Female Directors and Earnings Management: Evidence from UK companies

Abstract

Since the gender diversity of boards and the reporting of earnings are two of the most debated issues in the corporate world, the paper examines how the presence of women directors on the corporate board influences earnings management practices. We found that firms with a higher number of female and independent female directors are adopting restrained earnings management practices in the UK. We further made a distinction between high- and low-debt firms, and the outcomes reveal that female directors have a positive effect on the earnings management in low debt firms. The paper contributes to the debate on gender diversity on boards, and its impact on the use of accounting discretion in financial reporting.

Female Directors and Earnings Management: Evidence from UK companies[1]

1. Introduction

The literature on board diversity and firms' financial performance (e.g. Adams et al. 2009; Campbell and Mínguez-Vera 2008; Farrell and Hersch 2005; Carter et al. 2003; Erhardt et al. 2003) broadly supports the view that the presence of women representatives on the board enhances the firm's financial performance. The recent Davies Report (2011) has provided a business case for gender diversity on boards based on its potential impact on improving performance, accessing the widest talent pool, achieving better corporate governance and being more responsive to the market. However, the issue of improving the gender balance of corporate boards has continued as a worldwide concern. For instance, in the US, women held only 16.9% of Fortune 500 board seats in 2013, and less than one-fifth of companies had 25% or more women directors, while one-tenth had no women serving on their boards (Catalyst 2013). The Davies Report (2011) further shows the levels of under-representation of women on corporate boards across the globe, ranging from 3.6% in the industrialised Asia-Pacific region to 23% in Sweden and the Philippines; the figure for the UK was 9.6%.

Flexibility in accounting standards allows managers to estimate and project accounting numbers different from the underlying economic conditions of a firm. For instance, under Generally Accepted Accounting Principles (GAAP), managers can exercise discretion over accounting-reported earnings to maximize the information value of the firm's earnings. Although this is an accepted strategy used by management in the corporate world for income smoothing, excessive use of this practice is detrimental. Furthermore, it has been acknowledged that managers may have an incentive to manipulate accounting earnings either to maximize the firm's value or obtain some private gain at the expense of shareholders (Beneish 2001; Christie and Zimmerman 1994). In the context of a conflict, managers exercise discretion over accounting earnings either to mislead shareholders about the firm's financial performance or to gain some private benefits at the expense of other stakeholders (i.e. opportunistic earnings management) (Healy and Wahlen 1999). The adaptable behaviour of managers through various reporting methods and estimates reflects an inaccurate picture of

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the company's financial fundamentals, such as in the accounting scandals involving major corporations such as Enron and WorldCom[2]. In short, the argument is that earnings management reduces the quality of earnings because the information in the financial reports does not reflect the underlying economic conditions of a firm.

The paper is organised as follows. The literature on female directors and earnings management, and the key questions, are set out in section 2, while section 3 discusses the empirical research methods used. Section 4 presents the results and section 5 concludes.

2. Female Directors and Earnings Management – the key questions

In business contexts, women are more ethical in the workplace and less likely to engage in unethical behaviour to gain financial rewards (Khazanchi 1995; Betz et al. 1989). Gul et al. (2009) argue that not only do females demonstrate greater risk aversion and ethical behaviour, but they are also better at obtaining voluntary information which may reduce information asymmetry between female directors and managers. Women are more cautious and less aggressive than men in a variety of decision-making contexts (Byrnes et al. 1999), and are less likely to take risks particularly in the financial decision environment (Powell and Ansic 1997). There is therefore a greater likelihood of a restrained approach to earnings management (Gul et al. 2009). In a similar vein, Krishnan and Parsons (2008) found that the quality of earnings management is higher for firms with more female directors, and argued that women are likely to be more ethical in their judgement and behaviour than men. However, in contrast to these findings, Sun et al. (2011) found no evidence for the impact of female representation on audit committees and earnings management, while Thiruvadi and Huang (2011) found that the presence of female directors on the audit committee is negatively related to earnings management. In light of the differing views, we are enquiring into the relationship between female directors and earnings management in the UK.

2 In many instnces, the 'earning guidance' prevalent in the corporate world is a high-stake game where the management seeks to hit the targets set by analysts, based on extensive private conversations between managers and analysts (Fuller and Jensen, 2010). On the basis of real-world experience, one can argue that opportunistic reasons for earnings management have intentionally influenced stakeholders, with a degree of misinterpretation of company performance.

In this paper, we further examine whether the gender of the Chief Financial Officer (CFO) affects the level of earnings management. CFOs have a strong role in companies, due to their primary responsibility of financial reporting. Jiang et al. (2010) found that the magnitude of accruals and the likelihood of beating analyst forecasts are more sensitive to CFO equity incentives than to those of the Chief Executive Officer (CEO). Although a significant amount of accounting research has been devoted to testing the association between the effectiveness of corporate governance and audit committees on earnings management (Lin and Hwang 2010; Benkraiem 2009; Ebrahim 2007; Xie et al. 2003; Klein 2002), only a few studies have examined the association between gender diversity on the board of directors and earnings management. For instance, Barua et al. (2011) investigated the association between CFO gender and earnings management and found that firms with female CFOs have lower discretionary accruals than firms with male CFOs. Similar findings were provided by Peni and Vähämaa (2010), who examined the association between CFO and CEO gender and earnings management, and found that firms with female CFOs have income-decreasing discretionary accruals, indicating that female CFOs are following more conservative financial reporting rules and standards. However, they found no association between earnings management and CEO gender. In contrast, Gavious et al. (2012) found that companies with female CEOs have less earnings management than those with males, with a negative relationship between female executives and earnings management. Instead, Hili and Affes (2012) found no association between earnings management and the presence of female directors on boards and audit committees in French and US companies respectively.

