Do cultural differences affect the quality of financial reporting in the EU? An analysis of Western EU countries vis a vis Eastern EU countries.

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ABSTRACT

- **Purpose**

This study examines the impact of national culture on classification shifting in Eastern European Member States of EU (EEU) vis a vis the Western Member States of EU (WEU). The EEU provides a unique sample to study the quality of financial reporting that we measure with classification shifting given that for more than five decades they were following the model of a centrally planned economy, where market-based financial reporting was absent. Yet, the EEU transitioned to a market-based economy and completed its accession to the EU.

- **Design/methodology/approach**

We employ a panel data set of firm year observations from 1996 and 2020 that covers the full transition of EEU. Our empirical analysis is based on fixed effects panel regression analysis where we report a plethora of identifications.

- **Findings**

Our study finds classification shifting in the EEU countries since their transition to the market-based economy, though they have no long record of market-based financial reporting. Our study also notices that cultural factors are associated with classification shifting across all Member States of the EU. We further examine the impact of interactions between cultural characteristics and special items and reveal variability between WEU and EEU. As part of the robustness analysis, we also test the impact of culture on real earnings management measures for both WEU vs EEU confirming the variability of the impact of culture on earnings management.

- **Originality**

This is the first study, to the best of our knowledge, that sheds light on the impact of national culture on classification shifting in EEU of EU vis a vis the "old" WEU of EU.

- **Research limitations/implications**

Future research could explore the role of religion differences in WEU vis a vis EEU states as they are also subject to cultural differences.

- **Practical implications**

The findings are important for regulators, external monitors, and investors, as they show that cultural factors affect earnings management with some variability across countries in the EU, and they should be acknowledged in policy making.

Keywords: Culture; Classification Shifting; Eastern European Countries; Financial Reporting; Real Earnings Management.

JEL: G3, M41, O52, P2

1. INTRODUCTION

Over the past decades, the process of integration pursued by the European Union (EU) aimed to create a unique economic and political union of western and eastern countries. A wider literature on this process has investigated different aspects of the alignment of economic and political development and democratic approach among different European countries (Persson & Tabellini, 2009; Schmidt, 2019). The dichotomy of Western European Countries (WEU) and Eastern European countries (EEU) has open rooms for management and accounting research on the implication of EEU countries institutional factors change and adaptation to WEU countries in management and accounting practices (Acemoglu et al., 2005; Albu et al., 2020, Mueller & Peev, 2007). The deepening and widening integration process has been pushed by the promotion of certain values among the European Countries with the acknowledgment of the historical differences between WEU and EEU countries. Researchers consider cultural values to be relatively stable societal characteristics (e.g., Inglehart & Baker, 2000; Schwartz, 2006). However, recent research has ascertained that under the considerable amounts of EU reforms initial cultural distance between the founders' average values and the countries acquiring membership has decreased (Akaliyski, 2019).

The influence of how cultural differences in societal groups and values affect the managers' behaviours in manipulating the accounting information (Boahen and Mamatzakis, 2020; Desender et al., 2011; Han et al., 2010; Nguyen et al., 2021) has been widely investigated, using cross countries analysis, including the EU. However, to the best of our knowledge, we find no evidence of research on the different cultural features and its evolution between WEU and the EEU countries on the management attitude to earning management.

This paper provides new international evidence on the impact of national culture on the classification shifting in the EU. Specifically, our research examines whether there are differences in classification shifting between the WEU and the EEU.

The use of classification shifting in our research is justified by its specific characteristics. Classification shifting is distinct from abnormal earnings management and real earnings management (REM) (McVay, 2006). This form of earnings management involves the shifting of individual components of the income statement that are intended to be useful to the investors. The result of this manipulation will not change the GAAP earnings and reduce future (or past) period earnings, as it happens with discretionary accruals and REM (Cohen & Zarowin, 2010; Jarvinen & Myllymaki, 2016; Kothari et al., 2016; Roychowdhury, 2006). Indeed, classification shifting does not involve actions for providing accruals from other periods or selling assets near the end of the year. This is different from abnormal accrual and REM methods. Abnormal accrual consists in the manipulation of earnings management through estimation and accounting methods that have no direct impact on cash flow while real earnings management is to manipulate earnings through operational activities that directly affect cash flow (Sun & Lan, 2014).

Leaving unchanged the GAAP net income, the classification shifting is less detectable by auditors and regulators for the subjectivity of the accounting assumptions applied for the classification of the items (McVay, 2006), making it a desirable tool for engaging in earnings management (Nelson et al., 2002). Additionally, accounting research showed classification shifting has become more pervasive in the post-IFRS era because of less strict regulations (Zalata & Roberts, 2017). The introduction of the IFRS in the EU and the reforms related with a high-quality investor protection environment (audit standards) have aligned the European countries and open more opportunities to manipulate earnings with classification shifting. In this context of regulatory alignment and higher opportunities of core earnings manipulations, it appears relevant to investigate whether the countries cultural differences play a role on the management decision to apply classifications shifting.

Our empirical examination is focused on the role of culture on classification shifting in EEU, where the culture has been influenced by decades of centrally planned economy and communist values, vis a vis WEU.

The context of the analysis is of a particular interest from the cultural point of view. The EEU have had significant progress towards their convergence to the EU[1], following a timely and laborious process of reforms that included also specific requirements for their underlying national statistical and financial reporting. This process is still an on-going and subject to certain challenges, mostly related to institutional heterogeneity between the WEU and EEU (Albu et al., 2020) which is interrelated with the differences in cultural values (Albu et al., 2020; Eder et al., 2017; Nguyen et al., 2021). This paper follows from previous studies regarding the importance of culture for EEU (Albu et al., 2020; Eder et al., 2017) and proposes to examine whether they explain earnings management in the form of classification shifting and real earnings management as a robustness analysis.

Our research builds a panel of cross-country data set with both culture and earnings management variables. We follow the seminal study of Han et al. (2010) that investigated how managers' earnings discretions relates to their value system (i.e., culture). Han et al. (2010) applied Gray's (1988) model of accounting values based on Hofstede's (1980) societal values, which are identified in individualism, uncertainty avoidance, power distance, masculinity. They analysed the difference between the U.S and non-U.S. companies and their findings showed that uncertainty avoidance and individualism dimensions of national culture are, respectively, negatively, and positively associated with earnings manipulation' behaviours. They extended Guan et al. (2005), which used firm-level data in 5 Asian-Pacific countries to evaluate the association between Hofstede's (1980) cultural dimensions' variables and discretionary

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[1] They overcame their recession in the early 1990's, created by their political and economic transformation after the fall of the Berlin Wall, that paved the way to market-based economy and to their accession to the EU.

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accruals. Following the same framework, the main literature on the influence of cultural dimensions on earnings management manipulation reports conflicting results (Kim et al., 2017; Paredes & Wheatley, 2017). Interestingly, concerning the WEU and EEU countries, no such study exists in the literature. Furthermore, the literature on earnings management and cultural dimensions is very limited (i.e., Desender et al., 2011) and without due cognisance of classification shifting.

Although prior cross-countries studies have demonstrated the differences in engaging in earnings management, accrual-based and REM (i.e., Leuz et al., 2003), only a few of them have analysed the extent of classification shifting (Behn et al., 2013; Haw et al., 2011). There are some cross-countries studies that research classification shifting with institutional features with Behn et al. (2013) showing that classification shifting is negatively affected by string investor protection, and Haw et al. (2011) revealed that classification shifting behaviour is associated with code law countries. However, we do not have knowledge of classification shifting investigated at the EU level and within it.

In order to explore the causal effects of countries' cultural dimensions on classification shifting, we take advantage of the fact that the EEU form a unique sample of countries that shared distinct culture values that depart from WEU. Most countries of the EEU are former members of the East European block and individualism was not a shared cultural value. Clearly, after historical events such as the collapse of Berlin wall and what followed, those countries switched to pro-western cultural values while they adopted reforms in financial reporting, legal institutions, and corporate governance. Despite those reforms, it is of interest to investigate whether there is variability in certain cultural characteristics in EEU vis a vis WEU. In addition, the EEU show a mix of historical and cultural influences with the presence of Western individualistic philosophies, geographical and political factors that have encouraged collectivism (Varnum et al., 2008). Therefore, the EEU provide a most noteworthy contrast to

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WEU. The efforts in transforming East Europe's governance and institutional practices have created a heterogeneous picture in recent times. These institutional changes have inevitably altered the countries' cultural dimensions; although these aspects are certainly apt for reducing the previous cultural approach produced by the paternalistic character of the regime, it will take time to align these countries to the WEU's culture of open markets. Moreover, these countries' reforms and development are regularly instrumentalized for political purposes or are otherwise subject to political influence in the way they are implemented (Haselmann et al., 2010). Therefore, we test how the cultural dimensions are transmitted to the private sector and affect managers' behaviour.

Our study applies Hofstede's model (1980, 2001) of the cultural dimensions to explain the implication of individualism, uncertainty avoidance, masculinity, and power distance on the classification shifting in the EU's market. Cross cultural research has been deeply informed using Hofstede model because of its "clarity, parsimony, and resonance with managers" (Kirkman et al., 2006, p. 286). However, several studies have questioned the applicability of Hofstede's cultural value scores, pointing out as major criticism the failure of the model in capturing the change of culture over time (Kirkman et al., 2006; Tang & Koveos, 2008). Inspired by Hofstede et al. (2010) and according to Beugelsdjik and Welzel (2018)'s approach, we use World Value Survey (WVS) 's waves data to capture the cultural dimensions of the EU countries. Furthermore, our study introduces Hofstede's "long-term orientation" dimension (Hofstede, 2010), which has been neglected in the previous analyses of the effects of cultural dimensions and earnings manipulation.

