

**CUE309 - EARNINGS MANAGEMENT DURING FINANCIAL CRISES IN LATIN AMERICA****Autoria**

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**Resumo**

Changes in economic environment have an impact on the firm's propensity to engage in earnings management practices, affecting earnings quality. The aim of this study is verify the relationship between financial crises and earnings quality of public companies in Latin America, considering the effects of financial constraints. We investigated if GDP variation affects differently earnings management practices in Latin American firms financially constrained and unconstrained from 2001 to 2016 by Panel Data Regressions. The results provided evidences of a decrease of earnings management practices during crises years in Latin American firms, improving quality information. An incremental analysis evidenced that financially constrained firms suffer more with financial crises, increasing earnings management practices. Some firm-level variables influenced earnings quality, as firm size, leverage and performance. We further evidenced that some institutional factors play an important role in earnings management practices, demonstrating that enforcement law decreases earning management practices, contributing to improve accounting quality information. This study contributes to demonstrate that earnings management practices are sensitive to change in economic conditions and financial constraints in Latin American firms.

## EARNINGS MANAGEMENT DURING FINANCIAL CRISES IN LATIN AMERICA

### ABSTRACT

Changes in economic environment have an impact on the firm's propensity to engage in earnings management practices, affecting earnings quality. The aim of this study is verify the relationship between financial crises and earnings quality of public companies in Latin America, considering the effects of financial constraints. We investigated if GDP variation affects differently earnings management practices in Latin American firms financially constrained and unconstrained from 2001 to 2016 by Panel Data Regressions. The results provided evidences of a decrease of earnings management practices during crises years in Latin American firms, improving quality information. An incremental analysis evidenced that financially constrained firms suffer more with financial crises, increasing earnings management practices. Some firm-level variables influenced earnings quality, as firm size, leverage and performance. We further evidenced that some institutional factors play an important role in earnings management practices, demonstrating that enforcement law decreases earning management practices, contributing to improve accounting quality information. This study contributes to demonstrate that earnings management practices are sensitive to change in economic conditions and financial constraints in Latin American firms.

**Keywords:** Financial Crises; Financial Constraint; Earnings Management; Accruals Quality; Latin America.

### 1. INTRODUCTION

In recent years, financial crises have been affected both the level of economic activity and firm environment around the world. Frankel and Saravelos (2012) argue that GDP decline is one of the most important characteristic of the effect of financial crises on economic environment. Iatridis and Dimitras (2013) further corroborate that the financial crises could differ among countries and GDP change is a progress indicator of the recession period.

In relation to firm environment, Filip and Raffounier (2014) add that dramatic changes in the economic environment have an impact on the firm's propensity to engage in earnings management practices, affecting the earnings quality, because accounting information is sensitive to the environment in which they are applied.

Hammed, Kang and Viswanathan (2010) affirm that investor confidence was lower during periods of crises, so that firms make efforts to maintain investor confidence and stabilize markets.

According to Ball and Brown (1968) and Beaver (1968), the financial information affects investor decision-making, in consequence managers tends to improve quality of financial reports strategically to restore investor confidence and liquidity during financial crises periods (Arthur, Tang & Lin, 2015).

Another aspect that could affect manager's decisions during financial crises is related with financial constraints. Campello, Graham and Harvey (2010) highlighted that the crises environment allows us to contrast the actions of firms that are considered financially constrained with those are less constrained.

Campello et al. (2010) analyzed 1,050 chief financial officers (CFOs) in 39 countries from North America, Europe and Asia during December 2008 and verified that financially constrained firms planned to cut more investment, technology, marketing and employment relative to their counterparts during the crises. The authors further added that constrained firms were forced to burn a sizeable portion of their cash holdings, accelerate the withdrawal of funds from their outstanding lines of credit and

restrict their pursuit of attractive investment projects, different from unconstrained firms that not engage in this behavior.

Habib, Bhuiyan and Islam (2013) analyze the managerial earnings management practices of financially distressed firms in New Zealand, and to consider whether these practices changed during the recent global financial crises. The results provided evidences of distressed firms engage more earnings management practices compared with their counterparts. They also demonstrated that the New Zealand market considers discretionary accruals to be informative only during non-crises period.

Therefore, the aim of this study is verify the relationship between financial crises and earnings quality of public companies in Latin America, considering the effects of financial constraints. That is, we investigated if financial crises, measured by GDP variation, affected differently earnings management practices in firms financially constrained and unconstrained from 2001 to 2016.

This study is motivated by some aspects: a) the relevance of financial crises, especially related with Latin American countries and the lack research in these topic; b) lack of studies investigating the relationship between macroeconomic factors and financial constraints on earnings quality with the approach of longitudinal data analysis, allowing analysis of multiple events of economic turbulence; c) relevance of Latin America for global economy has been grown, due their reforms, creating a less uncertain investment climate (Treviño & Mixon, 2004). International Monetary Fund (IMF, 2018) complement that Latin America's economy has been recovery from recessions and estimated a regional growth at 1.9 per cent in 2018 and 2.6 in 2019; d) Some characteristics from these countries could affect earnings management practices, as high levels of concentrated ownership (Santiago, C. Brown & Báenz-Díaz, 2009), consequently, improving mechanisms of control, reducing corruption, strengthen enforcement or improving the effectiveness of government play an important role to increase the quality of financial reports (Gonzalez & García-Meca, 2014).

