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Financial Crisis And Earnings Management: The European Evidence

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Abstract

We examine the impact of the 2008–2009 financial crisis on the earnings management behavior of European-listed firms. We find that earnings management has significantly decreased in the crisis years. This trend is confirmed in most of the 16 countries under review. We also report a link between the level of earnings management and the economic growth rate and provide evidence suggesting that national characteristics and market forces affect the propensity of income smoothing but not accruals quality.

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1. Introduction

In recent years, earnings management has received considerable attention from academics, to the point that there is now an extensive body of research on the determinants and consequences of the manipulation of earnings. A common characteristic of these studies is that they do not take into consideration the macroeconomic environment of the firm. In other words, general economic conditions are held constant or supposed not to influence the incentives for earnings management. Nevertheless, it can be assumed that dramatic changes in the economic climate have an impact on the firm's propensity to

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manipulate earnings and/or the sign of these manipulations. The purpose of this paper is to explore the influence of significant variations in the economic environment by comparing the earnings management practices of European companies during the 2008–2009 financial crisis and in the years before.

According to the accounting literature, the motivations for earnings management can be classified into two categories: those relating to the market, and those resulting from agency relationships. Concerning the market influence, several studies provide evidence consistent with the intuition that firms manage earnings upward to avoid reporting losses, earnings declines, or negative earnings surprises (Ayers, Jiang, & Yeung, 2006; Burgstahler & Dichev, 1997; Degeorge, Patel, & Zeckhauser, 1999). Firms are also suspected of manipulating earnings to facilitate the success of security issues. This hypothesis is supported by several studies showing that firms tend to inflate their earnings prior to seasoned equity offerings (Rangan, 1998; Teoh, Welch, & Wong, 1998) or initial public offerings (Teoh, Wong, & Rao, 1998). Earnings management can also be used as a tool to influence the execution of contracts between the firm and its stakeholders. Empirical studies also provide evidence consistent with the idea that managers manipulate earnings to increase their earnings-based compensation (Guidry, Leone, & Rock, 1999; Holthausen, Larcker, & Sloan, 1995), or to avoid debt covenant violations (DeFond & Jiambalvo, 1994; Dichev & Skinner, 2002).

Prior studies investigate how firm's attributes (e.g., presence of bonus plans, earnings-based management compensation, or debt covenants) or a particular event (bond or equity issue) create incentives to manage earnings. Nevertheless, there is also evidence that macroeconomic conditions do affect earnings quality. Johnson (1999), for example, documents that the value relevance of accounting earnings is sensitive to the business cycle,

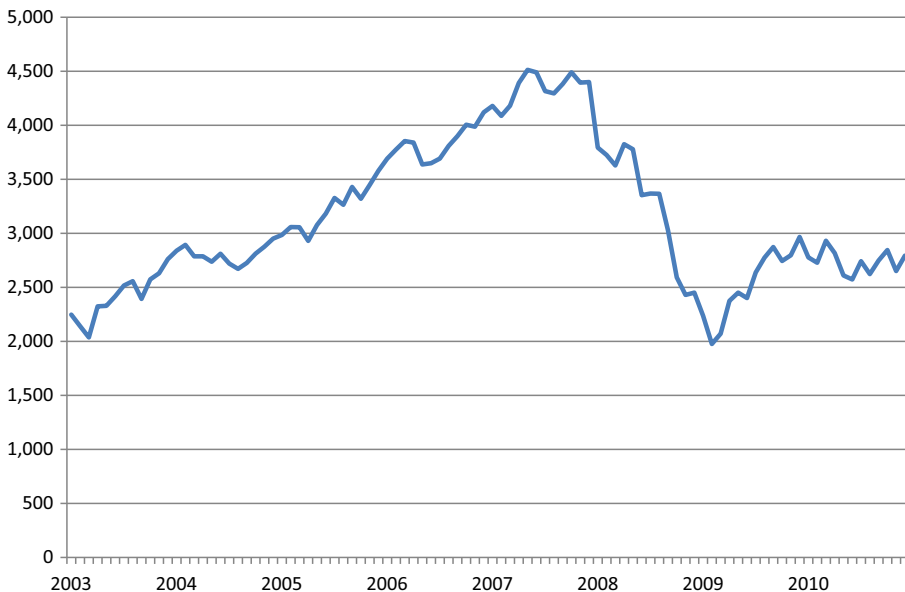


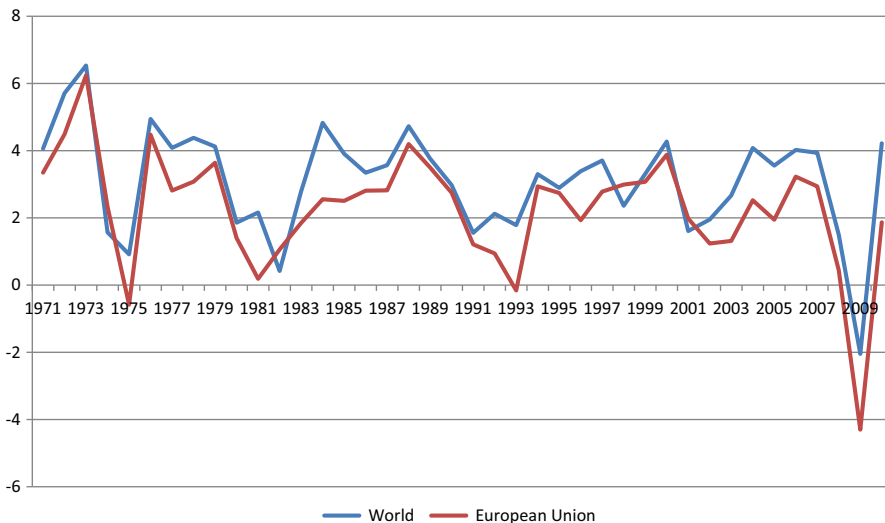
Fig. 1. Evolution of the EuroSTOXX50 index.

more precisely that the association between earnings and stock returns is higher during expansion periods than during contraction years.

Similarly, [Jenkins, Kane, and Velury \(2009\)](#) argue that since accounting information reflects both the consequences of general economic conditions and the effects of firm's activities, its information content may vary across the business cycle. Contrary to [Johnson \(1999\)](#), they find that earnings are more value relevant during contraction years than during expansion periods. If macroeconomic conditions affect the information content of accounting data, it can be expected that the predictive ability of accounting-based failure prediction models varies across the business cycle. Consistent with this conjecture, several studies report that these models are sensitive to the occurrence of a recession ([Kane, Richardson, & Graybeal, 1996](#); [Richardson, Kane, & Lobingier, 1998](#)).

These findings highlight the need for contextual earnings management studies, i.e., for research that would take into account the macroeconomic conditions in which firms operate. The 2008–2009 financial crisis and the preceding years provide a unique setting for such analysis. From 2003 to 2007, the European financial market experienced a moderate but continuous growth, reflected by the EuroSTOXX50 index, whose value rose from 2000 to 4500 points during this period. Following the subprime crisis, the index fell to less than 2000 points in February 2009. Since then, it partially recovered without exceeding the 3000-point threshold (see [Fig. 1](#)).

The financial crisis had significant consequences on the level of economic activity. Globally, the period from the early 1970s to 2008, witnessed an uninterrupted period of economic growth, with continuously positive GDP growth rates. In 2009, the gross domestic product declined for the first time in 40 years. In Europe, the crisis was particularly severe since the GDP growth rate fell to -4.30% vs. -2.05% for the world in general (see [Fig. 2](#)).



Source: World Bank

Fig. 2. Annual GDP growth rates.

To measure the impact of the financial crisis on accounting manipulations, we analyze the level and sign of earnings management by European companies over the period 2006–2009. The choice of Europe has several advantages. First, Europe has been severely affected by the 2008–2009 financial crisis. Accordingly, if macroeconomic conditions do affect earnings manipulations, significant differences in the magnitude and sign of earnings management are expected between the expansion period (2006–2007) and the crisis years (2008–2009).¹ Second, most prior studies were conducted at a single-country level, which makes the external validity of their findings questionable. Extending the analysis to a larger geographical area neutralizes country-specific influences and, consequently, provides stronger evidence. Assigning countries into subgroups will also make it possible to examine the impact of transnational factors such as the legal regime or the prevailing mode of financing.

