Does Female Human Capital Constrain Earning Management: The Case of the UK

Zakaria Ali-Aribi, Philip Kostov and Emhemmed Aghab

This is a pre-print of a paper forthcoming in 2021 in

Business Ethics, the Environment & Responsibility (BEER)

Abstract

The paper examines how the presence of female directors on corporate boards influences the practice of real and accrual earning management in UK firms. We account for the endogeneity of a range of corporate governance measures, including female board representation, with regard to earnings management and demonstrate that ignoring this problem may lead to perverse results. We find that female board representation constrains both forms of earnings management. Our results provide evidence that female directors bring considerable and diverse human capital, enhance board monitoring and contribute to qualitative shift in the decision-making process in the boardroom. We suggest that boards' gender diversity and earning management is an overlooked area in the UK and globally, and may require the attention of regulators.

Introduction

The issues of gender diversity on the board of directors have attracted widespread analytical attention. Internationally, female board representation is quite low and progress towards increasing it has been very slow. In Deloitte's (2017) analysis of nearly 7,000 companies in 60 countries, women held 15% of all board seats globally in 2017, up from 12% in 2015. In the UK, women directors accounted for 26.8% in 2017 up from 8.9 % in 2010 (Eastman, 2017), while about 100 companies in the FTSE 350 either have no women or just one on their board (Gordon, 2018). The Davis report (2011) asserted that that companies with a strong female representation at board and top management level perform better than those without and that gender diverse boards have a positive impact on performance.

Earning management (EM) is perceived as purposeful intervention in the external reporting process with the intent of obtaining some private gain by either a selection of accounting methods within the GAAPs or by applying given methods in particular ways (Belkaoui, 2004). This practice can mask the true financial position of firms and hide or manipulate relevant financial information that investors ought to know (Loomis, 1999). Such opportunistic practices by management mislead shareholders into incorrect interpretation of the firm's financial performance in order to gain some private benefits at the expense of other stakeholders (Arun et al., 2015). Because of its potential to distort reported earnings and mislead users of financial information, EM is a significant ethical concern. EM actions are not necessarily illegal, and many are within the manager's prerogatives. The ethical perspective, however, raises the question as to whether it is the right thing to do (Jooste, 2011).

The practice of EM can take two distinct forms, namely that of accounting information manipulation, denoted as Accruals Earnings Management (AEM) as well as real operating decisions, referred to as Real Earnings Management (REM). AEM occurs when managers use the flexibility in the GAAP to meet their target earnings. AEM takes place at the end of the firm's financial year and it affects the output of the accounting system but does not have any direct cash flow result (Zhao et al., 2012). On the other hand, REM usually occurs during the year (Gunny, 2010) and it has a direct impact on the cash flow. It is defined as management actions that deviate from normal business practices such as increasing production more than necessary in order to increase earnings, with the primary objective of meeting specific earnings thresholds (Roychowdhury, 2006). Thus, REM differs from AEM in that it includes manipulations of real business activities. Most previous studies examine the effect of gender diversity on one strategy of EM (i.e. either accruals or real). However, given the nature of EM practices, managers probably use multiple strategies at the same time to meet their target earnings. It is therefore beneficial to consider both EM practices at the same time. This will allow to identify possible trade-offs between the two strategies, as well as their relative significance with the broader usage of EM practices.

This paper is motivated by the emerging body of literature on the impact of female directors on EM. Prior studies provided mixed and inconsistent results on the impact of female directors on AEM. One needs to take into account that there has been shift away from AEM in recent years. This shift has become more prominent post 2000s when following the U.S. corporate scandals like Enron and WorldCom regulation that restricts such practices and

increase the chances of detection has been introduced (Bubaker and Aribi, 2020; Zalata et al., 2019). This shift suggests that the usage of REM, which is more difficult to detect may be increasing in relative terms. However, the evidence on the impact of female directors on REM is relatively scarce. In this paper, we provide new evidence that is relevant to this debate by investigating the hypothesis that gender diversity in the boardroom affects financial reporting quality. In particular, we ask the question whether female directors act more ethically when facing the dilemma of EM than male directors. If this is the case, their presence in the boardroom should constrain instances of opportunistic behaviour.

Using a large sample of 223 firms from FTSE 350 companies observed over 10 years from 2006 to 2015, our findings reveal that gender diverse boards mitigate both REM and AEM. Furthermore, we demonstrate that corporate governance mechanisms are endogenous with regard to EM and when this endogeneity is not accounted for one may obtain perverse results about the effect of gender diversity.

The results make several important contributions. First, by examining the human capital of female directors we indicate and reinforce the importance of gender diversity in board monitoring and hence improvements the financial disclosure quality through transparency. Specifically, our findings suggest that the characteristic features of the human capital associated with female directors, namely greater risk aversion and ethical attitudes translate into reducing instances of opportunistic behaviour of EM. Second, our results provide support to the effort of regulators to set minimal female representation quotas (as e.g. in France and Sweden).

The paper is organised as follows. The conceptual framework, literature and endogeneity problem, are set out in Section 2, 3 and 4, while Section 5 discusses the empirical research methods used. Section 6 presents the results and Section 6 concludes.

Conceptual framework

The concept of human capital is defined by the OECD as “the knowledge, skills, competencies and other attributes embodied in individuals or groups of individuals acquired during their life and used to produce goods, services or ideas in market circumstances”. Blundel et al. (1999) classified the concept of human capital into two main categories, the

early abilities of an individual which are either acquired or innate and skills acquired through formal education and training on the job. The formulations of the human-capital theory can be traced back to Mincer (1958) and Becker (1964). The human capital theory advocates that individuals derive economic benefits from their human capital, which is considered similar to other means of production, such as stock and machines. Thus, human capital is means of production, and additional investment into it yields additional output. In the same vein, Kesner, (1988) suggests that each director brings a unique set of attributes and human capital resources to the board. Prior studies suggest that the gender diversity of the board of directors will have an impact on the firm's performance (e.g., Isidro et al., 2015; Brahma et al., 2020). Indeed, gender diversity leads to unique human capital in the board because females are more likely to convey different attributes into the boardrooms (Terjesen et al., 2009). Women tend to have different management style and professional experiences than their male counterparts (Nielson & Huse, 2010). Dang et al (2014) report that women may bring slightly different human and social capital than men through their different professional experiences, especially by being more likely to come from Civil Society Responsibility positions. Some researchers suggest that women are more consensual and participative, better team players and able to better delegate, while men tend to be more directive and hierarchical in their approach (Chapman, 1975; Eagly et al., 2003). Dawson (1997) argues that women are inherently different from men in their ethical behaviour. Betz et al. (1989) indicate that women are expected to be more ethical in the workplace and less likely to engage in unethical behaviour to gain financial rewards. Likewise, Burgess and Tharenou (2002) assert that the call for gender diversity on board is related to females' higher propensity for ethical behaviour, social sensitivity, and they appear to be more concerned than male directors about societal matters (Garcia-Blandon et l., 2020). Post et al. (2011) argue that gender diversity on the board of directors improves the chances that these different types of knowledge, ideas, and perspectives will be considered in the decision-making process. This is likely to improve board effectiveness through improving the quality of board deliberations, better monitoring and higher quality of disclosures.

There are two psychological characteristics commonly attributed to females that are of particular relevance to the practice of EM. The first such characteristic is the ethical sensitivity. Burgess and Tharenou (2002) justify the call for gender diversity on the board by the females' greater (compared to males) ethical sensitivity. A greater predisposition towards ethical behaviour and attentiveness to social issues are exactly the type of psychological

features that are likely to constrain the practice of EM (Zalata et al., 2018). This ethical attitude by females' directors has been observed in several studies. For example, Ho et al. (2015) argued that the stronger ethical attitude of females' directors translates into stronger ethical leadership, and hence a more ethical work environment, which can foster greater levels of honesty in financial reporting, and thus potentially constrain earnings management. Similarly, Beji et al., (2020) argue that female directors could have more ethical perceptions than their male counterparts. They are also more likely to be sensitive and encourage ethical thinking in the decision-making process and may impact on decisions related to particular organizational practices, such as EM practice (Westphal & Milton, 2000; Carter et al., 2003; Nielsen and Huse, 2010). The second characteristic is that of risk aversion. Females are perceived to be more risk averse than their male counterparts and, therefore, are less likely to engage in aggressive EM (Vahamaa 2010; Arun, et al. 2015; Zalata et al., 2018). We argue that given the above two characteristics, greater females representation in the board of directors should be expected to contribute to restricting EM practices.

