COVID-19 outbreak and earnings management practice: case of Tunisia

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Abstract

Purpose – This article attempts to investigate the impact of COVID-19 outbreak on the earnings management (EM) for listed Tunisian companies.

Design/methodology/approach – The study focuses on both accrual-based and real EM (REM) practices. With panel data, the authors employ the multiple regression approach and the generalized least squares (GLS) estimate method. The sample is made up of 41 listed companies observed from the first half of 2016 to the second half of 2020.

Findings – This study finds that, during the pandemic period, Tunisian firms use decreasing income discretionary accruals. Also, with regard to REM, the COVID-19 variable displays a negative response coefficient but of lesser magnitude.

Research limitations/implications – This study's findings can help Tunisian authorities, listed companies and market investors to better understand EM practices during a negative shock and to better understand the various internal and external factors influencing the quality of financial reporting. These findings may contribute, also, significant EM implications for scholars interested in other emerging markets. As limitations, the authors point out mainly to the small sample size used in this study and that the authors used a single model, namely the modified Jones model (1995), to measure the accounting EM. Also, the authors used a binary variable as a proxy for the COVID- 19 pandemic.

Originality/value – To the best of authors' knowledge, it is the first in Tunisia, if not in Africa, to examine the impact of the COVID-19 pandemic on EM practices. Second, this study builds on previous work by examining both the accrual-based EM and the REM.

Keywords COVID-19 outbreak, Earnings management, Tunisia

Paper type Research paper

1. Introduction

On March 11, 2020, the World Health Organization (WHO) declared that the COVID-19 outbreak was a global pandemic. This news rocked global financial markets since COVID-19 was first released in China (more specifically in Wuhan) in December 2019. Since the WHO's declaration of the COVID-19 pandemic, there has been significant wide ranging global

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literature about the pandemic. Most of this literature focuses primarily on the impact of the COVID-19 pandemic on financial markets and financial assets such as gold, oil price exposure and exchange rate forecasting. Very few studies have contributed to the impact of the COVID-19 pandemic on earnings management (hereafter referred to as EM) practices. Although many studies have investigated EM in crises such as oil crises and financial crises (Kjærland *et al.*, 2020; Bugshan *et al.*, 2020), and financial crises (Kousenidis *et al.*, 2013; Filip and Raffournier, 2014; Cimini, 2015), there is very little empirical evidence of EM behaviors during the COVID-19 pandemic. To the best of our knowledge, only four studies have examined the impact of the COVID-19 pandemic on EM: These are: namely, Aljawaheri *et al.* (2021) in an Iraqi context; Xiao and Xi (2021), Lassoued and Khanchel (2021) in a European multinational context; and Ali *et al.* (2022) in the context of a group of 12 countries. It is noteworthy that all these studies have focused on accrual-based EM and that they have produced contradictory findings.

Even in theoretical terms, there is no complete agreement either on the use or the purpose of EM in difficult times. On the one hand, some authors argue that managers can be encouraged to publish financial reports with optimistic contents to mitigate the impact of the crisis and, therefore, maintain their relationships with stakeholders and reassure investors (Khanchel El Mehdi, 2011). On the other hand, others argue that the crisis period can be favorable to large scale practices (Kustono *et al.*, 2021) that are employed when large losses are unavoidable (Kjærland *et al.*, 2020). Another likely scenario is that EM is avoided throughout the crisis (Ahmad-Zaluki *et al.*, 2011). This is the basis of our research study. By focusing on Tunisia, a North African nation officially hit by COVID-19 on March 2, 2020, we investigate the influence of the COVID-19 pandemic on Tunisian enterprises' EM. We believe that Tunisia is an interesting area of study given its institutional setting and its socio-cultural specificities. This framework represents the typical characteristics of emerging markets with structures that comply with international standards. Most Tunisian businesses are either owned or controlled by the family.

This study contributes to the extant literature in the following perspectives. Firstly, to the best of our knowledge, it is the first in Tunisia, if not in Africa, to examine the impact of the COVID-19 pandemic on EM practices. Second, the empirical evidence is both inconclusive and provides contradictory opinions on the relationship between COVID-19 outbreaks and EM behaviors and, therefore there is a need for more evidence. Finally, this study builds on previous work by examining both the accrual-based EM and the real EM (REM). In fact, separate analysis of each approach can lead to biased results (Zang, 2012).

