Earnings management and investor protection during banking crises: The role of the "spare tire" effect

Abstract

This paper analyzes the association between earnings management and investor protection during banking crises. Using a sample of firms from 16 European countries for the period 2006-2018, we show that, as banking conditions worsen, firms are more likely to manage earnings upwards in countries with a stronger institutional environment, where alternative sources of financing are better available and more accessible. Moreover, we show that this strategy is successful because these firms are able to raise relatively more equity financing.

Keywords: earnings management, investor protection, crisis, equity finance

JEL Classification: M41, G14

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Introduction

This paper investigates whether and how the association between earnings management and investor protection[1] varies with the occurrence of banking crises. There is ample evidence that investor protection influences firms' financial reporting choices and earnings management (Leuz, 2010). On the one hand, stronger investor protection curbs earnings management by increasing the cost of misreporting and the degree of monitoring (Leuz et al., 2003) (*monitoring* channel). On the other hand, when investor protection is higher, outsiders tend to rely more on accounting information to dampen information asymmetries and form their valuations (*valuation* channel). Although several studies provide wide evidence in favor of the *monitoring* channel (Leuz et al., 2003; Burgstahler et al. 2006; Li and Zaiats, 2017), recent works (Samuels et al., 2021) suggest that the two channels may co-exist begging the question under which conditions one channel prevails over the other. We study whether banking crises can be one of these conditions.

Banks are a relevant source of financing worldwide. In Europe, bank loans represent the key funding source for firms as banks provide more than 70% of debt for European firms (Acharya et al., 2016). Therefore, banking crises represent a critical event for corporations because they impair access to a prominent source of financing and push firms to look for alternative funds (e.g. equity financing). Greenspan (1999a; 1999b) refers to this effect as the "spare tire" effect. Levine et al. (2016) document that this "spare tire" effect is more likely in countries with a strong institutional environment as higher investor protection facilitates access to equity markets. As accounting information plays a key role in firms' financing choices (Myers and Majluf, 1984; Roychowdhury et al., 2019) and firms will do everything they can to overcome a crisis situation (Trombetta and Imperatore, 2014), we contend that the occurrence of the "spare tire" effect in a banking crisis

[1] We use the terms investor protection and institutional environment interchangeably.

incentivizes firms to misreport to access equity markets and alleviate the negative consequences of the banking crisis. Even if we assume that equity investors rationally anticipate this misreporting behavior and discount price accordingly, earnings management could still be the optimal strategy for companies looking for equity funding, especially when they are facing financial constraints (Stein, 1989; Shivakumar, 2000)[2]. Thus, when the banking crisis hits, the "spare tire" effect increases the perceived benefits of the *valuation* channel and decreases the perceived cost of misreporting, so that the negative association between earnings management and investor protection is mitigated.

We test our hypothesis in a sample of 16 European countries for the period 2006-2018. In line with our expectations, we document that, during a banking crisis, companies use relatively *more* earnings management in countries with *stronger* investor protection to mitigate the adverse effects of the banking crisis by issuing more equity financing. Notably, we document that firms that manage earnings upwards more and operate in countries with a stronger institutional environment experience a lower reduction in equity financing when a banking crisis hits. We also find that results are stronger in companies that rely more on external finance and smaller firms.

We run a battery of additional analyses and robustness tests. First, we use alternative proxies for earnings management using the decomposition approach of Richardson et al. (2005) which is based on the different reliability of specific accruals. Results suggest that our results are driven by working capital accruals (i.e. accruals with a moderate level of reliability), while we do not find a significant effect for financial and non-current operating accruals. Moreover, we inspect whether our findings hold if we consider the role of societal trust. Prior works (Levine et al., 2018) show that, during a banking crisis, societal trust facilitates access to informal financing, but not to equity finance. In line with this view, we do not find evidence that firms in countries with higher societal trust are more likely to manage earnings upwards when a banking crisis occurs. Taken together,

[2] Kurt (2018) provides support for this "rational expectations" hypothesis.

these results attenuate concerns that our evidence is just due to changes in fundamentals rather than to earnings management.

The paper adds to diverse strands of research. First, we contribute to the literature on earnings quality and the characteristics of a country's institutional environment. There is ample evidence that earnings quality is higher in countries with a stricter institutional regime (Leuz et al. 2003; Burgstahler et al. 2006; Li and Zaiats, 2017) because of the stronger disciplining effect on managers' accounting choices. Our work suggests that the benefits of a stronger institutional environment can vary over time as a function of the banking sector's conditions. Specifically, we show that, although investors' protection is negatively associated with the degree of financial misreporting of companies, the negative effect is weaker during a banking crisis.

We also contribute to the literature investigating the relationship between financial reporting quality and changes in the banking system. Gormley et al. (2012) suggest that, after a reform in the banking system in India, firms are more conservative consistent with the idea that the improvement in the banking system increases demand for accounting information. Likewise, Khan and Lo (2019) show that the financial distress of a bank is associated with an increase in the conditional conservatism of its borrowers. Focusing on banking crisis, Ruckes (2004) and Dell'Ariccia and Marquez (2006) show that a banking crisis may generate an increase in public scrutiny and demand for accounting information. However, these prior studies focused on just one country. We extend this literature by using an international sample to test the possibility that the change in financial reporting strategies triggered by a banking crisis is moderated by the strength of the institutional environment.

Lastly, we speak to the literature analyzing the effects of a banking crisis on firms' financing decisions. Levine et al. (2016) document that, although equity financing decreases during a banking crisis, this negative effect is mitigated in countries with stronger investor protection. We complement the analysis of Levine et al. (2016) by showing that in countries with a stronger institutional environment, firms use earnings management to take more advantage of this "spare tire" effect. In this way, our results point out the importance of considering the interaction between

institutional factors and financial reporting while studying the impact of distress in the banking system on firms' behavior.

The paper proceeds as follows. In the next section, we review the relevant literature and develop our hypothesis. Research design and variable measurement are discussed in section three. Section four provides descriptive statistics and results for the multivariate analyses. Additional analyses and robustness tests are reported in section five and section six concludes.

Prior literature and hypothesis development

The association between countries' institutional features and earnings management has received ample attention in the literature. Starting from Ball et al. (2000) and Leuz et al. (2003), several studies documented that earning quality is higher (i.e. earnings management is lower) when investor protection is stronger (i.e. *monitoring* channel). This is because a stronger institutional environment assures investors that the reported path of earnings is reliable rather than the result of manipulation (Cahan et al., 2008) acting as a substitute for direct control by capital providers (An et al., 2016). Instead, in countries with weaker institutional regimes, the cost of misreporting is lower so that firms have stronger incentives and room to manage earnings.

However, the strength of investor protection affects not only the cost of misreporting but also capital providers' reliance on accounting numbers. When investor protection is low, capital providers tend to rely more on relationships and informal contracts (Burgstahler et al., 2006; Levine et al., 2018; Nam and Uchida, 2019) rather than accounting numbers. Instead, countries with stronger institutional environments are characterized by a greater reliance on financial statements and accounting numbers. This can generate incentives for firms to misreport and "look" better, especially when they look for external financing (i.e. *valuation* channel).

Given the broad evidence in favor of the *monitoring* channel, we still do not know if and under which conditions the *valuation* channel prevails over the *monitoring* one. Samuels et al. (2021) show that the intensity of public scrutiny can be a crucial factor. We claim that banking crises can

also be a crucial factor and increase the importance of the *valuation* channel enhancing firms' incentives to misreport in countries with stronger investor protection.

Banking crises are characterized by a credit-channel impact. Claessens et al. (2013) note that, when the burst involves banks, it is more likely to have real consequences because access to an important source of financing is threatened. For this reason, macroeconomists analyzing financial crises (IMF, 2008; Claessens et al., 2013) repeatedly pointed out the importance of distinguishing among different types of crises and considering the extent to which banks were involved in and hit by the turmoil.

As banking conditions deteriorate, firms bear two negative consequences. First, they experience a drop in lending due to banks' difficulties that hinder firms' pursuit of growth and investment opportunities (Ivashina and Scharfstein, 2010; Kahle and Stulz, 2013). Second, banks modify their investment decisions as a result of the turmoil. Ruckes (2004) and Dell'Ariccia and Marquez (2006) argue that banks' lending standards change as a function of credit cycles. During periods of credit expansion, lenders apply lower underwriting standards as the high credit demand reduces the benefits of firm-specific credit analysis and monitoring. Instead, when credit conditions worsen, lenders are more suspicious about borrowers' ability to meet obligations so they will exert stronger monitoring and require more information. Consistent with this idea, Lisowsky et al. (2017) show that after the 2007-2008 financial crisis, banks tightened their verification standards and collected more unqualified audited financial statements from clients. Moreover, following the distress, banks become more risk-averse preferring less risky firms and requiring a higher return on their investment (Hakkio and Keeton, 2009). Indeed, Hildebrand et al. (2012) document that, after the financial crisis, German banks modified their investment strategies preferring securities that were eligible as collateral in operations with central domestic firms in line with a flight to quality phenomena. Likewise, Khan and Lo (2019) show that US firms whose main bank lenders were affected by the emerging-markets financial crisis of the late 1990's experienced a tightening of lending requirements and, consequently, increased their level of conservatism after the crisis.

Both effects point to the fact that, when banking conditions worsen, less bank financing is available and firms may become financially constrained. Difficulties to access bank loans may push firms to look for alternative sources of financing (i.e. the "spare tire" effect).

However, access to the equity market is also influenced by the strength of the institutional environment. Levine et al. (2016) provide evidence that the "spare tire" effect is stronger in countries with a strict institutional environment where effective stock markets and legal infrastructures facilitate transactions and, hence, the substitution effect. Thus, when a banking crisis hits and firms have to search for substitutes to bank financing, the better availability of alternatives in countries with stronger investor protection increases the relative importance of the valuation channel in shaping firms' incentives to misreport.