Further to this, we explore the effect of female directors on earnings management in both high- and low-debt firms. We identify high-debt firms as those that rely more on debt financing, with larger boards and more independent directors (Coles et al. 2008; Faleye 2007). In contrast, low-debt firms depend on the firm-specific knowledge of insiders and have smaller boards with a greater number of insiders. The findings of pooled OLS regression reveal that the presence of a number of female directors on the board constrains the level of earnings management. These findings are consistent with the previous studies of Gavious et al. (2012), Peni and Vähämaa (2010) and Krishnan and Parsons (2008), who found that firms with a higher number of women on the board are less likely to manipulate earnings. The key research questions are: (1) is there an association between the number of female directors and earnings management? (2) is this relationship the same in low- and high-debt firms? and; (3) is there an association between CFO gender and earnings management?

3. Methods

It has been argued that managers are more likely to manage earnings through accruals since it is more difficult to be detected by outsiders (Kothari et al. 2005; Dechow et al. 1995; Jones 1991). In addition, managers can practise their discretion either on long- or short-term discretionary accruals to manipulate earnings. However, Becker et al. (1998) argue that managers have greater discretion over current accruals than long-term ones. In this paper, we use the modified Jones model (Dechow et al. 1995)[3] to estimate current discretionary accruals. The following cross-sectional regression equation is used to estimate current accruals[4].

$$CA_{it}/A_{it-1} = \beta_{it}[1/A_{it-1}] + \beta 1_{it}[(\Delta REV_{it} - \Delta REC_{it})/A_{it-1}] + \varepsilon_{it} \quad (1)$$

Where current accruals CA_{it} is net income before extraordinary items minus cash flow from operation for firm I in year t, ΔREV_{it} donates the change in revenue for firm i in year t, ΔREC_{it} is the change in receivable for firm i in year t, and A_{it-1} is total assets at the beginning of the year t for firm me. The residual of equation 1 is current discretionary accruals.

After estimating current discretionary accrual, the association between earnings management and the number of female directors on the board is investigated with ordinary least squares (OLS):

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[3] Based on the assumption that accruals are likely to result from changes in a firm's economic conditions, Jones (1990) proposes a regression-based model that controls for change in revenue and depreciation. She relates total accruals to the change in revenue (ΔREV) and gross property, plant and equipment (PPT) as follows:

$$TA_{it}/A_{it-1} = \propto_1 (1/A_{it-1}) + \propto_2 (\Delta REV_{it}/A_{it-1}) + \propto_3 (PPT_{it}/A_{it-1})$$

Given that revenue may be subject to earnings manipulation by managers (e.g. increasing sales recognition near year-end period), using the Jones model will remove part of the discretionary accruals. In response to the limitation of the Jones model, Dechow et al. (1995) developed a modified version of the model by subtracting the change in receivables (ΔREC) from change in revenues (ΔREV) to exclude the element in the change in revenue that is expected to be managed through managerial discretion.

[4] Following the studies of Subramanyam (1996) and DeFond and Jiambalvo (1994), industry groups with fewer than six observations are excluded from the sample.

$$CDA_{it} = \propto_0 + \propto_1 NFEM_{it} + \propto_2 INFEM_{it} + \propto_3 CFO_{it} + \propto_4 SIZE_{it} + \propto_5 OCF_{it} + \propto_6 ROA_{it} + \propto_7 LEV_{it} + \propto_8 GSALES_{it} + \propto_9 MB_{it} + \propto_{10} LOSS_{it} + \sum_{k=1}^{n-1} \propto_k INDUSTRY_i^k + \sum_{Y=2005}^{2011} \omega_y YEAR_i^y + \varepsilon_{it} \quad (2)$$

Where CDA_{it} is current discretionary accruals for me in year t. The independent variables in the regression specification model are NFEM, denoting to the number of female directors on the board; INFEM, the number of independent female directors on the board; EXFEM, the number of executive female directors on the board; and CFO, a dummy variable equal to one if the CFO of the firm is female, and zero otherwise.

We use control variables in the model for firm-specific characteristics that may affect the level of earnings management. These control variables are: $SIZE_{it}$ measured as the natural logarithm of total assets for firm i in year t; OCF_{it}, net operating cash flow divided by total assets; ROA_{it}, is on assets; LEV_{it}, financial leverage measured as total liabilities scaled by total assets; $GSALES_{it,}$ the sales growing ratio; MB_{it}, is market to book value; and $LOSS_{it,}$ a dummy variable taking the value one if firm i reported negative net income in year t, and zero otherwise.

Previous studies have suggested that the above firm-specific characteristics are useful in predicting earnings management (Kim et al. 2012; Hong and Andersen 2011; Chih et al. 2008). SIZE is included in the regression to control for the potential impact of firm size on the earnings management. There is no agreement in the literature regarding the effect of firm size on earnings management. For example, Watts and Zimmerman (1990) argue that larger companies are more likely to perform income-decreasing earnings management. In contrast, Richardson (2000) indicates that the market pressure is greater for larger companies because they are subject to close scrutiny by investors, an thus more likely to adopt aggressive accounting policies which lead to income-increasing earnings management practices. Therefore, firm size can be negatively or positively associated with earnings management. OCF was included to control for the differences of performance across firms within different industries and economic activity on earnings management. The studies by Gul et al. (2009) and Dechow et al. (1995) found that firms with a high operational cash flow are less likely to engage in income-increasing earnings management because they are already performing well. In line with the previous studies, we expect that firms with a high cash flow performance are less likely to engage in income-increasing earnings management. ROA is proxy for the firm's

financial performance, and it is expected that firms with a higher financial performance tend to manage earnings downwards (Watts and Zimmerman 1990). LEV is used as proxy for debt covenant violation (Elayan et al. 2008). The findings of the impact of LEV on earnings management were mixed (Dechow and Skinner 2000; DeFond and Jiambalvo 1994; Watts and Zimmerman 1990). Therefore, financial leverage can be negatively or positively associated with earnings management. GSALES and MB are included to control for a firm's growth. It is expected that firms with high growth tend to manage discretionary accruals upwards to report increased earnings (Chih et al. 2008). Loss is included to control for the financial condition of the firm and it is expected that firms facing financial problems tend to engage in income-decreasing earnings management (Healy 1985). The extent of earnings management may differ over time and across industries, so we control for time and potential industry effect. INDUSTRY in equation 2 is a dummy variable according to Industry Classification Benchmark (ICB) and YEAR is a dummy variable that indicates fiscal years.

