



Impact of international financial reporting standards on accounting quality: Evidence from Latin America and the Caribbean¹

Impacto de los estándares internacionales de información financiera en la calidad contable: evidencia desde Latinoamérica y el Caribe

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Abstract

This paper examines the impact of the application of International Financial Reporting Standards (IFRS) on accounting quality (financial report quality) of Latin American and Caribbean economies, regarding to their local accounting regulatory standards (Local GAAP). By using a sample of listed companies in Latin America and the Caribbean from 2006 to 2016, accounting quality is assessed under three measurement criteria: earnings management, timely loss recognition (accounting attributes) and value relevance (market attributes). The findings suggest a partial accounting quality improvement; it is showed through a decrease on the level of earnings management only after several years of the IFRS applica-

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tion. However, there is no evidence of a greater opportunity to recognize large losses; furthermore, the generated accounting information under IFRS is not valued, with greater usefulness by market agents. However, there is no evidence of greater opportunity to recognize large losses, while the accounting information generated under IFRS standards is not valued as with greater usefulness by market agents.

JEL Code: M41, M42, M48

Keywords: IFRS adoption; Earnings smoothing; Accounting quality; Earnings management; Value relevance

Resumen

Este artículo examina el impacto de la aplicación de los Estándares Internacionales de Información Financiera (IFRS) en la calidad contable (calidad del reporte financiero) de las economías latinoamericanas y del Caribe, respecto a su marco normativo local (Local GAAP); usando una muestra de compañías cotizadas en Latinoamérica y el Caribe durante los periodos 2006-2016, se valora la calidad contable bajo tres criterios de medición: la manipulación del resultado, el reconocimiento oportuno de pérdidas (atributos contables) y la relevancia valorativa (atributos de mercado). Los hallazgos sugieren un mejoramiento parcial de la calidad contable, evidenciado a través de una disminución en el nivel de manipulación del resultado sólo después de varios años de aplicación de IFRS. Sin embargo, no se evidencia mayor oportunidad al reconocer grandes pérdidas, al tiempo que, la información contable generada bajo los estándares IFRS, no es valorada con mayor utilidad por los agentes de mercado.

Código JEL: M41, M42, M48.

Palabras Clave: Adopción IFRS; Alisamiento del resultado; Calidad contable; Manipulación del resultado; Relevancia valorativa

Introduction

The more countries that apply the International Financial Reporting Standards (hereinafter IFRS), the greater the need and interest of the academic accounting world and regulatory bodies at the national and international levels to know in depth the result of its application according to the institutional characteristics of each adopting country. Numerous works show the importance of verifying whether the adoption of a common international accounting standard, as is the case with IFRS, is equally applicable in a great diversity of nations that are characterized by their political, economic, and institutional differences; without forgetting that IFRS are based on the accounting practices of Anglo-Saxon countries, mostly the practices of countries such as the United Kingdom and the United States of America (Hove, 1990). Previous researches analyze whether these standards are appropriate for countries other than

those of Anglo-Saxon origin; however, the relevance of IFRS is still a matter of interest to many academics and regulators for developing countries.

Therefore, the objective of this research is to analyze whether the application of IFRS contributes to the improvement of the quality of financial statements (expression of measurement of the accounting quality) for Latin American and Caribbean countries. Specifically, it is assessed whether the use of these standards is associated with an improvement in the quality of accounting information with respect to the application of generally accepted accounting principles in each country (hereinafter Local GAAP); this is evidenced through a lower earnings management, greater opportunity in the recognition of losses, and greater value relevance of the accounting magnitudes in the capital markets during the period of application of IFRS, with respect to the period of application of local standards.

The rest of the article is organized as follows. The second section reviews previous literature on the development and application of expressions measuring accounting quality and the influence of institutional factors as determinants of such quality, in addition to presenting the hypotheses for this study; the third and fourth sections describe the methodological design and the selection and distribution of the sample, respectively; the fifth section presents the empirical results of the study, while the sixth section presents the results obtained under a sensitivity analysis. Finally, the last section presents the conclusions of this research.

Review of the literature and hypothesis definition

Expressions of measurement of accounting quality and its applicability at the international level

The first theoretical manifestations of the multifaceted concept of accounting quality based on the notion of earnings management originated during the 1980s and 1990s. For example, Schipper (1989) defines earnings management as discretionary management intervention in the financial statement reporting process; years later, this conception was complemented by Healy and Wahlen (1999), who suggest that such intervention misleads shareholders about the economic performance of the firm. The concept of earnings management was referred to in turn through an indicator appropriate for the way or form of discretionary intervention exercised by the management on the result accounts, this indicator is described as earnings smoothing, which, according to Trueman and Titman (1988), is presented when the direction of the firms takes actions to reduce the fluctuations in the reported earnings.

Subsequently, said theoretical statements of accounting quality, seen from the combined effect of the elements of the reporting system on the main accounting variables, were operationalized and developed as measurement expressions (proxies) during the years 2003 to 2008,

and, together with these, expressions related to the level of accounting conservatism and the informative role of accounting (value relevance) were used. Leuz *et al.* (2003) documented a first approach when elaborating and applying, at an international level, new expressions for the measurement of accounting quality based on the relation of the variability of earnings with the variability of accruals, and the correlation between the latter and operating cash flows, in addition to other measurements; measurements that were subsequently used and complemented by Lang *et al.* (2003) and Lang *et al.* (2006) to compare the effects of accounting quality among U.S. and non-U.S. listed firms, and between local and foreign listed firms in the U.S. markets with earnings reconciliation, respectively.

These expressions have subsequently become one of the most popular instruments for comparing whether the quality of financial reporting varies with the use of IFRS standards, in addition to other accounting standards such as US GAAP. The first works reported in this line were conducted by Barth *et al.* (2006) and Barth *et al.* (2008), who have documented a lower level of earnings management for those firms that apply US GAAP compared to those that apply IAS (now IFRS), and a lower earnings management, greater opportunity in the recognition of losses, and greater value relevance for those firms that voluntarily apply IFRS at the international level, respectively.

Based on these proposals, the accounting literature based on the quality of the financial statements, and especially that related to the effects of the application of IFRS, has developed vertiginously with three measurement alternatives, two of them based on accounting attributes (earnings management and timely losses recognition) and the remaining one based on market attributes (value relevance).

Applying these alternatives, Paananen (2008) and Paananen and Lin (2009) conclude that the quality of the financial statements does not improve significantly in Sweden and Germany, respectively, contrariwise, it shows a decrease during the first years of application of the IFRS; for their part, Christensen *et al.* (2015), Günther *et al.* (2009) and Lin *et al.* (2012) report similar results for German firms forced to apply such standards, suggesting an increase in the level of earnings management and a decrease in value relevance; however, for German firms that voluntarily apply IFRS, the studies conducted by Christensen *et al.* (2015) and Günther *et al.* (2009) indicate a decrease in the level of earnings smoothing and an increase in the timely incorporation of losses; only Christensen *et al.* (2015) reveal an improvement in the value relevance of accounting magnitudes in the capital markets for these firms.

The accounting quality studies were applied simultaneously in other European countries, such as the United Kingdom (Iatridis 2008, 2010), Greece (Dimitropoulos *et al.*, 2013), and Romania (Brad *et al.*, 2014), where there was a decrease in the level of earnings smoothing during the periods of mandatory application of IFRS, in addition to an increase in the opportunity to recognize large losses and an improvement in the informative role of accounting

information for the first two cases mentioned. These results are also extendable to the voluntary application of IFRS in UK firms (Iatridis 2008, 2010), and for the Greek case, according to the study conducted by Iatridis and Rouvolis (2010), and show an improvement in the aspects of earnings management and value relevance for the latter firms from the second period of application of IFRS and onwards in relation to the first period of application of these standards.

With respect to multi-country studies of accounting quality, it can be said that different results are obtained, as in the case of Zeghal *et al.* (2012), who document a decrease (increase) in market attributes (accounting attributes) for 15 countries of the European Union. Conversely, the study conducted by Devalle *et al.* (2010) did not show an improvement in these attributes since earnings smoothing (the opportunity in the recognition of losses) did not decrease (nor increase) significantly for the 5 largest economies of Europe (Spain, France, Germany, Italy, and the United Kingdom). In the same direction, the study conducted by Aubert and Grudnitski (2011) applied on 13 member countries of the European Union did not show any significant increase in value relevance during the post-adoption period; however, Piot *et al.* (2010) managed to confirm, for 22 European countries, a decrease in the level of accounting conservatism.

