EARNINGS MANAGEMENT TOOLS DURING FINANCIAL DIFFICULTIES: EVIDENCE FROM FRENCH UNLISTED COMPANIES

Domenico Campa

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Earnings management tools during financial difficulties: evidence from French unlisted companies

Gestion des résultats en situation de difficultés financières : le cas des entreprises françaises non cotées

Domenico CAMPA
Associate Professor of Accounting
International University of Monaco
INSEEC Research Center
14, Rue Clerissi
98000 Principality of Monaco
dcampa@inseec.com

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Abstract
The aim of this paper is to investigate whether there is a relationship between the severity of financial difficulties of active firms (i.e., not involved in any insolvency procedure) and their level of earnings management, and how companies manipulate earnings during these situations. The evidence from a sample of French non-financial unlisted entities, composed of 6,190 different firms and 47,660 observations, with data from 2009 to 2016 subjected to multivariate analyses, reveals that firms with more severe financial problems exhibit higher levels of income-increasing earnings manipulation. It also indicates that, in situations of financial difficulties, entities manage earnings through real activities rather than accruals. All this evidence holds true for different proxies for financial concerns and earnings management, as well as after controlling for the impact of the financial crisis. The results highlight to auditors and other monitoring bodies the areas of an annual report that may indicate earnings manipulation during situations of financial difficulties. They contribute to the debate...
about the joint and/or alternative use of accrual-based and real transaction manipulation, showing that, during situations involving financial problems, companies use them as alternatives. They finally add to the research about the role of institutional settings and/or firm incentives in the choice between different earnings management tools.

**KEYWORDS:** FINANCIAL DIFFICultIES EARNINGS MANAGEMENT REAL ACTIVITY MANIPULATION DISCRETIONARY ACCRUALS

### Résumé

Le premier objectif de cet article est de déterminer s’il existe une relation entre la détresse financière des entreprises et la gestion des résultats. Le second objectif est de déterminer comment la gestion des résultats est opérée durant ces périodes spécifiques de difficultés financières. Les données sont issues de la base ORBIS. Un échantillon de 6 190 compagnies non financières françaises non cotées est analysé sur la période 2009-2016. Les tests sont réalisés à partir d’analyses multivariées. Les résultats indiquent que plus les difficultés financières sont importantes, plus les sociétés ont recours à la gestion de leur résultat à la hausse. Pour cela, elles favorisent l’utilisation de variables impactant leur activité réelle plutôt que l’utilisation de variables comptables de régularisation discrétionnaires. Les résultats obtenus peuvent être ainsi particulièrement utiles aux auditeurs et aux organes de contrôle. En effet, il est démontré que, lors de périodes de difficultés financières, leurs diligences ne doivent pas uniquement portées sur les variables comptables de régularisation discrétionnaire telles que les provisions mais aussi sur les variables impactant les décisions d’exploitation, de financement ou d’investissement. Cette analyse participe à un débat bien connu, celui de la gestion du résultat. Les résultats obtenus démontrent que lorsque les sociétés traversent des périodes de difficultés financières, elles utilisent alternativement des variables comptables de régularisation discrétionnaire et des variables relatives à leur activité réelle afin de gérer leur résultat. Les résultats contribuent à la littérature qui porte sur le rôle des cadres institutionnels et sur la motivation des sociétés dans l’utilisation des outils de gestion du résultat.

**MOTS CLÉS : DIFFICULTES FINANCIERES GESTION DE RÉSULTATS GESTION DES ACTIVITÉS RÉELLES VARIABLES COMPTABLES DE RÉGULARISATION DISCRETIONNAIRE.**

### 1. Introduction

Companies showing signs of financial difficulties are a matter of concern for several parties, such as shareholders who may perceive a decrease in their return on investment from a decline in share prices and/or dividends, employees who may feel their job position is in danger, lenders who can expect losses from the inability of firms to meet their obligations, public authorities, which must
protect firms’ stakeholders in the case of firms’ default and consequent liquidation, and for companies themselves, as they may find ‘closed doors’ when they ask for new funds to overcome difficult times. These scenarios can lead to irreversible consequences for the entities involved (Baumgartner and Dupius 2017). Accordingly, they may provide incentives to managers to put in place strategies aimed at concealing, or at least mitigating, the real company performance through income-increasing earnings management (e.g., Franz et al. 2014).

Extant evidence that explains the behaviours of firms in financial difficulties focuses mainly on entities that were already close to the end of their life (i.e., those that subsequently filed for bankruptcy) or on those firms that experienced negative events because of their poor performance in comparison with an agreed benchmark (i.e., violation of covenants). However, acting when the ‘illness’ is already present is an especially short-term vision, since these actions only postpone the irreversible consequences that financial problems bring. Entities have tools with which to assess whether their financial situation can be perceived as problematic by their stakeholders, even if such difficulties are transitory, and incentives to take actions to make their performance look better than it actually is. This is true, regardless of whether the firm is close to technical default or to covenant violation (e.g., Defond and Jiambalvo 1994).

Using a large sample of active (i.e., not involved in any insolvency procedure) French non-financial unlisted entities, composed of 6,190 different firms and 47,660 firm-year observations and data from 2009 to 2016, this paper aims to investigate whether the severity of firms’ financial difficulties is associated with more pervasive income-increasing earnings management and whether firms have any preferred earnings management tool when they experience financial problems.

The use of a sample of unlisted companies from France is relevant for the following reasons. Firstly, there is a paucity of studies about firms in difficult financial conditions focused on this country (Saboly 2001), although France generated, in 2018, the third largest GDP in the EU and represented the third most populous European country, according to statistics provided by the EU. Furthermore, the peculiarities of French law could limit access to external funds for firms in financial trouble (Plantin et al. 2013). More specifically, in relation to the first point, Saboly (2001) explicitly acknowledges that too little research has been undertaken on firms experiencing financial difficulties in France. She makes the first exploration of managers’ choices in companies in financial trouble using a sample from the 1990s and a rather descriptive methodology, followed by the analysis of three case studies. Hence, a study that uses a large sample and more recent data is relevant in terms of adding evidence to this field of research. The second point is also quite important for outlining the relevance of France as the targeted country for this study. In their work, Plantin et al. (2013) convincingly...
frame the impact of French law on firms with financial problems. The authors begin their work stating that “financial debt is the primary source of external funding for (French) firms” (Plantin et al. 2013, p. 1), as well as acknowledge that debt, rather than equity, is the main source from which French firms obtain funding. This is especially the case for unlisted firms that cannot rely on the markets for the attainment of funds. Thus, in a context such as France where, in line with the EU situation, unlisted entities represent more than 99% of companies (European Commission 2008) and are the main providers of employment and the source of a large proportion of economic growth (EcoDA 2010), the importance of investigating such firms is quite evident.

Significant exposure to external debt puts companies under severe financial stress, increasing the risk that they may not meet their obligations. It is here that French law plays a role. Indeed, Plantin et al. (2013) claim that French bankruptcy law is unique among other European countries in terms of the low level of protection afforded to creditors in comparison to other stakeholders. Therefore, creditors are well aware that, in the case of financial difficulties, French law will treat them quite unfairly, whereby they may become reluctant to lend if they are not reasonably sure that a company is financially healthy. In addition, Baumgartner and Dupius (2017) show that, if a company in financial difficulty attracts the attention of the French public authorities, the consequences are often irreversible, with the majority of them ending up in a liquidation process. Based on these premises, French entities would have very strong incentives to improve their financial performance in the presence of signals of financial problems.

The results of this study show that, among French unlisted entities, the level of their financial difficulties is related, in general, to higher income-increasing earnings manipulation. More detailed analyses indicate that companies manage earnings upwards through real activities, but do not make use of accrual manipulation. The results are robust in relation to different levels of financial difficulties, several proxies for financial concerns and earnings management, as well as after controlling for the impact of the financial crisis.

The findings make both practical and academic contributions. In terms of the former, the evidence is important for firms’ stakeholders, national authorities, and other regulatory and monitoring bodies. Indeed, it supports the concerns, as highlighted by Plantin et al. (2013), that a law which is unfair to creditors could discourage them from providing companies that look financially unhealthy with access to credit, which may incentivize the latter to boost their income through earnings management strategies. Accordingly, changes to the law for distressed companies may be considered, in accordance with the suggestions made by Plantin et al. (2013). The results could help auditors and other monitoring bodies to locate the areas of an annual report that may act as a red flag during situations of financial difficulties. From an academic point of view, the findings contribute
to the debate on the joint and/or alternative use of different earnings management tools (Zang 2012) by highlighting that, in situations of financial problems, companies rely on one particular earnings management tool: real transaction manipulation. This would indicate that firms prefer a less detectable way of managing earnings (Zang 2012) during situations that put them under the spotlight of several stakeholders (Pryshchepa et al. 2013). In addition, Enomoto et al. (2015) find that managers operating in countries with weak investor protection (including France) use more accrual earnings management and less real activity manipulation. The evidence from this paper shows that the pressure brought about by financial problems may be more relevant than the country level of investor protection in the course of investigating earnings manipulation tools.