We found evidences from a decrease of earnings management practices during crises years in Latin American firms, demonstrating an improvement of quality information. An incremental analysis evidenced that constrained firms suffer more with financial crises than their counterparts, increasing the absolute level of discretionary accruals in crises years, consequently, decreasing the level of accounting quality.

Findings also demonstrated some firm-level variables that influenced the earnings quality, as firm size, leverage and performance. Finally, some institutional characteristics and country-level factors significantly influenced earning management practices in Latin American firms.

The main contribution of our study is to demonstrate that earnings management practices in Latin American public firms is sensitive to economic conditions, decreasing these practices during financial crises periods, as a strategic way to recover market confidence. This paper also contributes by demonstrating the joint influence of financial constraint measures and financial crises on earnings management practices in Latin American firms, providing evidences that the behavior of increasing quality information is more sensitivity to constrained firms. That is, the tendency to decrease earnings management practices becomes weakened than their counterparts. Finally, this study also has policy implications, demonstrating the influence of enforcement law as a way to reduce earnings management behavior.

This paper is organized as follow: Section 2 describes hypotheses development; Section 3 presents the data and research methods; Section 4 presents results and analyses; Section 5, Conclusions Remarks and some implications for further research.

## 2. HYPOTHESES DEVELOPMENT

The extant literature indicates that managers have incentives to manage information to obtain own benefit. So, managers could make accounting choices to reach their goal and this way their bonus (Healy, 1985). Another way is related with debt contracts, which managers make accounting choices to obtain loans or when they are in the imminence of break a covenant (Sweeney, 1994).

Some endogenous and exogenous factors also could motivate earnings management practices. Internal factors are related, for example, with corporate mechanisms and organizational culture, on the other hand, some exogenous factors could be related with economic development and economic freedom (Riahi-Belkaoui, 2004) and aspects with legal system, including enforcement (Leuz, Nanda & Wysocki, 2003) and cultural values (Han, Kang, Salter, & Yoo, 2010).

In this sense, periods of financial crises tends to affect earnings management practices. Hameed et al. (2010) affirm that financial crises could affect investor confidence, causing illiquidity in the share market. Consequently, firms with more credible information could reduce asymmetry and enhance investor confidence and, thus, market performance (Teoh & Wong, 1993).

Chia, Lapsley and Lee (2007) affirm that managers have strong incentives to establish credibility of financial reports, because lower levels of earnings quality and greater uncertainty may result in additional monitoring by external players, especially, market regulators.

Lin, Jiang, Tang and He (2014) corroborate with additional evidence from firms in the United Kingdom. The results demonstrated that market liquidity was much lower during crises period, but firms with high-quality of financial reporting suffered fewer with the negative effects from financial crises, enhancing investor confidence.

According to Arthur et al. (2015), the same behavior could be verified in European firms during 2005 to 2010. The findings showed that EU firms, on average, engaged in less earnings management practices and presented higher quality accounting information during financial crises period than pre-crises period. This evidence suggests that managers have strong incentives to increase investor confidence during crises by providing reliable financial statements, reducing information asymmetry and improving market liquidity.

Especially in Latin American firms, we highlighted some aspects that could affect the incentives to managers engage in earnings management practices. Ferreira and Vilela (2004) affirms that firms suffering from economic instability or dependent of short-term debt tend to maintain a liquidity buffer to avoid insolvency, consequently, while increase their cash holdings also accumulate debt.

According to Gonzalez and García-Meca (2014), Latin American firms are sensitivity to constrictor mechanisms. The results demonstrated that when a country reduces corruption, strengthen the rule of law or improves the effectiveness of government, the quality and transparency of the financial information increase, reducing the level of discretionary accruals.

García, Alejandro, Sáenz and Sánchez (2017) provided evidences that IFRS adoption increase quality of accounting information in Latin American firms, especially in large firms and also firms with higher levels of capitalization.

Finally, A. Silva, Weffort, Flores and G. Silva (2013) also revealed a significant relation between crises and earnings management practices in Brazilian firms during 1997 to 2009. The authors further evidenced the influence of economic concepts of business cycles theory and political environment of instability in Brazil during 2002.

So, the first hypothesis is proposed below.

*H<sub>1</sub>: Latin American public firms engage in less earnings management practices in response to financial crises periods, increasing earnings quality.*

Aiming to provide incremental evidence from the influence of financial crises on earnings management practices, we also analyze the firms according financial constraint measures. Bhaired (2013) affirms that firms suffer severe liquidity pressure through prolonged recession, in consequence of difficulties to access credit. In this way, firms overly dependent on external financing are mostly exposed to adverse effects of credit's lack, especially when firms are constrained by external conditions.

Consequently, because these firms face financing frictions, liquidity management could become a key for corporate policy, contrarily from unconstrained firms, which is no need to safeguard against future investment needs and corporate liquidity (Almeida, Campello & Weisback, 2004). Finally, we proposed the last hypothesis.

*H<sub>2</sub>: Financially constrained firms engage in more earnings management practices than their counterparts, in response to financial crises periods, decreasing earnings quality.*

Therefore, the fact of constrained firms are in more difficult situation, as adverse financial dependence, if they tend to improve on accounting quality, it will be reflected in higher borrowing costs (Carvalho, Camargo & Kalatzis, 2017).