Literature review

A number studies examine the relationship between females and AEM. Krishnan and Parsons (2008) found that accrual quality is positively associated with female senior management. Pen et al. (2010) examine the effects of female executives on AEM and find that female chief financial officers (CFOs) are associated with income decreasing discretionary accruals, thereby implying that female CFOs are following a more conservative EM strategy. However, they found no association between AEM and female CEO. Barua et al. (2010) examine the association between CFO gender and the quality of accruals. Their results show a negative relationship between AEM and female CFO. Srinidhi et al. (2011) find that U.S. firms with gender-diverse boards practice less AEM. Likewise, Gavious et al. (2012) find evidence for a negative relationship between the presence of female directors and AEM. Arun et al. (2015) show that firms with a higher number of female and independent female directors tend to adopt more conservative accounting policies and employ less AEM. Aguir et al. (2015) find that the presence of women on the board reduces AEM in French listed firms. Similarly Gull et al. (2018) show that the presence of female directors deters managers from AEM.

However, such effects are not universal and while female participation in top management or boards is commonly found to reduce AEM, there is no such evidence for such effects of

female participation in audit committees. For example, Sun et al. (2011) find no link between the proportion of females on audit committees and the extent of AEM. Likewise, Hili and Affes (2012) found no association between AEM and the presence of female directors on audit committees in French and US companies respectively.

Very few studies in the literature examine the impact of female directors on REM. For example, Luo et al. (2017) analyse real activities manipulation and find that in China higher female presence on board is associated with lower levels of REM. Alquhaif et al (2017) provide evidence that women board members reduce REM in Malaysian listed firms. However, in contrast to the almost universal acceptance of the constraining effects of female board representation on AEM, the results for REM are less clear-cut. Take for example Debnath et al. (2019) who study the association between female directorship on the board and REM in Bangladesh throughout the period 2000-2017. Their results indicate that firms,with female director(s), tend to be involved in higher levels of EM. While it is difficult to generalise from such a limited number of studies where country specifics can play a prominent role in obtaining contradictory results, it is clear that the issue of the effect of female board representation on REM deserves further attention.

Most previous studies examine the effects of gender on one strategy of EM (i.e. either accruals or real). However, given the nature of EM practices, managers probably use multiple strategies at the same time to meet their target earnings. Prior studies also provided evidence that firms may use the two strategies as substitutes in manipulating earnings (Cohen et al. 2008; Zang, 2012). The focus of this study is on whether female directors can simultaneously constrain both REM and AEM. This research question is critical for two reasons. First, as reported by Fields et al. (2001), considering only one EM method at a time cannot explain the overall effect of EM activities. In particular, if managers use REM and AEM as substitutes for each other, examining the effects of say gender on either method of EM activities isolation cannot provide conclusive evidence.

In summary, previous studies do not fully agree about the impact of female directors on earning management. While in the case of AEM, most studies tend to agree on the negative effect of females on EM practices and only a few find no significant relationship, there seems to be more uncertainty with regard to the effect of female representation on REM. Here some studies actually claim that female board participation may reinforce EM (see e.g. Zalata et al., 2019). Given the relative scarcity of studies on female effects of REM (as compared to

similar studies on AEM), such results can be interpreted as creating a controversy, which needs to be addressed.

To address the conflicting findings in the studies mentioned above, we contend that one reason for previous studies' inability to provide consistent and robust relationship between female and earning management might be their research design. Past studies ignoring endogeneity issues during estimation can result in biased and inconsistent estimates, hence preventing effective inference about the issues of interest. In contrast to this, accounting for endogeneity allows one to obtain the correct relationship. In addition, the majority of prior studies focus on accrual earning management that became costly method rather than other, perhaps less costly, methods (such as real earning management) due to its higher detection cost after financial scandals (Abernathy et al. 2014, Zalata et al., 2018; Bubaker and Aribi, 2020).

Given these prior studies and the theoretical expectations of the constraining effect of female board representation on opportunistic behaviour we can formulate the following hypotheses. First, female board representation is expected to reduce AEM. This conforms to most of the previous studies. Second, we also expect a constraining effect of female board representation on REM. While the limited amount of previous studies are less than conclusive on what this effect should be, we believe that methodological problems in these studies may be a primary reason for their inconsistent results. Finally, we also explore whether the participation of females in audit committees affects EM. Unlike the case of females on company boards we do not think there are any compelling reasons of why audit gender diversity would affect EM and hence expect no effect on either form of EM.

The problem of endogeneity

Corporate governance mechanisms are often viewed as deliberate response to problems of opportunistic behaviour by company managers. Therefore, it can be expected that such mechanisms can be influenced by the very realisations of opportunistic behaviour, which they try to constrain. This interaction between corporate governance and opportunistic behaviour can lead to endogeneity issues. There are three, somewhat related, sources of endogeneity in econometric models, namely simultaneity, omitted variables and measurement errors. All three could be present in empirical settings that involve corporate governance measures. We briefly describe and comment on each of these in the context of the present study.

Simultaneity arises when the dependent variable and some covariate are determined at the same time either by a feedback mechanism of mutual causation, or, alternatively when another variable drives (i.e. causes) them both at the same time. Simultaneity always results in endogeneity. The other two sources of endogeneity, omitted variables and measurement errors only lead to endogeneity when there is an underlying dependence structure.

Hermalin and Weisbach (1998) argue that board composition is a result of bargaining process between the CEO and the board. The CEO's bargaining power depends on his/hers perceived (by the board members) ability relative to alternative candidates. In such settings if the CEO can affect firm performance measures either due to innate ability or by accounts manipulation (i.e. EM) this will allow him/her to more effectively resists board pressures. Therefore, EM can (amongst other things) affect the CG structures. Hermalin and Weisbach (1988) argue that in the U.S., board composition is likely to change following poor performance. Such an effect is also found by Kaplan and Minton (1994), Denis and Sarin (1999), Bhagat and Black (2002) and Easterwood and Raheja (2008) inter alia. Other CG characteristics can also be affected in similar lines. For example, Kole (1996) shows prior firm performance influences managerial ownership. Therefore, if firm performance affects both CG and EM, this will result in simultaneity of CG and EM. The source of endogeneity in this case is a missing variable (firm performance) driving both CG and EM. This can be remedied by including it in the empirical model. It is therefore important to try to include any such missing variables in empirical model used to investigate CG effects of EM.

As Demsetz and Lehn (1985) argued, governance structures are product of the firm specific agency costs. The literature of determinants of CG structures typically uses observable firm characteristics such as size, growth opportunities, number of business segments, age and the uncertainty of the firm's business environment to proxy for agency costs. Empirical studies, such as e.g. Mulherin (2005), Boone et al. (2007), Coles et al. (2008), Linck et al. (2008) demonstrate that board structures are closely related to such firm characteristics, while Demsetz and Lehn (1985), Himmelberg et al. (1999) and Demsetz and Villalonga (2001) manage to empirically relate firm characteristics (as proxies for agency costs) to management ownership. As per above this can lead to simultaneity of CG and firm performance and further evidence on this is provided by Denis and Kruse (2000), Hermalin and Weisbach (2003) and Wintoki et al. (2008).

