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The impact of leverage on accrual-based earnings management : the case of listed French firms

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Abstract: The primary aim of this study is to examine the impact of leverage increases on accrual-based earnings management practices for a sample of French firms indexed in CAC All-Tradable during a period from 2006 to 2012. We use panel data to calculate discretionary accruals and to empirically analyze the effect of firm leverage on the opportunistic behavior of managers. Consistent with debt covenants hypothesis, we find that firm leverage has a positive effect on earnings management for French firms. The empirical results show that leverage increases provide incentives for managers to manipulate earnings.

Keywords : Leverage, earnings management, discretionary accruals, panel data, opportunistic behavior.

1. Introduction

After the recent accounting scandals caused by the bankruptcy of several large international firms, a crisis of confidence regarding the reliability of accounting information and the effectiveness of control mechanisms has occurred. In fact, managers can abuse the trust that is

supposed to exist between firms and their stakeholders by acting on accounting results. Thus, we talk about the earnings management which has become one of the most discussed topics in the accounting literature.

In this study, we are interested in the question of credibility of the financial information posed by the existence of earnings management through discretionary accruals. In fact, earnings management consists of taking advantage of the flexibility provided by accounting principles in order to manage earnings according to the interests of managers.

The Positive Accounting Theory highlighted some basic incentives for earnings management, such as debt covenants, management compensation contracts and political costs. Thus, the link between debt contracts and the opportunistic earnings manipulation indicates a possible relationship between debt policy and earnings management. In this context, several studies have focused on examining this relationship and offers mixed results. On the one hand, some studies show that the leverage is positively associated with earnings management when firms want to reduce the likelihood of debt covenants violation and improve the firm's bargaining during debt negotiation (Defond and Jiambalvo (1994), Iatridis and Kadorinis (2009), Chamberlain et al. (2014)). On the other hand, other studies have found a negative relationship between leverage and earnings management (Rodriguez-Pérez and Van Hemen (2010), Wasimullah et al (2010), Alshairiri and Salama (2011), Zamri et al. (2013), Afza and Rashid (2014), suggesting that managers in leveraged firms may face control from creditors, making it difficult for them to engage in earnings management. These different findings about the relation between leverage and earnings management can be explained by legal system country differences, as indicated in Othman and Zhegal (2006). Consequently, the theoretical debates and the divergence of empirical results explain the complexity and importance of this theme. Additional international evidence may usefully contribute to explaining the differences between countries. Thus, the impact of leverage on earnings management needs more and more investigations.

The objective of this study is to determine whether the nature of the relationship between leverage and earnings management is different in leverage increasing firms and highly leveraged firms or otherwise. Highly leveraged firms are those with a high level of debt at both the beginning and the end of the sample period while the leverage inceasing firms are those with a low leverage at the beginning and a high leverage at the end of the sample

period. Indeed, this research seeks to examine indebtedness in the context of the opportunistic accounting choices of managers.

Our study contributes to the relation between the debt and earnings management debate by presenting evidence for a European code-law country (French), where a different set of arguments is needed to the ones normally employed in the United States (common-law context). This study is the first to compare the impact of leverage changes on the extent of accrual-based earnings management in highly leveraged and leverage increasing firms for the French context.

In this paper, we attempt to test the role of debt in determining earnings management practices through a multivariate analysis of panel data for the French context during the period 2006-2012. In contrast to findings in other studies of common-law countries, mainly the United States, our results show that leverage is positively associated with earnings management. Our findings indicate that leverage increases intensifie earnings management. The results obtained show that French firms that undergo leverage increases are more likely to commit accrual-based earnings management activities. These results contribute to the existing literature and to the ongoing debate over the implications of leverage on earnings management.

The results of this research allow us to provide a direct answer to the question that concerns investors about the credibility of accounting information. These results can help creditors and other stakeholders in deciding whether to lend or invest in the firm by enabling them to establish a precise evaluation of the firm and assess the capacity of its managers to manipulate earnings.

The rest of this article is organized as follows. Section 2 presents the literature review. Section 3 develops testable hypotheses. Section 4 describes our sample and reserach methodology. Section 5 discusses results and the final section presents the conclusion.