The data employed for the measurements of the classification shifting and other proxies of earnings management have been collected from Compustat Global Database. The data set includes 79,570 firm-year observations for the period from 1996 to 2020 across all European

countries (EU28). Our analysis is in line with prior studies (Behn et al., 2013), with a minimum of 10 firm-year observations used to estimate abnormal core earnings.

In terms of results, our study highlights a positive relationship between classification shifting and special items confirming the existence of misclassification both in WEU and EEU. To this end, it appears that the EEU countries have been catching up in terms of earnings management behaviours using the classification shifting.

When considering cultural factors, it appears evident how some cultural differences are still alive and the two blocs that are part of the EU, EEU and WEU, and they affect the manager's manipulation behaviours. Although masculinity and power distance showed the same impact on both the EU blocs analysed, due to the strict regulatory environment of the market and the application of IFRS, the cultural dimensions of uncertainty avoidance and independence differentiate the two blocs in their approach to the earnings management. The different level of acceptance of the uncertainty avoidance in the EEU, driven by years of regime and higher level of hierarchy with a strong control of all the aspect of social life, has a negative relation with the classification shifting (positive for the WEU), showing how the fear of the uncertainty act as a deterrent to manipulate the accounting figures. The same result has been found in relation with the independence where the relationship is negative with the earnings manipulation in EEU. This is the mirror of the lasting presence of the culture of "obshchina" (meaning community that entails solidarity across all community members, Kuchma, 2003), which enhances the awareness of the manager on the damage that earnings manipulation could bring on the firm, the efficiency of the market and the society at large.

We provide also additional evidence expanding earnings management measurement to include REM.

The paper proceeds as follows. Section 2 discuss the main studies on the earnings management, classification shifting and cultural values with the developed hypothesis

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contextualized for EEU; section 3 describes data, sample selection, and descriptive statistics and section 4 provides research design and discusses empirical methodology. Section 5 discusses empirical results. Section 6 presents robustness checks and section 7 offers the conclusion.

2. Literature Review and Hypotheses

2.1 Earnings management and culture values

Leuz et al. (2003) established the existence of the negative relationship between earnings management and countries' institutional factors, with the level of investor rights, based on firm-level data in 31 countries. Fernandes and Ferreira (2007) repeated the study by Leuz et al. (2003) with an analysis based on firm-level data in 47 countries, and their findings affirm that the accruals-based earnings management in a country is influenced by specific firm-level characteristics. Their research noted that external financing and firm valuation are negatively related to proxies for accruals-based earnings management.

The significance of the country's specific factors in the field of research on earnings management opened room for research on the effects of national culture on the company's behaviour and capital markets. Several studies have noted the implication of countries' cultural features on the financing choices (Fan et al., 2008), on the merger and acquisition (Ahern et al., 2015), and on corporate risk-taking approach (Li et al., 2013). These findings, confirm the interrelationship between a country's institutional factors and culture (Hutchings & Michailova, 2006) with people's behaviours shaped by their national cultural dimensions. Accordingly, managers' attitude toward specific practices "reflects the cultural values of the society in which they live and work" (Paredes & Wheatley, 2017, p. 43). Managers' opportunistic behaviours are reflected in the use of different earnings manipulation activities in financial reporting (Kim & Park, 2014). Most of the accounting literature on interrelationship between earnings

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management and national culture has focused on two main categories of accrual manipulation: discretionary accruals and REM (Healy & Wahlen, 1999). The discretionary accruals occur when managers manipulate the company's earnings by using the accounting discretion allowed under accounting standards (Jackson, 2018). The REM involves decisions on the timing and the structure of the earnings-related to actual business activities, such as R&D or advertising expense, aiming to meet current-period financial reporting targets (Cohen et al., 2020; Zang, 2012).

The accounting research has widely investigated how the management decision to manipulate earnings is affected by cultural differences (Guan et al., 2005; Leuz et al., 2003). This stream of the literature has rooted on the Hofstede's cultural model which defines culture as "the collective programming of the mind which distinguishes the members of one human group from another" (Hofstede, 1980, p. 25) [2].

The model developed in 1980 identifies power distance, individualism, uncertainty avoidance, masculinity and long-term orientations as cultural dimensions which characterize the culture of different countries (Hofstede, 1980; Hofstede et al., 2010).[3]

The degree of acceptance of inequality or equality in a country, organization, and institution has been measured by Hofstede with the cultural dimension known as power distance. Individualism versus collectivism is the cultural dimension used by Hofstede to measure the degree to which people are assimilated into societal groups or interpersonal

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[2] The cultural dimensions' model provides a quantitative score for each of the cultural variables identified by Hofstede (2010). Based on Hofstede's model, Gray (1988) developed a framework that classifies the different accounting practices based on cultural differences within countries – what he terms "national" accounting systems. This framework, subsequently expanded by Doupnik and Tsakumis (2004), uses Hofstede's (1980) societal values to identify system of accounting values that influence the accounting practices and outcome. Gray's (1988) model has been used to explain how the cultural differences may influence the outcome and the behaviours of accounting players, and their attitude to apply the same set of rules in different ways.

[3] The model was built on the analysis of a survey of employees' attitudes in all subsidiaries of IBM using 117 questionnaires in 40 countries. Subsequently, Hofstede (1991) applied the survey in 10 countries and three regional groupings of countries, not previously included in his cultural model. The new investigation led to the introduction of a new cultural variable, known as long-term orientation, which was identified as specific dimension revealed in the survey of Chinese employees and managers (Hofstede et al., 2010).

relationships. Hofstede's uncertainty avoidance dimension refers to the country's attitude to tolerate uncertain and ambiguous situations. The cultural dimension of masculinity measures the presence of the traditional role of male in a society. The distribution of power, control, and success between genders and the acceptance of predominance of the male and female role characterized by specific stereotypes will affect the cultural model enforced in a country. Long-time is a universal value that relates to how we see the influence of the past, present and future in our life: how far we plan; how quickly we expect our result and rewards; how important we consider saving and spending, etc. (Hofstede et al., 2010).

In accordance with this framework, Han et al. (2010) investigated the managers' discretional behaviour in manipulating a company's accruals and how it relates to their value system (i.e., culture). They analysed the difference between U.S and non-U.S. companies, and their findings showed that uncertainty avoidance and individualism dimensions of national culture are, respectively, negatively and positively associated with earnings manipulation' behaviours. Using a firm-level data in 5 Asian-Pacific countries, they expand the literature on cultural differences implications on the earnings management, following Guan et al. (2005) attempt of evaluating the relationship between the use of discretionary accruals and the cultural dimensions, as identified in Hofstede's model (1980). Their findings affirm a negative relationship between individualism, uncertainty avoidance, and discretionary accruals. In a related study on 49 countries, Callen et al. (2011) find that individualism is positively related to earnings management and that uncertainty avoidance has a negative relationship with accruals manipulation. Another cross-country analysis (Kim et al., 2017), using a sample of 38 countries, observe that higher levels of uncertainty avoidance, individualism, and power distance are associated with fewer earnings manipulation's behaviours, while higher levels of masculinity lead the managers to engage in more earnings management. Paredes and Wheatley (2017) extended the literature regarding the interrelationships between national culture and

REM for emerging countries, revealing a negative association between REM and Hofstede's (1980) measures of individualism, masculinity, and uncertainty avoidance, but a positive association with power distance. This interest on the implication of Hofstede's cultural dimensions has been concentrated mainly on abnormal accruals and REM behaviour, with only few studies related with classification shifting (Boahen and Mamatzakis 2021). These studies are mainly related with USA and with developed countries where the institutional factors seem to enhance the use of classifications shifting. As for today, there are no studies applying the Hofstede's model to the WEU and EEU to evaluate how their historical differences are still mirrored in the diverse management behaviours related with classifications shifting. This is the aim of this study. Based on the acknowledgement that the EEU integration process has inevitably flattened the difference in the institutional factors among the countries part of the Union, the analysis of the Hofstede's dimensions on the management behaviours appears to be significant for understanding if the integration has happened also at cultural level. Additionally, the use of the classification shifting in this context is justified by the implications of the harmonization process in term of financial statements with the application of IFRS which open different opportunities to manage the core earnings and without changing the final figures of the Income statements as for the accrual and REM (Zalata & Roberts, 2017).

2.2 Cultural values in Eastern European Countries and hypothesis developments

National culture shapes country-wide values, legal systems, and institutions as well as economic resource allocation (Stulz & Williamson, 2003). These factors characterize the investment's environment, which become the base for increasing the level of trust in the capital market (Bhattacharya et al., 2007; Stiglitz, 1989).

The EEU represent on this aspect a unique sample to investigate the unprecedented changes of national culture undertaken during the last two decades. After the fall of the Berlin

wall, the European Union was enlarged to include former East European countries' block; these countries rapidly had to adapt to the European legal framework and had to change their cultural approach, which had been crystallized under the communist system of centrally planned economies. The task of transiting from centrally planned to market-based economy is a herculean one, as the latter was in operation for over five decades. One might suspect that certain cultural characteristics could persist in former communist EEU. However, to this day there is no evidence for such persistence.

