Empirical evidence about the impact of debts and their cost on real earnings management in Algeria

الأدلة الميدانية حول تأثير الديون وتكلفتها على إدارة الدخل الحقيقي في الجزائر

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Abstract:

This study aims to provide empirical evidence about the impact of debts and their cost on real earnings management in the Algerian companies. The study included 119 firm-year observations for 17 Algerian companies during the period 2012-2018, using the model of abnormal cash flows for Roychowdhury (2006) to measure real earnings management, and a multiple linear regression model to test the hypotheses.

According to the results, debts and their cost do not have any impact on real earnings management in the Algerian companies. These results are inconsistent with the results of most previous studies due to the specificities of economic and institutional Algerian environment, where the debt covenant is prepared in a different manner, when compared with the developed environments.

Keywords: *Financial reporting quality, Real earnings management, Abnormal operating cash flows, Financial leverage, Cost of debts.*

JEL Classification: M41, M48, G32, D81.

ملخص:

تهدف هذه الدراسة إلى تقديم دليل ميداني حول أثر الديون وتكلفتها على إدارة الأرباح الحقيقية في الشركات الجزائرية. حيث شملت الدراسة 119 مشاهدة، تخص 17 شركة خلال الفترة 2012-2018، باستخدام نموذج التدفقات النقدية غير العادية المقترح من طرف Roychowdhury (2006) من أجل قياس إدارة الأرباح الحقيقية، ونموذج الانحدار الخطي المتعدد لاختبار فرضيات الدراسة.

حسب النتائج، فإن الديون وتكلفة الديون ليس لهما أي أثر على إدارة الأرباح الحقيقية في الشركات الجزائرية. وتتعارض هذه النتائج مع نتائج معظم الدراسات السابقة، نظرا لخصوصيات البيئة الاقتصادية والمؤسساتية الجزائرية، حيث يتم إعداد عقود الاستدانة بطريقة مختلفة، مقارنة بالبيئات المتقدمة.

كلمات مفتاحية: *جودة التقرير المالي، إدارة الأرباح الحقيقية، تدفقات نقدية تشغيلية غير عادية، رفع مالي، تكلفة الديون.*

تصنيف JEL: M41، M48، G32، D81.

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1. INTRODUCTION

The quality of financial reporting has become the summit of conceptual framework (IASB, 2018), as its different components have been oriented to reach that summit (Kimouche and Charchafa, 2020, pp. 407-408). In practice, financial reporting quality was taken the interest of managers when selecting and applying accounting policies, auditors when certifying financial statements, users when making decisions. From a stakeholder view, financial reporting quality is not given only the attention of managers, auditors, or users, but it is given also the attention of different parties related to the company when claiming their interests.

During the three last decades, earnings management has been used widely to capture the financial reporting quality (Kimouche and Cherroun, 2020, p. 484), since managers have employed many opportunistic practices to influence the content of financial statements. Earnings management contains many techniques leading to manipulate financial statements, and distort their desired attributes like the value relevance (Kimouche and Rouabhi, 2016a, 2016b; Kimouche, 2016, 2019) and the persistence (Kimouche and Charchafa, 2020). For that, the quality of financial reporting has been negatively affected, leading to change the perception of users, their expectations, and their current assessments for the company's future perspectives.

Earnings management can base on accounting decisions (accrual-based) or operational decisions (real earnings management). For practice perspective, managers prefer accrual-based earnings management, because it is easy to execute since it does not require affecting the cash flows using operational decisions. This is not the case under the efficient market (the weak form at least), the consciousness of users, and the scrutiny of auditors and regulators (Kabir, 2010). Accordingly, managers shift to manipulate financial statements using real earnings management.

A variety of factors were used to explain the shift of managers toward real earnings management. In this context, the increase of debt level has identified as a motivator of scrutiny by auditors and regulators, which encourage managers to manage earnings based on operational decisions. Starting from this idea many studies attempted to empirically test the hypothesis that the most leveraged companies tend to practice real earnings management more than accounting earnings management (Graham et al., 2005; López-Iturriaga and Hoffman, 2005; Jelinek, 2007; Kim and Sohn, 2013; Mlilo et al., 2014; Chen et al., 2015; Huang and Sun, 2017).