2. Literature review

The financial literature presents important empirical studies on the important role of leverage, in aligning the interests of managers with those of shareholders and reducing agency costs caused by the conflict of interest and informational asymmetry. According to the agency theory of Jensen and Meckling (1976) and the free cash flow theory of Jensen (1986), leverage plays a disciplinary role in monitoring discretionary activities of managers and

imposes disciplinary restrictions by reducing their access to the cash flow of firm. Indeed, leverage constitutes a commitment of the firm to use its free cash flow to pay interest plus principal of outstanding debt rather than spend it in investment in non-value maximizing projects. Leverage limits the amount of free cash flow available to managers and reduces the agency costs of free cash flow.

Even though leverage is a way to mitigate agency conflicts between shareholders and managers and to reduce the costs of information asymmetry, however, it gives rise to a problem of divergence of interests between shareholders and bondholders, on the one hand, and bondholders and managers, on the other hand. This new agency conflict obviously generates agency costs, for example the replacement cost asset. Indeed, the problem of moral hazard is associated with the debt contract. Managers can operate in the sense of wealth transfer from bondholders to shareholders, and by investing in high efficiency projects, but also with high risk, or furthermore by altering the funding policy or dividend policy. To face this expropriation of wealth and align the interests of different stackeholders, creditors stipulate in the debt contract, clauses that determine high profitability thresholds, below which the firm would see its debt contract change in terms that are much less favorable. In this case, the interest rate would be highly dependent on the achieved performance during the current year. Generally, these covenants are based on accounting figures and thresholds that managers are required to respect it, under penalty of being sanctioned. Otherwise, their violation can be costly to the firm. Thus, managers are encouraged to behave opportunistically by choosing accounting practices that avoid debt covenants violation. But, if these clauses and agreements that manager must respect, on pain of being penalized, recommend a partial resolution of the problems associated with leverage, on the other side, they represent a great motivation to manage earnings.

Thus, leverage does not appear to hinder the rise of earnings management. However, a high level of leverage still seems related to the cases of earnings management. Several studies have affirmed this idea, without there being provided an explicit demonstration of the nature of the role of debt policy in the context of earnings management.

A large part of the literature on earnings management showed a positive relationship between debt and incentive to manage earnings due to the existence of covenants in the firm's debt contracts. In addition, high leverage is also associated with financial distress (Beneish and Press (1995), Ohlson (1980)), and firms with failed covenants are likely to manage earnings

downwards in order to dramatize situation and to obtain advantageous terms from debt renegotiation contracts. Nevertheless, Watts and Zimmerman (1986) suggested that the managers of highly leveraged firms can artificially increase reported earnings to improve firm's bargaining power during debt negotiation in order to obtain funds at favorable conditions. In accordance to debt covenants hypothesis, Defond and Jiambalvo (1994), Iatridis and Kadorinis (2009), Dyreng et al. (2011), Januarsi et al. (2014), Chamberlain et al. (2014) and Obeidat (2016) found that managers engage in earnings management practices to avoid debt covenants violation.

Kim et al. (2010) found that the level of earnings management is higher in the presence of stricter debt covenants. Moreover, they found that earnings management is higher for borrowers that experienced increases in bankruptcy risk in the previous year.

In addition, Zagers-Mamedova (2009) examined the relationship between leverage increases and real earnings managament in order to determine whether there could be an incentive for managers to manipulate cash flow from operating activities (CFO) through the use of real earnings management, in situations with increasing leverage. He developed his main hypothesis with respect to the effect of leverage increases on real earnings management to influence CFO. The results indicate that in leverage increasing firms, the leverage results in real earnings management, in order to affect CFO, when using the absolute value of long term debt in calculating leverage. In this context, Gombola et al. (2016) showed that highly leveraged firms are more likely to engage in earnings management activities when leverage increases.

Although the previous literature has provided arguments to the positive association between earnings management and leverage, there is some empirical evidence with the opposite view. A review of literature on earnings management highlights that leverage limit earnings management. This result suggests that highly leveraged firms face increased monitoring by bankers and creditors, thus inhibiting the use of discretionary accounting accruals. It can be effective for creditors to engage in monitoring costs in order to assess the real quality of the debtor. Indeed, leverage requires the repayment of debt, thus reducing the available cash flow for non-optimal expenses.