Since firm characteristics, including those that proxy for agency costs are routinely used in the empirical models explaining EM, this clearly leads to simultaneity, in the sense that agency costs drive both CG and EM. The latter can be directly derived from the Agency theory, but such a conclusion can be equally valid if a different theoretical model was adopted. For example the signalling hypothesis implies that CG changes can be used to signal to outsiders issues (or improvements) related to the firm situation and practices which could include transparency, accounting practices, performance expectations etc.) and hence these unobservable can affect both CG and EM. Similarly, creating and maintaining legitimacy (as postulated by the Legitimacy theory) will involve a dynamic process that can affect both CG structures and EM.

The disagreements between theoretical models can also be translated into endogeneity. Different theoretical model postulate different possible determinants. So, unless one knows for sure which is the right theoretical model, there might be missing variables. The same may happen even if the theoretical model is known, but not all relevant quantities can be reliably measured. Whenever the missing variables are also related to some of the other covariates, we obtain a model structure which is in technical terms quite similar to the case of third variable cause of simultaneity. The difference is, of course, that this simultaneity is not objectively present but is an artefact of the empirical model specification.

Finally, measurement errors can also lead to endogeneity. In the present study context both the CG and EM measures are more than likely to suffer from measurement errors.

Measuring REM

REM is reflected in abnormal levels of production costs and discretionary expenses. Managers can cut discretionary expenditures to increase the reported earnings. Managers can also increase earnings by overproducing inventory to report lower costs of goods sold. At the same time, they can temporarily increase sales volumes through reduced prices, by offering more lenient credit terms and increased price discounts, but these are likely to disappear once the firm turns back to old prices (Cohen & Zarowin, 2010). Hence, REM is a reflected in abnormal levels of discretionary expenses and production costs. Following Roychowdhury (2006) we construct three measures of real earning management, namely abnormal cash flows from operations, abnormal discretionary expenses, and abnormal production costs. These measures have been widely used in prior research to proxy real activities manipulation. (Cohen & Zarowin, 2010; Farooqi et al., 2014; Kang & Kim, 2012; Zang, 2012). We measure

abnormal levels of the three REM measures as the residuals from the relevant models estimated as shown below:

Abnormal cash flow from operations (CFO)

We express normal CFO as a linear function of sales and change in sales. To estimate this model, we run the following cross-sectional regression for each industry and year:

$$CFO_{it} / A_{i,t-1} = \alpha + \beta_1 (1 / A_{i,t-1}) + \beta_2 (Sales_{i,t}) / A_{i,t-1}) + \beta_3 (\Delta Sales_{it} / A_{i,t-1}) + \varepsilon_{it} \quad (1)$$

The abnormal level of cash flow from operations is measured by the residuals (ε) from equation 1.

Abnormal production cost (PROD)

$$PROD_{i,t} / Assets_{i,t-1} = \alpha + \beta_1 (1/Assets_{i,t-1}) + \beta_2 (Sales_{it}/Assets_{i,t-1}) + \beta_3 (\Delta Sales_{i,t} /Assets_{i,t-1}) + \beta_4 (\Delta Sales_{i,t-1}/Assets_{i,t-1}) + \varepsilon_{it} \quad (2)$$

The abnormal production cost is measured as the residuals (ε) from equation 2.

Abnormal discretionary expenses

$$DISX_{i,t}/Assets_{i,t-1} = \alpha + \beta_1 (1/Assets_{i,t-1}) + \beta_2 (Sales_{i,t}/Assets_{i,t-1}) + \varepsilon_{i,t} \quad (3)$$

The abnormal level of discretionary expenditures is measured as the estimated residuals (ε) from equation 3.

To capture the effect of REM through the three measures, we construct a single variable for REM by combining the three individual REM variables (i.e. abnormal CFO, abnormal PROD and abnormal DISX). Consistent with Cohen & Zarowin, 2010, we multiply abnormal CFO and abnormal DISX by -1 so the higher the amount of abnormal CFO and abnormal DISX, the more likely it is that the firm is engaging in sales manipulations through price discounts and cutting discretionary expenses. Our combined measure is the sum of these three variables:

$$REM = - AB\_CFO – AB\_DISX + AB\_PROD$$

INSERT TABLE 1

Table 1 presents an overview of these different components of the REM measurement framework.

Measuring AEM

We use discretionary accruals as a proxy for AEM. We follow Kothari et al. (2005) and measure AEM by the residuals from the modified Jones model. The cross-sectional Modified Jones Model (1995) estimates the following regression model for each year (i.e. 10 separate regression in this case)

$$TAC_{it}/A_{i,t-1} = \alpha(1/TA_{i,t-1}) + \beta_1(\Delta REV_{it} - \Delta REC_{it})/A_{it-1}) + \beta_2(PPE_{it}/A_{i,t-1}) + \varepsilon_{it} \quad (4)$$

The above regression is estimated separately for each industry-year combination (i.e. a total of 120 = 12 (industries) times 10 (years) separate regressions are estimated). We then employed the coefficient estimates from the equations (4) to calculate normal accruals

(NA_{it}) for every firm-year observations in the sample:

$$NA_{it-1} = \alpha\,(1 / TA_{i,t-1}) + \beta 1\,(\Delta REV_{it} - \Delta REC_{it}) / A_{it-1}) + \beta 2\,(PPE\,it / A_{i,t-1}) \quad (5)$$

INSERT TABLE 2

Accordingly Table 2 presents an overview of the AEM measurement framework.

Data

We consider the companies in the UK FTSE 350 index during the period 2006 to 2015. However, we have removed the categories of regulated, financial, utility and mining industries due to their unique characteristics and specific regulations which may affect the results (DeFond and Jiambalvo, 1994, Klein, 2002). In addition, as in the case of prior studies industries with fewer than six observations and the firms with missing data have also been removed from the initial sample (DeFond and Jiambalvo, 1994). Removing firms with missing data results in a balanced panel dataset. This particular step is not always necessary

unless the statistical analysis methods that are applied explicitly require a balanced panel, which is the case in the present study. The final sample consists of 223 firms over 10 years period. The sample determination process is outlined in Table 3.

INSERT TABLE 3.

Data are gathered from the FAME database and firms' annual reports. Table 4 presents summary of the data used in the paper.

Independent variables

Following prior studies female representation on board is measured as a percentage of female directors to the total number of board members. The EM determinants are firm characteristics as in DeFond and Jiambalvo (1994) and Cohen et al. (2008), with the addition of corporate governance controls as discussed in Klein (2002) and Katmon and Farooque (2017). This design encompasses the variables considered in previous studies of gender effects on EM (e.g. Peni and Vähämaa, 2010; Barua et al., 2010; Srinidhi et al., 2011; Gavious et al., 2012; Arun et al., 2015; Almahrog et al, 2018). The control variables are listed below. Board size (BSIZE) is measured as the total number of directors. Board meetings (BMEET) is the number of board meetings held annually by the board of directors. Board independence (BIND) is measured as the percentage of independent directors. Audit committee size (ACSIZE) is the number of audit committee members. Female representation of the audit committee (ACFEM) is the percentage of female directors on the audit committee. Audit committee meetings (ACMEET) is measured as the number of annual audit committee meetings, while audit committee independence (ACIND) is the proportion of independent non-executive directors in the audit committee. The expertise of audit committee members (ACEXPE) is measured as the percentage of members with accounting and financial qualification and financial accounting expertise. Management ownership (MOWNE) is measured as the percentage of shares held by the directors. Institutional ownership (INSTITU3) is the percentage of shares owned by institutional investors with a stake of at least 3%, while block holders ownership (BLOCKH10) is measured as the percentage of shares owned by major block holders (which own at least 10 % of the company).

The rest of the variables are standard firm characteristics routinely used in similar studies. FSIZE is firm size measured as the natural log of the total assets, FLEVER is firm leverage

measured as total liabilities divided by total assets, ROA is return on assets measured as the earnings before interest and taxes divided by total assets, FGROW is the firm growth expressed as the percentage change in total assets relative to the previous year, Big.4 is a dummy variable which takes a value of 1 if the firm is audited by big four audit firm. Finally Z.SCORE is the Altman's Z-Score which is common measure of financial sustainability with lower values indicating the possibility of financial distress.