Indeed, the changes in terms of the legal environment are evident, considering that the reception of the different EU regulations and the transformation in the cultural approach have required time and they are still not easy to measure or evaluate. EEU experienced half a century of Communist rule, which posits contextual and situational causes for historical events and individual behaviour. It was a repressive regime that constrained individuals' freedom, affecting the level of trust in the institutions, and encouraging collectivist thinking and interdependent behaviour (Varnum et al., 2008).

Additionally, the collapse of communism in EEU produced great social and economic uncertainties for its newly independent states. The life, values, and culture of the population in these countries were affected by the rush to develop "market" economies, privatization, and marketization, which took place far faster than legislative reforms. Moving from a communist to a democratic political system, from a collectivistic to individualistic society, from centrally planned to market-based economy have inevitability changed the previous cultural characteristics of the EEU with a fast catch up with the values and the beliefs of the WEU (Akaliyski, 2019). These changes have naturally influenced the management behaviours and therefore their attitude in manipulating the earnings to meet the investors' expectations (Doupnik, 2008; Leuz et al., 2003).

2.2.1 Power distance

Power distance is a cultural dimension which represents the degree to which less powerful individuals in organizations expect and accept the unequal allocation of power (Halkos & Skouloudis, 2017). The higher is the score that measures the power distance dimension, the higher is the willingness of the members of the organization or institutions to accept an unequal power distribution (Fidrmuc & Jacob, 2010; Li et al., 2013).

In countries with the higher score in terms of power distance, Waldman et al. (2006) noted a social pressure on managers to be less opportunistic, which reduced the likelihood of them engaging in unethical earnings management practices. Hofstede et al. (2010) observed that power distance score tends to be higher for EEU than for WEU. A great role in the power perception of the EEU was played by the democratic centralism approach, investigated by Kets de Vries (2000). The author noted that democratic centralism gave the opportunity to all the members of the community to participate in the discussion related to policies and issues and vote for the leadership. However, after the election of the leader, he centralized all the powers and was given the legitimacy to carry out his/her chosen policies in an autocratic manner without opposition. Other studies have confirmed these results (Bakacsi et al., 2002; Schwartz & Bardi, 2001) with an emphasis on the predominance of hierarchical values in EEU, in contrast with autonomous values. In their analysis of the influence of national cultural dimensions and earnings management behaviours, Kim et al. (2017) find that managers in power distance engage less in earnings management. This discussion leads to the following hypothesis:

H1: Higher power distance, as associated with EEU, has a negative impact on classification shifting.

2.2.2 Individualism

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In societies where there are loose ties, limited links to the extended family, and where the immediate family and the personal interests are prominent, the score of individualism is high (Davis & Abdurazokzoda, 2016; Hofstede, 1980; Hofstede et al., 2010; Klasing, 2013). The findings of several studies affirm that East European culture is less individualistic than West European (Hofstede, 1980; Kolman et al., 2003). This can be explained by the East European authoritarian practices which structurally imposed the collectivist culture that shifted the authority perceptions away from individualism. The affirmation of the collectivist approach and power perception of the population living in the EEU has been facilitated by the rural value of "obshchina" (community), which enforced the strict control on the community but also the solidarity across community members (Kuchma, 2003). The Eastern European's cultural approach of interdependence, in which members of the community provide support and moral guidance, can be considered the legacy of obshchina (Kets de Vries, 2000). Hofstede et al. (2010) suggested that accounting plays a significant role in conducting business in individualistic countries than social collectivistic countries. Managers are more incline to show optimistic performance to meet analysts' expectation (Han et al., 2010). According to these assumptions we develop the following hypothesis:

H2: Low level of individualism, as associated with EEU countries, has a positive

impact on classification shifting.

2.2.3 Uncertainty avoidance

Uncertainty avoidance as a cultural dimension is associated with the degree to which the nation or society is tolerant of uncertainties or ambiguities (Ho et al., 2012; Hofstede, 1994; Ringov & Zollo, 2007). Nations or societies with high scores in this dimension are more inclined to being uncomfortable with new or uncertain situations and use laws, rules, and codes of conduct as a form of protection, aiming to mitigate uncertainties (Hofstede, 1980, 1994).

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Contrary to this, nations or societies with low scores in this dimension exhibit more flexibility in their attitudes and behaviours and are more likely to get more involved in uncertain situations (Hofstede, 1980). In their analysis, Hofstede et al. (2010) find a higher score for uncertainty avoidance in EEU rather than in WEU. The finding supports the historical and political development of these countries, considering the strict hierarchy and the rigid regime's control of social life. Consequently, managers in these countries are more risk-averse and careful in their decision to avoid possible and unpredictable outcomes. Therefore, societies with a high level of uncertainty avoidance develop more conservative accounting systems and behaviours (Gray, 1988). The influence of conservatism on the managers' behaviours could either lead to greater use of earnings management to side-step the risk associated with the potentially negative assessment of accruals management, and disincentivise the managers' engagement in earnings manipulation given its possible damaging effect on firm performance in the future. In their analysis Han et al. (2010) and Guan et al. (2005) highlight a negative relation between discretionary accruals and uncertainty avoidance. This discussion leads to the following hypothesis:

H3: Uncertainty avoidance, as associated with EEU, has a negative impact on classification shifting.

2.2.4 Masculinity

Nations or societies assumed as masculine are characterised by competitiveness, assertiveness, and individual achievement, with power and success envisaged as material returns (Ho et al., 2012; Hofstede, 1980). Under this cultural dimension, winning and being the best are the goals.

Thereby, higher score in terms of masculinity in a country are generally linked with a management cultural approach driven by ego-orientation, valuing money, and property values, which prioritizes high economic growth and prefers high pay. In Hofstede et al. (2010),

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masculinity is higher for EEU than WEU. Kim et al. (2017) findings support this discussion with evidence of the higher influence of the level of masculinity on the managers' earnings manipulation behaviours. Following the above discussions, we state the following hypothesis to be tested:

H4: Masculinity, as associated with EEU, has a positive impact on classification shifting.

2.2.5 Long-Term Orientation

Human societies have always been organized within space and time. The former is related to the relationship between humans and nature. The latter focuses on how we perceive and vision our life activities across the time spectrum. At the collective level, time spectrum exerts different degrees of influence in various societies, creating two orientations on this value-dimension: short- and long-term time orientation. In a nutshell, a focus on the past and on the present would lead more towards short-term time orientation, and a focus on the future will lead more towards long-term time orientation.

This dimension symbolises a nation that is more oriented towards the future and that attaches importance to the economy and persistence (Halkos & Skouloudis, 2017; Hofstede et al., 2010).

Contrarily, a short-term oriented nation appreciates tradition and abides by its social obligations (Hofstede, 1994) with focus on immediate outcomes, that may include satisfaction and happiness in the present (Thanetsunthorn & Wuthisatian, 2018). Hence, we formulate the following hypothesis:

H5: The degree of long-term orientation in EEU will assert a positive impact on classification shifting.

3. Data and Descriptive Statistics

3.1. Measuring Cultural Dimension Score – The World Value Survey and Hofstede's model

We collect national dimensions of culture datasets from the WVS according to Buegelsdjik and Welzel (2018)'s approach. The WVS is a common questionnaire developed to study and understand the values across cultures and across time (seven waves from 1981 to 2021). The data are collected from 1981 until the present over 100 countries on all six continents and are focused on beliefs, values, economic development, democratisation, religion, gender equality, social capital, and subjective well-being. Therefore, the WVS provides data on socio-cultural and political change worldwide, and it has been widely used in the cross-countries cultural analysis in different disciplines and in accounting, including Brochet et al. (2019) and Knechel et al. (2020).

Hofstede et al. (2010) have developed one of the cultural dimensions (long-term orientation) using some of the questions in the survey. Of relevance to this paper are people's responses to the questions on the ease with which they can be correlated with the Hofstede's cultural dimensions as for Beugelsdjik and Welzel (2018). More specifically, we use five WVS questions which capture power distance scores (PD), individualism scores (IND), uncertainty avoidance scores (UAI), masculinity scores (MASC) and long-term orientation scores (LTO) as for the table 1.

[**Table 1 near here**]

3.2. Data Collection for Classification shifting

All financial data comes from Compustat. The full sample consists of 79,570 firm-year observations for the period from 1996 to 2020 across EU28 countries. In some detail, our sample includes what we call the WEU Member states which are: Belgium, France, Germany,

Italy, Luxembourg, Netherlands, Denmark, Ireland, Greece, Portugal, Spain, Austria, Finland, Sweden. We also include in WEU the UK despite the recent developments due to Brexit, and we also include Cyprus and Malta, though there are not complete data sets for these two countries. The EEU are Czechia, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, Slovenia, Bulgaria, Romania, and Croatia. It should be noted that our sample is unbalanced as the various EEU and WEU Member states enter the EU at different years.

In line with prior studies (Behn et al., 2013), countries require a minimum of 10 firm-year observations to qualify for inclusion in the sample for this study. Again, all firm-years with missing observations for all variables were deleted. Furthermore, to effectively use sales as a deflator for most of the variables and avoid the creation of outliers, we exclude any firm-year observation with sales revenue less than $500,000 in line with prior studies (Fan et al., 2010; Haw et al., 2011; McVay, 2006;). Consistent with prior studies (Behn et al., 2013; Haw et al. 2011) in classification shifting, we use Fama and French (1997) four-digit (SIC) Industry Classification codes.

3.3 Firm specific data

Our main variable is classification shifting ($UE\_CE_{i,t}$), a widespread malpractice that inflates core earnings by altering the presentation of income statement line items without affecting bottom-line income. For classification shifting, we have relied on previous literature (such as McVay, 2006). and for REM ($REM1_{i,t}$ and $REM2_{i,t}$), we have based our variables on Cohen et al. (2020), but we will provide detail explanation of these variables in paragraph 4.