Finally, in order to isolate the impact of macroeconomic conditions, it is necessary to hold other factors constant. In this regard, the European experimental setting is a good choice inasmuch as since 2005, European-listed companies must comply with IFRS. All firms in the sample are thus subject to the same accounting regulation regardless of their nationality. As a result, country differences in the level of earnings management cannot be interpreted as reflecting differences in the permissiveness of local accounting standards.

Following prior research, earnings management is measured with several indicators: two metrics of income smoothing and three accrual quality measures. Our data come from 16 European countries and cover the period 2006–2009, leading to a sample of 8266 firm-year observations. We provide evidence that earnings management has significantly decreased in the crisis years and that this trend is confirmed in most of the countries under review. Further, we test and find a direct link between the magnitude of earnings management and the economic growth rate of the firm's country. Finally, we also report that institutional and market characteristics are associated with income-smoothing metrics, but not with accrual quality measures.

The main contribution of this study is to show that earnings management is sensitive to general economic conditions, a factor that was omitted by prior research. More specifically, it documents that income manipulations are more likely in growth periods than in crisis years, a finding that should be of interest to investors. This paper also contributes to the accounting literature by providing evidence that national characteristics do not equally affect all types of earnings management. In particular, income smoothing is shown as more closely reflecting institutional and market characteristics than accruals manipulations, suggesting that future research should not indiscriminately consider all types of earnings management.

The rest of the paper is organized as follows. First, we present a brief review of the literature and discuss factors that may affect earnings management during periods of

¹ The financial crisis started in the US in 2007 but hit its peak in September and October 2008 with the failure of several major financial institutions (Lehman Brothers, Merrill Lynch, Fannie Mae, Freddie Mac, Washington Mutual, Wachovia, Citigroup, and AIG). However, as shown by [Figs. 1 and 2](#), the consequences of the crisis started to be felt in Europe mostly in 2008. We thus refer to 2006 and 2007 as pre-crisis years, and 2008 and 2009 as crisis years.

economic stress. Second, we present the research design and the sample. Third, we discuss the results and make additional analyses to explain country differences. We conclude with a summary of the findings and their implications for further research.

2. Earnings management in troubled periods: the conflicting views

There are a number of reasons to believe that earnings management should be higher in periods of economic stress. First, in such periods, most firms probably exhibit lower earnings, which should motivate managers to engage in income-increasing earnings management to compensate for the decrease of operational performance (Ahmad-Zaluki, Campbell, & Goodacre, 2011). Managers of the most affected firms in particular may manipulate earnings upward to avoid a large decline of the firm's stock price that would negatively impact their compensation (Charitou, Lambertides, & Trigeorgis, 2007).

Another reason is the presence of debt covenants. Because such covenants are partially based on earnings (Dichev & Skinner, 2002), income-increasing manipulations should reduce the probability of violations (DeFond & Jiambalvo, 1994; Iatridis & Kadorinis, 2009; Saleh & Ahmed, 2005; Sweeney, 1994).

Consistent with the intuition that periods of economic turbulence incite managers to manipulate earnings upward, Ahmad-Zaluki et al. (2011) report that income-increasing earnings management by Malaysian firms engaged in initial public offerings was limited to IPOs that occurred during the Asian crisis period (1997–1998).

Adversely, in troubled periods, some firms may have incentives to manage earnings downward, in particular those that must undertake debt restructuring due to debt covenant violation or failure to meet a debt repayment. For these firms, reporting losses may help obtain concessions from lenders. Banks have the option to refuse these concessions and require the firm's liquidation. However, in recession periods, the realizable value of firm's assets is probably low (Shleifer & Vishny, 1992), which should incite them to accept conditions that they would ordinarily refuse. Consistent with this intuition, Asquith, Gertner, and Scharfstein (1994) provide evidence that rather than exercising their right to call the loan, banks generally prefer to restructure the debt by waiving covenants, delaying principal and interest, or reducing the interest rate.

Income-reducing earnings management might also result from agency relationships with employees. DeAngelo, DeAngelo, and Skinner (1994), for example, note that by reporting losses, managers portray the firm as seriously troubled, which may be useful to extract concessions from employees who otherwise would doubt the existence and persistence of the firm's difficulties. In support of this assertion, DeAngelo and DeAngelo (1991) show that reported earnings are lower during union renegotiations.

The search for political advantage can also motivate the reduction of earnings. In crisis periods, governments are likely to provide support to firms in financial distress (Peltzman, 1976). Governmental support may take various forms. Ahmed, Godfrey, and Saleh (2008) mention that during the Asian financial crisis, the Malaysian government instituted mechanisms to facilitate the debt restructuring of companies. In 2008–2009, governments of many countries provided banks with public funds to mitigate the credit crisis. Firms may also use the economic downturn as a pretext to obtain advantages or oppose new regulations. Because the probability of obtaining governmental aid increases as financial

performance worsens, firms have an incentive to deflate earnings. The literature provides evidence of income-reducing earnings management to obtain advantages from the government (Jones, 1991; Lim & Matolcsy, 1999; Navissi, 1999). In an analysis of accounting choices of troubled companies, DeAngelo et al. (1994) report that several distressed firms used their financial difficulties to argue for import relief or antitrust clearance.

All previous arguments suggest that periods of economic downturn should be associated with higher level of earnings management, although they do not agree with the sign of these manipulations. Nevertheless, there are also reasons to believe that crises are less favorable to earnings management than expansion periods.

First, it can be argued that during crises, firms are subject to increased monitoring from auditors, creditors, and other stakeholders, which should result in managers having less discretion to manage earnings (Chia, Lapsley, & Lee, 2007). Another reason is that litigation risk is probably higher during periods of economic decline, when equity markets experience sharp drops in stock prices. Managers should respond to this risk increase by a limitation of earnings management. Contraction periods should thus be associated with less earnings management and, consequently, more conservative (i.e., more timely) earnings (Jenkins et al., 2009). The influence of litigation risk on conservatism is well documented. Huijgen and Lubberink (2005), for example, show that firms report more conservative earnings in high legal liability regimes. Clients of Big 4 firms have also been shown as reporting more conservatively in the post-Enron context than before (Krishnan, 2007; Willekens & Bauwhede, 2003).

Lower level of earnings management in recession periods may also result from a higher demand for conservative earnings. Because of the transitory nature of crises, earnings reported in such periods are less persistent, and thus less useful for predictions. Consistent with this assertion, several studies show that the value relevance of earnings (i.e., the degree of association between accounting data and market prices) varies across the business cycle (Ball & Shivakumar, 2005; Brown, He, & Teitel, 2006). This increased uncertainty about future outcomes should motivate market forces to demand more conservative earnings in crisis periods (Jenkins et al., 2009), which should dissuade companies to manipulate reported earnings. One can also consider that in crisis periods, the market is more inclined to tolerate poor performance (Ahmad-Zaluki et al., 2011). As a consequence, firms have less incentive to engage in earnings management activities.

Bertomeu and Magee (2011) model the dynamics between accounting standards, the quality of financial reporting, and the state of the economy. Their analytical results show that financial reporting quality should reach its maximum when the economy is good (expansionary times), decrease as the economic conditions become less favorable (moderate times), and increase again if the economy becomes recessionary. Therefore, the financial reporting quality is non-monotonic with the state of the economy. Although their model refers to the regulator point of view, it assumes that the regulator passes the reporting quality level that is supported by a majority of the agents in the economy (Wagenhofer, 2011).

On the basis of the existing literature, the effect that economic crises should have on earnings management is unclear. Some argue that in such periods, firms are induced to manipulate their earnings, whereas others think that they have more incentives to report unbiased net income. Even among the proponents of increased earnings management, the

opinion is divided, some of them expecting income-increasing manipulations, while others argue that periods of economic stress should be associated with downward income adjustments. The empirical analysis should tell us which of these conflicting views is the most likely.

3. Measuring earnings management

To test if firms exhibit unusual earnings management behavior during the financial crisis, we employ standard techniques from the income smoothing and accruals quality literature. This section presents the research design and the econometric models used. The first two metrics capture income smoothing, whereas the last three are accrual quality measures.

Our first attribute of income smoothing is adapted from [Leuz, Nanda, and Wysocki \(2003\)](#) and focuses on insiders' reporting choices. Specifically, IS1 is defined as the standard deviation of cash flow from operations divided by the standard deviation of net income. In case of income smoothing, the variability of earnings (as measured by the standard deviation of net income) should be less than the variability of cash flow. Following [Leuz et al. \(2003\)](#),² we thus interpret high values of IS1 as evidence that managers exercise accounting discretion to smooth reported earnings.