INSERT TABLE 4

Descriptive statistics

The sample is characterised by an average BSIZE of 9 directors with a large variability from a minimum of 4 to a maximum of 19, although most cases have between 5 and 16 directors (each of the other numbers of directors accounts for less than 1% of the observations).

There are on average 8 annual board meetings in the range from 3 to 19, which appear to be concentrated (if as per above we ignore the cases with less than 1% support from the data) between 4 and 15. If we were to only count the cases with at least 10% of the total observations the board size would range between 5 and 10 meetings, which demonstrates that the observed average of 8 meetings per year is rather typical. On average about half of the board members are independent. A more careful investigation of the distribution of the board independence reveals that it is highly concentrated around its mean. The share of female board members in the sample is rather low with an average of 12%. Taking into account that over the period under study the female representation rose from 9% to at least 27% (Eastman, 2017) this means that in the omitted by this study industries (i.e. finance and regulated industries) this proportion is considerably higher. This makes sense since regulated industries and since the 2008 financial crisis the finance industry have been subject to closer public scrutiny which had led to higher female representation inter alia.That said 39% of the total year-firm observations (871) have no female representation, and the maximum is 45%. This means that in the present study female representation can be clearly viewed as diversity measure, since larger values increase gender diversity (if there were cases with more than 50% these would decrease gender diversity). It is also informative to look at the empirical density of female representation, presented on Figure 1.

INSERT FIGURE 1

We observe tri-modal distribution with local modes at around 21% complementing the modes at 0 and 11%. The drastic dip in the density distribution between the first two modes may hint that there is no tokenism (where a female director is appointed to demonstrate diversity). However taking into account that the average board size is 9 members, this means that a single female director correspond roughly to the mode of 11% representation, while the other nonzero mode can be accounted for by on average two female directors, hence raising questions about instances of tokenism.

In the case of female share in the audit committee, these is a higher instance of cases with no female representation of almost 57%, with two local modes at 25% and 33%. Since the average size of the audit committee is only 3.7, this again demonstrates female under-representation. Due to the small size of the audit committee the observed maximum of 67% for female representation is more of an incident (see Figure 1) so we can also consider the ACFEM as a diversity measure. The average value for managerial ownership is 5%, but the it highly dispersed with a maximum value of almost 54% and observations more or less uniformly spread over whole range. Since managerial ownership provides a major incentive for practising EM, such a wide spread is conducive to examining its effects. Both institutional and block-holder ownership are well represented in the sample accounting, on average, for respectively 37% and 28% of the firms' capital.

Empirical model

As we have already discussed, there are potential endogeneity problems in the investigation of the effect of CG on EM. The commonly used estimation (and indeed testing) approaches for endogeneity rely on instrumental variables used to identify the endogenous variable(s). Relevant empirical examples of such an approach include Schultz et al. (2010) and Wintoki et al. (2012). Finding and justifying correct instruments is however far from a trivial task and can potentially lead to a number of pitfalls. In order to avoid such complications in this paper we adopt an entirely instruments free estimation approach, namely a copula corrected estimation. The copula correction method (Park and Gupta, 2012) can be used when no instruments are available. The validity of this approach rests on the crucial assumption that the endogenous variables are not normally distributed, and in the case of continuous endogenous variables, it is preferable that they follow some type of skewed distribution. Therefore, checking the excess kurtosis and skewness of the endogenous variables provides

an indication of the applicability of the method. The underlying idea is that the marginal distribution for the error term (which is given by the statistical model estimated, typically a conditional Gaussian) can be complemented by assuming marginal distribution(s) for the endogenous variable(s). Then one can use a copula specification to specify a flexible multivariate joint distribution of the error term and the endogenous variables, given the covariates (a copula is a function that maps several conditional distribution functions (CDF) into their joint CDF, hence allowing for flexible modelling of multivariate distributions). The above specification allows for a very wide range of possible correlations between these marginals. In practice instead of assuming a particular marginal distribution for the endogenous variables, one can simply estimate their empirical distribution function using a standard kernel density estimation (in this case Epanechnikov kernel with a Silverman's rule of thumb choice of bandwidth). The joint multivariate distribution contains additional terms which are the correlations between the endogenous regressors and the error term and which have the role to correct for the effects of endogeneity on estimation. In the case of single endogenous variable, the model can be estimated directly by maximum likelihood. When there are several endogenous regressors, additional regressors constructed as the inverse of the marginal distribution of the endogenous variables are included in the model. These additional variables act as control functions and provide a correction derived from the correlations between the error term and the endogenous variables. The outcome from this procedure is that the resulting model (augmented as per above) is such that none of the included covariates is any longer correlated with the error terms and therefore the resulting model can be estimated by standard methods. Since the inference procedure proceeds in two stages (first the empirical distributions of the endogenous regressors are estimated and inverted and in the second stage the additional regressors computed during the first stage are used to augment the model), standards errors (and the covariance matrix in general) obtained during the second stage will be incorrect. To allow for correct inference bootstrap is used to construct confidence intervals. The distribution of the bootstrapped parameters is expected to be highly skewed and for this reason the non-parametric percentile confidence intervals are used.

It has to be noted that the above method is by no means a magical solution for the issue of endogeneity. In the case of incorrect model specification (for either the model or indeed the copula specifications itself), it can fail. It has however some useful characteristics. Since the correction for endogeneity is provided by including the additional variables, their statistical

significance can be interpreted as a formal test for the endogeneity of the variables used in their construction, similarly to the Wu-Hausman test in the case of conventional instruments. When this correction is insignificant, one will fail to find evidence for the endogeneity of the variable under question. Hence as an artefact of the estimation procedure we can test for endogeneity of the model covariates without needing valid instruments. A major disadvantage of the used approach is that (due to identification considerations) it is not applicable to binomially distributed potentially exogenous variables.

Results

Estimation details and validity tests

In principle the estimation strategy considered all CG variables as potentially endogenous and included the relevant 'control function' variables for each of them. Then the controls which were found to be statistically insignificant were removed from the specification. The firm characteristics, (i.e. firm size, leverage, growth) were assumed exogenous and were not tested alongside the above lines. Furthermore, the Big 4 indicator was also excluded from consideration, since it is binomially distributed and hence the copula correction method cannot be used to identify it, if it was endogenous. Therefore, we have considered the potential endogeneity of the CG variables and ROA. Return on assets is a firm (financial) performance measure, rather than a firm characteristic. Following the prior discussion of the sources of endogeneity in CG studies, it is possible that firm performance can be endogenous with regard to EM and hence we implicitly allow (and test for) such a possibility.

The methodology used in the paper is only applicable if the empirical statistical distribution of the variables suspected of endogeneity is skewed and preferably characterised by fat tails. For this reason, we start with a preliminary investigation of the statistical properties of the empirical distribution of the variables used in the study. We test the skewness and the excess kurtosis for each covariate. For conciseness, we only present these results for variables that are identified as endogenous in one of the two models presented further on. These tests statistics are presented in Table 5. These demonstrate that the variables that we later identify as endogenous (to any of the two forms of EM) are highly skewed and characterised by significant excess kurtosis. Therefore, the approach used in the paper is applicable to the models that we estimate. Furthermore, we present in Figure 2 plots of the empirical density of these variables against a normal density. These plots clearly demonstrate the high degree of

deviation from Gaussian distribution of all the endogenous variables, as well as the skewness and excess kurtosis (as shown in Table 5).

INSERT TABLE 5

INSERT FIGURE 2

Effects on REM

We now proceed to description of the estimated models. In order to demonstrate the effects of ignoring endogeneity we show side by side the estimation results from the main (i.e. copula correction) model and a standard panel regression model (with fixed company effects), which ignores the issue of potential endogeneity. Let us first consider the case of REM. The estimation results are presented in Table 6. Note that the standard model results (on the right hand side of Table 6) suggest that female board representation may increase the level of real EM. Such a result would contradict the theoretical and conceptual framework we discussed earlier and prior studies (e.g. Liu, Wei & Xie (2016; Xiong, 2016; Alquhaif et al; 2017) . Furthermore, all the other effects are plausible, in the sense that their signs and statistical significance both agree with expectations and with the correct results (on the left hand side of Table 6) which take into account the potential endogeneity. It would not therefore be inconceivable that such results can be presented and accordingly published.