We consider several firm specific control variables. Firstly, we consider the presence of income-decreasing special items ($SPITEM_{i,t}$) (Boahen & Mamatzakis, 2020). Ashbaugh et al. (2003) and Callen et al. (2011) show that size ($SIZE_{i,t}$) of firm matters, as large firms are less likely to manipulate reported core earnings compared to small firms. Book to market value

($MBV_{i,t}$) controls for the possible impact of market capitalisation. Zang (2012) shows that firms manipulate reported earnings to improve financial management. To capture such effects, we opt for leverage ($LEV_{i,t}$). Similarly, performance could be of importance, and we therefore include profitability ($ROA_{i,t}$) (see Kothari et al., 2005; Zalata & Roberts, 2015). Zalata and Roberts (2015) show that firms with low performance could be more likely to apply classification shifting. Athanasakou et al. (2009) and Doyle et al. (2003) show that cash flow is affected by growth of firms, thus we opt for firm growth. Myers et al. (2007) document that the firms that had preceding positive earnings are more likely to manipulate earnings to keep the consecutive earnings growth trend, and for this reason we control for economic development ($GROWTH_{i,t}$). Lastly, we include total common equity divided by equity shares, that is $EXPOSURE_{i,t}$, because prior evidence (Barton & Simko 2002; Cheng & Warfield 2005) shows that large amount of outstanding shares would indicate small earnings per share and thereby more incline to classification shifting.

4. Research design and empirical methodology

4.1. Measuring Classification Shifting

In line with prior studies (Behn et al., 2013; Boahen, 2017; Boahen & Mamatzakis, 2021; Fan et al., 2010; Haw et al., 2011; McVay, 2006), we model the core earnings ($CE_{i,t}$) at normal level for firm i and year t as:

$$CE_{i,t} = \beta_0 + \beta_1 \, CE_{i,t-1} + \beta_2 \, ATO_{i,t} + \beta_3 \, ACCRUALS_{i,t-1} + \beta_4 \Delta SALES_{i,t} + \beta_5 \, NEG\_\Delta SALES_{i,t} + \varepsilon_{i,t}$$

(1)

where core earnings with lag is $CE_{i,t-1}$; asset turnover is $ATO_{i,t}$ and measures sales divided by average net operating assets; accruals with lag is $ACCRUALS_{i,t-1}$; change in sales

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with lag is $\Delta SALES_{i,t}$; $NEG\_\Delta SALES_{i,t}$ is an index that takes value of one if change in sales is less than zero, and zero otherwise.

Given the criticism of Fan et al. (2010) that report issues with endogeneity with the current level of some of the variables, the above model does not use current accruals but its lagged value on the right-hand side as in McVay (2006).[4] Equal wise, given that core earnings are reported (see Fan et al., 2010) not to affect current level of normal core earnings, we opt for their lagged values. Nissim and Penman`s (2001) study shows that asset turnover ($ATO_{i,t}$) affects core earnings, thus we include it in equation 1. Therefore, we include the change in sales $\Delta SALES_{i,t}$ and negative change in sales $NEG\_\Delta SALES_{i,t}$ as in McVay (2006) model.

We employ the equation 1 using regression analysis and estimate the parameter for each firm in our sample, so as to measure the unexpected core earnings $(UE\_CE_{i,t})$ which are the reported core earnings $(REP\_CE_{i,t})$ minus normal core earnings $(CE_{i,t})$. The unexpected core earnings $(UE\_CE_{i,t})$ is the main variable that we use to test whether there is classification shifting.

Following from Ashbaugh et al. (2003), Behn et al. (2013), and Fan et al. (2010), we then test for the existence of classification shifting by estimating the following equation 2:

$$UE\_CE_{i,t} = \beta_0 + \beta_1 \; SPITEM_{i,t} + \beta_2 \; SIZE_{i,t} + \beta_3 \; BMV_{i,t} + \beta_4 LEV_{i,t} + \beta_5 ROA_{i,t} + \beta_6 GROWTH_{i,t} +$$
$$\beta_7 EXPOSURE_{i,t} + Year \; and \; Country \; Dummies + \varepsilon_{i,t} \qquad (2)$$

where unexpected core earnings is $UE\_CE_{i,t}$; income-decreasing special items multiplied by minus one is $SPITEM_{i,t}$; firm size is $SIZE_{i,t}$; book to market value is $BMV_{i,t}$;

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[4] Note that in line with Behn et al. (2013) and Francis and Wang (2008), accruals equal earnings before extraordinary items minus operating cash flows divided by total assets with one lag. Earnings before extraordinary items equal net income minus extraordinary items. Also note that operating cash flows equals the sum of earnings before extraordinary items, depreciation, and amortization, change in deferred income tax, change in untaxed reserve, change in other liabilities, minority interest minus current accruals.

leverage $LEV_{i,t}$; return on assets is $ROA_{i,t}$; growth counts for $GROWTH_{i,t}$ and total common

equity divided by equity shares $EXPOSURE_{i,t}$.

It is worth noting that classification shifting exists when special items would positively

affect unexpected core earnings. Therefore, the main parameter estimates of equation 2 concern

β_1. If β_1 is positive and statistically significant, it would imply that there is classification

shifting, which is misclassification of core expenses into special items.

4.2. Real Earnings Management

We also consider in our identification the impact of culture on REM. Regarding real activities

earnings management, we opt for two measures. The first measure for real activities

management ($REM1_{i,t}$) is estimated using the abnormal cash flows ($ABNOR\_CASH_{i,t}$), the

abnormal discretionary expenses ($ABNOR\_DEXP_{i,t}$) and the abnormal production costs

($ABNOR\_PCOST_{i,t}$) for each firm and industry classified by its two-digit SIC code (see also

Dechow et al., 1996). The $REM1_{i,t}$ is estimated as the sum of abnormal discretionary expenses

($ABNOR\_DEXP_{i,t}$) multiplied by minus one and abnormal production costs

($ABNOR\_PCOST_{i,t}$). Note that high values of $REM1_{i,t}$ would imply evidence that firms engage

in earnings management and thus underreport expenses to boost earnings.

The first step to estimate $REM1_{i,t}$ is to derive the abnormal cash flows ($ABNOR\_CASH_{i,t}$)

which is provided, similarly to classification shifting methodology, as deviations from predicted

values from the industry-year regression. More in detail, we use industry-year regression to

estimate cash flows over lagged total assets as follows:

$$\frac{CASFO_{i,t}}{TA_{i,t-1}} = \beta_0 + \beta_1 \left(\frac{SALES_{i,t}}{TA_{i,t-1}} \right) + \beta_2 \left(\frac{\Delta SALES_{i,t}}{TA_{i,t-1}} \right) + \varepsilon_{i,t} \qquad (3)$$

where $CASFO_{i,t}$ is the cash flow from operational activities. $SALES_{i,t}$ represents annual sales revenue and $TA_{i,t}$ total assets is the aggregate of both non-current and current assets, whilst $\Delta SALES_{i,t}$ is change in sales. The figure for $(ABNOR\_CASH_{i,t})$ is multiplied by minus one, in line with previous studies (Roychowdhury, 2006; Zang, 2012).

The abnormal production costs $(ABNOR\_PCOST_{i,t})$ are derived as deviations from predicted values from the industry-year regression. Following Cohen and Zarowin (2010) we estimate abnormal production costs using the following equation:

$$\frac{PCOST_{i,t}}{TA_{i,t-1}} = \beta_0 + \beta_1\left(\frac{SALES_{i,t-1}}{TA_{i,t-1}}\right) + \beta_2\left(\frac{\Delta SALES_{i,t}}{TA_{i,t-1}}\right) + \left(\frac{\Delta SALES_{i,t-1}}{TA_{i,t-1}}\right) + \varepsilon_{i,t} \quad (4)$$

where $PCOST_{i,t}$ is the aggregate of cost of sales and change in inventory during the year.

The normal level of discretionary expenses as in Cohen and Zarowin (2010) and Roychowdhury (2006) is derived from the following equation:

$$\frac{D_{EXP_{i,t}}}{TA_{i,t-1}} = \beta_0 + \beta_1\left(\frac{SALES_{i,t-1}}{TA_{i,t-1}}\right) + \varepsilon_{i,t} \quad\quad\quad (5)$$

where $DEXP_{i,t}$ is the sum of advertising expenses, R&D expenses, and general and administration expenses[5]; $\frac{SALES_{i,t-1}}{TA_{i,t-1}}$ is annual sales revenues over lagged total assets.

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[5] As seen in Cohen and Zarowin (2010) and Zang (2012), we give the value of zero if selling and general expenses are available, but advertising and R&D expenses are not.

It is worth noting that we opt for lagged sales to avoid issues with endogeneity. Like in the above models, abnormal discretionary expenses *(ABNOR_DEXP$_{i,t}$)* are estimated using the parameter estimates of equation (5) from industry-year regression.

For robustness analysis in terms of dealing with possible model misspecification due to measurement errors, we also employ a second measure of REM, *REM2$_{i,t}$*. This time, to measure *REM2$_{i,t}$* we employ abnormal cash flows *(ABNOR_CASH$_{i,t}$)* times minus one and abnormal discretionary expenses (*ABNOR_DEXP$_{i,t}$*) times minus one. As before, high values of *REM2$_{i,t}$* would indicate earnings management.[6]

5. Empirical Regression Results and Discussions

5.1. Main Descriptive Statistics

Table 2 reports the main descriptive statistics for *UE_CE, REM1* and *REM2,* as well as the main variables of our identification for testing our hypotheses of earnings management for both WEU countries and EEU.