1.1. Problem statement

Algeria is a transition country that known deep reforms to shift from socialism to capitalism and integrate into the international economy. Since the 90s, Algeria has introduced many economic and institutional reforms to keep up the new reality. These reforms was imposed an accounting reform to satisfy the needs of users, which require different attributes of financial reporting quality under the new environment. Like other countries, managers of Algerian companies can manage earnings based on operational decisions, especially under the Financial Accounting System adopted since 2010, which might impact negatively the financial reporting quality. Besides that, debtors can be identified as prominent stakeholders in the Algerian companies that give more interest to financial reporting quality. Therefore, this study has concerned by the impact of debt characteristics, including level and cost, on the real earnings management in the Algerian companies through asking the following questions:

- Does financial leverage affects real earnings management in Algerian companies?
- Does the cost of debts affects real earnings management in Algerian companies?

1.2. Hypotheses

Consistent with many previous studies suggesting that leveraged companies tend to use real earnings management, we start from the following hypotheses:

- *Hypothesis*1: financial leverage has a positive effect on real earnings management in the Algerian companies.
- *Hypothesis*2: cost of debts has a positive effect on real earnings management in the Algerian companies.

2. THEORETICAL BACKGROUND

Schipper (1989, p. 92) defined earnings management as the "purposeful intervention in the external financial reporting process with the intent of obtaining some private gain". According to Healy and Wahlen (1999, p.368), "earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers".

These definitions have some commonality; they focus on achieving some private gain that implicit an opportunistic practice (Elkalla, 2017, p. 22). Opportunistic earnings management occurs when managers select accounting choices intentionally to mislead stakeholders about the performance of the company (Healy and Wahlen, 1999). Opportunism in earnings management means that managers seek to mislead the users of financial statements

by providing the target performance in accordance with their expectations, which allows managers to maintain or maximize their benefits.

Despite the negative view accompanied by earnings management, some authors referred to efficient earnings management in the opposite of opportunistic earnings management arguing that earnings management can be useful, as it can potentially improve the informativeness of earnings by conveying private information to the users of financial statements (Jiraporn et al., 2008; Siregar and Utama, 2008). The efficient view of earnings management is consistent with the information perspective, under which earnings management is a means for managers to signal their expectations about the company's future performance and its cash flows.

Since the middle of the 80s, studies about the managerial incentives to manipulate earnings have primarily based on accounting accruals. Beneish (2001) traced an explosive growth in accrual-based earnings management studies since accruals are the principal product of GAAP (Generally Accepted Accounting Principles). Accrual-based earnings management that referred also in the literature as "accounting earnings management" is easy to execute because it is the result of accounting decisions related to accounting policies selection and the estimations of managers required to apply them, while it is easy to discover.

Previous studies stated that since the passage of the Sarbanes-Oxley Act in 2002, which implemented to increase transparency and internal control, real earnings management has become an alternative to accrual-based earnings management. According to Cohen et al. (2008), due to the accordance of real earnings management activities with accounting standards, it is difficult to discover them by auditors because these activities can be identified as legal in response to economic conditions. Cohen et al. (2008) and Liu et al. (2011) argued that with the introduction of new corporate governance practices and the international standardization, managers have shifted from accounting to real earning management because it is less exposed to the scrutiny of auditors and regulators.

The preference of real earnings management was supported by Graham et al. (2005), who reported that 80% of CFOs decrease research and development, advertising, and maintenance expenditures in order to meet earnings objectives, while 55% of CFOs postpone a new project. Real earnings management is not new, its techniques were identified in some definitions of earnings management since the late of the 80s like Schipper (1989), and it was a subject of few studies. Nevertheless, the real emergence of real earnings management was motivated by the implementation of the Sarbanes-Oxley Act as previously mentioned.

Janin (2000) stated that real earnings management involves real business activities that have a direct impact on operating cash flows. For that, the impact of real earnings management on performance drives from cash flows, not from accruals as it is the case for accounting earnings management. Real earnings management includes all actions set by managers leading to deviate from the normal business practices of the company in order to meet target earnings (Roychowdhury, 2006).

Real earnings management is purposeful actions to alter disclosed earnings in a particular direction, by changing the timing or structuring of operating, investment, or financing transactions (Zang, 2012, p. 676). Real earnings management occurs when managers intentionally select operating decisions that have actual cash flow effects with the objective of changing the disclosed earnings (Elkalla, 2017, p. 28). These last two definitions add that real earnings management includes all managerial decisions, not only the operating but also the investment and financing.