The second indicator of income smoothing is also taken from [Leuz et al. \(2003\)](#). It represents the Spearman correlation between variations in accruals and variations in cash flow from operations. Because accruals buffer cash flow shocks, the correlation between changes in accruals and changes in cash flow should be negative ([Dechow, 1994](#)). However, if accruals are manipulated to smooth income, the absolute value of their correlation with cash flows should be particularly high. We define accruals as the difference between net income and cash flow from operations. As in prior research ([Ball & Shivakumar, 2005](#); [Barth, Landsman, & Lang, 2008](#); [Lang, Raedy, & Wilson, 2006](#)), we interpret a high negative correlation as evidence of earnings smoothing. For consistency of presentation and interpretation, the Spearman coefficient was multiplied by -1 so that higher IS2 scores reflect higher level of income smoothing.

Our first accrual quality metric is based on the modified Jones model. Although different models have been developed to detect earnings management, the [Jones \(1991\)](#) model and the modified Jones model developed by [Dechow, Sloan, and Sweeney \(1995\)](#) are the most extensively used in identifying discretionary accruals. The only difference between them is the inclusion of changes in accounts receivables in the modified Jones model. In addition, following [Kothari, Leone, and Wasley \(2005\)](#), we include a performance measure, i.e., return on assets, to control for the impact of firm performance on unexpected accruals. We require at least 20 observations in the same industry (defined

² [Leuz et al. \(2003\)](#) use the ratio of the standard deviation of net income to the standard deviation of cash flow from operations. For consistency in presenting and interpreting our results, we reverse the ratio so that high scores mean high levels of income smoothing.

as two-digit SIC code). The modified Jones model is estimated cross-sectionally, using all firm-year observations in the same industry. Its equation is as follows:

$$ACC_{it} = \alpha_0 + \alpha_1 1/A_{it-1} + \alpha_2(\Delta REV_{it} - \Delta REC_{it}) + \alpha_3 PPEN_{it} + \alpha_4 ROA_{it} + \zeta_{it} \quad (1)$$

Where:

ACC_{jt} accruals (change in non-cash current assets minus change in current liabilities adjusted for the current portion of long-term debt, minus depreciation and amortization expense) scaled by lagged total assets of firm j in year t ;

A_{it-t} lagged total assets of firm j in year $t - 1$;

ΔREV_{jt} change in sales scaled by lagged total assets of firm j in year t ;

ΔREC_{jt} change in receivables from clients scaled by lagged total assets of firm j in year t ;

$PPEN_{jt}$ net value of property, plant, and equipment scaled by lagged total assets of firm j in year t ;

ROA_{jt} net income scaled by lagged total assets of firm j in year t .

Following prior research, the un-standardized residual from Eq. (1) is deemed the discretionary accruals component or abnormal accruals. The principal idea behind the model is to determine the extent of the measurement error that can be unintentional (due to business activity) or intentional (due to earnings management). The variance of this measurement error can be viewed as an inverse measure of accrual quality (Dechow & Dichev, 2002; Francis, LaFond, Olsson, & Schipper, 2005; Rajgopal & Venkatachalam, 2011). Accordingly, the first accrual proxy, JONES1, represents the standard deviation of the residuals from the modified Jones model. We interpret a low standard deviation of residuals as reflecting high accrual quality, and thus low level of earnings management.

Our second accrual quality metric was also used by Jones, Krishnan, and Melendrez (2008). It is inspired by Larcker and Richardson (2004), who included in the Jones model two additional independent variables that are correlated with measures of unexpected accruals. The book-to-market ratio serves as a proxy for expected growth in the firm's operations. The rationale behind this inclusion is that growing firms are expected to have large accruals, not necessarily due to opportunistic managerial behavior. The operating cash flow is also included as a better specified measure of performance. The model is estimated cross-sectionally for each industry, with more than 20 observations using the following equation:

$$ACC_{it} = \alpha_0 + \alpha_1 1/A_{it-1} + \alpha_2(\Delta REV_{it} - \Delta REC_{it}) + \alpha_3 PPEN_{it} + \alpha_4 BM_{it} + \alpha_5 CFO_{it} + \zeta_{it} \quad (2)$$

Where:

BM_{jt} book value of equity divided by market value of firm j in year t ;

CFO_{jt} cash flow from operations scaled by lagged total assets of firm j in year t ;

All other variables defined before.

Un-standardized residuals from Eq. (2) represent an alternative proxy for discretionary accruals, and JONES2 represents the standard deviation of these residuals. We interpret a

low standard deviation of residuals as reflecting high accrual quality, and thus low level of earnings management.

The last accrual quality metric is based on the cross-sectional Dechow and Dichev (2002) model, as modified by McNichols (2002) and Francis et al. (2005). Some recent studies (e.g. Chen, Hope, Li, & Wang, 2011; Core, Guay, & Verdi, 2008; Jones et al., 2008; Kim & Qi, 2010) apply this model to assess accruals as a measure of earnings quality, arguing that accruals are temporary adjustments made to better measure firm performance. Francis et al. (2005) argue that the Dechow and Dichev (2002) approach is superior to the modified Jones (1991) model's identification of abnormal accruals because of a more direct link to information risk. The intuition behind this model is that accrual quality may be defined as the extent to which accruals map into cash flow realizations. We estimate the following model for each industry with more than 20 observations as follows:

$$\text{ACC}_{it} = \alpha_0 + \alpha_1 \text{CFO}_{it-1} + \alpha_2 \text{CFO}_{it} + \alpha_3 \text{CFO}_{it+1} + \alpha_4 (\Delta \text{REV}_{it} - \Delta \text{REC}_{it}) + \alpha_5 \text{PPEN}_{it} + \zeta_{it} \quad (3)$$

Where: All variables defined before.

The residuals from Eq. (3) represent the estimation errors in the current accruals that are not associated with operating cash flows and that cannot be explained by the change in revenue or the level of property, plant, and equipment. Our metric DD represents the standard deviation of these residuals. We interpret a low value of DD as evidence of high accrual quality. In all variations of these proxies, a low value indicates high accruals quality and thus a low level of earnings management.

4. Sampling and data collection

At the time when the European Parliament issued regulation no. 1606/2002 announcing the mandatory IFRS adoption in 2005 for all public firms, the European Union (hereafter EU) was composed of 15 member states. Because accounting standards influence the earnings management behavior of firms, our study focuses on these 15 “early” EU members that adopted a common set of high quality standards (IFRS). Luxembourg was excluded because of an insufficient number of observations. Although they are not members of the EU, Switzerland and Norway have been added to the sample, because they

Table 1
The sample.

| | |
|---|--------|
| Public firms from 16 countries | 6901 |
| – Non-IFRS firms | 2643 |
| – Banks and financial institutions | 901 |
| = Firms included in the sample | 3357 |
| Firm-year observations for 2006 to 2009 | 13,428 |
| – Observations with unavailable accounting data | 4060 |
| – Observations with negative equity | 948 |
| – Observations from industries with less than 20 observations | 154 |
| = Final number of observations | 8266 |

also issued regulations requiring the use of IFRS by all listed companies. This leads to a sample of 6901 firms coming from 16 countries with data available on Worldscope. Table 1 describes the sampling and data collection process.

To avoid ambiguity, 2643 firms following accounting standards other than IFRS (mainly US or local GAAP) during the period 2005 to 2010 were dropped from the sample.³ Although most European banks and financial institutions apply IFRS, they are also subject to specific reporting regulations. Moreover, the empirical models that capture earnings management behavior have been developed for commercial or industrial firms and, as such, are not appropriate for the financial industry. Banks and financial institutions were thus excluded from the sample.

Accounting data were collected for the four-year period 2006–2009. According to Capkun, Cazavan-Jeny, Jeanjean, and Weiss (2011), managers may use discretion allowed under IFRS 1 (which regulates first-time adoption of IFRS) to increase earnings management. As 2005 is the first IFRS reporting period for most companies, this year was not included in the analyses. To assure comparability across our different metrics of financial reporting quality, we required available financial statements data for all our variables. Data were not available for 4060 firm-year observations, and another 948 observations were dropped from the sample due to negative equity. Finally, we required at least 20 observations for each industry (two-digit SIC code). Our final sample consists therefore of 8266 firm-year observations.