As a result, managers in countries with stronger investor protection would have stronger incentives to manage earnings upwards when the banking crisis hits. Prior studies show that firms manage earnings upwards around seasoned equity offerings (Teoh et al., 1998a, 1998b). Moreover, there is also evidence that financially constrained firms manage earnings upwards when looking for equity financing (Linck et al., 2013; Kurt, 2018). Two arguments can be used to support the optimality of this strategy. The first argument is called the "rational expectation" hypothesis (Stein, 1989) according to which firms manage earnings exactly because they are expected to do so. In the presence of earnings management, rational investors correctly anticipate it and discount firm value accordingly. However, if this is the investor's expected strategy, then firms have to manage earnings if they want to maximize firm value. Shivakumar (2000) and Kurt (2018) provide evidence in favor of this hypothesis. The second argument is the so-called "signaling argument" and it is specific to the case of financially constrained firms. According to this argument, these firms use their accounting discretion to signal that they have superior investment projects. Linck et al. (2013) provide evidence that supports this hypothesis.

To summarize, banking crises compromise a crucial financing channel and generate financial constraints for many firms that look at the equity market as the "spare tire" for their financing

needs. In countries with a strong institutional environment, this "spare tire" effect is stronger. Moreover, it can be optimal for financially constrained firms to manage earnings while trying to access the equity market. Therefore, we conjecture that, during a banking crisis, the marginal effect of misreporting is higher in countries with stronger investor protection so that the *valuation* channel will prevail over the *monitoring* channel and the negative association between investor protection and earnings management is mitigated. Formally:

Hp: Banking crises weaken the negative association between investor protection and earnings management

Research design

Empirical model

We test our hypothesis by estimating the following logistic regression model:

$$Pr(DA_{it}>0) = F(\beta_0 + \beta_1 Banking\_Crisis_{jt} + \beta_2\, Antidi_{jt} + \beta_3\, Banking\_Crisis_{jt}\, x\, Antidi_{jt} + CONTROLS + \varepsilon_{it})\ (1)$$

DA_{it} are Discretionary Accruals for firm i in country j at time t. We use two alternative proxies for *DA*: i) $Posda_{it}$, computed according to the modified Jones model (1991), and ii) $Pospda_{it}$, computed using the performance-matched discretionary accruals model of Kothari et al. (2005). In both cases, we transform the measures into dummy variables that equal one in presence of positive discretionary accruals, and zero otherwise. We focus on positive discretionary accruals because we argue that firms will manage earnings *upwards* to ease their access to the equity market during a banking crisis and in a country with a strong institutional environment. This is in line with prior studies that documented that firms tend to inflate earnings in the period surrounding SEOs (Teoh et al., 1998a; Shivakumar, 2000). In other words, not only we expect to see earnings management in general. We expect to see a particular kind of earnings management, i.e. *income increasing* earnings management. Thus, we have a clear prediction of how accruals will be used by managers.

We start the computation of *DA* by estimating total accruals using the balance sheet approach. Hence, total accruals are the change in noncash current assets minus the change in non-debt current liabilities, minus depreciation, scaled by lagged total assets. Discretionary accruals (DA_{ijt}) are then computed either as the residuals from the modified Jones model (1991) or from the performance-matched model of Kothari et al. (2005). In line with Kothari et al. (2005), non-discretionary accruals are estimated without intercept and we require at least 7 observations for each industry-year-country combination.

Our test variable is the interaction term between *Banking_Crisis* and *Antidi*. According to our hypothesis, the coefficient β_3 for the interaction term should be positive and statistically significant. In line with Levine et al. (2016), *Antidi* is the anti-director index developed by Djankov et al. (2008) which captures the ease with which transactions occur and, hence, the strength of investor protection. In particular, the index gauges the degree to which the law protects minority shareholders from being expropriated by managers or by controlling shareholders using self-dealing transactions. Thus, investor protection is expected to be higher in countries with greater values of the anti-self-dealing index.

With respect to *Banking_Crisis*, we rely on prior studies (Kliesen et al., 2012) looking for observable manifestations of turbulence in the banking sector that can be used as proxies. A first approach is to consider historical narratives and chronology of well-known financial turmoil episodes. An alternative method is to use indexes based on a time series of a wide array of financial indicators able to pick up the variability of financial market conditions. Both approaches have pros and cons. A historical-based operationalization of financial turmoil is more consistent with the conception of financial distress as a sporadic and unforeseeable event. However, as pointed out by IMF (2008), the mere focus on the occurrence or absence of the shock overlooks the intensity of the distress, implicitly assuming that episodes are similar. The use of an index capturing the level of turbulence in the banking system overcomes this limit and it allows us to better capture the dynamics of the banking sector. Yet, as banking sector dynamics are highly correlated with real

economy dynamics, it is hard to attribute the co-movement of specific factors to pure banking dynamics. To attenuate such measurement concerns, we use both approaches and we operationalize *Banking_Crisis* in two ways. The first measure is a dummy variable equal to one if a banking crisis occurs in country (j) at time (t), and zero otherwise (*Banking_Crisis_dummy*). The existence of the banking crisis is determined on the basis of the dataset of banking crises created by Laeven and Valencia (2013). Our second measure is the country-level index of financial stress (CLIFS) created by the European Central Bank (ECB) (*Banking_Crisis_index*)[3].

A vector of control variables is also included to account for firm-level determinants of upwards earnings management (Gaio, 2010; Gopalan and Jayaraman, 2012). We account for the effect of firm size (*Size*), measured as the logarithm of total assets as larger firms tend to be more visible; firm performance (*Loss*), proxied with an indicator variable equal to one if the firm reported losses in the prior three years, and zero otherwise; firm leverage (*Leverage*), measured as total debt divided by total assets as more leveraged firms have higher incentives to manage earnings to avoid covenant violation. We also control for the tangibility of assets (*Oplev*), measured as net property, plant, and equipment divided by total assets; and sales growth (*Growth*), proxied by the change in net sales scaled by beginning-of-year net sales. Lastly, we add cash flows from operations (*Cfo*) scaled by total assets; the length of the operating cycle (*Cycle*); market-to-book ratio (*Mb*), and *Altman* as proxied by Altman Z-score (1968) to account for further firm's characteristics. In addition to firm-level determinants, we also include year dummies and an indicator variable equal to one if firms use IFRS accounting standards to account for the introduction of IFRS in 2005. Given that financial crisis and economic recessions tend to be correlated (Trombetta and Imperatore, 2014), we also include the GDP growth variation for the country at time (t) (*GDP*) as a control for macroeconomic activity.

[3]Monthly values of the CLIFS can be downloaded from https://sdw.ecb.europa.eu/browse.do?node=9693347. Given the annual frequency of the monthly data, we use the annual average of the monthly values as our proxy of banking crisis.

Because we are interested in the interaction term between *Antidi* and banking crises, in our main specifications we include firm fixed effects to control for time-invariant firm characteristics. As a consequence of the inclusion of firm fixed effects, the main effect for *Antidi* is subsumed in the intercept[4]. Given that, we also run our analyses and report our main findings by including industry and year-fixed effects. However, because we are interested in how the association between investor protection and earnings management changes over time depending on banking conditions, we believe that model specification including firm fixed effects better captures the within-firm variation we are interested in. Therefore, in the additional analyses section, we only report the estimation results of models including firm fixed effects. We cluster standard errors at firm-level (Petersen, 2009). All variables are winsorized at 1% and they are defined in the Appendix.

Sample selection

We run our analyses by focusing on a sample of 16 European countries[5] for the period 2006-2018. We start our sample after 2005 to avoid the confounding effect of the introduction of IFRS in Europe in 2005. Moreover, we focus on the European setting as this enables us to use a country-level indicator of financial distress while keeping enough variability in the strength of the institutional environment. We start with the population of all nonfinancial public firms listed in the 16 countries and available in Thomson Reuters Datastream database for the period 2006-2018. Then, we impose the requirement that data are available for all variables and that each industry-year-country combination has at least 7 observations for the computation of discretionary accruals according to the modified Jones model. After having computed all the variables of interest, the final sample is given by 46,223 firm-year observations (5,773 unique firms) for the period 2006-2018 and it changes across specifications given the diverse requirements to compute measures. Notably,

[4] In untabulated analyses, we include additional controls for stock market development (number of listed of firms, number of IPOs, market capitalization), both alone and interacted with our proxies for banking crises. Our results still hold.
[5] Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and UK.

as CLIFS is only available for 14 out of 16 countries, when *Banking_Crisis* is operationalized through the continuous variable, Switzerland and Norway are excluded.

Table 1 Panel A and B report the breakdown of the sample by country and year, respectively. UK (25.74%), Germany (14.66%), and France (14.55%) are the countries with the largest number of observations, while Ireland (0.22%) and Portugal (0.73%) are the least represented. Notably, the observations are evenly distributed across the years.

[Insert Table 1 around here]

Descriptive statistics and correlation analysis

Figure 1 shows the trend of the banking crisis index over time. The index ranges between 0.024 (i.e. 2006 and 2005) and 0.567 (i.e. 2009). The index reaches peaks in the period 2008-2010 (Great Financial Crisis), 2012 (Eurozone debt crisis), and 2015 (Greek government debt-crisis). The pattern occurs across all countries although with diverse timing and intensity.

[Insert Figure 1 around here]

Table 2 Panel A shows the descriptive statistics of the variables in testing our hypothesis.

[Insert Table 2 around here]

The average values for upwards earnings management are 0.420 and 0.418 for *Posda* and *Pospda*, respectively. Firms are quite large (the average value is 12.159 while the median is 11.977) and profitable as only 39.2% of firms report losses. Likewise, the average (median) value for cash flows from operations is 5.5% (9%) and the mean (median) value of the Altman Z-score is 3.297 (2.477). Firms in the sample have a low financial leverage ratio (the mean value is 22.3%, and the median is 19.1%) while the mean (median) value of operating leverage is 22.9% (16.3%). The average (median) value of sales growth is 16.6% (5%) while the mean market-to-book value of 2.466. Lastly, the average value of the operating cycle is equal to 232 days.

Looking at Pearson's pairwise correlation matrix reported in Table 2 Panel B, we observe that both earnings management measures are negatively and significantly correlated with *Antidi*, in line with prior works. Noteworthy, we do not find a significant correlation between earnings management proxies and *Banking_Crisis_dummy,* while the correlation between earnings management proxies and *Banking_Crisis_index* is negative and statistically significant.