[**Table 2 near here**]

5.2. Testing Existence of Classification Shifting

Because our focus is on examining the impact of the time-varying process of transitioning firms from EEU of the EU from central planning economy to market-based economy on classification shifting, we choose fixed effects panel regression analysis as this modelling is unbiased. To achieve this, our fixed effect model includes the unique characteristics of each firm, per Member State, that may affect classification shifting. Instead, our results would have been

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[6] Cohen and Zarowin (2010) and Haga et al. (2018) show that both measures might suffer from aggregation bias. Therefore, some caution is warranted.

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biased and of poor significance if we had used a simple panel regression without fixed effects. We can manage firm and country level heterogeneity using fixed effects. In essence, we can observe the impact of the transition to market-based economy on classification shifting for EEU thanks to our fixed effect panel model. This impact is net of time-invariant characteristics that may result in biased estimations. Because each firm in our sample is different and unique, our fixed effects model assumes that the error term for each firm and the constant term that regulates firm-specific attributes should be uncorrelated with each other.

Initially, we test UE_CE with SPITEM to check for the existence of classification shifting in the full sample (EU28), and then in the 2 subsamples (WEU and EEU) as reported in Table 3. This is preliminary results to establish whether there is classification shifting in EU. Fixed effects panel regressions are estimated to control for heterogeneity across firms. Note that we also opt for robust standard errors with 50 bootstrap replications to control for model misspecification. In the remaining empirical modelling, we augment the model to include additional variables that affect classification shifting.

It is worth noting that the main variable to identify the existence of classification shifting is the income-decreasing special items multiplied by minus one (see $SPITEM_{i,t}$). In general, a positive parameter estimation for $SPITEM_{i,t}$ would indicate the existence of classification shifting (Ashbaugh et al.,2003; Behn et al., 2013; Fan et al., 2010).

The coefficient of SPITEM is positive (for EU28 0.205, for WEU 0.287 and for EEU 0.476) and significant at 1% level, indicating that some firms in Europe and in the two sub samples inflate core earnings by misclassifying core expenses into special items. It is striking that we find evidence of classification shifting for the EEU states (also for the old ones) as the parameter estimate of SPITEM is positively and statistically significant at 1% level, while also significant in magnitude. This is the first time, as far as we are aware, that evidence of classification shifting is reported for the EEU.

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These findings suggest that when income is moved upward or core expenses are moved downwards on the income statement, unexpected core earnings increase (UE_CE), suggesting that firms do not only report true and fair performance but are also embarked on misclassification of special items to increase reported core earnings. Our findings are in line with previous literature indicating that unexpected core earnings increase with special items (Fan et al., 2010; McVay, 2006) mainly focused on Western countries. However, the result included in column 3 in Table 3 shows that classification shifting is present in the EEU and, that the magnitude of SPITEM coefficient is larger compared to WEU. The EEU, though they did transit from centrally planned economy to market based economy just two decades ago, appear to have quickly adopted earnings management practices of their colleagues in the WEU. Of course, this might not come as a surprise, given that the EEU have been overzealous in their convergence to the EU and the anger in terms of other characteristics, such as orientation to profit maximizations supported by opportunities raised by an open capital market.

[**Table 3 near here**]

5.3. Testing Relationship between Culture Variables and Classification Shifting

To test our hypotheses regarding the impact of culture, we run panel regressions that reveal the impact of underlying components of culture on UE_CE. In each model we include control variables to assist identification.

Table 4 reports a positive relationship between *UE_CE* and uncertainty avoidance (*UAI*) for the EU28 and for WEU, while the result is negative and significant for EEU. The results for the EU28 and WEU are in line with the literature (Han et al., 2010; Kim et al., 2017).

Our findings are in line with Hypothesis 3 that foresees a negative association between uncertainty avoidance and classification shifting. For EEU the negative impact of *UAI* on

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UE_CE could be explained by the persistence of centrally planned economy culture whereby laws and regulations were very restrictive and there was low uncertainty and deviations from the norm that gave fewer opportunities for opportunistic behaviour (see also Han et al., 2010 and Guan et al., 2005). Additionally, the culture of "obshchina" might enhance the awareness of the manager on the damage due to earnings manipulation on the community. On the other side, the positive relationship between UAI and WEU, affirms the prior reported effect that managers are usually more prone to managing earnings to meet market performance and persuade their own personal goals when facing uncertainty (Bermpei et al., 2022; Guo & Jiang, 2011; Hirshleifer et al., 2009).

ROA and *LEV* have positive and significant values in all models. These results are in line with previous literature (Zalata & Roberts, 2015), which indicate that firms with strong performance could be engaged with classification shifting. *GROWTH* and *BENCHMARK* also highlight a positive relationship, meaning that generally more profitable, growing, and leveraged companies are keener to engage in an activity of classification shifting. We can notice that there are significant relationships with all control variables tested in our analysis.

[**Table 4 near here**]

Table 5a shows a negative relationship between *UE_CE* and *MASC* with a rejection of our hypothesis 4. These results do not confirm the findings of Kim et al. (2017) in which the level of masculinity of the national culture influence positively the earnings management behaviours. In this case we must consider the peculiarity of our earnings management figure where the meaning of the manipulations is not to misreport the final income figure for a personal benefit but to manage core earnings often to meet investors' expectations. This result is in line with Hypothesis 4. Competitiveness, assertiveness, and individual achievement are

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characteristics of nations or communities that are thought to be dominated of male culture, with power and success seen as tangible rewards (Ho et al., 2012; Hofstede, 1980). The objectives in this cultural dimension are excellence and success. Therefore, higher scores for masculinity in a nation are typically associated with a management style that is motivated by ego, values money, and property, and favours strong economic growth over high pay. The research by Kim et al. (2017) provides evidence for the stronger impact of masculinity on managers' behaviours related to earnings manipulation. In our identification we also include control variables. To be concise and facilitate the presentation of results, we report the main variables. Results of control variables are available under request.

The significant relationship at the 1% level is still present for the whole sample and for the two subsamples between *LEV* and *UE_CE,* confirming the results of DeFond and Jiambalvo (1994) about the possible manipulations put in place by managers to move earnings upwards to meet debt covenants or contracts. *MBV* is positive and significantly related to *UE_CE* for the whole sample and WEU, suggesting that firms are generally less likely to engage in classification shifting when the book value is low.

Table 5b provides variability in the results of the relationship between *UE_CE* and *IND*. For the EU28 and for WEU, there is a positive and significant impact from *IND* to *UE_CE*, whereas for EEU the impact is negative confirming our second hypothesis. To this end, our findings for WEU confirm hypothesis 2 of positive association between individualism and classification shifting. However, for EEU there is a negative impact of individualism on classification shifting that confirms Han et al. (2010) arguing that the EEU are far less individualistic and self-oriented in terms of culture compared to the WEU. This can be explained by the different meaning of individualism in the EEU vis a vis the WEU, in which the "self" is still closely associated and identified with the "community". The former collectivist and the democratic centralist approaches of EEU have built up a concept of "individual

interests" which are assimilated with the "group interests" and "mutual dependence".

Table 5c shows a negative relationship between *UE_CE* and *PD* across all samples, confirm our first hypothesis. Our findings confirm the previous literature on the implication of a higher level of power distance in a country for earnings manipulation behaviour (Kim et al., 2017; Waldman et al., 2006). This result is in line with Hypothesis 1. Bakacsi et al. (2002), Kets de Vries (2000) and Schwartz & Bardi (2001) emphasise the predominance of hierarchical values in EEU, that explain that higher power distance would lead to lower classification shifting (Kim et al., 2017; Waldman et al., 2006). In general, managers have more legal and social pressures to be less opportunistic in countries with a higher power distance index, because they place less importance on their autonomy. For the WEU the managers` autonomy on the manipulations of companies' earnings has been inevitably reduced by the IFRS`s application and business law and regulation. The same factors have an impact on the EEU countries, even more so because in the EEU countries there was no strong sense of "autonomy" due to the democratic centralism, which have enhanced interdependent behaviours.

Overall, results show that *PD* mitigates managers' incentive to misclassify revenue items upwards to increase reported core earnings.

Table 5d shows a positive relationship between *UE_CE* and long-term orientation (*LTO)*, which has not been thoroughly investigated. This result is in line with our expectation as discussed by Hypothesis 5. Considering the high level of variability of the capital markets in the aftermath of financial crises, managers could engage in classification shifting not just for serving their own opportunistic interests, but for assuring the long-term sustainability of their firms. One, of course, could argue that earnings management practises are justified in periods of financial turmoil, but it provides the intuition behind the positive association between *UE_CE* and *LTO*. Clearly, in the long-term classification the shifting might prove that does little to the firm's sustainability. To study this type of effects we should collect longer time

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series of both *UE_CE* and *LTO*. Due to data limitations, we have no access to these at present. However, our results show the underlying complexities of the association between cultural values and earnings management.

Moreover, the long-term orientation represents a country that is more future-focused and values economic strength and perseverance (Halkos & Skouloudis, 2017; Hofstede et al., 2010). Contrarily, a short-term oriented society values tradition and upholds its social responsibilities with an emphasis on immediate results, which may include contentment and enjoyment in the here and now (Hofstede, 1994; Thanetsunthorn & Wuthisatian, 2018).