The remainder of this paper is structured as follows. Section 2 presents a review of the literature. Section 3 describes the data and specifies the research method. Section 4 reports and discusses the results. Finally, Section 5 sets out this study's conclusion.

2. Literature review

2.1 EM practices during crises

Initially, positive accounting theory developed the debate on the incentives of EM. Firms are motivated essentially by contractual issues. These are: namely, debt contract (Defond and Jiambalvo, 1994); compensation contract (Gaver *et al.*, 1995) and political costs (Watts and Zimmerman, 1986). According to agency theory, EM is explained by managers' opportunistic intentions (Jensen and Meckling, 1976). These behaviors are more important when companies are experiencing difficult times (Lisboa and Kacharava, 2018). More specifically, during a pandemic or natural disaster, managers, who possess moral hazard intentions, use this force majeure to strategically manipulate statements of financial position to serve their interests to such an extent that they risk losing them in the event of a pandemic. In addition to positive accounting theory, models, which explain EM during crises, are part of institutional theory.

According to this theory, the business environment, in which firms operate, is an important institutional component and has a significant and lasting effect on business practices (Campbell, 2007). This leads us to predict changes in accounting practices, such as EM, as well as responses to environmental pressures. Indeed, to react to exogenous shocks in their business environments, firms adopt certain practices such as conservative policies relating to the holding of liquid assets (Dessaint and Matray, 2017), capital investments (Wu *et al.*, 2022), mergers and acquisitions (Bonaime *et al.*, 2018) and EM (Chen *et al.*, 2012).

An overview of the literature on EM in crises shows three different perspectives. The first perspective argues that firms manage their earnings upwards during crises. Indeed, in such times, managers are under severe financial pressure due to their firms' low profitability. They tend to manage earnings upward to improve reported performance and to survive the economic downturns (Arthur *et al.*, 2015). Increased earnings help firms to mitigate the impact of the crisis and to sustain stakeholder relationships during these turbulent periods (Lisboa and Kacharava, 2018). More specifically, it increases the confidence of investors, who are troubled by the crisis (Arthur *et al.*, 2015), and, depending on earnings, reduces the risk of breaching debt covenants (Defond and Jiambalvo, 1994). According to Charitou *et al.* (2007), since this affects their wages, managers are encouraged, also, to increase earnings to escape a sharp drop in the firm's stock price. The second perspective is that firms deflate their profits in times of crisis so that they can renegotiate better conditions to restructure their debts (Asquith *et al.*, 1994). Alternatively, the firm may declare losses that can be seen as a sign of difficulties and, consequently in union negotiations, the firm makes concessions to its employees (Filip and Raffournier, 2014). In the same literature, some other authors consider that the troubled period can be favorable to large scale practices, which are used if losses cannot be avoided (Kjærland *et al.*, 2020; Kustono *et al.*, 2021). According to Saleh and Ahmed (2005), this is an accounting technique that allows managers to clean up their accounts when the firm's operating performance is expected to be poor. A third perspective argues that, when compared to periods of expansion, periods of recession are less favorable to EM practices. Indeed, Chia *et al.* (2007) consider that, in times of crisis, firms are closely monitored by auditors, creditors and other stakeholders. Therefore, in such circumstances, the firm's managers have less latitude to manage earnings. Also, according to Ahmad-Zaluki *et al.* (2011), the firm's managers have no incentive to manage earnings because the market seems to tolerate the firm's poor performance.

Empirically, EM has been examined during several crisis periods. These are namely, the 1997 Asian crisis (Chia *et al.*, 2007); the 2007–2009 subprime crisis; the 2014 oil crisis (Bugshan *et al.*, 2020; Kjærland *et al.*, 2020); and, more recently, the 2020 crisis caused by the COVID-19 pandemic (Aljawaheri *et al.*, 2021; Xiao and Xi, 2021; Lassoued and Khanchel, 2021; Ali *et al.*, 2022). Their studies' findings are both mixed and inconclusive. Indeed, Aljawaheri *et al.* (2021) examined the COVID-19 impact on the EM of 87 firms listed on the Iraqi Stock Exchange from 2018 to 2020. The results show that firms manipulate earnings to sustain profitability over time. In the same year, by using a sample of 2,029 A-share firms listed on the Shanghai and Shenzhen Stock Exchanges, Xiao and Xi's (2021) findings show that, during the COVID-19 pandemic, there was an increase in accrual-based EM. Similarly, Lassoued and Khanchel (2021) investigated the effect of COVID-19 pandemic on EM practices. Based on a sample of 2,031 listed companies from 15 European countries and using OLS (ordinary least squares) regressions, their study's findings provide evidence of significant income-increasing EM in 2020 during the period of the COVID- 19 pandemic. Therefore, their findings demonstrate that, by mitigating the level of reported losses, firms manage earnings upwards to restore the investor and stakeholder confidence needed to support the firm's economic recovery. More recently, Ali *et al.* (2022) aimed to investigate how the COVID-19 pandemic and investor protection influenced EM. By examining 5,519 firms registered in G-12 countries from 2015 to 2020, Ali *et al.*'s (2022) findings reveal that, contrary to the findings of previous studies, there is a negative and significant relationship between EM and the COVID-19 pandemic.