Real earnings management differs from accounting earnings management, since real earnings management affects cash flows by restructuring or rescheduling business operations, whereas accounting earnings management affects accruals in terms of timing or extent without effecting cash flows (Elkalla, 2017, p. 29; Wang and Zheng, 2020, p. 76). Consequently, real earnings management is likely to be more difficult and more costly than accounting earnings management, as suggested by Cohen et al. (2008) in a survey of over 400 CFOs of public companies. In addition, real earnings management must occur prior to the end of period, while accounting earnings management occurs after the end of period (Greiner, 2013, p. 9).

Real earnings management includes many managerial decisions related to the operation such as sales manipulation (price discounts, flexible credit terms to customers), overproduction to report lower cost of sales, discretionary expenditures (general and administrative, selling, and advertising expenditures). Managerial decisions for real earnings management contain also the decisions related to the investment like the sales of fixed assets and the reduction in research and development expenditures, and those related to the financing like stock options, stock repurchases, hedges, debt-equity swaps, and securitization.

Earnings are a major component of financial statements that have usually used to develop internally corporate policies (compensation, capital increasing) and externally major decisions that include debt covenants and investment decisions (Elkalla, 2017, p. 33). Therefore, manage earnings whether through real or accounting earnings management has become a strategy whether for efficient or opportunistic purposes. A driving force for opportunistic real earnings

management is the use of financial information in contracts (compensation and debt contracts). In this context, Bartov (1993) found that managers use gains on asset sales to meet earnings benchmarks for compensation purposes and leverage requirements.

Usually, managers establish contracts with investors and debtors and other stakeholders based on accounting numbers to minimize agency costs. After that, managers may have obligation to achieve reported accounting numbers such as the earnings to total debt ratio (Jha, 2013, p. 369), which can motivate real earnings management. This can improve managers' signals of future performance reducing both information asymmetry and agency problems (Greiner, 2013, p. 13).

According to Mard (2005), pressures of lenders and shareholders can motivate earnings management to reassure them about their interests, through improving the performance of companies. Therefore, many studies have adopted the assumption that leveraged companies tend to manage their earnings towards increasing. On the other hand, many studies adopted the inverse assumption that leverage limits accrual-based earnings management due to the scrutiny of auditors and regulators (Vakilifard and Mortazavi, 2016), which can encourage real earnings management.

3. LITERATURE REVIEW

Earnings management literature knew widespread in the last three decades. In the beginning, studies focused on accounting earnings management (accrual-based) that motivates accounting decisions to manipulate earnings. However, accounting earnings management alone has become incapable to explain some phenomena; as a result, studies have shifted toward using real earnings management as an explainer, which focuses on economic decisions to manipulate earnings, especially at the operating level. Studies have linked real earnings management with many variables, among the most notable is the financing policy.

Zamri et al. (2013) examined the association between financial leverage and real earnings management, using 3745 firm-year observations from companies listed on Bursa Malaysia during the period 2006-2011. The results showed a significant negative association between financial leverage and real earnings management suggesting that leveraged companies have lower levels of real earnings management.

Starting from the conclusion about the role of financial leverage in limiting the accrual-based earnings management, Vakilifard and Mortazavi (2016) explored whether the financial leverage motivates companies to shift from accrual-based earnings management to real earnings management, using 118 Iranian companies listed on the Stock Exchange during the period

2008-2013. The results indicated that managers tend to engage more in real earnings management than accrual-based earnings management once leverage is increasing.

Swai and Cosmas (2016) examined the impact of ownership structure on both accrual-based and real earnings management, using a sample of 44 non-financial East African listed companies for the period 2003 to 2013. They found little evidence that ownership structure has an impact on accrual-based earnings management. However, institutional ownership and ownership concentration have affected negatively and significantly real earnings management.

Park (2016) investigated whether earnings management is associated with short-term debt. The study employed 1146 firm-year observations from the US non-financial industries during the period 2004-2011 obtained from Compustat. The short-term debt was divided into three components: total current liabilities, debt in current liabilities, and short-term borrowings. According to the results, only debt in current liabilities affects significantly accrual-based earnings management, and only short-term borrowings affect significantly real earnings management.

Shahzad et al. (2017) explored whether the practice of real and accrual-based earnings management by family and non-family companies is associated with financial leverage. The study included 760 firm-year observations from Pakistani listed companies during 2007-2014. According to the results, leveraged companies tend to practice more real earnings management and less accrual-based earnings management due to its higher litigation risk. Moreover, the impact of leverage on real and accrual-based earnings management is stronger for family than non-family companies.