Results and discussion

Earnings management, investor protection, and banking crisis

Table 3 reports the empirical evidence for testing our hypothesis. Column (1) and Column (2) show the findings for *Posda* and *Pospda*, respectively, when the dichotomous variable (*Banking_Crisis_dummy*) is used as a proxy for the banking crisis for the 16 countries with industry and year-fixed effects. Columns (3) and (4) report the same findings with firm and year-fixed effects. In Columns (5) and (6), we include the findings for *Posda* and *Pospda*, respectively, when the continuous variable (*Banking_Crisis_index*) is used as a proxy for the banking crisis for the 14 countries for which the CLIFS index is available, with industry and year fixed effects. Columns (7) and (8) show the same results including firm and year-fixed effects.

[Insert Table 3 around here]

In line with prior studies (Leuz et al., 2003; Burgstahler et al., 2006), we find that the coefficient for *Antidi* is negative and statistically significant in Column (1), (2), (5), and (6) when industry fixed effects are included. The coefficients for *Banking_Crisis_dummy* and *Banking_Crisis_index* are also negative and statistically significant in all models, suggesting that firms are less likely to manage earnings upwards when the country in which they operate is hit by a banking crisis. Focusing on our coefficient of interest, we notice that the interaction term between *Banking_Crisis* and *Antidi* is positive and statistically significant in all columns, except Column (1), in line with our hypothesis. Hence, when a banking crisis occurs, firms operating in countries with a strong

institutional environment are more likely to use positive discretionary accruals to manage earnings than firms operating in countries with a weak institutional environment. Figure 2 provides a graphical representation of the interaction term *Banking_Crisis_dummy x Antidi* in Column (2).

[Insert Figure 2 around here]

We observe a negative association between earnings management and the strength of investor protection (*Antidi*) in the absence of a banking crisis. However, in line with the positive interaction term reported in Table 3, this negative association is weaker in presence of a banking crisis. Thus, when a banking crisis hits, differences across countries are attenuated. Moreover, we find that earnings management is lower in a period of banking crisis for each level of investor protection, except the highest one. Hence, in countries with the highest level of investor protection, firms are *more* likely to manage earnings during a banking crisis than in normal times. This evidence is in line with the idea that stronger investor protection is associated with broader access to alternative sources of financing that creates an incentive for companies to be more aggressive in their accounting choices to better tap the equity market. Interestingly, the switching point is between levels 4 and 5 of *Antidi,* where most of our observations are included[6].

Test for the mechanism

Our argument rests on the idea that, during a banking crisis, in countries with a strong institutional environment, earnings management is used as an intermediate tool to access equity financing (the "spare tire"). We test our conjecture that firms located in countries with a strong institutional environment use more positive accruals during a banking crisis to obtain more equity financing, by

[6] In untabulated analysis we find that, in countries with a stronger institutional environment, firms that are financially constrained, issue equity and manage earnings up perform better than those are not financially constrained, do not issue equity and do not manage earnings up. These results support the signalling hypothesis (Linck et al., 2013) versus the rational expectation (Stein, 1989) or the opportunistic hypothesis (Teoh et al., 1998a, 1998b) as the theoretical argument to justify earnings management as an a optimal strategy in a rational equilibrium where investors are not fooled.

using a two-stage regression approach[7]. In the first stage, we run model (1). In the second stage, we take the fitted value of DA from the first stage, and we add it to the following regression model:

$$Equity\ issuance_{it+1} = \beta_0 + \beta_1 Banking\_Crisis_{jt} + \beta_2\ Antidi_{jt} + \beta_3\ Fitted\_DA_{it+} \beta_4$$

$$Banking\_Crisis_{jt}\ x\ Antidi_{jt}\ x\ Fitted\_DA_{it} + CONTROLS + \varepsilon_{it}\ (2)$$

As in model (2), *DA* can be either $Posda_{ijt}$ (modified Jones model) or $Pospda_{ijt}$ (performance-matched model). In line with Levine et al. (2016), we measure *Equity issuance* as the change in the book value of common equity minus the change in retained earnings during a specific year *t*, scaled by total assets at the close of year *t-1*.[8] To better capture the sequence of corporate choices, the independent and control variables are taken at time *t* while equity issuance is considered at time *t+1*. *Banking_Crisis* and *Antidi* are defined as in model (1). Following Levine et al. (2016), we include a set of control variables: a dummy variable equal to 1 if a recession takes place at time (t), and 0 otherwise (*Recession*); firm leverage (*Leverage*), measured as total debt divided by total assets; firm size (*Size*), measured as the logarithm of total assets; Tobin's Q (*Tobin Q*), measured as the market value of total assets divided by book value of total assets; and cash flows from operations (*Cfo*) scaled by total assets. Industry, country, and year dummies are included in both stages. Our coefficient of interest is β_4 and it is expected to be positive and statistically significant. Empirical evidence for the second stage of the model (2) is reported in Table 4[9]. Columns (1) and (2) show the results for *Fitted_Posda* and *Fitted_Pospda*, respectively, using *Banking_Crisis_dummy*. Columns (3) and (4) exhibit the findings for *Fitted_Posda* and *Fitted_Pospda*, respectively, using *Banking_Crisis_index*.

[7] The two-stage approach is warranted in our context because both earnings management and equity issuance are endogenous variables and they both influenced by banking conditions and country characteristics.

[8] The average value of *Equity_Issuance* in the sample is equal to 1.4% of total assets.

[9] Results from the first stage are not tabulated for the sake of parsimony, but they are in line with the evidence reported in Table 4: when the banking crisis hits the country, firms are more likely to manage earnings upwards in presence of a stronger investor protection. In supplementary analyses, we replicate the model of Levine et al. (2016). We find that, when a banking crisis occurs, firms in countries with a stronger institutional environment issue more equity and, hence, the spare tire effect is more likely to be observed, in line with the evidence of Levine et al. (2016).

[Insert Table 4 around here]

We find a positive and statistically significant coefficient for *Banking_Crisis* in all columns. Given the inclusion of the three-way interaction, the coefficient for *Banking_Crisis* captures the effect of the banking crisis on equity financing when the other two variables are equal to 0 and, hence, it is not really interpretable. Instead, the coefficients for the institutional environment variable (*Antidi*) are positive and statistically significant, but the coefficients for *Banking_Crisis x Antidi* are negative and statistically significant. These results are consistent with the idea that there is no "spare tire" effect for firms with lower earnings management. Notably, the coefficients for *Fitted_Posda* and *Fitted_Pospda* are positive and statistically significant in line with the idea that managing earnings upwards helps firms to issue equity finance. Above all, the coefficients for the three-way interaction terms are positive and statistically significant. This means that, in countries with a stricter institutional environment and during a banking crisis, firms with more upwards earnings management are able to raise relatively more equity financing. Taken together, these results support our argument and extend the results of Levine et al. (2016) by showing the mechanism (upwards earnings management) used to access the "spare tire" (equity financing) when it is available (stronger institutional environment). Borrowing the terminology introduced by Samuels et al. (2021), we can say that our results are consistent with the idea that, during a banking crisis the valuation effect of a strong institutional environment dominates, and, hence, firms are more likely to manage earnings to increase the chance to raise equity finance.

To facilitate the interpretation of the findings reported in Table 4, we re-run model (1) in two sub-samples using *Equity issuance* as a partitioning variable. According to our argument, when the banking crisis hits the country, firms are more likely to manage earnings upwards when the institutional environment is stronger and they issue equity. Following Leary (2009), we use 5% of total assets to identify material equity issuances and we partition the sample accordingly. Equity

issuance occurs in 18.94% of the observations. Empirical evidence is reported in Table 5 Panel A for firms not issuing equity and in Table 5 Panel B for firms with equity issuance.

[Insert Table 5 around here]

In Table 5 Panel A, where we consider firms not issuing equity finance, we observe that the coefficient for *Banking_Crisis x Antidi* is positive and statistically significant only in Column (1), while the coefficient is not statistically significant in the other columns. Instead, in Table 5 Panel B, namely in firms raising equity finance in response to a deterioration in banking conditions, the coefficient is always positive and statistically significant. The coefficients are statistically different at 1% in all cases, except in Column (1). This evidence further confirms our claim that, when the banking crisis hits and firms look for alternative sources of financing, firms are more likely to manage earnings when equity markets are more accessible, and they successfully raise new equity[10].

In untabulated analyses, we also investigate whether firms engaging more in earnings management in countries with strong investor protection experience a change in the capital structure. If the "spare tire" mechanism is at work and firms substitute debt financing with equity financing, we should observe a reduction in the leverage ratio. In line with our conjecture, we find that, during a banking crisis, firms that are more likely to manage earnings upwards in countries with a strong institutional environment experience a decrease in the leverage ratio. This is in line with the idea that these firms want to raise equity to tap the reduction in debt financing due to the banking crisis[11].

[10] We obtain similar evidence if we consider proceeds from equity sale and we define equity issuance on the basis of 1%, and 10% of proceeds from equity sale with respect to total assets.

[11] We acknowledge that the lower reduction in equity financing and the greater decrease of the leverage ratio may also be explained by a re-balancing of the capital structure (e.g. firms far from their optimal leverage ratio, may issue more equity to rebalance their structure). This is reasonable if the cost of raising equity is lower during a banking crisis in countries with a stronger institutional environment and for firms with more aggressive accounting practices. This is unlikely to be the case in our setting. Nevertheless, to further reduce this concern, we inspect the impact on corporate investments. We find that firms with more upward earnings management operating in countries with stronger investor protection reduce less capital investments during a banking crisis with respect to other firms.

Additional analyses

Cross-sectional tests

To reinforce our main findings, we investigate whether our evidence is stronger when companies are hit more by the banking crisis. We consider two firms' characteristics: i) firms' reliance upon external financing; and ii) firm size because smaller firms are less visible and, hence, they face more difficulties accessing equity markets while relying more upon debt financing.

Levine et al. (2016) suggest that the "spare tire" effect is more pronounced for firms that depend more on external financing. Thus, we expect the coefficient for the interaction term *Banking_Crisis x Antidi* in model (1) to be greater for firms that heavily rely upon external finance and access equity finance. We test our conjecture by dividing our full sample into four sub-samples depending on whether the firm issues equity finance, and whether the firm-level of external finance dependence is above (below) the industry-country-year median value. Following Levine et al. (2016), we measure external finance dependence as the difference between capital expenditures and cash flows from operations, all divided by capital expenditures. The same approach is used when we consider firm size. Once the subsamples have been identified, we replicate model (1) for each subsample. Empirical evidence is reported in Table 6 Panel A for external finance dependence, and Table 6 Panel B for firm size. In both cases, we only report the results for *Banking_Crisis_index* for the sake of parsimony[12].

