The Impact of Debt, Taxation and Financial Crisis on Earnings Management: the case of Greece.

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Abstract

Purpose

The purpose of this study is to empirically investigate the Greek firms' earnings management policies compared with debt, taxation and the financial crisis.

Design/methodology/approach

In this paper, we show that existed measures of real earnings management, whether corrected for performance or not, rely crucially on strong assumptions. We provide a novel modeling that permits panel structure so as to correct for heterogeneity across firms while permitting to determine endogenously the number of underlying firm-groups in the data generating process.

Findings

The empirical results indicate that Greek firms are likely to reduce earnings manipulation activities when they face liquidity risk. Taxation and financial crisis have a negative and positive effect on earnings management, respectively.

Originality/value

The effect of debt, taxation and financial crisis on earnings management has never been investigated in Greece. The empirical results offer valuable information to shareholders and investors as they can understand how some main factors, such as debt, taxation and financial crisis, influence firm's accounting practices.

Keywords: real earnings management, discretionary accruals; leverage; taxation; fiscal debt; Greece.

JEL: C12, G01, G32, M41

1. Introduction

The impact of earnings management practices on financial reports is well-established in the economic literature (Kothari et al., 2005; Roychowdhury, 2006; Cohen et al., 2008; Dechow et al. 2010; Gunny, 2010; Zang, 2012). Managers use the earnings management methods beneficially to reflect more accurately the financial position of the firms. In this way, they manipulate the accounting rules by managing their earnings and expenses on the financial statements, to improve the appearance of the firm's market value to stockholders and investors. There are two methods of manipulation, the accrual earnings management, and the real earnings management (Kothari et al., 2012). In accrual-based earnings management practice managers try to manipulate the accounting policies to achieve earnings objectives. In real earnings management practice managers try to change the time or structure of firm's operations by manipulating the sales and discretionary expenditures such as R&D, advertising, and SGA, overproducing inventory to decrease the costs of goods sold and selling assets to recognize gains (Roychowdhury, 2006; Gunny 2010).

Some of the key factors which are related to earnings management are leverage and taxation. Leverage increases debt and reduces firm's cash flow and thus the possibility of stakeholders to maximize their revenues (Jensen and Meckling, 1976). So, debt is an alternative mechanism for stakeholders and debtholders to control the firm's financial value. For firms, the higher the leverage the higher the risk of bankruptcy and this may lead to high costs of debt especially in crisis periods (Costa et al., 2016). Taxation may provide incentives for managers to manipulate earnings to maximize financial profit and minimize taxable profit. Also, it is well documented in the empirical research that the recent financial crisis was one of the most difficult periods for firms worldwide, which gives rise to suspicion about the credibility of their financial reports.

The main contribution of this paper is that investigates earnings management practices that can be applied to a sample of Greek firms, considering the leverage, taxation and the fiscal debt crisis. Although the effect of these factors on earnings management has been investigated in other countries, the research on this issue in Greece is still limited. Moreover, our research contributes to the literature by examining firms' earnings management policies on both accrual and real earnings management basis. So, this study by providing useful information and empirical results sets the basis for policy recommendations for further policy improvements. Greece is an interesting case study

because the recent global financial crisis had a greater impact on this country compared with the other countries – members of the EU. During the period of crisis, Greece faced a high public deficit and public debt and as a result, entered economic adjustment programs and followed economic austerity policies (Pegkas, 2018). Many firms went into bankruptcy and the firm's financial performance decreased. Also, firms had to face more difficulties in access to loans and borrowing money from the banks. To examine Greek firms' earnings management policies compared with leverage, taxation and the period of the economic crisis we follow previous studies and employ accruals-based earnings management models (measured using the modified Jones model and the performance-controlled modified Jones model) and real earnings management models as depicted by Cohen et al. (2020). Our results indicate that the managers in Greek firms are likely to reduce the manipulation of earnings through accruals earnings management when they face the liquidity risk of leverage, but on the other hand, they are more likely to engage their earnings in the crisis period. Also, the negative effect of taxation on earnings management indicates that Greek firms prefer to avoid losses than to pay less in taxes.

The remainder of the paper is organised as follows; section 2 reviews the literature, while section 3 presents the methodology. Section 4 presents and discusses the data set. Section 5 provides the empirical findings and discusses the results, whereas the last section highlights some concluding remarks and economic policy implications derived from the empirical findings.

2. Literature review

Prior literature suggests that earnings management is associated with leverage, taxation and financial crisis. A large amount of research examines the link between leverage and earnings management, based on accrual and real earnings management. Some studies observe a positive association between leverage and earnings management because highly leveraged firms manipulate earnings to address stakeholders' and creditors' expectations (Roychowdhury, 2006; Cohen et al, 2008; Kim et al, 2012; Zang, 2012). Also, the managers of the firms with high leverage risk tend to employ more earnings management to avoid debt covenants violations (DeFond and Jiambalvo, 1994; Sweeney, 1994; DeAngelo et al., 1994; Dichev and Skinner, 2002; Jaggi and Lee, 2002; Costa et al., 2016; Alzoubi, 2018; Lazzem and Jilani, 2018). Other studies indicate that

high leveraged firms prefer to manipulate earnings by using real than accruals earnings management method because this method is less visible to the scrutiny of auditors and regulators (Graham et al., 2005; Kuo et al., 2014; Anagnostopoulou and Tsekrekos, 2017). In the opposite direction, Jensen (1986) argues that highly indebted firms tend to avoid using earnings management practices because they are under greater scrutiny from shareholders and creditors. These findings also supported by Ahn and Choi (2009), and Rodríguez-Pérez and van Hemmen (2010). Similarly, Jelinek (2007) suggests that leverage increases lead to a decrease in earnings management practices because managers show more discipline and reduce their opportunistic behaviour.

Regarding the relationship between taxation and earnings management, some literature supports the opinion that taxes induce increases in the possibility of firms employing earnings management practices, especially those with positive net income, hence firms try to maximize financial profit and minimize taxable profit (Northcut and Vines, 1998; Healy and Whalen, 1999; Mills and Newberry, 2001; Phillips et al. 2003; Zimmermann and Goncharov 2006; Frank et al., 2009 and Pereira and Alves, 2017). These studies found incentives for managers to engage in earnings management to pay fewer taxes when tax measurement is linked with financial statements. Other studies provide evidence that firms use taxes to manipulate earnings with the aim of meeting the expectations of the investors (Dhaliwal et al., 2004; Frank and Rego, 2006; Gupta et al., 2016). On the other hand, some studies suggest that taxation is negatively associated with earnings management or has no significant effect on earnings management, especially during the crisis period, because firms may choose to avoid losses into gains than pay less in taxes (Chen et al, 2006; Marques et al., 2011; Riahi and Ben Arab, 2011and Cazier et al., 2015).

Also, in the relevant literature, it is well documented that a debt crisis affects the managers' decisions about earnings management. Some literature argues that over a period of crisis and financial distress firms tend to engage earnings to present a better situation of the firm's value to the capital market (Charitou et al., 2007; Bamber et al., 2010; Safarzadeh and Mazaryazdi, 2010; Bertomeu and Magee, 2011; Iatridis and Dimitras, 2013; Dimitras et al., 2015; Persakis and Iatridis, 2016 and Mechelli and Cimini, 2017). In this way, the debt crisis is the most difficult period for firms which raises suspicion about the credibility of their financial reports. This impact is more relevant in countries where the legal protection of investors is weak. On the other hand, some studies suggest that firms have less incentive to engage in earnings management

during crisis periods (Habib et al., 2013; Lin et al., 2014; Cimini, 2015). A good explanation of this argument is that over a crisis period, the monitoring from creditors, auditors and stakeholders increases (Filip and Raffournier, 2014). Also, governments provide support to firms in financial distress and therefore, firms may prefer to show financial distress (Saleh and Ahmed, 2005). Moreover, firms may prefer to reduce earnings management because they want to present high-quality financial reports to attract more investors (Jenkins et al., 2009; Ahmad-Zaluki et al., 2011; Kousenidis et al., 2013).