The rest of the paper is organized as follows. Section 2 frames this study within the context of the extant literature, gives an overview of the French insolvency regime and develops the hypotheses. Section 3 sets out the sample selection procedure, how the data are obtained and how the models are used to test the hypotheses. Section 4 presents and discusses the empirical results as well as some additional tests. Finally, Section 5 concludes the paper, highlighting its main conclusions, contributions and limitations.

2. Background and hypotheses

2.1. Earnings manipulation in situations of financial difficulties

The financial accounting literature offers several examples of scenarios that may encourage managers to manipulate accounting figures. They include beating analysts’ forecast and/or delivering zero-earnings surprises (e.g., Burgstahler and Dichev 1997, Lee et al. 2006), meeting debt covenants (e.g., DeFond and Jiambalvo 1994, Jaggi and Lee 2002), increasing bonus-related salaries (e.g., Healy 1985, Shuto 2007), reducing taxation liabilities (e.g., Goncharov and Zimmermann 2006, Keating and Zimmerman 2000), decreasing regulatory bodies’ intervention (e.g., Jones 1991, Key 1997), and taking advantage of favourable IPO or equity issues (e.g., DuCharme et al. 2004, Friedlan 1994). The owners of firms as well as company stakeholders are not indifferent to the possibilities that managers will engage in earnings manipulation. Thus, constraints are usually put in place to mitigate and monitor such opportunistic behaviours, including market control for listed firms (e.g., Ball and Shivakumar 2005), the implementation of strong corporate governance features (e.g., Davidson et al. 2005), the activism of institutional investors (e.g., Velury and Jenkins 2006), and the presence of the Big 4 auditing firms (e.g., Francis and Wang 2008).
It is evident from the examples reported above that, when firms experience financial difficulties, they may be tempted to alter their performance artificially, because they could experience negative effects if their true situation is revealed. They could lose, for example, the confidence of their suppliers, who will not be sure whether the firm can pay for their payables (e.g., Platt and Platt 2002), or the trust of investors, who may renegotiate the existing debt or ask for higher interest rates on new loans (e.g., Van Binsbergen et al. 2010). Accordingly, there is evidence of income-increasing earnings manipulation when firms are close to violating debt covenants (e.g., Dichev and Skinner 2002, Franz et al. 2014), even in cases where this violation is not a signal of the firm’s impending bankruptcy (e.g., Defond and Jiambalvo 1994). DeAngelo et al. (1994), instead, state that the accounting choices of management during difficult financial situations is a reflection of these events, rather than evidence of deliberated earnings management. They also show that firms that experience financial problems exhibit income-decreasing strategies. The findings reported by Pryshchepa et al. (2013) link the studies mentioned above, since they show that firms that experience financial problems engage in more aggressive accounting policies, but only if investors do not realize that they are actually in financial distress. Meanwhile, they engage in conservative accounting behaviours if investors perceive the presence of financial concerns. This evidence is also relevant, given the investigation into a sample of unlisted firms, since the activism of investors and/or other monitoring bodies towards unlisted entities may be quite limited.

2.2. Financial difficulties and earnings manipulation tools

The accounting literature distinguishes between two main tools for earnings management: accrual manipulation and real activity manipulation (e.g., Schipper 1989). The former refers to the ‘abuse’ of practices allowed by the generally accepted accounting principles (Dechow and Skinner 2000, Gunny 2010). In particular, it is related to those items included in a financial statement that do not directly correlate to immediate cash flow movement and, thus, need a certain degree of estimation and judgement from management. Examples include the estimation of provisions for bad debts or for other potential future costs arising from current events, estimations of depreciation and amortization and, in general, all those items that must be recorded in the annual report in accordance with the matching principle of expense recognition and the accounting concept of prudence. This type of earnings management is relatively simple to carry out and usually takes place after the end of the fiscal year, when managers knows whether earnings management is needed (Zang 2012). However, companies cannot use it freely since accrual management is easy detectable by external...
monitoring bodies, such as auditors, which play an active role in reviewing companies’ accounting choices (Zang 2012).

Real activity manipulation, on the other hand, consists of implementing business transactions that do not reflect typical or optimal economic decisions, but are undertaken with the primary objective of influencing the company’s reported performance. Examples include selling goods under unusually favourable conditions with the aim of inflating sales (regardless of whether or not part of the cash flow related to those sales will flow to the entity in the future), overproduction with the aim of decreasing the cost of goods sold, and cutting or delaying discretionary expenses (e.g., marketing, R&D and maintenance) in order to show higher current earnings (Roychowdhury 2006). In contrast with accrual manipulation, this type of earnings management does not necessarily result in a departure from the accounting standards; thus, it is more difficult to detect, because auditors, regulators and other monitoring bodies are not in a position to judge the economic decisions of companies (Zang 2012). On the other hand, real activity manipulation can be potentially costly for companies because it may mean carrying out transactions that are not optimal from an economic point of view, which may have negative effects on future firm performance, liquidity and profitability (Bhojraj et al. 2009, Chen et al. 2009).

Originally, research on earnings management failed to investigate real activity manipulation, focusing almost exclusively on accrual-based earnings management, although the former seems to be the tool preferred by most managers (Graham et al. 2005). Accordingly, many of the earliest studies on earnings management among firms experiencing difficult financial conditions only focused on accrual earnings management, highlighting mixed results in terms of both higher income-increasing discretionary accruals (e.g., Rosner 2003, Beneish et al. 2012) and more pervasive income-decreasing discretionary accruals (e.g., Habib et al. 2013, Charitou et al. 2007) among companies with higher levels of financial problems. However, since the above-mentioned studies ignore real activity manipulation, they only provide a partial picture of the earnings management behaviours of firms in financial difficulties. In addition, firms can use both earnings management tools either jointly or alternatively (Roychowdhury 2006, Zang 2012), while possessing different characteristics and different cash flow implications. Thus, investigating how managers of firms with financial problems use accrual and real activity manipulation is indeed a relevant matter (Franz et al. 2014). According to the evidence reported by Pryshchepa et al. (2013), when investors discover that firms are experiencing financial problems, which in turn may negatively impact their ability to transfer wealth to shareholders, this can tilt the scale towards real activity manipulation since the latter is difficult to detect (Zang 2012). Similarly, Franz et al. (2014), investigating whether firms, which are close to debt covenant violation, manipulate earnings, find that firms
rely more on real activity manipulation for achieving their earnings management objectives and that, in more recent years (i.e., after the introduction of the Sarbanes-Oxley Act), they have reduced the use of income-increasing accrual manipulation in favour of the other tool.

2.3. Accounting information during financial difficulties: an overview of the French regime

Financial information in France becomes highly relevant when a company is experiencing financial difficulties (Saboly 2001). Indeed, even if a company is not technically in financial distress, it may be under the spotlight of the French public authorities if either the auditors have doubts about its going concern or whether the president of a court has doubts about its financial viability. In these situations, the managers of firms can be summoned to the court to provide clarifications about the severity of such financial difficulties and to explain how they are planning to resolve them (Saboly 2001). Being involved in this process, even in the absence of future events of distress, can create significant problems for entities since the mere perception of financial problems among creditors increases the level of monitoring activities over companies with negative effects in terms of value creation for shareholders (Pryshchepa et al. 2013). If, instead, the debt of the company exceeds its firm value, in accordance with the French regime, the entity enters into insolvency proceedings (Plantin et al. 2013).1

There are two main types of proceedings in French bankruptcy law: amicable procedures and legal procedures. Amicable procedures include three types of actions: ad hoc mandate, conciliation and accelerated financial safeguard. These methods are initiated by debtors and supervised by a mediator appointed by the court with the aim of striking an agreement between the debtor and its creditors (Domeget Morin and Pousset 2017, Plantin et al. 2013). Legal procedures include the judicial settlement, court-supervised liquidation and the safeguard procedure. The judicial settlement includes the adoption of a recovery or transfer plan following an observation period of six to 18 months, during which the firm is run by a court-appointed administrator and/or an official receiver (Plantin et al. 2013). Court-supervised liquidation instead puts an end to the debtor’s activity. The assets of the company are sold off to pay the creditors (Plantin et al. 2013). The safeguard procedure is a preventive procedure, which aims to enable the firm to

1. The firm value is the present value of the firm’s future cash flows in the event that it continues its activity, that is, the difference between its operating receipts and its disbursements (sales, wages, raw materials etc.), minus any net investment and taxes (Plantin et al. 2013, p. 5).
continue its activity, maintain employment and clear its debts. It enables firms
to take advantage of a number of measures set forth by the judge, which apply
to all of its creditors, including the cessation of individual proceedings and the
suspension of debt maturity dates (Plantin et al. 2013). Baumgartner and Dupius
(2017) note that 67.9% of insolvency proceedings in France end in liquidation
and 29.9% are concluded with a judicial settlement, while the safeguard pro-
ceeding is the outcome in only 2.2% of cases.