Jelinek (2007) studied the impact of leverage increases on earnings management for firms that undergo leverage increases and a control group of consistently highly leveraged firms. The results suggest that increased leverage is associated with a reduction in earnings management,

and that growth and free cash flow levels are factors influencing this relationship. They suggest that leverage changes and leverage levels have different impacts on earnings management. Moreover, Wasimullah et al. (2010) investigated the impact of leverage on practices of earning management in textile industry of Pakistan. They found that highly leverage firms result in low free cash flow as big portion of cash flow is used in the form of interest expenses and the managers avoid in investing in non-value maximizing projects. Resultantly their prudent approach of avoiding them from investing in non-value maximizing projects acts as control over creating accruals. They found that leverage increases reduce earnings management and thus supports negative relationship between earnings management and firm leverage.

Fung and Goodwin (2013) found a negative relationship between short-term debt and earnings management for the most creditworthy firms, in line with the control hypothesis. They also found that the relationship between short-term debt and discretionary accruals was stronger for the more creditworthy firms than for the less creditworthy firms, which proves that short-term debt lenders provide control of the management.

Rodriguez-Pérez and Van Hemmen (2010) and Alsharairi and Salama (2011) showed that creditors play a crucial role in improving corporate governance and in monitoring the firm, which would increase the credibility of corporate reports and restrict the use of managerial discretion to manipulate earnings.

In addition, Lin and Wan (2013) found that funding advantages of internal capital markets mask solvency problems resulting from higher leverage for firms, which in turn mitigates incentives for earnings management. Zamri et al. (2013) and Esadinia et al. (2014) demonstrated that leverage limits earnings management activities, which in turn, could influence the quality of accounting earnings.

Afza and Rashid (2014) showed that managers of Pakistani firms do not engage in opportunistic earnings management by using income increasing discretionary accruals. The results of their study show that changing maturity structure of debt has different impact on earnings management. In fact, they found that higher short-term debt promote earnings management activities due to less monitoring, whereas, higher long-term debt or total debt reduce earnings management activities due to better monitoring of creditors. In fact, creditors do not reduce their monitoring but they impose more restricted covenants in order to reduce the likelihood of bad debt.

In this context, Vakilifard and Mortazavi (2016) showed that debt has a negative and significant impact on accrual-based earnings management. They found that once financial leverage is increasing, the incentive for accrual-based earnings management is decreasing. They found that financial leverage increasing, the pressure of debt covenants and strict audits limit manager's opportunistic behaviors, which in turn reduces the earnings management activities.

3. Hypothesis development

Several previous studies found that shareholders and managers incur significant costs when they violate debt covenants. Since these covenants are often written in terms of accounting figures, violations costs provide managers strong incentives to engage in earnings management activities that reduce the likelihood of a violation. Thus, we propose to test the following hypothesis:

H1- Leverage is an incentive to earnings management practice.

Moreover, Jelinek (2007), Zagers-Mamedova (2009) and Wasimullah et al. (2010) found that the impact of leverage on earnings management is different in leverage increasing firms and highly leveraged firms. Jelinek (2007) and Wasimullah et al. (2010) concluded that leverage increasing firms create less discretionary accruals to manipulate their earnings. Zagers-Mamedova (2009) demonstrated that real earnings management is higher in leverage increasing firms than in highly leveraged firms. Thus, we propose the following hypothesis:

H2- Firms that undergo leverage increases during the sample period are more likely to use accrual-based earnings management practices.

4. Data and methodology
4.1.Sample selection and data collection

The initial sample cover all the French companies indexed in CAC All-Tradable (ex SBF 250) belonging to different sectors, excluding financial and insurance companies, during the period of seven years from 2006 to 2012. Any missing values and outliers determined in the sample firms were eliminated and, as a result, our sample consists of 185 non financial French companies. The data about relevant variables has been obtained from the annual report and consolidated accounts published by the companies. Accounting and financial information were collected annually from French firms websites.

Then these companies were divided into two groups, leverage increasing companies and highly leveraged companies. This classification of companies is in accordance with that used by Jelinek (2007), Zagers-Mamedova (2009) and Wasimullah et al. (2010).

In fact, a firm is classified as a leverage increasing firm if it is in the first or second quartile of sample leverage distribution, at the beginning of the period, and it moves up to the third or fourth quartile by the end of the sample distribution. Furthermore, a firm is classified as a highly leveraged firm if it is in the third or fourth quartile at both beginning as well as at the end of sample period. Firms, which fall neither in leverage increasing group nor in highly leveraged group, have been eliminated from the sample. After applying above classification criteria, 107 firms have been eliminated. So we are left with only 78 non financial French companies.