In this order of ideas, when evaluating the quality of the financial statements from 29 countries that obligatorily adopted IFRS during 2005, Ahmed *et al.* (2013) indicate a decrease in said quality, evidenced by an increase (decrease) in earnings management (opportunity in the recognition of great losses) with respect to those non-adopting countries.

Capkun *et al.* (2016) also find evidence of an increase in earnings management for those countries obligated to adopt IFRS since 2005, as well as for those that voluntarily adopted them before that year and made the change to the 2005 IFRS version, suggesting that the version of IFRS issued by the IASB, during the year indicated, allowed the choice of accounting alternatives suitable for managers to earnings management.

The studies of accounting quality under the methodology employed by Barth *et al.* (2008) were subsequently extended to American and Eastern countries. Authors such as Cardona Montoya and Cano Morales (2017), when evaluating the effect of enforced of IFRS in Canada, indicate an increase in the level of accounting conservatism and in the informative capacity of accounting magnitudes for its capital market. Zhou *et al.* (2009), for their part, find a decrease in the level of earnings management for Chinese firms that apply IFRS with respect to firms that do not, although they do not show greater opportunity to recognize losses. Liu *et al.* (2011), apart from documenting lower earnings management, report an increase in the value relevance of the accounting information for Chinese firms enforced to implement IFRS in 2007, analyzed against their pre-adoption period.

Similar findings were obtained by Temiz and Güleç (2017), Abdullah *et al.* (2017), and Fuad and Wijanarto (2017), in their studies for listed non-financial firms in Turkey, Malaysia,

and Indonesia, respectively, where they report an increase in value relevance for the first case and a decrease in the level of earnings management for the remaining economies during the IFRS application periods with respect to their corresponding previous periods. Finally, Chua *et al.* (2012) conclude on an increase in the quality of the financial statements by finding a decrease in the earnings smoothing, an increase in the timely frequency of recognizing losses, and an increase in the informational capacity of accounting for those Australian firms enforced to apply IFRS since 2005.

Regarding the literature on accounting quality under the concept of value relevance, it was developed through alternative methods to verify the informational capacity of accounting magnitudes in capital markets (Hellstrom, 2006), being the models proposed by Bartov *et al.* (2005), Basu (1997), and Ohlson (1995), the alternatives present in most of the studies applied and related until now. The model proposed by Ohlson (1995), for example, proposes that the variations in the share price could be explained by the amounts of the earnings and the book value of the equity reported to the market. Basu (1997) directs his analysis towards the concept of earnings conservatism under the conception that negative returns (bad news) are incorporated with greater opportunity in the earnings, with respect to the opportunity with which positive returns are incorporated (good news). For their part, Bartov *et al.* (2005) propose their measurement by relating the stock market profitability with the earnings for the period and, when applied to a group of German firms, they indicate a greater informational capacity of the earnings obtained from US GAAP with respect to those obtained with the application of IFRS.

Studies on accounting quality and institutional factors in Latin America

Studies on accounting quality in Latin America

During the last decades, the required use of IFRS by most Latin American countries allowed conducting several studies tending to analyze the impact of this accounting framework on the accounting quality, mainly of firms listed in Brazil, Mexico, and Chile, although the findings documented so far have been somewhat contradictory. Vieira *et al.* (2011), for example, using the methodology employed by Barth *et al.* (2008), show a decrease in the level of earnings management and an improvement in the value relevance for those Brazilian firms that partially adopted IFRS during 2008. Conversely, Klann and Beuren (2015) indicate an increase in the earnings management in the periods of full adoption of IFRS for these same firms during 2010, while Pelucio-Grecco *et al.* (2014), analyzing the accounting quality during the years 2006-2011, conclude that the transition to IFRS restricts the level of earnings management

after completing the implementation with respect to the periods prior to such standards.

The results obtained in the previous study have recently been reinforced by da Silva *et al.* (2017) for the electricity sector, who, when analyzing the financial statements of firms in this sector between 2003 and 2014, report a reduction in the level of earnings smoothing after the adoption of IFRS, concluding on an improvement in the accounting quality seen from a decrease in the level of earnings management.

For the Mexican case, Conesa *et al.* (2011), when analyzing the adaptation of Mexican GAAP to IFRS for the years 1997-2009, suggest a decrease in the level of earnings management; however, Palacios Manzano and Martínez Conesa (2014) do not suggest a decrease in this level of management since they find that, for the 1997-2008 period, the magnitude of discretionary accruals (a measure of accounting quality) does not decrease with the use of IFRS in Mexican non-financial firms listed on the NYSE.

For their part, Santana *et al.* (2014) indicate that Latin American firms report a lower level of accounting quality during the years 2011 and 2012, when comparing the magnitude of discretionary accruals between firms listed in Brazil and Chile with respect to the United Kingdom and Australia, and with respect to France and Germany; although Cardona Montoya (2018) and Melgarejo (2017), analyzing the impact of the application of IFRS during the years 2006 to 2014 and 1997 to 2015, respectively, suggest an increase in accounting quality for 25 Latin and Caribbean countries and for the 5 major Latin economies respectively, showing that the use of IFRS negatively impacts the magnitude of discretionary accruals, and that the latest work identifies a higher level of association between earnings and stock market prices during the period of application of these standards.

Institutional factors and their effectiveness in Latin America

Recent studies in the accounting literature focus their attention on identifying those institutional determinants of the quality of financial reporting and disclosure (Ball, 2001; Ball *et al.*, 2003; Ball & Shivakumar, 2005; Burgstahler *et al.*, 2006; Hail *et al.*, 2010; Leuz *et al.*, 2003), in which, in addition to considering IFRS standards as an institutional factor, they recognize that they are not the only element that conditions the behavior of financial reporting practices among countries (Leuz & Wysocki, 2016), especially the behavior at the level of earnings management (Houque *et al.*, 2012; Leuz *et al.*, 2003; Reverte, 2008).

Several studies warn about the presence of possible interdependencies between the same institutional factors, in addition to being all complementary to affect the quality of the financial report (Leuz, 2010; Leuz & Wysocki, 2016; Wysocki, 2011); additionally, the literature calls for a response to the high interest of academics and market regulators to identify those institutions that are necessary, sufficient, or more important for the development of capital

markets between countries (Wysocki, 2011). Previous studies, such as those conducted by Kothari (2000) and Ball (2001), already revealed other institutions different from the accounting system that could condition the development of economic and capital markets in a country, for example, legal, economic, and regulatory institutions; however, more recent studies identify and process over 35 countries, a wide variety of institutional factors, in addition to the previous ones, others of a sociological and geopolitical type, and that somehow affect the quality of accounting information (Isidro *et al.*, 2016).

Regarding the presence of these institutions in Latin America and the Caribbean, as revealed by multi-country studies, they have marked differences with respect to the institutions present in the rest of the countries (Leuz, 2010); therefore, in line with previous literature, it would affect the quality of accounting information during the mandatory application of IFRS. Precisely by monitoring the degree of effectiveness of some of the institutions present for the Latin region, the following institutions are identified: levels of judicial independence, independence of the board of directors, and protection of the rights of minority shareholders; levels of financing through capital markets and their development; and the degree of effectiveness of enforcement mechanisms on financial reporting and auditing standards.

The level of judicial independence, as a factor of security and support for the property rights of investors (La Porta *et al.*, 2004) is on average significantly lower for countries with a civil- French law tradition (in which all Latin American countries are found) than for other groups of countries with civil law (German and Scandinavian) and common law (Anglo-Saxon) (Porta *et al.*, 1998), which negatively impacts the financial transparency of firms (Bushman *et al.*, 2004), in addition to presenting less conservative accounting practices with respect to the practices of countries with greater judicial independence (Bushman & Piotroski, 2006); more recent studies, such as the one led by Leuz (2010), place the Latin American region in the lowest positions of the rule of law index after the Far East and Mediterranean regions in its order, and only above the African region.

With regard to the independence of the board of directors and the level of protection of the rights of minority shareholders, several studies have suggested that levels of earnings management are likely to increase in countries where their firms have fewer independent directors (Ebrahim, 2007; Klein, 2002; Peasnell *et al.*, 2005) and show a greater degree of concentration of ownership (Reverte, 2008), respectively. Although La Porta *et al.* (2000) describe that those countries with civil law tradition report a lower level of protection of the rights of investors and, therefore, lower quality in corporate governance measures, recently the Global Competitiveness Measurement Index indicates a slight improvement in the mean with respect to the effectiveness of boards of directors, and in the levels of protection of minority interests in most Latin American countries (WEF, 2017); additionally, the index of protection of minority shareholders calculated in the study conducted by Leuz (2010) reveals

a position of the Latin American region above the Mediterranean and Eastern Europe regions.