Our initial sample for the study is the UK FTSE 350 index during the period 2005-2011. However, we have removed the categories of regulated, mining and financial industries due to their unique characteristics and specific regulations which may affect the results (Klein 2002; DeFond and Jiambalvo 1994). In addition, as in the case of prior studies by Subramanyam (1996) and DeFond and Jiambalvo (1994), industries with fewer than six observations and the firms with missing data have also been removed from the initial sample. The final sample consists of 1,217 firm-year observations during the study period. Table I summarises the distribution of the final sample in accordance with the Industry Classification Benchmark (ICB) classification.

Table I: Final sample classified by industry

ICB	Industries	2005	2006	2007	2008	2009	2010	2011	Total
0500	Oil & Gas	12	13	13	14	13	16	16	97
2700	Industrial Goods & Services	54	56	56	56	57	57	54	390
3500	Food & Beverage	11	11	11	11	11	11	11	77
3700	Personal & Household Goods	10	12	12	13	13	13	13	86
4500	Health Care	8	8	8	8	8	8	8	56
5300	Retail	18	20	24	25	25	25	25	162
5500	Media	7	8	9	9	9	9	10	61
5700	Travel & Leisure	20	20	21	21	22	22	22	148
6500	Telecommunications	6	6	6	6	6	6	6	42
9500	Technology	13	14	15	15	15	15	14	101
Total		**159**	**168**	**175**	**178**	**179**	**182**	**179**	**1220**

Three main resources were used to collect the data, namely FAME, Thomson One Banker, and firms' annual reports. Earnings management and control variables were collected mainly from FAME and Thomson One Banker databases, while female director variables were gathered from firms' annual reports.

4. Empirical Findings

As can be seen from Table II, the mean value of current discretionary accruals (CDA) measured by the modified Jones model is -0.020. The findings indicate that UK companies, on average, tend to be conservative and prefer to engage in income-decreasing (negative) earnings management. Regarding female directors on the board, Table II shows that the median number is 1 and the maximum number 4. These results are consistent with the previous study of Gavious et al. (2012) who found the average number of female directors on the board of Israeli companies was 1 and the maximum 5. The median of independent female directors on the board was 0 and the maximum number 3. Table II also reports descriptive statistics for various firm-specific variables and shows that the mean company log total assets are 3.109, and the mean CFO is 12 percent of total assets. The mean ROA is around 10 percent of total assets, and financial leverage is 5.9 percent. The rate of annual GSALES is 2 percent, and MB value is £3.5 million. Some 9 percent of the companies reported negative earnings in their financial statements during the given period.

Table II: Descriptive statistics

	Mean	Min	P50	Max	Sd.
CDA	-0.020	-0.788	-0.018	0.805	0.076
NFAM	0.813	0.000	1.000	4.000	0.932
INFAM	0.392	0.000	0.000	3.000	0.632
FCO	0.028	0.000	0.000	1.000	0.165
SIZE	3.109	1.318	3.047	5.341	0.673
OCF	0.120	-0.347	0.103	1.461	0.108
ROA	0.097	-0.544	0.081	1.341	0.125
LEV	0.592	-0.100	0.599	1.319	0.211
GSALES	0.212	-0.774	0.102	8.341	0.569
MB	3.504	-0.387	2.657	25.055	3.233
LOSS	0.092	0.000	0.000	1.000	0.289

CDA = Current discretionary accruals using the modfied Jones model; ***NFAM***= Number of female directors on the board; ***INFAM*** = Number of independent female directors on the board; ***FCO*** = Dummy variable equals 1 if the CFO is female, and 0 otherwise; ***SIZE*** = Firm size as measured by natural logarithm of total assets; ***OCF*** = Operating cash flow; ***ROA*** = Firm's performance as measured by net revenue to total assets ratio; ***LEV*** = Financial leverage as measured by total liabilities to total assets ratio; ***GSALES*** = Growing sales; ***MB*** = Market-to-book ratio; ***LOSS*** = 1 if the firm has a loss, and 0 otherwise.

Recently, UK companies have become more responsive to the demand for a gender-balanced board. This gradual shift in recognising the role of females on corporate boards was evident in the work of Grosvold et al. (2007), which concluded that the presence of female directors in UK FTSE 100 companies had risen from 4.5 percent in 1999 to 10.5 percent in 2005. Table III shows the highest propotion of NFAM (12 percent) and INFAM (6 percent) in 2011. However, with respect to FCOs, Table III shows that the highest number was 7 in 2008 and the lowest was 3 in 2009, which indicates an inconsistent trend. Table IV shows that the highest correlation was between the number of female directors on the board and the number of independent female directors with a coefficient of 59 percent and significant at the 1 percent level[5]. Therefore, the problem of multicollinearity does not exist between the independent variables.

[5] According to Gujarati (2003), a coefficient of ±80 percent is considered as the point at a which multicollinearity problem might begin, harming the results of the regression analysis.