The most empirical earnings management studies that investigated the case of Greece focused on the firm's behaviour during the pre - and post - International Financial Reporting Standards (IFRS) adoption period and used data for the pre-crisis period. Specifically, Dimitropoulos and Asteriou (2010) concluded that greater board independence is strongly associated with increased value relevance of earnings and also firms with an increased amount of total assets and higher growth opportunities are associated with greater abnormal accruals. Karampinis and Hevas (2011) found a negative relationship between cash flow and accruals and weak evidence to support that mandatory IFRS adoption had a positive impact on the value relevance of accounting earnings reported by Greek firms. Tsipouridou and Spathis (2012) found that firms with low cash flows tend to use accrual-increasing accounting policies and firms with increased leverage manage earnings upwards. Tsalavoutas et al (2012) concluded that there is no change in the combined value relevance of book value of equity and net income, meaning that the adoption of IFRS did not improve the accounting quality of Greek firms if accounting quality is defined as the overall association between book and market values. Ferentinou and Anagnostopoulou (2016) found a significant decrease in accrual earnings management and a significant increase in real earnings management for the period after IFRS adoption. Also, more levered, and lower growth firms are more prone to use accrual earnings management, while larger firms are more likely to use real earnings management.

In conclusion, following the existing literature, we conclude that the empirical evidence about the relationship between leverage, taxation and debt crisis with earnings management is a complex one.

3. Methodology

3.1. A simple model of accruals earnings management

Previous models of deriving discretionary accruals and real earnings management follow Dechow et al. (1998) who detail a simple model for cash flow as a function of sales and a shock in sales. Moreover, the cash flow equals:

$$CF_{it} = \pi S_{it} - \alpha\varepsilon_{it} \quad (1)$$

where $CF_{it}$is cash flow for i firm at period t, S_{it} is sales and $\varepsilon_{it} = S_{it} - S_{it-1}$ is the change in sales depicted as a shock. In addition, the cash margin, π, (an approximation of profit margin) of sales is constant and α represents sales is on credit.

From equation (1) one derives accruals, AC_{it}, as:

$$AC_{it} = \alpha\varepsilon_{it} \quad (2)$$

Note that $\pi S_{it} = X_{it} = CF_{it} + \alpha\varepsilon_{it}$ where X_{it} is earnings.

To derive discrete accrual and real earnings management measures, Dechow et al. (1998), Kothari et al. (2005) as well as Cohen et al. (2020) assume that sales follow a random walk:

$$E_t(AC_{it+1}) = E_t(\alpha\varepsilon_{it+1}) = 0$$

and

$$E_{it}(CF_{it+1}) = E_{it}(\pi S_{it+1} - \alpha\varepsilon_{it+1}) = \pi S_{it} = X_{it} \quad (3)$$

So, if sales follow a random walk, then accruals are zero. But accrual might be not zero because sales might not follow a random walk or profit margins change or there changes in other parameters. Based on this model Dechow, et al. (1998) (see also Jones 1991) estimate discretionary accruals.

3.2. Measuring Accruals-Based Earnings Management

Following the above (see for details Dechow, et al. 1998; and Jones 1991), we shall derive the accruals-based earnings management. As a first stage the following regression for total accruals, TAC_{it}, is estimated:

$$\frac{TAC_{it}}{TA_{it-1}} = \beta_0 + \beta_1\left(\frac{\Delta SALES_{it} - \Delta REC_{it}}{TA_{it-1}}\right) + \beta_2\left(\frac{PPE_{it}}{TA_{it-1}}\right) + \varepsilon_{it} \quad (4)$$

where total accruals TAC_{it} = $EBXI_{it}$-$CASFO_{it}$; $EBXI_{it}$ is the earnings before extraordinary items and discontinued operations; $CASFO_{it}$is the cash flow from

operational activities scaled by TA_{it-1}, (lagged total assets). $\Delta SALES_{it}$ is the change in sales and is scaled by TA_{it-1}, whereas ΔREC_{it} is the change in accounts receivables. PPE_{it} is the net property, plant and equipment, also scaled by TA_{it-1}, whilstε_{it} is the residual that provides the measure of earnings management.[1]

Moreover, the regressions coefficients from equation (4) to calculate the normal accruals (NA_{it}) for each firm as:

$$NAC_{it} = \beta_0 + \beta_1 \frac{\Delta SALES_{it}}{Assets_{i,t-1}} + \beta_2 \frac{PPE_{it}}{Assets_{i,t-1}} \quad (5)$$

Then, the abnormal accruals (discretionary accruals based on Kothari et al. 2005) for each firm is the difference between total accruals and the estimated normal accruals[2]:

$$DAC_{it} = \left(\frac{TAC_{it}}{TA_{it-1}}\right) - NA_{it} \quad (6)$$

3.3. Modified for performance Accrual-Based Earnings Management

Kothari et al. (2005) and Cohen et al. (2020) following Dechow et al. (1998) argue that the discretionary (abnormal) accrual models could be mis-specified when applied to samples of firms with extreme performance in part because performance and estimated discretionary accruals exhibit a mechanical relation.

Kothari et al. (2005) propose that mean reversion (or a trend) in performance would affect forecasted earnings and sales and could be used to predict accruals. So, accruals should filter out their performance-related component so as not to result in spurious estimations of accruals and thereby discretionary accruals.

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[1] In line with previous studies (Kothari et al., 2005), assets are used as a deflator to mitigate heteroskedasticity in residuals, but not to eliminate it, and a constant in the model estimation is also included in order (i) to manage heteroskedasticity not dealt with by using assets as a deflator, and (ii) to minimise the effect of omitted variables (Brown, Lo, and Lys, 1999).

[2]Measurement issues have been attracting criticism, so we also estimate abnormal discretionary accruals replacing total accruals with working capital accruals (*WC_ACRUALS$_{it}$*), defined as income before extraordinary items, plus depreciation and amortisation, minus cash flows from operating activities (Dechow et al., 2012; Peasnell et al., 2005; Kothari et al., 2005). The modified Jones model is, thus, as follows:

$$\frac{WC_{\text{ACCRUALSit}}}{\text{TA}_{\text{it}-1}} = \beta_0 + \beta_1 \left(\frac{\Delta\text{SALES}_{\text{it}} - \Delta\text{REC}_{\text{it}}}{\text{TA}_{\text{it}-1}}\right) + \beta_2 \left(\frac{\text{PPE}_{\text{it}}}{\text{TA}_{\text{it}-1}}\right) + \varepsilon_{\text{it}}$$

where $WC_{ACCRUALS_{it}}$ = *IB$_{it}$+DP-OANCF$_{it}$.IB$_{it}$* is the earnings before extraordinary items; DP are depreciation and amortisation; and *OANCF$_{it}$* is cash flow from operational activities.

In some detail, Kothari et al. (2005) employ matching based on a firm's return on assets and industry membership. Kothari et al. (2005) follow Dechow et al. (1998) who argue that ROA controls for the effect of performance on measured discretionary accruals. Barber and Lyon (1996) have been the first to argue that matching on an operating performance measure like the ROA tends to be better than matching on other variables. Kothari, et al. (2005) proceed with performance match discretionary accruals (DAC_{it}) using 250 randomly selected samples from Compustat and test for differences in DAC_{it} measures using a t-statistics as follows:

$$\overline{DAC}_{it}/(s(DAC_{it})/\sqrt{N}) \sim t_{N-1} \tag{7}$$

Where DAC_{it} is discretionary accruals and

$$\overline{DAC}_{it} = \frac{1}{N}\sum_{t=1}^{N} DAC_{it} \tag{8}$$

$$s(DAC_{it}) = \sqrt{\sum_{t=1}^{N} \frac{(DAC_{it} - \overline{DAC}_{it})^2}{N-1}}$$

where DAC_{it} is discretionary accruals adjusted for performance for firm *i* and year *t* and $\overline{DAC}_{it}$ is its mean. There are other matching variables like size, earnings growth, earnings yield, and market-to-book.

Kothari et al. (2005) argue that their performance matching analysis of, for example, discretionary accruals is statistically the best-specified measure of discretionary accruals across a wide variety of simulated event conditions. They justify the performance matching analysis by reasoning that the mean reversion or momentum in sales and earnings performance is quite likely for firms exhibiting unusual past performance. In substance, they suggest future performance predictability would allow predicting future accruals and thereby discretionary accruals. They further argue that their matched-firm approach does not impose any functional form on the relation between performance and accruals. It simply assumes that, on average, the treatment and control firms have the same estimated non-event discretionary accruals.