2.4. Hypotheses development

Based on the literature discussed above, two main points should be high-
lighted. It is evident that, if there is suspicion that a company is experiencing
financial difficulties, it may enter into an investigation led by the public authori-
ties (Saboly 2001), which may alarm investors (Pryshchepa et al. 2013) and often
create irreversible consequences for entities (Baumgartner and Dupius 2017).
Accordingly, firms that experience financial difficulties, but are not involved in
any insolvency procedure, may have incentives to manipulate earnings upwards,
with the aim of concealing and/or postponing the negative consequences that
this situation can cause. This may be highly relevant in a country such as France,
where national law could limit access to external funds for firms in financial
trouble (Plantin et al. 2013). Accordingly, the first hypothesis of this paper can
be stated as follows:

\[ \text{HP1. The severity of firms’ financial difficulties is related to higher income-}
increasing earnings manipulation.} \]

Managers can manipulate earnings using either accruals or real activities, or
both. While many of the previous studies on this topic have ignored the possi-
bility that managers manipulated earnings through real activities (e.g., Habib et
al. 2013, Charitou et al. 2007), recent research has provided evidence to show
that both earnings manipulation tools can be used to manipulate company per-
formance in scenarios of financial problems (García Lara et al. 2009). Firms
in financial trouble receive closer attention from stakeholders, including exter-
nal auditors, which would make accrual manipulation a risky choice as it can
easily be detected (DeAngelo et al. 1994), and lenders, who could look more
closely at the accounting policies of companies (DeAngelo et al. 1994). Indeed,
as observed by Pryshchepa et al. (2013), firms identified as distressed exhibit
more conservative accounting policies because income-increasing accrual manip-
ulation would likely be detected by investors, given the greater amount of mon-
itoring these firms are subjected to. Hence, a less detectable strategy (i.e., real
activity manipulation) of earnings manipulation may be the preferred earnings
manipulation tool for firms with more severe financial problems. Accordingly,
the second hypothesis can be stated as follows:

\[ \text{HP2. Firms with more severe financial difficulties are more likely to use real }
activity manipulation of earnings.} \]
HP2. The severity of firms’ financial difficulties is related to higher income-increasing earnings manipulation through real activities, while it is not related to higher income-increasing accrual manipulation.

3. Methodology

3.1. Sample selection

To test the hypotheses presented in the previous section, a sample of non-financial unlisted companies operating in France has been selected using the ORBIS database. The time series covers the period from 2009 to 2016, representing the earliest and most recent years available on ORBIS at the time of data collection. The starting point was the population of unlisted active firms operating in France included in the ORBIS database which do not operate in the financial sector (i.e., US two-digit SIC code from 60 to 67). This resulted in a total of 197,225 individual firms. To obtain a manageable number of observations and ensure that there were not too many missing data, firms not filing annual reports and very small firms, (i.e., companies with a turnover of less than 10 million euros) were excluded. This further step brought the sample down to 6,859 entities. After eliminating companies without all of the necessary data for the calculation of the variables used in the empirical analyses, the final sample consisted of 6,190 firms and 47,660 observations.

3.2. Measuring financial difficulties

Since the severity of firms’ financial problems is the main focus of this study, it is crucial to find a good proxy for estimating this. The extant literature has developed several measures aimed at capturing the financial difficulties of entities. Some of these proxies look at the relationship between financial figures, such as firm liabilities and the market value of assets (e.g., Black and Scholes 1973, Merton 1974), or between interest expenses and operating income (Fich

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2. The ORBIS database was last checked for updates in January 2018. At that time, it potentially had data from 2008 to 2017. However, data from 2017 were absent for effectively all the companies. The time series starts from 2009 because of the use of lagged values for the estimation of some of the variables used in the empirical analyses.

3. The total number of firm-year observations is slightly lower than 49,520 (6,190 different firms over eight years, i.e., 2009-2016), since there were cases where a complete time series was not available.
and Slezak 2008). Meanwhile, some indices measure financial problems as a discrete-time hazard model (e.g., Chava and Jarrow 2004), whereas others apply coefficients to several company financial ratios (e.g., Altman 1968, 2000, Beaver 1996, Carcello and Neal 2000, Zmijewski 1984). This paper employs the traditional Altman Z-score and, in particular, given the structure of the sample, the version developed for unlisted companies. The reasons for this choice are multiple. Firstly, as indicated above, this index does not require market data, so it is suitable for unlisted firms. Secondly, while several other indexes have been mainly used to predict bankruptcy, the Altman Z-score deals with other types of financial problems experienced by firms (Altman et al. 2017). Therefore, this allows for considering company financial difficulties in a much broader way, which is the aim of this study. Thirdly, the Z-score is accurate. Indeed, Altman et al. (2017) tested the performance of the Z-score using unlisted non-financial companies across all industrial sectors (i.e., a sample with similar characteristics to the sample employed in this paper) at an international level. They provided evidence that the Altman Z-score works very well in the majority of the countries investigated, with a prediction accuracy of about 75% (Altman et al. 2017).

In accordance with Altman (2000), the Z-score is expressed by the following equation (1). It is estimated for every firm-year observation included in the sample:

\[ Z = 0.717 \times X_1 + 0.847 \times X_2 + 3.107 \times X_3 + 0.420 \times X_4 + 0.998 \times X_5 \]  

(1)

In the above equation:
- \( X_1 \) is current assets minus current liabilities divided by total assets
- \( X_2 \) is retained earnings divided by total assets
- \( X_3 \) is earnings before interest and taxes divided by total assets
- \( X_4 \) is the book value of equity divided by total liabilities
- \( X_5 \) is sales divided by total assets

Once the Z-scores are estimated, firm-year observations are divided into three groups based on the severity of the financial situation, in accordance with the discrimination zones set by Altman (2000): a Z-score lower than 1.23 signals a situation of very severe concern, a Z-score higher than 1.23 but lower than 2.9 highlights a ‘grey’ area, and a Z-score greater than 2.9 suggests a financially healthy situation. In turn, an index that measures the severity of a company’s financial situation, \( FINDIFF \), is generated, which, starting from 0, increases in value as a firm becomes financially riskier. In particular, the variable \( FINDIFF \) takes a value of 0 for firm-year observations with a Z-score greater than 2.9, a value of 1 for observations exhibiting a Z-score between 1.23 and 2.9, and a value of 2 for Z-scores lower than 1.23.
3.3. Earnings management tools

3.3.1. ACCRUAL MANIPULATION

Accrual manipulation is estimated using performance-adjusted discretionary accruals (Ashbaugh et al. 2003, Kothari et al. 2005). Indeed, this is the most widely used measure in accounting research as it estimates discretionary accruals more precisely than other methodologies (e.g., Chi et al. 2014, Cohen et al. 2008, Zang 2012): it eliminates the presumed tendency to cause a measurement error, due to the discretion of revenue recognition (Bartov et al. 2001) from the Jones (1991) model, and controls for the firm’s contemporaneous performance using the return on assets (ROA) (Ashbaugh et al. 2003, Kothari et al. 2005).

The estimation of the performance-adjusted discretionary accruals requires several steps. Firstly, total accruals are calculated based on the following formula (2):

\[ TA_{it} = \Delta CA_{it} - \Delta CL_{it} - \Delta CASH_{it} + \Delta STD_{it} \]  

A description of the variables is given in Appendix 1.

Total accruals are used to estimate the regression coefficients from the following model (3), estimated each year using all firm-year observations with the same two-digit SIC code:

\[ TA_{it} = \beta_1 \left( \frac{1}{A_{it-1}} \right) + \beta_2 \Delta REV_{it} + \beta_3 PPE_{it} + \beta_4 ROA_{it-1} + \varepsilon_{it} \]  

A description of the variables is given in Appendix 1.

The coefficient estimates are then used to measure expected, non-discretionary accruals (NDAs), controlling for performance and changes in account receivables:

\[ NDA_{it} = \tilde{\beta}_1 \left( \frac{1}{A_{it-1}} \right) + \tilde{\beta}_2 (\Delta REV_{it} - \Delta REC_{it}) + \tilde{\beta}_3 PPE_{it} + \tilde{\beta}_4 ROA_{it-1} \]  

A description of the variables is given in Appendix 1.

