007)	0.001 (0.015)	0.004 (0.007)	0.022 (0.023)	0.027*** (0.007)
CONSTRUCTION	-0.005 (0.009)	0.005* (0.003)	0.013** (0.005)	0.010*** (0.003)	-0.007 (0.009)	0.005* (0.003)
FINANCE AND INSURANCE	0.010 (0.016)	0.010* (0.005)	0.017* (0.010)	0.016*** (0.005)	0.013 (0.016)	0.014*** (0.005)
HEALTH CARE AND SOCIAL ASSISTANCE	0.006	0.001	0.012	0.006	0.007	0.004

	(0.022)	(0.007)	(0.013)	(0.007)	(0.021)	(0.007)
INFORMATION	0.018***	0.014***	0.027***	0.014***	0.019***	0.014***
	(0.007)	(0.002)	(0.004)	(0.002)	(0.007)	(0.002)
MANUFACTURING	-0.005	-0.001	0.001	0.001	-0.008	-0.002
	(0.005)	(0.002)	(0.003)	(0.002)	(0.005)	(0.002)
MINING, QUARRYING, AND OIL AND GAS EXTRACTION	-0.015	-0.011	-0.013	-0.008	-0.016	-0.011
	(0.034)	(0.011)	(0.021)	(0.011)	(0.034)	(0.011)
PROFESSIONAL, SCIENTIFIC, AND TECHNICAL SERVICES	0.015**	0.008***	0.028***	0.011***	0.014**	0.007***
	(0.007)	(0.002)	(0.004)	(0.002)	(0.007)	(0.002)
REAL ESTATE AND RENTAL AND LEASING	0.009	0.012**	0.029***	0.018***	0.014	0.016***
	(0.015)	(0.005)	(0.010)	(0.005)	(0.015)	(0.005)
RETAIL TRADE	0.124***	0.018***	0.003	0.006*	0.123***	0.017***
	(0.010)	(0.003)	(0.006)	(0.003)	(0.010)	(0.003)
TRANSPORTATION AND WAREHOUSING	-0.006	0.000	0.003	0.004	-0.007	-0.000
	(0.011)	(0.004)	(0.007)	(0.003)	(0.011)	(0.003)
UTILITIES	0.000	-0.003	0.014**	0.001	-0.001	-0.006
	(0.011)	(0.004)	(0.007)	(0.003)	(0.011)	(0.004)
WHOLESALE TRADE	-0.003	0.005	0.001	0.003	-0.004	0.004
	(0.011)	(0.004)	(0.007)	(0.003)	(0.011)	(0.003)
2018	0.024***	0.014***	0.024***	0.015***	0.024***	0.013***
	(0.004)	(0.001)	(0.002)	(0.001)	(0.004)	(0.001)
2019	0.023***	0.012***	0.024***	0.014***	0.022***	0.012***
	(0.004)	(0.001)	(0.002)	(0.001)	(0.004)	(0.001)
2020	0.029***	0.018***	0.021***	0.017***	0.028***	0.017***
	(0.004)	(0.001)	(0.002)	(0.001)	(0.004)	(0.001)
2021	0.029***	0.018***	0.025***	0.017***	0.030***	0.018***
	(0.004)	(0.001)	(0.002)	(0.001)	(0.004)	(0.001)
AUSTRIA	0.044***	0.022***	0.061***	0.042***	0.043***	0.022***
	(0.016)	(0.005)	(0.010)	(0.005)	(0.016)	(0.005)