Kothari et al. (2005) report simulation results for 250 samples of 100 firms each. They draw samples without replacement from the full sample or from stratified subsets. The

subsets are the lowest and highest quartiles of firms ranked on book-to-market, past sales growth, earnings-to-price, size (market value of equity, referred to as large and small firms) and operating cash flow. To construct the subsets, each year they rank all firm-year observations based on each partitioning characteristic (e.g., book-to market or size, measured at the beginning of the year). Each year only retains the upper and lower quartiles of the sample. For each partitioning variable, then pool observations across all years to form two sub-samples, one based on pooling all data from the annual upper quartiles and another based on pooling all data from the annual lower quartiles. Then, they estimate the performance-matched discretionary accrual as the difference between the discretionary accruals (as in equation 6 above) and the corresponding discretionary accrual for a performance-matched firm. Similarly, to compare the effectiveness of performance matching, versus a regression-based approach, estimate an additional discretionary accrual measure that includes return on assets (ROA) in the models. Then, they match each firm-year observation with another from the same two-digit SIC code and the year with the closest return on assets in the current year, $ROA_{i,t}$ (return on assets). Performance matching is also done based on two-digit SIC code, year and $ROA_{i,t-1}$.[3]

3.4. Measuring Real Activities Earnings Management

In addition to discretionary (abnormal) accruals, we have similar issues for real earnings management as depicted by Cohen et al. (2020).

Cohen and Zarowin (2010) argue that firms that manipulate earnings upwards are characterised by unusually low cash flows from operations, low discretionary expenses, and high production costs. Hence, for real earnings management, we employ the abnormal cash flows (*ABNOR_CASH*$_{it}$), the abnormal discretionary expenses

[3] The model adjusted for ROA is:
$\frac{\mathrm{TAC_{it}}}{\mathrm{TA_{it-1}}} = \beta_0 + \beta_1 \left(\frac{\Delta\mathrm{SALES_{it}} - \Delta\mathrm{REC_{it}}}{\mathrm{TA_{it-1}}}\right) + \beta_2 \left(\frac{\mathrm{PPE_{it}}}{\mathrm{TA_{it-1}}}\right) + \beta_3 \left(\frac{ROA_{\mathrm{it-1}}}{\mathrm{TA_{it-1}}}\right) + \varepsilon_{\mathrm{it}}$,
where TAC_{it} denotes total accruals, ROA is returns on assets (with $l = 0$ or 1), $\Delta\, SALES_{i,t}$ is change in sales scaled by lagged total assets, $ASSETS_{i,t1-1}$, and $PPE_{i,t}$ is net property, plant and equipment scaled by $ASSETS_{i,t-1}$. Use of assets as the deflator is intended to mitigate heteroskedasticity in residuals. Kothari et al. (2005) use residuals from the annual cross-sectional industry regression model of this model as the Jones model discretionary accruals. Moreover, cross-sectionally estimate the modified-Jones model using sales changes net of the change in accounts receivables [i.e., use $\Delta\, SALES_{i,t} - \Delta\, AR_{i,t}$].

(*ABNOR_DEXP*$_{it}$) and the abnormal production costs (*ABNOR_PCOST*$_{it}$) (see Dechow et al. 1996).

Abnormal cash flows (*ABNOR_CASH*$_{it}$) is computed as deviations from the predicted values from the industry and year regression:

$$\frac{\text{CASFO}_{\text{it}}}{\text{TA}_{\text{it}-1}} = \beta_0 + \beta_1 \frac{1}{\text{TA}_{\text{it}-1}} + \beta_2 \left(\frac{\text{SALES}_{\text{it}}}{\text{TA}_{\text{it}-1}}\right) + \beta_3 \left(\frac{\Delta\text{SALES}_{\text{it}}}{\text{TA}_{\text{it}-1}}\right) + \varepsilon_{\text{it}} \qquad (9$$

where *CASFO*$_{it}$ is the cash flow from operational activities. *SALES*$_{it}$ represents annual sales revenue and *TA*$_{it}$ total assets is the aggregate of both non-current and current assets, whilst $\Delta SALES_{it}$ is a change in sales. The abnormal level of cash flow from operation *(ABNOR_CASH*$_{it}$*)* is measured as the residuals, ε_{it}. Note that high values for ε_{it} would imply high abnormal cash flow from operation and would also thereby imply high earnings through increasing sales.

The abnormal production costs *(ABNOR_PCOST*$_{it}$*)* are derived as deviations from expected values from the industry-year regression. Following Cohen and Zarowin (2010) we estimate abnormal production costs using the regression model:

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$$\frac{PCOST_{it}}{TA_{i,t-1}} = \beta_0 + \beta_1 \frac{1}{TA_{i,t-1}} + \beta_2 \frac{SALES_{i,t}}{TA_{i,t-1}} + \beta_3 \frac{\Delta SALES_{it}}{TA_{i,t-1}} + \beta_4 \frac{\Delta SALES_{it-1}}{TA_{i,t-1}} + v_{it}, \qquad (10)$$

where $PCOST_{it}$ measures the cost of sales and change in inventory for firm *i* and year *t*. v_{it} is an error term and measures Abnormal Production Cost. The i refers to the firm and t to time. The higher the v_{it} the higher the abnormal production costs, and thus the higher the earnings through reducing the cost of goods sold.

Discretionary expenses *D_EXP*$_{it}$ variable is a function of lagged sales as in Cohen and Zarowin (2010) and Roychowdhury (2006):

$$\frac{DEXP_{it}}{TA_{i,t-1}} = \gamma_0 + \gamma_1 \frac{1}{TA_{i,t-1}} + \gamma_2 \frac{SALES_{i,t-1}}{TA_{i,t-1}} + u_{it}, \qquad (11)$$

where *D_EXP*$_{it}$ is the sum of advertising expenses, research, and development (*R&D*$_{it}$) expenses and selling, general and administration expenses.[4] Sales equal annual sales revenue and assets (*TA*$_{it}$) is the aggregate of both non-current and current assets. u_{it} is an error term and measures Abnormal Discretionary Expenses *(ABNOR_DEXP*$_{it}$*)*. We multiply the *ABNOR_DEXP*$_{it}$ by minus one so that higher values of *ABNOR_DEXP*$_{it}$

[4]Following previous studies (Zang, 2012; Cohen and Zarowin, 2010), where selling and general expenses are available, but advertising and R&D expenses are not available, the value of zero is given.

would mean lower discretionary expenditures and thereby a higher increase in reported earnings.

The abnormal R&D costs *(ABNOR_R&D$_{it}$)* are derived as deviations from expected values from the industry-year regression. Following Gunny (2010) and Cohen et al. (2020) we estimate abnormal R&D costs using the regression model:

$$\frac{R\&D_{it}}{TA_{i,t-1}} = \delta_0 + \delta_1 \frac{1}{TA_{i,t-1}} + \delta_2 MV_t + \delta_3 Q_t + \delta_4 \frac{INT_{i,t}}{TA_{i,t-1}} + \delta_5 \frac{R\&D_{i,t-1}}{TA_{i,t-1}} + u_{it}, \qquad (12)$$

where R&D is R&D expense, MV is the natural logarithm of the market value of equity (outstanding shares times stock price), Q is Tobin' s Q [= MVE + book value preferred stock + book value of long-term debt + debt in current liabilities)/total assets], and INT is internally generated funds (the sum of Net Income before extraordinary items, R&D expense, and Depreciation and Amortization). The abnormal R&D costs *(ABNOR_R&D$_{it}$)* are the residuals from the above model.

The abnormal selling, general and administrative costs *(ABNOR_SGA$_{it}$)* are derived as deviations from expected values from the industry-year regression. Following Gunny (2010) and Cohen et al. (2020) we estimate abnormal SGA costs using the regression model:

$$\frac{SGA_{it}}{TA_{i,t-1}} = \delta_0 + \delta_1 \frac{1}{TA_{i,t-1}} + \delta_2 MV_t + \delta_3 Q_t + \delta_4 \frac{INT_{i,t}}{TA_{i,t-1}} + \delta_5 \frac{\Delta SALES_{i,t}}{TA_{i,t-1}} + \delta_6 \frac{\Delta SALES_{i,t}}{TA_{i,t-1}} \times DD + u_{it}, \qquad (13)$$

where SGA is selling, general and administrative costs, ΔSALES is a change in annual sales. DD is an indicator variable equal to one when total sales decrease from year *t−1* to *t*, and zero otherwise. The abnormal SGA costs *(ABNOR_SGA$_{it}$)* are the residuals from the above model.

