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IFRS and earnings management in the financial information of Colombian SMEs

IFRS y earnings management en la información financiera de las pymes colombianas

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Abstract

The objective of this research is to examine the effect of IFRS convergence on the financial information quality of Colombian SMEs based on the empirically validating earnings management (EM), which involves discretionary alterations of data accounting. The occurrence of this phenomenon is estimated using two models from positive accounting theory: accrual earnings management (AEM) and real earnings management (REM) on a sample of 3140 companies. Besides, with the outputs obtained, panel data with fixed-effects analysis is conducted to assess how these practices vary between two periods: the pre-adoption international standards (2011-2015) and the mandatory application period (2016-2020). Furthermore, the study examines how these practices are explained by specific factors of the companies such as size, indebtedness, liquidity, among others. The findings reveal that the magnitude of the EM is slightly significant between 2011 and 2020, suggesting the presence of discretionary alterations marginals on accounting data of the sample. Moreover, it was observed that tax expenses is the variable that most encourage the generation of EM. The application to IFRS has had little effect on reducing these practices, although the AEM showed a relevant decrease between the studied intervals.

JEL Code: G39, M21, M41
Keywords: financial information; earnings management; colombian SMEs; IFRS; positive accounting theory

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Resumen

El objetivo de esta investigación es examinar el efecto de la convergencia hacía los IFRS en la calidad de la información financiera de las pymes colombianas a partir de la validación empírica de los earnings management (EM), es decir, las alteraciones discrecionales de las cifras contables. La ocurrencia de este fenómeno se estima a partir de dos modelaciones de la teoría contable positiva: los accrual earnings management (AEM) y los real earnings management (REM) en una muestra de 3140 empresas. Además, con los outputs obtenidos se procesan paneles de datos con efectos fijos para analizar como estas prácticas varían entre el periodo previo (2011-2015) y el de aplicación obligatoria de los estándares internacionales (2016-2020). También como se explican por factores específicos de las compañías como el tamaño, el endeudamiento, la liquidez, entre otros. Los resultados muestran que la magnitud de los EM es ligeramente significativa entre 2011 y 2020, lo que sugiere alteraciones discrecionales de las cifras contables marginales en la muestra. Asimismo, se observa que los gastos por impuestos es la variable que más incentiva su generación, mientras la aplicación de los IFRS ha tenido poco efecto en reducir estas prácticas, si bien los AEM mostraron una disminución relevante entre los intervalos estudiados.

Código JEL: G39, M21, M41
Palabras clave: información financiera; earnings management; pymes colombianas; IFRS; teoría contable positiva

Introduction

The convergence with International Financial Reporting Standards (IFRS) by several jurisdictions globally is a significant institutional change in the preparation and disclosure of financial information and its use for decision-making by different economic agents, mainly capital suppliers. The understanding of the effects of this process, particularly for companies in developing countries, as well as its assimilation into the business environment over time, are issues that still require considerable theoretical and empirical scrutiny (Gómez, 2016; Leuz & Wysocki, 2016; Samaha & Khlif, 2016; Oribio *et al*., 2018; Cao & Patel, 2019).

Therefore, research has focused on analyzing the positive or negative modifications that have affected the quality of financial information. This term refers to a variation in users' perceptions of the qualitative attributes that should characterize the accounting data included in the reports and associated disclosures; specifically, it is about examining whether, after the application of IFRS, these values are more relevant, understandable, comparable or have a greater predictive capacity, among other aspects (Barth *et al*., 2008; DeGeorge *et al*., 2016).

Accordingly, in Colombia, studies have explored the equity effect of the convergence process, the change in different financial indicators, the behavior of the cost of capital and the stock market value of companies, stock market liquidity, the degree of conservatism, comparability, and informative and value relevance. The conclusions show important advances in the disclosure of financial information (comparability and informative relevance), but a weak effect has also been apparent in issues associated

with the effective use that economic agents make of this (value relevance and cost of capital) (Bedoya & Giraldo, 2018; Lasso *et al*., 2018; Ruano *et al*., 2018; Laverde *et al*., 2019; Pelucio *et al*., 2019; Rico *et al*., 2020; Ruiz *et al*., 2020; Católico, 2021; Rico, 2022; Vergara *et al*., 2023).

Within this analysis trend, this research aims to examine the effect of the convergence with IFRS on the probability of showing changes in the magnitude of earnings management (EM) in the financial information of Colombian small and medium-sized enterprises (SMEs). This concept refers to the set of measures related to the discretionary alteration of policies, procedures, and numbers that support the accounting process of an organization, as well as the information distortion of the economic decisions made in the development of the business (Watts & Zimmerman, 1986; Schipper, 1989; Martínez & García, 2013).