### 3. DATA AND RESEARCH METHOD

#### 3.1 Sample and Data Sources

To examine the relationship between financial crises and earnings management practices, the sample includes all public firms belonging to Argentina, Brazil, Chile, Colombia, Mexico and Peru, that are most representative of Latin America. We collected data from 2000 to 2016<sup>1</sup>, aiming to cover an extensive period of GDP variation.

Consistent with prior literature (Leuz et al., 2003), financial and insurance institutions are excluded from our sample, due to their special regulations and operations, which could affect the motivations to engage in earnings management practices.

Finally, we also exclude missing values from firm-year observations to measure accruals and control variables and financial constraint measures. Our final sample results in a total of 2,960 firm-year observations, as showed in Table 1.

**Table 1- Sample Composition**

Latin American Public Firms	1,277
(-) financial and insurance	-207
(=) Initial Sample	1,070
* sample period (years)	16
<b>(=) Initial firm-year observations</b>	<b>17,120</b>
(-) missing values - accruals and control variables	-11,788
(-) missing values - financial constraint measures	-2,372
<b>(=) Final Sample (firm-year observations)</b>	<b>2,960</b>

Note: The authors.

All financial and accounting information was collected from the Thomson Reuters Eikon database. We also collected information from The World Bank databases related to macroeconomic characteristics and institutional factors, as described in the following topic.

<sup>1</sup> The sample period is composed by 2001-2016 due to the measurement of accruals lagged variables.

## 3.2 Variable Definitions

### 3.2.1 Earnings management measures

According to Healy (1985) accruals measurements are used in earnings management analysis. In this case, the models focus on management's use of their discretion power, as can see in Healy (1985), Jones (1991), Dechow, Sloan and Sweeney (1995), separating total accruals into nondiscretionary and discretionary components.

However these models could to be incurring in problems of specification. Dechow et al. (1995, p. 193) conclude that "all models reject the null hypothesis of no earnings management at rates exceeding the specified test levels when applied to samples of firms with extreme financial performance". So, that is an influence of firms' performance on earnings management.

Kothari, Leone and Wasley (2005) proposal a model based in performance-matched discretionary accrual measures; improving the reliability of inferences from earnings management models after control the performance differences between firms. The model is defined by Equation 1 (Kothari et al., 2005, p. 174).

$$TA_{i,t} = \delta_0 + \delta_1 \left( \frac{1}{ASSETS_{i,t-1}} \right) + \delta_2 \Delta SALES_{i,t} + \delta_3 PPE_{i,t} + \delta_4 ROA_{i,t} + u_{i,t} \quad (1)$$

where  $TA_{i,t}$  is total accruals defined as the difference between net income and cash flow from operating activities;  $\Delta SALES_{i,t}$  is change in sales and accounting receivables;  $PPE_{i,t}$  is total of plant, property and equipment - gross. All these variables are scaled by  $ASSETS_{i,t-1}$ , lagged total assets;  $ROA_{i,t}$  is return on assets in the year  $t$ , as net income divided by total assets.

The discretionary accrual component,  $DAC_{i,t}$ , is obtained by the residuals from the annual cross-sectional regression,  $u_{i,t}$ , as defined by model (1). We estimated regressions for each year from the sample period, like previous studies (Jones, 1991; Kothari et al. 2005; Barth, Landsman & Lang, 2008).

Considering that residuals can be income-increasing or income-decreasing accruals to meet earnings target, we obtain the absolute value of discretionary accruals,  $|DA|_{i,t}$ , as an inverse measure of earnings quality, according previous studies (Chen, Tang, Jiang & Lin, 2010; Gonzalez & García-Meca, 2014; Arthur et al., 2015). A higher magnitude of absolute discretionary accruals would therefore indicate a greater level of earnings management, consequently, a lower level of accruals quality.

### 3.2.2 Financial crises measures

Iatridis and Dimitras (2013) highlight the fact of no clear single time point when a financial crisis starts for different countries. For example, in case of European financial crises, the authors observe different countries face GDP fluctuations, but not simultaneously at the same time for all ones.

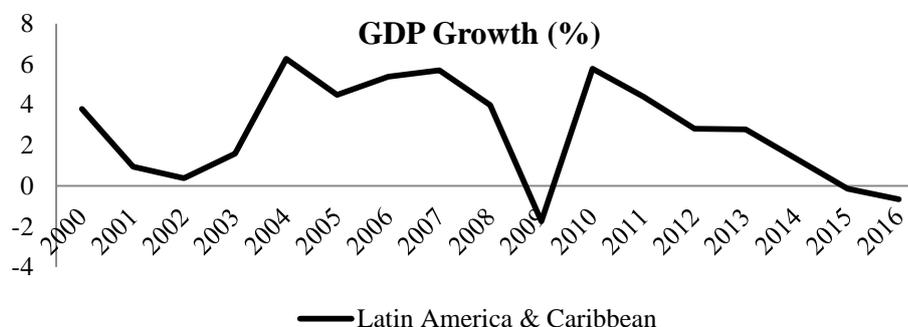
So, the GDP growth could explain the occurrence of financial crises (CRISIS) among various countries, by a decline of GDP as consequence of recession years (Rose & Spiegel, 2011; Frankel & Saravelos, 2012; Filip & Raffounier, 2014; Dimitras, Kyriakou & Iatridis, 2015).

Gruppe and Lange (2014) complement that little or even negative growth of GDP and strong increasing long-term interest rates for bonds paired with high budget deficit ratios are related with economic challenges. The authors provided evidences from Spanish and Germany economy, signaling that when a country suffers from financial downturns, it could be observed a drop of GDP (Gruppe & Lange, 2014).