Table III: The number and propotion of females on boards, classified by year

	2005		2006		2007		2008		2009		2010		2011		Total	
Board Size	1484		1563		1610		1654		1631		1652		1681		11275	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
NFAM	97	0.065	117	0.075	131	0.081	138	0.083	141	0.086	157	0.095	209	0.124	990	0.088
INFAM	41	0.028	51	0.033	62	0.039	64	0.039	73	0.045	80	0.048	106	0.063	477	0.042
FCE	3	0.002	6	0.004	5	0.003	7	0.004	3	0.002	4	0.002	6	0.004	34	0.003

NFAM= Number of female directors on the board; ***INFAM*** = Number of independent female directors on the board; ***FCE***= Dummy variable equals 1 if the CFO firm is female and 0 otherwise

TableIV: Correlation matrix

Variable	A	B	C	D	E	F	G	H	I	J	K
A CDA	1.000										
B NFAM	-0.030	1.000									
C INFAM	-0.028	0.587***	1.000								
D FCO	0.007	0.312***	0.037	1.000							
E SIZE	-0.186***	0.296***	0.222***	-0.022	1.000						
F OCF	-0.301***	0.085**	0.010	0.032	-0.127***	1.000					
G ROA	0.162***	0.028	-0.040	0.025	-0.097***	0.455***	1.000				
H LEV	-0.199***	0.062*	0.039	-0.070*	0.282***	0.054	-0.017	1.000			
I GSALES	0.005	-0.024	-0.112***	0.021	-0.208***	-0.041	-0.006	-0.133***	1.000		
J MB	-0.032	-0.017	-0.036	0.011	-0.035	0.195***	0.216***	0.266***	-0.089**	1.000	
K LOSS	-0.177***	0.003	-0.004	-0.002	-0.042	-0.236***	-0.299***	0.034	0.101***	-0.121***	1.000

CDA = Current discretionary accruals using the modfied Jones model; ***NFAM***= Number of female directors on the board; ***INFAM*** = Number of independent female directors on the board; ***FCO*** = Dummy variable equals 1 if the CFO is female, and 0 otherwise; ***SIZE*** = Firm size as measured by natural logarithm of total assets; ***OCF*** = Operating cash flow; ***ROA*** = Firm's performance as measured by net revenue to total assets ratio; ***LEV*** = Financial leverage as measured by total liabilities to total assets ratio; ***GSALES*** = Growing sales; ***MB*** = Market-to-book ratio; ***LOSS*** = Coded 1 if firm has a loss, and 0 otherwise.

The estimation results of our pooled ordinary least squares (OLS) regressions are presented in Table V. The adjusted R^2 of the estimated models vary between 29.8 and 30.3 percent. The lower levels of adjusted R^2 are normal in this type of accruals regression models (Gavious et al. 2012; Srinidhi et al. 2011; Sun et al. 2011). The main independent variables in our models are the number of female (NFAM) and independent female directors (INFAM) on the board, as well as CFO director variables. As can be seen from Table V, the coefficients of female variables are consistently positive in all four regression specifications. Although the results show that NFAM and INFAM are positively significant at 0.05 and 0.10 respectively related to earnings management, we do not observe any significant association between CFO and earnings management. Recall from the descriptive statistics results in Table II that the mean value of current discretionary accruals (CDA) is negative (-0.020), so the results in Table V suggest that firms with female directors and independent female directors on the boards may tend to be more conservative and more likely to practise income-decreasing earnings management. These findings are consistent with the study of Gavious et al. (2012) who found that female and independent female dirctors on boards in Israel were more likely to engage in less earnings management. Peni and Vähämaa (2010) found that the presence of female executives in US companies is associated with income-decreasing earnings management. Our results also confirmed this trend, but further show that the CFO has no impact on the practice of earnings management.

The results in Table V suggest that the gender of a firm's directors may affect the quality of financial reports. The regression estimates indicate that firms with a higher number of female and independent female directors are more likely to practise conservative financial reporting policies and tend to employ more income-decreasing earnings management practices than their counterparts in firms with a lower number of female and independent female directors[6]. Thus, it can be argued that the presence of female directors on the board may mitigate income-increasing earnings management. Although the coefficient of the female FCO is consistently positive, the female FCO director seems not to have any statistically significant effect on earnings management. Thus, the findings provide empirical evidence for the significant impact of female directors on the quality of financial reporting.

[6] These findings are consistent with the previous gender literature on conservatism and income-decreasing earnings management (Gavious et al. 2012; Peni and Vähämaa 2010; Jianakoplos and Bernasek 1998; Johnson and Powell 1994).

Table III: Regression results concerning on the number of female directors on the board

CDA	Exp. sign	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	?	0.093*** (9.566)	0.093*** (9.594)	0.095*** (9.630)	0.093*** (9.563)	0.095*** (9.661)
NFAM	+		0.006** (2.329)			0.007** (2.419)
INFAM	+			0.004* (1.833)		0.004* (1.887)
FCO	+				0.004 (0.510)	-0.007 (-0.861)
SIZE	+	-0.024*** (-11.287)	-0.024*** (-11.388)	-0.025*** (-11.307)	-0.024*** (-11.278)	-0.025*** (-11.418)
OCF	+	-0.267*** (-12.757)	-0.269*** (-13.107)	-0.269*** (-12.858)	-0.267*** (-12.743)	-0.271*** (-13.236)
ROA	?	0.097*** (4.897)	0.095*** 4.863	0.098*** (4.931)	0.097*** (4.899)	0.095*** (4.885)
LEV	?	-0.033*** (-4.411)	-0.033*** (-4.492)	-0.033*** (-4.425)	-0.033*** (-4.382)	-0.034*** (-4.554)
GSALES	?	-0.004 (-1.354)	-0.004 (-1.424)	-0.003 (-1.319)	-0.004 (-1.383)	-0.004 (-1.355)
MB	?	0.001 (0.044)	0.001 (0.164)	0.001 (0.084)	0.001 (0.035)	0.001 (0.245)
LOSS	?	-0.035*** (-6.001)	-0.035*** (-6.094)	-0.035*** (-5.980)	-0.035*** (-6.006)	-0.035*** (-6.071)
Industry		included	included	included	included	Included
Year		included	included	included	included	Included
Observations		1217	1217	1217	1217	1217
Adjusted R^2		0.298	0.301	0.299	0.298	0.303
F-Value		21.850***	21.850***	20.820***	20.870***	20.640***

CDA = Current discretionary accruals using the modified Jones model; ***NFAM***= Number of female directors on the board; ***INFAM*** = Number of independent female directors on the board; ***FCO*** = Dummy variable equals 1 if the CFO of the firm is female, and 0 otherwise; ***SIZE*** = Firm size as measured by natural logarithm of total assets; ***OCF*** = Operating cash flow; ***ROA*** = Firm's performance as measured by net revenue to total assets ratio; ***LEV*** = Financial leverage as measured by total liabilities to total assets ratio; ***GSALES*** = Growing sales; ***MB*** = Market-to-book ratio; ***LOSS*** = Coded 1 if firm has a loss, and 0 otherwise.