To this end, the greatest difficulty is identifying and measuring this phenomenon, which is not directly observable. Accordingly, positive accounting theory has suggested several estimation proposals from functionalist perspectives. Therefore, methodologically, this paper takes two of the most widely used analytical approaches for this purpose: the modified Jones Model, which evaluates the AEMs that affect net income (Jones, 1991; Dechow *et al*., 1995; Kothari *et al*, 2005); and the REM Model, which establishes the abnormal levels of production costs, discretionary expenditures, and cash flows from operating activities, which are understood as a proxy for discretionary changes in these accounting elements (Roychowdhury, 2006; Xu *et al*., 2007).

Considering these models, these two types of EM are calculated for the previous period (2011-2015) and the period of mandatory application of IFRS (2016-2020) for a sample of Colombian SMEs whose financial information is taken from databases published by the Colombian Superintendency of Companies. The comparison of these estimates will show the magnitude of these measures and whether there have been substantial changes in the defined time intervals.

Likewise, following the literature and the theory of reference, the absolute value of the estimated EM is taken as the dependent variable of new econometric models: fixed effects data panels, in which it is correlated with specific factors of the companies (independent variables), such as size, profitability, financial indebtedness, liquidity, presentation of losses, and tax expenditure, in order to determine statistically which of these aspects motivate this phenomenon. The mandatory application of IFRS is also added as an explanatory variable derived from the institutional environment.

The study results show that the magnitude of EM is slightly relevant between 2011 and 2020, suggesting measures of alteration of the marginal accounting figures in the sample. Likewise, it is found, among other aspects, that tax expenditure is the variable that most encourages its generation, while the application of IFRS has had little impact on its reduction, although the AEM decreases significantly between the intervals studied.

The text contributes to the literature since there is little research that applies this perspective of empirical analysis to the context of Latin American SMEs, in this case, Colombian SMEs, including measurements of REM that have not been done before. Additionally, it is based on a database that has rarely been considered for this type of study since much of the literature has focused on publicly traded companies. Thus, it contributes to a better understanding of the IFRS implementation process in an emerging economy, which requires the improvement of public policies on the subject and, particularly, the formulation of more effective accounting and administrative controls at the company level so that they can capitalize on the potential benefits of the regulatory change.

Therefore, the text is structured as follows: after this introduction, the second section presents the frame of reference, emphasizing the research that has dealt with the Latin American environment from the theoretical perspective mentioned above. The third section describes the data used and the methodological procedure. Fourth, the results are presented and discussed. Finally, in the fifth section, the conclusions are formulated.

Reference framework

Literature on earnings management

Since it was first proposed in the 1980s, within the framework of positive accounting theory, the gigantic amount of literature using the concept of EM has become a notable field of empirical research in the discipline. Despite this, there is no unanimity on its definition. Therefore, this paper takes the following meaning: "any practice intentionally carried out by management, for opportunistic or informative purposes, to report desired accounting figures different from the real one" (García *et al*., 2005, p. 1004).

This orientation is not free from criticism since it assumes management opportunism without considering behavioral nuances and other agents' roles in generating financial information (Arya *et al*., 1998; Liang, 2004). Moreover, it assimilates discretionary alteration measures to extraordinary or unexpected transactions that are often important or numerous, for example, in contexts with high economic and political uncertainty, leading to overestimating their magnitude (Ball, 2013; Brennan, 2021).

This concept is related to management because, from the point of view of management and the legal guidelines, this corporate body is in charge of the accounting process and its final product: the financial statements. In other words, within the framework of an agency problem, there is an asymmetry in which an actor can alter the financial information, reducing its quality for users; this happens because it directly or indirectly determines different contracts and transactions in which the company is involved

and because the accounting regulations have different options for recognizing and valuing the same economic facts (Shipper, 1989; Dechow *et al*., 1995; García *et al*., 2005).

Accordingly, a good part of the academic literature has highlighted management's motivations for using discretion inappropriately. They are usually classified into three groups (Healy & Wahlen, 1999; Cornejo & Guiñez, 2016):

1. Contractual motivations: Accounting is modified to reflect information that facilitates obtaining benefits in developing a contract. For example, in the search for bank loans, presenting "good" profit data may facilitate granting such loans. Accounting figures can also be altered to facilitate the calculation of salary bonuses or the renegotiation of management contracts. Likewise, a notable amount of revenue could enhance the amount and approval of sales commissions (Watts & Zimmerman, 1986; Xu *et al*., 2007; Beatty *et al*., 2008).

2. Fiscal motivations: This refers to accounting management to obtain benefits concerning the company's relation with the State. There are incentives to adjust the accounting figures if, for example, the company wants to reduce the burden of tax expenditure or if it seeks government subsidies or some other tax advantage. Similarly, the literature suggests that regulated companies in areas such as utilities may alter their accounting data to avoid attracting the attention of state authorities that monitor the industries (Jones, 1991; McNichols, 2000, 2002; Erickson *et al*., 2004).