Moreover, because the previous studies' findings are mixed and inconclusive, it is noteworthy that these studies have focused only on accrual-based EM and have ignored EM in its real aspect.

2.2 Accrual-based EM and real EM

Most previous EM studies used only one strategy: namely, either Arthur *et al.*, 2015 accrual-based; or REM. The accrual-based EM allows managers to use financial report assessments to adjust the level of accruals and, subsequently, profitability. The REM, which is called, also, EM through real activity manipulation, is defined as management actions which vary from conventional business activities and which are conducted with the primary goal of achieving particular levels of earnings (Roychowdhury, 2006). Since Roychowdhury's (2006) theoretical work, certain authors, such as Cohen and Zarowin (2010) and Baker *et al.* (2018), have provided evidence that managers use both methods to achieve the desired profitability. According to Zang (2012), separate analysis of each approach can lead to misleading results. Furthermore, for Tunisian firms, Elleuch Hamza and Kortas (2019) investigated the relationship between accrual-based EM and REM (determined by discretionary expenditures and sales manipulation). Their findings suggest that, in addition to a substitutive interaction between accruals management and discretionary spending, there is a complementary relationship between accruals-based EM and sales manipulation. Finally, whether they are substitutable and/or complimentary, we believe that, to arrive at reliable conclusions, the accounting and REM need to be investigated together.

3. Methodology

3.1 Description of data

To investigate the effect of the COVID-19 pandemic on EM, we used semiannual data in this study. We chose such data because it provides a more accurate view of an event by better capturing fluctuations in earnings and, therefore, increasing the likelihood of detecting EM (Kjærland *et al.*, 2020). To carry out our empirical study, we began with all the Tunisian firms listed on the Tunisian Stock Exchange that had published their semi-annual financial reports in the period from 2016 to 2020. For the sake of maintaining a balanced sample, we used as an initial sample the 79 firms listed in 2016. Next, we removed 33 financial institutions due to their accounting specificities and 5 firms with missing data). As shown in Table 1, our final sample comprises 41 companies monitored during the period from 2016 to 2020. This study period includes the prepandemic period spanning the first half of 2016 to the second half of 2019 and then the period of the COVID-19 pandemic from March to December 2020. Consequently, there are, in total, 410 observations. We collected by hand the semi-annual and annual financial statements data available on the Financial Market Council website (http://www.cmf.org.tn) and on the Tunisian Stock Exchange website (http://www.bvmt.com.tn).

3.1.1 Dependent variable. The dependent variable is "earnings management, EM" And in this respect, our study covers both accounting and REM.

Initial sample	79
Financial firms (less)	(33)
Firms with insufficient data (less)	(5)
Final sample	41
Study duration (Semesters)	10
Total observations	410

Table 1.
Sample selection

Source(s): Authors own work

3.1.1.1 The accrual-based earnings management (AEM). Consistent with most EM research studies, we used the modified Jones model, introduced by Dechow *et al.* (1995), to determine the nondiscretionary level of total accruals (TAC). The measure of discretionary accruals (DA) is the residuals from firm-specific regression of changes in noncash sales and gross level of property, plant and equipment. Discretionary or abnormal accruals (lagged by total assets) serve then as a proxy for AEM and are calculated as follows:

To begin, calculate TAC:

$$\frac{TAC_{i,t}}{TA_{i,t-1}} = \frac{1}{TA_{i,t-1}}\left[\alpha_0 + \alpha_1(\Delta REV_{i,t} - \Delta REC_{i,t}) + \alpha_2 PPE_{i,t}\right] + \varepsilon_{ij} \quad (1)$$

Where, i and t denote respectively the firm and the semester during the period from 2016 to 2020; TA is the total assets; ΔREV is the variation in revenues; and ΔREC is the variation in net accounts receivables.

