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Ownership structures, corporate governance and earnings management in the European Oil Industry.

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Abstract

In this paper we investigate the impact of corporate governance and ownership structure variables on earnings management in the European oil industry. We used quarterly data and a panel data methodology. The findings show non-linear relationships among institutional investors ownership and governmental ownership with the magnitude of earnings management. For institutional investors ownership we found a positive association within lower levels of ownership (consistently with the short-term transient view of institutional investors shareholding) and a negative association within higher levels of ownership (consistently with the long-term orientation view of institutional investors, playing a monitoring role over the company's financial performance). For governmental ownership, we found that a positive association within lower levels of ownership, consistently with the incentives for oil companies to avoid closer political scrutiny on the reported results (political costs hypothesis). We found a negative association with earnings management magnitude in firms where governments are the controlling shareholders or a large blockholders. The findings also show that relevant governance variables, such as the proportion of independent directors, the audit committees size and meeting frequency, contribute to constrain earnings management. Overall, the results suggest that key variables related to ownership and governance structures impact on earnings management across different national settings and governance systems. Moreover, the relationship of ownership structures with earnings management appears to be complex and varying at different levels of ownership. This study could have several practical implications. Firstly, accountability and stricter control could be two issues for firms where governments are shareholders that engages in earnings management practices. Secondly, higher participation of institutional investors in the ownership and in the governance may be beneficial may be an effective monitoring device over earnings manipulation. Finally, the homogeneous results could mean that governance practices are more integrated at an European level than the national governance models and codes' recommendations are.

**Keywords:** earnings management, ownership structures, corporate governance

**JEL Code:** M41, G3

## 1. Introduction

After having extensively studied the earnings management practice in response to specific objectives, academic literature is increasingly focusing on the impact of corporate governance and ownership structures on earnings manipulation (Cornett *et al.*, 2008; Sanchez-Ballesta & Garcia-Meca, 2007).

This paper attempts to answer to prior call for research on earnings management practices in specific industries (Utama & Siregar, 2008) and on the relationship between corporate governance and earnings management in an European setting (Garcia-Meca and Sanchez-Ballesta, 2009).

The paper investigates the impact of ownership structures and corporate governance on earnings management in the European Oil industry in the period 2006-2010. In particular, we ascertain whether ownership structure and governance variables affect the magnitude of earnings management.

There are several reasons of interest for this type of study.

Firstly, prior research found that the oil price fluctuations offer several reasons for earnings manipulation to oil companies. Prior research studied the earnings management practices of the US petroleum refining firms in response to political costs-increasing events (Han & Wang, 1997; Byard *et al.*, 2007). To the best of our knowledge, there is no prior study investigating the relationship between corporate governance and ownership structure with earnings management in the oil industry.

Secondly, the European Countries offer the opportunity to study the effect of ownership structures and governance variables across different governance systems (one-tier versus two-tier systems).

Thirdly, the widespread presence of national governments in oil companies marks a significant difference with prior research focused on the U.S. context. In several Countries, national governments are shareholders of big oil firms, being in some cases also the controlling shareholders. The national governments assume in this way a rather ambiguous role, being at the same time the Tax Authority responsible for the excise tax (significantly higher in Europe than in US; EIA, 2011), the Securities Market Authority, the Antitrust Authority and a relevant player in the market (in most cases, the biggest one at a national level). It is therefore very interesting to explore the effect of government ownership on earnings management.

We study the earnings management using quarterly interim results with a panel data methodology. The use of quarterly data ensures a better appreciation of the EM activity in this specific industry rather than a study of the yearly earnings. The frequent oil price fluctuations are usually “transmitted” to the fuel prices and can have therefore sudden impact on the quarterly earnings (Han & Wang, 1998; Byard *et al.*, 2007).

We examine the oil companies with quarterly data available on Compustat, classified under in the Standard Industrial Classification codes 2911 (Petroleum Refining) and 1311 (Exploration and Production), localized in the European Economic Area. Some of these firms are engaged in refining and marketing petroleum products, operating most service stations in Europe.

The findings show non-linear relationships among institutional investors ownership and governmental ownership with the magnitude of earnings management. In both cases, we found a positive association with earnings manipulation within lower levels of ownership and a negative association within higher levels of ownership. This finding suggest that the relationship of ownership structures with earnings management appears to be complex and varying at different levels of ownership.

The findings also show that relevant governance variables, such as the proportion of independent directors, the audit committees size and meeting frequency, contribute to constrain earnings management across different national settings and governance systems.

This study can contribute to the literature in several ways. Firstly, the research provides empirical evidence that key ownership structure and some governance variables impact on earnings management across different national settings and across different governance systems (one-tier vs two-tier settings). Secondly, the study shows that several types of ownership structures (institutional investors and governmental shareholding) have non-linear associations with earnings management, that is the impact of ownership structures changes according to the level of shareholding. Although not significant in this study, the directors' shareholding also appear to have a non-linear relationship with earnings management. Thirdly, the study provides evidence about the impact of governmental ownership on earnings management in a key industry of the economy. Finally, this paper could suggest the case for future researches on earnings management and corporate governance at an industry level.