3. Motivations related to the company's valuation: The appreciation of the value of the business as a whole is important for the financing of the business. Likewise, if one of its branches or segments is to be merged or sold, the accounting figures are the basis for negotiation. Therefore, profitability indicators derived from altered data can contribute to a higher profit in these transactions. On the other hand, if the company is listed on the stock exchange, better accounting numbers can induce positive expectations in investors and thus attract more capital resources (Kothari *et al*., 2005).

Considering these motivations, as mentioned above, the key issue is identifying and measuring how this phenomenon occurs in a set of companies. The academic proposals in this regard can also be grouped into three groups, the first of which is the one adopted in this text:

1. Total accruals approach: What researchers do, mainly starting with Jones (1991), is empirically define a general statistical measure derived from accounting data: the AEM. The argument is based on indicating that of the total transactions that have an impact on the net income for the year, discounting those that affect the cash flow from operating activities, the recognitions directly related to accruals remain, most of which (based on an econometric regression) could be explained by normal records such as ordinary revenues or the acquisition of fixed and intangible assets. In contrast, residual or

anomalous records would correspond to alterations, for example, through extraordinary revenues or particular provisions and impairments, among others.

On the other hand, subsequent studies have pointed out that although transactions that affect cash flow may be less manipulable, to the extent that some are corroborated with an external source or involve considerable changes in base policies such as costs and inventories, they are not free of difficulties. To this end, the concept of REM arose as a statistical metric to reflect the alteration of a company's operating activities in order to avoid losses, for example, by establishing price discounts to temporarily increase revenues, bringing forward excess production to report a lower cost of goods sold, reducing administrative expenditure to improve reported margins, or recording in advance the profit on the sale of a non-current asset, among others (Zang, 2012; Doukakis, 2014; Reis *et al.*¸2015; Campa *et al*., 2019; Habib *et al*., 2022).

2. Approximation by particular accruals: In this case, the aim is to analyze whether, in a specific element of the financial statements, there is a statistical trend that suggests that the associated data are being altered. A good prospectus for this approach is the study of property, plant, and equipment; this is a relevant asset in most companies, on which several financial decisions must be made and where the standard allows different alternatives that may be intentionally aimed at obtaining an opportunistic or information purpose; judgments must be made on aspects such as which parameters are included in the initial measurement of the asset, subsequent valuation, depreciation method, useful life, and impairment. What studies with this approach do is examine the behavior of depreciation expenditure recognitions with regard to the total value of these assets, and they argue that anomalous or unexpected data are those that would provide evidence of probable manipulations (Healy & Wahlen, 1999; Marquardt & Wiedman, 2004).

3. Approximation of the distribution of earnings: It arises from the work of Burgsthaler and Dichev (1997) and consists of statistically validating the behavior of earnings concerning the total assets or market value of many companies over several periods. These researchers argue that when these data are accumulated, they should follow a normal bell-shaped distribution where most would be concentrated around zero. Nevertheless, if there is manipulation, a discontinuity in this trend will be evident since, based on the behavioral assumption that they do not want to reveal losses, management would modify the result in order to report at least a small profit (Govorona *et al*., 2013; Burgsthaler & Chuk, 2017).

In addition to the definition of the concept, the associated motivations, and the expressed ways of measuring the phenomenon, a fourth aspect on which research in positive accounting theory has been focused is to establish which factors influence its formation and change, recognizing two types:

1. Specific factors: These relate to the particular conditions or characteristics of each organization that may encourage or limit the occurrence of EM measures, such as indebtedness, self-

financing, size, type of economic activity, ownership structure, type of company, length of service, and fiscal costs, among others (Watts & Zimmerman, 1986; Francis *et al*., 2008; Sánchez & Yagüe, 2022).

Studies have also found empirical evidence to affirm that strengthening companies' control mechanisms, such as audit quality, robust corporate governance, strong internal control, expert board directors, and effective investor protection measures, has a substantial impact on decreasing EMs (DeFond & Subramanyan, 1998; Leuz *et al*., 2003; Al-Qadasi *et al*., 2023).

2. Environmental or institutional factors refer to the contextual variables that affect the incentives and parameters on which financial information and the business organization are built. They may be political, regulatory, or economic. For example, some research has shown the importance of aspects such as economic crises, changes in fiscal policies, and the strength of the Anglo-Saxon or continental European legal system in the occurrence of EMs (Arcas & Vidal, 2004; Francis *et al*., 2008; Francis *et al*., 2016; Oz & Yelkenci, 2018; Cao & Patel, 2019; Lee *et al*., 2023).