[**Table 5a to 5d near here**]

5.4 Testing the impact of interaction between SPITEM and Culture Variables

Given the importance of SPITEM for classification shifting, next we investigate the impact of interactions between cultural variables and SPITEM on classification shifting. It could be the case that certain cultural variables would moderate or amplify the impact of SPITEM on classification shifting that has been reported to be positive.

Table 6 includes the interaction between *SPITEM* and *UAI* (*SPITEM × UAI*). The evidence varies. The impact of interaction *SPITEM × UAI* is positive, and significant at 5% level for the whole EU sample and for EEU, suggesting that *UAI* fails to moderate the effect of *SPITEM* on classification shifting. This is of interest because the individual impact of *UAI* on classification shifting is negative. However, the joint effect of *UAI* and *SPITEM × UAI* is negative. For the WEU the interaction SPITEM × UAI is insignificant.

[**Table 6 near here**]

Table 7 reports the interaction between *SPITEM* and *MASC* (*SPITEM × MASC*). The evidence again varies in WEU vis a vis EEU. The negative effect of *MASC* on *UE_CE* is amplified in the presence of *SPITEM* in EEU though the magnitude is small, while for the WEU the results are not significant.

[**Table 7 near here**]

Table 8 contains the interaction between *SPITEM* and *IND* (*SPITEM × IND*). The interaction term is insignificant for the WEU sub sample, whereas for the EEU *IND* fails to moderate the impact of SPITEM as seen in the case of *UAI*, though the joint effect of *IND* and *SPITEM × IND* is negative.

[**Table 8 near here**]

Table 9 contains the interaction between *SPITEM* and *PD* (*SPITEM × PD*). Results are of interest as the effect of *SPITEM × PD* is negative and significant at 5% level for the EU28, but positive for the sub-samples. These results highlight the complexities of the underlying relationships and provide evidence of the underlying heterogeneity across the different samples. The underlying heterogeneity of EU across its Member States could highlight the fact that there is no 'one-size-fits-all' main finding. In the case of cultural differences (with heterogeneity across countries) *PD* is present and feeds into our empirical findings. There should be a dominant Member State at the EU level that drives the negative effect of *SPITEM × PD* on classification shifting, which is not feasible to explore in the current context due to data limitations. Note, however, that the joint effect of *PD* and *SPITEM × PD* is positive across all samples.

[**Table 9 near here**]

Table 10 reports the interaction between *SPITEM* and *LTO* (*SPITEM* × *LTO*). Again, we find variability between WEU and EEU. For the WEU, findings show a positive and significant relationship at 5% level between the interaction of *SPITEM* × *LTO* and *UE_CE*, while for EEU this relationship is reported negative and significant (at 5% level), suggesting that *LTO* would mitigate the impact of *SPITEM* on *UE_CE*. Yet, the joint effect of *LTO* and *SPITEM* × *LTO* on classification shifting is positive.

[**Table 10 near here**]

6. Real earnings management and Hofstede - Cultural Variables

As a robustness check, this study also considers the relationship between *REM1*, *REM2* and all the five WVS questions that capture people's values. It is worth noting that the second measure of REM *REM2* is obtained using abnormal cash flows and abnormal discretionary expenses to consider criticism of measurement errors in *REM1* (see Cohen & Zarowin 2010; Roychowdhury, 2006; Zang, 2012).

Results regarding *REM1* and *REM2* are reported in Tables 11 and 12 respectively. All in all, parameter estimates of cultural variables are in line with the ones reported for the case of classification shifting. Similarly, control variables show similar effects as seen in the classification shifting models. In some detail, it is worth noting (see Table 11) that IND has a larger magnitude impact *REM1* in the case of EEU vis a vis WEU, whereas PD seems to subdue *REM1* in EEU while it asserts a positive impact on WEU. These results might not come as a surprise, as EEU of EU have been under a centrally planned economy structure for decades,

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and cultural variables like PD would be expected to have a significant impact from an economic and statistical point of view. Similarly, patterns are observed for the long-term orientation, see LTO, where its impact is much more pronounced for the EEU compared to the WEU. However, MASC appears to assert a negative and significant impact on REM1 in both sub-samples, WEU and EEU.

[**Table 11 near here**]

Table 12 reports results for the second measure of REM, *REM2*. Results show variability, suggesting the underlying complexities of cultural variables across Member States. In some detail, in the case of *REM2*, MASC asserts a negative impact on EEU compared to a positive impact on WEU, whilst PD asserts a positive impact on EEU whereas it has a negative impact on WEU.

[**Table 12 near here**]

7. Conclusion

Checking whether the EEU countries are engaging in classification shifting, our results show that these countries are manipulating the core earnings with a higher magnitude compared to the WEU. To this end, EEU is catching up to the financial misreporting of their colleagues in WEU, although the changes in institutional factors, such as harmonization and application of accounting regulation and investment protection, the shift from a closed to an open capital market as well as an approach to the maximization of the profit happened only two decades ago. This first result seems to support the view the European Union integration process has

been relatively effective, though according to Akaliyski (2019) such process has also altered values and beliefs in the EEU.

On this assumption, we have also examined the effects of Hofstede 'cultural dimensions (individualism, uncertainty avoidance, power distance, masculinity, and long-term orientation). Our findings show that cultural factors play a significant role at the European level and confirm that there are still differences in the two sub-samples considered. In addition, our results show there is no 'one-size-fits-all' case as there is variability. The cultural dimensions aligned between the two blocs of countries are Power distance, Masculinity and Long-Term orientation, however only the first confirm its negative relationships with earnings management in line with our hypothesis and with the literature (Kim et al., 2017). Individualism and Uncertainty avoidance, present different effects on the classification shifting behaviour applied in the WEU and EEU, confirming that in the EEU the sense of "community" and the collective culture ("obshcina") still play a significant role in mitigating classification shifting although the IFRS and other regulations have been generally applied. The findings are important for regulators, external monitors, and investors. They show how cultural dimensions of the EEU should be taken into account in planning future action for enhancing financial reporting quality across the EU. Future research could explore how EU accounting and finance regulations have been embraced across EU Member States and further examined whether EEU cultural dimensions have played a role. Additionally, future investigations might take into account the cultural implication of the recognition of the EU legitimacy in EEU or/and how the presence of Western companies operating in EEU have been facilitating the swift in the cultural dimensions and classification shifting practices.

This study is limited in the analysis of the timing in which the EEU have joined the European Union. The effects of cultural dimensions on classification shifting can be influenced by how long each Eastern country has been influenced by the integration process. Additionally,

considering how different religions followed in the EEU and how they can influence the cultural dimension, the analysis of this factor could highlight barriers to a cultural integration and its effects on the management behaviour.

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Table 1. Questions correlated with the Hofstede's cultural dimensions.

World Value Survey (WVS) code	Abbreviations	Meaning
A165	UAI	Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?
C001	MASC	Men should have more right to a job than women
E035	IND	Incomes should be made more equal
E036	PD	Private ownership of business should be increased
G006	LTO	National pride

Table 2. Descriptive statistics.

WEU					
Variable		Obs	Mean	Std. dev.	Min	Max
UE_CE	68,200	-0.950636	1.334846	-1.55563	0.8682073
REM1	68,200	0.2513372	0.6171511	-1.914479	3.291414
REM2	68,200	-0.3850883	0.232891	-1.570834	-0.2061559
SPITEM	68,200	0.0166673	0.045743	0	0.2257756
UAI	68,200	0.6681526	0.1433022	0.32	0.92
MASC	68,200	0.7956343	0.0927514	0.34	0.98
IND	68,200	5.081061	0.7969354	0	6.09
PD	68,200	4.90331	0.2585417	4.16	5.54
LTO	68,200	1.753236	0.2632681	1.31	2.4
ROA	68,200	0.0065401	0.2071599	-1.050746	0.4030962
SIZE	68,200	5.383291	2.903174	-0.8698844	13.85758
MBV	68,200	3.837095	6.693637	-10.37798	44.01131
LEV	68,200	0.5484592	0.3164304	0.0048465	1.877104
GROWTH	68,200	0.1026817	0.3222051	-0.4872325	0.990605
EXPOSURE	68,200	0.255761	0.2854782	-0.0950299	1.359554

EEU					
Variable		Obs	Mean	Std. dev.	Min	Max
UE_CE	11,080	-0.847092	1.306465	-1.33273	1.578676
REM1	11,080	0.2561604	0.6260299	-1.783286	3.288493
REM2	11,080	-0.4009217	0.265223	-1.570834	-0.2061407
SPITEM	11,080	0.0149667	0.0446274	0	0.2257756
UAI	11,080	0.7862561	0.0438927	0.71	0.93
MASC	11,080	0.6300856	0.0937571	0.43	0.89
IND	11,080	6.028114	0.7742489	3.48	7.61
PD	11,080	5.837713	0.9360385	3.29	6.75
UAI	11,080	1.584278	0.2205169	1.34	2.22
ROA	11,080	0.0290461	0.1602962	-1.050746	0.4030962
SIZE	11,080	5.15729	2.851859	-0.8698844	13.85758
MBV	11,080	2.867603	4.473934	-10.37798	44.01131
LEV	11,080	0.5109883	0.3226684	0.0048465	1.877104
GROWTH	11,080	0.0996803	0.3344038	-0.4872325	0.990605
EXPOSURE	11,080	0.1759752	0.2411788	-0.0950299	1.359554

Table 3. Evidence of Classification shifting and special items.