On the other hand, the levels of financing through the capital markets (as an expression of measuring market size) and the regulation of these markets are considered to have an inverse relationship with the levels of earnings management in line with the studies by Halabi and Yi (2015) and Reverte (2008), respectively. Although Latin American capital markets have been classified as emerging markets (Leuz, 2010), they report, on average, an improvement in both institutions according to the Global Measurement Index for most of their countries (WEF, 2017), an improvement that is documented by Leuz (2010) in its securities regulation index, being even above the Mediterranean region, Africa, and Eastern Europe. Additionally, the multi-country study conducted by Houque *et al.* (2012), which includes the 7 main Latin American capital markets, found the aforementioned inverse relationship between the levels of regulation of these markets and earnings management (measured through the magnitude of discretionary accruals) during the periods of application of IFRS.

Finally, regarding the degree of effectiveness of enforcement and control mechanisms over financial reporting standards and auditing standards, Halabi and Yi (2015) demonstrate an inverse relationship between the former and the magnitude of discretionary accruals during the application of IFRS standards at the multi-country level. Meanwhile, Francis *et al.* (2003) suggest a direct relationship between the latter and the quality of financial reporting. And although some studies have reported negative reactions in capital markets with the adoption of IFRS in countries where the first institution is rated as weak (Armstrong *et al.*, 2010), the Latin American region is characterized by improving its positions for both institutions in most of its countries during the last few years, according to the Global Competitiveness Index (WEF, 2017), an improvement that is evidenced by Houque *et al.* (2012) in its multi-country study (which includes several Latin American countries), noting a lower level of earnings management when both institutions are qualified as rigorous.

Definition of the hypotheses

Based on the findings documented in international literature and especially those related to the Latin American region so far, the following hypotheses are put forward:

H1: It is expected that during the IFRS application periods, the level of earnings management will decrease significantly with respect to the local GAAP application periods in the Latin American and Caribbean region.

H2: During IFRS application periods, the opportunity is expected to increase significantly when recognizing losses (timely losses recognition) with respect to local GAAP application periods in the Latin American and Caribbean region.

H3: During IFRS application periods, accounting information is expected to present a significant increase in informational capacity (value relevance) in the Latin American and Caribbean capital markets with respect to local GAAP application periods.

Research method

This study operationalizes the concept of accounting quality through the quality of financial statements and this in turn, through three expressions (proxies) related to the quality of the reported earnings, which are globally used in the accounting literature, two of them based on accounting attributes (earnings management and the timely losses recognition) and the remaining one, based on market data (value relevance), strengthen the findings with respect to the multifaceted concept of accounting quality.

Therefore, the expressions used to examine accounting quality not only reflect the effects attributable to the applied accounting regulatory framework, but also to the other elements of the accounting system, including the interpretation that managers make of the standards, the enforcement mechanisms used by each country to guarantee the correct application of the regulatory framework and the presence of the litigation risk that managers and audit firms have on their responsibility in the financial information they issue to capital markets.

A number of control variables are included in the various measures in order to be able to attribute changes in accounting quality to elements of the system (including IFRS) rather than to changes in management incentives; these controls relate to voluntary accounting decisions made by management (Barth *et al.*, 2008) and to the characteristics of the economic environment (country and industry) in which each firm operates, which may have an influence on the accounting magnitudes.

The expressions of the accounting quality of the firms that adopted the IFRS standards, are compared in their pre- and post-adoption periods under a cross-sectional study, being the same firm its own control to guarantee the constancy of the economic characteristics of the same one and thus the changes in the accounting quality can be attributed to the application of the above-mentioned standards.

In order to control the effects of the economic environment on the accounting magnitudes, independent variables such as industry, country, and the year of information analyzed have been included, in this way the effects of the economic environment are captured so that they cannot alter the effects actually attributed to the accounting system, in addition the firms in the sample adopted the IFRS standards in different periods of time and this mitigates the potential effect of the change in the economic environment.

To evaluate the statistical significance of the differences in each of the expressions from one period to another, a t-test based on the empirical distribution of the differences between

periods is used. The bootstrapping method is used to obtain the empirical distribution of the differences, in which the same number of observations is randomly selected with a replacement from each original sub-sample (local GAAP and IFRS) to form a random sample of the same size as the original ones; subsequently each expression of the accounting quality is calculated in said random sample and the difference between the two analyzed periods is found. This procedure is repeated 1000 times and thus the empirical distribution of the differences in each of the expressions is obtained. This procedure is extended for all expressions, except those in which the significance is evaluated through the P-Value of the respective coefficients of some of the variables.

Earnings management (accounting attributes)

Following Barth *et al.* (2008), four (4) indicators are used to measure earnings management, and these are used to test the first of the hypotheses defined (H1); three (3) of the indicators are related to earnings smoothing and the remaining indicator refers to the earnings management towards a target. Barth *et al.* (2008) have documented that with lower earnings smoothing and lower earnings management towards a target, the lower the management of the same and, therefore, the higher the accounting quality will be.

Earnings smoothing

The measurement indicators used are: the variance of the change in the net income (ΔNI) (Lang *et al.*, 2006), the ratio of the change variance in the net income to the change variance in operating cash flow ($\Delta NI/\Delta CFO$) (Lang *et al.*, 2003), and the Spearman correlation between the accruals (ACCRUALS or ACC) and the operating cash flow CFO, $Corr(ACC, CFO)$ (Leuz *et al.*, 2003).

The residues obtained from their respective regression are taken from all of them and are defined as follows: ΔNI^* , $(\Delta NI^*/\Delta CFO^*)$, $corr(ACC^*, CFO^*)$; the decision to take the residual is due to the fact that each indicator is sensitive to a series of factors not related to the general accounting system, which have been included in the controls defined for their respective regression. The residual from each regression is expected to correspond to those variables not contained in the control variables, which would explain part of the changes in the defined indicators and refer to the elements of the accounting system.

The indicators are interpreted as follows:

(ΔNI^*) : given a small variance in the residual of the change in the net income, this should be evidence of the existence of earnings smoothing (Barth *et al.*, 2008).

($\Delta NI^*/\Delta CFO^*$): given a lower ratio in the period of IFRS application with regard to the ratio in the period of local GAAP, the presence of earnings smoothing is made evident. Previous papers have documented that firms with greater volatility in their operating cash flow typically have greater volatility in the net income. Therefore, if firms smooth out the earnings, the variance in the residual from the change in net income is expected to be lower than the variance in the residual from the change in operating cash flow, and this translates into a lower ratio between them (Lang *et al.*, 2003).

Corr (ACC^* , CFO^*): a higher negative correlation between the CFO and accruals is indicative of greater earnings smoothing (earnings management), suggesting that firms use accruals to smooth variability in cash flows (Land & Lang, 2002; Lang *et al.*, 2003).

The ΔNI^* are the residues of the following equation:

$$\Delta NI_{it} = \alpha + \beta_1 SIZE_{it} + \beta_2 GROWTH_{it} + \beta_3 EISSUE_{it} + \beta_4 LEV_{it} + \beta_5 DISSUE_{it} + \beta_6 TURN_{it} + \beta_7 CFO_{it} + \beta_8 AUD_{it} + \beta_9 NUMEX_{it} + \beta_{10} XLIST_{it} + \sum_{i=1}^5 \beta_{i+10} YEAR_i + \sum_{i=1}^{19} \beta_{i+15} Country_i + \sum_{m=1}^{18} \beta_{m+34} Industry_i + \varepsilon_{it} \quad (1)$$

Where:

For firm i in year t ,

ΔNI = change in net income before extraordinary items divided by total assets at end of year.

$SIZE$ = natural logarithm of total assets at end of year (firm size).

$GROWTH$ = percentage change in sales.

$EISSUE$ = percentage change in total equity.

LEV = total liabilities divided by the book value of equity, both at the end of the period (leverage).

$DISSUE$ = percentage change in total liabilities.

$TURN$ = sales divided by total assets at end of year (asset turnover).

CFO = cash flow from operating activities divided by total assets, both at end of year.