The abnormal gains *(ABNOR_GAIN$_{it}$)* are derived as deviations from expected values from the industry-year regression. Following Gunny (2010) and Cohen et al. (2020) we estimate abnormal SGA costs using the regression model:

$$\frac{GAIN_{it}}{TA_{i,t-1}} = \delta_0 + \delta_1 \frac{1}{TA_{i,t-1}} + \delta_2 MV_t + \delta_3 Q_t + \delta_4 \frac{INT_{i,t}}{TA_{i,t-1}} + \delta_5 \frac{ASALES_{i,t}}{TA_{i,t-1}} + \delta_6 \frac{ISALES_{i,t}}{TA_{i,t-1}} + u_{it}, \qquad (14)$$

where GAIN is gain from asset sales (times – 1), ASALES is long-lived assets sales, ISALES is long-lived investment sales. The abnormal GAINS *(ABNOR_GAIN$_{it}$)* are the residuals from the above model.

Following Cohen et al. (2020), we proceed with modified real earnings management in line also with Gunny (2010) and Vorst (2016). Modified abnormal cash flows (*MODABNOR_CASH*$_{it}$) are computed as deviations from the predicted values from the industry and year regression:

$$\frac{\text{CASFO}_{\text{it}}}{\text{TA}_{\text{it}-1}} = \beta_0 + \beta_1 \frac{1}{\text{TA}_{\text{it}-1}} + \beta_2 \left(\frac{\text{SALES}_{\text{it}}}{\text{TA}_{\text{it}-1}}\right) + \beta_3 \left(\frac{\Delta\text{SALES}_{\text{it}}}{\text{TA}_{\text{it}-1}}\right) + \beta_4 \left(\frac{\Delta\text{SALES}_{\text{it}}}{\text{TA}_{\text{it}-1}}\right) \times DD + \varepsilon_{\text{it}} \quad (15)$$

where DD is an indicator variable equal to one when total sales decrease from year t−1 to t, and zero otherwise.

The modified abnormal production costs *(MODABNOR_PCOST*$_{it}$) are derived as deviations from expected values from the industry-year regression. Following Cohen and Zarowin (2010) we estimate abnormal production costs using the regression model:

$$\frac{PCOST_{it}}{TA_{i,t-1}} = \beta_0 + \beta_1 \frac{1}{TA_{i,t-1}} + \beta_2 \frac{SALES_{i,t-1}}{TA_{i,t-1}} + \beta_3 \frac{\Delta SALES_{it}}{TA_{i,t-1}} + \beta_4 \frac{\Delta SALES_{it-1}}{TA_{i,t-1}} + \beta_5 \frac{\Delta SALES_{it}}{TA_{i,t-1}} \times DD + \beta_6 \frac{\Delta SALES_{it-1}}{TA_{i,t-1}} \times DD + v_{it}, \quad (16)$$

where v_{it} is an error term and measures the modified Abnormal Production Cost.

The modified discretionary expenses *MODD_EXP*$_{it}$ variable is a function of lagged sales as in Cohen and Zarowin (2010) and Roychowdhury (2006):

$$\frac{DEXP_{it}}{TA_{i,t-1}} = \gamma_0 + \gamma_1 \frac{1}{TA_{i,t-1}} + \gamma_2 \frac{SALES_{i,t-1}}{TA_{i,t-1}} + \gamma_3 \frac{\Delta\, SALES_{it}}{TA_{i,t-1}} + \gamma_4 \frac{\Delta\, SALES_{it}}{TA_{i,t-1}} \times DD + u_{it}, \quad (17)$$

where u_{it} is the modified discretionary expenses *MODD_EXP*$_{it.}$

Cohen et al. (2020) raise criticism on the above measures of real earnings management given the lack of underlying performance type of analysis. Such analysis has been proposed by Kothari et al. (2005) who opt for performance matching to measure discretionary accruals that yield higher efficiency compared to models such as the Jones (1991) or modified-Jones model (Dechow et al., 1995).

The performance matching analysis of Kothari et al. (2005) is simple. As the first step for each abnormal real earnings management measure estimates a performance-matched version for a given treatment firm each year by matching it to another firm in the same two-digit S.I.C. code whose ROA is within ±10%. Then, the performance-matched real earnings management measure is the difference between the real earnings

management measures of the treatment firm and that of its match. This exercise of performance-matched real earnings management measure is performed for each firm *i* in year *t* (Kothari et al., 2005).

For a recent application of the performance-matching approach see Cohen et al. (2020). They match treatment firms to control firms based on ROA, where ROA is defined as income before extraordinary items divided by lagged total assets. Each treatment firm (*i*) is matched to a performance-matched control firm (*j*) in the same 2-digit SIC code whose ROA is within ±10%of the treatment firm. Cohen et al. (2020) then define the difference between the REM measure of the treatment firm and the REM measure of the control firm to be the resulting performance-matched REM measure. Using abnormal CFO as an example, $PM\_CFO_{it}=Ab\_CFO_{it} - Ab\_CFO_{jt}$.

Also, we use the modified Jones model to estimate discretionary accruals, as in previous studies (Defond and Jiambalvo, 1994; Dechow et al., 1996; Cohen and Zarowin, 2010; McGuire et al., 2012; Gerakos and Kovrijnykh, 2013). The model allows researchers to decompose discretionary accruals from non-discretionary accruals by adjusting the change in sales for the change in receivables. We estimate the model for each firm and industry, classified by its two-digit SIC code. This procedure partially enables us to regulate the changes in economic conditions that affect industries and total accruals so that the coefficients differ across time. We subtract the change in accounts receivable (ΔAR_{it}) from a change in sales ($\Delta SALES_{it}$) before estimating the residuals cross-sectionally and yearly for all firm-year observations in the same two-digit SIC code.

We compute the abnormal cash flows (ABNOR_CASH), abnormal discretionary expenses (ABNOR_DEXP) and abnormal production costs (ABNOR_PCOST) for each firm and industry classified by its two-digit SIC code (see also Dechow et al. 1996). Abnormal cash flows (ABNOR_CASH) are computed as the deviations from the predicted values from the industry-year regression. We run the following panel model for each industry and year:

$$\frac{\mathrm{CASFO_{it}}}{\mathrm{TA_{it-1}}} = \beta_0 + \beta_1 \left(\frac{\mathrm{SALES_{it}}}{\mathrm{TA_{it-1}}}\right) + \beta_2 \left(\frac{\Delta\mathrm{SALES_{it}}}{\mathrm{TA_{it-1}}}\right) + \varepsilon_{\mathrm{it}} \qquad (18)$$

where CASFO is the cash flow from operational activities. $SALES_{it}$ represents annual sales revenue and *TA* total assets is the aggregate of both non-current and current assets, whilst $\Delta SALES_{it}$ is the change in sales. The figure for *(ABNOR_CASH)* is multiplied by negative one (-1), in line with previous studies (Zang, 2012; Roychowdhury, 2006).

Second, we estimate abnormal production costs *(*ABNOR_PCOST) as deviations from predicted values from the industry-year regression. We follow Cohen and Zarowin (2010) to estimate abnormal production costs using the following regression model:

$$\frac{PCOST_{it}}{TA_{it-1}} = \beta_0 + \beta_1 \left(\frac{SALES_{it-1}}{TA_{it-1}}\right) + \beta_2 \left(\frac{\Delta SALES_{it}}{TA_{it-1}}\right) + \left(\frac{\Delta SALES_{it-1}}{TA_{it-1}}\right) + \varepsilon_{it} \quad (19)$$

where PCOST is the aggregate cost of sales and change in inventory during the year. Third, we model discretionary expenses as a function of lagged sales to avoid the problem of significantly lower residuals from running regression using current sales. Subsequently, abnormal discretionary expenses *(*ABNOR_DEXP*)* are computed from the predicted values from the industry-year regression. We follow Cohen and Zarowin (2010) and Roychowdhury (2006) to estimate the abnormal discretionary expenses using the following regression model:

$$\frac{D\_EXP_{it}}{TA_{it-1}} = \beta_0 + \beta_1 \left(\frac{SALES_{it-1}}{TA_{it-1}}\right) + \varepsilon_{it} \quad (20)$$

where D_EXP is the sum of advertising expenses, research, and development (R&D) expenses and selling, general and administration expenses.[5] Sales equal annual sales revenue and assets (TA) is the aggregate of both non-current and current assets. Also, consistent with previous studies, the figure for *(*ABNOR_DEXP*)* is multiplied by a negative one (-1). As noted by Cohen and Zarowin (2010), firms that manipulate earnings upwards are characterised by unusually low cash flows from operations, low discretionary expenses, and high production costs.