The annual percentage growth rate of GDP is obtained by World Development Indicators (WDI), which is available in The World Bank data.

In the first graph, we illustrate GDP fluctuations in all countries of Latin America and Caribbean.

**Graph 1 – GDP fluctuations in Latin American countries**



Source: The World Bank (2017).

In graph 1, there is a decrease of GDP during 2001-2002, signaling an influence of currency crises. But, recession effects were perceived as more severe in subprime crises, during 2008-2009. In recent years, the Latin American countries continue to suffer from worldwide crises, as seen by the GDP decrease.

### 3.2.3 Financial constraints measures

Aiming to verify the impact of financial crises on earnings management practices, considering the effects of financial constraints, we first separated firms based on Almeida et al. (2004) and Han and Qiu (2007). We also applied the index proposed by Hadlock and Pierce (2010), as a complement of the previous measures.

The first index is dividend payout ratio. Firms are assigned to the financially constrained group if they have not paid out dividends during the year and belong to the financially unconstrained group if they paid out dividends in the year. According to Fazzari, Hubbard and Petersen (1988), a firm that are financially constrained have significantly lower payout ratios.

The second index is issuer rating. We considered a general rating, based on issuer, that groups bonds and commercial ratings, as a single measurement of the assessment of market credit quality of a firm (Almeida et al., 2004). We categorized firms annually in financially constrained when they did not have their ratings during the year sample. In other hand, if a firm has been rated during the year, it was classified as financially unconstrained.

The third index is proposed by Kaplan and Zingales (1997). This index is constructed by the following equation for each year analyzed:

$$KZ = -1.002 * CFO + 0.283 * Q + 3.139 * LEV - 39.368 * DIV - 1.315 * CH \quad (2)$$

where  $KZ$  is  $KZ$  index;  $CFO$  is cash flow from operating activities divided by total assets;  $Q$  is market value divided by book value of total assets;  $LEV$  is leverage, defined by the ratio with total liabilities and total assets;  $DIV$  is dividend dummy;  $CH$  is cash holdings, defined by cash and equivalents divided by total assets.

We categorized firms in the bottom (top) three deciles of  $KZ$  index as financially unconstrained (constrained) for all the years of sample period. This approach was applied by Baker, Stein and Wurgler (2003) and Almeida et al. (2004).

The last index is size-age or SA index (Hadlock & Pierce, 2010). According to them, it is not only firm size but also age, since both are useful predictors of financial constraint levels. The authors further demonstrated that the role of size and age in predicting constraints is nonlinear, that is financial constraints fall abruptly as young and small firms begin to mature and grow, being eventually level off. The SA index is defined by equation 03.

$$SA_{index} = (-0.737 * Size) + (0.043 * Size^2) - (0.04 * Age) \quad (3)$$

where *Size* is the natural log of total assets; *Age* is the number of years from the first year that a firm has a non-missing stock pricing. Firms in the bottom (top) 30 percent of the index are considered unconstrained (constrained), as defined in previous studies (Linck, Netter & Shu, 2013).

Using an annual classification, firms can change their status over sample period (Almeida et al., 2004). However, we highlight that financial constraint could not to be characterized as a dynamic behavior, so companies tend to maintain a trend of classification during the period. Therefore, this could be observed in our sample, in that companies do not show expressive variations of their status.

Considering our primary interest is verify the effects of financial constraints on earnings management practices, we constructed dummy variables for each criterion, as follow: if a firm is previously classified as ‘financially constrained’, the FCdummy=1, or FCdummy=0, if a firm is “financially unconstrained”. Similar approach was applied by Carvalho, Kalatzis and Albuquerque (2014) to verify the influence of earnings quality on investment decisions.

### 3.2.4 Control variables

First, we include firm control variables that are traditionally used in the literature, as firm size, cash flow from operating activities, debt and firm performance.

The firm size, *SIZE*, is defined by the natural logarithm of total assets (Equation 03). According to Gu, Lee and Rosett (2005), size is one of the most important characteristics of a firm, demonstrating that large firms have more benefits in terms of economies of scale and more mature and operate state, and they tend to be more diversified, decreasing the operational volatility and, consequently, a lower variability of accruals, when compared with small firms.

Cash flow from operating activities, (Equation 02) contains valuable information about a firm’s investment opportunities (Alti, 2003). Kumar and Krishman (2008) further demonstrate that CFO value-relevance increases with investment opportunities, both with high or low levels of investment opportunities. The authors highlighted that this increase in CFO value-relevance is consistent with cost differentials between internal and external financing, demonstrating that CFO could to be an increasingly important determinant of the realization of investment opportunities.

In addition, Bratten and Hulse (2016) found a relation with earnings management practices and investment opportunities, which vary according financial constraint behavior. The authors provided results supporting evidence that the use of earnings management practices could relieve constraints of financial constrained firms with valuable projects and increase firm value.

Leverage<sup>2</sup>, *LEV*, is defined as total liabilities divided by total assets. According to Gu et al. (2005), managers tends to increase earnings to avoid technical default or they might want to decrease earnings to avoid renegotiations of debt contracts, so

<sup>2</sup> Leverage and debt are correlated (Spearman correlation =0.7099, p>z = 0.000). We repeat the tests using debt instead leverage, where debt is constructed using total debt instead total liabilities. Although the results not differ substantially, we observed better significance in case of total liabilities.

earnings quality decreases with firm-leverage ratio. However, Cohen and Zarowin (2010) argue that higher leveraged firms tends to have higher agency costs and greater monitoring, improving the quality information.