In contrast to that our methodological approach which controls for endogeneity conforms to the theoretical model in that I tshows that gender diversity does indeed manage to constrain opportunistic behaviour (in the case of REM) via the postulated effects of diverse human capital brought into the boardroom by the greater predisposition for ethical behaviour that female representation signifies.

INSERT TABLE 6

Let us now review the full results obtained using the copula correction method for endogeneity. The first point of interest concerns the findings of possible endogeneity. Since the ‘control variables’ constructed from the copula marginals of the potentially endogenous variables correct for the correlation between such variables and the error term, the significance of any such controls (denoted as PStar.X where X is the name of the corresponding endogenous variable. For example the control function variable

PStar.MOWNE controls for the correlation between managerial ownership (MOWNE) and the error term) indicates that the variable under question is indeed endogenous. This is so because correlation between exogenous covariate and the error term is explicitly disallowed in regression models. Four variables were found to be endogenous with regard to REM. These are managerial ownership, female board representation, firm size and experience of the audit board. Managerial ownership was clearly always the prime suspect for endogeneity since managerial ownership provides incentives for EM, but can also serve as a constraining factor. Furthermore, changes in managerial ownership can be used to signal certain pieces of information to the company stakeholders in the same way corporate reports are used. Therefore, the endogeneity of managerial ownership is to be expected. We also find that the female board representation itself is endogenous. Once again this fits with the expectations. The other two endogenous variables are however somewhat unexpected. These are firm size and experience of the audit committee. While characteristics of the audit structures can be expected to be determined simultaneously with AEM, this is not so obvious for REM, since unlike AEM it is less concerned with reporting matters which are the domain of the internal audit structures and one could have expected that characteristics of the executive management (such as the board of directors) are more likely to be endogenous. Another point to note is that the control for the experience of the audit committee members is only marginally significant (with a P-value of 5.8%) and hence this result might be artefact from the specific (small) sample used in this study.

It is also informative to note some of the CG variables that we fail to identify as being endogenous. Most notably (with reference to the issues raised in the previous discussions) these include return on assets and female representation on the audit committee. The question of financial performance can be explained by the conjecture that supposed detrimental effects of EM on financial performance may take some time to materialise (as it is often assumed in empirical studies) thus ruling out simultaneity in this case. The issues of potential delays (i.e. lags) in the mutual causation of financial performance and CG is discussed for example in Schoar and Washington (2011) and in the presence of such delays contemporaneous causation (i.e. simultaneity) may not materialise.

With regard to REM nevertheless one cannot totally rule out the possibility for endogeneity of financial performance in general, but real activities would often affect the assets base and hence the particular performance measure used in this study could be partially responsible for us failing to detect endogeneity. In what the female representation on the audit committee is

concerned, such an outcome (lack of endogeneity) can be expected since as we already mentioned audit structures are probably more relevant to AEM. Finally, failing to register endogeneity for any other (than female representation) characteristics of the executive board is somewhat surprising.

We now turn our attention to the actual estimation results (in comparison to the 'standard' model). The pattern of most effects (in terms of significance and signs) is mostly consistent between the two models with some notable exceptions, which we outline below. Ignoring the issue of endogeneity results in estimating a significant and positive effects of female board representation on REM. Such a result clearly contradicts both expectations and the conceptual framework. In contrast to this, accounting for endogeneity leads to obtaining the correct negative (i.e. constraining effect) of female board representation on REM. Overall, taking endogeneity into account results in a model with considerably more significant effects. This result consistent with prior studies (e.g. Barua *et al*., 2011; Arun *et al.*, 2015). In line with the human capital theory, this finding provides empirical evidence that female directors bring a unique set of attributes and human capital resources to the board.

Only one of the considered covariates is significant in the mis-specified standard model, while not being significant in the correct (copula-correction) model and it is the female representation on the audit committee. Its negative sign probably counterbalances the strange effect of positive impact of BFEM and in general would be surprising. The extra significant effects in the main model (compared to the standard one) are the positive effect of blockholders and the Big 4 indicator and the negative impact of institutional ownership. Two of these are in line with expectations. Institutional ownership would be expected to constrain opportunistic behaviour mainly by requiring additional reporting information, which would increase both the transparency and quality of financial reporting. Large blockholders could on the other hand be less interested in such transparency (since they would often be insiders) and hence will foster an environment that is more conducive to opportunism. The Big 4 result is however hardly what one would expect. The empirical literature routinely claims that a reputable (proxied by a big 4) auditor leads (on average) to more transparency and hence should constraint EM. Notwithstanding the obvious fact that such a 'reputable' auditor (big 6, 5 or 4) was involved in all of the big corporate scandals in recent years such a conjecture may still be right. Unfortunately, the big audit firms dominate the audit of big corporations (and account for more than 70% of the observations in this study) possibly leading to a type of tokenism, rather than a proper measure of transparency. It is also possible that the Big 4

indicator itself can be the outcome of strategic consideration, such as a search for legitimacy, in which case it may be endogenous. Unfortunately the present estimation approach does not allow for binary endogenous variable and hence we could not property test this.

Effects on AEM

Given the dramatic effect that accounting for endogeneity has on estimates for REM, it is important to re-examine the effect of female board representation on AEM. The previous studies on this issue agree with expectations, but re-evaluating such effect within an endogenous interaction framework will allow for a better appraisal of the issues of interest. The estimated model, together with a standard version which ignores endogeneity, is presented in Table 7. With regard to AEM, we identify five endogenous variables. Once again managerial ownership leads the way in the list of endogenous variables, which is expected. Most auditing committee characteristics (independence, size and expertise) are also endogenous, which fits the conceptual framework rather well. Interestingly we fail to find evidence for endogeneity of female representation on the board or audit committee. This is the single audit committee characteristic that does not appear to be endogenous (unlike the rest). The one endogenous variable that is out of sync with prior expectations is the marginally significant board independence. As stated before one could expect that executive board characteristics are more likely to be endogenous with regard to REM, while audit committee characteristics are more likely to form endogenous interaction patterns with AEM.

INSERT TABLE 7

Let us now examine the estimated effects themselves. The effect of female board representation appears (perhaps coincidentally) remarkably similar between the two specifications. Since female board representation does not appear to be endogenous, the overall effect of ignoring endogeneity problems seems to be smaller in this case. Indeed, if we compare the coefficients between the two models, they consistently have the same signs (although not necessarily the same statistical significance). Hence, it is fair to say that for the case of the UK firms in the study period at least, ignoring endogeneity does not appear to have as serious effects on the qualitative nature of the estimation results for AEM as in the case of REM. Unlike the case of REM, the investigation into AEM is consistent with the predictions of the human capital theory for both the correct (endogeneous) and the misspecified (i.e. exogenous) model specifications. In both cases female representation restricts opportunistic behaviour.

In terms of the actual estimated effects, the 'standard' model for AEM includes significant negative effect for the board independence and marginally significant positive impact for the number of board meetings, which however disappear in the main model, probably due to the endogeneity of board independence itself. Notwithstanding the above, accounting for endogeneity still results in a number of statistically significant impacts that are not present when endogeneity is ignored. These include the positive impact of managerial ownership, institutional holding, the negative impact of a big 4 auditor and a marginally negative impact of Z-Score (p=value of 8.7%). All the above are consistent with expectations. More specifically both managerial ownership and institutional holding provide clear incentives for accruals based EM. The institutional holders have some expectations that managers may be under pressure to meet. The constraining effect of reputable auditor (proxied here by the Big 4 indicator) has been documented in the empirical literature so it is not unexpected. As for the constraining effects of the Z-score, it basically means that companies in better financial health are less likely to be involved in AEM. One may argue that when companies experience significant financial distress, (hence have a Z-score below some threshold) their ability to engage in accruals manipulation may also be constrained. However, since we employ a sample of firms which do not experience such high levels of financial distress we should not be able to observe such effects and therefore a linear relationship between the Z-score and AEM is justifiable.