Our income-smoothing metrics (IS1 and IS2) are computed by pooling all observations of a particular year or time period. Our measures of accrual quality (JONES1, JONES2, and DD) are obtained in two steps. First, we compute discretionary accruals with each model by pooling all observations from all countries and years within the same 2-digit industry SIC code. These discretionary accruals are then grouped by year or time period.

5. Results

Table 2 reports the values of the five earnings management metrics for the pooled sample, for each year, and for the pre- and post-crisis periods. Both measures of income smoothing (IS1 and IS2) exhibit a similar time pattern: the lowest value is for the year 2008 for IS1 (0.750) and for the year 2009 for IS2 (0.576), whereas highest values are in the year 2007 (IS1 = 1.015 and IS2 = 0.685). These observations denote a strong decrease in income smoothing in the period of the financial crisis.

The accrual quality metrics are reported in the last three columns of the table. The year with the highest accrual quality (i.e., lowest standard deviation of residuals) is the year 2009 in all cases. The quality of accruals seems to increase in the last three years under review, since there is a monotonous decreasing pattern of earnings management indicators from 2007 to 2009. For instance, the value of JONES1 is 0.172 and 0.203 for the pre-crisis years, which compares to only 0.124 and 0.113 for the crisis period.

According to Bertomeu and Magee (2011), financial reporting quality should reach its maximum when the economy is good, decrease as the economic conditions become less

³ Regulation no. 1606/2002 allowed entities following other high quality accounting standards (i.e., US GAAP) to postpone the adoption of IFRS to 2007. Moreover, in some countries, the financial market is segmented and only firms that are listed on the main segment must comply with IFRS.

Table 2
Earnings management metrics by period.

| Year | N | Income smoothing | | Accrual quality | | |
|------------|------|------------------|----------|-----------------|----------|----------|
| | | IS1 | IS2 | JONES1 | JONES2 | DD |
| Pool | 8266 | 0.894 | 0.625 | 0.156 | 0.147 | 0.143 |
| 2006 | 1897 | 0.942 | 0.668 | 0.172 | 0.166 | 0.159 |
| 2007 | 2041 | 1.015 | 0.685 | 0.203 | 0.186 | 0.177 |
| 2008 | 2146 | 0.750 | 0.628 | 0.124 | 0.118 | 0.116 |
| 2009 | 2182 | 0.946 | 0.576 | 0.113 | 0.112 | 0.106 |
| 2006–2007 | 3938 | 0.981 | 0.678 | 0.189 | 0.176 | 0.169 |
| 2008–2009 | 4328 | 0.810 | 0.600 | 0.119 | 0.115 | 0.111 |
| Difference | | 0.171*** | 0.078*** | 0.070*** | 0.061*** | 0.057*** |
| | | (21.36) | (66.95) | (86.36) | (88.17) | (90.28) |

IS1 is the ratio of the standard deviation of CFO_{jt} to the standard deviation of NI_{jt} ; IS2 is the Spearman correlation between variations in accruals (defined as the difference between net income and cash flow from operations) scaled by lagged assets and variations in CFO_{jt} , multiplied by minus one; JONES1 is the standard deviation of the residuals from the modified Jones model: $ACC_{jt} = \alpha_0 + \alpha_1 1/A_{jt-1} + \alpha_2(\Delta REV_{jt} - \Delta REC_{jt}) + \alpha_3 PPEN_{jt} + \alpha_4 ROA_{jt} + \varepsilon_{jt}$ (1); JONES2 is the standard deviation of the residuals from the modified Jones model: $ACC_{jt} = \alpha_0 + \alpha_1 1/A_{jt-1} + \alpha_2(\Delta REV_{jt} - \Delta REC_{jt}) + \alpha_3 PPEN_{jt} + \alpha_4 BM_{jt} + \alpha_5 CFO_{jt} + \varepsilon_{jt}$ (2); DD is the standard deviation of the residuals from the modified Dechow and Dichev model: $ACC_{jt} = \alpha_0 + \alpha_1 CFO_{jt-1} + \alpha_2 CFO_{jt} + \alpha_3 CFO_{jt+1} + \alpha_4(\Delta REV_{jt} - \Delta REC_{jt}) + \alpha_5 PPEN_{jt} + \varepsilon_{jt}$ (3).

Where ACC_{jt} = accruals (change in non-cash current assets minus change in current liabilities adjusted for the current portion of long-term debt minus depreciation and amortization expense) scaled by lagged total assets of firm j in year t ; A_{jt-1} = lagged total assets of firm j in year $t-1$; ΔREV_{jt} = change in sales scaled by lagged total assets of firm j in year t ; ΔREC_{jt} = change in receivables from clients scaled by lagged total assets of firm j in year t ; $PPEN_{jt}$ = net value of the property, plant and equipment scaled by lagged total assets of firm j in year t ; ROA_{jt} = net income scaled by lagged total assets of firm j in year t ; BM_{jt} = book-to-market ratio of firm j in year t ; CFO_{jt} = operating cash flow of firm j in year t scaled by lagged total assets; NI_{jt} = net income of firm j in year t scaled by lagged total assets.

*, **, *** indicate statistical significance at 0.10, 0.05, and 0.01 respectively; t -statistics into brackets.

favorable, and increase again if the economy becomes recessionary. Our results seem consistent with this conjecture.

This intuition is confirmed by the comparison of the average values of indicators for the pre-crisis (2006–2007) and the crisis period (2008–2009). All earnings management metrics experience a sharp decrease in the crisis years. Indicators of income-smoothing IS1 and IS2 dropped from 0.981 to 0.810 and 0.678 to 0.600 respectively. Similarly, the values of accrual quality measures fell from 0.189 to 0.119 (JONES1), 0.176 to 0.115 (JONES2), and 0.169 to 0.111 (DD).

The significance of these differences was tested using a bootstrapping procedure that randomly chooses a sample of 100 firms-year observations with replacement from a period. We computed our attributes of earnings management and repeated the procedure 10,000 times. We next performed an independent-samples t -test. All differences between the two sub-periods are statistically significant at usual levels, which is consistent with the conjecture that firms engage less in earnings management during crisis periods.

The impact of the financial crisis on the earnings management behavior of firms might be influenced by the management's incentives to manipulate earnings upwards or downwards. Therefore we separate the sample in positive and negative discretionary accruals. A firm-year

observation is defined as positive (negative) discretionary accrual if the un-standardized residual is positive (negative) on all three discretionary accruals models (Eqs. (1), (2), and (3)). The results are presented in Table 3.

They confirm the previous findings that earnings management is significantly decreasing in the crisis years, as the difference between the pre-crisis (2006–2007) and the crisis period (2008–2009) is positive and statistically significant, irrespective of the sign of discretionary accruals. However, this decrease is more pronounced for firms with positive discretionary accruals, i.e., engaging in income-increasing earnings management. These firms exhibit a higher level of earnings management in the pre-crisis period compared to those with negative discretionary accruals, while the gap between the two sub-samples is narrowing during the crisis years. With the exception of IS2, the difference in differences is positive and highly significant, which suggests that firms tend to manage earnings upwards more than downwards. Again, the gap between the two subsamples is narrowing during the crisis

Table 3
Positive vs. negative discretionary accruals.

| | N | Income smoothing | | Accrual quality | | |
|--|------|---------------------|-----------------------|----------------------|----------------------|----------------------|
| | | IS1 | IS2 | JONES1 | JONES2 | DD |
| <i>Positive discretionary accruals</i> | | | | | | |
| 2006–2007 | 1463 | 1.082 | 0.691 | 0.237 | 0.216 | 0.203 |
| 2008–2009 | 1279 | 0.650 | 0.645 | 0.117 | 0.112 | 0.108 |
| Difference | | 0.432*** (25.14) | 0.046*** (41.25) | 0.120*** (124.73) | 0.103*** (125.25) | 0.095*** (126.49) |
| <i>Negative discretionary accruals</i> | | | | | | |
| 2006–2007 | 1572 | 0.968 | 0.660 | 0.109 | 0.110 | 0.106 |
| 2008–2009 | 1817 | 0.816 | 0.593 | 0.085 | 0.085 | 0.085 |
| Difference | | 0.152*** (53.36) | 0.067*** (58.68) | 0.025*** (58.17) | 0.024*** (59.32) | 0.021*** (51.66) |
| Difference in difference | | 0.280*** (49.52) | -0.021*** (-68.22) | 0.095*** (101.19) | 0.079*** (104.70) | 0.074*** (103.33) |