Next, we used the parameter estimates from equation (1) to generate the non-DA. DA are then calculated as follows:

$$DA_{i,t} = \frac{TAC_{i,t}}{TA_{i,t-1}} - \left(\frac{\widehat{\alpha}_0}{TA_{i,t-1}} + \widehat{\alpha}_1\frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{TA_{i,t-1}} + \widehat{\alpha}_2\frac{PPE_{i,t}}{TA_{i,t-1}}\right) \quad (2)$$

Clearly, high DA reflect an upward accounting EM. For our empirical analysis, AEM = DA.

3.1.1.2 The Real EM (REM). We measured REM by using three proxies. These are namely, operating cash-flows; discretionary spending and cost of production. According to Roychowdhury (2006), an abnormal low level of cash-flow from operating activities, an abnormal low level of discretionary expenses, such as administrative expenses and R&D expenses, and an abnormal high level of production costs can be used to indicate REM occurrence. Due to data availability issues, we decided to remove the third proxy. Hence, we designed the following:

$$\frac{CFO_{it} + DEx_{i,t}}{TA_{i,t-1}} = \gamma_0\frac{1}{TA_{i,t-1}} + \gamma_1\frac{SALES_{i,t}}{TA_{i,t-1}} + \gamma_2\frac{\Delta SALES_{i,t}}{TA_{i,t-1}} + \gamma_3\frac{\Delta SALES_{i,t-1}}{TA_{i,t-1}} + \varepsilon_{i,t} \quad (3)$$

where, i and t denote respectively the firm and the semester during the period from 2016 to 2020; and CFO (Chief Financial Officer) is the operating cash flow; and DEx is the discretionary expenses. In terms of the total of advertising expenses, R&D expenses and selling, general and administrative expenses, TA is the total assets and the residual term ε refers to the sum of abnormal operating cash flow and abnormal discretionary spending.

Then we used the parameter estimations from equation (3) to generate the abnormal operating cash flow (AbnCFO) and abnormal discretionary expenses (AbnDEx).

$$AbnCFO_{i,t} + AbnDEx_{i,t} = \frac{CFO_{i,t} + DEx_{i,t}}{TA_{i,t-1}} - \left(\widehat{\gamma}_0\frac{1}{TA_{i,t-1}} + \widehat{\gamma}_1\frac{SALES_{i,t}}{TA_{i,t-1}} + \widehat{\gamma}_2\frac{\Delta SALES_{i,t}}{TA_{i,t-1}} + \widehat{\gamma}_3\frac{\Delta SALES_{i,t-1}}{TA_{i,t-1}}\right) \quad (4)$$

Finally, we multiplied (AbnCFO + AbnDEx) by a negative one to obtain the extent of REM. For our empirical analysis, REM = − (AbnCFO + AbnDEx). The higher values suggest that, to manage earnings upwards, the firms decreased more operating cash flows and discretionary costs. In this work, the REM is combined with the accrual-based EM to derive total EM. We then get the following: EM = AEM + REM = DA − (AbnCFO + AbnDEx).

3.1.2 Independent variable. To investigate the influence of the COVID-19 pandemic on EM, the independent variable in our modeling is a binary variable (COVID) which takes the value of 1 if the observation concerns the year 2020 (the pandemic period) and otherwise is zero.

3.1.3 Control variables. The modeling includes six control variables that may influence EM. These are namely, return on assets (ROA), market-to-book (MTB), financial leverage (LEV), audit quality (AUD), ownership concentration (BLOC) and firm size (SIZE).

All of these variables are summarized in Table 2.

3.2 Specification of empirical approach

To fulfill our study's objective, we examined not only the whole EM but, also, separately the real and the accrual-based EM. We used the multiple regression methodology with panel data. The data has two dimensions: namely, an individual dimension (1) representing the firm and a (t) index representing the period of study. Given the particular nature of panel data, certain tests need to be performed to obtain reliable estimates. To test for the presence of individual effects, we performed first an 'F-statistic'. Significant chi-square values are displayed that indicate the presence of individual effects and confirm sample heterogeneity. Then, we implemented the Hausman test to choose between fixed and random effects models. The results, which are not reported here, indicate that the random-effects model outperforms the fixed-effects model. Accordingly, we applied the generalized least-squares (GLS) estimation method.