To estimate the proxy of real activities earnings management (REALMGMT1), we multiply abnormal discretionary expenses (ABNOR_DEXP) by a negative one (-1) and the results are added to abnormal production costs (ABNOR_PCOST). The higher the REALMGMT1, the stronger the evidence that the firm is cutting expenses. A higher REALMGMT1 is an indication that firms might engage in driving earnings upwards. Again, we compute the aggregate of abnormal cash flows *(*ABNOR_CASH*)* and abnormal discretionary expenses (ABNOR_DEXP) after multiplying each of them by a negative one (-1). The residuals from abnormal cash flows (ABNOR_CASH) and

[5]Following previous studies (Cohen and Zarowin, 2010; McGuire et al., 2012; Zang, 2012), where selling and general expenses are available, but advertising and R&D expenses are not available, the value of zero is given.

abnormal discretionary expenses (ABNOR_DEXP) are aggregated as proxy REALMGMT2. This measure is multiplied by negative one (-1) to assess the extent of manipulation in sales and discretionary expenses. The higher the REALMGMT2, the more likely the firm is engaged in managing earnings upwards. As indicated by Cohen and Zarowin (2010), the individual variables have varying impacts and therefore can change or provide misleading results when aggregated. In the robustness check, we examine and report on both aggregated measures and individual proxies for real activities.

4. The Data set

Our financial data consist of annual firm-level observations for non-financial Greek business firms from 2007 to 2015. This period provides comparability between years to allow us to investigate real earnings management measurements including the period of crisis. Our sample contains firms from the industries of manufacturing, information technology, services (including mainly firms from the wholesale and retail trade) and professional and scientific activities. Initially, the breakdown of the available data for 2007 covers the economic activities (Nace Rev.2) by the firm level of analysis. Next, the data classification is organized into a 2-digit industry level. In the initial sample, the collected annual data of Greek firms included 125 firms with 424 observations. Finally, our sample covers a total of 100 firms with 351 observations when restricted to firms with complete data on the variables of interest.[6] Table 1 presents the number of observations and firms by industry of the sample.

[Table 1 about here]

We collect financial data from firms in Greece for the following variables: R&D is R&D expense, MV is the natural logarithm of the market value of equity (outstanding shares times stock price), Q is Tobin' s Q [= MVE + book value preferred stock + book value of long-term debt + debt in current liabilities)/total assets], INT is internally generated funds (the sum of Net Income before extraordinary items, R&D expense, and Depreciation and Amortization). SGA is selling, general and administrative costs.

[6] The paper uses a confidential dataset from ICAP, a private data provider of balance sheet data of Greek firms, that we have been granted access to subject to confidentiality agreement not to disclose information about the identity of those firms. Data availability has been a major impediment to applied research at firm level in Greece. The available data cover the period 2007-2015 and though we would like to have additional firm-years observations we face data restrictions.

GAIN is gain from asset sales (times − 1), DD is an indicator variable equal to one when total sales decreases from year t − 1 to t, and zero otherwise. Sales Growth: (sales − lagged sales)/lagged sales. Market Value of Equity: Fiscal year-end stock price multiplied by common shares outstanding. Book/Market: Book value of common equity divided by the MVE. Earnings/Price: Diluted earnings per share excluding extraordinary items divided by the fiscal year-end stock price.

Data have been assembled from the firm's accounts and financial statements that submitted in the General Electronic Commercial Registry (G.E.MH.)[7] of the Greek Ministry of Development and Investments. Table 2 reports descriptive statistics on the natural logarithm of the model variables.

[Table 2 about here]

5. Regressions

We control for the impact of firm's leverage and taxation[8] on firm's earnings management policies. We adopted four different financial variables, current liabilities, other current liabilities (including accrued expenses, sales taxes payable, deferred tax liabilities, servicing liabilities, etc), loans and creditors, as proxies of leverage. Also, the models include some control variables, which represent profitability, size, and firm value. Profitability includes return on assets (ROA) and shows the. Furthermore, we incorporated Qtobin and MVE as control variables, given that leverage influences the firm's size and market value. We used panel data regression models with fixed effects since the results of the Hausman test revealed that residuals are not correlated with the constant. In some detail, our regression analysis using fixed effects (FE) is justified because of our data set that include variables that vary over time. Our sample includes firm level data that has its own individual characteristics that are time varying. To this end, in our modelling we control a specific characteristic of firm *i* at year *t* may impact or bias dependent variables and we, therefore, control for this using FE. Thus, the FE model controls for the effect of time-invariant variables because those time-invariant variables are unique to the firm and therefore they should not be correlated with other

Commented [ΠΠ2]: Comment 3. Μανώλη εδώ πρέπει να δοθεί η απάντηση

[7] General Electronic Commercial Registry (G.E.MI) records all disclosures of business documents and financial data for the Greek companies (Law No 3419/2005).

[8] For details about the Corporate Tax Rates in Greece over the examined period 2007-2015, please see on https://stats.oecd.org (Dataset: Statutory Corporate Income Tax Rates).

variables. In this way, our modelling approach treats each firm as different from another firm and thus the firm's *i* error term and the constant are not correlated with the other firms. The Hausman test provides a statistical test for fixed effects vs random effects (which is appropriate for data sets with time-invariant variables, like gender).[9]

Table 3 presents the regression results of the eight separate fixed effect regression models, measured by abnormal discretionary accruals, abnormal working capital accruals, abnormal based on ROA accruals, abnormal cash flows from operations, abnormal discretionary expenses, abnormal R&D expenses, abnormal selling and general expenses and abnormal gains from sales of fixed assets.

[Table 3 about here]

We find negative and statistically significant coefficients of taxation. Managers during the examined period tend to not manipulate earnings to reduce the current tax expense. One of the possible reasons for such behaviour could be that firms may be more concerned to avoid losses than paying fewer taxes. Our findings are in line with the prior studies which found that taxation has negative or insignificant effects on earnings management (Chen et al, 2006; Marques et al., 2011; Riahi and Ben Arab, 2011and Cazier et al., 2015).

Furthermore, in the cases of abnormal discretionary accruals and abnormal ROA accruals that we have statistically significant coefficients, the results reveal that debt included in current liabilities, loans, creditors, and other current liabilities is negatively associated with earnings management practices. These results suggest that firms are likely to reduce manage accrual earnings when they face the liquidity risk of debt. One possible explanation for the negative impact of leverage on earnings management could be that during the examined period Greek firms were more closely controlled by banks or creditors, and thus managers have fewer possibilities to engage in earnings management. Therefore, managers have improved accounting reports to avoid a negative perception of stakeholders and show confidence and credibility. Our results are consistent with the prior studies of Jensen (1986), Jelinek (2007), Ahn and Choi,

[9] The Hausman test is Lagrange Multiplier Test that formally tests fixed effects vs random effects. High values reject the null hypothesis and imply that the fixed effects model is the appropriate one. In out estimations, Hausman tests show high values of above 200, justifying the use of fixed effects. This is in line with the fact that we do not have variables in our sample that are time invariant.

(2009) and Rodríguez-Pérez & van Hemmen, (2010), who suggested that leverage limits earnings management.

With respect to control variables, the profitability proxy ROA is found to be positively associated with accrual-based earnings management in most specifications, indicating that the higher the performance of the firm, the higher the possibility for the firm's incentive to manipulate its earnings. The signs of the coefficients on the Qtobin are significantly positive in relation to abnormal selling and general expenses and significant negative in relation to abnormal gains from sales of fixed assets, suggesting that larger firms manage gains and expenses from sales more than smaller firms maybe because they want to meet investor's perceptions, especially in the period of crisis. The signs of the coefficients on the MVE are significant negative only in the cases of abnormal discretionary expenses, abnormal R&D expenses and abnormal selling and general expenses indicating that firms with higher market value have a low tendency to use expenses to manipulate earnings, to improve the firm's value.

In Table 4 to the measures of real earnings management, we use two other proxies based on real earnings management activities REM 1 and REM 2 and next following Cohen et al. (2020) we proceed with modified versions of abnormal cash flows from operations and abnormal production costs.