Another variable is firm performance, ROA. According to Kothari et al. (2005), return on assets is used as a performance proxy and is defined as net income divided by total assets (Equation 1). Lee, Li and Yue (2006) suggested that earnings management is positively associated with firm performance and growth, which indicates that higher profitability and firm grow are likely to result in increasing earnings management.

To control the influence about country-level, we included the variation of country foreign exchange rate (FXVAR). According to Kaminsky and Reinhart (1999), there is a dynamic link between financial crises and currency crises. They argue that the precedence of a financial crisis has fragile and deteriorating economic conditions, aggravating the problems of banking sector due to the depreciation of the exchange rate and the increase in the interest rates, undertaken to attempt to stabilize exchange rate. By means, there is a spiral vicious that the authors named "twin crises". The official exchange rate was collected in annual basis from WDI, which is available in The World Bank data.

Finally, we control some aspects related with institutional environment. A strong institutional environment tends to mitigate the agency conflicts, reducing earnings management activities. This occurs because strong mechanisms like investor protection and legal enforcement tend to limit management practices to acquire private control benefits (La Porta, Lopez-de-Silanes, Shleifer & Vishny, 1998; Leuz et al., 2003).

An, Le and Yu (2016) add that strong institutional environments enforce investor rights in mitigating the impact of earnings management on corporate decisions, making them less sensitive to capital structure decisions.

To control these influence, we considered mandatory adoption of international accounting standards, IFRSADOPT, and Rule of Law (RULELAW) and Control of Corruption (CORRUPT), these last previous defined by La Porta et al. (1998).

The IFRS variable as defined by a dummy, that is equal to one (1) for the years from mandatory adoption and zero (0) for the prior years to the mandatory adoption. Barth et al. (2008) found that IFRS adoption tends to improve accounting quality, as decreasing earnings management practices. However, the authors overlook that these results could be influenced by incentives and institutional environment, once they tend to affect legal enforcement.

In table 2, we highlight countries' sample and respective IFRS mandatory adoption's year.

**Table 2- IFRS Mandatory Adoption in Latin American Countries**

Country	Stock Exchange	Mandatory Adoption
Argentina	BVBA - <i>Bolsa de Comercio de Buenos Aires</i>	2012
Brazil	B <sup>3</sup> - <i>Brasil Bolsa Balcão</i>	2010
Chile	BCS - <i>Bolsa de Comercio de Santiago</i>	2010
Colombia	BVC - <i>Bolsa de Valores de Colombia</i>	2015
Mexico	BMV- <i>Bolsa Mexicana de Valores</i>	2012
Peru	BVL - <i>Bolsa de Valores de Lima</i>	2012

Source: IFRS (2017).

The second is defined by Kaufmann, Kraay and Mastruzzi (2010). According to them, "Rule of Law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence" (p.3). This variable is compiled by The World Bank Group, through the project The

Worldwide Governance Indicators (WGI), by an annual score that ranges from 0 to 100. A higher score indicates that the country presents a strong law enforcement environment, that is, greater enforcement.

The Control of Corruption<sup>3</sup> “captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as “capture” of the state by elites and private interests” (Kaufmann et al., 2010, p.3). This variable is also compiled by The World Bank Group (WGI), in which the index is scaled from 0 (lowest corruption) to 10 (highest corruption).

### 3.3 Regression Specification

We estimated the following regression equation to verify the influence of financial crises on earnings quality, though earnings management measures. We also investigate the effects of financial constraint on earnings quality when they suffer from recession period, through the interaction variable.

$$AbsDA_{i,t} = \beta_0 + \beta_1 Crisis_{i,t} + \beta_2 FCdummy_{i,t} + \beta_3 Crisis_{i,t} * FCdummy_{i,t} + \beta_k Control_{k,t} + u_{i,t} \quad (4)$$

where *AbsDA* is absolute value of discretionary accruals, according Kothari et al. (2005) model; *Crisis* is GDP variation of each country; *FCdummy* is each one of the four previously financial constraint measures, where =1 if the firm is constrained or zero, unconstrained; *Control* is the set of control variables, including firm-level, country-level and institutional environment.

All continuous variables, except macroeconomic and institutional variables, were winsorized at 3%, aiming to mitigate the effects of outliers in the sample, as previous studies (Kothari et al., 2005; Barth et al., 2008).

Our coefficient of primary interest is  $\beta_1$ . A positive (negative) coefficient will imply increasing (decreasing) earnings management practices by firms due to the effects of financial crises, incurring, consequently in decreasing (increasing) earnings quality.

As previous stated in our  $H_1$ , we would expect the coefficient  $\beta_1$  to be negative, demonstrating that firms could engage in less earnings management practices as a strategy view, giving clear signals to the market of the actual performance, not affecting negatively the confidence of the market to earnings quality during crises periods (Arthur et al., 2015).

We also analyze the effect of  $\beta_3$ . The interaction coefficient will demonstrate the effect of crises together with the financial constraint dimension on earnings quality.  $H_2$  predicts that the interaction coefficient (CRISIS x FCdummy) to be positive. That is a mitigation effect of the interaction with crises period and financial constraint behavior on earnings quality, demonstrating that financially constrained firms facing financing frictions, suffering more from the recession periods, when compared with their counterparts (Almeida et al., 2004).