Conclusions

This paper explores whether female board representation improves companies' financial disclosure quality. We develop an empirical model to measure the effect of female representation in an endogenous interactions framework. We simultaneously estimate the effects of interest and test for endogeneity of the corporate governance mechanisms. There are two types of results concerning the endogeneity of corporate governance mechanisms with regard to EM and their effect on EM respectively. We demonstrate that ignoring the issue of endogeneity can result in misleading results. In particular if we fail to account for this endogeneity we will obtain positive effects of female board representation on REM. Such a result clearly contradicts both expectations and the conceptual framework. In contrast to this, accounting for endogeneity leads to obtaining the correct negative (i.e. constraining effect) of female board representation on REM.

Our findings are consistent with the human capital theory and suggest that female representation on boards enhances board monitoring and brings new perspectives to the decision-making process in the boardroom, thereby improving the financial disclosure quality through transparency and promoting active board communication to investors. Our results indicate that female board representation, constrains the ability of management to exercise both AEM and REM practices. The female representation on auditing committees, however, does not appear to have a discernible effect of any form of EM.

Since this study is focused to large corporations, namely the non-financial UK companies listed in FTSE 350, the results might not be pertinent to smaller firms. Future studies should try to investigate the EM practices by firms with different capitalizations. Second, we use a UK sample only. Future studies could examine whether specific country-level variables influence the impact of female directors on AEM and REM, considering factors such as culture, governance, religion, and macro-social level dimensions. Future studies should try to expand across different legal and cultural systems to help global investors interpret financial reporting. Thirdly, subsequent studies can consider other female attributes that may influence AEM and REM, such as education, age and experience.

References:

Adams, R. B., & Ferreira, D. (2009). Women in the boardroom and their impact on governance and performance. *Journal of financial economics*, 94 (2), 291-309.

Almahrog, Y., Aribi, Z. A., & Arun, T. (2018). Earnings management and corporate social responsibility: UK evidence. *Journal of Financial Reporting and Accounting*, 16(2), 311 – 332.

Alquhaif, A. S., Latif, R. A., & Chandren, S. (2017). Employee stock options and real earnings management through accretive share buyback in Malaysia, *Journal of Advanced Research in Business and Management Studies*, 1(1), 76-84.

Arellano M, Bond S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equation, *Review of Economic Studies*, 58(2), 277–297.

Arellano M, Bover O. (1995). Another look at the instrumental variable estimation of error component models. *Journal of Econometrics*, 68(1), 29–51.

Aribi, Z. A., Alqatamin, R. M., & Arun, T. (2018). Gender diversity on boards and forward-looking information disclosure: evidence from Jordan. *Journal of Accounting in Emerging Economies*, 8(2), 205-222.

Arun, T. G., Almahrog, Y. E., & Aribi, Z. A. (2015). Female directors and earnings management: Evidence from UK companies. *International Review of Financial Analysis*, 39, 137-146.

Barua, A., Davidson, L. F., Rama, D. V., & Thiruvadi, S. (2010). CFO gender and accruals quality. *Accounting Horizons*, 24,1, 25-39.

Becker, G. S. (1964). *Human capital: a theoretical and empirical analysis, with special reference to education*. Columbia University Press, New York:.

Betz, M., O'Connell, L., & Shepard, J. M. (1989). Gender differences in proclivity for unethical behaviour. *Journal of Business Ethics*, *8*(5), 321-324.

Bhagat, S., Black, B., (2002). The non-correlation between board independence and long-term firm performance. *Journal of Corporation Law*, 27, 231–273.

Bierens, H. J. (1990). A Consistent Conditional Moment Test of Functional Form. *Econometrica*, 58 (6), 1443–1458.

Bierens, H. J., and W. Ploberger (1997). Asymptotic Theory of Integrated Conditional Moment Tests , *Econometrica*, 65(5), 1129–1151.

Blundell, R. W., and J. L. Horowitz (2007). A Non-Parametric Test of Exogeneity. *Review of Economic Studies*, 74 (4), 1035–1058.

Boone, A., Field, L., Karpoff, J., Raheja, C.G., (2007). The determinants of corporate board size and composition: an empirical analysis. *Journal of Financial Economics,* 85 (1), 66–101.

Brammer, S. J., & Pavelin, S. (2006). Corporate reputation and social performance: The importance of fit. *Journal of management studies*, 43(3), 435-455.

Burgess, Z., & Tharenou, P. (2002). Women board directors: Characteristics of the few. *Journal of business Ethics*, 37(1), 39-49.

Brahma, S., Nwafor, C., & Boateng, A. (2020). Board gender diversity and firm performance: the UK evidence. *International Journal of Finance and Economics*. https://doi.org/10.1002/ijfe.2089

Caetano, C. (2015). A Test of Exogeneity Without Instrumental Variables in Models With Bunching. *Econometrica*, 83 (4), 1581-1600.

Campbell, K., & Mínguez-Vera, A. (2008). Gender diversity in the boardroom and firm financial performance. *Journal of Business Ethics*, 83 (3), 435-451.

Chapman, J. B. (1975). Comparison of male and female leadership styles. *Academy of Management Journal*, 18 (3), 645-650.

Cohen, D. A., Dey, A., & Lys, T. Z. (2008). Real and accrual-based earnings management in the pre-and post-Sarbanes-Oxley periods. *The accounting review*, 83 (3), 757-787.

Coles, J.L., Daniel, N.D., Naveen, L., (2008). Boards: does one size fit all?. *Journal of Financial Economics*, 87 (2), 329–356.

Dang, R., Bender, A. F., & Scotto, M. J. (2014). Women on French corporate board of directors: How do they differ from their male counterparts?. *Journal of Applied Business Research*, 30 (2), 489-508.

Davies, L. 2011. Women on Boards. Department for Business. London: Innovation & Skills.

Dawson, L. M. (1997). Ethical differences between men and women in the sales profession. *Journal of Business Ethics*, 16 (11), 1143-1152.

De Andres, P., & Vallelado, E. (2008). Corporate governance in banking: The role of the board of directors. *Journal of banking & finance*, 32(12), 2570-2580.

Debnath, N., Patnaik, B., & Satpathy, I. (2019). Female directorship and real earnings management in Bangladesh: Towards an analytical assessment. *Management Science Letters*, 9(11), 1723-1740.

DeFond, M. L., & Jiambalvo, J. (1994). Debt covenant violation and manipulation of accruals. *Journal of accounting and economics*, 17(1), 145-176.

Deloitte. (2013). Women in the boardroom: a global perspective.

Demsetz, H., & Villalonga, B. (2001). Ownership structure and corporate performance. *Journal of corporate finance*, 7(3), 209-233.

Demsetz, H., & Lehn, K. (1985). The structure of corporate ownership: Causes and consequences. *Journal of political economy*, 93(6), 1155-1177.

Denis D.J., Sarin A.Fcoles (1999) Ownership and board structures in publicly traded corporations. *Journal of Financial Economics*, 52(2), 187–223.

Dowling, M., & Aribi, Z. A. (2013). Female directors and UK company acquisitiveness. *International Review of Financial Analysis*, 29, 79-86.

Eagly, A. H., Johannesen-Schmidt, M. C., & Van Engen, M. L. (2003). Transformational, transactional, and laissez-faire leadership styles: a meta-analysis comparing women and men. *Psychological bulletin*, 129(4), 569.