[Insert Table 6 around here]

In Table 6 Panel A, we find that the coefficient for interaction term *Banking_Crisis_index x Antidi* is positive and statistically significant at the 1% level in Columns (7) and (8), where we consider firms that heavily rely upon external finance and issue equity finance. In the case of firms that rely

[12] We draw the same conclusions if we adopt *Banking_Crisis_dummy* and alternative measures of earnings management.

less upon external finance and issue equity, the coefficient for the interaction is positive and statistically significant only in Column (4). Instead, the coefficient is not statistically significant for firms that rely less on external finance or do not issue equity. The coefficients are statistically different at the 1% level, suggesting that firms are more likely to manage earnings upwards when they depend more on external finance and issue equity, namely when the spare tire effect is more likely to occur. We obtain similar evidence in Table 6 Panel B, where we consider firm size. In this case, we find that the coefficient for interaction term *Banking_Crisis_index x Antidi* is positive and statistically significant at the 1% level only in Columns (3) and (4), namely only for smaller firms that issue equity finance. The coefficient is not statistically significant at conventional levels for larger firms and for firms that do not raise equity finance. A formal t-test confirms that the coefficients are statistically different confirming that upwards earnings management is more likely when firms are hit more by the banking crisis and raise equity to keep their operations.

Robustness tests: alternative measures of earnings management

We corroborate our results by conducting a battery of robustness tests. First, we use alternative measures for earnings management. In our main tests, we used *Posda* and *Pospda* as our measures of earnings management because we had a clear prediction on how managers adjust their earnings to tap equity markets. Yet, we acknowledge that the use of a dummy variable overlooks the intensity of the manipulation (upwards and downwards). Hence, in additional tests, we re-run our analyses by using the continuous measure of both discretionary accruals (*DA*) and performance-matched discretionary accruals (*PDA*). Untabulated evidence is in line with our main findings: as banking conditions worsen, managers manage earnings (upwards) more in countries with a stricter institutional environment and the effect is stronger for firms issuing equity.

Moreover, as prior literature has repeatedly pointed out limitations and measurement issues associated with the use of discretionary accruals (Larson et al., 2018), we adopt the accruals typology developed by Richardson et al. (2005). In contrast with discretionary accruals, Richardson et al. (2005) distinguish accruals based on their measurement reliability and the extent to which they

are influenced by judgment and estimates. Following their approach, we compute total accruals (*T_ACC*) and subsequently decompose them into current operating accruals (*WC_ACC*), non-current operating accruals (*NCO_ACC*), and financial accruals (*FIN_ACC).* Current operating accruals are considered more reliably measured than non-current operating accruals; while financial accruals are more reliable than operating accruals components. The adoption of this alternative approach not only attenuates measurement concerns but also enables us to better assess the interplay of the *monitoring* and *valuation* effects when banking conditions worsen. We re-run model (1) by substituting *Posda* and *Pospda* with the four alternative accruals measures. For the sake of parsimony, we report the results using *Banking_Crisis_index*[13] for the two sub-samples of firms without and with equity issuance.

Empirical evidence is reported in Table 7. Columns (1), (2), (3) and (4) show the findings for firms that do not raise equity financing, while Columns (5), (6), (7), and (8) report the evidence for firms issuing equity.

[Insert Table 7 around here]

We find that, when a banking crisis hits the country, firms that do not issue equity in countries with a stricter institutional environment do not seem to adjust the levels of total accruals (Column 1). If we consider the specific components, we observe that these firms report lower levels of non-current operating accruals (Column 3), namely the accruals with the lowest level of reliability. We observe the opposite effect for the financial (Column 4), and working capital accruals (Column 2). These findings may suggest that, when firms do not raise equity, the monitoring effect associated with a stricter institutional environment improves the information environment when banking conditions worsen. In the case of firms issuing equity, we find that, when the banking crisis occurs, firms operating in countries with stronger investor protection report higher total accruals (Column 5),

[13] We obtain similar conclusions if we use *Banking_Crisis_dummy* as proxy.

especially working capital accruals (Column 6). Instead, we do not find significant results for non-current (Column 7) and financial accruals (Column 8). Coefficients are statistically different at 5% in Columns (1) and (5), and Columns (2) and (6).

Taken together, these results seem to confirm that the *valuation* channel plays a more important role when banking conditions worsen, triggering firms to manage earnings more to access alternative sources of financing. However, the *valuation* effect does not completely offset the *monitoring* one, as firms will not use the most unreliable accruals to appear better in face of capital providers. Above all, evidence in Table 7 mitigates the concern that our findings are merely driven by changes in business fundamentals as firms use specific accruals in distinct ways depending on their level of reliability, perceived valuation benefits, and monitoring costs.

Robustness tests: alternative measures of investor protection

Next, we inspect whether our results are robust to alternative measures for investor protection. Specifically, we consider i) the rule of law as computed by Kaufmann et al. (2003); and ii) the cluster classification proposed by Leuz (2010). Leuz (2010) identifies three clusters of countries on the basis of institutional and capital market characteristics: 1) outsider-oriented economies; 2) insider-oriented economies with a strong institutional regime; 3) insider-oriented economies with a weak institutional regime. Our conclusions hold if we adopt such alternative measures.

In our main analyses, we have focused on the level of investor protection as the main feature of the institutional environment triggering the "spare tire" effect documented by Levine et al. (2016). However, equity financing is not the only alternative source of financing firms may look for when a banking crisis hits. Levine et al. (2018) document that, when a banking crisis blocks the normal bank financing channel, firms may look for informal finance (e.g. trade credit) and this is more likely in countries with higher levels of societal trust. They also show that higher societal trust does not influence equity issuance which relies more on formal arrangements. Relying on these insights, we run a falsification test to further rule out the role of changes in business fundamentals in our findings. Indeed, if our results are due to earnings management and firms' needs to raise equity, we

should observe the coefficient for the interaction term between *Banking_Crisis* and societal trust to be not statistically significant or negative. We should also observe that the interaction term between *Banking_Crisis* and *Antidi* is robust to the inclusion of this additional country feature.

To test these conjectures, we follow Nanda and Wysocki (2015), and proxy societal trust using the societal trust index based on data tabulated from Wave 4 and 5)of the World Values Survey and the Latinbarometro Survey[14] (*Societal_trust*). Then, we re-run model (1) adding the interaction term between our proxies for banking crises and *Societal_trust.* Empirical evidence is reported in Table 8 Panel A. For the sake of parsimony, we only tabulate results for *Banking_Crisis_index*, but the evidence is similar using *Banking_Crisis_dummy.* Columns (1) and (2) report the findings for the full sample for *Posda* and *Pospda*, respectively. Columns (3) and (4) show the results for firms not issuing equity, while Columns (5) and (6) display the evidence for firms raising equity.

[Insert Table 8 around here]

We find that the coefficient for the interaction term between *Banking_Crisis_index* and *Antidi* is positive and statistically significant both in the full sample (Columns 1 and 2), and in presence of equity issuances (Columns 5 and 6). Instead, it is not statistically significant in Columns (3) and (4), for firms that do not raise equity finance. A formal t-test confirms that the coefficients are statistically different at the 1% level in line with evidence reported in Table 5. Above all, the coefficient for *Banking_Crisis_index x Societal_trust* is negative and statistically significant only in Columns (1) and (3). The coefficient for the interaction term is not statistically significant in Columns (5) and (6), namely when firms raise equity suggesting that, when banking conditions deteriorate, firms in countries with high societal trust do not manage earnings more to raise equity. These results are in line with the evidence of Levine et al. (2018) according to which societal trust

[14] Survey respondents answered the question of trust of people in their country. The two possible answers were "Most people can be trusted" and "Can"t be too careful". Based on the responses, a "TRUST INDEX" was calculated for each country as: 100 + (% Most people can be trusted) - (% Can´t be too careful). The average value of *Societal_trust* in our sample is 76.527, with a minimum of 21.9 (Portugal) and a maximum value equal to 148 (Norway). Instead, the correlation between *Antidi* and *Societal_trust* is negative and statistically significant at 1% level.

does not affect access to equity finance so that firms have low incentives to manage earnings upwards.

Notably, we find some evidence that, when a banking crisis hits, firms operating in countries with high societal trust are less likely to manage earnings upwards (Column 1), especially when firms do not issue new equity finance (Column 3). As a high level of societal trust facilitates firms' access to less formal types of financing (i.e. trade credit) during the banking crisis, we dig further into these results by inspecting the association between earnings management and this alternative "spare tire" effect. Specifically, we want to rule out the possibility that, as banking conditions deteriorate, firms in countries with a weaker institutional environment (i.e. high societal trust) are less likely to manage earnings because they substitute impaired debt funds with more informal financing for which (hard) accounting information is less relevant.

Following Levine et al. (2018) and Nam and Uchida (2019), we consider trade credit (*Trade_credit*) as an informal source of financing alternative to debt. *Trade_credit* is computed as changes in accounts payable divided by total assets at time (t-1). As changes in accounts payable represent a component of discretionary accruals, we focus on non-current operating accruals (*NCO_ACC*) to avoid capturing mechanical associations. As we have pointed out before, *NCO_ACC* is the least reliable type of accruals because it is more exposed to estimates and judgments. We re-run model (1) using *NCO_ACC* as a dependent variable in two sub-samples determined on the basis of the sample median value of *Trade_credit*. Empirical evidence is reported in Table 8 Panel B for *Banking_Crisis_dummy* (Columns 1 and 2) and *Banking_Crisis_index* (Columns 3 and 4).