AUD = dichotomous variable, takes the value of one (1) if the firms are audited by a Big4 (PWC, KPMG, EY, and DELOITTE) and of zero (0) otherwise.

$NUMEX$ = number of stock exchanges on which the shares of the firm are listed.

$XLIST$ = dichotomous variable, takes values of one (1) if the firm is listed on a U.S. stock market and that market is not its primary stock exchange.

$YEAR$ = reporting year of information.

$Country$ = variable indicator, with Argentina being used as reference (Benchmark). The total number of countries in the sample is 20. For the purposes of the econometric model, 19 variables are established to avoid the problem of perfect multicollinearity.

Industry= variable indicator, industry classification based on the NACE code provided by the financial information database ORBIS. Agriculture was used as reference (Benchmark). The total industries in the sample is 19; for the purposes of the econometric model 18 variables are established to avoid the problem of perfect multicollinearity.

ΔCFO^* is the residual of the following equation:

$$\begin{aligned} \Delta\text{CFO}_{it} = & \alpha + \beta_1\text{SIZE}_{it} + \beta_2\text{GROWTH}_{it} + \beta_3\text{EISSUE}_{it} + \beta_4\text{LEV}_{it} + \beta_5\text{DISSUE}_{it} + \\ & \beta_6\text{TURN}_{it} + \beta_7\text{CFO}_{it} + \beta_8\text{AUD}_{it} + \beta_9\text{NUMEX}_{it} + \beta_{10}\text{XLIST}_{it} + \sum_{l=1}^5 \beta_{l+10}\text{YEAR}_i + \\ & \sum_{l=1}^{19} \beta_{l+15}\text{Country}_i + \sum_{m=1}^{18} \beta_{m+34}\text{Industry}_i + \varepsilon_{it} \end{aligned} \quad (2)$$

Where:

ΔCFO = change in operating cash flow divided by total assets at end of year.

All other variables were defined above.

Therefore, the second indicator is based on the residual ratio obtained from equations 1 and 2, ($\Delta\text{NI}^*/\Delta\text{CFO}^*$), comparing this ratio between local GAAP and IFRS periods.

CFO^* and ACC^* are the residuals of the following equations:

$$\begin{aligned} \text{CFO}_{it} = & \alpha + \beta_1\text{SIZE}_{it} + \beta_2\text{GROWTH}_{it} + \beta_3\text{EISSUE}_{it} + \beta_4\text{LEV}_{it} + \beta_5\text{DISSUE}_{it} + \\ & \beta_6\text{TURN}_{it} + \beta_7\text{AUD}_{it} + \beta_8\text{NUMEX}_{it} + \beta_9\text{XLIST}_{it} + \sum_{l=1}^5 \beta_{l+9}\text{YEAR}_i + \\ & \sum_{l=1}^{19} \beta_{l+14}\text{Country}_i + \sum_{m=1}^{18} \beta_{m+33}\text{Industry}_i + \varepsilon_{it} \end{aligned} \quad (3)$$

$$\begin{aligned} \text{ACC}_{it} = & \alpha + \beta_1\text{SIZE}_{it} + \beta_2\text{GROWTH}_{it} + \beta_3\text{EISSUE}_{it} + \beta_4\text{LEV}_{it} + \beta_5\text{DISSUE}_{it} + \\ & \beta_6\text{TURN}_{it} + \beta_7\text{AUD}_{it} + \beta_8\text{NUMEX}_{it} + \beta_9\text{XLIST}_{it} + \sum_{l=1}^5 \beta_{l+9}\text{YEAR}_i + \\ & \sum_{l=1}^{19} \beta_{l+14}\text{Country}_i + \sum_{m=1}^{18} \beta_{m+33}\text{Industry}_i + \varepsilon_{it} \end{aligned} \quad (4)$$

Where:

CFO = is the cash flow from operating activities divided by total assets at end of year.

ACC = are the accruals divided by the total assets at the end of year. Total accruals are derived from net income after subtraction of operating cash flow ($\text{ACC}=\text{NI}-\text{CFO}$).

The other variables were defined above.

The correlation of the residues is obtained from equations 3 and 4 CFO* and ACC* and compared for both periods.

In both equations the independent variable CFO is excluded.

From equations 1 to 4 the regressions are estimated by separating the observations for the local GAAP period and the IFRS period.

Earnings management towards a target

This expression is operationalized through the frequency of reporting small positive net income and is evidenced by the SPOS coefficient contained in the regression (5) (Burgstahler & Dichev, 1997), a single coefficient is obtained for both periods and with this one, it is examined whether in one period with respect to the other there is a greater probability of earnings management towards small positive net income.

The results of this model are verified through regression under the LOGIT model and all the observations of both periods are grouped.

$$Period(0,1)_{it} = \alpha + \beta_1 SIZE_{it} + \beta_2 GROWTH_{it} + \beta_3 EISSUE_{it} + \beta_4 LEV_{it} + \beta_5 DISSUE_{it} + \beta_6 TURN_{it} + \beta_7 CFO_{it} + \beta_8 AUD_{it} + \beta_9 NUMEX_{it} + \beta_{10} XLIST_{it} + \beta_{11} LNEG_{it} + \varepsilon_{it} \quad (5)$$

Where:

Period (0, 1) = is a dichotomous variable, it takes the value of one (1) for observations belonging to the IFRS period and of zero (0) otherwise.

SPOS= takes the value of one (1) if the net income scaled by the total assets at the end of the year is between 0 and 0.01 and of zero (0) otherwise (Lang *et al.*, 2003). A negative coefficient of the SPOS variable indicates that the firm manages earnings towards small positive net income more frequently in the local GAAP period than in the IFRS period, which translates into lower earnings management for the latter period.

The other variables were defined above.

Timely losses recognition (accounting attributes)

The timely losses recognition operates under the assumption that IFRS standards allow accounting policies aimed at recognizing, in a timely manner, losses in the net income, and this in turn is an indication of an improvement in accounting quality.

This expression is operationalized through frequency when recognizing large losses (Ball, 2001), and with this the second of the hypotheses (H2) is tested.

$$Period(0,1)_{it} = \alpha + \beta_1 SIZE_{it} + \beta_2 GROWTH_{it} + \beta_3 EISSUE_{it} + \beta_4 LEV_{it} + \beta_5 DISSUE_{it} + \beta_6 TURN_{it} + \beta_7 CFO_{it} + \beta_8 AUD_{it} + \beta_9 NUMEX_{it} + \beta_{10} XLIST_{it} + \beta_{11} SPOS_{it} + \varepsilon_{it} \quad (6)$$

Where:

LNEG (Large negative Net Income) = is a dichotomous variable, it takes the value of one (1) for observations in which the net income scaled by the total assets at the end of the year is less than -0.20, and of zero (0) otherwise. A positive LNEG coefficient indicates that firms recognize large losses more frequently in the IFRS period than in the local GAAP period, which is an indication of higher accounting quality.

The other variables were defined above.

The results of this model are verified through regression under the LOGIT model and all the observations of both periods are grouped.

Value relevance (market attributes)

It is operationalized through three indicators or measurement models: Ohlson (1995), Bartov *et al.* (2005), and Basu (1997). These models base their analysis on the informational capacity of the accounting magnitudes in the capital markets, allowing them to test the third defined hypothesis (H3).

Ohlson's model (1995) refers to the explanatory power of accounting earnings per share (EPS) and book value of equity per share (BVEPS) on changes in share price (P); this is in addition to including control variables that have fixed effects on price such as industry, country, and reporting year. Within the equation, the independent variable POST, and its interaction with the variables EPS and BVEPS, is added. The term POST is a dichotomous variable, it takes the value of one (1) for the IFRS period and of zero (0) otherwise. Differences in value relevance between periods are expected to be reflected in the significantly positive coefficient between the terms of interaction with the POST variable, in β_4 and β_5 of the equation (7).