BELGIUM	-0.012 (0.011)	-0.008** (0.004)	0.011 (0.007)	-0.007** (0.003)	-0.017 (0.011)	-0.012*** (0.004)
CROATIA	0.020 (0.014)	0.004 (0.004)	0.016* (0.009)	0.005 (0.004)	0.022 (0.014)	0.006 (0.004)
DENMARK	0.016 (0.011)	0.007** (0.004)	0.012* (0.007)	0.010*** (0.003)	0.018 (0.011)	0.009** (0.004)
FINLAND	-0.008 (0.010)	0.003 (0.003)	-0.002 (0.006)	0.002 (0.003)	-0.008 (0.010)	0.003 (0.003)
FRANCE	-0.018*** (0.005)	-0.008*** (0.002)	-0.014*** (0.003)	-0.008*** (0.002)	-0.017*** (0.005)	-0.008*** (0.002)
GERMANY	0.013** (0.005)	0.009*** (0.002)	0.015*** (0.003)	0.008*** (0.002)	0.012** (0.005)	0.008*** (0.002)
GREECE	-0.039*** (0.008)	-0.018*** (0.002)	-0.032*** (0.005)	-0.019*** (0.002)	-0.038*** (0.008)	-0.017*** (0.002)
IRELAND	0.049*** (0.013)	0.026*** (0.004)	0.046*** (0.008)	0.029*** (0.004)	0.048*** (0.013)	0.024*** (0.004)
ITALY	-0.018*** (0.007)	-0.011*** (0.002)	-0.023*** (0.004)	-0.013*** (0.002)	-0.017** (0.007)	-0.010*** (0.002)
LITHUANIA	-0.010 (0.026)	0.000 (0.008)	-0.013 (0.016)	-0.001 (0.008)	-0.009 (0.026)	-0.001 (0.008)
LUXEMBOURG	0.007 (0.023)	0.000 (0.007)	-0.006 (0.015)	-0.004 (0.007)	0.008 (0.023)	0.001 (0.007)
POLAND	0.032*** (0.006)	0.007*** (0.002)	0.001 (0.004)	0.000 (0.002)	0.033*** (0.006)	0.007*** (0.002)
ROMANIA	0.027* (0.015)	0.023*** (0.005)	0.020** (0.009)	0.017*** (0.004)	0.026* (0.015)	0.022*** (0.005)
SPAIN	0.006 (0.009)	0.002 (0.003)	-0.003 (0.005)	0.001 (0.003)	0.006 (0.009)	0.003 (0.003)
SWEDEN	-0.003 (0.006)	0.003* (0.002)	0.001 (0.004)	0.003 (0.002)	-0.004 (0.006)	0.003 (0.002)
THE NETHERLANDS	-0.002	0.000	0.003	0.000	-0.002	0.001

	(0.011)	(0.003)	(0.007)	(0.003)	(0.011)	(0.003)
CONST	0.105***	0.061***	0.094***	0.064***	0.104***	0.061***
	(0.007)	(0.002)	(0.004)	(0.002)	(0.007)	(0.002)
R-squared	0.590		0.109		0.592	
R-squared Adj.	0.588		0.105		0.590	

The heteroscedasticity consistent standard errors are presented within parenthesis underneath the coefficient

*, **, *** denote the significance level at 10%, 5% and 1% level respectively

I represents OLS regression and II represents the robust regression

TABLE 12 FULL MAIN MODEL RESULTS

Variables	AEM1 I	AEM1 II	AEM2 I	AEM2 II	AEM3 I	AEM3 II
IDV	0.058*** (0.008)	0.033*** (0.003)	0.058*** (0.005)	0.035*** (0.003)	0.057*** (0.008)	0.032*** (0.003)
UAI	0.040*** (0.006)	0.023*** (0.002)	0.035*** (0.004)	0.020*** (0.002)	0.039*** (0.006)	0.023*** (0.002)
COVID	0.041** (0.017)	0.025*** (0.006)	0.043*** (0.011)	0.024*** (0.005)	0.042** (0.017)	0.027*** (0.005)
IDV*COVID	-0.035 (0.037)	-0.017 (0.012)	-0.040* (0.023)	-0.013 (0.011)	-0.038 (0.037)	-0.021* (0.012)
UAI*COVID	-0.005 (0.019)	-0.009 (0.006)	-0.021* (0.012)	-0.009 (0.006)	-0.005 (0.019)	-0.009 (0.006)
SIZE	-0.010*** (0.001)	-0.005*** (0.000)	-0.010*** (0.001)	-0.006*** (0.000)	-0.010*** (0.001)	-0.005*** (0.000)
ROA	-0.137*** (0.001)	-0.063*** (0.000)	0.000 (0.001)	0.001 (0.000)	-0.138*** (0.001)	-0.067*** (0.000)
LEVERAGE	0.014*** (0.002)	0.008*** (0.001)	0.004*** (0.001)	0.004*** (0.001)	0.014*** (0.002)	0.008*** (0.001)
LOSS	-0.020*** (0.004)	-0.002 (0.001)	0.023*** (0.003)	0.011*** (0.001)	-0.019*** (0.004)	-0.003* (0.001)
ACCOMMODATION AND FOOD SERVICES	-0.057*** (0.018)	-0.027*** (0.006)	-0.045*** (0.011)	-0.026*** (0.006)	-0.058*** (0.018)	-0.028*** (0.006)
ADMINISTRATIVE AND SUPPORT AND WASTE MANAGEMENT AND REMEDIATION SERVICES	-0.010 (0.012)	0.001 (0.004)	0.004 (0.008)	0.005 (0.004)	-0.010 (0.012)	0.001 (0.004)
ARTS, ENTERTAINMENT, AND RECREATION	0.022 (0.023)	0.027*** (0.007)	0.001 (0.015)	0.003 (0.007)	0.022 (0.023)	0.026*** (0.007)