We find that the coefficient for the interaction term *Banking_Crisis x Antidi* is negative and statistically significant in Columns (1) and (3), i.e. for lower levels of trade credit; while it is not statistically significant in Columns (2) and (4), i.e. for higher levels of trade credit. The coefficients are statistically different between the two sub-samples at the 10% level. These results provide two main insights. First, they confirm that, when banking conditions worsen, the *monitoring* channel still exists in countries with a stricter institutional environment, but it only disciplines firms that do

not look for alternative sources of finance (either equity finance or trade credit). Second, they attenuate concerns that, when banking conditions worsen, firms in countries with a laxer institutional environment manage earnings less as they prefer less information-sensitive and more informal sources of financing (e.g. trade credit).

Conclusion

We investigate the association between earnings management and investor protection during banking crises. A lack of access to adequate financing sources can have serious effects on firms' investment and growth. A reduction in firms' investment translates either into a deceleration of overall economic activity or a recession. For this reason, it is very important to understand how firms react to banking crises, because this knowledge may help regulators and policymakers at intervening and reducing the negative consequences of the crisis. Using a sample of European listed firms in 16 countries for the period 2006-2018, we document that firms located in countries with a stronger institutional environment are more likely to manage earnings upwards as banking conditions worsen. When the country's banking system is under threat and access to bank financing is hindered, firms have incentives to adjust their accounting policies to look for alternative financial resources. This strategy is optimal even if investors anticipate it because it is used to signal good prospects for the future (Lick et al., 2013). These incentives are stronger in countries where the institutional environment facilitates access to alternative markets. We show that, in these countries, income-increasing earnings management eases access to the equity market during a banking crisis thus acting as the transmission mechanism for the "spare tire" effect documented by Levine et al. (2016). We corroborate our analyses by running a battery of sensitivity tests using alternative measures of earnings management and institutional environment.

Our results show that banking crises are a fundamental factor to take into consideration while evaluating the role of the institutional environment in shaping managers' incentives to manage earnings. Previous literature has provided support for a negative relationship between investor

protection and earnings management. This idea is based on the *monitoring* effect of investor protection that appears to dominate in normal times. However, we document that the disciplining effects of a strict institutional environment may vary over time and be reduced during a banking crisis, because of the increased importance of the *valuation* effect of the institutional environment. Despite its contributions, the work is subject to limitations. For example, throughout our analyses, we did not make any specific assumption about managers' specific incentives to manage earnings when banking system conditions are threatened. We implicitly assumed that managers manipulate earnings to facilitate access to financing without considering personal managers' incentives to do so in a period of turmoil. The evidence that earnings management has subsequent positive implications reduces the concerns that managers will manage earnings for their own benefit at expense of shareholders. Yet, differences can occur across firms. Future research could address this issue by exploiting heterogeneity in managers' incentives and ability to manage earnings.

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Appendix

Variables definition

Variable	*Definition*
DA	Discretionary accruals computed according to modified Jones model (1991)
PDA	Performance matched discretionary accruals computed following Kothari et al. (2005)
Posda	Dummy variable equal to 1 if DA is positive, and 0 otherwise
Pospda	Dummy variable equal to 1if PDA is positive, and 0 otherwise
Antidi	Anti-Director Index computed by Djankov et al. (2008)
Banking_Crisis_dummy	Dummy variable equal to 1 if a banking crisis occurs according to Laeven and Valencia (2013), and 0 otherwise
Banking_Crisis_index	CLIFS indicator of financial distress created by European Central Bank (ECB), available at https://sdw.ecb.europa.eu/browseExplanation.do?node=9693347
GDP	Percentage change in GDP growth. Data on GDP have been retrieved from World Bank
Recession	Dummy variable equal to 1 if a recession took place at time (t). A recession is defined by considering negative variation in GDP growth, and 0 otherwise
Size	Natural logarithm of total assets
Loss	Dummy variable equal 1 if firm reports a loss in the three previous years, and 0 otherwise
Leverage	Total debt divided by total assets
Oplev	Net property, plant and equipment divided by total assets
Growth	Change in net sales divided by net sales at (t-1)
Cfo	Cash flow from operations scaled by total assets
Cycle	Length of the operating cycle, defined as the number of days receivables minus the number of days inventory. Days receivables is computed as 360 divided by the ratio of average receivables to sales. Days inventory is similarly defined as 360 divided by the ratio of average inventory to cost of goods sold.
Mb	Market-to-book ratio. Market equity divided by book value of equity. Market equity is defined as shares outstanding times the fiscal year closing price.
Altman	Altman Z-score (1968), computed as (1.2 x (Working capital divided by total assets) + (1.3 x (Retained earnings divided by total assets)) + (3.3 x (ebit divided by total assets)) + (0.6 x (Market equity divided by total liabilities)) + (sales divided total assets).
IFRS	Dummy variable equal 1 if firm adopts IFRS and 0 otherwise
Equity_issuance	Change in the book value of common equity minus the change in retained earnings during a specific year (t), scaled by total assets at the close of year (t −1).
Tobin Q	Ratio of the market value of assets to total assets. The market value of assets is defined as the book value of total assets plus market equity minus common equity. Market equity is defined as shares outstanding times the fiscal year closing price.
Financial dependence	Difference between capital expenditures and cash flow from operations divided by capital expenditures.
T_ACC	Total accruals calculated as the sum of current operating accruals (WC_ACC), non-current operating accruals (NCO_ACC) and financial accruals (FIN_ACC) (Richardson et al., 2005).
WC_ACC	Current operating accruals calculated as WCt – WCt-1 deflated by average total assets. WC is defined as Current Operating Assets (WCA) - Current Operating Liabilities (WCL). Current operating assets accruals calculated as WCAt – WCAt-1 deflated by average total assets. WCA is defined as Current Assets (WC02201) - Cash and Short-Term Investments (WC02001). Current operating liabilities accruals calculated as WCLt – WCLt-1 deflated by average total

	assets. WCL is defined as Current Liabilities (WC03101) - Debt in Current Liabilities (WC03051).
NCO_ACC	Non-current operating accruals calculated as NCOt – NCOt-1 deflated by average total assets. NCO is defined as Non-Current Operating Assets (NCOA) - Non-Current Operating Liabilities (NCOL). Non-current operating assets accruals calculated as NCOAt – NCOAt-1 deflated by average total assets. NCOA is defined as Total Assets (WC02999) - Current Assets (WC02201) - Long-Term Investments [Long Term Receivables (WC02258) + Investment in Associated Companies (WC02256) + Other Investments (WC02250)]. Non-current operating liabilities accruals calculated as NCOLt – NCOLt-1 deflated by average total assets. NCOL is defined as Total Liabilities (WC03351) - Current Liabilities (WC03101) – Long-term debt (WC03251).
FIN_ACC	Financial accruals calculated as FINt – FINt-1 deflated by average total assets. FIN is defined as Financial Assets (FINA) - Financial Liabilities (FINL), where FINA = Short-Term Investments [Cash and Short-Term Investments (WC02001) – Cash (WC02003)] + Long-Term Investments [Long Term Receivables (WC02258) + Investment in Associated Companies (WC02256) + Other Investments (WC02250)] and FINL = Long-term debt (WC03251) + Debt in Current Liabilities (WC03051) + Preferred Stock (WC03451).
Societal_trust	Trust Index from WVS - measure of interpersonal trust. “TRUST INDEX” = 100 + (% Most people can be trusted) - (% Can´t be too careful).
Trade_credit	Change in accounts payable between time (t) and (t-1), divided by total assets at time (t-1).

Table 1. *Sample Composition*

Panel A. *Sample distribution by country*

Country	N	%	Unique firms	Average yearly obs by firm
Austria	608	1.32	73	8
Belgium	925	2.00	110	8
Denmark	1,210	2.62	140	9
Finland	1,450	3.14	157	9
France	6,725	14.55	835	8
Germany	6,775	14.66	813	8
Greece	2,427	5.25	262	9
Ireland	101	0.22	21	5
Italy	2,725	5.90	344	8
Netherlands	1,173	2.54	140	8
Norway	1,841	3.98	271	7
Portugal	336	0.73	37	9
Spain	1,378	2.98	161	9
Sweden	4,763	10.30	706	7
Switzerland	1,889	4.09	190	10
UK	11,897	25.74	1.513	8
Total	***46,223***	***100***	***5,773***	

Panel B. *Sample distribution by year*

Year	Freq.	%
2006	3,459	7.48
2007	3,750	8.11
2008	3,871	8.37
2009	3,840	8.31
2010	3,736	8.08
2011	3,638	7.87
2012	3,488	7.55
2013	3,418	7.39
2014	3,443	7.45
2015	3,419	7.40
2016	3,367	7.28
2017	3,393	7.34
2018	3,401	7.36
Total	***46,223***	***100***

Table 1 Panel A shows the breakdown of our sample observations by country. We report the overall number of observations, the percentage with respect to the total sample, the number of unique firms as well as the average number of firms by country. Table 1 Panel B includes the breakdown of our sample observations by year.

Table 2. Summary statistics

Panel A. *Descriptives*

Variable	N	Mean	Min	p25	p50	p75	Max
Posda	46,223	0.420	0.000	0.000	0.000	1.000	1.000
Pospda	45,040	0.418	0.000	0.000	0.000	1.000	1.000
DA	46,223	-0.014	-0.439	-0.054	-0.011	0.029	0.412
PDA	45,040	-0.014	-0.387	-0.055	-0.012	0.029	0.368
Banking_Crisis_dummy	46,223	0.248	0.000	0.000	0.000	0.000	1.000
Banking_Crisis_index	42,493	0.131	0.024	0.067	0.091	0.166	0.567
Antidi	46,223	3.960	2.000	4.000	4.000	5.000	5.000
GDP	46,223	1.184	-9.132	0.576	1.793	2.431	25.163
Recession	46,223	0.187	0.000	0.000	0.000	0.000	1.000
Size	46,223	12.159	5.807	10.468	11.977	13.750	18.079
Loss	46,223	0.392	0.000	0.000	0.000	1.000	1.000
Leverage	46,223	0.223	0.000	0.060	0.191	0.330	1.119
Oplev	46,223	0.229	0.000	0.048	0.163	0.342	0.964
Growth	46,223	0.166	-0.990	-0.045	0.050	0.168	7.221
Cfo	46,223	0.055	-1.399	0.019	0.090	0.151	0.530
Cycle	46,223	232.135	7.690	90.688	141.264	216.148	5236.673
Mb	46,223	2.466	-7.254	0.886	1.626	2.959	24.167
Altman	46,223	3.297	-1.829	1.401	2.477	3.936	61.173
IFRS	46,223	0.866	0.000	1.000	1.000	1.000	1.000
Equity issuance	45,962	0.014	-5.280	-0.011	0.000	0.027	2.729
Tobin_Q	46,223	1.737	0.417	0.997	1.297	1.876	12.437

Table 2 Panel A reports the descriptive statistics for variables used in the main analyses. Table 2 Panel B shows the Pearson's pairwise correlation matrix for all variables used in the main analyses. Significance level: * p-value<0.1. All variables are defined in the Appendix.