The measure of discretionary accruals (DAs) is the difference between total accruals (TAs) and NDAs.

A second measure of accrual manipulation, focused on short-term accruals and derived from Dechow and Dichev’s (2002) methodology, is employed. Dechow and Dichev (2002) set up a model where discretionary accruals are estimated by the residuals of firm-specific regressions concerning changes in working capital according to past, present and future operating cash flow realizations. This approach deals with the concerns raised by Hribar and Collins (2002), who stated that discretionary accrual measures, which do not take into...
account cash flow statement measures, could introduce measurement errors into accruals estimates. Dechow and Dichev’s (2002) methodology is complemented by the finding reported by McNichols (2002, p. 65), who provided evidence that “linking the approach taken by Dechow and Dichev (2002) with that taken by Jones (1991) has the potential to strengthen both approaches, and to calibrate the errors associated with Jones’ measure of discretionary accruals and Dechow and Dichev’s (2002) measure of earnings quality”. Accordingly, she added a proxy for growth and the level of property, plant and equipment to the original Dechow and Dichev (2002) model. Thus, in line with Dechow and Dichev (2002) and McNichols (2002), the residuals from the following model (4), denominated \( DADD \), are used as an additional proxy for discretionary accruals.

\[
\Delta WC_{it} = \alpha + \beta_1 CFO_{it-1} + \beta_2 CFO_{it} + \beta_3 CFO_{it+1} + \beta_4 \Delta REV_{it} + \beta_5 \bar{PPE}_{it} + \epsilon_{it} 
\]

A description of the variables is given in Appendix 1.

3.3.2. REAL ACTIVITY MANIPULATION

Sales manipulation will be used as a proxy for real activity manipulation. Two main reasons explain this choice. Firstly, sales revenue was found to be the largest single accounting item subject to manipulation in previous research (e.g., Stubben 2010), following the examination of restatements and enforcement cases of the Security and Exchange Commission (e.g., Palmrose and Scholz 2004), an analysis of the frequency of situations in which audited clients put pressure on auditors (Nelson et al. 2003), and the evidence from famous accounting scandals, such as Parmalat (see Melis 2005) or Gowex (see Gotham City Research 2014). Secondly, sales manipulation would be the most suitable strategy for companies in financial trouble. Indeed, other real activity manipulation techniques would either require a significant investment of resources, which entities under difficult economic conditions may not have, such as in the case of production cost manipulation\(^4\) (Campa and Camacho-Miñano 2015), or may significantly compromise future profitability (Bhojraj et al. 2009, Chen et al. 2009), as in the

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\(^4\) According to Roychowdhury (2006), if companies increase the level of production, the fixed overheads are distributed over a larger number of units with a consequent reduction in fixed costs per unit. This will then reduce the reported cost of goods sold, thus increasing the operating profit. However, overproduction also means additional costs in terms of investments in raw materials, storage and safeguarding expenses etc.
case of cutting discretionary expenses (i.e., R&D, advertising, maintenance or safety expenses).5

Sales manipulation consists of accelerating the timing of sales through larger discounts or more convenient credit terms. This will temporarily increase sales revenues, while, at the same time, delaying and/or reducing operating cash flows. Additional recorded sales, under positive margins, will boost current earnings.

Following the methodology developed by Roychowdhury (2006), sales manipulation is investigated using the following cross-sectional regression (5), estimated for each year by using all firm-year observations with the same two-digit SIC code.

\[
CFO_{it} = \alpha + \beta_1 \left( \frac{1}{A_{it-1}} \right) + \beta_2 \Delta REV_{it} + \beta_3 \Delta REV_{it} + \epsilon_{it} 
\]

A description of the variables is given in Appendix 1.

For each firm, the abnormal cash flow is obtained in terms of the residuals from equation (5). Lower values of abnormal cash flow would be evidence of more income-increasing sales manipulation.6 Accordingly, to make the interpretation easier and consistent with other earnings manipulation proxies, the residuals of model (5) are multiplied by -1, in order to obtain a continuous variable (\(ABNCFO\)) which increases with an increasing level of upward earnings manipulation.

In line with Franz et al. (2014), the two proxies for discretionary accruals and for sales manipulation are also, in turn, combined into a unique variable, which

5. The use of production cost manipulation and discretionary expense manipulation, as in the case of Roychowdhury (2006), would have significantly reduced the sample size. Indeed, the cost of goods sold was available for only 95 observations (0.20\% of the total sample). Discretionary expenses, instead, are not provided by the ORBIS database, at least for the companies included in the investigated sample.

6. Lower levels of \(ABNCFO\) suggest higher levels of income-increasing real activity manipulation. Indeed, a lower \(ABNCFO\), given the reported sales, indicates that fewer sales are converted into cash, which can be due to several means of increasing sales and thus profit: the concession of abnormal discounts to customers, premature sales recognition, more lenient credit terms etc. (Roychowdhury 2006).
measures the total level of earnings management, $TEM$ and $TEM2$, equal to the sum of $DA$ and $ABNCFO$ and $DADD$ and $ABNCFO$, respectively.\footnote{The measures of discretionary accruals are incorporated into the variable $TEM$, one by one, in order to determine the combined effect of accruals and real activity manipulation. Putting all of the three measures together would bias the variable $TEM$ because it would be similar to including discretionary accruals twice, given that, as indicated in the correlation table, the two proxies for accrual manipulation are strongly correlated.}

### 3.4. Empirical model

The following regression (6) is used to test the hypotheses:

$$EM_{it} = \alpha + \beta_1 FINDIFF_{it} + \beta_2 SIZE_{it} + \beta_3 GROWTH_{it} + \beta_4 LEV_{it} + \beta_5 EISSUE_{it} + \beta_6 DISSUE_{it} + \beta_7 ROA_{it} + \beta_8 BIG4_{it} + \epsilon_{it} \quad (6)$$

A description of the variables is given in Appendix 1.

The sign and the significance of $\beta_j$ provide evidence of the relationship between earnings management and the level of entities' financial difficulties. In particular, a positive (negative) $\beta_1$ would be consistent with higher (lower) levels of income-increasing earnings manipulation in the presence of the increased severity of financial problems.

In line with previous studies on earnings management, model (6) above includes classic control variables, such as size (Johnson et al. 2002), growth (Carey and Simnett 2006), level of company debt (Dechow et al. 1995), issuance of debt and equity (Shan et al. 2013), profitability (Kothari et al. 2005), and the presence of a Big 4 firm (Francis and Wang 2008). The model includes industry and year dummy variables. The $p$-values are calculated using statistics estimated from robust standard errors, clustered by firm. Finally, all continuous variables are winsorized at the first and 99th percentiles to avoid the results being biased due to the presence of outliers.

### 4. Results and discussion

#### 4.1. Descriptive statistics and univariate analyses

Table 1 presents the descriptive statistics for the variables used in the study.
A description of the variables is given in Appendix 1.

The average of the proxies for earnings management is close to 0, since they come from residuals of a model.\(^8\) The average FINDIFF is 0.78. Given that this variable takes integer values from 0 (companies with no sign of financial problems) to 2 (companies with severe financial difficulties), this indicates that, on average, the firms included in the sample do not exhibit extremely severe financial situations. Indeed, the average Altman Z-score is 2.54, which falls in the “grey” area of financial problems. Untabulated statistics show that the financial situation of companies, from this perspective, is stable over the time series investigated, with the average FINDIFF ranging from 0.76 in 2012 to 0.80 in 2015 and in 2016. The average Altman Z-score is also somewhat consistent over time, ranging from 2.49 in 2016 to 2.58 in 2011 and 2012. Companies do not show major changes in terms of growth, probably because the time period investigated

---

\(^8\) The average of DA is not exactly zero because, in accordance with Kothari et al. (2005), that variable is not a pure residual from a first-stage model but includes adjustments (see section 3.3.1). In addition, it is worth pointing out that all continuous variables, thus including the earnings management proxies, are winsorized (see end of section 3.4).
includes financial crisis years and non-financial crisis years, as well as several sectors of the economy, which compensate each other. The entities included in the sample have mainly financed their business through debt; around 7% of them have issued new equity and 30% have issued new debt. Companies have an average ROA of 3.4% and a significant majority of the sample employs a Big 4 audit firm.

The Pearson correlation matrix is reported in Table 2.