4.2.Earnings management measure

Consistent with previous studies, discretionary accruals[1] are used as a proxy of earnings management. Indeed, most studies have calculated discretionary accruals using ordinary-least-squares regression (OLS), taking into account time series data or cross-sectional data. However, panel regression is more accurate when we have time observations for each firm. Hsiao (2005) showed that panel data has several advantages over time-series or cross-sectional data by blending inter-individual differences and intra-individual dynamics.

To check for robustness of our results, we propose to estimate discretionary accruals across four estimation models which capture different aspects of earnings manipulation, i.e. the Hribar and Collins (2002) model, the Kothari et al., (2005) model, the McNichols (2002) model and the Raman and Shahrur (2008) model.

The Hribar and Collins (2002) model which is based on an income-statement, is presented as follows:

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[1] Total accruals are divided into discretionary and non-discretionary accruals. Non-discretionary accruals arise from the normal activity of the firm, while discretionary accruals come from the opportunistic activity of managers. In other words, discretionary accruals are manipulated voluntarily by managers and they are used to detect earnings management.

$$TA_{i,t}/A_{i,t-1} = \alpha_0 (1/A_{i,t-1}) + \alpha_1 (\Delta REV_{i,t}/A_{i,t-1}) + \alpha_2 (PPE_{i,t}/A_{i,t-1}) + u_{i,t} + \varepsilon_{i,t}$$

Where : $TA_{i,t}$ = Total Accruals of the firm i in year t measured as follows

$$TA_{i,t} = Operating\ income_{i,t} - Operative\ cash\ flow_{i,t}$$

$A_{i,t-1}$ = Beginning total assets of firm i in year t

$\Delta REV_{i,t}$ = Change in sales revenues minus change in accounts receivables of firm i in year t

$PPE_{i,t}$ = Property, Plant and Equipment of firm i in year t

$u_{i,t}$ = The fixed-or random-effect component (=0 if we consider an OLS regression)

$\varepsilon_{i,t}$ = denotes unspecified random factors

The standardized residuals of ($u_{i,t} + \varepsilon_{i,t}$) are our primary proxy for discretionary accruals.

Changes in sales revenues are adjusted by changes in credit sales to correct any manipulation of the terms of credit by the managers. All model variables are standardized by lagged total assets (t-1) to reduce the problem of heteroscedasticity.

Kothari et al. (2005) adjusted the Hribar and Collins (2002) model by a performance indicator, i.e. the return on assets (ROA). This model relates the accruals and the return on assets as a measure of corporate performance. Unlike the study of Kothari et al. (2005), we follow the flows approach advocated by Hribar and Collins (2002)[2].

The Kothari et al. (2005) model is presented as follows:

$$TA_{i,t}/A_{i,t-1} = \alpha_0 (1/A_{i,t-1}) + \alpha_1 (\Delta REV_{i,t}/A_{i,t-1}) + \alpha_2 (PPE_{i,t}/A_{i,t-1}) + \alpha_3(ROA_{i,t-1}) + u_{i,t} + \varepsilon_{i,t}$$

$ROA_{i,t-1}$ = Return On Asset, which is the ratio between the net income and total assets at the beginning of period.

In addition, we measure discretionary accruals by using the McNichols (2002) model, which controls for current, t-1 and t+1 operating cash flows, taking into consideration depreciation accruals.

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[2] In practice, the calculation of total accruals is done either by the direct approach (the difference between net income and operating cash flow) or the indirect approach (evaluating each of its components: WCR and reversal of depreciation). We adopt for this study, the direct approach seen its superiority to the indirect approach. Indeed, the ease of application of the direct approach and the quality of its results are already proven by Hribar and Collins (2002).

$$TA_{i,t}/A_{i,t-1} = \alpha_0 \left(1/A_{i,t-1}\right) + \alpha_1 \left(\Delta REV_{i,t}/A_{i,t-1}\right) + \alpha_2 \left(PPE_{i,t}/A_{i,t-1}\right) + \alpha_3(CFO_{i,t}/A_{i,t-1}) + \alpha_4(CFO_{i,t-1}/A_{i,t-2}) + \alpha_5(CFO_{i,t+1}/A_{i,t}) + u_{i,t} + \varepsilon_{i,t}$$