Panel B. *Pearson's pairwise correlation matrix*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1. Posda	1																				
2. Pospda	0.82*	1																			
3. DA	0.65*	0.61*	1																		
4. PDA	0.63*	0.66*	0.96*	1																	
5. Banking_Crisis_dummy	-0.01	-0.01*	0.01	-0.01	1																
6. Banking_Crisis_index	-0.01*	-0.01*	-0.01*	-0.01*	0.68*	1															
7. Antidi	-0.02*	-0.02*	-0.02*	-0.02*	0.09*	0.02*	1														
8. GDP	0.02*	0.02*	0.01*	0.01*	-0.52*	-0.67	0.16*	1													
9. Size	-0.04*	-0.05*	0.02*	0.01*	-0.02*	-0.01*	-0.14*	-0.03*	1												
10. Loss	-0.06*	-0.03*	-0.10*	-0.06*	0.05*	0.06*	0.09*	-0.05*	-0.40*	1											
11. Leverage	0.02*	0.03*	0.02*	0.04*	0.01	0.03	-0.13*	-0.07*	0.20*	-0.01	1										
12. Oplev	0.14*	0.14*	0.09*	0.1*	-0.01	0.02*	-0.06*	-0.02*	0.29*	-0.14*	0.35*	1									
13. Growth	0.04*	0.04*	0.04*	0.05*	-0.02*	-0.05*	0.05*	-0.07*	-0.09*	0.07*	-0.02*	-0.02*	1								
14. Cfo	-0.17*	-0.20*	-0.24*	-0.28*	-0.02*	-0.01*	-0.10*	-0.01*	0.36*	-0.43*	-0.06*	0.15*	-0.08*	1							
15. Cycle	0.05*	0.06*	0.07*	0.08*	0.01*	0.01	-0.02*	-0.02*	-0.10*	0.13*	0.05*	-0.05*	0.02*	-0.21*	1						
16. Mb	-0.01*	-0.01*	-0.01*	-0.02*	-0.06*	-0.09*	0.07*	-0.09*	-0.09*	0.01	-0.13*	-0.14*	0.07*	-0.05*	-0.01	1					
17. Altman	0.05*	0.04*	0.08*	0.07*	-0.02*	-0.05*	0.10*	0.08*	-0.10*	0.01	-0.34*	-0.13*	0.08*	0.09	0.05*	0.26*	1				
18. Ifrs	-0.02*	-0.03*	-0.01*	-0.02*	0.18*	0.06*	-0.02*	-0.13*	0.26*	-0.04*	0.07*	0.02*	-0.03*	0.05*	-0.01*	-0.05*	-0.03*	1			
19. Equity issuance	0.01	0.01	0.01	0.01*	0.01	0.01	0.01	0.01	0.01*	-0.01	-0.01	-0.01	0.03*	0.01	-0.01	-0.01	-0.01	0.01	1		
20. Recession	-0.01*	-0.01*	-0.01*	-0.01*	0.51*	0.69*	-0.12*	-0.75*	-0.01	0.06*	0.06*	0.02*	-0.05*	-0.01	0.02*	-0.08*	-0.06*	0.12*	-0.01*	1	
21. Tobin_Q	-0.01	0.01	-0.01	-0.01	-0.05*	-0.08*	0.13*	0.09*	-0.29*	0.11*	-0.08*	-0.20*	0.09*	-0.28*	0.05*	0.54*	0.33*	-0.06*	0.01	-0.08*	1

Table 3. *Earnings management, investor protection and banking crisis*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	Posda	Pospda	Posda	Pospda	Posda	Pospda	Posda	Pospda
Antidi	-0.016***	-0.018***			-0.025***	-0.032***		
	(0.004)	(0.004)			(0.005)	(0.005)		
Banking_Crisis_ dummy	-0.047*	-0.074***	-0.071***	-0.072***				
	(0.025)	(0.025)	(0.026)	(0.026)				
Banking_Crisis_ dummy x Antidi	0.008	0.012**	0.018***	0.015***				
	(0.005)	(0.005)	(0.006)	(0.006)				
Banking_Crisis_ Index					-0.277**	-0.398***	-0.261**	-0.201*
					(0.117)	(0.117)	(0.122)	(0.122)
Banking_Crisis_ index x Antidi					0.056**	0.101***	0.069***	0.079***
					(0.024)	(0.024)	(0.026)	(0.026)
GDP	0.002	0.001	0.004**	0.003	0.003	0.003	0.004**	0.005**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Size	-0.011***	-0.009***	0.042***	0.041***	-0.011***	-0.009***	0.035***	0.036***
	(0.001)	(0.001)	(0.007)	(0.007)	(0.002)	(0.002)	(0.007)	(0.007)
Loss	-0.177***	-0.151***	-0.143***	-0.122***	-0.179***	-0.151***	-0.144***	-0.122***
	(0.006)	(0.006)	(0.007)	(0.007)	(0.006)	(0.006)	(0.007)	(0.008)
Leverage	-0.009	0.008	-0.026	0.000	-0.011	0.008	-0.017	0.014
	(0.016)	(0.016)	(0.024)	(0.025)	(0.017)	(0.017)	(0.025)	(0.026)
Oplev	0.423***	0.424***	0.230***	0.220***	0.428***	0.431***	0.230***	0.219***
	(0.017)	(0.017)	(0.037)	(0.038)	(0.018)	(0.018)	(0.040)	(0.041)
Growth	0.018***	0.018***	0.031***	0.032***	0.017***	0.018***	0.031***	0.032***
	(0.003)	(0.003)	(0.004)	(0.004)	(0.003)	(0.004)	(0.004)	(0.004)
Cfo	-0.605***	-0.642***	-0.885***	-0.893***	-0.609***	-0.651***	-0.895***	-0.910***
	(0.019)	(0.020)	(0.026)	(0.026)	(0.020)	(0.021)	(0.027)	(0.028)
Cycle	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Mb	-0.004***	-0.004***	0.001	0.000	-0.003***	-0.003***	0.001	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Altman	0.007***	0.007***	0.009***	0.010***	0.007***	0.007***	0.009***	0.010***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
IFRS	-0.026***	-0.032***	-0.018	-0.027	-0.028***	-0.037***	-0.019	-0.031*
	(0.008)	(0.008)	(0.016)	(0.016)	(0.009)	(0.009)	(0.017)	(0.018)
Observations	46,223	45,040	46,223	45,040	42,493	41,412	42,493	41,412
Firm FE	No	No	Yes	Yes	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No	Yes	Yes	No	No
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.100	0.101	0.090	0.086	0.101	0.104	0.093	0.089
Number of firms	5,773	5,685	5,773	5,685	5,312	5,232	5,312	5,232

This table shows the estimation results of a logistic regression model of earnings management over banking crisis, investor protection and their interaction term. Columns (1), (3), (5) and (7) show the results using *Posda* as a proxy for earnings management, while Columns (2), (4), (6) and (8) show the findings using *Pospda. Banking_Crisis_dummy* is an indicator variable equal to 1 if a banking crisis takes place at time (t) and, 0 otherwise according to the banking crisis database created by Laeven and Valencia (2013). *Banking Crisis index* is the CLIFS indicator of financial distress for country j at time t created by European Central Bank. *Antidi* is the Anti Director Index computed by Djankov et al. (2008). All control variables are defined in the Appendix. Industry and year fixed effects have been included in Columns (1)-(4), while firm and year fixed effects have been included in Columns (5)-(8). The constant has not been reported (but it was included in the models). Standard errors are clustered at firm-level, and they are reported in parentheses. Statistical significance is denoted as follows: *** p<=0.01; ** p<=.05; * p<=.1.

Table 4. *Impact on equity issuance*

	(1)	(2)	(3)	(4)
	Banking_Crisis = Banking_Crisis_dummy		*Banking_Crisis = Banking_Crisis_index*	
Dependent variable:	Equity issuance (t+1)	Equity issuance (t+1)	Equity issuance (t+1)	Equity issuance (t+1)
Antidi	0.774***	1.445***	0.833***	1.517***
	(0.145)	(0.273)	(0.154)	(0.282)
Banking_crisis	2.961***	26.901***	3.303***	28.956***
	(0.581)	(5.113)	(0.634)	(5.418)
Banking_crisis x Antidi	-0.707***	-6.202***	-0.793***	-6.711***
	(0.138)	(1.182)	(0.152)	(1.258)
Fitted_Posda	7.011***	13.644***		
	(1.272)	(2.549)		
Fitted_Posda x Antidi	-1.706***	-3.202***		
	(0.310)	(0.600)		
Fitted_Posda x Banking_crisis	-6.893***	-62.163***		
	(1.273)	(11.622)		
Banking_crisis x Antidi x Fitted_Posda	1.683***	14.468***		
	(0.311)	(2.715)		
Fitted_Pospda			7.696***	14.614***
			(1.382)	(2.693)
Fitted_Pospda x Antidi			-1.876***	-3.433***
			(0.337)	(0.634)
Fitted_Pospda x Banking_crisis			-7.613***	-66.801***
			(1.385)	(12.308)
Banking_crisis x Antidi x Fitted_Pospda			1.859***	15.543***
			(0.338)	(2.873)
Recession	-0.028	0.004	0.001	0.032
	(0.032)	(0.040)	(0.034)	(0.042)
Leverage	0.116**	0.048	0.084*	0.012
	(0.046)	(0.050)	(0.045)	(0.051)
Size	0.005	0.006	0.006	0.008*
	(0.004)	(0.004)	(0.004)	(0.004)
Tobin Q	0.034***	0.036***	0.031***	0.032***
	(0.006)	(0.007)	(0.006)	(0.007)
Cfo	0.122**	0.099*	0.081*	0.047
	(0.048)	(0.054)	(0.046)	(0.051)
Observations	47,660	43,954	47,500	43,808
Industry FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

This table shows the estimation results of the second step of a system of regression equations. In the first step (untabulated), we re-run the estimation model used in Table 3. In the second step, we replicate the findings of Levine et al. (2016) in our sample regressing equity issuance over banking crisis, investor protection (*Antidi)* and their interaction term by adding the fitted value of *DA* (*Fitted_Posda* and *Fitted_Pospda*) as estimated from the first step and its interaction terms with banking crisis and investor protection (*Antidi*). *Equity issuance* is the change in the book value of common equity minus the change in retained earnings during a specific year (t), scaled by total assets at the close of year (t −1). In line with Levine et al. (2016), it is taken at time (t+1). Columns (1) and (2) shows the findings using *Banking_Crisis_dummy* as proxy for banking crisis, while Columns (3) and (4) show the results for *Banking_Crisis_index.* Control variables are defined in the Appendix. We add year, industry and country fixed effects. As the result, the constant is omitted. Robust standard errors are reported in parentheses. Statistical significance is denoted as follows: *** p<=0.01; ** p<=.05; * p<=.1.