## 4 EMPIRICAL RESULTS

First, we present summary statistics of our sample, considering the period of 2001-2016, for the four financial constraint measures, according table 3.

<sup>3</sup> We verified strong correlation with Rule of Law and Corruption (Spearman correlation = 0.8018,  $p > z = 0.000$ ). We followed the analysis for both variables, whose results were similar, but, when we analyze significance level, the results for rule of law provided better levels, keeping this forward.

Table 3- Descriptive Statistics

Financial Constraint Criteria	Variables	Mean	Std Dev	Min	Max	Obs
Dividend Payout and Issuer Rating	AbsDA	0.0505	0.0467	0.00004	0.2502	2,960
	CRISIS	0.0375	0.0291	-0.1089	0.1013	
	FCdividend	-	-	0	1	
	FCdividendCRISIS	0.0024	0.0126	-0.1089	0.1013	
	FCrating	-	-	0	1	
	FCratingCRISIS	0.0230	0.0305	-0.1089	0.1013	
	SIZE	20.3349	1.7924	16.7246	23.8031	
	CFO	0.0951	0.0850	-0.0744	0.3278	
	LEV	0.4702	0.1894	0.0950	0.8337	
	ROA	0.06889	0.06654	-0.05370	0.26716	
	IFRSADOPT	-	-	0	1	
	FXVAR	0.0285	0.1173	-0.1678	206,479	
	RULELAW	0.5949	0.2584	0.1875	0.8947	
KZ index	AbsDA	0.0538	0.0485	0.0000	0.2487	1,826
	CRISIS	0.0382	0.0300	-0.1089	0.1013	
	FCkzdummy	-	-	0	1	
	FCkzCRISIS	0.0168	0.0275	-0.1089	0.1013	
	SIZE	20.0669	1.8506	16.7246	23.8031	
	CFO	0.0956	0.0911	-0.0744	0.3278	
	LEV	0.4408	0.2209	0.0950	0.8337	
	ROA	0.0712	0.0722	-0.0537	0.2672	
	IFRSADOPT	-	-	0	1	
	FXVAR	0.0286	0.1276	-0.1678	20,648	
	RULELAW	0.5774	0.2586	0.1875	0.8947	
SA index	AbsDA	0.0500	0.0471	0.0000	0.2502	1,782
	CRISIS	0.0373	0.0287	-0.1089	0.1013	
	FCsdummy	-	-	0	1	
	FCsaCRISIS	0.1602	0.0258	-0.1089	0.1013	
	SIZE	20.3369	2.2031	10.0000	23.8031	
	CFO	0.0983	0.0869	-0.0744	0.3278	
	LEV	0.4559	0.1967	0.0950	0.8337	
	ROA	0.0684	0.0672	-0.0537	0.2672	
	IFRSADOPT	-	-	0	1	
	FXVAR	0.0282	0.1183	-0.1678	20,648	
	RULELAW	0.5927	0.2571	0.1875	0.8947	

Notes: The authors. Output Software Stata®, all variables were previous defined.

The results of Table 3 show convergence between the four financial constraint measures, as the values of the descriptive statistics are similar between them. An average level of discretionary accruals (AbsDA) could be observed in all measures

around of 0.05. These values are comparable with European firms, which was evidenced an average absolute value of discretionary accruals around 0.06 after crises period, as analyzed by Arthur et al. (2015).

Aiming to compare the level of discretionary accruals (AbsDA) across groups of financial distress measures, we first verify the normality, by the Shapiro-Wilk normality test, as showed in Table 4.

Table 4- SW Normality Test

Financial Constraint Criteria	Dividend Payout	Issuer Rating	KZ index	SA index
Firm-observations	2,960	2,960	1,826	1,782
Shapiro-Wilk Test (z)	14.12	14.12	12.581	12.829
<b>prob &gt; (z)</b>	<b>0.0000***</b>	<b>0.0000***</b>	<b>0.0000***</b>	<b>0.0000***</b>

Note: The authors. Output Software Stata®. \* / \*\* / \*\*\* denotes the significance levels 0.10 / 0.05 / 0.01

For all measures we rejected the null hypothesis of normality of the discretionary accruals variable, AbsDA, indicating that is appropriate to apply a non-parametric test. Mann-Whitney test is an alternative to t-Student test when the normality is violated or when the sample is small. The authors also complement that this test verifies median equality of two groups, unlike the last one, which tests equality of means. The results of Mann-Whitney test was showed in table 5.

Table 5- Mann-Whitney Non-Parametric Test

Financial Constraint Criteria	Dividend Payout		Issuer Rating		KZ index		SA index	
	FC=1	FC=0	FC=1	FC=0	FC=1	FC=0	FC=1	FC=0
Mean	0.0621	0.0496	0.0544	0.0458	0.0597	0.04845	0.0432	0.0568
Median	0.0469	0.0354	0.0388	0.0336	0.0442	0.0353	0.0300	0.0414
Std Dv	0.0543	0.0459	0.0502	0.0416	0.0512	0.0452	0.0407	0.0518
Obs (n)	221	2,739	1,635	1,325	869	952	891	891
<b>Mann-Whitney Test  z </b>	<b>3.311</b>		<b>3.524</b>		<b>4.668</b>		<b>5.316</b>	
<b>prob &gt;  z </b>	<b>0.0009***</b>		<b>0.0004***</b>		<b>0.0000***</b>		<b>0.0000***</b>	

Note: The authors. Output Software Stata®. Mann-Whitney test presents null hypothesis of equality of median groups. FCdummy =1 when the firm is financially constrained or zero, unconstrained. \* / \*\* / \*\*\* denotes the significance levels 0.10 / 0.05 / 0.01.