$CFO_{i,t}$ = Operating cash flow of firm i in year t

$CFO_{i,t-1}$ = Operating cash flow of firm i in year t-1

$CFO_{i,t+1}$ = Operating cash flow of firm i in year t+1

Raman and Shahrur (2008) propose a new approach to measure earnings management. They estimate discretionary accruals by using the Jones modified model taking into account performance (Kothari et al., 2005) and growth of the firm. The model Shahrur and Raman (2008) is written as follows:

$$TA_{i,t}/A_{i,t-1} = \alpha_0 \left(1/A_{i,t-1}\right) + \alpha_1 \left(\Delta REV_{i,t}/A_{i,t-1}\right) + \alpha_2 \left(PPE_{i,t}/A_{i,t-1}\right) + \alpha_3(ROA_{i,t-1}) + \alpha_4 BM_{i,t} + u_{i,t} + \varepsilon_{i,t}$$

$BM_{i,t}$ = Ratio of total assets to total assets minus the book value of equity plus the market value of firm i in year t.

As we seek to study the impact of debt on the magnitude of earnings management rather than a particular sense of this practice, we will use the measurement of accruals in absolute value.

4.3. Model and control variables

To test the hypothesis on the nature of the relationship between leverage and absolute value of discretionary accruals as a proxy for earnings management, we estimate panel-regression models, where the different discretionary accruals calculated with each of the four models are used as the dependent variables. The estimated model is:

$$|DAC_{i,t}| = \alpha_1 + \beta_1\,LEV_{i,t} + \beta_2\,LEVINC_{i,t} + \beta_3 ROA_{i,t} + \beta_4 SFR_{i,t} + \beta_5 INTEXP_{i,t} + \mu_{i,t}$$

Where ; μ : The error term

i : indicate firm

t : presents the year of analysis

- **Leverage (LEV)**

We measure leverage by the ratio of long-term debt to total book value of equity. This measure was used by Jelinek (2007) and Wasimullah et al., (2010). The book value of debt has the ability to better explain the indebtness of the company as market value of debt may be inflated due to the share prices.

- **Leverage Increases (LEVINC)**

This is a dummy variable that takes the value of 1 if the firm is classified as a leverage increasing firm and 0 if it is classified as a highly leveraged firm. This variable was used by Jelinek (2007), Zagers-Mamedova (2009) and Wasimullah et al. (2010) to measure the effect of leverage increases during the sample period.

- **Return On Assets (ROA)**

Discretionary accruals may result from past or current performance. Thus, according to Kothari et al. (2005) and Wasimullah et al. (2010), we have used return on assets to control the impact of current performance on the creation of discretionary accruals. Kothari et al. (2005) found a negative relationship between ROA and earnings management. This result indicates that managers of poor performers firms are more motivated to engage in earnings management activities.

This measure of the profitability of the firm's assets is calculated as follows:

$$\text{ROA} = \frac{Net\ income}{Total\ assets}$$

- **The Self-Financing Ratio (SFR)**

This ratio expresses the operating cash flow divided by net investments in fixed assets. In fact, this ratio shows the company's capacity to finance its investments in fixed assets from its own resources. Wasimullah et al. (2010) showed a negative relationship between self-financing ratio and earnings management.

- **Interest Expense (INTEXP)**

We used this measure to control the effect of interest expense. This measure, which was used by Jelinek (2007) and Wasimullah et al. (2010) is calculated as the ratio of interest expense to total debt. A high interest rate can result in a dubious ability of the firm to pay its financial expenses, which decreases its chance to contract new debts. In fact, Jelinek (2007) suggested that leverage increases may lead to an increase in interest payments which in turn results a decrease in net income. Although according to control hypothesis, increases of debt is supposed to reduce earnings management by controlling the opportunistic behavior of managers, but this can lead in higher accruals. For example, in case of high leverage, managers have to meet the expectations of creditors and other stakeholders. To meet their expectations, they might get engaged in different types of earnings management activities.

To control for this, we have used the interest expense ratio, which is calculated as follows:

$$INTEXP = \frac{Interest\ expense}{Total\ debt}$$

5. Results
5.1. Univariate analysis

Table 1 presents the descriptive statistics for discretionary accruals in absolute value, and table 2 presents the descriptive statistics for independent variables.