IS1 is the ratio of the standard deviation of CFO_{jt} to the standard deviation of NI_{jt}; IS2 is the Spearman correlation between variations in accruals (defined as the difference between net income and cash flow from operations) scaled by lagged assets and variations in CFO_{jt}, multiplied by minus one; JONES1 is the standard deviation of the residuals from the modified Jones model: $ACC_{jt} = \alpha_0 + \alpha_1 1/A_{jt-1} + \alpha_2(\Delta REV_{jt} - \Delta REC_{jt}) + \alpha_3 PPEN_{jt} + \alpha_4 ROA_{jt} + \epsilon_{jt}$ (1); JONES2 is the standard deviation of the residuals from the modified Jones model: $ACC_{jt} = \alpha_0 + \alpha_1 1/A_{jt-1} + \alpha_2(\Delta REV_{jt} - \Delta REC_{jt}) + \alpha_3 PPEN_{jt} + \alpha_4 BM_{jt} + \alpha_5 CFO_{jt} + \epsilon_{jt}$ (2); DD is the standard deviation of the residuals from the modified Dechow and Dichev model: $ACC_{jt} = \alpha_0 + \alpha_1 CFO_{jt-1} + \alpha_2 CFO_{jt} + \alpha_3 CFO_{jt+1} + \alpha_4(\Delta REV_{jt} - \Delta REC_{jt}) + \alpha_5 PPEN_{jt} + \epsilon_{jt}$ (3).

Where ACC_{jt} = accruals (change in non-cash current assets minus change in current liabilities adjusted for the current portion of long-term debt minus depreciation and amortization expense) scaled by lagged total assets of firm j in year t; A_{jt-1} = lagged total assets of firm j in year t - 1; ΔREV_{jt} = change in sales scaled by lagged total assets of firm j in year t; ΔREC_{jt} = change in receivables from clients scaled by lagged total assets of firm j in year t; PPEN_{jt} = net value of the property, plant and equipment scaled by lagged total assets of firm j in year t; ROA_{jt} = net income scaled by lagged total assets of firm j in year t; BM_{jt} = book-to-market ratio of firm j in year t; CFO_{jt} = operating cash flow of firm j in year t scaled by lagged total assets; NI_{jt} = net income of firm j in year t scaled by lagged total assets.

*, **, *** indicate statistical significance at 0.10, 0.05, and 0.01 respectively; t-statistics into brackets.

years. These conclusions hold for all our accrual quality metrics, whereas the results for the income-smoothing metrics are less consistent. This confirms that the two categories of proxies capture different faces of earnings management.

These results suggest the existence of a link between the macroeconomic conditions in which the firm operates and its level of earnings management. To more deeply investigate this association, we regressed our five yearly metrics of earnings management on the growth rate of Gross Domestic Product (GDP). The results are presented in Table 4.

For all accrual quality metrics (JONES1, JONES2, and DD) and the second income-smoothing attribute (IS2), the response coefficients are positive and statistically significant. The only growth metric that is not associated with earnings management is IS1. Globally, these results are consistent with the conjecture that economic crises are less favorable to earnings management than expansion periods.

It is interesting to note that IS2 and accrual quality metrics follow a similar pattern. This is not surprising, given that IS2 is measuring the correlation between variations in accruals and variations in cash flow from operations, whereas IS1 is not a direct measure of accruals.

Table 4
Results of regressions: earnings management and economic growth

$$\text{Model : } EM_{kt} = \alpha_0 + \alpha_1 \text{GROWTH}_{kt} + \zeta_{kt}$$

Where: EM_{kt} earnings management metric of country k in year t; GROWTH_{kt} growth rate of GDP of country k in year t (source: <http://epp.eurostat.ec.europa.eu>).

| EM_{kt} | Income smoothing | | Accrual quality | | |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | IS1 | IS2 | JONES1 | JONES2 | DD |
| Intercept | 1.118*** (19.292) | 0.632*** (33.285) | 0.136*** (15.967) | 0.130*** (17.108) | 0.126*** (18.248) |
| GROWTH_{kt} | -0.010 (-0.081) | 0.329*** (2.739) | 0.336*** (2.811) | 0.305** (2.519) | 0.348*** (2.924) |
| N | 64 | 64 | 64 | 64 | 64 |
| F | 0.007 | 7.504*** | 7.903*** | 6.346** | 8.547*** |
| R ² | 0.000 | 0.108 | 0.113 | 0.093 | 0.121 |

IS1 is the ratio of the standard deviation of CFO_{jt} and the standard deviation of NI_{jt} ; IS2 is the Spearman correlation between variations in accruals (defined as the difference between net income and cash flow from operations) scaled by lagged assets and variations in CFO_{jt} , multiplied by minus one; JONES1 is the standard deviation of the residual from the modified Jones model: $\text{ACC}_{jt} = \alpha_0 + \alpha_1 I / A_{jt-1} + \alpha_2 (\Delta \text{REV}_{jt} - \Delta \text{REC}_{jt}) + \alpha_3 \text{PPEN}_{jt} + \alpha_4 \text{ROA}_{jt} + \varepsilon_{jt}$ (1); JONES2 is the standard deviation of the residual from the modified Jones model: $\text{ACC}_{jt} = \alpha_0 + \alpha_1 I / A_{jt-1} + \alpha_2 (\Delta \text{REV}_{jt} - \Delta \text{REC}_{jt}) + \alpha_3 \text{PPEN}_{jt} + \alpha_4 \text{BM}_{jt} + \alpha_5 \text{CFO}_{jt} + \varepsilon_{jt}$ (2); DD is the standard deviation of the residual from the modified Dechow and Dichev model: $\text{ACC}_{jt} = \alpha_0 + \alpha_1 \text{CFO}_{jt-1} + \alpha_2 \text{CFO}_{jt} + \alpha_3 \text{CFO}_{jt+1} + \alpha_4 (\Delta \text{REV}_{jt} - \Delta \text{REC}_{jt}) + \alpha_5 \text{PPEN}_{jt} + \varepsilon_{jt}$ (3).

Where ACC_{jt} — accruals (change in non-cash current assets minus change in current liabilities adjusted for the current portion of long term debt minus depreciation and amortization expense) scaled by lagged total assets of firm j in year t; A_{jt-1} — lagged total assets of firm j in year t - 1; ΔREV_{jt} — change in sales scaled by lagged total assets of firm j in year t; ΔREC_{jt} — change in receivables from clients scaled by lagged total assets of firm j in year t; PPEN_{jt} — net value of the property, plant and equipment scaled by lagged total assets of firm j in year t; ROA_{jt} — net income scaled by lagged total assets of firm j in year t; BM_{jt} — book-to-market ratio of firm j in year t; CFO_{jt} — operating cash flow of firm j in year t scaled by lagged total assets; NI_{jt} — net income of firm j in year t scaled by lagged total assets.

*, **, *** indicate statistical significance at 0.10, 0.05, and 0.01 respectively; t-statistics into brackets.

Table 5

The influence of the financial crisis on earnings management: country results.