CONSTRUCTION	-0.006	0.005*	0.013**	0.009***	-0.007	0.004
	(0.009)	(0.003)	(0.005)	(0.003)	(0.009)	(0.003)
FINANCE AND INSURANCE	0.010	0.010*	0.017	0.016***	0.013	0.013***
	(0.016)	(0.005)	(0.010)	(0.005)	(0.016)	(0.005)
HEALTH CARE AND SOCIAL ASSISTANCE	0.005	0.001	0.012	0.006	0.007	0.004
	(0.022)	(0.007)	(0.013)	(0.007)	(0.021)	(0.007)
INFORMATION	0.018***	0.014***	0.027***	0.014***	0.019***	0.014***
	(0.007)	(0.002)	(0.004)	(0.002)	(0.007)	(0.002)
MANUFACTURING	-0.006	-0.001	0.001	0.000	-0.008	-0.002
	(0.005)	(0.002)	(0.003)	(0.002)	(0.005)	(0.002)
MINING, QUARRYING, AND OIL AND GAS EXTRACTION	-0.016	-0.011	-0.014	-0.009	-0.016	-0.011
	(0.034)	(0.011)	(0.021)	(0.011)	(0.034)	(0.011)
PROFESSIONAL, SCIENTIFIC, AND TECHNICAL SERVICES	0.015**	0.008***	0.028***	0.010***	0.014**	0.007***
	(0.007)	(0.002)	(0.004)	(0.002)	(0.007)	(0.002)
REAL ESTATE AND RENTAL AND LEASING	0.009	0.012**	0.028***	0.018***	0.014	0.016***
	(0.015)	(0.005)	(0.010)	(0.005)	(0.015)	(0.005)
RETAIL TRADE	0.124***	0.017***	0.003	0.005*	0.123***	0.017***
	(0.010)	(0.003)	(0.006)	(0.003)	(0.010)	(0.003)
TRANSPORTATION AND WAREHOUSING	-0.006	0.000	0.003	0.004	-0.007	-0.000
	(0.011)	(0.004)	(0.007)	(0.003)	(0.011)	(0.003)
UTILITIES	0.000	-0.004	0.014*	0.001	-0.001	-0.006
	(0.011)	(0.004)	(0.007)	(0.003)	(0.011)	(0.004)
WHOLESALE TRADE	-0.003	0.005	0.001	0.003	-0.004	0.003
	(0.011)	(0.004)	(0.007)	(0.003)	(0.011)	(0.003)
2018	0.030***	0.017***	0.024***	0.019***	0.030***	0.016***
	(0.008)	(0.003)	(0.005)	(0.003)	(0.008)	(0.003)
2019	0.029***	0.016***	0.024***	0.018***	0.027***	0.015***
	(0.008)	(0.003)	(0.005)	(0.003)	(0.008)	(0.003)
2020	0.020**	0.013***	0.019***	0.012***	0.020**	0.013***