The previous regression specifications are based on the number of female and independent female directors and indicate that firms with female and independent female directors are associated with conservative and income-decreasing financial reporting. To provide reasonable assurance that the preliminary results in Table V are robust to the specifications of different measures, we use the proportion of female directors (PFAM) and independent female directors (PIFAM) as alternative measures of the presence of female directors on the

board. Recall that from the previous discussion, the female FCO variable is a dummy variable that takes the value 1 if the FCO is female, and 0 otherwise.

As can be seen from Table VI, the coefficients of female variables are consistently positive in all four regression specifications and the proportions of females and independent females are statically significant at 0.05 and 0.10 percent respectively. However, the coefficient of female FCO dummy variable is positive, although it does not reveal any significant association with earnings management. These results are in line with the previous findings, indicating that firms with female directors tend to be conservative and more likely to practise income-decreasing earnings management. However, theses results reveal that the presence of a female FCO does not effect the direction of earnings management. In light of the above, the results in Table VI are robust and consistent with the different measures of female dirctors on the boards; the associaction between females and earnings management is not affected by the different measures of females.

Table VI: Regression results for the proportion of female directors on the board

CDA	Exp. sign	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	?	0.093*** 9.566	0.092*** 9.519	0.094*** 9.678	0.093*** 9.563	0.094*** 9.627
PFAM	+		0.058** 2.219			0.070** 2.335
PIFAM	+			0.038* 1.933		0.039* 2.004
FCO	+				0.004 0.510	-0.007 -0.936
SIZE	+	-0.024*** -11.287	-0.024*** -11.196	-0.025*** -11.396	-0.024*** -11.278	-0.025*** -11.312
OCF	+	-0.267*** -12.757	-0.268*** -13.015	-0.269*** -12.882	-0.267*** -12.743	-0.270*** -13.157
ROA	?	0.097*** 4.897	0.095*** 4.868	0.098*** 4.947	0.097*** 4.899	0.096*** 4.907
LEV	?	-0.033*** -4.411	-0.034*** -4.503	-0.033*** -4.437	-0.033*** -4.382	-0.034*** -4.585
GSALES	?	-0.004 -1.354	-0.004 -1.407	-0.003 -1.298	-0.004 -1.383	-0.003 -1.310
MB	?	0.001 0.044	0.001 0.152	0.001 0.125	0.001 0.035	0.001 0.278

LOSS	?	-0.035*** -6.001	-0.035*** -6.082	-0.035*** -5.990	-0.035*** -6.006	-0.035*** -6.068
Industry		included	included	included	included	included
Year		included	included	included	included	included
Observations		1,217	1,217	1,217	1,217	1,217
Adjusted R2		0.298	0.301	0.3	0.298	0.303
F-Value		20.690***	21.850***	22.180***	20.940***	20.870***

CDA = Current discretionary accruals using the modified Jones model; ***PFAM***= Proportion of female directors on the board; ***PINFAM*** = Proportion of independent female directors on the board; ***FCO*** = Dummy variable equals 1 if the CFO is female, and 0 otherwise; ***SIZE*** = Firm size as measured by natural logarithm of total assets; ***OCF*** = Operating cash flow; ***ROA*** = Firm's performance as measured by net revenue to total assets ratio; ***LEV*** = Financial leverage as measured by total liabilities to total assets ratio; ***GSALES*** = Growing sales; ***MB*** = Market-to-book ratio; ***LOSS*** = Coded 1 if firm has a loss, and 0 otherwise.

To investigate whether the firm's characteristics affect the association between females on the board and earnings management, we divided the pooled sample into two sub-sets of data according to the leverage median (see Coles et al. (2008) and Faleye (2007)). The first data set comprises firms that have leverage above the median and is identified as "high-debt firms", while, the second set comprises firms with leverage below the median identified as "low-debt firms". To test whether the board size and number of female directors is statistically different from zero in high- and low-debt firms, we applied univariate tests using T-test. The results of the univariate tests are presented in Table VII, which shows that the mean board size for high-debt firms is larger than its counterpart in low-debt firms; the mean difference is statistically significant at the 0.05 percent level[7]. This result is in line with the findings of Coles et al. (2008); and Faleye (2007), who argue that high-debt firms have larger boards than low-debt firms. However, the female FCO is significantly different from zero at the 0.05 percent level for both high- and low-debt firms, which shows that the presence of a female FCO in low-debt firms is higher than its counterpart in high-debt firms. Table VII indicates that the mean of Current Discretionary Accruals (CAD) is significantly different from zero at 0.01 percent, and that the mean value of CAD in high-debt firms is -0.031

[7] The board size variable is not of specific interest and the aim of showing it is to provide evidence of whether the mean board size is significantly different from zero for high- and low-debt firms, as well as whether high-debt firms have larger or smaller boards than low-debt firms.

compared to -0.009 in low-debt firms. This result suggests that high-debt firms are more likely to engage in income-decreasing earnings management than are low-debt firms. While the means of Cash Flow Operation (CFO), Return on Assets Ratio (ROA) and Losses (LOSS) are not statistically significant at any level, the differences between the means of firm size (SIZE), leverage (LEV), growing sales (GSALES) and market-to-book ratio (MB) range from 0.01 to 0.05 percent.