Table 1- Descriptive statistics for discretionary accruals in absolute value

	Obs	Mean	Std. Dev.	Min	Max
Approach 1: Hribar and Collins (2002) model					
$|DAC_1|$	546	0.0408569	0.0498993	0.0000263	0.5066339
Approach 2: Kothari et al. (2005) model					
$|DAC_2|$	546	0.0408328	0.0499341	6.14e-06	0.5013925
Approach 3 : McNichols (2002) model					
$|DAC_3|$	546	0.0282107	0.0420596	1.60e-06	0.4808871
Approach 4: Raman and Shahrur (2008) model					
$|DAC_4|$	546	0.0408368	0.0499368	0.0000365	0.5016704

The mean of absolute value of discretionary accruals is significantly different from zero, for the four different models of calculating discretionary accruals, which indicates the existence of earnings management in the French firms that tend to conceal their failures and mask their financial situations. This proves that the quality of financial and accounting information is low.

Table 2- Descriptive statistics for independent variables

variable	Obs	Mean	Std. Dev.	Min	Max
LEV	546	0.7380361	0.5691606	0	6.061191
LEVINC	546	0.2179487	0.413231	0	1
ROA	546	0.0301126	0.0524373	-0.2691229	0.4568527
SFR	546	1.910695	2.701044	-5.004484	39.4
INTEXP	546	0.0438085	0.0182926	0	0.1235026

The mean of leverage is 73.80361% and it varies between 0 and (6.061191), which show that the leverage among the French firms in the sample is high. Long term debt seems to be an important source of financing for our sample firms. About 21.79487% of the sample firms are classified as leverage increasing firms. On average our sample are profitable with a mean of ROA of 30.1126%. In addition, the self-financing ratio mean of (191.0695%) suggests that the average firm in our sample have a high capacity to finance its investments in fixed assets from its own resources.The mean cost of debt indicates that on average French firms have an interest expenses of 4.38% of the total debt.

5.2.Multivariate analysis

To achieve the regressions, it is essential to study the correlations between the different variables of the model and test the multicollinearity problem. Thus, we examine, at first, the correlations between the variables used in our empirical analysis. Second, we use VIF (Variance Inflation Factor).

Table 3 reports the Correlation Matrix of the independent variables and the VIF.

Table 3- Correlation Matrix of the Independent Variables and VIF

	LEV	LEVINC	ROA	SFR	INTEXP	VIF
LEV	1.0000					1.11

LEVINC	-0.299*	1.0000				1.14
ROA	-0.0450	-0.0843*	1.0000			1.02
SFR	-0.0300	0.0423	0.0864*	1.0000		1.02
INTEXP	0.0800	-0.1678*	0.0040	0.1092*	1.0000	1.05

We find that the correlation is low between explanatory variables of our model. All the correlation coefficients are less than (0.7), limit traced by Kervin (1992) from which we begin to have a problem of multicollinearity. In addition, for the various explanatory variables, the VIF tests are significantly less than 10, value which is suggested by Myers (1990) as a limit from which the multicollinearity problem is pronounced. Therefore, there is no a multicollinearity problem.

To improve the robustness of our results, we estimate several regressions due to the complexity of panel data regressions. The estimation of the regression coefficients as well as their interpretations comes in the final stage, after applying the econometric tests. The first step is to verify the existence of individual effects in our database. Then, we perform the Hausman test to determine if this effect is fixed or random. In the last step we address the issue of heteroskedasticity and autocorrelation to make any corrections in our model.

In table 4, we present te econometric tests and the results with the regressions of independent variables explained above on each one of the dependent absolute value of discretionnary accruals variables calculated with the four models we have used as earnings-management measures.

Table 4- Regressions of determinants of absolute value of discretionary accruals with different models

$|DAC|$	Hribar and Collins (2002) model	Kothari and al. (2005) model	McNichols (2002) model	Raman and Shahrur (2008) model
Constant	0.0190391**	0.018272**	0.0105083	0.0182145**
	(2.51)	(2.37)	(1.39)	(2.36)
LEV	0.0072876**	0.0074818**	0.0075075**	0.0075145**
	(2.08)	(2.11)	(2.36)	(2.12)
LEVINC	0.0082349***	0.0086342***	0.0047762	0.0086674***
	(2.99)	(2.86)	(1.30)	(2.88)
ROA	0.253846**	0.2572542**	0.126796	0.2576862**
	(2.48)	(2.52)	(1.28)	(2.53)