Considering the periodicity in which accounting information is publicly available, the share price is measured 6 months after the end of the annual accounting period (Lang *et al.*, 2003; Lang *et al.*, 2006).

$$P_{it} = \alpha + \beta_1 BVEPS_{it} + \beta_2 EPS_{it} + \beta_3 POST_{it} + \beta_4 BVEPS_{it} \times POST_{it} + \beta_5 EPS_{it} \times POST_{it} + \sum_{i=1}^{12} \beta_{i+5} Country_i + \sum_{m=1}^{17} \beta_{m+17} Industry_i + \sum_{m=1}^8 \beta_{m+34} YEAR_i + \varepsilon_{it} \quad (7)$$

In the model by Bartov *et al.* (2005) it is expected that the announcement of the accounting earnings will affect the share price and, therefore, its profitability—the dependent variable in the equation is profitability (RETURN), while the independent variables are EPS, POST, and their respective interaction term, in addition to adding the variables industry, country, and information reporting year. The difference between value relevance for the two periods analyzed is expected to be reflected in the significantly positive coefficient of the interaction between POST and EPS, β_3 of equation (8). Profitability (RETURN) is calculated as the natural logarithm of the share price ratio 6 months after the end of the fiscal year on the share price 6 months before the end of the fiscal year, adjusted for dividends (Lang *et al.*, 2006).

$$RETURN_{it} = \alpha + \beta_1 EPS_{it} + \beta_2 POST_{it} + \beta_3 EPS_{it} \times POST_{it} + \sum_{l=1}^{12} \beta_{l+3} Country_i + \sum_{m=1}^{17} \beta_{m+15} Industry_i + \sum_{m=1}^8 \beta_{m+32} YEAR_i + \varepsilon_{it} \quad (8)$$

The model proposed by Basu (1997) considers the accounting earnings as a function of returns, incorporating within the model the BAD variable and its interaction with the profitability(return) variable; the BAD variable takes the value of one (1) in the periods in which the firms report negative returns and of zero (0) otherwise. The assumption is that the reported accounting earnings is finally reflected in the share price, the matter to be valued is whether news, especially bad news, are incorporated into the accounting earnings in a timely manner and if this is confirmed through the interaction coefficient between returns and the bad news variable.

The POST variable is also incorporated, as well as its interaction with the other variables indicated so far for this model. Based on the assumption that IFRS contain accounting policies that allow the timely incorporation of losses in the net income, the estimated coefficient β_7 of equation (9) will turn out to be positive and significant. The magnitude of coefficient β_7 is a measure of the incremental sensitivity with which bad news are reflected in the accounting earnings relative to good news during the period of application of IFRS (accounting conservatism).

$$(EPS/P)_{it} = \alpha + \beta_1 RETURN_{it} + \beta_2 BAD_{it} + \beta_3 RETURN_{it} \times BAD_{it} + \beta_4 POST_{it} + \beta_5 RETURN_{it} \times POST_{it} + \beta_6 BAD_{it} \times POST_{it} + \beta_7 RETURN_{it} \times BAD_{it} \times POST_{it} + \sum_{l=1}^{12} \beta_{l+7} Country_i + \sum_{m=1}^{17} \beta_{m+19} Industry_i + \sum_{m=1}^8 \beta_{m+36} YEAR_i + \varepsilon_{it} \quad (9)$$

Where:

(EPS/P)= are the earnings per share deflated by the share price at the beginning of the period.

All other variables were defined above.

Sample, distribution, and descriptive statistics

Selection and distribution of the sample

Table 1 presents the selection of the initial sample (Panel A) from 5,545 firms reported as active in the ORBIS financial information database, listed during the analysis period of 2006-2016, with at least one annual report under IFRS and from Latin America or the Caribbean (41,602 observations in total); 3,178 firms are excluded, 1,820 for being listed in securities markets other than Latin American or Caribbean (14,786 observations) and 1,358 firms for not having financial statement reporting under local accounting principles (9,086 observations), making up an initial sample of 2,367 firms and with a remaining total of 17,730 observations.

In Panel B (Panel C) of the same table, the conformation of the sample is reported for the tests related to the accounting attributes (market attributes) starting from the observations selected in the initial sample; in Panel B (Panel C), 13,159 (15,163) observations are eliminated, 5,209 (14,384) for lost data, 7,099 (364) for observations that only present financial information under one of the two accounting regimes, and the remaining 851 (415) observations given that they belong to the transition period from the local regulatory framework to IFRS, forming a final sample for Panel B (Panel C) of 734 (379) firms and a remaining total of 4,571 (2,567) observations

Table 1

Selection of the sample

	No. of firms	No. of Obs.		Total
		Local GAAP	IFRS	
<i>Panel A: Initial sample</i>				
Firms classified as active in ORBIS, currently listed or that were listed during the 2006-2016 period, with at least three years of available financial information, at least one annual report under IFRS and from Latin America or the Caribbean.	5 545	14 494	27 108	41 602
Firms not listed in the Latin American or Caribbean markets.	(1 820)	(339)	(14 447)	(14 786)
Firms without financial reporting under local accounting principles (Local GAAP).	(1 358)	(2 799)	(6 287)	(9 086)
Total Initial Sample	2 367	11 356	6 374	17 730
<i>Panel B: Sample for testing accounting attributes</i>				
Sample from Panel A	2 367	11 356	6 374	17 730

Lost data for variables related to earnings management and timely losses recognition.		(3 325)	(1 884)	(5 209)
Firms reporting observations in only one accounting regime.		(6 333)	(766)	(7 099)
Observations pertaining to the transition period from Local GAAP to IFRS.		(108)	(743)	(851)
Total Sample from Panel B	734	1 590	2 981	4 571
<i>Panel C: Sample for testing market attributes</i>				
Sample from Panel A	2 367	11 356	6 374	17 730
Lost data for variables related to value relevance.		(10 285)	(4 099)	(14 384)
Firms reporting observations in only one accounting regime.		(57)	(307)	(364)
Observations pertaining to the transition period from Local GAAP to IFRS.		(45)	(370)	(415)
Total Sample from Panel C	379	969	1 598	2 567

Source: own elaboration

Table 2 shows the distribution of the sample by country (Panel A), industry (Panel B), and year of analysis (Panel C), classified according to the type of test: accounting attributes (Sample A) and market attributes (Sample B). In both types of sample contained in Panel A, a greater participation of firms and observations located in Brazil are present, followed by observations in Chile, Argentina, and Peru.

In Panel B, for the sample related to accounting attributes (Sample A) there is a greater participation of observations pertaining to the manufacturing industry and energy supply, followed by firms belonging to the financial activities industry; the observations of firms located in the retail and wholesale trade, transportation and storage, and agriculture and livestock sectors represent a high participation of the total of the observations.

For the sample related to market attributes (Sample B), although the observations pertaining to the manufacturing and gas supply sectors represent more than half of the total sample, the commercial, construction, extractive, and communication activities industries have a representative role in the total sample.

Regarding Panel C, there is a greater participation of observations between 2007 and 2009 under Local GAAP, after these years there is an increasing participation of observations under the IFRS accounting regime, being in recent years when most Latin American countries have incorporated into their legislation the mandatory application of IFRS.

Table 2
Distribution of the sample

Country	Sample A (accounting attributes)			Sample B (market attributes)		
	No. of Firms	No. of Obs.	% of Obs.	No. of Firms	No. of Obs.	% of Obs.
<i>Panel A – Distribution of firms and observations by country</i>						
Argentina	86	539	11.8%	46	333	13.0%
Bahamas	2	7	0.2%	2	8	0.3%
Bermuda	8	43	0.9%	6	43	1.7%
Bolivia	27	153	3.3%	0	0	0.0%
Brazil	268	1 732	37.9%	181	1 256	48.9%
Chile	171	1 088	23.8%	93	640	24.9%
Colombia	20	109	2.4%	5	24	0.9%
Costa Rica	2	12	0.3%	0	0	0.0%
Ecuador	32	181	4.0%	0	0	0.0%
El Salvador	1	6	0.1%	0	0	0.0%
Honduras	1	5	0.1%	6	21	0.8%
Cayman Islands	2	7	0.2%	3	17	0.7%
British Virgin Islands	3	12	0.3%	3	19	0.7%
Mexico	3	8	0.2%	1	2	0.1%
Nicaragua	1	5	0.1%	0	0	0.0%
Panama	3	16	0.4%	1	8	0.3%
Paraguay	29	166	3.6%	0	0	0.0%
Peru	57	383	8.4%	25	156	6.1%
Uruguay	6	34	0.7%	0	0	0.0%
Venezuela	12	65	1.4%	7	40	1.6%
Total	734	4 571	100%	379	2 567	100%