Table VII: Univariate analysis

Variable	High-debt firms		Low-debt firms		T-test
	Mean	Sd.	Mean	Sd.	
CDA	-0.031	0.077	-0.009	0.073	5.022***
Board Size	9.464	2.460	9.066	2.389	-2.864**
NFAM	0.865	0.899	0.762	0.962	-1.934*
INFAM	0.428	0.668	0.356	0.593	-1.970*
FCO	0.013	0.114	0.043	0.202	3.136**
SIZE	3.229	0.639	2.990	0.769	-8.392***
OCF	0.122	0.092	0.116	0.098	-1.066
ROA	0.093	0.120	0.100	0.130	0.867
LEV	0.756	0.138	0.428	0.127	-43.081***
GSALES	0.149	0.371	0.275	0.708	3.900***
MB	4.283	3.951	2.726	2.025	-8.654**
LOSS	0.099	0.298	0.085	0.280	-0.802

Furthermore, we examined the question of whether the role of female directors on boards in constraining the manipulation of earnings through accruals is affected by the firm's characteristics. The estimation results are presented in Table VIII, in two panels: Panel A reports the results for high-debt firms, and Panel B the results for low-debt firms. As can be seen from Panel A, the number of female directors, independent female directors as well as a dummy female FCO variable in high-debt firms do not affect the earnings management. However, Panel B shows that the number of females and independent females on the boards of low-debt firms is positively significantly related to earnings management, at 0.01 percent. These results indicate that female and independent female directors in low-debt firms are more likely to be more conservative and engage in income-decreasing earnings management. A possible explanation of these findings is that high-debt firms might have larger boards than low-debt firms and that the former might be less effective than the latter (Coles et al. 2008). Therefore, the role of female directors might be more effective where they work on smaller boards. In both groups, there is no evidence for an association between female CFO and the level of earnings management.

The results in Table VIII show that the number of female directors in low-debt firms follows more conservative financial reporting policies and manipulates earnings downwards more than do their counterparts in firms with a low number of females. On the other hand, the number of female dirctors in high-debt firms does not show any significant association related to the level of earnings management. Given that low-debt firms have smaller boards than high-debt firms, the results of this study are in line with the argument that smaller boards are more effective than larger ones (Coles et al. 2008). Regarding the role of females on boards in constraining earnings management, the results show that the role of female director on smaller boards is more effective than on larger boards.

Table VIII: High- and low-debt firms' results considering the number of female directors

CDA	Exp. sign	Model 1	Model 2	Model 3	Model 4	Model 5
Panel A: High-debt firms						
Intercept	?	0.107***	0.108***	0.107***	0.107***	0.108***
		5.376	5.420	5.368	5.351	5.382
NFAM	+		0.005			0.005
			1.098			1.124
INFAM	+			0.001		0.001
				-0.132		-0.071
FCO	+				-0.003	-0.006
					-0.389	-0.719
SIZE	+	-0.028***	-0.028***	-0.028***	-0.028***	-0.028***
		-7.819	-7.868	-7.764	-7.805	-7.803
OCF	+	-0.242***	-0.245***	-0.242***	-0.242***	-0.245***
		-7.772	-8.023	-7.757	-7.767	-8.026
ROA	?	0.079***	0.078***	0.079***	0.079***	0.078***
		3.269	3.270	3.258	3.265	3.258
LEV	?	-0.054***	-0.055***	-0.054***	-0.054***	-0.055***
		-3.765	-3.814	-3.765	-3.748	-3.793
GSALES	?	-0.003	-0.003	-0.003	-0.003	-0.003
		-0.378	-0.425	-0.382	-0.379	-0.431
MB	?	0.000	0.001	0.001	0.001	0.001
		-0.018	0.091	-0.023	-0.019	0.094
LOSS	?	-0.037***	-0.037***	-0.037***	-0.037***	-0.037***
		-4.596	-4.528	-4.599	-4.592	-4.520
Industry		included	included	included	included	included
Year		included	included	included	included	included
Observations		608	608	608	608	608
R-squared		0.273	0.274	0.273	0.273	0.274
F-Value		11.210	11.330	10.720	10.770	10.500
Panel B: Low-debt firms						
Intercept	?	0.091***	0.091***	0.096***	0.091***	0.097***
		6.398	6.472	6.611	6.410	6.711
NFAM	+		0.009**			0.012***
			2.435			2.660

INFAM	+			0.008**		0.008***
				2.562		2.679
FCO	+				0.008	-0.011
					0.910	-0.934
SIZE	+	-0.021***	-0.022***	-0.024***	-0.022***	-0.024***
		-7.244	-7.385	-7.512	-7.247	-7.706
OCF	+	-0.289***	-0.291***	-0.291***	-0.290***	-0.293***
		-10.150	-10.427	-10.315	-10.180	-10.597
ROA	?	0.116***	0.112***	0.116***	0.117***	0.110***
		3.583	3.545	3.556	3.588	3.466
LEV	?	-0.036***	-0.036**	-0.035**	-0.035**	-0.037**
		-2.258	-2.306	-2.203	-2.210	-2.297
GSALES	?	-0.004	-0.005	-0.004	-0.005	-0.004
		-1.561	-1.724	-1.526	-1.681	-1.623
MB	?	0.001	0.001	0.001	0.001	0.001
		0.355	0.345	0.361	0.286	0.429
LOSS	?	-0.032***	-0.033***	-0.032***	-0.032***	-0.034***
		-3.541	-3.767	-3.595	-3.545	-3.875
Industry		included	included	included	included	included
Year		included	included	included	included	included
Observations		609	609	609	609	609
R-squared		0.323	0.330	0.330	0.325	0.338
F-Value		10.490	10.850	10.300	10.160	10.430

CDA = Current discretionary accruals using the modified Jones model; ***NFAM***= Number of female directors on the board; ***INFAM*** = Number of independent female directors on the board; ***FCO*** = Dummy variable equals 1 if the CFO of the firm is female, and 0 otherwise; ***SIZE*** = Firm size as measured by natural logarithm of total assets; ***OCF*** = Operating cash flow; ***ROA*** = Firm's performance as measured by net revenue to total assets ratio; ***LEV*** = Financial leverage as measured by total liabilities to total assets ratio; ***GSALES*** = Growing sales; ***MB*** = Market-to-book ratio; ***LOSS*** = Coded 1 if firm has aloss, and 0 otherwise.