	(0.009)	(0.003)	(0.006)	(0.003)	(0.009)	(0.003)
2021	0.021**	0.013***	0.023***	0.012***	0.022**	0.014***
	(0.009)	(0.003)	(0.006)	(0.003)	(0.009)	(0.003)
AUSTRIA	0.043***	0.022***	0.060***	0.041***	0.042***	0.021***
	(0.016)	(0.005)	(0.010)	(0.005)	(0.016)	(0.005)
BELGIUM	-0.009	-0.006	0.016**	-0.005	-0.014	-0.009**
	(0.012)	(0.004)	(0.007)	(0.004)	(0.012)	(0.004)
CROATIA	0.016	0.002	0.012	0.003	0.017	0.003
	(0.014)	(0.005)	(0.009)	(0.004)	(0.014)	(0.004)
DENMARK	0.015	0.006	0.010	0.009**	0.017	0.008**
	(0.011)	(0.004)	(0.007)	(0.003)	(0.011)	(0.004)
FINLAND	-0.008	0.003	-0.002	0.001	-0.008	0.002
	(0.010)	(0.003)	(0.006)	(0.003)	(0.010)	(0.003)
FRANCE	-0.016***	-0.007***	-0.011***	-0.006***	-0.015**	-0.006***
	(0.006)	(0.002)	(0.004)	(0.002)	(0.006)	(0.002)
GERMANY	0.014***	0.009***	0.015***	0.008***	0.012**	0.009***
	(0.005)	(0.002)	(0.003)	(0.002)	(0.005)	(0.002)
GREECE	-0.041***	-0.018***	-0.033***	-0.019***	-0.040***	-0.017***
	(0.008)	(0.003)	(0.005)	(0.002)	(0.008)	(0.003)
IRELAND	0.048***	0.025***	0.045***	0.027***	0.047***	0.023***
	(0.013)	(0.004)	(0.008)	(0.004)	(0.013)	(0.004)
ITALY	-0.016**	-0.010***	-0.020***	-0.012***	-0.014**	-0.008***
	(0.007)	(0.002)	(0.004)	(0.002)	(0.007)	(0.002)
LITHUANIA	-0.011	-0.000	-0.014	-0.002	-0.009	-0.002
	(0.026)	(0.008)	(0.016)	(0.008)	(0.026)	(0.008)
LUXEMBOURG	0.007	0.000	-0.006	-0.004	0.007	0.001
	(0.023)	(0.007)	(0.015)	(0.007)	(0.023)	(0.007)
POLAND	0.033***	0.008***	0.003	0.001	0.034***	0.008***
	(0.006)	(0.002)	(0.004)	(0.002)	(0.006)	(0.002)

ROMANIA	0.023 (0.015)	0.021*** (0.005)	0.016* (0.009)	0.015*** (0.005)	0.022 (0.015)	0.020*** (0.005)
SPAIN	0.005 (0.009)	0.002 (0.003)	-0.004 (0.005)	0.001 (0.003)	0.005 (0.009)	0.002 (0.003)
SWEDEN	-0.004 (0.006)	0.002 (0.002)	-0.001 (0.004)	0.002 (0.002)	-0.005 (0.006)	0.002 (0.002)
THE NETHERLANDS	-0.000 (0.011)	0.001 (0.003)	0.004 (0.007)	0.001 (0.003)	0.000 (0.011)	0.002 (0.003)
CONST	0.100*** (0.007)	0.058*** (0.002)	0.091*** (0.004)	0.061*** (0.002)	0.099*** (0.007)	0.058*** (0.002)
R-squared	0.590		0.110		0.593	
R-squared Adj.	0.588		0.105		0.590	

The heteroscedasticity consistent standard errors are presented within parenthesis underneath the coefficient