Easterwood, J. C. and Raheja, C. G., (2008) CEOs vs. Directors: Who Calls the Shots When Firms Underperform? , Working paper, Available at SSRN: https://ssrn.com/abstract=931037 or http://dx.doi.org/10.2139/ssrn.931037

Eastman, M. T. (2017). Women on Boards Progress Report 2017. MSCI ESG Corporate Gender Diversity Series (December).

Farooqi, J., Harris, O., & Ngo, T. (2014). Corporate diversification, real activities manipulation, and firm value. *Journal of Multinational Financial Management*, 27, 130-151.

Fields, T. D., Lys, T. Z., & Vincent, L. (2001). Empirical research on accounting choice. *Journal of accounting and economics*, 31(3), 255-307.

Fondas, N. and Sassalos, S. (2000). A different voice in the boardroom: How the presence of women directors affects board influence over management. *Global Focus*, 12(2), 13–22.

Garcia Blandon, J., Castillo Merino, D., Argilés Bosch, J. M., & Ravenda, D. (2020). Board level ethics committees in large European firms. Business Ethics: A European Review, 29(4), 824-841.

Gavious, I., Segev, E., & Yosef, R. (2012). Female directors and earnings management in high-technology firms. *Pacific Accounting Review*, 24 (1), 4-32.

Gordon, S., (2018). Men are still winning three-quarters of new boardroom jobs, Financial Times, December 11.

Gul, F. A., S. Y. K. Fung, and B. Jaggi. 2009. Earnings quality: Some evidence on the role of auditor tenure and auditors' industry expertise. *Journal of Accounting and Economics*, 47 (3),265-287.

Gull, A. A., Nekhili, M., Nagati, H., & Chtioui, T. (2018). Beyond gender diversity: How specific attributes of female directors affect earnings management. *The British Accounting Review*, 50(3), 255-274.

Gunny, K. A. (2010). The relation between earnings management using real activities manipulation and future performance: Evidence from meeting earnings benchmarks. *Contemporary Accounting Research*, 27(3), 855-888.

Hausman, J. A. (1978): Specification Tests in Econometrics, *Econometrica*, 46 (6), 1251–1271.

Hermalin, B.E., Weisbach, M.S., (1988). The determinants of board com- position. *The Rand Journal of Economics*, 589–606.

Hermalin, B. E., & Weisbach, M. S. (1998). Endogenously chosen boards of directors and their monitoring of the CEO. American Economic Review, 96-118.

Hili, W., & Affess, H. (2012). Corporate boards gender diversity and earnings persistence: The case of French listed firms. *Global Journal of Management and Business Research*, 12(22).

Himmelberg, C.P., Hubbard, R.G., Palia, D., (1999). Understanding the determinants of managerial ownership and the link between ownership and performance. *Journal of Financial Economics*, 53(3), 353–384.

Howe, E. and McRae, S. (1991). Women on the Board. Policy Studies Unit, London.

Jooste, L. (2011). A comparison of ethical perceptions of earnings management practices. *South African Journal of Economic and Management Sciences, 14*(4), 422-435.

Isidro, H., & Sobral, M. (2015). The effects of women on corporate boards on firm value, financial performance, and ethical and social compliance. *Journal of Business Ethics*, 132(1), 1-19.

Kang, S. A., & Kim, Y. S. (2012). Effect of corporate governance on real activity-based earnings management: Evidence from Korea. *Journal of Business Economics and Management*, 13(1), 29-52.

Kaplan, S. N., and B. A. Minton, (1994) Appointments of Outsiders to Japanese Boards: Determinants and Implications for Managers. *Journal of Financial Economics*, 36, 225–258.

Katmon, N., & Al Farooque, O. (2017). Exploring the impact of internal corporate governance on the relation between disclosure quality and earnings management in the UK listed companies. *Journal of Business Ethics*, 142(2), 345-367.

Kesner, I. F. (1988). Directors' characteristics and committee membership: An investigation of type, occupation, tenure, and gender. Academy of Management journal, 31(1), 66-84.

Khaled, B., & Aribi, Z. (2020). The Impact of Corporate Governance and Accruals Flexibility on the Interaction between Earnings Management Strategies. International Journal of Accounting, Auditing and Performance Evaluation.

Klein, A. (2002). Audit committee, board of director characteristics, and earnings management. *Journal of accounting and economics*, 33(3), 375-400.

Kole, S. R., (1996) Managerial Ownership and Firm Performance: Incentives or Rewards. *Advances in Financial Economics*, 2, 119–149.

Kothari S P, Leone A J and Wasley C E (2005). Performance Matched Discretionary Accruals", *Journal of Accounting and Economics*, 39(1), 23-49.

Krishnan, G. V., & Parsons, L. M. (2008). Getting to the bottom line: An exploration of gender and earnings quality. *Journal of Business Ethics*, 78(1-2), 65-76.

Lakhal, F., Aguir, A., Lakhal, N., & Malek, A. (2015). Do women on boards and in top management reduce earnings management? Evidence in France. *Journal of Applied Business Research*, 31(3), 1107-1118.

Lewbel, A. (1997) Constructing Instruments for Regressions with Measurement Error When No Additional Data are Available, With an Application to Patents and R&D, *Econometrica*, 65(5), 1201–1213.

Lewbel, A. (2012). Using Heteroskedasticity to Identify and Estimate Mismeasured and Endogenous Regressor Models. *Journal of Business & Economic Statistics*, 30(1), 67-80.

Lin, J. W., and M. I. Hwang. 2010. Audit Quality, Corporate Governance, and Earnings Management: A Meta-Analysis. *International Journal of Audit*ing 14 (1), 57-77.

Linck, J. S., Netter, J. M., & Yang, T. (2008). The determinants of board structure. Journal of financial economics, 87(2), 308-328.

Liu, Y., Wei, Z., & Xie, F. (2016). CFO gender and earnings management: Evidence from China. *Review of Quantitative Finance and Accounting*, 46(4), 881-905.

Loomis, C. J. (1999). Lies, damned lies, and managed earnings. *Fortune*, *140*(3), 74-92.

Luo, J. H., Xiang, Y., & Huang, Z. (2017). Female directors and real activities manipulation: Evidence from China. *China Journal of Accounting Research*, 10(2), 141-166.

Mincer, J. (1958). Investment in human capital and personal income distribution. *Journal of political economy*, *66*(4), 281-302.

Mulherin, J. H., (2005) Corporations, Collective Action and Corporate Governance: One Size Does Not Fit All. *Public Choice*, 124, 179–204.

Na, K., & Hong, J. (2017). CEO gender and earnings management. *Journal of Applied Business Research*, 33(2), 297-308.

Nielsen, S., & Huse, M. (2010). The contribution of women on boards of directors: Going beyond the surface. *Corporate governance: An international review*, 18(2), 136-148.

OECD (1998): Human Capital Investment, Paris

Parente, P. M. D. C., J. M. C. Santos Silva (2012). A cautionary note on tests of overidentifying restrictions. *Economics Letters*, 115(2), 314-317.

Park S, Gupta S. (2012). Handling Endogeneous Regressors by Joint Estimation Using Copulas.*Marketing Science*, 31(4), 567–586.

Peni, E., & Vähämaa, S. (2010). Female executives and earnings management. *Managerial Finance*, 36(7), 629-645.

Post, C., Rahman, N., & Rubow, E. (2011). Green governance: Boards of directors' composition and environmental corporate social responsibility. *Business & Society*, 50(1), 189–223.

Riahi Belkaoui, A. (2004). Is earnings management affected by human development and economic freedom?. *Review of Accounting and Finance*, 3 (1),115-127.

Rose C. 2007. Does female board representation influence firm performance? The Danish evidence. *Corporate Governance: An International Review*,15(2),404–13.

Roychowdhury, S. 2006. Earnings management through real activities manipulation. Journal of Accounting and Economics 42 (3), 335-370.

Schoar A. and E.L. Washington (2011) Are the Seeds of Bad Governance Sown in Good Times?, NBER Working Papers 17061, National Bureau of Economic Research, available at: https://ideas.repec.org/p/nbr/nberwo/17061.html

Schultz E. L , D, T. Tan and K. D. Walsh (2010) Endogeneity and the corporate governance – performance relation. *Australian Journal of Management*, 35(2) 145–163.