In addition to the numbers, we used the propotion of females as an alternative measure (see appendix A), and the results are consistent with the results shown in Table VIII. Further, we examined the robustness of the preliminary results in Table V, using the Jones (1991) model as an alternative measure of earnings management to investigate whether alternative measures of current discretionary accruals affect the primary results presented in Table V.

The equation of the Jones model is calculated as follows:

$$\mathrm{CA_{it}}/\mathrm{A_{it-1}} = \beta_{it}(1/\mathrm{A_{it-1}}) + \beta 1_{it}\,(\Delta \mathrm{REV_{it}}/\mathrm{A_{it-1}}) + \varepsilon_{it} \qquad (3)$$

As can be seen from Table IX, the findings are consistent with the main results in Table V, suggesting that the main findings are robust for different measurements of earnings management.

Table IX: Regression results concerning the number of female: calculated with the Jones model

CA	Exp. sign	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	?	0.049***	0.049***	0.052***	0.049***	0.052***
		4.824	4.863	5.000	4.837	5.040
NFAM	+		0.007**			0.007**
			2.353			2.041
INFAM	+			0.005**		0.005**
				2.117		2.129
FCO	+				0.010	0.001
					1.374	0.030
SIZE	+	-0.010***	-0.010***	-0.011***	-0.010***	-0.011***
		-4.402	-4.480	-4.647	-4.401	-4.716
OCF	+	-0.272***	-0.274***	-0.274***	-0.272***	-0.277***
		-11.830	-12.199	-11.929	-11.838	-12.292
ROA	?	0.102***	0.100***	0.103***	0.102***	0.101***
		4.766	4.746	4.811	4.771	4.795
LEV	?	-0.027***	-0.027***	-0.027***	-0.026***	-0.027***
		-3.134	-3.226	-3.151	-3.065	-3.246
GSALES	?	-0.002	-0.002	-0.002	-0.002	-0.002
		-0.691	-0.766	-0.644	-0.753	-0.721
MB	?	0.001	0.001	0.001	0.001	0.001
		0.783	0.908	0.833	0.758	0.960
LOSS	?	-0.035***	-0.035***	-0.035***	-0.035***	-0.035***
		-5.436	-5.514	-5.411	-5.450	-5.486
Industry		included	included	included	included	included
Year		included	included	included	included	included
Observations		1,217	1,217	1,217	1,217	1,217
R-squared		0.229	0.233	0.232	0.23	0.235
F-Value		11.670***	12.300***	11.140***	11.220***	11.280***

CDA = Current discretionary accruals using the Jones model; ***NFAM***= Number of female directors on the board; ***INFAM*** = Number of independent female directors on the board; ***FCO*** = Dummy variable equals 1 if the CFO of the firm is female, and 0 otherwise; ***SIZE*** = Firm size as measured by natural logarithm of total assets; ***OCF*** = Operating cash flow; ***ROA*** = Firm's performance as measured by net revenue to total assets ratio; ***LEV*** = Financial leverage as measured by total liabilities to total assets ratio; ***GSALES*** = Growing sales; ***MB*** = Market-to-book ratio; ***LOSS*** = 1 if firm has a loss, and 0 otherwise.

Furthermore, we re-estimated all the prevous regressions in Table IX by using the proportion of female directors as an alternative measure of female directors on the board. The results (see appendix B) are similar to the findings presented in Table IX, suggesting that the main results in this paper are robust and consistent with the different measures of females and current discretionary accruals.

Pooled OLS regression was used in the main analysis to predict the relationship between female directors and earnings management. In order to test the robustness of the main result, we applied pooled OLS with robust regression as an alternative regression estimator, which shows results similar to the primary findings. The findings of Variance Inflation Factor (VIF) and tolerance tests reveal that the highest value of VIF is for ROA, at 1.37, which is lower

than the critical value of 10 (Gujarati 2003, p.339). This result indicates that our model does not suffer from multicollinearity. Finally, we tested whether there are any heteroscedasticity issues in our analysis. The Breusch-Pagan / Cook-Weisberg test reveals that the test statistic is insignificant, which indicates that heteroscedasticity is less likely to be a substantive issue in our model.

5. Conclusion

In this study, we examine the link between female directors and earnings management practices in the UK. The findings show that firms with a higher numbers of female and independent female directors tend to adopt more conservative accounting policies compared with those companies with lower numbers of female and independent female directors. In other words, the research finds that managers in the firms with higher numbers of female and independent female directors prefer to engage in income-decreasing rather than income-increasing earnings management. Following on from this, we further examined whether this relationship exists in different types of company. However, the results indicate that female directors on the board in high-debt firms have no impact on the levels of earnings management. In the low-debt firms, we found that the number of females and independent females on the board is positively related to earnings management, indicating that firms in the low-debt group with high numbers of female and independent female directors tend to be more conservative than companies with low numbers of females and independent females on their boards. In both types of company, we noted that the CFO has no impact on the practice of earnings management.

The use of accounting discretion to make adjustments in financial statements is a big game which itself distorts corporate decision making. This paper adds to this debate by providing evidence of the relationship between female representation on corporate boards and earning management practices. We have aimed to include all the key characteristics in the model, and carried out robustness checks to ensure the rigour of the results. However, the sample consists of very large publicly traded companies, and the findings of the study need to be interpreted on this basis. Since female representation is limited on corporate boards, their actual influence on earnings management may also be limited, but this provides yet another argument for our distant dream of gender-balanced corporate boards.