The table highlights a positive correlation between income-increasing total earnings management and sales manipulation and the level of financial difficulties (p-value=0.000 in all cases) and a negative correlation between the income-increasing discretionary accrual proxies and the severity of entities’ financial problems (p-value=0.000 in both cases). This indicates that companies experiencing financial difficulties exhibit higher levels of income-increasing total and real activity earnings manipulation, but lower levels of income-increasing discretionary accruals. Financial problems of firms worsen in relation to firm size and leverage. The level of financial difficulty is also directly related to the issuance of new debt and equity, indicating that firms with financial problems need to find additional resources by asking for funds, either from shareholders or from external lenders. Finally, the severity of companies’ financial situation is negatively related to growth and profitability. The latter relations are rather intuitive, since companies that struggle to generate enough wealth or entities that do not grow are more prone to experiencing financial issues. The earnings management proxies are, by definition, highly correlated, based on their similar nature. However, the correlation coefficients are not high if we only look, for example, at the accrual and real activity manipulation proxies.

Table 2 exhibits several significant correlations between variables to be included in the regression models. Therefore, only a multivariate analysis can provide statistically reliable evidence to test the hypotheses.9

9. A diagnostic test for multicollinearity, through the estimation of the variance inflation factor (VIF) coefficients for all regressions, was carried out. The VIF coefficients associated with the variables of interest and with the control variables are always below the threshold of 10 (Kennedy 2008), suggesting that multicollinearity does not affect the analyses. Strong VIF coefficients are only associated with the year dummy variables; however, a re-estimation of all of the analyses, by removing such variables, shows absolutely no effect on the evidence reported in the paper.
Table 2. Pearson correlation table

<table>
<thead>
<tr>
<th></th>
<th>TEM</th>
<th>TEM2</th>
<th>DA</th>
<th>DADD</th>
<th>ABNCFO</th>
<th>FINDIFF</th>
<th>SIZE</th>
<th>GROWTH</th>
<th>LEV</th>
<th>EISSUE</th>
<th>DISSUE</th>
<th>ROA</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEM</td>
<td></td>
<td>0.939***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TEM2</td>
<td>0.939***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DA</td>
<td>0.759***</td>
<td>0.631***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DADD</td>
<td>0.465***</td>
<td>0.546***</td>
<td>0.778***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ABNCFO</td>
<td>0.824***</td>
<td>0.845***</td>
<td>0.257***</td>
<td>0.014***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FINDIFF</td>
<td>0.114***</td>
<td>0.145***</td>
<td>-0.107***</td>
<td>-0.142***</td>
<td>0.263***</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>SIZE</td>
<td>-0.058***</td>
<td>-0.012***</td>
<td>-0.080***</td>
<td>0.004</td>
<td>-0.017***</td>
<td>0.241***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GROWTH</td>
<td>-0.070***</td>
<td>-0.059***</td>
<td>0.022***</td>
<td>0.082***</td>
<td>-0.123***</td>
<td>-0.083***</td>
<td>0.033***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEV</td>
<td>0.128***</td>
<td>0.162***</td>
<td>-0.071***</td>
<td>-0.090***</td>
<td>0.251***</td>
<td>0.431***</td>
<td>0.040***</td>
<td>0.014***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EISSUE</td>
<td>0.044***</td>
<td>0.048***</td>
<td>0.044***</td>
<td>0.048***</td>
<td>0.027***</td>
<td>0.062***</td>
<td>0.080***</td>
<td>0.054***</td>
<td>0.029***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DISSUE</td>
<td>-0.007</td>
<td>-0.008*</td>
<td>0.078***</td>
<td>0.108***</td>
<td>-0.078***</td>
<td>0.054***</td>
<td>0.037***</td>
<td>0.024***</td>
<td>0.035***</td>
<td>0.023***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROA</td>
<td>-0.281***</td>
<td>-0.338***</td>
<td>0.136***</td>
<td>0.206***</td>
<td>-0.535***</td>
<td>-0.408***</td>
<td>-0.027***</td>
<td>0.156***</td>
<td>-0.394***</td>
<td>-0.088***</td>
<td>-0.032***</td>
<td></td>
</tr>
<tr>
<td>BIG4</td>
<td>0.004</td>
<td>0.001</td>
<td>0.001</td>
<td>-0.004</td>
<td>0.004</td>
<td>0.000</td>
<td>-0.001</td>
<td>-0.004</td>
<td>0.003</td>
<td>0.003</td>
<td>0.001</td>
<td>-0.001</td>
</tr>
</tbody>
</table>

*, **, *** indicate that a coefficient is statistically significant at the 10%, 5%, and 1% level or better.

A description of the variables is given in Appendix 1.
4.2. Regression analysis

Table 3 presents the estimation of model (6).

**Table 3. Earnings manipulation and financial difficulties**

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>TEM (A)</th>
<th>TEM2 (B)</th>
<th>DA (C)</th>
<th>DADD (D)</th>
<th>ABNCFO (E)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-0.166</td>
<td>-0.029</td>
<td>-0.171</td>
<td>-0.033***</td>
<td>0.005</td>
</tr>
<tr>
<td>FINDIFF</td>
<td>0.008***</td>
<td>0.009***</td>
<td>-0.009***</td>
<td>-0.008***</td>
<td>0.017***</td>
</tr>
<tr>
<td>SIZE</td>
<td>-0.13***</td>
<td>-0.003***</td>
<td>-0.008***</td>
<td>0.002***</td>
<td>-0.004***</td>
</tr>
<tr>
<td>GROWTH</td>
<td>-0.040***</td>
<td>-0.009</td>
<td>-0.005</td>
<td>0.026***</td>
<td>-0.035***</td>
</tr>
<tr>
<td>LEV</td>
<td>0.009</td>
<td>0.011**</td>
<td>-0.006*</td>
<td>-0.005*</td>
<td>0.015***</td>
</tr>
<tr>
<td>EISSUE</td>
<td>0.023***</td>
<td>0.012***</td>
<td>0.031***</td>
<td>0.021***</td>
<td>-0.009***</td>
</tr>
<tr>
<td>DISSUE</td>
<td>-0.005**</td>
<td>-0.005***</td>
<td>0.025***</td>
<td>0.024***</td>
<td>-0.030***</td>
</tr>
<tr>
<td>ROA</td>
<td>-0.735***</td>
<td>-0.716***</td>
<td>0.196***</td>
<td>0.214***</td>
<td>-0.930***</td>
</tr>
<tr>
<td>BIG4</td>
<td>0.001</td>
<td>0.000</td>
<td>0.000</td>
<td>-0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>Observations</td>
<td>47,660</td>
<td>47,660</td>
<td>47,660</td>
<td>47,660</td>
<td>47,660</td>
</tr>
<tr>
<td>R-Squared</td>
<td>0.098</td>
<td>0.145</td>
<td>0.043</td>
<td>0.087</td>
<td>0.319</td>
</tr>
<tr>
<td>F-stat</td>
<td>65.82***</td>
<td>102.33***</td>
<td>26.79***</td>
<td>57.35***</td>
<td>281.72***</td>
</tr>
</tbody>
</table>

Notes:

For clarity, year-specific and industry-specific intercepts are omitted. *, **, *** indicate that a coefficient is statistically significant at the 10%, 5%, and 1% level or better. P-values calculated from standard errors clustered by firm.

A description of the variables is given in Appendix 1.

Columns A and B report the results for the total earnings management proxies and provide evidence with which to test HP1. The coefficient $\beta_1$ is positive and significant at the 1% level in both columns ($\beta=0.008$; p-value=0.000 in...
column A; $\beta=0.009$; p-value=0.000 in column B). This indicates that companies involved in the most severe financial situations exhibit higher income-increasing earnings manipulation. In particular, it shows that, on average, an increase in the level of their financial problems, based on Altman’s discrimination zones, would increase total earnings management by 0.8% or 0.9% of a firm’s total assets, depending on the discretionary accrual proxy used, ceteris paribus. This finding is in line with HP1 and previous evidence stating that, on average, income-increasing earnings manipulation practices are more pervasive among firms experiencing financial difficulties (e.g., Franz et al. 2014).

Columns C, D and E focus on HP2 and consider accrual and sales manipulation. The coefficient $\beta_1$ in columns C and D is negative and significant at the 1% level ($\beta=-0.009$; p-value=0.000 in column C; $\beta=-0.008$; p-value=0.000 in column D). This suggests that companies with serious financial difficulties exhibit lower income-increasing discretionary accruals than companies with safer profiles. More specifically, an increase in the index of financial difficulty results in lower discretionary accruals between 0.9% and 0.8% of a firm’s total assets, ceteris paribus. This shows that accrual manipulation is not a tool used by companies with financial problems to improve their apparent performance (e.g., Habib et al. 2013, Charitou et al. 2007), which is in line with the finding reported by Pryshchepa et al. (2013) in which firms identified as distressed exhibit more conservative accounting policies (i.e., minus income-increasing accrual earnings manipulation), because income-increasing accrual manipulation would likely be detected, given the higher levels of monitoring experienced by such entities.