Industry No. of Firms	Sample A (accounting attributes)		Sample B (market attributes)			
	No. of Obs.	% of Obs.	No. of Firms	No. of Obs.	% of Obs.	
<i>Panel B – Distribution of firms and observations by industry</i>						
Agriculture, livestock, forestry, and fishing	40	256	5.6%	18	104	4.1%
Extractive Industries	26	160	3.5%	18	128	5.0%
Manufacturing industry	239	1 524	33.3%	144	995	38.8%
Electricity, gas, and steam supply	104	655	14.3%	53	359	14.0%
Water supply, sanitation activities	17	106	2.3%	5	38	1.5%
Construction	38	238	5.2%	23	155	6.0%
Wholesale and retail trade	51	308	6.7%	24	160	6.2%
Transport and storage	41	262	5.7%	15	108	4.2%
Hospitality	7	46	1.0%	1	8	0.3%
Information and communication	28	167	3.7%	19	132	5.1%
Financial and insurance activities	65	378	8.3%	21	135	5.3%
Real estate activities	34	212	4.6%	25	170	6.6%
Professional, scientific, and technical activities	9	53	1.2%	3	18	0.7%

Administrative activities	3	17	0.4%	2	13	0.5%
Public administration	2	7	0.2%	0	0	0.0%
Education	5	26	0.6%	1	5	0.2%
Sanitary activities	6	39	0.9%	3	21	0.8%
Artistic and recreational activities	11	65	1.4%	2	7	0.3%
Other services	8	52	1.1%	2	11	0.4%
Total	734	4 571	100%	379	2 567	100%

Analysis Year	Sample A (Accounting attributes)				Sample B (Market attributes)			
	Local GAAP		IFRS		Local GAAP		IFRS	
	No. of Obs.	% Obs.	No. of Obs.	% of Obs.	No. of Obs.	% of Obs.	No. of Obs.	% of Obs.
<i>Panel C – Distribution of observations by year of analysis</i>								
2007	0	0.0%	0	0.0%	248	25.6%	0	0.0%
2008	499	31.4%	0	0.0%	322	33.2%	0	0.0%
2009	520	32.7%	0	0.0%	250	25.8%	4	0.3%
2010	222	14.0%	140	4.7%	69	7.1%	98	6.1%
2011	191	12.0%	438	14.7%	57	5.9%	268	16.8%
2012	141	8.9%	480	16.1%	23	2.4%	279	17.5%
2013	17	1.1%	553	18.6%	0	0.0%	313	19.6%
2014	0	0.0%	674	22.6%	0	0.0%	329	20.6%
2015	0	0.0%	671	22.5%	0	0.0%	307	19.2%
2016	0	0.0%	25	0.8%	0	0.0%	0	0.0%
Total	1 590	100%	2 981	100%	969	100%	1 598	100%

Source: own elaboration

Descriptive Statistics

Table 3 includes the descriptive statistics of the test and control variables used in the analysis of the comparability of accounting quality; as presented in said table, there is a significant difference in the mean (median) with respect to the change in net income (Δ NI) between the periods analyzed, with it being much lower during the period of application of IFRS, at the same time, there is a significant decrease in the mean (median) with respect to the variation in operational cash flows (Δ CFO), in addition to a much more negative and significant amount in the mean and in the median with respect to accruals. It may be alluded that part of the decrease in the variation in the net income is not only due to negative variations in operating cash flows, but also to a greater use of accruals.

Regarding the frequency in the report of large losses (LNEG) there is a significant increase in the mean during the period of application of IFRS, suggesting that possibly during this last period large losses are recognized more frequently than those recognized during the

pre-adoption periods. Regarding the frequency in the report of small positive net income (SPOS), although concerning the mean there is a decrease during the period of application of IFRS, it is not statistically significant, suggesting the same level of frequency when reporting small positive net income between both periods.

The statistics also indicate a significant decrease in the mean (median) with respect to the return on assets ratio (TURN) for the period of application of IFRS, this decrease is explained by a significant decrease in the mean (median) growth of firms, analyzed through the variation in sales (GROWTH) and also explained by a significant growth in the mean (median) with respect to the size of the same measured through assets (SIZE).

A significant decrease is reported in the forms of financing of the firm (in mean and median) given the variation in equity (EISSUE) and the variation in liabilities (DISSUE); however, although the leverage (LEV) registers an increase in the mean (median) for the period of application of IFRS, it only turns out to be significant with respect to its median; the above findings do not suggest a relationship between firm growth (SIZE) and the way firms are financed. The increase in firm size during the IFRS period can be explained by the impact of the revaluation contained in the IFRS, and ratified with the same level in mean and median (without statistical significance) of the operating cash flows (CFO) of the firm.

Statistics also report that during the period of implementation of IFRS, firms sustain significant growth in the use of audit services by BIG4 (AUD) and in the acceptance of their listing on a greater number of stock markets (NUMEX). However, the results do not suggest any change with respect to the acceptance of their listing on U.S. markets (XLIST).

With regard to the variables used to measure value relevance, IFRS impact the amount of the earnings per share (EPS) and the book value of equity per share (BVEPS), decreasing significantly (in mean and median) the former and increasing significantly (in median) the amount of equity; the price per share (P) shows a significant fall in the mean (median) for the IFRS period, being extensible to return per share, although the decrease in the latter does not prove to be statistically significant.

Table 3

Descriptive Statistics: comparison of variables under Local GAAP and IFRS periods

Variable	Period (Local GAAP)			Period (IFRS)	
	Equality of Variance	Mean	Median	Mean	Median
Observation		1 590		2 981	
ΔNI	*	-0.001	-0.002	-0.008*	-0.003**
SIZE	***	11.971	12.035	12.764*	12.792*
GROWTH	*	0.173	0.111	-0.028*	-0.033*

EISSUE	*	0.123	0.082	-0.026*	-0.048*
LEV	*	1.421	0.970	1.465	1.010**
DISSUE	*	0.172	0.100	-0.004*	-0.037*
TURN	*	0.717	0.630	0.620*	0.555*
SPOS	**	0.074	0	0.067	0
LNEG	*	0.022	0	0.033**	0**
AUD	*	0.538	1	0.676*	1*
NUMEX	**	0.955	1	1.065*	1*
XLIST		0.017	0	0.016	0
CFO		0.062	0.057	0.058	0.059
ΔCFO	*	0.031	0.017	-0.004*	0.001*
ACC	*	-0.015	-0.012	-0.028*	-0.022*
Observation		969		1 598	
EPS		0.379	0.160	0.119*	0.137**
BVEPS		6.788	1.840	7.254	2.663***
P (PRICE)	*	7.762	3.029	6.208*	2.546*
RETURN	*	4.891	4.854	4.780	4.729

Source: own elaboration

*, **, *** Indicates a statistically significant difference between periods with a level $p < 0.01$, $p < 0.05$, and $p < 0.1$, respectively (two-tailed test), for the measurement of significance between the medians of the variables AUD, LNEG, and SPOS a test of comparison of proportions based on Fisher's exact test is used, for the other variables the Mann-Whitney-Wilcoxon rank-sum test is used.

Although the normality assumption is not confirmed by the Shapiro-Wilk test, this assumption is relaxed because the sample size is large enough (greater than 30 observations), so normality is assumed according to the Central Limit Theorem.

A t-test is used for the comparison of means between variables, except for those variables in which previously their comparison of variances turned out to be different from zero (significant), in these cases a t-test of comparison of means with different variances is used.

In all variables of the regressions, with the exception of the dichotomous variables, the effects of the outlier values (winsorized) in the 5th and 95th percentiles are controlled.

Results

The comparative results of the accounting quality between the pre- and post-adoption periods are presented in Tables 4 and 5. Table 4 presents the accounting quality findings including all available observations grouped between the analysis periods (LOCAL GAAP and IFRS), while Table 5 reports the comparative analyses only between the period immediately prior to

the adoption of IFRS and the period immediately following the adoption of IFRS (restricted sample).

Panel A of Table 4 compares the expressions related to earnings smoothing, the first of them, the variability of the change in the net income (ΔNI^*), presents a significant decrease in the post-adoption period with respect to the pre-adoption period (0.0020 vs. 0.0022), being contrary to the expected coefficient; this possibly suggests an increase in earnings smoothing. Since the variability of the net income could be affected by the variability in cash flows (ΔCFO^*), and the latter are not accounting discretionary techniques, the variability (ΔNI^*)/variability (ΔCFO^*) ratio is analyzed. This ratio turns out to have a statistically significant increase during the post-adoption period (0.2464 vs. 0.1992), which suggests an increase in accounting quality for the latter period.