## **2. Literature review& hypothesis development**

Academic literature extensively studied earnings management in response to incentives to achieve specific objectives (Cornett et al. 2009). Examples are given by the “window dressing” activity prior to IPOs, the attempt to increase the executives' compensation, the violation of lending contracts, the attempt to reduce regulatory or political costs (Healy and Wahlen, 1999; Bergstresser and Philippon, 2006; Cheng and Warfield, 2005).

In recent years academic research is increasingly focusing on the relationship between corporate governance and earnings management. Using the theoretical framework provided by agency theory, literature studied whether relevant governance control

devices, such as the independent directors or the audit committee, are effective in reducing the opportunistic earnings management (Klein, 2002; Xie *et al.*, 2003; Cornett *et al.* 2008; Jaggi *et al.*, 2009). This stream of research also studied the effect of ownership structures on earnings management, considering i.e. insider ownership (Warfield *et al.*, 1995; Koh, 2003) or institutional ownership (Rajgopal *et al.*, 2002; Koh, 2003; Cornett *et al.*, 2008; Siregar & Utama, 2008). Others also focused on key features of the investigated setting, such as the studies on Eastern Asian Countries regarding the effect of family ownership on earnings management (Jaggi *et al.*, 2009; Siregar & Utama, 2008).

The majority of these studies used national samples comprising companies included in different industries, e.g. the S&P 500 used by Xie *et al.* (2003) and Klein (2002), comprehensive samples of firms listed on a stock exchange, such as the Jakarta Stock Exchange in Siregar & Utama (2008), the Australian Stock Exchange in Koh (2003), the Hong Kong firms studied by Jaggi *et al.* (2009).

In a departure from prior research, we focus on a specific industry and consider an international setting. We study the oil industry in the European Economic Area, that is the UE Countries plus Switzerland, Norway, Iceland and Liechtenstein. All the listed companies in this area apply IAS/IFRS since the 2005. This allows an international comparison of earnings management practices in the same accounting environment, but with different ownership structures and governance practices.

We develop two set of hypotheses about the impact of ownership structure and corporate governance on earnings management.

### *Ownership structures*

Academic literature provides arguments supporting opposite views on the impact of institutional investors' ownership on the level of discretionary accruals (see also the thorough discussion included in Koh, 2003). According to the first view, the institutional investors are considered intrinsically short-term oriented and transient, as they focus on current rather than long-term earnings in determining the stock prices (Bushee, 1998; Porter, 1992; Koh, 2003). The incentive to "short-termism" is given either by the need to reduce monitoring costs (Porter, 1992) or by the time gap between long-term performance assessment and fast investment portfolio decisions (Black and Coffee 1994; Stapledon, 1996).

Academic literature provides evidence that the excessive focus on current earnings by such institutional investors creates incentives for firm managers to manage earnings (Graves and Waddock, 1990; Porter, 1992; Koh, 2003). Other researchers found that managers aggressively manage earnings, especially to avoid decreases or losses, when the market rewards earnings growth (Barth *et al.*, 1999) or when there are established patterns of positive earnings (Burgstahler and Dichev, 1997).

An opposite view on institutional ownership argues that large institutional investors can have incentives to limit earnings management. Large investors ownership makes option

exits more expensive, given the significant discounts related to large share sales (Black and Coffee, 1994). Such institutional ownership also creates incentives for investors to be more informed and to exercise stricter control over the firms performance (Pound, 1992; Koh, 2003). Prior empirical research found evidence supporting this view. Bushee (1998) found that institutional ownership reduces managerial incentives to manage earnings upwards through R & D activities. Similarly, active outside blockholders are found to mitigate aggressive earnings management (Dechow *et al.*, 1996; Park & Shin, 2004).

We develop two alternative hypotheses. We hypothesize that institutional investors are positively associated to the magnitude of earnings management (“short-term orientation” hypothesis). Alternatively, we hypothesize that long-term oriented institutional ownership is negatively associated with the magnitude of earnings management (“long-term orientation” hypothesis).

*HP1a: there is a positive association between institutional ownership and the level of earnings management*

*HP1b: there is a negative association between institutional ownership and the level of earnings management*

Academic literature provides alternative views on the impact of managerial ownership on earnings management. One view is that higher insider ownership contributes to align the interests of shareholders and managers (Jensen & Meckling, 1976; Fama & Jensen, 1983), substantially reducing the benefits of opportunistic earnings management for directors/shareholders. Consistently with this view, Warfield *et al.* (1995) found a negative relation between directors’ shareholding and the absolute value of abnormal accruals. An opposite perspective suggests that greater insider ownership can result in entrenchment by directors/shareholders and lack of market discipline (Gabrielsen, 2002; Cornett *et al.*, 2008). Managerial entrenchment would result in opportunistic behavior detrimental to the other shareholders’ interests. This could include opportunistic earnings management (Gabrielsen, 2002; Cornett *et al.*, 2008). Prior research found evidence that directors’ shareholding is associated to greater earnings management magnitude (Sanchez-Ballesta & Garcia-Meca, 2007; Cornett *et al.*, 2008). We develop a set of two alternative hypotheses on the relationship between managerial ownership and the level of discretionary accruals.