Table 5. *Role of equity issuance - Sub-samples approach*

Panel A. *Earnings management, investor protection and banking crisis – no equity issuance*

	(1)	(2)	(3)	(4)
Group:	*Equity issuance <5% Total Assets*			
Dependent variable:	Posda	Pospda	Posda	Pospda
Banking_Crisis_dummy	-0.064**	-0.052*		
	(0.028)	(0.028)		
Banking_Crisis_dummy x Antidi	0.014**	0.009		
	(0.006)	(0.006)		
Banking_Crisis_index			-0.142	-0.012
			(0.131)	(0.131)
Banking_Crisis_index x Antidi			0.042	0.039
			(0.028)	(0.028)
Observations	37,259	36,552	34,299	33,645
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
R-squared	0.108	0.101	0.111	0.104
Number of firms	5,417	5,354	4,995	4,934

Panel B. *Earnings management, investor protection and banking crisis – yes equity issuance*

	(1)	(2)	(3)	(4)
Group:	*Equity issuance >=5% Total Assets*			
Dependent variable:	Posda	Pospda	Posda	Pospda
Banking_Crisis_dummy	-0.143	-0.340***		
	(0.105)	(0.111)		
Banking_Crisis_dummy x Antidi	0.044*	0.080***		
	(0.023)	(0.024)		
Banking_Crisis_index			-1.445**	-1.888***
			(0.584)	(0.633)
Banking_Crisis_index x Antidi			0.354***	0.470***
			(0.114)	(0.125)
Observations	8,703	8,251	7,990	7,579
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
R-squared	0.068	0.073	0.073	0.078
Number of firms	3,881	3,726	3,556	3,416

This table shows the estimation results of a logistic regression model of earnings management over banking crisis, investor protection, and their interaction term for sub-samples of firms identified on the basis of equity issuance. Panel A shows the findings for firms for which *Equity issuance* is lower than 5% of total assets. Panel B shows the findings for firms for which *Equity issuance* is greater than 5% of total assets. *Equity issuance* is the change in the book value of common equity minus the change in retained earnings during a specific year (t), scaled by total assets at the close of year (t −1). Columns (1) and (3) show the results using *Posda* as a proxy for earnings management, while Columns (2) and (4) show the findings using *Pospda. Banking_Crisis_dummy* is an indicator variable equal to 1 if a banking crisis takes place at time (t) and, 0 otherwise. Banking crises are identified by relying upon the banking crisis database created by Laeven and Valencia (2013). *Banking_Crisis_index* is the CLIFS indicator of financial distress for country j at time t created by European Central Bank. *Antidi* is the Anti Director Index computed by Djankov et al. (2008). All control variables are defined in the Appendix. Firm and year fixed effects have been included. As a result of the inclusion of firm fixed effects, the constant is not interpretable and, hence, it has not been reported (but it was included in the models). Standard errors are clustered at firm-level, and they are reported in parentheses. Statistical significance is denoted as follows: *** p<=0.01; ** p<=.05; * p<=.1.

Table 6. *Cross-sectional tests*

Panel A. *External Finance Dependence*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Group:	*Low Finance Dependence & Equity issuance<5% Total Assets*	*Low Finance Dependence & Equity issuance<5% Total Assets*	*Low Finance Dependence & Equity issuance>=5% Total Assets*	*Low Finance Dependence & Equity issuance>=5% Total Assets*	*High Finance Dependence & Equity issuance<5% Total Assets*	*High Finance Dependence & Equity issuance<5% Total Assets*	*High Finance Dependence & Equity issuance>=5% Total Assets*	*High Finance Dependence & Equity issuance>=5% Total Assets*
Dependent variable:	Posda	Pospda	Posda	Pospda	Posda	Pospda	Posda	Pospda
Banking_Crisis_index	-0.043	-0.024	0.366	-1.326	-0.129	0.258	-2.179***	-2.568***
	(0.180)	(0.188)	(1.326)	(1.391)	(0.209)	(0.212)	(0.767)	(0.856)
Banking_Crisis_index x Antidi	0.023	0.043	0.067	0.464*	0.064	0.005	0.490***	0.566***
	(0.038)	(0.039)	(0.245)	(0.257)	(0.046)	(0.047)	(0.153)	(0.173)
Observations	18,267	18,013	2,857	2,751	14,706	14,400	4,589	4,344
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.121	0.108	0.119	0.118	0.069	0.062	0.067	0.058
Number of firms	3,933	3,883	1,840	1,777	3,998	3,938	2,347	2,249

Panel B. *Firm size*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Group:	*Small firms & Equity issuance<5% Total Assets*	*Small firms & Equity issuance<5% Total Assets*	*Small firms & Equity issuance>=5% Total Assets*	*Small firms & Equity issuance>=5% Total Assets*	*Large firms & Equity issuance<5% Total Assets*	*Large firms & Equity issuance<5% Total Assets*	*Large firms & Equity issuance>=5% Total Assets*	*Large firms & Equity issuance>=5% Total Assets*
Dependent variable:	Posda	Pospda	Posda	Pospda	Posda	Pospda	Posda	Pospda
Banking_Crisis_index	-0.252	-0.059	-2.240***	-2.119***	-0.172	-0.039	0.528	-0.885
	(0.209)	(0.206)	(0.764)	(0.808)	(0.173)	(0.177)	(0.961)	(1.137)
Banking_Crisis_index x Antidi	0.059	0.038	0.530***	0.554***	0.058	0.056	0.001	0.259
	(0.045)	(0.045)	(0.154)	(0.163)	(0.037)	(0.037)	(0.186)	(0.219)
Observations	14,132	13,691	4,953	4,613	20,167	19,954	3,037	2,966
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.117	0.108	0.082	0.091	0.139	0.128	0.087	0.073
Number of firms	2,835	2,776	2,133	2,018	2,800	2,784	1,678	1,640

Panel A shows the estimation results of a logistic regression model of earnings management over banking crisis, investor protection and their interaction term for sub-samples of firms identified on the basis of external financial dependence and equity issuance. Columns (1) and (2) show the findings for firms for which *Equity issuance* is below 5% of total assets and financial dependence is below the median. Columns (3) and (4) show the findings for firms for which *Equity_issuance* is above 5% of total assets and financial dependence is below the median. Columns (5) and (6) show the findings for firms for which *Equity issuance* is below 5% of total assets and financial dependence is above the median. Columns (7) and (8) show the findings for firms for which *Equity issuance* is above 5% of total assets and financial dependence is above the median.

Panel B shows the estimation results of a logistic regression model of earnings management over banking crisis, investor protection (*Antidi*) and their interaction term for sub-samples of firms identified on the basis of firm size and equity issuance. Columns (1) and (2) show the findings for firms for which *Equity issuance* is below 5% of total assets and firm size is below the median. Columns (3) and (4) show the findings for firms for which *Equity issuance* is above 5% of total assets and firm size is below the median. Columns (5) and (6) show the findings for firms for which *Equity_issuance* is below 5% of total assets and firm size is above the median. Columns (7) and (8) show the findings for firms for which *Equity_issuance* is above 5% of total assets and firm size is above the median. *Equity_issuance* is the change in the book value of common equity minus the change in retained earnings during a specific year (t), scaled by total assets at the close of year (t −1). *Financial_dependence* is the difference between capital expenditures and cash flow from operations divided by capital expenditures. *Firm size* is the logarithm of total assets. In both panels, the dependent variable is *Posda* in Columns (1), (3), (5) and (7), and it is *Pospda* in Columns (2), (4), (6) and (8). *Banking_Crisis_index* is the CLIFS indicator of financial distress for country j at time t created by European Central Bank. *Antidi* is the Anti Director Index computed by Djankov et al. (2008). Control variables, firm and year fixed effects have been included. As a result of the inclusion of firm fixed effects, the constant is not interpretable and, hence, it has not been reported (but it was included in the models). Standard errors are clustered at firm-level, and they are reported in parentheses. Statistical significance is denoted as follows: *** p<=0.01; ** p<=.05; * p<=.1.