SFR	-0.0022148**	-0.0021074*	-0.000877	-0.0021066*
	(-2.05)	(-1.93)	(-0.93)	(-1.92)
INTEXP	0.2563953*	0.26107*	0.2049409*	0.2614278*
	(1.69)	(1.73)	(1.76)	(1.73)
Obs.	546	546	546	546
R^2	0.0887	0.0899	0.0407	0.0902
F Statistic	4.09	4.20	2.61	4.21
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Hausman test	7.51	7.57	4.26	7.54
	(0.1112)	(0.1087)	(0.3719)	(0.1101)
BP Lagrange test	135.02	142.16	51.18	142.38
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Modified Wald test	6701.44	6984.21	38566.10	7041.09
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Wooldridge test	2.093	2.145	0.595	2.125
	(0.1521)	(0.1471)	(0.4430)	(0.1490)
Wald Chi2	14.88	14.81	16.29	14.86
Prob>Chi2	0.0109	0.0112	0.0061	0.0110

*significant at the 10% level **significant at the 5% level ***significant at the 1% level

The application of the homogeneity test shows that the null hypothesis of no individual effect is rejected (Prob> F = 0.000 less than 0.05). Therefore, we will move to individual-specific effects model (fixed or random). Based on the Hausman test, we find in the four models that the values (Prob> Chi2) are above 0.05, so we use a random effects model to estimate our regression.

To verify the presence of a randon effect, we apply the Breush Pagan LM test. The results obtained allow us to reject the null hypothesis of the absence of randon effect (Prob> chibar2 = 0.000 <0.05). Then, the random effect is the most appropriate.

To assess heteroskedasticity we apply the modified Wald test. The results of this test indicate the existence of a heteroskedasticity problem since the values obtained (Prob> Chi2 = 0.0000) are less than 5% in all models, which leads us to reject the null hypothesis.

In order to test the autocorrelation of errors, we apply the Wooldridge test. The results obtained lead us to accept the null hypothesis of the absence of autoccorelation of the errors since we find that the values of Prob> F are greater than 5%, in the four models. Thus, we conclude that there is no problem of autocorrelation of errors.

Based on the tests we performed to determine the most appropriate estimation method, we noted a problem of heteroskedasticity that we need to correct. Then, we proceed to the generalized least squares method to correct this heteroskedasticity problem. However, Beck and Katz (1995) have proved that this method overestimates the significance of the coefficients and they have suggested another method which makes it possible to overcome the problem of heteroskedasticity while providing more robust results, i.e. the method of Panel Corrected Standar Erros (PCSE).

The estimated regression gives a positive and significant coefficient at the 5% level of the debt ratio. This finding appears in all models considered, showing the robustness of the analysis. Indeed, the regression of the absolute value of discretionary accruals based on the leverage ratio shows that this ratio affects positively and significantly the practice of earnings management. We conclude, as well, that our first hypothesis is verified for our sample of French companies affirming that the managers of leveraged firms engage in earnings management activities to avoid the violation of debt covenants.

This result supports those of the studies of Zagers-Mamedova (2009), Iatridis and Kadorinis (2009), Dyreng et al. (2011), Chamberlain et al. (2014) which showed that managers of highly leveraged firms choose to use accounting methods in order to artificially increase earnings. In fact, the debt covenants literature suggests that highly leveraged firms have to meet the expectations of investors, therefore, they get engaged in income-increasing discretionary accruals. In other words, the existence of debt covenants encourages managers to manipulate earnings.

To minimize the wealth transfers by shareholders for their own accounts at the expense of creditors, debt contracts include clauses that limit the discretion of managers to make decisions that affect the value of the debt. All these debt covenants are translated by accounting figures that managers must respect them. Otherwise, their violation can be costly to the firm. Thus, managers must choose accounting procedures that avoid debt covenants violation by exploiting the generally accepted accounting principles and the flexibility assigned to them.

We find that the impact of leverage increases on earnings management, is positive and significant at the 1% level, in three of the four models. These findings reveal that earnings management is higher in leverage increasing firms than in highly leverage firms. Thus relationship between leverage and earnings management, measured by the absolute value of

discretionary accruals, is different in two groups of firms, one group, which undergoes leverage increasing process during the sample period, and second group which consistently employs higher leverage at both beginning as well as at the end of sample period. Indeed, these findings show that the effect of leverage levels on earnings management is different between the leverage increasing firms and highly leveraged firms since it is higher for leverage inceasring firms. In other words, the leverage increases have a positive effect on the earnings management practice. Thus we accept our second hypothesis that leverage increasing firms will create comparatively more accruals.