*HP2a: there is a positive association between managerial ownership and the level of earnings management*

*HP2b: there is a negative association between managerial ownership and the level of earnings management*

Prior research studied earnings management in U.S. oil companies in response to the political costs-increasing events, such as the Gulf War or the hurricanes Katrina and Rita (Han & Wang, 1998; Byard *et al.*, 2007). These events produced sudden increases

in the oil-based product prices (especially the fuel price), making the oil companies subject to tightened political scrutiny, with risk of potential adverse political actions, such as antitrust, regulation, government subsidies cut, increased taxes (Watts and Zimmerman, 1986). These researchers found evidence of downward earnings manipulation in periods of increased political costs.

In our paper, we study the impact of government shareholding on the level of discretionary accruals. The management of companies controlled by government or in which governments are key shareholders could be less sensitive to political costs. This should happen especially where the biggest national oil company is government-controlled. We expect a negative relationship between government and the magnitude of earnings management.

*HP3: there is a negative association between governmental ownership and the level of earnings management*

#### *Governance*

There is a considerable literature on the monitoring role played by independent directors in the board (Fama & Jensen, 1983; Leftwich *et al.*, 1981; Carcello *et al.*, 2002). The competition in the outside control experts market suggests that independent directors may have incentive to constrain earnings management, by exercising their monitoring role (Fama & Jensen, 1983). Consistently with this view, prior research on U.S. and U.K. samples found evidence that higher proportions of independent directors in the board are effective in constraining earnings management and reducing the likelihood of frauds (Dechow *et al.*, 1996; Beasley, 1996; Peasnell *et al.*, 2005; Cornett *et al.*, 2008). Other researches did not find such type of evidence across different national settings (Garcia-Osma & Gil-de-Albornoz Noguera, 2007; Bradbury *et al.*, 2006; Kim & Yoon, 2008; Park & Shin, 2004).

These investigations were conducted considering both the proportion of independent in the board of directors in one-tier governance systems (e.g. Park & Shin, 2004) and in the supervisory boards in two-tier systems (Bradbury *et al.*, 2006; Siregar & Utama, 2008). We hypothesize that the proportion of independent directors either in the boards or in the supervisory boards is negatively associated with the magnitude of earnings management.

*HP4: there is a negative association between the proportion of directors in the board of directors/supervisory board and the level of earnings management*

CEO duality signals the absence of separation between decision control and decision management (Fama and Jensen, 1983; Finkelstein and D'Aveni, 1994; Lipton and Lorsch, 1992). Duality allows the CEO to effectively control information available to other board members, thus possibly impeding effective monitoring (Jensen, 1993). Whilst CEO duality is common in the U.S. (Cornett *et al.*, 2008), it is less widespread in Europe (Allegrini & Greco, 2011).

Dechow *et al.* (1996) found that firms manipulating earnings are more likely to have CEOs serving also as Chairman of the Board. Other studies did not find a significant negative association between CEO duality and the magnitude of earnings management (Bradbury *et al.*, 2006; Cornett *et al.*, 2008).

If CEO duality limit monitoring by the board of directors, we can expected a greater use of discretionary accruals. We therefore hypothesize that CEO duality is associated to a higher magnitude of discretionary accruals.

*HP5: there is a positive association between CEO duality and the level of earnings management*

Academic literature provided empirical evidence of several benefits to shareholders associated with the presence and the activity of audit committees, such as enhanced level of oversight on the financial reporting process (Carcello *et al.*, 2002); greater transparency about the executive compensation practices (Laksmana, 2008); higher likelihood of making earnings forecasts (Karamanou and Vafeas, 2005).

Drawing from these studies, we expect that the presence, size and level of activity by audit committees contribute to constrain earnings management. The audit committees' size can influence the amount of workload they can deliver, especially in large and complex firms (Karamanou and Vafeas, 2005). Meeting frequency can be considered as a proxy for the time directors have to perform their duties and for the level of monitoring activity delivered (Carcello *et al.*, 2002; Laksmana, 2008; Greco, 2011).

We hypothesize that the presence of an audit committee, its size and meeting frequency are negatively associated with the magnitude of earnings management.

*HP6: there is a negative association between the presence of an audit committee and the level of earnings management*

*HP6b: there is a negative association between the audit committee size and the level of earnings management*

*HP6c: there is a negative association between the audit committee meeting frequency and the level of earnings management*

### **3. Research methodology**

#### *3.1 Sample*

We extracted from the Compustat database all the companies classified in the SIC Codes 2911 (petroleum refining firms) and 1311 (crude petroleum & natural gas), located in the European Economic Area, with interim results available in the period 2006-2010 and fiscal year ending the 31<sup>st</sup> December. We considered all the quarters from march 2006 (Q1 2006) to December 2010 (Q4 2010), discarding the quarters of the transition year 2005.