| | N | Income smoothing | | Accrual quality | | |
|-----|-----|------------------|----------|-----------------|-----------|-----------|
| | | IS1 | IS2 | JONES1 | JONES2 | DD |
| AUT | 82 | 0.952 | 0.754 | 0.170 | 0.168 | 0.164 |
| | 88 | 1.246 | 0.687 | 0.104 | 0.097 | 0.108 |
| | | −0.294*** | 0.067*** | 0.066*** | 0.071*** | 0.056*** |
| | | (−6.90) | (7.12) | (14.15) | (14.83) | (10.91) |
| BEL | 122 | 0.930 | 0.690 | 0.157 | 0.155 | 0.157 |
| | 139 | 1.000 | 0.686 | 0.127 | 0.122 | 0.143 |
| | | −0.070*** | 0.004 | 0.030 | 0.033 | 0.015*** |
| | | (−2.91) | (1.35) | (0.23) | (0.28) | (3.32) |
| CHE | 202 | 0.880 | 0.629 | 0.153 | 0.159 | 0.144 |
| | 217 | 0.737 | 0.619 | 0.112 | 0.118 | 0.120 |
| | | 0.143*** | 0.009* | 0.040*** | 0.041*** | 0.024*** |
| | | (12.58) | (1.70) | (10.00) | (8.58) | (5.46) |
| DEU | 571 | 1.198 | 0.688 | 0.201 | 0.184 | 0.177 |
| | 610 | 1.123 | 0.621 | 0.134 | 0.123 | 0.115 |
| | | 0.076*** | 0.068*** | 0.067*** | 0.061*** | 0.062*** |
| | | (5.90) | (4.91) | (11.12) | (12.23) | (13.49) |
| DNK | 116 | 0.869 | 0.518 | 0.130 | 0.134 | 0.150 |
| | 124 | 0.763 | 0.487 | 0.105 | 0.108 | 0.091 |
| | | 0.106*** | 0.031*** | 0.025*** | 0.025*** | 0.059*** |
| | | (13.16) | (3.56) | (6.73) | (8.26) | (19.73) |
| ESP | 144 | 1.546 | 0.890 | 0.302 | 0.123 | 0.112 |
| | 165 | 1.117 | 0.716 | 0.113 | 0.101 | 0.091 |
| | | 0.430*** | 0.174*** | 0.189*** | 0.022*** | 0.021*** |
| | | (11.06) | (20.40) | (8.48) | (86.63) | (8.17) |
| FIN | 162 | 1.189 | 0.707 | 0.198 | 0.205 | 0.212 |
| | 167 | 0.970 | 0.624 | 0.118 | 0.120 | 0.124 |
| | | 0.219*** | 0.084*** | 0.079*** | 0.084*** | 0.088*** |
| | | (8.92) | (8.49) | (7.98) | (8.42) | (8.30) |
| FRA | 665 | 1.025 | 0.751 | 0.182 | 0.178 | 0.165 |
| | 690 | 1.121 | 0.683 | 0.094 | 0.093 | 0.092 |
| | | −0.096*** | 0.068*** | 0.088*** | 0.085*** | 0.073*** |
| | | (−2.15) | (4.87) | (10.01) | (8.92) | (9.76) |
| GBR | 820 | 0.884 | 0.593 | 0.147 | 0.144 | 0.142 |
| | 943 | 0.680 | 0.506 | 0.134 | 0.125 | 0.123 |
| | | 0.204*** | 0.088*** | 0.013*** | 0.018*** | 0.019*** |
| | | (3.88) | (4.99) | (5.05) | (5.97) | (5.95) |
| GRC | 194 | 1.093 | 0.870 | 0.203 | 0.196 | 0.193 |
| | 209 | 0.613 | 0.775 | 0.116 | 0.121 | 0.120 |
| | | 0.479*** | 0.096*** | 0.087*** | 0.075*** | 0.073*** |
| | | (2.30) | (11.54) | (15.96) | (12.31) | (11.43) |
| IRL | 40 | 1.073 | 0.445 | 0.061 | 0.059 | 0.061 |
| | 50 | 1.043 | 0.341 | 0.126 | 0.131 | 0.114 |
| | | 0.030*** | 0.104*** | −0.066*** | −0.072*** | −0.053*** |
| | | (3.96) | (5.44) | (−40.49) | (−39.11) | (28.51) |
| ITA | 253 | 1.271 | 0.803 | 0.202 | 0.201 | 0.195 |
| | 309 | 1.031 | 0.690 | 0.094 | 0.091 | 0.085 |
| | | 0.240*** | 0.113*** | 0.108*** | 0.111*** | 0.110*** |
| | | (11.43) | (10.98) | (14.95) | (14.15) | (14.49) |

Table 5 (continued)

| | N | Income smoothing | | Accrual quality | | |
|-----|-----|-----------------------|---------------------|---------------------|----------------------|----------------------|
| | | IS1 | IS2 | JONES1 | JONES2 | DD |
| NLD | 159 | 1.026 | 0.734 | 0.137 | 0.126 | 0.123 |
| | 167 | 0.724 | 0.485 | 0.127 | 0.134 | 0.139 |
| | | 0.301*** (18.46) | 0.249*** (18.99) | 0.010** (2.20) | −0.008*** (−3.38) | −0.016*** (−4.65) |
| NOR | 136 | 0.916 | 0.568 | 0.367 | 0.363 | 0.317 |
| | 164 | 1.124 | 0.401 | 0.166 | 0.164 | 0.130 |
| | | −0.208* (−1.87) | 0.168*** (12.15) | 0.201*** (19.32) | 0.199*** (19.88) | 0.187*** (22.30) |
| PRT | 52 | 1.642 | 0.764 | 0.091 | 0.087 | 0.083 |
| | 61 | 3.011 | 0.776 | 0.081 | 0.077 | 0.078 |
| | | −1.369*** (−15.18) | −0.011 (−0.44) | 0.010*** (7.73) | 0.010*** (6.76) | 0.005*** (2.63) |
| SWE | 220 | 0.890 | 0.522 | 0.138 | 0.134 | 0.129 |
| | 225 | 1.002 | 0.535 | 0.075 | 0.080 | 0.076 |
| | | −0.112 (−1.18) | −0.013 (−0.93) | 0.063*** (22.36) | 0.054*** (19.24) | 0.053*** (17.80) |

Countries are named using ISO country codes.

For each country:

- 1st line: mean value 2006–2007
- 2nd line: mean value 2008–2009
- 3rd line: difference (*, **, *** indicate statistical significance at 0.10, 0.05 and 0.01, respectively)
- 4th line: t-statistics into brackets

IS1 is the ratio of the standard deviation of CFO_{jt} to the standard deviation of NI_{jt} ; IS2 is the Spearman correlation between variations in accruals (defined as the difference between net income and cash flow from operations) scaled by lagged assets and variations in CFO_{jt} , multiplied by minus one; JONES1 is the standard deviation of the residuals from the modified Jones model: $ACC_{jt} = \alpha_0 + \alpha_1 I / A_{jt-1} + \alpha_2(\Delta REV_{jt} - \Delta REC_{jt}) + \alpha_3 PPEN_{jt} + \alpha_4 ROA_{jt} + \varepsilon_{jt}$ (1); JONES2 is the standard deviation of the residuals from the modified Jones model: $ACC_{jt} = \alpha_0 + \alpha_1 I / A_{jt-1} + \alpha_2(\Delta REV_{jt} - \Delta REC_{jt}) + \alpha_3 PPEN_{jt} + \alpha_4 BM_{jt} + \alpha_5 CFO_{jt} + \varepsilon_{jt}$ (2); DD is the standard deviation of the residuals from the modified Dechow and Dichev model: $ACC_{jt} = \alpha_0 + \alpha_1 CFO_{jt-1} + \alpha_2 CFO_{jt} + \alpha_3 CFO_{jt+1} + \alpha_4(\Delta REV_{jt} - \Delta REC_{jt}) + \alpha_5 PPEN_{jt} + \varepsilon_{jt}$ (3).

Where ACC_{jt} = accruals (change in non-cash current assets minus change in current liabilities adjusted for the current portion of long-term debt minus depreciation and amortization expense) scaled by lagged total assets of firm j in year t ; A_{jt-1} = lagged total assets of firm j in year $t-1$; ΔREV_{jt} = change in sales scaled by lagged total assets of firm j in year t ; ΔREC_{jt} = change in receivables from clients scaled by lagged total assets of firm j in year t ; $PPEN_{jt}$ = net value of the property, plant and equipment scaled by lagged total assets of firm j in year t ; ROA_{jt} = net income scaled by lagged total assets of firm j in year t ; BM_{jt} = book-to-market ratio of firm j in year t ; CFO_{jt} = operating cash flow of firm j in year t scaled by lagged total assets; NI_{jt} = net income of firm j in year t scaled by lagged total assets.

Table 5 reports the values of earnings management metrics for each country and sub-period. Due to a low number of observations in several countries, the significance of the differences was tested using a bootstrapping procedure consisting in repeating 1000 times the procedure with a sample of 10 firms-year observations.

In most countries, the findings are consistent with the previously reported trend, as most earnings management metrics are lower in the crisis years than in the preceding period. However, in Austria, Belgium, France, Norway, and Portugal, income smoothing as captured

by IS1 increases through time. On the other hand, IS2 is positive and significant in 13 countries but not in Belgium, Portugal, and Sweden. With regard to accruals quality measures, all countries except Ireland and the Netherlands exhibit significant increases. These results show that although there is a general trend toward less earnings management in crisis periods, not all countries exhibit the same evolution.

6. Explaining country differences

Differences reported in Table 5 suggest that earnings management is sensitive to country characteristics. As noted by Ball, Robin, and Wu (2003), financial reporting practices depend on the incentives of managers who are in charge of financial statement preparation, and these incentives are the product of market and political forces that operate at the country level. In this section, we investigate the impact of these forces on the level of earnings management in each sub-period.