In column E, the coefficient $\beta_1$ is positive and significant at the 1% level ($\beta=0.017$; p-value=0.000). This indicates that the financial problems of firms are related to more pervasive income-increasing sales manipulation by 1.7% of a firm’s total assets, ceteris paribus.

Overall, the evidence from columns C to E supports HP2, confirming that, based on the severity of their financial problems, firms improve their performance artificially using real activity manipulation rather than discretionary accruals. As indicated before, firms in financial difficulty receive closer attention from stakeholders, including external auditors and lenders (DeAngelo et al. 1994), which would make accrual manipulation a risky choice, as it may be easily discovered. Hence, a less detectable strategy (i.e., real activity manipulation) of
earnings manipulation is the preferred earnings manipulation tool for firms in financial trouble.\textsuperscript{10}

In terms of the control variables, columns C, D and E indicate a somewhat opposite trend between income-increasing accrual manipulation and upward real activity manipulation with respect to firm size, firm growth, the issuance of equity and debt, and firm profitability. In line with the extant literature, real earnings manipulation is more pervasive among highly leveraged firms and small entities (e.g., Carey and Simnett 2006, Dechow \textit{et al.} 1995).\textsuperscript{11}

\textsuperscript{10} The results are tested for reverse causality. To carry out this test, a model has been estimated employing the measure of financial distress, based on the Altman Z-Score, as a dependent variable, both as an indicator variable – \textit{FINDIFF} – (using an ordered logistic regression) and as a continuous variable – \textit{ALTMAN_Z-SCORE} – (using an OLS regression) and each proxy for earnings management, as well as other determinants of distress such as working capital, changes in cash, operating cash flow, the current ratio, firm leverage, profitability, growth, size, and the type of auditors as independent variables. The results (not tabulated) do not reveal reverse causality problems. Indeed, regardless of the earnings management proxy used, the evidence indicates that, in the presence of earnings management which depresses the net income, the level of firms’ financial difficulties increases. It means that a collapse in reported profitability is associated with firms’ level of distress, even when it is caused by earnings manipulation. On the contrary, the evidence from the main analyses of the paper shows that, in situations of financial difficulties, entities manage earnings upwards through real activities but not through accruals. Accordingly, the findings are robust in relation to reverse causality. In fact, if there had been reverse causality problems, this test should have shown a non-significant coefficient for the accrual manipulation measures and a positive coefficient for the total and the real activity manipulation proxies. The sign and the significance of the other control variables are in line with the expectations. More specifically, the level of firms’ financial difficulty is worse when firms exhibit a decrease in cash, significantly high levels of working capital, lower cash flow from operations, lower current ratios, higher levels of leverage, lower levels of growth and profitability, and when firms are bigger. Meanwhile, the financial problems of firms are not related to the type of auditor, i.e., Big 4 versus non-Big 4 audit firm.

\textsuperscript{11} As a test of robustness, model (6) was estimated using all the different earnings management proxies simultaneously, via the generalized method of moments, in order to account for the simultaneity of real activity and accrual manipulation. Indeed, this simultaneous approach takes account of correlations in the residuals across equations and allows us to consider the interdependence of sales, accrual and total earnings manipulation. The results (not tabulated) are exactly the same as those presented in Table 3.
4.3. Additional tests

4.3.1. ALTERNATIVE PROXIES FOR FINANCIAL DIFFICULTIES

To increase the reliability of the findings presented above, model (6) is estimated using two alternative proxies for financial difficulties, which are suitable for unlisted companies. Firstly, instead of using the three discrimination zones of the Altman (2000) approach, the raw values of the Z-scores (ALTMAN_Z-SCORE), calculated from formula (1), are used in place of the variable FINDIFF. In this case, it is important to bear in mind that higher values of the Z-scores are related to lower levels of financial problems.

The second proxy for financial concerns is based on the methodology developed by Fich and Slezak (2008). This is a dummy variable, which takes the value of 1, if the ratio that uses the operating profit as the numerator and the interest expenses as the denominator is lower than 1, and 0 otherwise. This indicator is built on the assumption that, when an entity cannot generate an operating profit large enough to cover its interest expenses, it could soon be defaulting on its debt. The fact that this proxy is not a score, but comes from a financial ratio, also helps to address the issue that indicators derived from scores could be ambiguous and lead to spurious results (Grice and Ingram 2001).

The estimation of model (6) using the two proxies explained above is reported in Table 4. Panel A reports the results using the raw values of the Altman (2000) Z-score, while panel B shows the results of the Fich and Slezak (2008) approach.

<table>
<thead>
<tr>
<th>Table 4. Earnings manipulation and financial difficulties: alternative estimations for financial problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>PANEL A – Raw values of the Altman (2000) Z-score</td>
</tr>
<tr>
<td>Dependent variable</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Intercept</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>ALTMAN_Z-SCORE</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>SIZE</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>GROWTH</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>LEV</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
### PANEL A – Raw values of the Altman (2000) Z-score

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>TEM (A)</th>
<th>TEM2 (B)</th>
<th>DA (C)</th>
<th>DADD (D)</th>
<th>ABNCFO (E)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EISSUE</td>
<td>0.023***</td>
<td>0.013***</td>
<td>0.032***</td>
<td>0.021***</td>
<td>-0.009***</td>
</tr>
<tr>
<td>DISSUE</td>
<td>-0.005**</td>
<td>-0.005***</td>
<td>0.025***</td>
<td>0.026***</td>
<td>-0.030***</td>
</tr>
<tr>
<td>ROA</td>
<td>-0.739***</td>
<td>-0.720***</td>
<td>0.191***</td>
<td>0.021***</td>
<td>-0.930***</td>
</tr>
<tr>
<td>BIG4</td>
<td>0.001</td>
<td>0.000</td>
<td>0.000</td>
<td>-0.001</td>
<td>0.001</td>
</tr>
</tbody>
</table>

- **Observations**: 47,660
- **R-Squared**: 0.098, 0.145, 0.043, 0.087, 0.318
- **F-stat**: 65.73***, 102.14***, 26.99***, 57.63***, 281.21***
- Year and Industry dummies: Yes, Yes, Yes, Yes, Yes

### Table 4 (cont’d). Earnings manipulation and financial difficulties: alternative estimations for financial problems

### PANEL B – Fich and Slezak (2008) indicator

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>TEM (A)</th>
<th>TEM2 (B)</th>
<th>DA (C)</th>
<th>DADD (D)</th>
<th>ABNCFO (E)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-0.173</td>
<td>-0.035</td>
<td>-0.161</td>
<td>-0.026**</td>
<td>-0.007</td>
</tr>
<tr>
<td>FINDIFF_FS</td>
<td>0.015***</td>
<td>0.013***</td>
<td>-0.004*</td>
<td>-0.002*</td>
<td>0.011***</td>
</tr>
<tr>
<td>SIZE</td>
<td>-0.012***</td>
<td>-0.002**</td>
<td>-0.009***</td>
<td>0.001**</td>
<td>-0.003***</td>
</tr>
<tr>
<td>GROWTH</td>
<td>-0.041***</td>
<td>-0.011</td>
<td>-0.003</td>
<td>0.027***</td>
<td>-0.038***</td>
</tr>
<tr>
<td>LEV</td>
<td>0.015**</td>
<td>0.018***</td>
<td>-0.015***</td>
<td>-0.012***</td>
<td>0.030***</td>
</tr>
<tr>
<td>EISSUE</td>
<td>0.023***</td>
<td>0.013***</td>
<td>0.031***</td>
<td>0.021***</td>
<td>-0.008***</td>
</tr>
<tr>
<td>DISSUE</td>
<td>-0.005**</td>
<td>-0.005***</td>
<td>0.024***</td>
<td>0.024***</td>
<td>-0.029***</td>
</tr>
<tr>
<td>ROA</td>
<td>-0.751***</td>
<td>-0.734***</td>
<td>0.218***</td>
<td>0.234***</td>
<td>-0.968***</td>
</tr>
</tbody>
</table>

- **Observations**: 47,660
- **R-Squared**: 0.145, 0.043, 0.087, 0.318
- **F-stat**: 102.14***, 26.99***, 57.63***, 281.21***
- Year and Industry dummies: Yes, Yes, Yes, Yes, Yes
In both panels, the evidence is in line with the main findings. More precisely, in panel A, the coefficient $\beta_1$ is negative and significant at the 5% level in column A and at the 1% level in columns B and E, while it is positive and significant at the 1% level in columns C and D. As indicated above, higher values of the Z-score indicate healthier financial situations; therefore, these results highlight higher levels of income-increasing total earnings management and real activity manipulation, as well as lower levels of upward accrual manipulation, among firms with more severe financial problems (i.e., those with a lower Z-score).