In contrast to findings in Jelinek (2007) and Wasimullah et al. (2010) studies, our results show that French firms that undergo leverage increases in their long-term debt are more likely to commit accrual-based earnings management activities than firms that have a consistently high leverage. This can be explained by the idea that leverage increasing firms are always tending to increase their indebtedness by contracting new debts. Then, the managers of these firms manage earnings to persuade the lenders of the good management, since the lenders place a particular interest on the continuity of the company and its performance, which indicates its capacity to settle its obligations and respect its commitments. Our findings corroborate those of Zagers-Mamedova study (2009), which demonstrated that the impact of leverage changes on earnings management is different in leverage increasing firms and highly leveraged firms. They found that leverage increasing has a positive effect on earnings management.

Moreover, we find that the coefficients of performance are all positive and significant at the 5% level in three of the four models. These results indicate that firm performance encourages the practice of earnings management. These findings show that companies with extreme current performance are engaged in earnings management practices. In fact, firms with extreme performance get engaged in the practice of earnings management to maintain the confidence of the stock market. The results obtained are consistent with those of empirical studies of Kothari et al, (2005) and Wasimullah et al., (2010) which showed that the practices of earnings management are influenced by the past and present performance of the firm when it is good or bad. Moreover, the results obtained confirm those of the study of Chen et al. (2010) who found that profitable companies are engaged in managing earnings downwards. Our results are consistent with Gunny (2010) who found that managers of the most profitable firms use discretionary accruals to signal to the stock market their future performance especially when their compensation will be based on their ability to provide reliable information on future performance of the firm. Indeed, managers use the practice of earnings

management when the firm achieves extreme performance to better reflect the maintenance of good performance. Firms that register good performance, seeking to hide their extreme performance, for reasons relating to the stock market, in particular, increasing the level of analyst expectations and for reserve maintenance considerations for the coming period.

We find that the coefficient of the self-financing ratio is negative (-0.000877) but not significant in the third model. However, for the other three models, we find that the self-financing affects negatively and significantly the earnings management. These results indicate that managers who finance their investments through internal resources and who do not need external resources do not practice earnings management. Thus, we find that high self-financing capacity limits the opportunistic behavior of managers. These findings corroborate the result found by Wasimullah et al. (2010).

Concerning the interest expense variable, we find that the cost of debt has a positive and significant effect at the 10% level on earnings management for the four models of earnings management measures. These results show that interest expense has a positive influence on the practice of earnings management. These findings are in line with those of Jelinek's (2007) study which showed that increase of debt may lead to an increase of interest payments which results an earnings management downward.

6. Conclusion

In this paper, we have empirically investigated the impact of leverage increases on extent of accrual-based earnings management in the French context. We are particularly interested in leverage increasing firms, which have low leverage at the beginning and high leverage at the end of sample period, and highly leveraged firms, which have consistently higher leverage. After an empirical analysis of the impact of leverage on earnings management, we find that leverage has a positive effect on earnings management. Our findings suggest a significantly positive association between the absolute value of discretionary accruals and leverage. The empirical results obtained support the literature of debt covenants, which argues that highly leveraged firms have to meet the expectations of investors, and subsequently, they have engaged in the practice of earnings management. Thus, debt provides the framework for the emergence and rise of earnings management. Indeed, the debt loses its disciplinary role, as recommended in financial theory, to provide the incentives for managers to manipulate earnings. In addition, we found that firms that undergo long-term debt increases during the sample period are more likely to manage their earnings than highly leveraged firms. In other

words, the leverage increases are a source of motivation for accrual-based eanings management.

This research has some limitations. First, we have not measured the opportunistic behavior of managers directly but we just estimated it through the creation of accruals. Second, we have not considered the determinants of managerial discretion (managerial ownership, external directors, audit committee structure). In future research, we can analyze the effect of a firm-specific characteristic on the relation between leverage and earnings management. Moreover, we can differentiate the impact of public and private debts on this relationship between earnings management and leverage focusing on different nature of supervision by public and private debt holders.

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