We found 22 companies for the SIC Code 2911 (Han & Wang, 1998 and Byard *et al.*, 2007, found 29 firms in the US 2911 Sic Code). We discarded one company with multiple missing balance sheet data. We found 26 companies for the SIC Code 1311<sup>1</sup>. We discarded 6 companies reporting zero sales for one or more quarters in 2005. The 1311 companies drill wells and build infrastructures in the first year of life (or years in some cases), reporting only costs in their income statements. Afterwards, these firms start ordinary production activity, selling crude petroleum. We therefore included in our sample 20 companies in the SIC Code 1311 with ordinary production activity started prior to the 2005.

Our final sample is composed by 820 firm-quarters observations (41 firms and 20 quarters).

The data on corporate governance and ownership structures were hand collected from the companies websites, annual reports and governance reports. Given the short term constancy of the governance and the ownership structure variables, we used the data from the 2007 reports (usually issued in march-april 2008) for the quarters from Q1 2006 to Q2 2008. We used the data from the 2009 reports (usually issued in march-april 2010) for the period Q2 2008 – Q4 2010.

### *3.2 Earnings management measurement*

We analyze two accruals measures: total accruals and working capital accruals. Total accruals are computed as the sum of the changes in inventory, account receivables and other current assets, minus the changes in account payables and other current liabilities, minus the depreciation and amortization expense (Jones, 1991; Dechow, 1995)<sup>2</sup>. To measure the working capital accruals, the depreciation and amortization expense is excluded from the computation used for the total accruals (DeFond&Jiambalvo, 1994).

We used two models of earnings management. The first model (Model 1) is based on the Jones (1991) model. The second test is based on the DeFond & Jiambalvo (1994) modification of the Jones (1991) model to consider only working capital accrual. We estimated the discretionary accruals as the absolute value of the residuals from the

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<sup>1</sup> A number of companies classified in this code applied IAS/IFRS from the 2007, year of listing on the UK AIM.

<sup>2</sup> It was impossible to calculate total accruals as the difference between net income and operating cash flows, because the operating cash flow data in Compustat were not quarterly, but cumulative at the end of quarter *n* for the majority of the observations.

following models (widely used in prior research, e.g. Warfield *et al.*, 1995; Klein, 2002; Bowen *et al.*, 2008)<sup>3</sup>.

Model (1)

$$TTAC_{it}/TA_{i,t-1} = \alpha(1/TA_{i,t-1}) + \beta_1(\Delta REV_{it}/TA_{i,t-1}) + \beta_2(PPE_{it}/TA_{i,t-1}) + \varepsilon_{it}$$

Model (2)

$$WCA_{it}/TA_{i,t-1} = \alpha (1/TA_{i,t-1}) + \beta_1(\Delta REV_{it}/TA_{i,t-1}) + \varepsilon_{it}$$

where:  $TTAC_{it}$  = total accruals for firm  $i$  in quarter  $t$ ;  $WCA_{it}$  = working capital accruals for firm  $i$  in quarter  $t$ ;  $TA_{i,t-1}$  = total assets for firm  $i$  in quarter  $t - 1$ ;  $\Delta REV_{it}$  = change in revenues for firm  $i$  in quarter  $t$ ;  $PPE_{it}$  = net property, plant and equipment for firm  $i$  in quarter  $t$ ;  $\varepsilon_{it}$  = error term for firm  $i$  in quarter  $t$ ;

The usage of quarterly data in longitudinal panel data analysis can potentially produce serial autocorrelation in the residuals, thus making the least square estimates inefficient. We checked the presence of serial autocorrelation in the estimation of discretionary accruals using the Woolridge (2002) test for serial autocorrelation<sup>4</sup>. For model 1, the F test statistic is  $F(1,40) = 1.553$ , with  $p$ -value 0.2199; for model 2 the F statistic is  $F(1, 40) = 1.417$ , with  $p$ -value 0.2409. The non-significant test statistics indicate the absence of serial autocorrelation of the residuals. The Hausman test showed that the GSL random effects model properly fitted our panel data.

### 3.3 Models for the impact of ownership structures and corporate governance on earnings management

To test our hypotheses, we regressed the estimated discretionary total accruals and the estimated discretionary working capital accruals on independent variables, proxies for ownership and corporate governance structures. We included independent variables to test our hypotheses as well as variables to control for possible non-linear relationships among ownership structures and earnings management. Following prior research (Koh, 2003; Utama & Cready, 1997; Sanchez-Ballesta & Garcia-Meca, 2007), we included the

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<sup>3</sup> The absolute value is also used given the different earnings management incentives related to the ownership structure and governance variables, that could be income increasing or decreasing depending on the variable considered (Klein, 2002).

<sup>4</sup> We used the xtserial Stata programme, written by Drukker (2003).

square of the institutional investors/governmental/directors proportion of ordinary shares. We also included as control variables the firm profitability and the size.