We design the following models:

$$(\mathbf{M_1})\ \boldsymbol{AEM_{i,t}} = \alpha_0 + \alpha_1 \boldsymbol{COVID}_{i,t} + \alpha_2 ROA_{i,t} + \alpha_3 MTB_{i,t} + \alpha_4 LEV_{i,t} + \alpha_5 AUD_{i,t} + \alpha_6 BLOC_{i,t} + \alpha_7 SIZE_{i,t} + \varepsilon_{it}$$

Variable	Definition	Measure
Dependent variable		
AEM	Accrual-based earnings management	Discretionary accruals (DA) (Based on the modified Jones model (1995))
REM	Real earnings management	the total of abnormal operating cash flow and abnormal discretionary spending, multiplied by (−1)
EM	Total earnings management	AEM + REM
Independent variable		
COVID	COVID-19 outbreak	Binary variable taking the value of 1 if the observation is the first or the second half of 2020, otherwise 0
Control variables		
ROA	The ratio of return on assets	Net income per Total assets
MTB	The ratio of market-to-book	Market capitalization per net book value
LEV	The ratio of financial leverage	Total debt per total assets
AUD	Audit quality	A binary variable taking the value of 1 if the firm is audited by a big-4 firm, otherwise 0
BLOC	Ownership concentration	5% or more of capital held by blockholders per total capital
SIZE	Firm size	Natural logarithm of total assets

Source(s): Authors own work

Table 2. Summary of study variables

$$(\mathbf{M_2})\ \boldsymbol{REM_{i,t}} = \alpha_0 + \alpha_1 \boldsymbol{COVID}_{i,t} + \alpha_2 ROA_{i,t} + \alpha_3 MTB_{i,t} + \alpha_4 LEV_{i,t} + \alpha_5 AUD_{i,t} + \alpha_6 BLOC_{i,t} + \alpha_7 SIZE_{i,t} + \varepsilon_{it}$$

$$(\mathbf{M_3})\ \boldsymbol{EM_{i,t}} = \alpha_0 + \alpha_1 \boldsymbol{COVID}_{i,t} + \alpha_2 ROA_{i,t} + \alpha_3 MTB_{i,t} + \alpha_4 LEV_{i,t} + \alpha_5 AUD_{i,t} + \alpha_6 BLOC_{i,t} + \alpha_7 SIZE_{i,t} + \varepsilon_{it}$$

where, i and t denote respectively the firm and the semester during the period 2016–2020.

4. Results and discussion

4.1 Preliminary data analysis

Table 3 displays the descriptive statistics for all study variables. It shows that, on average, the total EM is 0.016; the accrual-based EM is 0.012; and the REM is 0.003. According to these statistics, Tunisian listed firms generally use both real and accounting EM strategies to value their earnings. As for the control variables, the average profitability is 0.046 with a minimum of −0.254 and a maximum of 0.789. On average, the MTB ratio is 1.832. Tunisian firms appear, also, to be heavily indebted. Indeed, the ratio of debt-to-total-assets (mean = 0.606) averages well over half of total assets and varies from 0.008 to 2.265. The binary variable, "Audit quality", shows an average of 0.185 and the variable, "Ownership concentration", shows that in more than half of Tunisian firms the average capitalization, three is 5% or more block holder participation (0.547).

To identify any potential multicollinearity issue, Table 4 displays the correlation matrix between the different explanatory variables. According to Gujarati *et al.* (2004), such problems can occur when the correlation between two variables exceeds a value of 0.8. This

Variables	Mean	Median	Standard deviation	Min	Max
EM	0.0163	0.2037	0.2348	−1.1877	1.9174
AEM	0.0124	0.3324	0.1834	−1.1650	1.5917
REM	0.0039	0.0014	0.0312	−0.3701	0.5633
ROA	0.0466	0.0304	0.1036	−0.2548	0.7899
MTB	1.8325	0.6182	3.1942	0.1310	42.819
LEV	0.6067	0.3954	0.3346	0.0082	2.2650
AUD	0.1853	0	0.2422	0	1
BLOC	0.5471	0.4225	0.1987	0	0.8560
SIZE	17.2961	14.3410	2.9811	12.1844	20.6442