The results reveal that in most cases there are negative effects of taxation on real earnings management. Furthermore, the results indicate that leverage does not have a significant impact on real earnings management, as in all cases the coefficients are statistically insignificant.

[Table 4 about here]

With respect to control variables, the profitability proxy ROA is found to be positively associated with REM 1, modified abnormal cash flow, and modified abnormal production cost and negatively with REM 2 and the modified discretionary expenses. These results indicate that the higher the performance and profitability of the firm, the higher the possibility for the firm's incentive to manipulate its earnings through decreasing the cost of goods sold, R&D, advertising, and SGA expenses to report lower discretionary spending. On the other hand, the negative relation between ROA and abnormal cash flow suggests that the less profitable firms may have more incentives to manipulate their earnings. The sign of the coefficient on the Qtobin is significantly positive in relation to modified abnormal cash flow and significant negative in relation

to REM 2 and REM 1. These results suggest that larger firms manage earnings by decreasing the cost of goods sold more than smaller firms, probably because they want to meet investor's perceptions**.** The sign of the coefficient on the MVE is significant negative only in the case of modified discretionary expenses, indicating that firms with higher market value have a low tendency to use expenses to manipulate earnings, to improve the firm's value.

Next, we examine the impact of the debt crisis on earnings management. We add in our estimates a dummy variable for the year 2008 that represents the year of the global financial crisis.

[Table 5 about here]

The results that presented in Tables 5 and 6 on taxation, leverage and control variables are like those that introduced in Tables 3 and 4. The variable of crisis has a significant positive impact on accruals earnings management and real earnings management. Contrary to the findings related to leverage and taxation, it appears that firms during crisis use to a greater extent cash flow and expenses as a mechanism of earnings management. These results support the opinion that Greek firms tend to increase earnings management practice by decreasing the cost of goods sold R&D, advertising, and SGA expenses to report lower discretionary spending, to weather the crisis. Our results are in line with the prior studies that provide evidence of increased earnings management during the global financial crisis, especially in countries where the legal protection of investors is weak (Charitou et al., 2007; Bamber et al., 2010; Bertomeu and Magee, 2011; Iatridis and Dimitras, 2013; Dimitras et al., 2015 and Persakis and Iatridis, 2016 and Mechelli and Cimini, 2017).

[Table 6 about here]

Tables 7 and 8 provide a robustness check of the results considering the endogeneity problem. A problem of endogeneity is likely to exist when there are measurement errors, omitted variable bias and reverse causality. We conduct a two-stage least square (2SLS) regression analysis, to control for endogeneity. As instruments we use variables that are highly correlated with the independent variables but could not endogenous. Therefore, we use lagged independent variables as instruments. Independent variables of the previous year are strictly exogenous.

[Table 7 and 8 about here]

Commented [ΠΠ3]: Comment 5. Μανώλη εδώ πρέπει να δοθεί η απάντηση. Έχει ένα point ο referee εδώ μιας και τη μεγαλύτερη πτώση του GDP στην Ελλάδα ήταν το 2011 (-10,1%) και το 2012 (-7,1%). Πιστεύεις ότι θα πρέπει να πάρουμε το GDP? Σε αυτή την περίπτωση θα πρέπει να έχουμε νέα results. Αν πάρουμε το GDP να σου στείλω τα data for GDP growth?

Ok Pano
Na to kanume gia na min mas leei oti den trexame new results. Vevaia exoume to QTOBIN poy metraei to economic activity alla telos panton na kanume kai ena neo regression.

Commented [ΠΠ4]: Comment 4. Μανώλη εδώ πρέπει να δοθεί η απάντηση

The results of all the robustness tests performed confirm our preliminary findings on the relation between earnings management and taxation, leverage, crisis, and control variables.

6. Conclusions

Prior literature suggests that earnings management is associated with debt, taxation, and financial crisis. Overall, our results indicate that Greek firms are likely to reduce manage earnings via accruals when they face the liquidity risk of leverage, probably because they were more closely controlled by banks and creditors and thus managers had fewer possibilities to engage in earnings management. Also, concerning taxation firms prefer to avoid losses than pay fewer taxes. Furthermore, we find that managers tend to engage earnings to present a better situation of the firm's value to the capital market in the debt crisis and financial distress. To sum up, the results support the argument of the empirical literature that leverage can be a mechanism that enhances the quality of corporate reporting and reduce managers' opportunistic behaviours. Also, the financial crisis has revealed inadequacies of the accounting practices of Greek firms. The firms' managers tend to present information and good news to the capital market in financial distress conditions so that possible reductions in the firm's value can be prevented. This study presents useful empirical results about the Greek business environment and offers valuable information to shareholders and investors as they can understand how some main factors, such as leverage, taxation and financial crisis, influence firm's accounting practices.

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Tables

Table 1: The industry composition of the sample

Industry	No. of firms	%	No. of obs.	%
Manufacturing activities	49	49%	182	51,9%
Information technology activities	19	19%	73	20,8%
Professional and scientific activities	13	13%	33	9,4%
Services activities	19	19%	63	17,9%
Total	**100**	**100%**	**351**	**100%**

Note: All data are obtained from Authors' calculations. The industries are specified according to the classification of NACE 2.

Table 2: Descriptive statistics of performance-matched model variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Normal Accruals	351	0.7911352	0.2002357	0.1427718	1.403696
Discretionary Accruals	351	-0.0924285	0.5705667	-2.084069	3.207967
Abnormal Discretionary Accruals	351	0.7109504	0.1397858	0.0873132	1.538556
working capital accruals	351	0.0255742	0.0239086	-0.1134912	0.1784358
ROA accruals	351	0.7101639	0.1446426	0.049164	1.493471
abnormal cash flows	351	0.0703633	0.0985307	-0.0968651	0.5997513
abnormal discretionary expenses	351	0.2558149	0.0624352	-0.0560824	0.3249245
abnormal production costs	279	0.9073713	0.3112655	0.5349782	2.449856
abnormal research and development (R&D) expenses	344	0.0477829	0.0860075	-0.0158131	0.7522444
abnormal selling, general and administration expenses	344	0.2069173	0.0726549	0.0174985	0.5356307
abnormal gain	344	0.0095206	0.0581716	-0.280906	0.2029425
Q Tobin	344	0.0477829	0.108349	0.0000298	1.033105
market value of equity	344	0.7256758	0.4223613	0.0253044	2.456017
Modified Abnormal Cashflow	344	0.0708433	0.0990606	-0.101894	0.5964593
Modified abnormal discretionary expenses	344	0.2552625	0.0683169	-0.0316413	0.4423798
Modified Abnormal production costs	218	0.9056127	0.3302784	0.5606377	2.48511
REM1	279	0.6521631	0.3719135	0.2406951	2.505939
REM2	351	-0.3261782	0.069099	-0.7233875	-0.17938
Taxation	351	391428.1	1238605	-8598000	1.13E+07
Long term debt	351	1.37e+07	6.16E+07	0	7.71E+08
Current liabilities	351	2.13e+07	3.63E+07	0	2.64E+08
loans	351	8880428	2.02E+07	0	1.57E+08
creditors	351	7104701	1.11E+07	0	7.91E+07
Other current liabilities	351	5323953	1.24E+07	4982	1.17E+08

Note: All data are obtained from Authors' calculations.