Model (3)

$$EM1_{it} = \beta_0 + \beta_1 GOVSHARE_{it} + \beta_2 INVSHARE_{it} + \beta_3 DIRSHARE_{it} + \beta_4 IND_{it} + \beta_5 CEOCH_{it} + \beta_6 AC_{it} + \beta_7 ACSIZE_{it} + \beta_8 ACMEET_{it} + \beta_9 INVSHARESQ_{it} + \beta_{10} DIRSHARESQ_{it} + \beta_{11} GOVSHARESQ_{it} + \beta_{11} ROA_{it} + \beta_{12} SIZE_{it} + \varepsilon_{it}$$

Model (4)

$$EM2_{it} = \beta_0 + \beta_1 GOVSHARE_{it} + \beta_2 INVSHARE_{it} + \beta_3 DIRSHARE_{it} + \beta_4 IND_{it} + \beta_5 CEOCH_{it} + \beta_6 AC_{it} + \beta_7 ACSIZE_{it} + \beta_8 ACMEET_{it} + \beta_9 INVSHARESQ_{it} + \beta_{10} DIRSHARESQ_{it} + \beta_{11} GOVSHARESQ_{it} + \beta_{11} ROA_{it} + \beta_{12} SIZE_{it} + \varepsilon_{it}$$

Where:  $EM1_{it}$  = the absolute value of discretionary total accruals,  $EM2_{it}$  is the absolute value of discretionary working capital accruals,  $GOVSHARE_{it}$  = the percentage of ordinary shares owned by the National government or by governmental agencies,  $INVSHARE_{it}$  = percentage of ordinary shares owned by institutional investors,  $DIRSHARE_{it}$  = percentage of ordinary shares owned by the firm's directors,  $IND_{it}$  = proportion of independent directors in the board/supervisory board,  $CEOCH_{it}$  = dummy variables, 1 if the CEO is also the Chairman of the board, 0 otherwise (the dummy is always 0 in two-tier systems),  $AC_{it}$  = dummy variable, 1 if there is an audit committee, 0 otherwise,  $ACSIZE_{it}$  = audit committee size measured by the number of directors in the AC,  $ACMEET_{it}$  = audit committee meeting frequency measured by the yearly number of meeting held by the audit committee,  $INVSHARESQ_{it}$  = square of the percentage of ordinary shares owned by institutional investors,  $GOVSHARESQ_{it}$  = square of the percentage of ordinary shares owned by the National government or by governmental agencies,  $DIRSHARESQ_{it}$  = square of the percentage of ordinary shares owned by the firm's directors,  $ROA_{it}$  = return on assets for firm  $i$  in quarter  $t$ ,  $SIZE_{it}$  = natural logarithm of total assets for firm  $i$  in quarter  $t$ ,

Using the Woolridge (2002) test, we detected serial autocorrelation in Model 3 and 4. For Model 3 the F statistic is  $F(1,40)=22.406$ , with  $p$ -value 0.000, for Model 4, the F statistic is  $F(1,40)=23.144$ , with  $p$ -value 0.000. We therefore fitted the models with feasible generalized least square model (FGLS). The FGLS obtains efficient least

square estimates in presence of autocorrelation and heteroskedasticity in the disturbances (Greene, 2002; Gujarati, 2004)<sup>5</sup>.

#### 4. Empirical results

##### 4.1 Descriptive statistics

Table 1 reports the descriptive statistics of our sample for year 2007. As abovementioned, there are not substantial changes in ownership and governance structure values throughout the period considered (2006-2010). The statistics show that the average sample companies size is high, about 6,5 billions € in sales and about 19 billions € in assets. There are however differences between the petroleum refining firms and the crude oil & natural gas firms, with the first group being on average bigger than the second group. We found governmental ownership in the 22% of the sample, institutional investors ownership in the 82% of the sample companies and directors' shareholding in the 68% of the sample companies. The institutional investors' shareholding is widespread with an average the 21,69% of the ordinary shares. Directors' shareholding is usually limited, but in some cases we have companies in which large shareholders also sit in the board.

===== TABLE 1 ABOUT HERE =====

##### 4.2 Multivariate analysis

Table 2 reports the results of the FGLS regression of the impact of ownership structures and governance variables. The results show a non-linear association between institutional investors ownership and the magnitude of earnings management. The institutional investors ownership (INVSHARE) has a positive and significant coefficient ( $p$ -value  $<0.00$  in both Model 3 and 4), whilst its quadratic term (INVSHARESQ) has a negative and significant coefficient ( $p$ -value  $<0.05$  in both Model 3 and 4). The relationship between institutional investors shareholding appears to have the shape of an inverse U, that is a concave relation (Koh, 2003; Utama & Cready, 1997; Sanchez-Ballesta & Garcia-Meca, 2007). This result suggests that the hypotheses formulated HP1a and HP1b are not mutually exclusive, but can be related to different levels of institutional investors ownership. A positive association between institutional ownership

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<sup>5</sup> In short, the FGLS procedure transforms the data taking into account the autocorrelation structure and the heteroskedasticity. The GLS on the transformed data satisfies the standard least-square assumptions. It is called feasible because the autocorrelation coefficient is unknown and estimated in the procedure (Gujarati, 2004). We used the `xtgls` command with Stata, allowing for panel-specific AR1 autocorrelation structure and for heteroskedasticity.

and the magnitude of earnings manipulation is observed within lower levels of institutional ownership, consistently with the short-term orientation view of institutional investors. A negative association is found at higher levels of institutional ownership, consistently with the long-term orientation view of institutional investors. These findings are consistent with the idea that investors are not to be considered as an homogeneous group (Utama & Cready, 1997; Koh, 2003). With low shareholding, investors interested in short-term returns could incentive earnings manipulation. By contrast, large long-term oriented investors are likely to play a strengthened monitoring role on the firm financial performance, constraining earnings management practices.