6.1. *The influence of the legal and regulatory environment*

A common assertion is that earnings management is more frequent in countries with a low level of shareholder protection. This argument is based on the idea that strong investor protection restricts insiders' profit appropriation and thus reduces their incentive to engage in earnings management to conceal their profit diversion activities (Kinnunen & Koskela, 2003). On the contrary, when shareholder protection is low, the likelihood of profit diversion by insiders is high, which should constitute an incentive for earnings management.

Several studies report evidence consistent with these predictions. Leuz et al. (2003) in particular show that earnings management is negatively related to shareholder protection. Similar results were found by Haw, Hu, Hwang, & Wu (2004), Burgstahler, Hail, and Leuz (2006), and Nabar and Boonlert-U-Thai (2007). Consistent with prior studies, one of our proxy for shareholder protection is the anti-director rights index (ANTIDIR) developed by La Porta, Lopez-de-Silanes, and Shleifer (1998). This index, whose values range from 0 to 6, is a combined measure of six individual rights of shareholders, such as suing directors or calling special shareholder meetings. It measures minority shareholders' protection from expropriation by corporate insiders or majority shareholders. Because this index was elaborated in the '90s, its values do not capture the potential effects of important regulatory changes that occurred in Europe since that time (such as the enactment of the Market Abuse Directive, adopted by the EU in response to the US Fair Disclosure Regulation). In order to have an updated measure of investor protection, we also use the Strength of Investor Protection index (INVPRO) developed by the World Bank. This indicator, calculated each year, is the average of three indexes measuring the extent of disclosure, the extent of director liability, and the ease of shareholder suits in each country.

Strong legal rules are a necessary condition to guarantee that the rights of shareholders are protected, but not a sufficient one. Legal rules may remain largely ineffective without proper enforcement (Burgstahler et al., 2006). Furthermore, a solid system of legal enforcement can also substitute for weak rules, since active and well-functioning courts can rescue investors abused by managers (La Porta et al., 1998).

The influence of law enforcement is supported by several studies dealing with various aspects of accounting quality (Daske, Hail, Leuz, & Verdi, 2008; DeFond, Hung, & Trezevant, 2007). With regard to earnings management, Bushman and Piotroski (2006) document that firms in countries with strong public law enforcement slow the recognition of good news in reported earnings relative to firms in countries with weak public law enforcement. We thus expect a negative association between law enforcement and earnings management measures.

La Porta et al. (1998) proposed several proxies for the quality of law enforcement. Leuz et al. (2003) obtained a global indicator by averaging three of them in a single measure. We used it (ENFORC) to test whether stronger law enforcement constrains earnings management. In order to have an updated estimate, we also use the Rule of Law index (RULLAW) developed by the World Bank. This indicator reflects confidence that people have in the rules of society, in particular the quality of contract enforcement, property rights, the police, and the courts.

Law is not the only source of protection for investors. Compliance with corporate governance recommendations may also reduce the level of expropriation by insiders (Renders & Gaeremynck, 2007). Durnev and Kim (2005) show that firms with better governance are valued higher on stock markets, especially where legal investor protection is weak, which leads them to the conclusion that firms adapt to poor legal environments to establish efficient governance practices.

There is a growing body of research on the influence of corporate governance characteristics on accounting quality. The proportion of outside directors in particular was found as being positively related to earnings timeliness (Beekes, Pope, & Young, 2004) and negatively associated with earnings management (Klein, 2002; Peasnell, Pope, & Young, 2000). Variables aimed at measuring the quality of legal enforcement, such as those developed by La Porta et al. (1998), cannot capture the extent of corporate governance rules because they don't take into account extra-legal regulations. Institutional Shareholder Services provides a Corporate Governance Quotient for a large sample of international companies. Aggarwal, Erel, Stulz, and Williamson (2007) used it to construct two indexes of corporate governance quality at the national level. One of them focuses on seven individual governance characteristics that have received the most attention in the academic literature. We use this index (GOVERN) as a proxy for the quality of national corporate governance systems.

6.2. *The influence of market forces*

It is traditional to oppose bank and market-oriented financial systems. In the former, banks are the main providers of company financing, whereas in the latter, companies generally prefer raising funds from the market. Ball, Kothari, and Robin (2000); Ball et al. (2003) argue that in market-oriented countries, the large number of stockholders generates a high demand for accounting quality, in particular for more timely incorporation of economic income in accounting earnings. Inversely, in bank-oriented countries, the demand for high-quality accounting data is lower, because information asymmetry is more likely to be resolved through insider communications with management. This view is supported by several studies that document the influence of the capital market structure on the accounting behavior of companies. Burgstahler et al. (2006) in particular show that

earnings management is less prevalent in countries with large and highly developed equity markets than in bank-oriented economies.

La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997) proposed three measures of the importance of stock market in an economy: market capitalization of minorities/GNP; number of listed domestic firms/population; and number of IPOs/population. Leuz et al. (2003) synthesized them in a single measure by taking the average rank on these ratios (MKIMP1). These variables have been extensively used by prior studies to reflect the prevailing financing mode in each country. We also use the conglomerate index of financial structure developed by Demirguc-Kunt and Levine (1999) as an alternative measure of the relative importance of banks and markets in the financing of companies. This index (MKIMP2) is a combination of measures of size, activity, and efficiency of capital markets. A high value on this indicator means that a country's financial system relies more on market-oriented financing than on bank-based financing.

7. The results

Table 6 shows the association between earnings management measures and institutional or market characteristics. Panel A reports the Spearman's ρ for the pre-crisis period (2006–2007). Both measures of income smoothing (IS1 and IS2) are significantly correlated with the quality of law enforcement (ENFORC and RULLAW), and the sign of the association is as expected: countries with a high level of law enforcement exhibit lower income smoothing than less rigorous jurisdictions.

Similarly, income smoothing decreases as the quality of corporate governance (GOVERN) increases. By contrast, income smoothing seems not constrained by the level of investor protection, except for IS2, which exhibits a negative association with INVPRO. This suggests that law does not dissuade managers to manipulate earnings if not completed by strict enforcement provisions and/or extra-legal regulations, such as corporate governance codes. Consistent with the intuition that earnings management is more frequent in bank-based financing environments, there is a negative association between our income-smoothing metrics (IS1 and IS2) and both measures of financial market importance.

A striking finding is the contrast between the results obtained with income-smoothing measures and those related to other earnings management proxies. Whereas the former are partially consistent with expectations, there is no significant association between accruals quality measures and institutional or market characteristics.

Panel B of Table 6 reports the same analyses for the crisis period (2008–2009). The results are largely consistent with those of previous years. The main difference is the negative association between investor protection, as measured by ANTIDIR, and the second income-smoothing metric IS2, which becomes marginally significant (at the 5% level). This suggests that law is more dissuasive for managers during troubled periods.

Nevertheless, it is worth noting that the association is no longer significant for the other measure of income smoothing. Another difference is the association between our first metric of income smoothing (IS1) and the rule of law index (RULLAW) that becomes not significant, while there is still a significant association with the other measure of law enforcement (ENFORC).

As expected, income smoothing is lower in market-based economies and countries with high law enforcement and high quality corporate governance mechanisms; and these relations hold irrespective of the period considered (crisis or expansion years). By contrast, accruals manipulations seem totally independent from country characteristics. This suggests that institutional characteristics and market forces govern the income smoothing behavior of firms, but do not affect the quality of accruals. Although this result must be taken with prudence, given the small number of observations, it is, to our knowledge, the first evidence of such differences between two forms of earnings management.

8. Conclusion

The purpose of this paper was to investigate the influence of macroeconomic conditions on income manipulations through an analysis of the earnings management behavior of European-listed companies during the 2008–2009 financial crisis and the years before. The main finding is a significant decrease in income smoothing and an improvement of accruals quality in the crisis period.

This result has several interpretations. First, it is possible that managers have less incentive to manipulate earnings in crisis periods due to a higher market tolerance for poor performance. It can also be argued that litigation risk increases during crises, which should dissuade insiders to engage in earnings management. Finally, the change in the behavior of companies may also respond to a higher demand for more timely earnings in troubled periods.

European countries are relatively homogeneous in economic and political terms. They belong to a deeply integrated economic area characterized by the absence of internal trade barriers. All EU countries also obey a common regulation intended to favor internal competition and movements of capital. Since 2005, all European-listed firms must also comply with IFRS, which minimizes an important factor (accounting standards) identified by the literature as affecting earnings management.