In panel B, the coefficient $\beta_1$ is positive and significant at the 1% level in columns A, B and E, while it is negative and significant at the 10% level in columns C and D. Again, this indicates that companies in financial difficulty, based on the Fich and Slezak (2008) indicator, exhibit higher levels of total and real activity manipulation, as well as lower levels of accrual manipulation, than safer companies. Accordingly, HP1 and HP2 are verified under these alternative measures of financial concern.

4.3.2. ALTERNATIVE PROXIES FOR EARNINGS MANIPULATION

Model (6) has been re-estimated using alternative proxies for earnings management. More specifically, since the main analyses include only one explicit proxy for real activity manipulation because of a lack of data (see endnote 5), some indirect estimations for the latter, used in studies focused on unlisted entities, have been employed. Such proxies are based on the distribution of earnings and related to loss avoidance and earnings-decrease avoidance (Coppens
and Peek 2005, Van Tendeloo and Vanstraelen 2008). Indeed, as explained by Burgstahler and Dichev (1997), stakeholders use heuristic thresholds at zero earnings or zero earnings changes to value their implicit claim on the firm and to determine the terms of transactions with the firm (Coppens and Peek 2005). Thus, entities have incentives to manipulate earnings beyond such thresholds. Moreover, Kahneman and Tversky (1979) suggest that investors do not like negative net income and that the disutility for a reported loss of one euro would be higher than the utility from a reported profit of the same amount (Coppens and Peek 2005). Accordingly, managers would not be inclined to report small losses or small earnings declines, but would use income-increasing earnings management to shift them into a net profit or to beat last year’s earnings, respectively. Determining whether loss avoidance and earnings-decrease avoidance are achieved through real activity manipulation or using accrual earnings management is not straightforward. Using UK firms, Gore et al. (2007) show that, if discretionary accruals are removed from earnings, the distribution of the latter does not show any discontinuity around the benchmarks of zero and last year’s earnings, but they do if discretionary accruals are included. This would suggest that the discontinuities are due, at least in part, to discretionary accruals. On the other hand, Dechow et al. (2003) find that firms reporting small profits exhibit the same level of discretionary accruals than entities reporting small losses, indicating that real activity manipulation may be the one used to turn small losses into a profit or to beat last year’s net income. Finally, Campa et al. (2019) explicitly find that entities use real activity manipulation through asset sales to boost earnings near the benchmark of last year’s earnings. Accordingly, based on the above, it cannot be excluded that loss avoidance and earnings-decrease avoidance are achieved through real earnings manipulation practices.

Loss avoidance and earnings-decrease avoidance are estimated using two indicator variables, \( SPOS \) and \( CHANGENI \). In line with Burgstahler and Dichev (1997) and Van Tendeloo and Vanstraelen (2008), these variables take the value of 1 if a firm respectively exhibits reported earnings and a reported change in earnings which is positive but lower than 1% of beginning total assets. These additional earnings management measures are used, in turn, as the dependent variable in model (6). Given the dichotomous nature of \( SPOS \) and \( CHANGENI \), the model is estimated using logistic regression. The results are reported in Table 5.
Table 5. Earnings manipulation and financial difficulties: alternative proxies for real earnings management

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>SPOS (A)</th>
<th>CHANGENI (B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-4.151***</td>
<td>-2.278***</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>FINDIFF</td>
<td>0.294***</td>
<td>0.065**</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.020)</td>
</tr>
<tr>
<td>SIZE</td>
<td>0.056**</td>
<td>0.077***</td>
</tr>
<tr>
<td></td>
<td>(0.017)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>GROWTH</td>
<td>-0.165*</td>
<td>0.996***</td>
</tr>
<tr>
<td></td>
<td>(0.088)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>LEV</td>
<td>1.040***</td>
<td>-0.252***</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>EISSUE</td>
<td>0.297***</td>
<td>0.051</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.328)</td>
</tr>
<tr>
<td>DISSUE</td>
<td>0.118***</td>
<td>0.014</td>
</tr>
<tr>
<td></td>
<td>(0.002)</td>
<td>(0.609)</td>
</tr>
<tr>
<td>ROA</td>
<td>-2.579***</td>
<td>1.103***</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>BIG4</td>
<td>0.066</td>
<td>0.005</td>
</tr>
<tr>
<td></td>
<td>(0.121)</td>
<td>(0.864)</td>
</tr>
<tr>
<td>Observations</td>
<td>47,660</td>
<td>47,660</td>
</tr>
<tr>
<td>Wald Chi-Squared</td>
<td>865.36***</td>
<td>620.85***</td>
</tr>
<tr>
<td>Year and Industry dummies</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes:
For clarity, year-specific and industry-specific intercepts are omitted. *, **, *** indicate that a coefficient is statistically significant at the 10%, 5%, and 1% level or better. P-values calculated from standard errors clustered by firm.
A description of the variables is given in Appendix 1.

Columns A and B report the results for loss avoidance and earnings-decrease avoidance, respectively. The evidence is consistent with that reported for the real activity manipulation measure. Indeed, in both columns, the coefficient $\beta_1$ is positive and significant at least at the 5% level ($\beta_1=0.294$; p-value=0.000 in column A; $\beta_1=0.065$; p-value=0.020 in column B). This indicates that firms experiencing financial difficulties are more likely to exhibit small positive net income and small earnings increases: situations usually associated with income-increasing earnings.
manipulation (Coppens and Peek 2005) which may be carried out through real earnings management (Dechow et al. 2003, Campa et al. 2019).

As far as accrual manipulation is concerned, discretionary accruals based on the Jones (1991) model, discretionary accruals based on the Dechow et al. (1995) model, and the raw values for total accruals have been used instead of the performance-adjusted discretionary accruals (Kothari et al. 2005). Results (not tabulated for reasons of space) are exactly in line with those reported in Table 3.

4.3.3. THE IMPACT OF THE FINANCIAL CRISIS

The time period investigated in this study includes the financial crisis of 2007-2009. This crisis was severe. Indeed, as highlighted by Haldane (2009, p. 2), “some have suggested that it is the worst since the early 1970s; others, the worse since the Great Depression; others still, the worst in human history”. The significant negative impact of the crisis on the performance of firms is well established (Lins et al. 2017), while the general earnings management literature agrees that companies have a greater incentive to manage earnings when their profitability is under pressure (Burghstahler and Dichev 1997, Young 2008). Accordingly, the following analysis examines whether the behaviour of firms highlighted in Table 3 was affected by the financial crisis. The results of this test are presented in Table 6. In particular, panel A reports the results for the period including the financial crisis (i.e., 2009-2011), while panel B shows the results for the period after the financial crisis (i.e., 2012-2016).

Table 6. Earnings manipulation and financial difficulties: the impact of the financial crisis

<table>
<thead>
<tr>
<th>PANEL A – Period including the financial crisis (2009-2011)</th>
<th>TEM (A)</th>
<th>TEM2 (B)</th>
<th>DA (C)</th>
<th>DADD (D)</th>
<th>ABNCFO (E)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.102***</td>
<td>0.021</td>
<td>0.048***</td>
<td>-0.034***</td>
<td>0.055***</td>
</tr>
<tr>
<td>FINDIFF</td>
<td>0.006*</td>
<td>0.006**</td>
<td>-0.008***</td>
<td>-0.009***</td>
<td>0.015***</td>
</tr>
<tr>
<td>SIZE</td>
<td>-0.011***</td>
<td>-0.000</td>
<td>-0.007***</td>
<td>0.003***</td>
<td>-0.003***</td>
</tr>
<tr>
<td>GROWTH</td>
<td>-0.020*</td>
<td>0.003</td>
<td>-0.001</td>
<td>0.022***</td>
<td>-0.018***</td>
</tr>
<tr>
<td>LEV</td>
<td>0.012</td>
<td>0.013*</td>
<td>-0.006</td>
<td>-0.004</td>
<td>0.017***</td>
</tr>
<tr>
<td>EISSUE</td>
<td>0.014*</td>
<td>0.001</td>
<td>0.028***</td>
<td>0.015***</td>
<td>-0.014***</td>
</tr>
</tbody>
</table>
### Table 6 (cont’d). Earnings manipulation and financial difficulties: the impact of the financial crisis