Table 3: Impact of Debt and Taxation on Accruals Earnings Management

VARIABLES	ANACC (1) Fixed Effects	WKAcruals (2) Fixed Effects	ROAAcr (3) Fixed Effects	ANCASFO (4) Fixed Effects	ANDexp (5) Fixed Effects	ANRD (6) Fixed Effects	ANSGA (7) Fixed Effects	ANGAIN (8) Fixed Effects
Taxation	-0.0399***	-0.070***	-0.0359***	-0.00181	0.0875***	-0.0456***	-0.026***	-0.0119***
	(0.00617)	(0.00117)	(0.00637)	(0.00239)	(0.00108)	(0.001424)	(0.00126)	(0.00111)
Qtobin	0.0385	0.0618***	0.0294	0.0115***	0.0489***	0.0268	0.0365***	-0.179***
	(0.0265)	(0.00502)	(0.0273)	(0.0012)	(0.00461)	(0.0182)	(0.0114)	(0.00487)
MVE	0.000403	0.000230	0.00253	0.000445	-0.00172*	-0.0251***	-0.030***	-0.000412
	(0.00511)	(0.000969)	(0.00527)	(0.00198)	(0.000890)	(0.00351)	(0.00221)	(0.000941)
ROA	0.00699***	0.00136***	0.00693***	0.00318***	-0.000363***	0.000192	-5.97e-05	-0.000142
	(0.000724)	(0.000138)	(0.000748)	(0.000280)	(0.000126)	(0.000497)	(0.00031)	(0.000133)
Current Liabilities	-1.99e-07*	-3.21e-08	-3.29e-07***	-2.75e-09	-4.70e-09	-1.30e-09	-1.15e-08	9.51e-10
	(1.05e-07)	(1.99e-08)	(1.08e-07)	(4.06e-08)	(1.83e-08)	(7.21e-08)	(4.54e-08)	(1.93e-08)
Loans	-1.99e-07*	-3.21e-08	-3.29e-07***	2.63e-09	4.69e-09	1.63e-09	1.16e-08	-9.14e-10
	(1.05e-07)	(1.99e-08)	(1.08e-07)	(4.06e-08)	(1.83e-08)	(7.21e-08)	(4.54e-08)	(1.93e-08)
Creditors	-2.01e-07*	-3.26e-08	-3.31e-07***	3.50e-09	4.87e-09	1.01e-09	1.14e-08	-8.41e-10
	(1.05e-07)	(1.99e-08)	(1.08e-07)	(4.06e-08)	(1.83e-08)	(7.21e-08)	(4.54e-08)	(1.93e-08)
Other Current Liabilities	-1.98e-07*	-3.20e-08	-3.28e-07***	2.86e-09	4.79e-09	1.74e-09	1.17e-08	-1.05e-09
	(1.05e-07)	(1.99e-08)	(1.08e-07)	(4.06e-08)	(1.83e-08)	(7.21e-08)	(4.54e-08)	(1.93e-08)
Constant	0.670***	0.0167	0.646***	0.0432	0.276***	0.396***	0.631***	0.165***
	(0.0741)	(0.0141)	(0.0765)	(0.0287)	(0.0129)	(0.0509)	(0.0321)	(0.0137)
Observations	343	343	343	343	343	343	343	343
R-squared	0.295	0.301	0.297	0.344	0.053	0.167	0.429	0.846
FE	YES	YES	YES	YES	YES	YES	YES	YES

Notes: ***, ** and * are used in a two tailed test to respectively indicate statistical significance at 1%, 5% and 10% levels, respectively. Standard errors are in the parentheses.

Table 4: Impact of Debt and Taxation on Real Activities Management

VARIABLES	REALMGMT1 (1) Fixed Effects	REALMGMT2 (2) FixedEffects	modANCash (3) Fixed Effects	modANdisExp (4) Fixed Effects	modANprodC (5) Fixed Effects
Taxation	-0.0346***	0.0932***	-0.0187***	0.0138***	-0.0466***
	(0.00598)	(0.00192)	(0.0024)	(0.00146)	(0.00855)
Qtobin	-0.0379***	-0.0164**	0.0171*	0.00243	-0.0436***
	(0.00305)	(0.00822)	(0.0103)	(0.00624)	(0.00389)
MVE	0.00471	0.00127	0.000173	-0.00296**	0.0109
	(0.00560)	(0.00159)	(0.00199)	(0.00121)	(0.00827)
ROA	0.00351***	-0.00281***	0.00326***	-0.000706***	0.00234**
	(0.000805)	(0.000225)	(0.000282)	(0.000171)	(0.00112)
Current Liabilities	-2.21e-08	7.45e-09	-7.82e-09	-9.05e-09	-3.34e-08
	(9.94e-08)	(3.26e-08)	(4.09e-08)	(2.48e-08)	(1.02e-07)
Loans	2.18e-08	-7.32e-09	7.69e-09	9.03e-09	3.29e-08
	(9.94e-08)	(3.26e-08)	(4.09e-08)	(2.48e-08)	(1.02e-07)
Creditors	2.42e-08	-8.37e-09	8.32e-09	9.88e-09	3.68e-08
	(9.94e-08)	(3.26e-08)	(4.09e-08)	(2.48e-08)	(1.02e-07)
Other Current Liabilities	2.16e-08	-7.66e-09	8.10e-09	9.17e-09	3.20e-08
	(9.94e-08)	(3.26e-08)	(4.09e-08)	(2.48e-08)	(1.02e-07)
Constant	0.606***	-0.319***	0.0432	0.295***	0.768***
	(0.0784)	(0.0230)	(0.0288)	(0.0175)	(0.114)
Observations	273	343	343	343	217
R-squared	0.100	0.393	0.353	0.105	0.060
FE	YES	YES	YES	YES	YES

Notes: ***, ** and * are used in a two tailed test to respectively indicate statistical significance at 1%, 5% and 10% levels, respectively. Standard errors are in the parentheses.

Table 5: Impact of Debt, Taxation and Crisis on Accruals Earnings Management

VARIABLES	(1) ANACC	(2) WKAcruals	(3) ROAAcr	(4) ANCASFO	(5) ANDexp	(6) ANRD	(7) ANSGA	(8) ANGAIN
Taxation	-0.0354***	-0.0697***	-0.0323***	-0.0124***	0.0954***	-0.0314***	-0.0136***	-0.0323***
	(0.006)	(0.0017)	(0.00635)	(0.00237)	(0.00108)	(0.00461)	(0.0035)	(0.00286)
crisis	0.0176***	0.015***	0.0550***	0.00894*	0.000194	0.0188*	0.0765***	0.0738***
	(0.0131)	(0.00248)	(0.0135)	(0.00504)	(0.00229)	(0.00989)	(0.00752)	(0.00614)
ROA	0.00696***	0.00135***	0.00693***	0.00319***	-0.000386***	-0.000168	-0.000539	-0.000180
	(0.000714)	(0.000135)	(0.000736)	(0.000275)	(0.000125)	(0.000536)	(0.000408)	(0.000333)
Qtobin	0.0317***	0.0761***	0.0317***	0.0803*	0.00392	0.0221*	0.0217***	0.0332***
	(0.0131)	(0.00248)	(0.0135)	(0.00504)	(0.00229)	(0.00989)	(0.00752)	(0.00614)
MVE	0.0424***	0.0839***	0.0451***	0.0210***	0.00016	0.0208	-0.000989	-0.0011
	(0.000714)	(0.000135)	(0.000736)	(0.000275)	(0.000125)	(0.000536)	(0.000408)	(0.000333)
Current Liabilities	-2.01e-07*	-3.31e-08*	-3.30e-07***	-6.74e-09	-4.23e-09	-2.48e-09	-5.17e-09	-3.06e-09
	(1.05e-07)	(1.98e-08)	(1.08e-07)	(4.02e-08)	(1.83e-08)	(7.82e-08)	(5.95e-08)	(4.86e-08)
Loans	-2.01e-07*	-3.31e-08*	-3.30e-07***	6.59e-09	4.21e-09	2.46e-09	4.94e-09	2.68e-09
	(1.05e-07)	(1.98e-08)	(1.08e-07)	(4.02e-08)	(1.83e-08)	(7.82e-08)	(5.95e-08)	(4.86e-08)
Creditors	-2.03e-07*	-3.35e-08*	-3.32e-07***	7.31e-09	4.37e-09	1.26e-09	4.37e-09	2.80e-09
	(1.05e-07)	(1.98e-08)	(1.08e-07)	(4.02e-08)	(1.83e-08)	(7.82e-08)	(5.95e-08)	(4.86e-08)
Other Current Liabilities	-2.00e-07*	-3.29e-08*	-3.29e-07***	6.91e-09	4.31e-09	2.57e-09	4.97e-09	2.54e-09
	(1.05e-07)	(1.98e-08)	(1.08e-07)	(4.02e-08)	(1.83e-08)	(7.82e-08)	(5.95e-08)	(4.86e-08)
Constant	0.707***	0.0256***	0.706***	0.0553***	0.255***	0.0468***	0.214***	0.0178***
	(0.0137)	(0.00259)	(0.0141)	(0.00526)	(0.00239)	(0.0103)	(0.00784)	(0.00640)
Observations	350	350	350	350	350	343	343	343
R-squared	0.287	0.296	0.290	0.346	0.038	0.019	0.018	0.030
FE	YES	YES	YES	YES	YES	YES	YES	YES

Notes: ***, ** and * are used in a two tailed test to respectively indicate statistical significance at 1%, 5% and 10% levels, respectively. Standard errors are in the parentheses.