Wijesinghe and Kavinda (2017) explored the impact of leverage on real earnings management, using a sample of Sri Lankan listed manufacturing companies, with 600 firm-quarterly observations during the period 2010-2015. The results showed that the manufacturing companies have abnormal cash flows and production costs in their operations, and there is a significant positive impact of leverage on real earnings management in Sri Lankan listed manufacturing companies.

Anagnostopoulou and Tsekrekos (2017) examined whether financial leverage level impacts the empirically documented trade-off between real earnings management and accrual-based earnings management, using a sample of companies from Compustat during 1990-2009. The results indicated that financial leverage level affects positively and significantly upward real earnings management, with no significant effect on income-increasing accrual-based earnings management, whereas the results indicated a complementarily effect between

unexpected levels of real earnings management and accrual-based earnings management for companies with very high levels of and changes in leverage, due to the heavy outsider scrutiny, which requires using both earnings management forms to achieve earnings targets.

Gao et al. (2017) compared between real and accrual-based earnings management for Chinese listed companies. The sample included 6766 firm-year observations, during the period 2008-2012. The results indicated that the level of real earnings management is higher for companies with lower government intervention, higher financial leverage, and lower corporate governance. However, accrual-based earnings management is higher for companies in a less stringent legal environment, double-listed companies, and companies with higher growth prospects.

Eng et al. (2019) compared real earnings management between Chinese family companies and US family companies after the 2008 financial crisis, using 7467 US and 7778 Chinese firm-year observations during 2004-2014. The results showed a difference between the US and Chinese family companies in crisis and non-crisis periods in terms of real earnings management. For the US sample, real earnings management in family companies is greater than non-family companies, and real earnings management in the post-financial crisis period is greater than the pre-financial crisis period. For the Chinese sample, real earnings management in family companies is greater than non-family companies, but real earnings management is lower in Chinese family companies relative to non-family companies in the period before the financial crisis than the period after the financial crisis.

Pappas et al. (2019) analyzed the design of loan contract terms in the presence of real earnings management. They employed 22918 firm-year observations that consist of 3723 US companies recorded in the Thomson Reuters LPC DealScan Database, during 1996-2017. According to the results, a high level of real earnings management is accompanied by a high level of interest spreads, shorter maturities, a higher likelihood of imposing collateral requirements, and more intensive financial covenants, suggesting that lenders are likely to discover real earnings management.

Khanh and Thu (2019) investigated the effect of leverage on the form and extent of earnings management, using a panel data of 1687 firm-year observations that concern 241 companies listed on the Vietnam stock market during 2010-2016. Consistent with the "debt hypothesis", the study found a positive relationship between leverage and earnings management. Furthermore, the results indicated a preference of real than accrual-based earnings management in high leveraged companies.

Tulcanaza-Prieto et al. (2020) tried to determine how leverage components influence real earnings management in the Korean non-financial companies of the CSP-Index during 2010-2018. The study used 6207 firm-quarter observations and employed total, short-term, and long-term debt ratios as independent variables. The results suggested a significant positive relationship between leverage and real earnings management in suspicious companies, whereas the effect of leverage is insignificant in the non-suspicious companies. The positive relationship is stronger in the second half of the year, showing the prevalence of the seasonality of real earnings management, as managers collect high-frequency financial information during this period.

Kim et al. (2020) tested whether real earnings management is associated with the cost of debts at the international level. The study employed 14654 firm-year observations across 18 countries during the period 1987-2013. The results found that on average, real earnings management is positively associated with the cost of debts and that debts impose more premiums on the cost of debts for companies in countries with more developed debt markets.

Tonye and Sokiri (2020) investigated the effect of financial leverage on earnings management in manufacturing companies listed on the Nigeria Stock Exchange (NSE), using 29 observations during the period 2011-2016. The results revealed weak effects of financial leverage on accrual earnings management, real earnings management, and deferred tax earnings management. The effect of financial leverage on accrual earnings management was positive, while the effect of financial leverage on real earnings management was negative.

Regarding Algeria, our review did not provided any reference about the real earnings management, all studies that found were interested with the accounting earnings management (Benilles, 2015; Kimouche, 2015, 2017; Mehar, 2016; Kimouche and Cherroun, 2020). Benilles (2015) is almost the first who explored the behavior of Algerian banks in terms of earnings management basing on the semi-structured interviews and the analysis of accounting documents. The results revealed that the Algerian banks have relatively managed their earnings through the impairment losses of debtors, and that the dividends are the primary motivation for that behavior. On the other hand, current control systems cannot effectively detect and limit earnings management practices in the Algerian banks.