#### PANEL B – Period after the financial crisis (2012-2016)

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>TEM (A)</th>
<th>TEM2 (B)</th>
<th>DA (C)</th>
<th>DADD (D)</th>
<th>ABNCFO (E)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-0.143</td>
<td>-0.009</td>
<td>-0.163</td>
<td>-0.029**</td>
<td>0.020</td>
</tr>
<tr>
<td></td>
<td>(0.542)</td>
<td>(0.946)</td>
<td>(0.292)</td>
<td>(0.026)</td>
<td>(0.866)</td>
</tr>
<tr>
<td>FINDIFF</td>
<td>0.009***</td>
<td>0.011***</td>
<td>-0.010***</td>
<td>-0.008***</td>
<td>0.019***</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>SIZE</td>
<td>-0.014***</td>
<td>-0.004***</td>
<td>-0.009***</td>
<td>0.001***</td>
<td>-0.005***</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.034)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>GROWTH</td>
<td>-0.057***</td>
<td>-0.019**</td>
<td>-0.008</td>
<td>0.030***</td>
<td>-0.049***</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.026)</td>
<td>(0.242)</td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>LEV</td>
<td>0.007</td>
<td>0.009</td>
<td>-0.007*</td>
<td>-0.005</td>
<td>0.014***</td>
</tr>
<tr>
<td></td>
<td>(0.330)</td>
<td>(0.118)</td>
<td>(0.074)</td>
<td>(0.113)</td>
<td>(0.002)</td>
</tr>
<tr>
<td>EISSUE</td>
<td>0.028***</td>
<td>0.020***</td>
<td>0.033***</td>
<td>0.026***</td>
<td>-0.005</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.143)</td>
</tr>
<tr>
<td>DISSUE</td>
<td>-0.006**</td>
<td>-0.003</td>
<td>0.024***</td>
<td>0.027***</td>
<td>-0.031***</td>
</tr>
<tr>
<td></td>
<td>(0.022)</td>
<td>(0.119)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>ROA</td>
<td>-0.722***</td>
<td>-0.684***</td>
<td>0.184***</td>
<td>0.223***</td>
<td>-0.906***</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
</tbody>
</table>
We refer to Table 1 for the list of variables. The panel data includes non-financial firms and financial firms separately. For clarity, year-specific and industry-specific intercepts are omitted. *, **, *** indicate that a coefficient is statistically significant at the 10%, 5%, and 1% level or better. P-values calculated from standard errors clustered by firm. A description of the variables is given in Appendix 1.

The evidence is again in line with the main results in both panels. Indeed, in both panel A and panel B, the coefficient $\beta_1$ is positive and significant in columns A, B and E, while it is negative and significant in columns C and D. These findings indicate that the financial crisis had no effect on the earnings management behaviours of firms in financial difficulties.

### 4.3.4. THE IMPACT OF THE SEVERITY OF FINANCIAL PROBLEMS

The test presented in this section explores whether the trade-off between accrual and real activity manipulation depends on the severity of the financial problems of entities or whether, for example, the manipulation of real activities is used only by companies in a highly difficult financial situation as the very last attempt to improve their performance (García Lara et al. 2009).

To carry out this analysis, we exploit the way in which the variable FINDIFF is constructed. Indeed, it takes the value of 0 for firms without any sign of financial problems, 1 for entities with some signs of financial deterioration, and 2 for companies in the worst financial situation. Accordingly, model (6) has been re-estimated by excluding, in turn, companies with a FINDIFF value of 0, 1, and 2. The results (untabulated) reveal that the findings reported in the main analyses are confirmed for all of the sub-samples detailed above. Accordingly, results are not driven by a particular group of entities. The presence of financial weaknesses places much pressure on the management of firms, which, on the one hand, want to improve companies’ true performance, while, on the other, do not want to be discovered, given the increased monitoring of stakeholders prompted by severe financial situations. As a result, they manage earnings upwards using a
less detectable earnings management tool, i.e., real activity manipulation (Zang 2012).

5. Conclusions

Financial troubles impose a great deal of pressure on managers. Indeed, several stakeholders may be concerned about companies that show signs of financial problems: shareholders may fear a decrease in their return on investment, employees may see their job position at risk and lenders may be concerned about the ability of companies to repay their loans. All these potential adversities may incentivize managers to put in place strategies aimed at concealing or mitigating the financial condition of firms through income-increasing earnings manipulation practices (e.g., Franz et al. 2014). This situation may be exacerbated in settings, such as the one investigated in this paper, in which external financing is the primary source of funding for firms and the national context does not offer adequate protection to creditors (Plantin et al. 2013).

Using a large sample of non-financial unlisted firms operating in France, the results provide consistent evidence of more pervasive income-increasing earnings manipulation among firms with more severe signs of financial difficulties. This income-increasing earnings manipulation is carried out through real activity manipulation and not by using accruals.

The findings from this study have several implications. Supporting the concerns highlighted by Plantin et al. (2013), that insolvency legislation which is unfair to creditors provides incentives to unhealthy firms to increase their earnings through earnings management strategies, the results could encourage regulatory bodies to increase the level of creditor protection. They may also help auditors and other monitoring bodies to locate the areas in an annual report that may indicate earnings manipulation during periods of financial problems. They further contribute to the debate about the joint and/or alternative use of accrual-based and real transaction manipulation, while adding to the research on the role of institutional settings and/or firm incentives in the choice between different earnings management tools. For example, this study shows that the pressure brought about by financial problems may be more relevant than the country level of investor protection when investigating earnings manipulation tools.

This research is not free of limitations. The use of a single country might limit the generalizability of the results. Future research could look at countries with bankruptcy laws which ensure high levels of protection to creditors or evaluate the impact of changes in laws on the earnings management behaviours of firms in financial difficulty. This paper uses the most common proxies for estimating financial problems, which are applicable to unlisted firms. The same is true
for the proxies for earnings management. It must be acknowledged that several other proxies for estimating these phenomena are available. However, they have not been used here due to the lack of available data and because of the methodological decision to follow the main tools used in the extant literature, given the characteristics of the sample. The literature regularly investigates three aspects of real activity manipulation: sales manipulation, production cost manipulation and discretionary accrual manipulation. Due to the aforementioned sample characteristics and based on the available data (see endnote 5), only sales manipulation could have been estimated as a direct proxy for real activity manipulation. Accordingly, the main analyses of the paper use real activity manipulation with the meaning of sales manipulation.

References


Appendix 1. Variable description
(in alphabetical order)

$A$: total assets.

$ABNCFO$: residuals of model (2) multiplied by minus 1.


$BIG4$: a dummy variable that takes 1 if the auditor (or one of the auditors) is a Big 4 audit firm.

$CFO$: cash flow from operations scaled by beginning total assets.

$CHANGENI$: a dummy variable that takes 1 if the change in net income of firms, scaled by beginning total assets, is positive but lower than 0.01.

$DA$: performance-adjusted discretionary accruals estimated using the Kothari $et\ al.$ (2005) model.


$DISSUE$: a dummy variable that takes 1 if the firm issue new debt.

$EISSUE$: a dummy variable that takes 1 if the firm issue new equity.

$EM$: $TEM$, $DA$, $DADD$, and $ABNCFO$, in turn.

$FINDIFF$: an indicator variable that goes from 0 to 2 and increases with the severity of companies’ financial difficulties based on the discrimination zones related to the Altman (2000) $Z$-score.

$FINDIFF\_FS$: a dummy variable that takes the value of 1 if the ratio between operating profit and interest expenses is below 1 (i.e., evidence of financial distress based on the Fich and Slezak (2008) methodology) and zero otherwise.

$GROWTH$: percentage of annual change in revenue.

$NDA$: non-discretionary accruals.

$PPE$: gross property, plant and equipment scaled by beginning total assets.

$REV$: net revenues scaled by beginning total assets.

$ROA$: Net income before extraordinary items, divided by total assets.

$SIZE$: natural logarithm of total assets.

$SPOS$: a dummy variable that takes 1 if the net income of firms, scaled by beginning total assets is positive but lower than 0.01.

$TA$: Total accruals scaled by beginning total assets.

$TEM1$: $DA + ABNCFO$.

$TEM2$: $DADD + ABNCFO$.

$\Delta CA$: change in current assets scaled by beginning total assets.

$\Delta CASH$: change in cash and equivalents scaled by beginning total assets.
\( \Delta CL \): change in current liabilities scaled by beginning total assets.
\( \Delta REC \): change in accounts receivable from the prior year scaled by beginning total assets.
\( \Delta REV \): change in revenues scaled by beginning total assets.
\( \Delta STD \): change in short-term debts scaled by beginning total assets.
\( \Delta WC \): change in operating working capital (i.e., current assets after subtracting cash and cash equivalent, less current liabilities net of the current portion of long term debt) scaled by beginning total assets