Source(s): Authors own work

Table 3. Descriptive statistics

	ROA	MTB	LEV	AUD	BLOC	SIZE
ROA	1					
MTB	0.64	1				
LEV	0.39	0.15	1			
AUD	0.10	−0.02	−0.05	1		
BLOC	0.47	0.09	−0.18	0.59	1	
SIZE	−0.08	0.11	0.24	0.67	−0.42	1

Source(s): Authors own work

Table 4. Pearson's correlation matrix

study's results show very low correlations between the independent variables (best 0.67) and no multicollinearity problems. Furthermore, Table 5 shows the mean difference in AEM, REM and EM between 2020 and other years. This study's results show negative values for 2020 which is contrary to all the other years. This difference is statistically significant for the three variables. A priori, the COVID-19 pandemic tends to have a negative influence on EM; this needs to be validated by multivariate analysis.

4.2 Empirical results

Table 6 displays the results for the estimated models M1, M2 and M3 using the GLS method. It is noteworthy that the dependent variables for these models are respectively total EM, accrual-based EM and REM. In this regard, the Wald test indicates that models M1, M2 and M3 significantly fit the data. Table 5 shows that the Wald χ^2 global significance test is significant at the 1% level for all models.

As expected, the market-to-book (MTB) and Financial leverage (LEV) variables as control variables show clearly positive coefficients in the three models. On the one hand, firms with higher market's expectations for future profitability and those, which are greatly leveraged, tend to engage in more upward EM practices. On the other hand, EM is influenced negatively by the profitability variable (ROA) and BLOC. However, the (BLOC) variable does not have a significant effect on REM (see Model 2). For the AUD and SIZE, neither appears to have any significant effect on the EM practices.

The COVID-19 pandemic (COVID) is the variable of interest in our regressions. As shown in Table 6, this variable has a negative and significant impact (−0.014) at the 5% threshold on accrual-based EM (see model 1). Therefore, during the period of the COVID-19 pandemic, Tunisian listed companies used decreasing income DA. With regard to REM (see Model 2), the variable (COVID) displays, also, a negative and significant response coefficient at the 10%

Table 5.
Differences between earnings management means

	Mean year 2020	Mean other years	*t*-test
AEM	−0.0173	0.0198	2.58***
REM	−0.0021	0.0054	1.56*
EM	−0.0194	0.0253	3.98***

Note(s): *, **, ***: Significant at 0.1, 0.05 and 0.01 level, respectively
Source(s): Authors own work

Table 6.
Impact of COVID-19 outbreak on earnings management

Explanatory variables	Predicted sign	M1 Coef. (z-statistic)	M2 Coef. (z-statistic)	M3 Coef. (z-statistic)
COVID	?	−0.014** (−2.55)	−0.009* (−1.86)	−0.021*** (−3.26)
ROA	−	−0.011** (−1.99)	−0.008** (−2.11)	−0.014*** (−4.77)
MTB	+	0.009** (2.55)	0.008* (1.84)	0.013** (2.04)
LEV	+	0.011* (1.88)	0.019** (2.39)	0.028** (2.14)
AUD	−	−0.011 (−1.02)	0.003 (0.59)	−0.017 (−0.75)
BLOC	−	−0.009*** (−4.87)	−0.004 (−0.81)	−0.012*** (−6.03)
SIZE	?	0.005 (0.94)	0.002 (0.016)	0.006 (1.08)
Constant	?	0.427*** (20.29)	−0.187*** (−9.51)	0.523*** (17.54)
Observations		410	410	410
Wald χ^2		105.07***	94.31***	154.31***
Log likelihood		37.416	23.294	51.294