Kimouche (2015) investigated whether managers of the Algerian companies use accounting methods related to operating items in order to manage earnings, using 11 companies during the period 2005-2012. The results suggested significant associations between accounting

accruals and operating items, except the association between accounting accruals and inventories, which is not significant.

Mehar (2016) interested the impact of internal governance mechanisms on the relevance of financial information on one hand, and the reliability of financial information on the other. The study included 10 Algerian companies of insurance during the period 2007-2001, and indicated significant relationships between earnings management and certain governance mechanisms.

Kimouche (2017) explored whether the financing policy affects earnings management, using 25 Algerian companies during 2003-2015. The results suggested that the relationships between financial structure and earnings management were not statistically significant. However, a positive and statistically significant relationship between WACC and earnings management have been found. The relationship between financial charges and earnings management was also significant but negative.

Finally, Kimouche and Cherroun (2020) explored whether leverage affects earnings management in the Algerian companies, using 14 companies during the period 2006-2018. The results showed that leverage ratios do not affect earnings management in the Algerian companies.

4. RESEARCH DESIGN

This study followed a descriptive approach; for that, the supposed relationships between variables have been represented in Equation (1), and data related to variables have been collected to estimate the model.

4.1. Model

The model takes the form of multiple leaner regression relating the dependent variable (real earnings management) with independent variables (leverage and cost of debts) and control variable (cost of capital) as shown in Equation (1). This model has widely used by accounting literature with different forms, as the independent variables have been changed consistence with the hypotheses (Zamri et al., 2013; Gao et al., 2017; Shahzad et al., 2017; Wijesinghe and Kavinda, 2017; Eng et al., 2019).

$$REM_{it} = \alpha + \beta\, LEV_{it} + \gamma\, DC_{it} + \delta\, WACC_{it} + \varepsilon_{it} \qquad (1)$$

Where:

REM_{it}: is the real earnings management for the company i during the period t.

LEV_{it}: is the financial leverage for the company i at the end of period t.

DC_{it}: is the cost of debts for the company i at the end of period t.

$WACC_{it}$: the weighted average cost of capital for the company *i* at the end of period *t*.

α: is a constant.

β, γ, and δ: are the regression coefficients.

ε_{it}: is the residuals.

4.2. Data collection

The study includes 119 firm-year observations for 17 Algerian companies during the period 2012-2018. The only criterion used to select the companies is the availability of and the accessibility to their financial statements, due to the secrecy and caution characterizing corporate governance in the Algerian companies. Appendix 1 presents the studied companies and their main characteristics.

4.3. Measurement of real earnings management

The measure of real earnings management is based on Roychowdhury (2006), using the model of abnormal cash flows from operations, following Dechow et al. (1998). As shown in Equation (2), the model expressed the cash flows from operations as a linear function of sales and change in sales.

$$CFO_{it}/A_{t-1} = \alpha_0 + \alpha_1 (1/A_{t-1}) + \beta_1 (S_{it}/A_{t-1}) + \beta_2 (\Delta S_{it}/A_{t-1}) + \delta_{it} \quad (2)$$

Where:

CFO_{it}: is the net cash flows from operations for the company *i* during the period *t*.

A_{t-1}: is the total assets for the company *i* at the end of period *t*-1.

S_{it}: is the sales for the company *i* during the period *t*.

α_0, α_1, β_1, and β_2: are the regression coefficients.

δ_{it}: is the residuals, which represent the abnormal cash flows from operations, as they are unrespectable, so they used as a proxy for real earnings management (cash-based).

Cash-based earnings management value is the actual OCF minus the ''normal'' OCF calculated using the estimated coefficients (α_0, α_1, β_1, and β_2).

4.4. Measurement of independent variables

The independent variables are measured as follows:

- Financial leverage (LEV_{it}): is measured by the debts to book equity ratio.
- The cost of debts (DC_{it}): is measured by the financial charges to total debts ratio.
- The weighted average cost of capital ($WACC_{it}$): is measured by the weighted average cost of equity and debts.