The findings documented so far for Latin America and the Caribbean are contradictory; Lin *et al.* (2012) present the same situation for the German case and suggest that the most conclusive measures would be those that adjust the volatility of the net income to the volatility of the cash flow. According to this, the following expression analyzed, the Correlation of ACC^* and CFO^* , turns out to be less negative and statistically significant during the post-adoption period (-0.6702 vs. -0.7144); therefore, the available evidence indicates that during the period of application of IFRS firms present a lower level of earnings smoothing (lower earnings management), which translates into higher accounting quality.

With respect to the frequency in small positive net income report (Panel B) and the frequency in the large losses report (Panel C), the findings do not suggest a significant change between periods ($SPOS=-0.1818$) and ($LNEG=0.2807$), respectively; accordingly, the results obtained in Panel C allow to reject the second hypothesis.

Under the model proposed by Ohlson (1995) contained in Panel D, a positive and significant coefficient for the incremental magnitude of the book value of equity ($\beta_4=0.001$) and negative and significant for the incremental magnitude of earnings during the period of application of IFRS ($\beta_5=-0.019$) is presented, the decrease in the informational capacity of the earnings is corroborated again through the model proposed by Bartov *et al.* (2005) ($\beta_3=0.001$); in general, the results suggest a greater (lower) capacity to explain the book value of equity (earnings) in the face of variations in the price per share (price and return per share) with respect to the period in which local standards are applied.

Finally, under the model proposed by Basu (1997) the bad news coefficient turns out to be negative without statistical significance during the post-adoption period ($\beta_7=-0.036$), and positive and significant during the periods prior to the implementation of IFRS ($\beta_3=0.032$); these results indicate that during the period of application of IFRS (LOCAL GAAP), negative returns are incorporated with equal (greater) opportunity in the earnings with respect to good news, being indicative of less value relevance during the post-adoption period.

In general, the findings obtained for Latin America and the Caribbean show, with respect to earnings management (accounting attributes), an increase in the level of accounting quality during the period of application of IFRS, which confirms the first hypothesis defined. However, under the metrics related to value relevance (market attributes), the findings suggest a decrease in the informational capacity of the accounting magnitudes in the capital markets, thus rejecting the third hypothesis. The previous results are similar to those obtained for the European Union (Zeghal *et al.*, 2012), in which, despite evidencing an increase in accounting quality via a decrease in earnings management, the accounting information prepared under IFRS is not considered as having greater usefulness by investors.

The results documented so far are in turn supported by Cahan *et al.* (2009), who state that even if the IFRS accounting system generates high quality accounting information in a country with weak investor protection infrastructure, the information will continue to be less important for market participants.

Iatridis *et al.* (2010) show in their analysis that, from the second period of application of IFRS, firms report a decrease in the level of earnings management and an increase in the value relevance of financial information in the Greek capital markets, supported by the presumption of greater clarity and familiarity with the process of implementation and use of IFRS; accordingly, an additional analysis (Robustness Test) of the comparability of accounting quality is included below, only considering the period before and the period after the application of IFRS (restricted sample) (Table 5)

Table 4
Comparison of accounting quality (all observations)

	Obs.		Pre-adoption (LOCAL GAAP)	Post-adoption (IFRS)	Expected sign	Difference (Post-Pre)
	Pre	Post				
<i>Panel A – Earnings Smoothing</i>						
Variance of Δ NI*	1 590	2 981	0.0022	0.0020	+	-0.0002***
Variance of Δ NI*/ Δ CFO*	1 590	2 981	0.1992	0.2464	+	0.0471*
Correlation of ACC* and CFO*	1 590	2 981	-0.7144	-0.6702	+	0.0441**
<i>Panel B – Earnings Management Towards a Target</i>						
	4 571		-0.1818	-		
<i>Panel C – Timely Losses Recognition</i>						
	4 571		0.2807	+		
<i>Panel D – Value Relevance</i>						

Ohlson Model (1995)									
	β_1	β_2	β_3	β_4	β_5				
Coefficient	0.471	0.345	1.377	0.001	-0.019		R2 Adj.		Obs.
Expected Sign	+	+		+	+				
Level of Significance	#	##	##	#	#				

Bartov <i>et al.</i> Model (2005)						
	β_1		β_2		β_3	
Coefficient	0.358		-0.136		-0.001	
Expected Sign	+				+	
Level of Significance	#				#	

Basu Model (1997)									
	β_1	β_2	β_3	β_4	β_5	β_6	β_7	R2 Adj.	Obs.
Coefficient	0.008	-0.097	0.032	-0.008	0.004	0.037	-0.036	0.13	2 567
Expected Sign	+		+		+		+		
Level of Significance	#	##	###						

Source: own elaboration

*, **, *** Indicates a statistically significant difference between periods with a level $p < 0.01$, $p < 0.05$, and $p < 0.1$, respectively. The statistical significance of the difference between periods for each metric is obtained through the t-test applied on the empirical distribution of the differences (bootstrapping).

#, ##, ### Indicates a significant difference of zero (0) with a level $p < 0.1$, $p < 0.05$, and $p < 0.01$, respectively (two-tailed test). Statistical significance other than zero is obtained through the significance of each coefficient reported.

The SPOS (Panel B) and LNEG (Panel C) coefficients obtained through the LOGIT model are tabulated.

For all regressions, except those based on the LOGIT models, the assumptions of the linear regression model are evaluated under ordinary least squares (OLS); there is no multicollinearity among the regressors of the models, obtaining the respective Variance Inflation Factors (VIF) with values lower than 5 and some lower than 10. Homoscedasticity is assumed by performing all the equations under OLS with White's Robust test in STATA. The Durbin-Watson and Durbin tests indicate high probability of falsehood in the hypothesis of no autocorrelation (probability greater than 0.10) in the models of Variance of ΔNI^* for the observations belonging to the period of Local GAAP (Panel A), of Ohlson (1995) (Panel D), and of Bartov et al. (2005) (Panel D). This situation is corrected by performing robust regression again under the Prais-Winsten model in the same software (using the generalized least squares model GLS). For Panel A regressions, although the assumption of normality in disturbances is not confirmed by the Shapiro-Wilk test, this assumption is relaxed because the sample size is large enough (greater than 30 observations), so normality is assumed according to the Central Limit Theorem. In all variables of the regressions, except the dichotomous variables, the effects of the outliers (winsorized) values in the 5th and 95th percentiles are controlled. The

residuals of Panel A are obtained through the ordinary least squares (OLS) model; the outlier values of the residuals are controlled (winsorized) in the 1st and 99th percentiles.

Panel A of Table 5 reports, for the post-adoption period, a significant decrease in the expressions related to the variability of the change in net income (ΔNI^*) and the variability (ΔNI^*)/variability (ΔCFO^*) ratio (0.0017 vs. 0.0027) and (0.1998 vs. 0.2562), respectively, suggesting greater earnings smoothing for the IFRS application periods; however, the Correlation of ACC* and CFO* turns out to have a statistically non-significant increase during this last period (-0.6966 vs. -0.7248).

With respect to the frequency in the small positive net income report (Panel B) and the frequency in the large losses report (Panel C), the findings do not suggest a statistically significant change between periods (SPOS=-0.1362) and (LNEG=-0.1689), respectively. Accordingly, the results obtained in Panel C allow to reject the second hypothesis once more.

With reference to Panel D, the model proposed by Ohlson (1995) presents a negative and significant coefficient for the incremental magnitude of the book value of equity ($\beta_4=0.0087$), as well as for the incremental magnitude of the earnings during the period of application of IFRS ($\beta_5=-0.0615$). However, the decrease in the informative capacity of the earnings is not corroborated through the model proposed by Bartov *et al.* (2005) ($\beta_3=-0.005$) since it does not report statistical significance. In aggregate terms, the results suggest a lower explanatory capacity of the book value of equity and of the earnings in light of the variations in the price per share, with respect to the period immediately prior to the application of IFRS.

Finally, the coefficient of bad news under the model proposed by Basu (1997), despite being positive, does not report statistical significance during the post-adoption period ($\beta_7=0.057$), and it also does not report significance for the period prior to the application of IFRS ($\beta_3=-0.008$). These results suggest that during the period of application of IFRS (LOCAL GAAP), negative returns are incorporated with equal opportunity in the earnings with respect to good news, with no evidence of changes in value relevance during the period of application of IFRS.

The findings obtained for Latin America and the Caribbean suggest a decrease in the level of accounting quality during the period immediately following the application of IFRS, seen from an increase in earnings management and from a decrease in the informative capacity of the accounting magnitudes in the capital markets (value relevance). The conclusions obtained for these countries during the period immediately following the application of IFRS, apart from rejecting the first and third hypotheses, are far from the conclusions obtained for this same region under an analysis of approximately 5 years of application of IFRS (Table 4).