VARIABLES	(1) EU28 UE_CE	(2) WEU UE_CE	(3) EEU UE_CE
SPITEM	0.205***	0.287***	0.476***
	(4.193)	(3.497)	(3.815)
Constant	0.060***	0.053***	0.106***
	(31.363)	(24.988)	(22.419)
Observations	79,570	68,200	11,080
R-squared	0.004	0.006	0.001
Number of Firms	8,401	7,160	1,221
Industry FE	YES	YES	YES
Year FE	YES	YES	YES
Country FE	YES	YES	YES

Note: t-statistics in parentheses, *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 4. Classification shifting and uncertainty avoidance (UAI).

VARIABLES	(1) EU28 UE_CE	(2) WEU UE_CE	(3) EEU UE_CE
UAI	0.242***	0.245***	-0.061**
	(3.208)	(3.148)	(-2.084)
SPITEM	0.272***	0.204***	0.552***
	(9.329)	(8.028)	(4.656)
ROA	0.650***	0.568***	1.161***
	(9.762)	(7.879)	(6.477)
SIZE	0.069***	0.067***	0.090***
	(12.218)	(11.021)	(5.383)
MBV	0.006***	0.006***	0.005
	(4.871)	(4.673)	(1.482)
LEV	1.469***	1.415***	1.707***
	(41.434)	(35.819)	(20.767)
GROWTH	1.401***	1.443***	1.189***
	(73.383)	(68.454)	(25.847)
EXPOSURE	-0.625***	-0.645***	-0.451***
	(-21.079)	(-19.948)	(-5.875)
Constant	-3.582***	-3.561***	-3.480***
	(-23.982)	(-22.658)	(-5.869)
Observations	41,461	34,883	6,419
R-squared	0.169	0.169	0.172
Number of Firms	7,014	5,906	1,089
Industry FE	YES	YES	YES
Year FE	YES	YES	YES
Country FE	YES	YES	YES

Note: t-statistics in parentheses, *** $p<0.01$, ** $p<0.05$, * $p<0.1$

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Table 5a. Classification shifting and masculinity (MASC).

VARIABLES	(1) EU28 UE_CE	(2) WEU UE_CE	(3) EEU UE_CE
MASC	-0.628***	-0.858***	-0.124***
	(-4.144)	(-4.644)	(-3.452)
SPITEM	0.290***	0.236***	0.554***
	(9.460)	(8.235)	(4.666)
Constant	-2.962***	-2.760***	-3.456***
	(-25.555)	(-19.291)	(-17.729)
Observations	41,461	34,883	6,419
R-squared	0.170	0.170	0.172
Number of Firms	7,014	5,906	1,089
Industry FE	YES	YES	YES
Year FE	YES	YES	YES
Country FE	YES	YES	YES

Table 5b. Classification shifting and individualism (IND).

VARIABLES	(1) EU28 UE_CE	(2) WEU UE_CE	(3) EEU UE_CE
IND	0.209**	0.107***	-0.117***
	(2.002)	(2.734)	(-2.858)
SPITEM	0.269***	0.201***	0.516***
	(9.309)	(8.014)	(4.553)
Constant	-3.409***	-3.420***	-2.845***
	(-57.095)	(-54.777)	(-10.752)
Observations	41,461	34,883	6,419
R-squared	0.169	0.169	0.174
Number of Firms	7,014	5,906	1,089
Industry FE	YES	YES	YES
Year FE	YES	YES	YES
Country FE	YES	YES	YES

Table 5c. Classification shifting and power distance (PD).

VARIABLES	(1) EU28 UE_CE	(2) WEU UE_CE	(3) EEU UE_CE
PD	-0.175***	-0.239***	-0.045***
	(-4.356)	(-4.612)	(-3.683)
SPITEM	0.573***	0.593***	0.542***
	(9.020)	(7.729)	(4.627)
Constant	-2.517***	-2.202***	-3.262***
	(-11.980)	(-8.575)	(-8.027)
Observations	28,625	22,047	6,419
R-squared	0.169	0.168	0.172
Number of Firms	5,288	4,180	1,089

	YES	YES	YES
Industry FE	YES	YES	YES
Year FE	YES	YES	YES
Country FE	YES	YES	YES

Table 5d. Classification shifting and long-term orientation (LTO).

VARIABLES	(1) EU28 UE_CE	(2) WEU UE_CE	(3) EEU UE_CE
LTO	0.463***	0.430***	0.233*
	(5.242)	(4.776)	(1.901)
SPITEM	0.343***	0.303***	0.541***
	(9.146)	(7.919)	(4.627)
Constant	-4.395***	-4.350***	-5.018***
	(-27.238)	(-25.866)	(-6.338)
Observations	35,063	28,485	6,419
R-squared	0.172	0.172	0.173
Number of Firms	6,172	5,064	1,089
Industry FE	YES	YES	YES
Year FE	YES	YES	YES
Country FE	YES	YES	YES

Note: Note that we include the same control variables as in Table 4, namely ROA; SIZE; MBV; LEV; GROWTH; EXPOSURE. Results show high significance in parameter estimates and are available under request. t-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 6. Classification shifting and interaction between SPITEM and uncertainty avoidance.

VARIABLES	(1) EU28 UE_CE	(2) WEU UE_CE	(3) EEU UE_CE
SPITEM	0.244***	0.457***	0.791***
	(3.363)	(2.856)	(3.902)
UAI	0.235**	0.253**	-0.191**
	(2.168)	(2.177)	(-2.160)
SPITEM×UAI	0.0321**	-0.364	0.069**
	(3.302)	(-0.329)	(2.137)
ROA	0.650***	0.568***	1.156***
	(9.755)	(7.881)	(6.446)
SIZE	0.069***	0.067***	0.090***
	(12.219)	(11.021)	(5.388)
MBV	0.006***	0.006***	0.005
	(4.878)	(4.659)	(1.497)
LEV	1.469***	1.416***	1.703***
	(41.338)	(35.773)	(20.704)
GROWTH	1.401***	1.443***	1.189***
	(73.383)	(68.453)	(25.842)
EXPOSURE	-0.625***	-0.645***	-0.447***
	(-21.063)	(-19.950)	(-5.830)
Constant	-3.577***	-3.567***	-3.377***
	(-23.810)	(-22.548)	(-5.631)
Observations	41,461	34,883	6,419
R-squared	0.169	0.169	0.172
Number of Firms	7,014	5,906	1,089
Industry FE	YES	YES	YES
Year FE	YES	YES	YES
Country FE	YES	YES	YES

Note: t-statistics in parentheses, *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 7. Classification shifting and interaction between SPITEM and masculinity.

VARIABLES	(1) EU28 UE_CE	(2) WEU UE_CE	(3) EEU UE_CE
SPITEM	0.877***	0.903*	0.174***
	(3.154)	(1.665)	(3.251)
MASC	-0.595***	-0.841***	-0.103***
	(-3.892)	(-4.505)	(-3.374)
SPITEM×MASC	-0.088*	-0.851	-0.053***
	(-1.759)	(-0.589)	(-3.644)
ROA	0.649***	0.574***	1.156***
	(9.750)	(7.972)	(6.440)
SIZE	0.074***	0.073***	0.091***
	(12.779)	(11.737)	(5.451)
MBV	0.006***	0.006***	0.005
	(4.886)	(4.648)	(1.491)
LEV	1.469***	1.418***	1.707***
	(41.401)	(35.863)	(20.761)
GROWTH	1.397***	1.437***	1.186***
	(73.070)	(68.121)	(25.823)
EXPOSURE	-0.622***	-0.640***	-0.449***
	(-20.949)	(-19.807)	(-5.854)
Constant	-2.987***	-2.772***	-3.468***
	(-25.578)	(-19.168)	(-17.711)
Observations	41,461	34,883	6,419
R-squared	0.170	0.170	0.172
Number of Firms	7,014	5,906	1,089
Industry FE	YES	YES	YES
Year FE	YES	YES	YES
Country FE	YES	YES	YES

Note: t-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1

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Table 8. Classification shifting and interaction between SPITEM and individualism.

VARIABLES	(1) EU28 UE_CE	(2) WEU UE_CE	(3) EEU UE_CE
SPITEM	0.773***	0.953*	0.207**
	(2.813)	(1.740)	(2.079)
IND	0.101**	0.328**	-0.122***
	(2.094)	(3.860)	(-2.929)
SPITEM×IND	0.094*	0.145	0.0921***
	(1.727)	(0.676)	(3.659)
ROA	0.651***	0.568***	1.171***
	(9.781)	(7.874)	(6.537)
SIZE	0.069***	0.066***	0.093***
	(12.114)	(10.871)	(5.613)
MBV	0.006***	0.006***	0.005
	(4.895)	(4.680)	(1.433)
LEV	1.469***	1.416***	1.712***
	(41.392)	(35.819)	(20.786)
GROWTH	1.403***	1.445***	1.199***
	(73.576)	(68.583)	(26.169)
EXPOSURE	-0.626***	-0.645***	-0.451***
	(-21.089)	(-19.965)	(-5.876)
Constant	-3.404***	-3.427***	-2.814***
	(-56.371)	(-54.146)	(-10.468)
Observations	41,461	34,883	6,419
R-squared	0.169	0.169	0.174
Number of Firms	7,014	5,906	1,089
Industry FE	YES	YES	YES
Year FE	YES	YES	YES
Country FE	YES	YES	YES

Note: t-statistics in parentheses, *** $p<0.01$, ** $p<0.05$, * $p<0.1$

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Table 9. Classification shifting and interaction between SPITEM and power distance.