5. RESULTS AND DISCUSSION

5.1. Estimation of real earnings management

Table 1 summarizes the coefficients estimation results of Model (2) that used to measure real earnings management. As shown in the table, the model is statistically significant at 1% level; also the constant and the regression coefficient of sales (S_{it}/A_{t-1}) are statistically significant at 1% level, while the regression coefficient of the variation in sales ($\Delta S_{it}/A_{t-1}$) is not statistically significant. Concerning the inverted total assets ($1/A_{t-1}$), it was close so much to zero and it was automatically excluded by the SPSS.

Table 1. Model (2) estimation results.

Model (2)	Unstand. Coef.		Stand.	t	Sig.	Collinearity Statistics		F[a]	Sig
	B	Std. Error	Coef.			Tolerance	VIF		
(Constant)	0.087	0.012		7.22	0.000				
S_{it}/A_{t-1}	-0.038	0.012	-0.282	-3.14	0.002	0.929	1.08	5.13	0.007
$\Delta S_{it}/A_{t-1}$	0.029	0.020	0.129	1.44	0.154	0.929	1.08		

a. Dependent Variable: OCF_{it}/A_{it-1}

Source: Depending on SPSS V26.

5.2. Descriptive statistics

Table 2 presents the descriptive statistics for 119 observations that consist of 17 Algerian companies during the period 2012-2018. The table shows that the abnormal cash flows from operations reach 7.2% of total assets suggesting that Algerian companies were engaged in real earnings management through cash flows during the period of study. The real earnings management level in the Algerian companies is situated between 0.15% and 27.60% of total assets, whereas the Median shows that 50% of observations are less than 5.63% of total assets.

According to the Mean, financial leverage reaches 139.92% of book equity on average, which means that on average debt is more than the equity in the Algerian companies, as leverage is more than 110.56% of book equity for 50% of observations. The cost of debts and the weighted average cost of capital reach 4.12% and 6.53% respectively; with observing the Median of each one, it appears that equity is more costly than debts, as the cost of debts is less than 2.38% for 50% of observations, which explain the high level of debts comparing with book equity. Finally, Standard Deviation shows that financial leverage is the most dispersal, then the weighted average cost of capital, the cost of debts, and real earnings management respectively.

Table 2. Descriptive statistics for variables.

	REM_{it}	LEV_{it}	DC_{it}	$WACC_{it}$
Mean	0.0720	1.3992	0.0412	0.0653
Median	0.0563	1.1056	0.0238	0.0518
Std. Deviation	0.0575	1.9009	0.0686	0.0745
Minimum	0.0015	-4.0723	0.0000	-0.1036
Maximum	0.2760	11.8895	0.3302	0.3041
Observations	119	119	119	119

Source: Depending on SPSS V26.

5.3. Correlation

Table 3 shows the results of correlations between different variables of Model (1) measured by the Pearson coefficient. From the table, we note that the correlation relationship between real earnings management and the weighted average cost of capital is high (0.595) and statistically significant at 1% level. On the other hand, the correlation relationship between real earnings management and the cost of debts is also statistically significant at 1% level, while it is weak (0.267). Regarding the financial leverage, its correlation relationship with real earnings management is not statistically significant. Finally, the correlation relationships between different independent variables are not statistically significant, except the correlation relationship between the cost of debts and the weighted average cost of capital, which is statistically significant at 1% level, but it is not high; and consequently, there is no sign of collinearity between different independent variables of Model (1).

Table 3. Correlations between variables results.

		REM_{it}	LEV_{it}	DC_{it}	$WACC_{it}$
REM_{it}	Pearson Correlation	1	-0.118	0.267	0.595
	Sig. (2-tailed)		0.202	0.003	0.000
LEV_{it}	Pearson Correlation		1	-0.102	-0.171
	Sig. (2-tailed)			0.269	0.062
DC_{it}	Pearson Correlation			1	0.426
	Sig. (2-tailed)				0.000
$WACC_{it}$	Pearson Correlation				1
	Sig. (2-tailed)				
Observations		119	119	119	119

Source: Depending on SPSS V26.

5.4. Model (1) validity test

The estimation of Model (1) is based on the Ordinary Least Squares (OLS), which requires the satisfaction of four criteria: homoscedasticity, normality of residuals, no perfect multicollinearity, no autocorrelation.

Table 4 summarizes the results of Kolmogorov-Smirnov and Shapiro-Wilk used to test the normality of residuals resulting from the estimation of Model (1). As noted in the table, the significance level of both Kolmogorov-Smirnov and Shapiro-Wilk is more than 5% level, hence the residuals of Model (1) are normally distributed.