Shafer, W.E., 2015. Ethical climate, social responsibility, and earnings management. Journal of Business Ethics, 126(1), 43-60.

Singh, V., Terjesen, S., & Vinnicombe, S. (2008). Newly appointed directors in the boardroom:: How do women and men differ?. European management journal, 26(1), 48-58.

Srinidhi, B., Gul, F. A., & Tsui, J. (2011). Female directors and earnings quality. *Contemporary Accounting Research*, 28(5), 1610-1644.

Sun, J., Liu, G., & Lan, G. (2011). Does female directorship on independent audit committees constrain earnings management?. *Journal of Business Ethics*, *99*(3), 369-382.

Terjesen, S., Sealy, R., & Singh, V. (2009). Women directors on corporate boards: A review and research agenda. *Corporate governance: an international review*, *17*(3), 320-337.

Williams, R. J. (2003). Women on corporate boards of directors and their influence on corporate philanthropy. *Journal of Business Ethics*, 42(1), 1-10.

Wintoki, M. B., J.S. Linck , and J.M.Netter (2012) Endogeneity and the dynamics of internal corporate governance, *Journal of Financial Economics*, 105, 581–606.

Xiong, J. (2016). Chairman characteristics and earnings management: Evidence from Chinese listed firms. *Open Journal of Accounting*, 5(4), 82-94.

Yu, S., Lord, R., Peni, E. and Vähämaa, S., 2010. Female executives and earnings management. Managerial Finance.

Zalata, A. M., Ntim, C., Aboud, A., & Gyapong, E. (2019). Female CEOs and core earnings quality: new evidence on the ethics versus risk-aversion puzzle. Journal of Business Ethics, 160(2), 515-534.

Zang, A. Y. (2012). Evidence on the trade-off between real activities manipulation and accrual-based earnings management. *The accounting review*, 87(2), 675-703.

Zhao, Y., Chen, K. H., Zhang, Y., & Davis, M. (2012). Takeover protection and managerial myopia: Evidence from real earnings management. *Journal of Accounting and Public Policy*, 31(1), 109-135.

Table 1. Sample determination details

Description	UK sample	
	Number of firms	Percentage
Initial sample	350	100%
Excluded:		
Financial, insurance and investment companies	(57)	16%
Regulated firms	(13)	4%
Missing data and unavailable annual reports	(17)	5%
Established after 2006	(40)	11%
Foreign majority-owned and foreign affiliates firms	----------	--------
Final sample	223	64%

Table 2. Variables description and summary statistics

Variable	Description	Mean	Min	Max	SD
Ac.M.Jones.	Accruals EM	0.061	-0.001	0.817	0.078
Aggregate.REM	Aggregate REM	0.000	-1.251	0.999	0.276
BSIZE	Board size	9.385	4.000	22.000	2.631
BMEET	Number of board meetings	8.439	3.000	19.000	2.491
BIND	Board iindependence	0.504	0.111	0.889	0.106
BFEM	Share of females on the board	0.115	0.000	0.450	0.113
ACSIZE	Size of the audit committee	3.682	2.000	9.000	0.971
ACMEET	Number of AC meetings	4.127	2.000	13.000	1.604
ACIND	AC independence	0.838	0.250	1.000	0.168
ACEXPE	AC members expertise	0.847	0.250	1.000	0.184
ACFEM	Females share on the AC	0.140	0.000	0.667	0.175
MOWNE	Managers' ownership	0.051	0.001	0.538	0.068
INSTITU3.	Institutional ownership	0.372	0.031	0.785	0.164
BLOCKH10.	Blockholding over 10%	0.284	0.100	0.743	0.143
FSIZE	Firms size	6.223	4.040	8.699	0.709
FLEVER	Firm leverage	0.554	0.004	1.000	0.237
ROA	Return on assets	0.129	0.000	0.980	0.118
FGROW	Firm growth	0.087	-0.996	0.999	0.212
Big.4	Is the external auditor a big 4 firm	0.718	0.000	1.000	0.450
Z.SCORE	Z score	2.452	1.000	6.880	1.125

Table 3. Skewness and kurtosis tests on endogenous variables

	Skewness	T-stat	P-value	Excess kurtosis	T-stat	P-value
MOWNE	3.446	66.430	0.000	15.619	150.559	0.000
BFEM	0.598	11.535	0.000	-0.597	-5.759	0.000
BIND	-0.151	-5.759	0.000	0.468	-2.918	0.004
ACIND	-0.419	-8.078	0.000	-0.920	-8.872	0.000
ACEXPE	-0.814	-15.696	0.000	-0.303	-2.917	0.004
ACSIZE	1.795	34.611	0.000	4.829	46.544	0.000

Table 4. Estimation results for real EM

	Main model			Standard panel model		
	Estimate	P value		Estimate	P value	
BSIZE	0.008	0.004	**	0.011	0.000	***
BMEET	0.001	0.564		0.002	0.491	
BIND	-0.032	0.570		0.011	0.821	
BFEM	-1.055	0.000	***	0.229	0.000	***
ACSIZE	-0.057	0.000	***	-0.016	0.003	**
ACMEET	-0.010	0.007	**	-0.014	0.000	***
ACIND	-0.001	0.973		0.005	0.825	
ACEXPE	0.149	0.130		-0.007	0.793	
ACFEM	-0.039	0.368		-0.073	0.025	*
MOWNE	-0.091	0.511		-0.132	0.213	
INSTITU3.	-0.163	0.001	***	-0.037	0.320	
BLOCKH10.	0.165	0.003	**	0.008	0.874	
FSIZE	-0.019	0.072	.	-0.055	0.004	**
FLEVER	0.005	0.827		0.002	0.932	
ROA	-0.567	0.000	***	-0.505	0.000	***
FGROW	0.021	0.433		0.010	0.591	
Big.4	0.039	0.002	**	-0.002	0.932	
Z.SCORE	-0.003	0.608		-0.005	0.253	
PStar.MOWNE	0.024	0.009	**			
PStar.BFEM	0.182	0.000	***			
PStar.ACEXPE	-0.012	0.058	.			
PStar.ACSIZE	0.028	0.013	*			

Significance levels:

*** 0.1%** 1%

* 5%

. 10%

Table 5. Estimation results for accruals EM

	Main model			Standard panel model		
	Estimate	P value		Estimate	P value	
BSIZE	-0.001	0.167		-0.002	0.021	*
BMEET	0.000	0.953		0.001	0.084	.
BIND	0.154	0.178		-0.044	0.017	*
BFEM	-0.052	0.006	**	-0.052	0.010	*
ACSIZE	0.020	0.000	***	0.007	0.000	***
ACMEET	0.003	0.001	**	0.005	0.000	***
ACIND	-0.369	0.000	***	-0.034	0.000	***
ACEXPE	-0.068	0.015	*	-0.012	0.222	
ACFEM	0.009	0.473		0.009	0.462	
MOWNE	0.093	0.017	*	0.026	0.500	
INSTITU3.	0.027	0.050	*	0.019	0.175	
BLOCKH10.	-0.016	0.307		-0.021	0.241	
FSIZE	-0.007	0.014	*	-0.011	0.124	
FLEVER	0.003	0.612		0.003	0.709	
ROA	0.082	0.000	***	0.046	0.007	**
FGROW	0.003	0.648		0.017	0.011	*
Big.4	-0.023	0.000	***	-0.013	0.213	
Z.SCORE	-0.002	0.087	.	0.000	0.873	
PStar.MOWNE	-0.006	0.031	*			
PStar.BIND	-0.022	0.070	.			
PStar.ACIND	0.019	0.000	***			
PStar.ACEXPE	0.005	0.006	**			
PStar.ACSIZE	-0.008	0.013	*			

Significance levels:

*** 0.1%** 1%

* 5%

. 10%