Interestingly, the governmental shareholding also seems to have a non-linear relationship with earnings management. The correlation coefficient of governmental ownership (GOVSHARE) is positive and significant ( $p$ -value  $<0.00$  in both Model 3 and 4). The correlation coefficient of the square of governmental ownership (GOVSHARESQ) is negative and significant ( $p$ -value  $<0.00$  in both Model 3 and 4). These results provides partial support for HP3. The positive significant relationship between governmental shareholding and the magnitude of earnings management reverses for higher levels of governmental ownership. The effect of governmental shareholding may thus vary according to the level of ownership.

We can interpret the findings in the perspective of the political costs hypothesis. Prior literature found that oil companies reported earnings are politically sensible, especially when related to strikingly high consumer product prices, that is fuel prices (Han&Wang, 1998; Byard *et al.*, 2007). In firms where the government is the controlling shareholders or a large blockholder, managers have probably no incentives in earnings manipulation aimed at avoiding political scrutiny. By contrast, the threat of tighter scrutiny by governments or governmental agencies with limited shareholdings might create incentive to earnings manipulation for managers<sup>6</sup>

We did not find a significant relationship between directors ownership and earnings manipulation. There is therefore no support HP3a or HP3b. However, we can observe that the coefficient of the association between directors shareholding (DIRSHARE) with earnings management is negative. The sign of the coefficient reverses for the quadratic term (DIRSHARESQ). This is consistent with prior findings suggesting that insider ownership contributes to constrain earnings manipulation when the proportion of shares owned by directors is not too high. By contrast, large insider shareholders can be entrenched and more prone to opportunistic earnings management detrimental to other shareholders (Sanchez-Ballesta & Garcia-Meca, 2007).

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<sup>6</sup> We are unable to broadly estimate the maximization point (the "turning point") of the concave relationships among institutional investors ownership and governmental ownership with earnings management. The coefficients obtained running a FGLS do not have the same meaning as those estimated with the regular OLS, used by Koh (2003) or by Utama and Cready (1997) to estimate the "turning point" of concave relations. From a non-technical point of view, looking at the mean values of EM per range of institutional investors/government ownership, the maximization point could lay somewhere between the 30% and the 40% proportion of ordinary shares.

===== TABLE 2 ABOUT HERE =====

The empirical findings also show that the proportion of independent directors in the board of directors/supervisory board (IND) has a negative association with the magnitude of earnings management ( $p$ -value  $< 0.05$  in both Model 3 and 4). This finding supports HP4 and is consistent with the view that the increased presence of outside independent directors contributes to constrain the level of discretionary accruals. The absence of separation of roles between CEO and Chairman of the board (CEOCH) appears to be positively associated with the magnitude of discretionary accruals ( $p$ -value  $< 0.05$  in both Model 3 and 4), supporting HP5. The concentration of power at the board's top appears to limit the board monitoring activity, thus allowing a higher level of discretionary accruals.

The presence of an audit committee (AC) does not appear to be *per se* related to the earnings management. There is therefore no support for HP6a. We found that the audit committee size (ACSIZE) is negatively associated to the magnitude of earnings manipulation ( $p$ -value  $< 0.00$  in both Model 3 and 4). This result support HP6b. Larger audit committees (with 4 or 5 members, against an average of 3) are probably better able to cope with the workload of large and complex companies, such as the oil firms. We found limited support for HP6c. The audit committee meeting frequency (ACMEET) is negatively associated with the level of total discretionary accruals with a  $p$ -value  $< 0.10$  and with the level of working capital discretionary accruals with a  $p$ -value  $< 0.05$ ). Overall, active audit committees may be effective in constraining earnings management (Xie *et al.*, 2003). Frequent meetings during the year could be effective in limiting working capital discretionary accruals, especially in quarterly time frames.

#### 4.3 Sensitivity analysis

We checked whether our results are robust to alternative measures of earnings management used in prior studies on the oil industry (Han&Wang, 1998; Byard *et al.*, 2007). We used two models based on the work of Han & Wang (1998), considering both total accruals and working capital accruals (Models 5 and 6). The Woolridge's test for autocorrelation is near the significance but it is not significant. For model 5, the F-statistic is  $F(1, 40) = 2.666$ , with  $p$ -value = 0.1103; for model 6, the F-statistic is  $F(1, 40) = 2.430$ , with  $p$ -value 0.1269. The Hausman test suggested the use of a GLS random effects model to fit the data. Discretionary accruals were estimated as the absolute value of the residuals from the models (5) and (6).