Table 4. Normality test for Model (1).

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Standardized Residual	0.103	119	0.200	0.773	119	0.063

a. Lilliefors Significance Correction

Source: Depending on SPSS V26.

Table 5 summarizes the results of Breusch-Pagan and Koenker used to test the homoskedasticity of residuals resulting from the estimation of Model (1). The results indicate that the significance level of each test is more than 5% level, so the null hypothesis that suggests the no heteroscedasticity of residuals must be accepted, and thus the residuals have constant variance and they are homoskedastic.

Table 5. Homoskedasticity test for Model (1).

------- Breusch-Pagan and Koenker test statistics and sig-values --------		
	LM	**Sig.**
BP	1.937	0.586
Koenker	1.317	0.725
Null hypothesis: heteroskedasticity not present (homoskedasticity) if sig-value less than 0.05, reject the null hypothesis		

Source: Depending on SPSS V26.

Regarding the multicollinearity, Table 8 shows that the variance inflation factors (VIF) do not exceed the value 2 for all independent variables. Thereby, no independent variable is a perfect linear function of other independent variables in the Model (1), and therefore, there is no sign of multicollinearity between independent variables, which confirms the results of correlation in Table 3.

Finally, concerning the autocorrelation, the calculated Durbin-Watson statistic in Table 7 reaches 2.264 and it is situated between 2 and 2.335 (2.335 = 4 - dU), knowing that dU is the upper critical value from Durbin-Watson table (n = 119, k' = 3, Sig. = 1%). As a result, observations of the residuals are uncorrelated with each other, or in other term, the residuals of Model (1) are uncorrelated between observations.

5.5. Hypothesis testing

Table 6 presents the analysis variance for Model (1) that estimated using the OLS. From the table, we observe that Model (1) is significant at 1% level, thereby the determination coefficient of Model (1) differs substantially from zero, and the real earnings management can be explained by an independent variable at least. Consequently, one of the independent variables or more has a statistically significant effect on real earnings management.

Table 6. ANOVA for Model (1).

Model		Sum of Squares	df	Mean Square	F	Sig.
(1)	Regression	0.373	3	0.124	22.713	0.000 [a,b]
	Residual	0.629	115	0.005		
	Total	1.001	118			

a. Dependent Variable: REM_{it}

b. Predictors: (Constant), $WACC_{it}$, LEV_{it}, DC_{it}

Source: Depending on SPSS V26.

Table 7 presents a summary for Model (1), which confirms the results summarized in Table 6, considering that the determination coefficient reaches 35.60% and differs substantially from zero, so one of the independent variables or more explains 35.60% the changes in real earnings management during the period. This explanatory ability is below the medium, since the majority of the changes in real earnings management (64.40%) caused by the other variables and the random errors.

Table 7. Model (1) summary.

Model	R	R Square	Adjusted R Square	Std. Error ofthe Estimate	Durbin-Watson
(1)	0.610[a,b]	0.372	0.356	0.07394797	2.264

a. Predictors: (Constant), $WACC_{it}$, LEV_{it}, DC_{it}

b. Dependent Variable: REM_{it}

Source: Depending on SPSS V26.

Table 8 summarizes the regression coefficients of Model (1), where the results indicate that the constant and the regression coefficient of the weighted average cost of capital are statistically significant at 1% level. Therefore, a positive and statistically significant effect of the weighted average cost of capital on real earnings management has existed, so any change in the weighted average cost of capital with 1% leads to a change in real earnings management with 0.86% in the same direction.

Besides that, the results indicate that the regression coefficients of both financial leverage and cost of debts are not statistically significant, as the significance level is more than 5% level for each regression coefficient, and thus it does not exist any association of real earnings management neither with the financial leverage nor with the cost of debts, which contradicts with *Hypothesis*1 and *Hypothesis*2 that must be rejected, and therefore financial leverage and cost of debts do not have any effect on real earnings management in the Algerian companies.

Table 8. Model (1)'s regression coefficients.

Model		Unstand. Coef.		Stand.	t[a]	Sig.	Collinearity Statistics	
		B	Std. Error	Coef.			Tolerance	VIF
(1)	*(Constant)*	-0.052	0.011		-4.787	0.000		
	LEV_{it}	-0.001	0.004	-0.015	-0.206	0.837	0.971	1.030
	DC_{it}	-0.232	0.127	-0.173	-1.823	0.071	0.608	1.644
	$WACC_{it}$	0.866	0.118	0.700	7.318	0.000	0.596	1.677

a. Dependent Variable: REM_{it}

Source: Depending on SPSS V26.