Despite these commonalities, the intensity of earnings management varies considerably from one country to another. We show that national characteristics such as law enforcement, corporate governance quality, and importance of financial markets partially explain country differences in income smoothing, which is consistent with a fast-growing body of research relating accounting quality to institutional factors.

Nevertheless, we also show that country characteristics have no impact on measures of accrual quality. This finding suggests that whereas national political and market forces shape multi-periodic earnings management such as income smoothing, European firms are on equal terms with regard to mono-periodic manipulations of accruals. As a consequence, further research dealing with international data should not treat all forms of earnings manipulations indifferently, but clearly distinguish between these two types of earnings management.

There has been little research on the impact of macro-economic conditions on earnings management. Our results can only be compared to those of [Chia et al. \(2007\)](#), who found that service-oriented Singapore companies engaged in less earnings management during the 1997 Asian financial crisis, a result consistent with our findings. Contrary to its Asian predecessor, the 2008 financial crisis had an impact on most countries. It would thus be

Table 6
Correlations between earnings management measures and institutional/market characteristics.

| Earnings management measures | | | Investor protection | | Law enforcement | | Corporate governance | Market forces | |
|------------------------------------|--------|-------------------|---------------------|-----------|-----------------|-----------|----------------------|---------------|-----------|
| | | | ANTIDIR | INVPRO | ENFORC | RULLAW | GOVERN | MKIMP1 | MKIMP2 |
| <i>Panel A: 2006–2007 (N = 32)</i> | | | | | | | | | |
| Income smoothing | IS1 | Spearman's ρ | -0.063 | -0.266 | -0.611*** | -0.489*** | -0.424** | -0.595*** | -0.444** |
| | | Sig. (2-tailed) | 0.732 | 0.141 | 0.000 | 0.005 | 0.016 | 0.000 | 0.011 |
| | IS2 | Spearman's ρ | -0.231 | -0.552*** | -0.593*** | -0.623*** | -0.540*** | -0.631*** | -0.526*** |
| | | Sig. (2-tailed) | 0.203 | 0.001 | 0.000 | 0.000 | 0.001 | 0.000 | 0.002 |
| Accrual quality | JONES1 | Spearman's ρ | -0.059 | -0.240 | 0.089 | 0.008 | -0.022 | -0.126 | -0.016 |
| | | Sig. (2-tailed) | 0.749 | 0.186 | 0.629 | 0.965 | 0.905 | 0.494 | 0.930 |
| | JONES2 | Spearman's ρ | -0.155 | -0.213 | 0.193 | 0.079 | 0.061 | -0.052 | -0.062 |
| | | Sig. (2-tailed) | 0.398 | 0.241 | 0.291 | 0.666 | 0.740 | 0.777 | 0.737 |
| | DD | Spearman's ρ | -0.168 | -0.163 | 0.218 | 0.134 | 0.079 | -0.057 | -0.096 |
| | | Sig. (2-tailed) | 0.358 | 0.373 | 0.230 | 0.464 | 0.666 | 0.756 | 0.601 |
| <i>Panel B: 2008–2009 (N = 32)</i> | | | | | | | | | |
| Income smoothing | IS1 | Spearman's ρ | 0.011 | 0.000 | -0.404** | -0.289 | -0.485*** | -0.551*** | -0.634*** |
| | | Sig. (2-tailed) | 0.951 | 0.998 | 0.022 | 0.109 | 0.005 | 0.001 | 0.000 |
| | IS2 | Spearman's ρ | -0.354** | -0.416** | -0.454*** | -0.550*** | -0.335* | -0.543*** | -0.478*** |
| | | Sig. (2-tailed) | 0.047 | 0.018 | 0.009 | 0.001 | 0.061 | 0.001 | 0.006 |

| | | | | | | | | | |
|-----------------|--------|-------------------|--------|-------|-------|-------|-------|-------|-------|
| Accrual quality | JONES1 | Spearman's ρ | 0.065 | 0.067 | 0.119 | 0.097 | 0.184 | 0.174 | 0.101 |
| | | Sig. (2-tailed) | 0.724 | 0.714 | 0.515 | 0.598 | 0.315 | 0.341 | 0.584 |
| | JONES2 | Spearman's ρ | 0.004 | 0.057 | 0.200 | 0.143 | 0.241 | 0.251 | 0.115 |
| | | Sig. (2-tailed) | 0.982 | 0.755 | 0.273 | 0.434 | 0.184 | 0.166 | 0.530 |
| | DD | Spearman's ρ | -0.090 | 0.004 | 0.174 | 0.068 | 0.181 | 0.170 | 0.016 |
| | | Sig. (2-tailed) | 0.624 | 0.981 | 0.341 | 0.713 | 0.323 | 0.353 | 0.930 |

IS1 is the ratio of the standard deviation of CFO_{jt} and the standard deviation of NI_{jt} ; IS2 is the Spearman correlation between variations in accruals (defined as the difference between net income and cash flow from operations) scaled by lagged assets and variations in CFO_{jt} , multiplied by minus one; JONES1 is the standard deviation of the residual from the modified Jones model: $ACC_{jt} = \alpha_0 + \alpha_1 1 / A_{jt-1} + \alpha_2(\Delta REV_{jt} - \Delta REC_{jt}) + \alpha_3 PPEN_{jt} + \alpha_4 ROA_{jt} + \varepsilon_{jt}$ (1); JONES2 is the standard deviation of the residual from the modified Jones model: $ACC_{jt} = \alpha_0 + \alpha_1 1 / A_{jt-1} + \alpha_2(\Delta REV_{jt} - \Delta REC_{jt}) + \alpha_3 PPEN_{jt} + \alpha_4 BM_{jt} + \alpha_5 CFO_{jt} + \varepsilon_{jt}$ (2); DD is the standard deviation of the residual from the modified Dechow and Dichev model: $ACC_{jt} = \alpha_0 + \alpha_1 CFO_{jt-1} + \alpha_2 CFO_{jt} + \alpha_3 CFO_{jt+1} + \alpha_4(\Delta REV_{jt} - \Delta REC_{jt}) + \alpha_5 PPEN_{jt} + \varepsilon_{jt}$ (3).

Where ACC_{jt} — accruals (change in non-cash current assets minus change in current liabilities adjusted for the current portion of long term debt minus depreciation and amortization expense) scaled by lagged total assets of firm j in year t ; A_{jt-1} — lagged total assets of firm j in year $t-1$; ΔREV_{jt} — change in sales scaled by lagged total assets of firm j in year t ; ΔREC_{jt} — change in receivables from clients scaled by lagged total assets of firm j in year t ; $PPEN_{jt}$ — net value of the property, plant and equipment scaled by lagged total assets of firm j in year t ; ROA_{jt} — net income scaled by lagged total assets of firm j in year t ; BM_{jt} — book-to-market ratio of firm j in year t ; CFO_{jt} — operating cash flow of firm j in year t scaled by lagged total assets; NI_{jt} — net income of firm j in year t scaled by lagged total assets.

ANTIDIR = Index of anti-director rights (source: La Porta et al., 1998); INVPRO = Strength of investor protection index (source: World Bank <http://www.doingbusiness.org>); ENFORC = Average of three legal enforcement measures (source: Leuz et al., 2003); RULLAW = Rule of Law index (source: World Bank <http://databank.worldbank.org>); GOVERN = Index of corporate governance quality based on 7 attributes (source: Aggarwal et al., 2007); MKIMP1 = Mean rank across three variables: stock market capitalisation held by minorities/GNP; number of listed domestic firms/population; number of IPOs/population (source: Leuz et al., 2003); MKIMP2 = index of the degree of stock market orientation of the country's financial system (source: Demurgic-Kunt and Levine, 1999).

*, **, *** indicate statistical significance at 0.10, 0.05, and 0.01 respectively.

useful to reiterate the analysis in other geographical areas to find whether the European evidence is specific or not.

After measuring the impact of the financial crisis on earnings management, it would be interesting to examine its effect on other aspects of accounting quality. In particular, has the decrease of income smoothing in crisis years been associated with an increase of the value relevance and timeliness of accounting figures? Generally speaking, the consequences of macro-economic changes on the quality of accounting information are largely unexplored. Interesting developments could result from investigations in this domain, especially if the economy enters in turbulent times characterized by an alternation of growth and crisis periods.

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