Table 5 shows evidence that constrained and unconstrained firms are statistically different in terms of discretionary accruals component, because, in all measures, we rejected the null hypothesis of equality of median groups, at better than 5 per cent level of significance.

The variable AbsDA reported by constrained firms (FCDummy=1) are significantly larger compared to unconstrained counterparts (FCDummy=0), as could be observed by the comparisons. Considering that AbsDA is an inverse measure of quality information, it could be stated that the earnings quality adjustments is, on average, lower for financially constrained firms.

As a complement of this analysis, Carvalho et al. (2014) further demonstrated a comparison of earnings quality by groups of investment decisions. The authors provided evidences that earnings quality is, on average, higher and statistical significant for the group considered efficient, when compared with inefficient companies. So, better quality information is negatively related with lowers degrees of investment decisions.

These analyses provided initial insights about the effects of financial constraints on earnings management practices but did not control for other known determinants of firm characteristics and country-level. So, additional evidence by Panel Data regression was presented in following table.

Table 6- Panel Data Regressions with Robust Std. Errors

Dependent Variable AbsDA	Financial Constraint Criteria			
	Dividend Payout	Issuer Rating	KZ index	SA index
Independent Variables	Coefficient (sign.)	Coefficient (sign.)	Coefficient (sign.)	Coefficient (sign.)
<b>CRISIS</b>	<b>-0.1076**</b>	-0.0592	<b>-0.1306**</b>	<b>-0.1459**</b>
(p-value)	(0.011)	(0.2220)	(0.012)	(0.029)
FCDUMMY	-0.0034	0.0003	-0.0033	0.0002
(p-value)	(0.374)	(0.946)	(0.519)	(0.981)
<b>FCCRISIS</b>	<b>0.2389**</b>	-0.0339	<b>0.2232***</b>	<b>0.1335*</b>
(p-value)	(0.017)	(0.586)	(0.001)	(0.077)
<b>SIZE</b>	0.0018	<b>-0.0046***</b>	<b>-0.0061***</b>	<b>-0.0064***</b>
(p-value)	(0.424)	(0.000)	(0.000)	(0.000)
<b>LEV</b>	<b>0.0262**</b>	<b>0.0411***</b>	<b>0.0418***</b>	<b>0.0388***</b>
(p-value)	(0.036)	(0.000)	(0.001)	(0.000)
CFO	-0.0323	-0.0402	-0.0183	-0.0086
(p-value)	(0.217)	(0.115)	(0.548)	(0.800)
<b>ROA</b>	<b>0.1561***</b>	<b>0.1639***</b>	<b>0.1693***</b>	<b>0.1800***</b>
(p-value)	(0.000)	(0.000)	(0.000)	(0.000)
IFRSADOPT	-0.0023534	0.0002	-0.0001	0.0000
(p-value)	(0.335)	(0.927)	(0.969)	(1.000)
<b>FXVAR</b>	<b>-0.0279***</b>	<b>-0.0280***</b>	-0.0114	<b>-0.0210***</b>
(p-value)	(0.000)	(0.000)	(0.162)	(0.007)
<b>RULELAW</b>	-0.0025593	<b>-0.0187***</b>	<b>-0.0196***</b>	<b>-0.0226***</b>
(p-value)	(0.933)	(0.005)	(0.004)	(0.005)
<b>CONST</b>	0.0015548	<b>0.1349***</b>	<b>0.1635***</b>	<b>0.1702***</b>
(p-value)	(0.973)	(0.000)	(0.000)	(0.000)
Obs. (n)	2,960	2,960	1,826	1,782
Mean VIF	1.56	2.19	2.17	2.87
Fixed / Random	Fixed-Effects	Random-Effects	Random-Effects	Random-Effects
R-sq overall	0.0278	0.0866	0.1076	0.1276
F statistics	6.64*** (0.000)	112.57*** (0.000)	128.63*** (0.000)	112.19*** (0.000)
Breusch-Pagan/Cook-Weisberg Test for Heteroskedasticity	150.22*** (0.000)	123.88*** (0.000)	67.95*** (0.000)	159.1*** (0.000)
Breusch-Pagan LM Test	527.24*** (0.000)	544.79*** (0.000)	295.50*** (0.000)	288.96*** (0.000)
Cluster-Robust Hausman Test	22.25** (0.0139)	17.07* (0.0728)	4.93 (0.9313)	10.33 (0.4097)

Note: The authors. Output Software Stata®. The dependent variable is AbsDA defined by absolute value of accruals discretionary obtained by model of Kothari et al. (2005); The sample period is 2001-2016; CRISIS is defined by GDP variation of each country; FCDUMMY=1 if a firm is financially constrained and zero otherwise; FCCRISIS is the interaction variable with FCDUMMY\*CRISIS; SIZE is the natural log of total assets; LEV is the leverage ratio, defined by total liabilities divided by total assets; CFO is cash flow from operating activities; ROA is return on assets; IFRSADOPT is dummy variable=1 from the year of mandatory adoption of international accounting standards and zero, otherwise; FXVAR is the variation of foreign exchange rate which is available at The World Bank databases; RULELAW is the level of country's enforcement available at The World Bank databases. \* / \*\* / \*\*\* denotes the significance levels 0.10 / 0.05 / 0.01.