The findings of this study confirm the results of Park (2016), who did not find any effect of financial leverage on real earnings management, and Tonye and Sokiri (2020), who revealed a weak effect of financial leverage on real earnings management. Even that, the findings of this study are inconsistent with the hypothesis that financial leverage motivates real earnings management because it is accompanied by scrutiny of auditors and regulators, which limits accrual-based earnings management (Vakilifard and Mortazavi, 2016; Shahzad et al., 2017; Wijesinghe and Kavinda, 2017; Anagnostopoulou and Tsekrekos, 2017; Gao et al., 2017; Pappas et al., 2019; Khanh and Thu, 2019; Tulcanaza-Prieto et al., 2020; Kim et al., 2020). The findings of this study are inconsistent also with Zamri et al. (2013), who showed a significant negative association between financial leverage and real earnings management.

6. CONCLUSION

Earnings management is one of the accounting data management techniques that has widely used by managers to condition the financial statements for efficient or opportunistic purposes. Earnings management is a means for managers to affect the quality of financial reporting whether positively if it used for efficient purposes or negatively if it used for opportunistic purposes.

The earlier studies that interested in earnings management indicated that accruals-based earnings management is more employed than real earnings management because it is easy to execute and less costly. However, after the implementation of the Sarbanes-Oxley Act in 2002, which impacted the corporate governance in many countries, studies indicated that managers have shifted toward real earnings management due to the scrutiny of auditors and regulators.

Financial leverage is among the factors that have widely used to explain earnings management practices due to the debtors' scrutiny associated with debts. In this context, studies have adopted two assumptions; the first argued that leveraged companies tend to manage their earnings towards increasing. On the other hand, the second argued that leverage limits accrual-based earnings management due to the scrutiny of auditors and regulators, which might motivate real earnings management.

Based on the above, this study tried to provide empirical evidence about the impact of debts and their cost on real earnings management in the Algerian companies, assuming a positive impact, so the more the Algerian companies are leveraged and have a high cost of debts, the more the real earnings management level is. The study included 119 firm-year observations for 17 Algerian companies during the period 2012-2018, using the model of abnormal cash flows for Roychowdhury (2006) to measure real earnings management, and a multiple linear regression model to test the hypotheses.

The results of this study are inconsistent neither with the assumptions nor with the most of previous studies since any significant impact on real earnings management has recorded neither from the financial leverage nor from the cost of debts. The only significant positive impact on real earnings management has come from the weighted average cost of capital. Therefore, the study concluded that debts and their cost do not have any impact on real earnings management in Algerian companies.

The inconsistency of this study with previous studies can be assigned to the specificities of economic and institutional Algerian environment, where the debt covenant is prepared in a different manner and the high dependence on the guarantees and mortgage, besides the

difference of accounting practices and the periods. Although the importance of this study and its practical implications, the small sample that used to obtain the data (17 companies) can consider its major limiataion. Therefore, future studies must extend the sample and examine the impact of other factors on real earnings management, especially the characteristics of governance and the characteristics of companies. Future studies must also use different approaches to measure real earnings management.

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8. Appendices

Appendix 1. The studied Algerian companies.

No.	Company	Status	Industry	Size (assets 10^3 DA)
1	SCHS	Public	Cement	348 490 966
2	SCAEK	Public	Cement	199 309 980
3	ETRHB	Private	Construction	19 470 599
4	COSIDER	Public	Construction	92 342 321
5	ALTRO	Public	Construction	18 642 575
6	ENTP	Private	Energy	71 040 107
7	SONATRACH	Public	Energy	9 089 000 000
8	SONELGAZ	Public	Energy	3 283 392 000
9	ENAFOR	Public	Energy	51 291 581
10	CEVITAL	Private	Food	168 508 653
11	NCA-ROUIBA	Private	Food	8 340 205
12	AMOR BENAMOR GROUP	Private	Food	88 340 205
13	EL AURASSI	Public	Hotel	12 022 765
14	SAIDAL	Public	Pharmaceutical	34 921 901

15	BIOPHARM	Private	Pharmaceutical	38 195 806
16	SPA DAHLI	Private	Real estate	33 635 486
17	AIR ALGÉRIE	Public	Transport	151 801 745