Analyzing the results obtained jointly (Tables 4 and 5), the findings allow concluding that the familiarization with the use of IFRS during several years of application promotes the improvement of the accounting quality for the Latin American and Caribbean countries,

verified through an improvement in the accounting attributes (decrease in earnings management). However, and in spite of the use of IFRS for several years, it was not possible for the accounting information of quality to acquire greater value relevance (market attributes) for the actors in these capital markets. These results are also partially in line with Iatridis *et al.* (2010) for the Greek case, only insofar as familiarity with IFRS for several years diminishes the use of earnings management by managers.

Table 5

Comparison of accounting quality with the period before and the period after IFRS (restricted sample)

	Obs.		Pre-adoption (LOCAL GAAP)	Post-adoption (IFRS)	Expected sign	Difference (Post-Pre)			
	Pre	Post							
<i>Panel A – Earnings Smoothing</i>									
Variance of ΔNI^*	699	699	0.0027	0.0017	+	-0.0001*			
Variance of $\Delta NI^*/\Delta CFO^*$	699	699	0.2562	0.1998	+	-0.0564**			
Correlation of ACC* and CFO*	699	699	-0.7248	-0.6966	+	0.0282			
<i>Panel B – Earnings Management towards a Target</i>									
$\beta_{11}SPOS$	1 398		-0.1362		-				
<i>Panel C – Timely Losses Recognition</i>									
$\beta_{11}LNEG$	1 398		-0.1689		+				
<i>Panel D – Value Relevance</i>									
Ohlson Model (1995)									
	β_1	β_2	β_3	β_4	β_5	R2 Adj.	Obs.		
Coefficient	0.5746	0.1945	2.0804	-0.0087	-0.0615	0.56	694		
Expected Sign	+	+		+	+				
Level of significance	#			##	#				
Bartov <i>et al.</i> (2005) model									
	β_1	β_2	β_3			R2 Adj.	Obs.		
Coefficient	0.372	0.235		-0.005		0.22	694		
Expected Sign	+	+		+					
Level of significance	#								
Basu (1997) Model									
	β_1	β_2	β_3	β_4	β_5	β_6	β_7	R2 Δ Adj.	Obs.
Coefficient	0.013	-0.022	-0.008	0.055	-0.001	0.058	0.057	0.09	694
Expected Sign	+		+		+		+		
Level of significance	#								

Source: own elaboration

*, **, *** Indicates a statistically significant difference between periods with a level $p < 0.01$, $p < 0.05$, and $p < 0.1$, respectively. The statistical significance of the difference between periods for each metric is obtained through the t-test applied on the empirical distribution of the differences (bootstrapping).

#, ##, ### Indicates a significant difference of zero (0) with a level $p < 0.1$, $p < 0.05$, and $p < 0.01$, respectively (two-tailed test). Statistical significance other than zero is obtained through the significance of each coefficient reported.

The SPOS (Panel B) and LNEG (Panel C) coefficients obtained through the LOGIT model are tabulated.

For all regressions, except those based on the LOGIT models, the assumptions of the linear regression model are evaluated under ordinary least squares (OLS); there is no multicollinearity among the regressors of the models, obtaining the respective Variance Inflation Factors (VIF) with values lower than 5 and some lower than 10. Homoscedasticity is assumed by performing all the equations under OLS with White's Robust test in STATA. The Durbin-Watson and Durbin tests indicate high probability of falsehood in the hypothesis of no autocorrelation (probability greater than 0.10) in the models of Variance of ΔCFO^* necessary to calculate the Variance of $\Delta\text{NI}^*/\Delta\text{CFO}^*$ ratio for observations pertaining to the period of IFRS (Panel A) and Ohlson (1995) (Panel D). This situation is corrected by performing robust regression again under the Prais-Winsten model in the same software (using the generalized least squares model GLS). For Panel A regressions, although the assumption of normality in disturbances is not confirmed by the Shapiro-Wilk test, this assumption is relaxed because the sample size is large enough (greater than 30 observations), so normality is assumed according to the Central Limit Theorem. In all variables of the regressions, except the dichotomous variables, the effects of the outliers (winsorized) values in the 5th and 95th percentiles are controlled. The residuals of Panel A are obtained through the ordinary least squares (OLS) model; the outlier values of the residuals are controlled (winsorized) in the 1st and 99th percentiles.

Sensitivity analysis

Bearing in mind that more than 60% and 70% of the observations in Samples A and B, respectively, belong to firms domiciled and listed in Brazil and Chile, the accounting quality measurement indicators for each of these nations are applied again¹. For the Brazilian case, the results obtained in aggregate terms do not differ from those reported in Table 4. Nevertheless, it should be noted that the informative capacity of the earnings and the book value of equity in the Brazilian capital market (Ohlson and Bartov Models) decreases significantly during the period of application of IFRS.

When considering the Chilean case, although the results do not differ from those obtained in panels B to D of Table 4, they do indicate a significant increase in the level of earnings management given that two of the three indicators related to the level of earnings smoothing turn out to be negative and statistically significant. Finally, addressing the rest of the Latin American and Caribbean countries, the results obtained do not differ from the conclusions reached from Table 4. Likewise, the results contribute additionally to the improvement in

¹Only the results obtained from these individual analyses are described without reporting tables and annexes related to the application of the measurement indicators proposed in the methodology.

the accounting attributes for these countries given a significant increase in the frequency of recognizing large losses (LNEG) during the period of application of IFRS.

Conclusions

The purpose of this research is to examine whether the quality of financial reporting (expression of measurement of accounting quality) has increased after the application of IFRS for firms domiciled and listed in the Latin American and Caribbean capital markets. Specifically, it examines whether the application of IFRS in 16 Latin American countries and 4 Caribbean countries is associated with lower earnings management, greater opportunity in the recognition of losses, and greater value relevance of accounting information during an analysis period of approximately 11 years (2006 to 2016).

After controlling the factors specific to firms, time, and the economic environment that affect the accounting magnitudes, the results suggest that during the first period of application of IFRS there is a decrease in accounting quality for Latin America and the Caribbean, seen from an increase in earnings management and a decrease in the value relevance of the accounting magnitudes for investors in the capital markets. However, when replicating the analysis including several years of IFRS application, only an improvement in the accounting attributes is perceived (decrease in the level of earnings management), while the accounting information in the Latin and Caribbean markets remain without being valued as with greater usefulness.

The use of the methodology proposed by Barth *et al.* (2008) and used in this research, although not a perfect indicator of the multifaceted concept of accounting quality, makes it possible to compare and contrast the results obtained for Latin America and the Caribbean with those obtained for other countries under this same methodology. As documented by previous research, these results not only depend on IFRS accounting standards, but are a combined effect—in addition to the standards—of the other elements of the accounting information system, such as: Enforcement mechanisms to guarantee the quality of the information, IFRS application and interpretation guides, and the risk of litigation that falls on several economies and on those responsible for the preparation and assurance of financial information (Burgstahler *et al.*, 2006; Cairns, 1999).

The inferences and conclusions obtained from this research are based on the assumption made by Barth *et al.* (2008), a greater earnings smoothing translates into greater earnings management (low accounting quality). It is important to clarify that the use and interpretation of indicators for measuring accounting quality depend on the attributes of the same that it is sought to be evaluated. For example, other types of research (Francis *et al.*, 2008; Ewert and Wagenhofer, 2011) have used the increase in earnings smoothing as an indication of

greater predictability for investors (greater accounting quality) through the incorporation of additional information in the earnings on the part of the managers, achieving a greater smoothing of the same.

This paper contributes to the literature by including almost all Latin American and Caribbean countries during an extended period of analysis, providing sufficient evidence on the implications of the use of IFRS in the quality of financial reporting for countries with French influenced accounting systems (La Porta *et al.*, 1997), and resolving the limitations identified in the previous literature, in which the results could not be generalized given that information was only available for one country and in a limited range of years of application of IFRS.

Future research could compare the impact on accounting quality between the same Latin American countries, with additional measures of quality based, for example, on the discretion of the management over the accruals to manage earnings, or even comparing the accounting quality between Latin American countries (French accounting system) with respect to countries with Anglo-Saxon, Scandinavian, and/or Germanic accounting systems (La Porta *et al.*, 1997).

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