Model (5)

$$\begin{aligned} \text{TTAC}_{it}/\text{TA}_{i,t-1} = & \alpha(1/\text{TA}_{i,t-1}) + \beta_1(\Delta\text{REV}_{it}/\text{TA}_{i,t-1}) + \beta_2(\text{PPE}_{it}/\text{TA}_{i,t-1}) \\ & + \beta_3D_1 + \beta_4D_2 + \beta_5D_3 + \beta_6Y_{06} + \beta_7Y_{07} + \beta_8Y_{08} + \beta_9Y_{09} + \varepsilon_{it} \end{aligned}$$

Model (6)

$$\begin{aligned} \text{WCA}_{it}/\text{TA}_{i,t-1} = & \alpha(1/\text{TA}_{i,t-1}) + \beta_1(\Delta\text{REV}_{it}/\text{TA}_{i,t-1}) + \beta_2D_1 + \beta_3D_2 + \beta_4D_3 \\ & + \beta_5Y_{06} + \beta_6Y_{07} + \beta_7Y_{08} + \beta_8Y_{09} + \varepsilon_{it} \end{aligned}$$

where:  $\text{TTAC}_{it}$  = total accruals for firm  $i$  in quarter  $t$ ;  $\text{WCA}_{it}$  = working capital accruals for firm  $i$  in quarter  $t$ ;  $\text{TA}_{i,t-1}$  = total assets for firm  $i$  in quarter  $t - 1$ ;  $\Delta\text{REV}_{it}$  = change in revenues for firm  $i$  in quarter  $t$ ;  $\text{PPE}_{it}$  = net property, plant and equipment for firm  $i$  in quarter  $t$ ;  $D_t$  is a quarter indicator dummy variable with 1 for the quarter  $t$  ( $t = 1,2,3$ ) and 0 otherwise,  $Y_t$  is a year indicator dummy variable with 1 for the year  $t$  ( $t = 2006, \dots, 2009$ ) and 0 otherwise,  $\varepsilon_{it}$  = error term for firm  $i$  in quarter  $t$ ;

The estimated discretionary accruals were used as dependent variables in regression with the same independent variables previously used. We detected serial autocorrelation in both cases. For this reason, we used again an FGLS model, allowing for AR1 autocorrelation structure and heteroskedasticity. The results are displayed in Table 3.

We re-run the models 3,4,7 and 8 using an OLS regression with Newey-West standard errors. In the Newey-West regression the error term is assumed to be heteroskedastic and autocorrelated up to some lag (Gujarati, 2004). We obtained consistent results (not reported)<sup>7</sup>.

Overall, we checked how the empirical results are robust to alternative measures of earnings management and to alternative methods of treating autocorrelation and heteroskedasticity in least square estimates.

===== TABLE 3 ABOUT HERE =====

## 5. Conclusions

This paper investigates the impact of ownership structures and corporate governance on earnings management in the European oil industry. Overall, the findings show that ownership structure variables (institutional investors shareholdings and governmental

<sup>7</sup> We used the *newey* stata command and considered an AR1 autocorrelation structure (1 lag).

shareholdings) and corporate governance variables (the independent directors and the audit committee size and meeting frequency) are significantly associated to the magnitude of earnings manipulation across different national settings and across different governance systems.

We found a non-linear inverse U shaped relationship between institutional investors ownership and earnings management. These findings are consistent with the view that institutional investors are not a homogeneous group. Institutional investors shareholding shows a positive association with earnings manipulation for lower levels of ownership, consistently the transient view of institutional investors, mostly interested in short-term returns. For higher levels of shareholding, the association reverses and is negative, consistently with the long-term orientation view of institutional investors, playing a monitoring role over the company's financial performance.

A non-linear relationship is also found between governmental ownership and earnings management. The positive relationship found at lower levels of ownership reverses for higher levels of ownership. We understand these findings in the perspective of the political costs hypothesis. Oil companies reported earnings undergo political scrutiny, especially when increases in earnings are associated with fuel price and other consumer products increases. We found a positive relationship between governmental shareholding and the magnitude of earnings management for lower levels of ownership. This could be consistent with the idea that the threat of tighter scrutiny by governments or governmental agencies might create incentive for earnings manipulation for the management. A negative association between governmental ownership and the magnitude of earnings manipulation is observed within higher levels of ownership. Managers have probably no incentives in earnings manipulation aimed at avoiding political scrutiny in firms where the government is the controlling shareholders or a large blockholder.

We also found that the proportion of independent directors either in the board of directors or in the supervisory board, the audit committee size and the audit committee meeting frequency are negatively associated with earnings management. Regardless of the governance national systems, these governance control devices appear to be effective in constraining earnings management. The findings also show that the concentration of power at the board's top in one-tier systems is positively associated with the magnitude of earnings management.

This study can contribute to the literature in several ways.

Firstly, the research provides evidence of the impact of key ownership structure and governance variables on earnings management across different national settings and across different governance systems (one-tier vs two-tier settings). Secondly, the study shows that several types of ownership structures (institutional investors and governmental shareholding) have non-linear associations with earnings management,



that is the impact of ownership structures changes according to the level of shareholding, making the relationship more complex. Thirdly, the study provides evidence about the impact of governmental ownership on earnings management in a key industry of the economy. Finally, this paper could suggest the case for future researches on earnings management and corporate governance at an industry level.