Table 6: Impact of Debt, Taxation and Crisis on Real Activities Management

VARIABLES	(1) REALMGMT1	(2) REALMGMT2	(3) ModANCash	(4) ModANdisExp	(5) ModANprodC
Taxation	-0.0345***	0.0288***	-0.0134***	0.018***	-0.0446***
	(0.00595)	(0.0019)	(0.00241)	(0.00146)	(0.00865)
crisis	0.0279***	0.00913**	0.00769	0.00853***	0.0555***
	(0.0140)	(0.00406)	(0.00517)	(0.00312)	(0.0172)
Qtobin	0.02838***	0.00181	0.0318***	0.0824**	0.00366
	(0.0038)	(0.0025)	(0.0049)	(0.00247)	(0.00231)
MVE	0.0235***	0.0188***	0.0312***	0.0238***	0.0362
	(0.00139)	(0.00324)	(0.00498)	(0.0018)	(0.007)
ROA	0.00351***	-0.00281***	0.00328***	-0.000731***	0.00241**
	(0.000799)	(0.000221)	(0.000280)	(0.000169)	(0.00112)
Current Liabilities	-2.38e-08	1.10e-08	-1.13e-08	-1.24e-08	-3.66e-08
	(9.90e-08)	(3.24e-08)	(4.09e-08)	(2.47e-08)	(1.03e-07)
Loans	2.35e-08	-1.08e-08	1.12e-08	1.23e-08	3.62e-08
	(9.90e-08)	(3.24e-08)	(4.09e-08)	(2.47e-08)	(1.03e-07)
Creditors	2.59e-08	-1.17e-08	1.16e-08	1.30e-08	3.99e-08
	(9.90e-08)	(3.24e-08)	(4.09e-08)	(2.47e-08)	(1.03e-07)
Other Current Liabilities	2.32e-08	-1.12e-08	1.16e-08	1.25e-08	3.54e-08
	(9.90e-08)	(3.24e-08)	(4.09e-08)	(2.47e-08)	(1.03e-07)
Constant	0.639***	-0.311***	0.0566***	0.249***	0.888***
	(0.0153)	(0.00423)	(0.00539)	(0.00326)	(0.0177)
Observations	278	350	343	343	217
R-squared	0.092	0.394	0.351	0.109	0.047
FE	YES	YES	YES	YES	YES

Notes: ***, ** and * are used in a two tailed test to respectively indicate statistical significance at 1%, 5% and 10% levels, respectively. Standard errors are in the parentheses.

Table 7: Impact of Debt, Taxation and Crisis on Accruals Earnings Management controlling for endogeneity.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	ANACC	WKAcruals	ROAAcr	ANCASFO	ANDexp	ANRD	ANSGA	ANGAIN
Taxation	-0.0218***	-0.0042***	-0.015***	-0.0035***	0.0611***	-0.0417***	-0.021***	-0.0106***
	(0.00594)	(0.00112)	(0.006)	(0.00182)	(0.0082)	(0.0043)	(0.00265)	(0.00114)
crisis	-0.0782***	-0.0183***	0.0149***	0.00729*	0.0047***	0.0181*	0.0579***	0.0203***
	(0.0128)	(0.00242)	(0.00130)	(0.00392)	(0.00178)	(0.00929)	(0.00573)	(0.00246)
Qtobin	0.0395	0.00631	0.0286	0.00830	0.00737**	0.0222	0.0383***	-0.179***
	(0.0257)	(0.00486)	(0.0260)	(0.00786)	(0.00356)	(0.0186)	(0.0115)	(0.00493)
MVE	-6.88e-05	8.82e-05	0.000986	-0.00139	-0.000443	-0.0262***	-0.0292***	0.000160
	(0.00500)	(0.000944)	(0.00505)	(0.00153)	(0.000692)	(0.00362)	(0.00223)	(0.000958)
ROA	0.00677***	0.00131***	0.00655***	0.00287***	-0.000167*	1.28e-05	0.000140	-6.57e-05
	(0.000715)	(0.000135)	(0.000723)	(0.000219)	(9.90e-05)	(0.000517)	(0.000319)	(0.000137)
Current Liabilities	-2.03e-07*	-3.39e-08*	-3.36e-07***	-0	-8.75e-09	-5.84e-09	-1.80e-08	-1.46e-09
	(1.00e-07)	(1.89e-08)	(1.01e-07)	(3.07e-08)	(1.39e-08)	(7.26e-08)	(4.48e-08)	(1.92e-08)
Loans	-0.0204***	-0.0339***	-0.03360	-0.01	0.087***	0.061	0.0180	0.015
	(0.001)	(0.0018)	(0.0403)	(0.0307)	(0.018)	(0.0726)	(0.0218)	(0.0192)
Creditors	-0.02050**	-0.0343	-0.0338***	0.008	0.089***	0.052**	0.0178	0.016
	(0.01)	(0.019)	(0.010)	(0.0021)	(0.012)	(0.026)	(0.0238)	(0.032)
Other Current Liabilities	-0.023***	-0.0338***	-0.03360***	0.001	0.088***	0.063***	0.0181	0.013
	(0.010)	(0.011)	(0.0101)	(0.0243)	(0.0139)	(0.0216)	(0.0448)	(0.0542)
Constant	0.678***	0.0197	0.672***	0.0706***	0.255***	0.410***	0.606***	0.155***
	(0.0736)	(0.0139)	(0.0743)	(0.0225)	(0.0102)	(0.0532)	(0.0328)	(0.0141)
Observations	335	335	335	335	335	335	335	335
FE	YES	YES	YES	YES	YES	YES	YES	YES

Notes: ***, ** and * are used in a two tailed test to respectively indicate statistical significance at 1%, 5% and 10% levels, respectively. Standard errors are in the parentheses.

Table 8: Impact of Debt, Taxation and Crisis on Real Earnings Management controlling for endogeneity.

	(1)	(2)	(3)	(4)	(5)
VARIABLES	REALMGMT1	REALMGMT2	modANCash	modANdisExp	modANprodC
Taxation	-0.00292	-0.0261***	-2.70e-10	0.00138	0.00324
	(0.00607)	(0.00171)	(1.85e-09)	(0.0029)	(0.00881)
crisis	0.00159	-0.00776**	0.00623	0.00870***	0.00474
	(0.0146)	(0.00370)	(0.00399)	(0.00260)	(0.0180)
Qtobin	-0.0387	-0.0157**	0.0170*	0.00215	-0.0462
	(0.0320)	(0.00741)	(0.0100)	(0.00521)	(0.0418)
MVE	0.00667	0.00183	0.00015	-0.00158	0.0136
	(0.00579)	(0.00144)	(0.00123)	(0.00101)	(0.00887)
ROA	0.00377***	-0.00270***	0.00293***	-0.000478***	0.00277**
	(0.000846)	(0.000206)	(0.000222)	(0.000145)	(0.00123)
Current Liabilities	-2.59e-08	8.78e-09	-3.91e-09	-1.74e-08	-4.01e-08
	(1.00e-07)	(2.89e-08)	(3.12e-08)	(2.03e-08)	(1.04e-07)
Loans	2.55e-08	-8.62e-09	3.80e-09	1.73e-08	3.96e-08
	(1.00e-07)	(2.89e-08)	(3.12e-08)	(2.03e-08)	(1.04e-07)
Creditors	2.78e-08	-9.64e-09	4.39e-09	1.80e-08	4.37e-08
	(1.00e-07)	(2.89e-08)	(3.12e-08)	(2.03e-08)	(1.04e-07)
Other Current Liabilities	2.52e-08	-8.91e-09	4.16e-09	1.75e-08	3.85e-08
	(1.00e-07)	(2.89e-08)	(3.12e-08)	(2.03e-08)	(1.04e-07)
Constant	0.576***	-0.326***	0.0581***	0.269***	0.730***
	(0.0822)	(0.0212)	(0.0041)	(0.0149)	(0.124)
Observations	335	335	335	335	335
FE	YES	YES	YES	YES	YES

Notes: ***, ** and * are used in a two tailed test to respectively indicate statistical significance at 1%, 5% and 10% levels, respectively. Standard errors are in the parentheses.