Source(s): Authors own work

threshold, but of lesser magnitude (−0.009). A priori, during the COVID-19 pandemic, Tunisian firms have deferred their revenues by delaying sales and/or accelerating spending on R&D, advertising campaigns and pension contributions. By combining accounting and REM, Model 3 estimates show that, at the 1% threshold, the COVID-19 pandemic has had a negative and significant impact on total EM. The magnitude of this effect is larger (−0.021) when compared to models M1 and M2. Tunisian listed firms adopted both accrual-based and REM downwards during the period of the COVID-19 pandemic. These findings support Kjærland *et al.*'s (2020) and Kustono *et al.*'s (2021) hypotheses that troubled periods can be favorable to large scale practices. According to Habib *et al.* (2013), large scale accounting practices during the crisis period allows firms to report positive earnings in the post-crisis period. Investors may expect firms to report losses and, therefore, it is a rational managerial response to manage earnings downward by adopting large scale accounting practices during such times. Since firms' managers realize that the market tolerates poor performance during a crisis, they have greater incentives to reduce earnings further and to reverse the performance in the post-crisis period. Certainly, Tunisian firms have been greatly affected by the lockdown and restriction measures announced on March 9, 2020 in the hope of overcoming the health crisis. Economic activity has been affected mainly through multiple transmission channels, such as halting production, closing stores, halting business-to-business recovery and suspending international trade operations. It was expected then that these measures would result in firms' poor operating performance. In this sense, a survey conducted in March 2020 by the Arab Institute of Business Leaders in Tunisia (IACE, Institut Arabe des Chefs d'Entreprises), shows that 96.7% of the questioned business leaders feared that the COVID-19 pandemic would have a negative and significant influence on their activities for the next six months. This could explain the tendency of managers to clean up their accounts to make future performance seem better.

4.3 Additional analysis

We conducted an additional interaction analysis to strengthen the empirical analysis. We tested the interaction effects of each explanatory variable and the COVID-19 pandemic on EM. Table 7 shows the estimation results of the following model:

Explanatory variables	Predicted sign	M4 Coef	(z-statistic)
COVID	?	−0.024***	(−4.06)
COVID*ROA	−	−0.006	(−0.77)
COVID*MTB	+	0.037***	(5.06)
COVID*LEV	+	0.022*	(1.84)
COVID*AUD	−	−0.008***	(−3.41)
COVID*BLOC	−	−0.002	(−1.03)
COVID*SIZE	?	0.011	(0.57)
Constant	?	0.388**	(2.17)
Observations		410	
Wald χ^2		217.41***	
Log likelihood		−124.378	

Source(s): Authors own work

Table 7.
Interaction effect on earnings management

$$(\mathbf{M_4})\ \boldsymbol{EM_{i,t}} = \alpha_0 + \alpha_1 \boldsymbol{COVID}_{i,t} + \alpha_2\, COVID_{i,t} * ROA_{i,t} + \alpha_3\, COVID_{i,t} * MTB_{i,t} + \alpha_4\, COVID_{i,t} * LEV_{i,t} + \alpha_5\, COVID_{i,t} * AUD_{i,t} + \alpha_6\, COVID_{i,t} * BLOC_{i,t} + \alpha_7\, COVID_{i,t} * SIZE_{i,t} + \varepsilon_{it}$$

When compared to the M3 estimation results, we note first that in their interactions with the COVID variable, the ROA and BLOC variables no longer have a statistically significant impact on EM practices. However, the AUD variable, which has no significant effect in the estimation of M3, shows a negative and statistically significant interaction coefficient at the 1% threshold. As for the MTB variable, its contribution to explaining EM is much greater (coefficient of 0.037 versus 0.013) when combined with the COVID variable.

5. Conclusion

This study examined the impact of the COVID-19 pandemic on the Tunisian listed firms' EM practices. The findings show that these firms used decreasing income DA during the period of the COVID-19 pandemic. Also, with regard to REM, the COVID variable displays a negative and significant response coefficient but of lesser magnitude. Tunisian listed firms adopted both accounting and REM downwards during the period of the COVID-19 pandemic, indicating that the troubled period can be favorable to large scale practices. These findings present strong implications. In fact, this study's findings can help Tunisian authorities, listed companies and market investors to better understand EM practices during a negative shock and to better understand the various internal and external factors influencing the quality of financial reporting. These findings may contribute, also, significant EM implications for scholars interested in other emerging markets. As limitations, we point out mainly to the small sample size used in this study and that we used a single model, namely the modified Jones model (1995), to measure the accounting EM. Also, we used a binary variable as a proxy for the COVID- 19 pandemic. Going forward, we recommend that future research studies rely more on annual data. This would certainly increase the sample size since all firms publish annual reports. In addition, we recommend that future studies evaluate the impact of the severity of the COVID-19 epidemic on EM by making use of other COVID-19 indicators such as (Ali *et al.*, 2022) either the mortality rate or the hospitalization rate. It would also be interesting to integrate the financial distress (Ali *et al.*, 2022) variable and to study the effect of its interaction with the COVID-19 pandemic on EM.

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Further reading

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