Table 7. *Specific Discretionary Accruals*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Group:	*Equity issuance <5% Total Assets*				*Equity issuance >=5% Total Assets*			
Dependent variable:	T_ACC	WC_ ACC	NCO_ ACC	FIN_ ACC	T_ACC	WC_ ACC	NCO_ ACC	FIN_ ACC
Banking_Crisis_ index	-0.052	-0.040**	0.014	-0.046	-0.647**	-0.316**	-0.020	-0.327
	(0.033)	(0.019)	(0.028)	(0.034)	(0.320)	(0.145)	(0.234)	(0.287)
Banking_Crisis_ index x Antidi	-0.007	0.010**	-0.028***	0.019**	0.142**	0.081***	0.027	0.054
	(0.008)	(0.004)	(0.006)	(0.007)	(0.062)	(0.029)	(0.047)	(0.054)
Observations	29,568	34,583	34,889	29,569	6,114	7,910	8,030	6,114
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.136	0.345	0.157	0.178	0.185	0.172	0.210	0.171
Number of firms	4,405	4,996	5,040	4,405	2,843	3,551	3,594	2,843

This table shows the estimation results of a OLS regression model of earnings management over banking crisis, investor protection and their interaction term for sub-samples of firms identified on the basis of equity issuance. Columns (1), (2), (3) and (4) show the findings for firms for which *Equity_issuance* is lower than 5% of total assets. Columns (5), (6), (7) and (8) show the findings for firms for which *Equity_issuance* is greater than 5% of total assets. *Equity_issuance* is the change in the book value of common equity minus the change in retained earnings during a specific year (t), scaled by total assets at the close of year (t −1). In Columns (1) and (5), the dependent variable is total accruals (*T_ACC*), calculated as the sum of current operating accruals (*WC_ACC*), non-current operating accruals (*NCO_ACC*) and financial accruals (*FIN_ACC*). In Columns (2) and (6), the dependent variable is current operating accruals (*WC_ACC).* In Columns (3) and (7), the dependent variable is non-current operating accruals (*NCO_ACC).* In Columns (4) and (8), the dependent variable is financial accruals (*FIN_ACC*). *Banking_Crisis_index* is the CLIFS indicator of financial distress for country j at time t created by European Central Bank. *Antidi* is the Anti Director Index computed by Djankov et al. (2008). All variables are defined in the Appendix. Firm and year fixed effects have been included. As a result of the inclusion of firm fixed effects, the constant is not interpretable and, hence, it has not been reported (but it was included in the models). Standard errors are clustered at firm-level, and they are reported in parentheses. Statistical significance is denoted as follows: *** p<=0.01; ** p<=.05; * p<=.1.

Table 8. *Informal financing*

Panel A. *Role of societal trust*

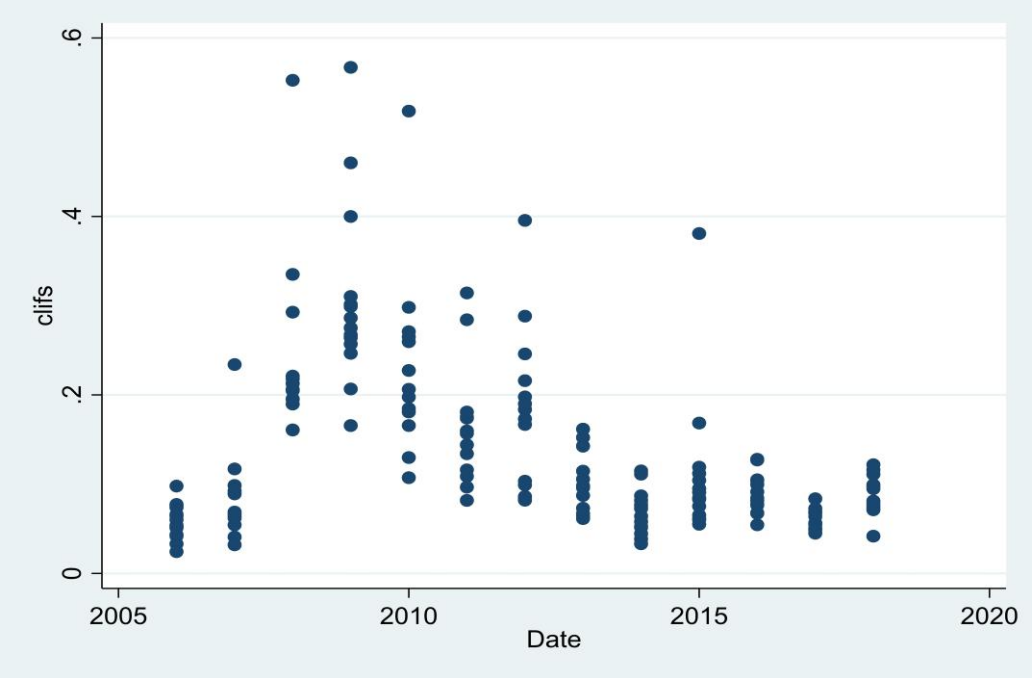
	(1)	(2)	(3)	(4)	(5)	(6)
Group:	*Full sample*		*Equity issuance < %5 Total Assets*		*Equity issuance > =5% Total Assets*	
Dependent variable:	Posda	Pospda	Posda	Pospda	Posda	Pospda
Banking_Crisis_index	-0.133	-0.111	-0.018	0.036	-1.345**	-1.641**
	(0.138)	(0.138)	(0.149)	(0.149)	(0.686)	(0.748)
Banking_Crisis_index x Antidi	0.067***	0.078***	0.041	0.039	0.345***	0.447***
	(0.026)	(0.026)	(0.028)	(0.028)	(0.119)	(0.130)
Banking_Crisis_index x Societal_trust	-0.002*	-0.001	-0.002*	-0.001	-0.001	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)
Observations	42,493	41,412	34,299	33,645	7,990	7,579
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.093	0.089	0.111	0.104	0.073	0.078
Number of firms	5,312	5,232	4,995	4,934	3,556	3,416

Panel B. *Role of trade credit*

	(1)	(2)	(3)	(4)
Group:	*Below median Trade credit*	*Above median Trade credit*	*Below median Trade credit*	*Above median Trade credit*
Dependent variable:	NCO_ACC	NCO_ACC	NCO_ACC	NCO_ACC
Banking_Crisis_dummy	0.046***	0.010		
	(0.008)	(0.012)		
Banking_Crisis_dummy x Antidi	-0.007***	0.000		
	(0.002)	(0.003)		
Banking_Crisis_index			-0.030	-0.020
			(0.039)	(0.053)
Banking_Crisis_index x Antidi			-0.030***	-0.006
			(0.009)	(0.012)
Observations	23,352	23,238	21,338	21,446
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
R-squared	0.138	0.160	0.136	0.157
Number of firms	5,349	5,476	4,916	5,041

Panel A shows the estimation results of logistic regression model estimating earnings management over banking crisis, investor protection and their interaction term, controlling for the effect of societal trust. Columns (1) and (2) show the findings for the full sample. Columns (3) and (4) show the results for firms for which *Equity issuance* is lower than 5% of total assets. Columns (5) and (6) show the findings for firms for which *Equity issuance* is greater than 5% of total assets. In Columns (1), (3) and (5), the dependent variable is *Posda,* while in Columns (2), (4) and (6), the dependent variable is *Pospda. Societal_trust* is the Trust Index from WVS. Panel B shows the estimation results of OLS regression model estimating earnings management over banking crisis, investor protection and their interaction term, controlling for sub-sample of firms identified using *Trade_credit* as partitioning variable. Columns (1) and (3) show the findings for firms for which *Trade_credit* is below the sample median value. Columns (2) and (4) show the results for firms for which *Trade_credit* is above the sample median value. *Trade_credit* is change in accounts payable between time (t) and (t-1), divided by total assets at time (t-1). The dependent variable is the level of non-current operating accruals (*NCO_ACC*). All other variables are defined in the Appendix. Firm and year fixed effects have been included. As a result, the constant is not interpretable and, hence, it has not been reported (but it was included in the models). Standard errors are clustered at firm-level, and they are reported in parentheses. Statistical significance is denoted as follows: *** p<=0.01; ** p<=.05; * p<=.1.

Figure 1 - Trend of *Banking_Crisis_index* over the sample period



This figure shows the time-trend of *Banking_Crisis_index* for our sample period (2006-2018) for the 14 countries for which the CLIFS index is available.

Figure 2 - Interaction Plot "spare tire" effect

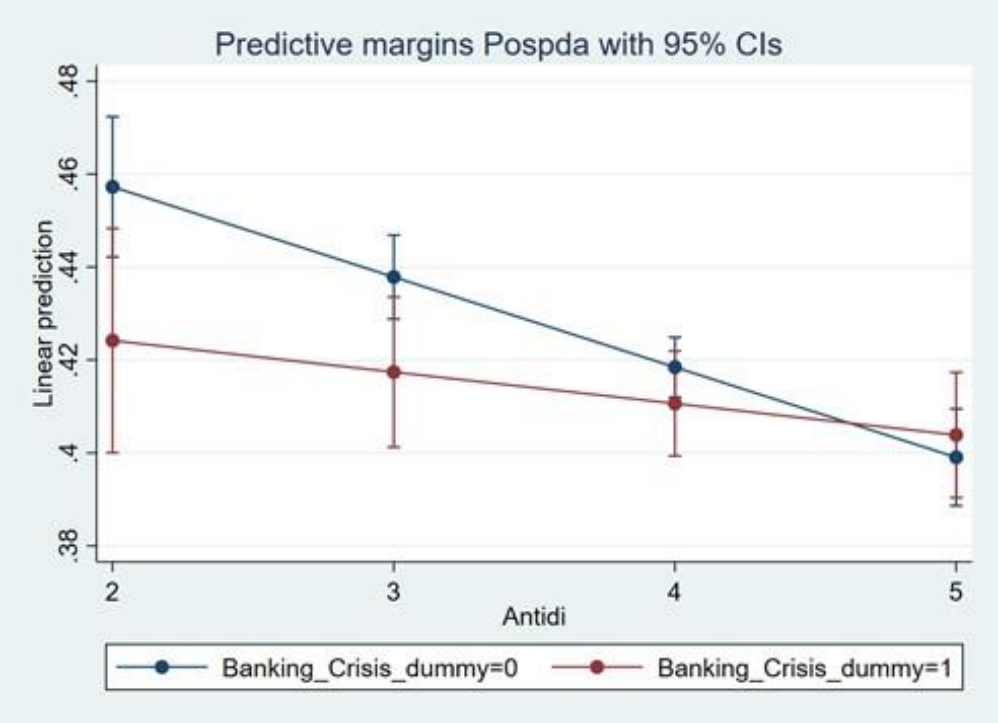


Figure 2 graphically represents the coefficient for the interaction term between *Antidi* and *Banking_Crisis_dummy*. The x-axis shows the values of *Antidi* in our sample, while the y-axis shows the fitted value of *Pospda*. The blue line represents the association between *Antidi* and *Posda* when *Banking_Crisis_dummy* is 0 (i.e. no banking crisis), while the red line represents the association between *Antidi* and *Posda* when *Banking_Crisis_dummy* is 1 (i.e. banking crisis is in place).