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Appendix A:

High- and low-debt firms' results considering the proportion of female directors

CDA	Exp. sign	Model 1	Model 2	Model 3	Model 4	Model 5
Panel A: High-debt firms						
Intercept	?	0.100***	0.100***	0.102***	0.100***	0.102***
		7.263	7.292	7.284	7.241	7.315
PFAM	+		0.074			0.080
			1.900			1.565
PINFAM	+			0.032		0.035
				0.994		1.083
FCO	+				0.012	-0.002
					1.115	-0.142
SIZE	+	-0.026***	-0.026***	-0.027***	-0.026***	-0.026***
		-7.726	-7.737	-7.737	-7.678	-7.763
OCF	+	-0.261***	-0.263***	-0.263***	-0.261***	-0.266***
		-9.153	-9.419	-9.226	-9.173	-9.527
ROA	?	0.091***	0.089***	0.091***	0.091***	0.089***
		3.748	3.702	3.758	3.773	3.692
LEV	?	-0.033***	-0.033***	-0.034***	-0.032***	-0.034***
		-2.806	-2.837	-2.827	-2.727	-2.844
GSALES	?	-0.004	-0.004	-0.004	-0.004	-0.004
		-1.342	-1.407	-1.297	-1.390	-1.355
MB	?	0.001	0.001	0.001	0.001	0.001
		0.015	0.152	0.050	-0.007	0.205
LOSS	?	-0.029***	-0.030***	-0.030***	-0.030***	-0.031***
		-3.195	-3.293	-3.208	-3.235	-3.305
Industry		included	included	included	included	included
Year		included	included	included	included	included
Observations		609	609	609	609	609
R-squared		0.259	0.264	0.260	0.261	0.265
F-Value		10.290	10.780	9.810	9.930	9.890
Panel B: Low-debt firms						
Intercept	?	0.093***	0.092***	0.095***	0.093***	0.094***
		6.002	5.893	6.154	5.997	6.017
PNFAM	+		0.038*			0.039*
			1.933			2.004
PINFAM	+			0.045*		0.047*
				1.792		1.866
FCO	+				-0.005	-0.013
					-0.613	-1.329
SIZE	+	-0.024***	-0.024***	-0.025***	-0.024***	-0.025***
		-8.402	-8.313	-8.627	-8.391	-8.500
OCF	+	-0.294***	-0.295***	-0.296***	-0.293***	-0.296***
		-8.851	-8.901	-8.916	-8.818	-8.959
ROA	?	0.096***	0.095***	0.099***	0.096***	0.098***
		2.746	2.748	2.844	2.742	2.848
LEV	?	-0.033***	-0.033***	-0.033***	-0.033***	-0.034***
		-3.456	-3.509	-3.471	-3.487	-3.608
GSALES	?	0.012	0.011	0.012	0.012	0.012
		0.618	0.560	0.668	0.641	0.654
MB	?	0.001	0.001	0.001	0.001	0.001

		0.213	0.219	0.329	0.224	0.369
LOSS	?	-0.041***	-0.041***	-0.040***	-0.041***	-0.040***
		-5.239	-5.292	-5.118	-5.226	-5.158
Industry		included	included	included	included	included
Year		included	included	included	included	included
Observations		608	608	608	608	608
R-squared		0.367	0.368	0.370	0.367	0.372
F-Value		14.580	14.380	14.250	14.220	14.390

CDA = Current discretionary accruals using the modified Jones model; ***PFAM***= Proportion of female directors on the board; ***PINFAM*** = Proportion of independent female directors on the board; ***FCO*** = Dummy variable equals 1 if the CFO of the firm is female, and 0 otherwise; ***SIZE*** = Firm size as measured by natural logarithm of total assets; ***OCF*** = Operating cash flow; ***ROA*** = Firm's performance as measured by net revenue to total assets ratio; ***LEV*** = Financial leverage as measured by total liabilities to total assets ratio; ***GSALES*** = Growing sales; ***MB*** = Market-to-book ratio; ***LOSS*** = Coded 1 if firm has loss, and 0 otherwise.

Appendix B

Regression results considering the proportion of females: calculated using the Jones model

CA	Exp. sign	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	?	0.049***	0.049***	0.051***	0.049***	0.050***
		4.824	4.791	4.953	4.837	4.923
PFAM	+		0.056**			0.054*
			2.043			1.714
PIFAM	+			0.043**		0.044**
				2.045		2.037
FCO	+				0.010	0.001
					1.374	0.139
REVLW	+	-0.010***	-0.010***	-0.011***	-0.010***	-0.011***
		-4.402	-4.337	-4.589	-4.401	-4.529
OCF	+	-0.272***	-0.273***	-0.274***	-0.272***	-0.276***
		-11.830	-12.063	-11.946	-11.838	-12.165
ROA	?	0.102***	0.101***	0.104***	0.102***	0.102***
		4.766	4.747	4.824	4.771	4.808
LEV	?	-0.027***	-0.027***	-0.027***	-0.026***	-0.028***
		-3.134	-3.222	-3.165	-3.065	-3.241
GSALES	?	-0.002	-0.002	-0.002	-0.002	-0.002
		-0.691	-0.738	-0.625	-0.753	-0.678
MB	?	0.001	0.001	0.001	0.001	0.001
		0.783	0.878	0.869	0.758	0.960
LOSS	?	-0.035***	-0.035***	-0.035***	-0.035***	-0.035***
		-5.436	-5.490	-5.420	-5.450	-5.471
Industry		included	included	included	included	included
Year		included	included	included	included	included
Observations		1217	1217	1217	1217	1217
R-squared		0.229	0.232	0.232	0.230	0.23
F-Test		11.670***	12.030***	11.200***	11.220***	11.080***

CDA = Current discretionary accruals using the modified Jones model; ***PFAM***= Proportion of female directors on the board; ***PINFAM*** = Proportion of independent female directors on the board; ***FCO*** = Dummy variable equals 1 if the CFO of the firm is female, and 0 otherwise; ***SIZE*** = Firm size as measured by natural logarithm of total assets; ***OCF*** = Operating cash flow; ***ROA*** = Firm's performance as measured by net revenue to total assets ratio; ***LEV*** = Financial leverage as measured by total liabilities to total assets ratio; ***GSALES*** = Growing sales; ***MB*** = Market-to-book ratio; ***LOSS*** = Coded 1 if firm has loss, and 0 otherwise.