This study also could have some practical implications. Firstly, the findings show that also firms where governments are shareholders engage in earnings management practices. Accountability and stricter control could be two issues for such type of firms. Secondly, the results suggest that an increased presence of institutional investors may be an effective monitoring device over earnings manipulation. Higher participation of this subjects in the ownership and in the governance may be beneficial. Finally, the results about the impact of governance variables on earnings management show that there is a significant level of homogeneity despite the differences in the national governance systems. This means that governance practices could be more integrated at a European level than the national governance models and codes' recommendations actually are.

Future research could try to understand if and how the “timing” of increases and decreases in the consumer product prices, following oil price fluctuations, is used as an earnings management tool. Future research could also make an international comparison with US and emerging Countries oil companies.

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Table 1 – Descriptive statistics ( <i>n</i> = 41)					
	Mean	Median	Std Dev	10% Percentile	90% Percentile
Revenues in €/000	6.495, 08	241,7	15.285,83	12,73	18.375,43
Assets in €/000	18.916,07	2.117,88	43.440,79	230,03	60.868,27
GOVSHARE	8,93	0,00	19,07	0,00	35,50
INVSHARE	21,69	18,47	17,12	0,00	40,27
DIRSHARE	9,43	0,01	19,65	0,00	32,80
IND	4,20	4,00	2,75	0,00	8,00
ACSIZE	3,05	3,00	1,83	0,00	5,00
ACMEET	4,00	3,00	3,65	0,00	7,00
Dummy variables	Yes (=1)	No (=0)			
CEOCH	20%	80%			
AC	83%	17%			

Table 2 – Feasible generalized least square (FGLS) regression ( $n = 820$ )

	Hypothesis	Expected sign	Model 3 Dependent variable: EM1		Model 4 Dependent variable: EM2	
			Coefficient	z- stat	Coefficient	z- stat
INVSHARE	HP1a / HP1b	+ / -	0,00073***	3,35	0,00083***	3,67
DIRSHARE	HP2a /HP2b	+ / -	-0,00006	-0,22	-0,00012	-0,42
GOVSHARE	HP3	-	0,00085***	3,77	0,00095***	4,16
IND	HP4	-	-0,00122**	-2,46	-0,00121**	-2,32
CEOCH	HP5	+	0,00715**	2,39	0,0074**	2,44
AC	HP6a	-	-0,00237	-0,73	-0,00294	-0,92
ACSIZE	HP6b	-	-0,00283***	-3,25	-0,00314***	-3,69
ACMEET	HP6c	-	-0,00054*	-1,83	-0,00071**	-2,53
INVSHARESQ			-7,97e-06**	-2,08	-9,87e-06**	-2,56
DIRSHARESQ			5,59e-06	1,27	7,17e-06	1,61
GOVSHARESQ			-0,00001***	-3,09	-0,00001***	-3,32
ROA			-0,04487	-1,29	-0,0509	-1,48
SIZE			0,00096	1,28	0,00171**	2,21
<i>const</i>			0,25008***	4,00	0,01864***	2,97
Wald chi2 (13)			80,81		86,59	
Prob > chi2			0,0000		0,0000	

All  $p$ - values are two-tailed

\*\*\* Coefficient is significant at the 0.01 level (two-tailed)

\*\* Coefficient is significant at the 0.05 level (two-tailed)

\* Coefficient is significant at the 0.10 level (two-tailed)

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Table 3 – Feasible generalized least square (FGLS) regression ( $n = 820$ )

			Model 7 Dependent variable: discretionary total accruals estimated with Han&Wang(1998) model		Model 8 Dependent variable: discretionary working capital accruals estimated with Han&Wang(1998) model	
	Hypothesis	Expected sign	Coefficient	z- stat	Coefficient	z- stat
INVSHARE	HP1a / HP1b	+ / -	0,0006***	3,15	0,0007***	3,41
DIRSHARE	HP2a /HP2b	+ / -	-0,0001	-0,06	-0,0001	-0,36
GOVSHARE	HP3	-	0,0006***	3,06	0,0008***	3,46
IND	HP4	-	-0,0088*	-1,79	-0,0010**	-2,01
CEOCH	HP5	+	0,0083***	2,74	0,0081***	2,63
AC	HP6a	-	-0,0010	-0,30	-0,0016	-0,51
ACSIZE	HP6b	-	-0,0023***	-2,65	-0,0028***	-3,26
ACMEET	Hp6c	-	-0,0054*	-1,87	-0,0071**	-2,56
INVSHARESQ			-8,03-e06**	-2,11	-9,20e-06**	-2,32
DIRSHARESQ			4,59e-06	1,05	6,56e-06	1,47
GOVSHARESQ			-8,60e-06**	-2,44	-0,00001***	-2,73
ROA			-0,0264	-0,77	-0,3428	-1,00
SIZE			0,0005	0,80	0,00156**	2,04
<i>Const</i>			0,0248***	3,97	0,1808***	2,93
Wald chi2 (13)			67,31		75,09	
Prob > chi2			0,0000		0,0000	

All  $p$ - values are two-tailed

\*\*\* Coefficient is significant at the 0.01 level (two-tailed)

\*\* Coefficient is significant at the 0.05 level (two-tailed)

\* Coefficient is significant at the 0.10 level (two-tailed)