*, **, *** denote the significance level at 10%, 5% and 1% level respectively

I represents OLS regression and II represents the robust regression

TABLE 13 FULL ADDITIONAL MODEL RESULTS

Variables	AEM1 I	AEM1 II	AEM2 I	AEM2 II	AEM3 I	AEM3 II
IDV	0.052*** (0.008)	0.029*** (0.002)	0.051*** (0.005)	0.031*** (0.002)	0.051*** (0.008)	0.029*** (0.002)
UAI	0.019*** (0.005)	0.012*** (0.002)	0.016*** (0.003)	0.010*** (0.001)	0.018*** (0.005)	0.011*** (0.002)
COVID	0.038** (0.017)	0.024*** (0.005)	0.040*** (0.011)	0.022*** (0.005)	0.039** (0.017)	0.025*** (0.005)
IDV*COVID	-0.035 (0.037)	-0.017 (0.012)	-0.040* (0.023)	-0.013 (0.011)	-0.038 (0.037)	-0.021* (0.012)
UAI*COVID	-0.005 (0.019)	-0.009 (0.006)	-0.021* (0.012)	-0.009 (0.006)	-0.005 (0.019)	-0.009 (0.006)
SIZE	-0.010*** (0.001)	-0.005*** (0.000)	-0.010*** (0.001)	-0.006*** (0.000)	-0.010*** (0.001)	-0.005*** (0.000)
ROA	-0.137*** (0.001)	-0.063*** (0.000)	0.000 (0.001)	0.001 (0.000)	-0.138*** (0.001)	-0.067*** (0.000)
LEVERAGE	0.014*** (0.002)	0.008*** (0.001)	0.004*** (0.001)	0.004*** (0.001)	0.014*** (0.002)	0.008*** (0.001)
LOSS	-0.020*** (0.004)	-0.002 (0.001)	0.023*** (0.003)	0.011*** (0.001)	-0.019*** (0.004)	-0.003* (0.001)
MAS	0.040*** (0.007)	0.019*** (0.002)	0.038*** (0.004)	0.023*** (0.002)	0.040*** (0.007)	0.019*** (0.002)
PDI	0.018*** (0.006)	0.010*** (0.002)	0.008** (0.004)	0.004** (0.002)	0.017*** (0.006)	0.010*** (0.002)
LTO	0.021*** (0.007)	0.014*** (0.002)	0.027*** (0.004)	0.016*** (0.002)	0.020*** (0.007)	0.013*** (0.002)
ACCOMMODATION AND FOOD SERVICES	-0.058*** (0.018)	-0.027*** (0.006)	-0.046*** (0.011)	-0.027*** (0.006)	-0.059*** (0.018)	-0.028*** (0.006)
ADMINISTRATIVE AND SUPPORT AND WASTE MANAGEMENT AND REMEDIATION SERVICES	-0.011	0.001	0.003	0.004	-0.010	0.001

	(0.012)	(0.004)	(0.008)	(0.004)	(0.012)	(0.004)
ARTS, ENTERTAINMENT, AND RECREATION	0.021	0.027***	0.000	0.003	0.021	0.026***
	(0.023)	(0.007)	(0.015)	(0.007)	(0.023)	(0.007)
CONSTRUCTION	-0.007	0.005*	0.012**	0.009***	-0.008	0.004
	(0.009)	(0.003)	(0.005)	(0.003)	(0.009)	(0.003)
FINANCE AND INSURANCE	0.009	0.010*	0.016	0.016***	0.012	0.013**
	(0.016)	(0.005)	(0.010)	(0.005)	(0.016)	(0.005)
HEALTH CARE AND SOCIAL ASSISTANCE	0.005	0.001	0.011	0.005	0.006	0.003
	(0.022)	(0.007)	(0.013)	(0.007)	(0.021)	(0.007)
INFORMATION	0.017***	0.013***	0.026***	0.013***	0.018***	0.013***
	(0.007)	(0.002)	(0.004)	(0.002)	(0.007)	(0.002)
MANUFACTURING	-0.007	-0.001	0.000	0.000	-0.009*	-0.003*
	(0.005)	(0.002)	(0.003)	(0.002)	(0.005)	(0.002)
MINING, QUARRYING, AND OIL AND GAS EXTRACTION	-0.016	-0.012	-0.014	-0.009	-0.017	-0.012
	(0.034)	(0.011)	(0.021)	(0.011)	(0.034)	(0.011)
PROFESSIONAL, SCIENTIFIC, AND TECHNICAL SERVICES	0.014**	0.008***	0.027***	0.010***	0.013*	0.006***
	(0.007)	(0.002)	(0.004)	(0.002)	(0.007)	(0.002)
REAL ESTATE AND RENTAL AND LEASING	0.008	0.011**	0.028***	0.017***	0.013	0.015***
	(0.015)	(0.005)	(0.010)	(0.005)	(0.015)	(0.005)
RETAIL TRADE	0.123***	0.017***	0.002	0.005	0.122***	0.017***
	(0.010)	(0.003)	(0.006)	(0.003)	(0.010)	(0.003)
TRANSPORTATION AND WAREHOUSING	-0.007	-0.000	0.002	0.003	-0.008	-0.001
	(0.011)	(0.004)	(0.007)	(0.003)	(0.011)	(0.003)
UTILITIES	-0.001	-0.004	0.013*	0.001	-0.002	-0.006*
	(0.011)	(0.004)	(0.007)	(0.003)	(0.011)	(0.004)
WHOLESALE TRADE	-0.004	0.004	-0.000	0.002	-0.005	0.003
	(0.011)	(0.004)	(0.007)	(0.003)	(0.011)	(0.003)