VARIABLES	(1) EU28 UE_CE	(2) WEU UE_CE	(3) EEU UE_CE
SPITEM	0.329**	0.204***	0.133**
	(2.164)	(3.479)	(2.080)
PD	-0.178***	-0.244***	-0.149***
	(-4.409)	(-4.679)	(-2.739)
SPITEM×PD	-0.0370**	0.0737**	0.0297**
	(-2.138)	(2.085)	(2.029)
ROA	0.912***	0.842***	1.159***
	(10.564)	(8.464)	(6.466)
SIZE	0.070***	0.067***	0.089***
	(10.779)	(9.371)	(5.359)
MBV	0.007***	0.007***	0.005
	(4.704)	(4.505)	(1.498)
LEV	1.522***	1.443***	1.704***
	(35.654)	(28.644)	(20.733)
GROWTH	1.327***	1.365***	1.191***
	(57.776)	(51.004)	(26.026)
EXPOSURE	-0.616***	-0.653***	-0.446***
	(-17.466)	(-16.379)	(-5.813)
Constant	-2.505***	-2.177***	-3.239***
	(-11.914)	(-8.427)	(-7.961)
Observations	28,625	22,047	6,419
R-squared	0.169	0.168	0.173
Number of Firms	5,288	4,180	1,089
Industry FE	YES	YES	YES
Year FE	YES	YES	YES
Country FE	YES	YES	YES

Note: t-statistics in parentheses, *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 10. Classification shifting and interaction between SPITEM and long-term orientation.

VARIABLES	(1) EU28 UE_CE	(2) WEU UE_CE	(3) EEU UE_CE
SPITEM	0.502**	0.136**	0.542***
	(3.510)	(2.121)	(2.732)
LTO	0.462***	0.427***	0.233*
	(5.221)	(4.744)	(1.899)
SPITEM×LTO	0.503***	0.856**	-0.101**
	(2.865)	(2.191)	(-2.001)
ROA	1.153***	1.142***	1.174***
	(14.334)	(12.581)	(6.543)
SIZE	0.083***	0.082***	0.090***
	(13.634)	(12.298)	(5.494)
MBV	0.007***	0.007***	0.005
	(5.315)	(5.220)	(1.470)
LEV	1.640***	1.610***	1.712***
	(41.223)	(35.188)	(20.805)
GROWTH	1.343***	1.382***	1.196***
	(64.291)	(58.520)	(26.031)
EXPOSURE	-0.684***	-0.727***	-0.456***
	(-20.950)	(-20.038)	(-5.936)
Constant	-4.393***	-4.347***	-5.018***
	(-27.223)	(-25.847)	(-6.331)
Observations	35,063	28,485	6,419
R-squared	0.172	0.172	0.173
Number of Firms	6,172	5,064	1,089
Industry FE	YES	YES	YES
Year FE	YES	YES	YES
Country FE	YES	YES	YES

Note: t-statistics in parentheses, *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 11. REM1 and Hofstede - Cultural Variables.

VARIABLES	(1) EU28 REM1	(2) WEU REM1	(3) EEU REM1
UAI	0.179***	0.064	0.332***
	(3.265)	(1.023)	(4.311)
MASC	-0.621***	-0.414***	-0.381***
	(-16.005)	(-7.924)	(-5.938)
IND	0.021***	0.012***	0.337***
	(6.797)	(3.393)	(6.716)
PD	0.046***	0.037*	-0.425***
	(4.040)	(1.725)	(-4.966)
LTO	0.042*	0.104***	5.513***
	(1.756)	(2.915)	(6.818)
ROA	0.840***	0.849***	0.784***
	(57.406)	(51.922)	(24.932)
SIZE	0.002**	0.004***	0.001
	(2.045)	(3.578)	(0.283)
MBV	0.001*	0.000	0.001*
	(1.775)	(0.403)	(1.824)
LEV	0.163***	0.223***	0.052***
	(19.217)	(22.435)	(3.126)
GROWTH	0.471***	0.456***	0.487***
	(101.908)	(87.710)	(50.047)
EXPOSURE	-0.129***	-0.152***	-0.082***
	(-17.978)	(-19.519)	(-4.797)
Constant	0.099	-0.016	-9.699***
	(1.107)	(-0.099)	(-6.384)
Observations	42,411	31,558	10,578
R-squared	0.350	0.351	0.352
Number of firms	4,476	3,235	1,221
Industry FE	YES	YES	YES
Year FE	YES	YES	YES
Country FE	YES	YES	YES

Note: t-statistics in parentheses, *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 12. REM2 and Hofstede - Cultural Variables.

VARIABLES	(1) EU28 REM2	(2) WEU REM2	(3) EEU REM2
UAI	-0.023	-0.025***	-2.042***
	(-1.421)	(-3.521)	(-8.016)
MASC	0.176***	0.114***	-0.224***
	(15.563)	(8.397)	(-2.797)
IND	-0.005***	-0.003***	-0.114***
	(-5.646)	(-2.692)	(-7.677)
PD	-0.031***	-0.029***	0.208***
	(-9.456)	(-5.367)	(8.008)
LTO	-0.019***	-0.035***	-0.420***
	(-2.700)	(-3.911)	(-5.879)
ROA	-0.070***	-0.056***	-0.095***
	(-16.711)	(-13.490)	(-8.650)
SIZE	0.014***	0.010***	0.043***
	(42.402)	(33.211)	(31.751)
MBV	-0.000	-0.000	-0.000
	(-0.555)	(-0.422)	(-0.214)
LEV	-0.037***	-0.047***	-0.006
	(-14.892)	(-18.314)	(-1.078)
GROWTH	-0.015***	-0.016***	-0.012***
	(-11.293)	(-12.329)	(-3.432)
EXPOSURE	0.038***	0.038***	0.040***
	(17.752)	(18.575)	(6.687)
Constant	-0.298***	-0.212***	2.833***
	(-11.627)	(-5.058)	(6.170)
Observations	45,836	34,068	11,478
R-squared	0.071	0.065	0.133
Number of firms	4,574	3,316	1,238
Industry FE	YES	YES	YES
Year FE	YES	YES	YES
Country FE	YES	YES	YES

Note: t-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1

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Do cultural differences affect the quality of financial reporting in the EU? An analysis of Western EU countries vis a vis Eastern EU country.

Response to Reviewer 2

We would like to thank the Reviewer for having read and accepted our paper. We have revised the paper inspired by your comments and suggestions.

Our revision is now complete.

We responded to all points in our response.

Please find below our detailed responses to each comment.

Summary
The Reviewer argues that the paper has substantially improved through the revision and the authors have thoroughly addressed all my major concerns and found a satisfactory solution to the issues.
The Reviewer proposes some minor issues that we address below.

Minor concerns
1. Title: The Reviewer suggests using "Eastern" instead of "East" as the authors also use "Western".

Thank you for this comment, we have amended the title accordingly.

2. The authors should use abbreviations only after having introduced them. In particular, the acronym "REM" is first used on page 3 but only a few sentences later, they introduce REM as "real earnings management".

We introduced REM as "real earnings management" two sentences before as suggested by the reviewer. In general, we have checked all abbreviations used in the paper.

3. The footnote no. 1 is irrelevant as they define "classification shifting" only 3 sentences later in the text.
Thank you for this point, we absolutely agree with this, and we removed that footnote.

4. On page 4. The authors state that "This paper [...] proposes to examine whether they explain earnings management in the form of classification shifting and real earnings management". In the abstract, in contrast, they only refer to classification shifting. They need to be more specific: is it classification shifting only or do they also include REM in their analysis?

Thank you for this point. The main analysis is on classification shifting and later in the paper we also verify REM as robustness exercise. So, we slightly modified the point mentioned by the reviewer at page 4 of the paper specifying that the main analysis is on classification shifting and REM is a robustness analysis.

5. The term "EU-new" still appears in the paper (e.g., p. 7)

We changed this point using the new abbreviation (EEU) and in general we controlled the rest of the paper to avoid any other similar typos.

6. Can the authors please review hypothesis H2. Maybe there is a misunderstanding. In 2.2.2 they state that "East European culture is less individualistic than West European (Hofstede, 1980; Kolman et al. 2003)". However, H2 seems to be contradictory to this: "High level of individualism, as associated with EEU countries,…". In my view it should read, "Low level of individualism, as associated with EEU countries,…"

Thank you very much for this point. We redraft hypothesis 2 to address this point and now reads: "Low level of individualism, as associated with EEU countries,…"

7. p. 27: please reconsider the sentence "According to Hofstede et al. (2010), EEU have more men than WEU." Do the authors mean that there are more men in management positions? This is also the case in WEU, however, maybe it's even more in EEU?

In line with this comment, we delete this reference as it could create a misleading interpretation and it is not part of our identification.

8. Although in their CoE letter they state that they deleted the notion "Authors' estimations" in all tables, it is in fact still to be found under tables 6 to 12.

We removed now "Authors' estimations" also from all tables where it was still included in the previous version of the paper.

9. The manuscript still has some issues with English language and writing, particularly with punctuation and grammar (e.g., p. 2, remove the period before referring to (Akaliyski, 2019); p. 25, "showed" should be changed to "shown", p. 25 the double "in in" should be removed; p. 33, "WEE" should be changed to "WEU"; p. 33 "taken in account" should be changed to "taken into account"; p. 34, again "taken into account" should be used; literature: the source Akaliyski (2019) should apply the same referencing style (remove ":"). I suggest that the authors must fix this before this work can be published.

Thank you for all the above comments that we take into account in the revised manuscript. We also proof read the manuscript for remaining errors.