According table 6, all regressions are significant (F statistics= 0.000\*\*\*) and there is no multicollinearity (mean VIF<10). According to Breusch-Pagan/Cook-Weisberg Test for Heteroskedasticity, we rejected the null hypothesis of constant variance, being necessary apply robust std. errors in all panel data regressions.

Despite the fact of many previous research used firm fixed-effects models, the Cluster-Robust Hausman Test, applied to robust std. error models, indicates the use of random-effects as the best estimator for most of the constraint factor. We corroborate this assumption considering the associated effects of financial constraint and financial crisis in the firm.

CRISIS variable is statistically significant at 5 per cent for three financial constraint measures, except for Issuer Rating. Then, we could note a convergence in these measures, demonstrating a negative and significant relation with earnings management and financial crises period. They tend to improve of quality information during financial crises period, corroborating with previous studies (Chia et al., 2007; Filip & Raffounier, 2014; Arthur et al., 2015).

This improvement of quality information could be linked with the creditors' dependence of Latin American firms. So, better financial reports provide better transparency during crises periods, as a manner to maintain market relationship, especially from external financing to avoid financial difficulties from recession periods. Petersen and Rajan (1994) affirms that stable relationships between creditors and firms could improve availability and financing conditions, reducing the costs to obtain them.

When we analyzed the interaction variable, FCdummy x CRISIS, it should be noted a significant relation with earnings management practices in three financial constraint criteria. The positive relation demonstrates a mitigation effect of financial constraint on earnings management practices, during financial crises period.

According to Almeida et al. (2004), financially unconstrained firms have not need to safeguard against future investment needs. That is, a financially unconstrained firm has no precautionary motive for cash holdings (Han & Qiu, 2007), suffering less with cash reduction, in recession periods. So, it is costlier for constrained firms improve quality information (Carvalho et al., 2017), because most financially constrained firms tend to suffering greatest consequences with the credit crunch (Bhaïrd, 2013).

This result is also linked with Habib et al. (2013). They provided evidence that financially constrained firms in New Zealand engage more earnings management practices compared with their counterparts during financial crises periods and also demonstrated that the New Zealand market considers discretionary accruals more informative in non-crises period.

Firm size (SIZE) has a negative and significant (1 per cent) relation with earnings management practices, demonstrating that large firms have more benefits in terms of economies of scale, decreasing their levels of accruals (Gu et al., 2005), so they tend to exercise less discretion in accounting results (Arthur et al., 2015).

Leverage (LEV) is significant in all regressions and has a positive relation with earnings management. That is, leveraged firms tend to present lower levels of earnings quality. According to Defond and Jiambalvo (1994), firms are likely to manage their results prior to debt covenant violations.

ROA variable presents a positive relation with discretionary accruals component, with 1 per cent level of significance. The performance variable demonstrated a decreasing of earnings quality that is; firms with extreme performance tend to manage more their results, in line with previous studies (Kothari et al., 2005; Lee et al., 2006; Dimitras et al., 2015).

The country-level variable, FXVAR, demonstrates a negative coefficient, indicating that an increasing in country foreign exchange rate is related with a decrease of earnings management practices, as could be seen for an indicative of the firm's behavior in crises periods.

The institutional environment plays a role in earnings management practices in these firms. The variable RULELAW presents a negative relation with discretionary accruals component for three regressions with 1 per cent of significance. This relation

evidences a reducing of earnings management practices. So, a better enforcement tends to improve quality of accounting information, corroborating with previous literature (La Porta et al., 1998; Leuz et al., 2003; Filip & Raffounier, 2014; An et al., 2016).

Finally, we highlighted that IFRSADOPT was not significant in all regressions. It could be attached by the recent period of adoption in these countries. Another aspect could be the influence of enforcement mechanisms and management incentives, because these specific characteristics strongly influence the implementation of standards (Gonzalez & García-Meca, 2014; Rathke, Santana, Lourenço & Dalmácio, 2016).

## 5 Concluding Remarks

We analyzed the effect of financial crises on earnings quality of public companies in Latin America, during 2001 to 2016. We also verify the influence of financial constraint measures on earnings management practices during financial crisis.

Findings demonstrated a decrease of earnings management practices during crises years in these firms, corroborating with the assertion that managers have incentives to establish credibility of financial reports, reducing negatives effects of crises periods.

However, when we analyzed the firms by financial constraint criteria, an incremental analysis evidenced that financially constrained firms tend to increase earnings management practices during financial crises, decreasing earnings quality, confirming our hypotheses.

Some specific factors also influence earnings management practices, like firm size, leverage and performance. We also showed that institutional and country-level characteristics demonstrated influence on earning management practices in Latin American firms.

We highlighted that our research is subject to limitations. The first is related with measurement of earnings management. Although there are several models for the measurement of discretionary accruals, we apply Kothari et al. (2005) model, due their performance control and has been applied recently by related literature. Our results are restricted by the Latin American countries from 2001 to 2016. Further research could be extended to other countries and periods to provide comparisons. We also added that consequences of macroeconomic changes in developing countries are generally unexplored. Interesting studies could investigate these effects together with other measures of earnings quality, considering different dimensions of asymmetric financing opportunities, like ownership, banking dependence, and the behavior of these countries on crises periods.

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