2018	0.025*** (0.009)	0.014*** (0.003)	0.020*** (0.005)	0.016*** (0.003)	0.025*** (0.008)	0.014*** (0.003)
2019	0.024*** (0.009)	0.013*** (0.003)	0.020*** (0.005)	0.015*** (0.003)	0.023*** (0.009)	0.012*** (0.003)
2020	0.019** (0.009)	0.012*** (0.003)	0.018*** (0.006)	0.011*** (0.003)	0.019** (0.009)	0.012*** (0.003)
2021	0.019** (0.009)	0.012*** (0.003)	0.022*** (0.006)	0.011*** (0.003)	0.020** (0.009)	0.013*** (0.003)
AUSTRIA	0.033** (0.013)	0.018*** (0.004)	0.048*** (0.008)	0.034*** (0.004)	0.033** (0.013)	0.017*** (0.004)
BELGIUM	-0.016 (0.011)	-0.011*** (0.004)	0.009 (0.007)	-0.009*** (0.004)	-0.021* (0.011)	-0.013*** (0.004)
CROATIA	0.013 (0.014)	-0.000 (0.004)	0.010 (0.009)	0.003 (0.004)	0.014 (0.014)	0.001 (0.004)
DENMARK	0.026** (0.011)	0.012*** (0.004)	0.021*** (0.007)	0.015*** (0.003)	0.028** (0.011)	0.013*** (0.003)
FINLAND	0.003 (0.010)	0.009*** (0.003)	0.008 (0.006)	0.008** (0.003)	0.002 (0.010)	0.008** (0.003)
FRANCE	-0.017*** (0.006)	-0.008*** (0.002)	-0.011*** (0.004)	-0.006*** (0.002)	-0.016*** (0.006)	-0.007*** (0.002)
GERMANY	0.000 (0.006)	0.001 (0.002)	-0.000 (0.004)	-0.002 (0.002)	-0.001 (0.006)	0.002 (0.002)
GREECE	-0.039*** (0.008)	-0.017*** (0.002)	-0.031*** (0.005)	-0.018*** (0.002)	-0.038*** (0.008)	-0.016*** (0.002)
IRELAND	0.041*** (0.012)	0.023*** (0.004)	0.039*** (0.008)	0.024*** (0.004)	0.040*** (0.012)	0.021*** (0.004)
ITALY	-0.026*** (0.007)	-0.015*** (0.002)	-0.030*** (0.004)	-0.018*** (0.002)	-0.024*** (0.007)	-0.013*** (0.002)
LITHUANIA	-0.007 (0.023)	0.000 (0.007)	-0.012 (0.015)	-0.001 (0.007)	-0.005 (0.023)	-0.001 (0.007)

LUXEMBOURG	0.003 (0.023)	-0.002 (0.007)	-0.010 (0.014)	-0.007 (0.007)	0.004 (0.023)	-0.001 (0.007)
POLAND	0.030*** (0.006)	0.007*** (0.002)	0.003 (0.004)	0.001 (0.002)	0.030*** (0.006)	0.007*** (0.002)
ROMANIA	0.019 (0.014)	0.018*** (0.004)	0.015* (0.009)	0.015*** (0.004)	0.018 (0.014)	0.017*** (0.004)
SPAIN	0.008 (0.008)	0.004 (0.003)	0.000 (0.005)	0.003 (0.003)	0.008 (0.008)	0.004 (0.003)
SWEDEN	0.007 (0.006)	0.007*** (0.002)	0.009** (0.004)	0.007*** (0.002)	0.006 (0.006)	0.007*** (0.002)
THE NETHERLANDS	0.008 (0.011)	0.005 (0.003)	0.011* (0.007)	0.005 (0.003)	0.009 (0.011)	0.005 (0.003)
CONST	0.087*** (0.006)	0.051*** (0.002)	0.079*** (0.004)	0.054*** (0.002)	0.086*** (0.006)	0.051*** (0.002)
R-squared	0.590		0.110		0.593	
R-squared Adj.	0.588		0.105		0.590	

The heteroscedasticity consistent standard errors are presented within parenthesis underneath the coefficient

*, **, *** denote the significance level at 10%, 5% and 1% level respectively

I represents OLS regression and II represents the robust regression