Likewise, it has been argued that when a country develops effective policies to improve the efficiency of government and markets, strengthen the rule of law, and combat corruption, this has a positive impact on the reduction of EMs (Sáenz & García, 2014; Saona & Muro, 2018). Within this literature, one of the most reviewed topics in recent years is, precisely, the analysis of the implications of adopting IFRS in a country or geographic region (Callao & Jarne, 2010; Ferentinou & Anagnostopoulou, 2016; Bonito & Pais, 2018). This analysis is illustrated below for the case of Latin America.

IFRS and earnings management in the Latin American context

A remarkable amount of accounting research in the region has been conducted in Brazil (Macias, 2018). EM studies in this country have been published since at least 2001 (Martinez, 2013). Studies on the application of IFRS in particular are inconclusive: While Joia and Nakao (2014) point out that the introduction of international standards did not affect the alteration of accounting figures in non-financial listed companies as did the size of the companies and their level of indebtedness, Pelucio *et al*., (2014) indicate for these same companies that IFRS implied a limitation of these measures that led to a higher quality of financial information.

Studies agree that discretionary disruption strategies depend on the costs associated with their formulation. These are significantly determined, at the company-specific level, by the degree of competition in the market to which it belongs, the industry, the financial health of the organization and the investment in fixed assets (Cupertino *et al*., 2017), and in the institutional context, by the strength or weakness of the legal system, which in the case of Brazil is continuously affected by inflationary cycles, market volatility, and high political uncertainty (Viana & Lourenço, 2022).

Another country for which there is meaningful research is Mexico. For example, Martínez *et al*. (2011) point out that with the application of the Financial Reporting Standards (FRS), issued since 2006 by the Mexican Financial Reporting Standards Council (CINIF; Spanish: *Consejo Mexicano de Normas de Información Financiera*) and which in several aspects take IFRS as a reference, a significant reduction of EM was achieved, which was more pronounced in Mexican companies listed on the US Stock Exchange; likewise, they found that this change was not influenced by the fact that the auditing firm was one of the large multinationals in this industry.

Similarly, Palacio and Martínez (2014) indicate that, in addition to less discretionary alteration of accounting data, Mexican FRS improved the comparability of the results of companies that also formulated their financial information under Generally Accepted Accounting Principles (US GAAP). More recently, Eiler *et al*. (2022) found that already in the final transition from local regulations to IFRS in 2012, there was also an evident decrease in these measures, which was more significant in Mexican companies that listed their securities abroad in countries with high levels of investor protection.

Research analyzing the issue from a more general perspective, taking companies from several Latin American countries, includes the study by Rathke and Santana (2015), which found a reduction of EMs that had an impact on greater homogeneity and comparability of the financial information of companies in the first three jurisdictions to adopt IFRS: Brazil, Chile, and Peru.

Similarly, Cardona (2018) indicates that for a considerable proportion of listed companies in 25 countries in Latin America and the Caribbean, once they implemented IFRS in the period between 2006 and 2014, there was an increase in the quality of financial information expressed in terms of less EM, measured from five different versions of the Jones Model. The study also found that the larger a company is in the region, the lower the discretionary alterations of accounting data, and the higher the indebtedness, the greater the incentives to resort to and materialize these measures.

Similarly, Muñoz *et al*. (2021a; 2021b) show that the application of IFRS in parallel with the development of the Latin American Integrated Market (MILA; Spanish: *Mercado Integrado de América Latina*) comprising Chile, Colombia, Mexico, and Peru, reduced agency costs and companies' EM, which in turn led to an increase in liquidity in the stock exchanges of these jurisdictions, and generated a more effective means of control over the health of corporate capital structures (Muñoz *et al*., 2022).

Conversely, based on a sample of 871 listed companies from Argentina, Brazil, Chile, Colombia, Mexico, and Peru in the period 2000 to 2016, Mongrut and Winkelried (2019) find that the introduction of IFRS led to an increase in the opacity of financial information, as measured by EMs. They argue that this is mostly explained by company-specific factors rather than by the institutional characteristics of each country and also by an overconfidence that international standards by themselves

would reaffirm transparency without the need to accompany them with reinforcements on key issues such as external audits and corporate governance.

Finally, in this type of study it is worth highlighting for the jurisdiction under analysis, the work of Contreras *et al*. (2019), who, for the period 2000-2018, based on a sample of 321 listed companies in Chile and Colombia and using different metrics for evaluating the quality of the result (including the EM), establish that with IFRS there is evidence of a decrease in these measures and in general a progressiveness in the qualitative attributes of the financial information in these countries. Considering this argument and the literature reviewed, the methodological procedure is described below.

Methodology

As can be seen from the studies referred to, most of them take samples of companies listed on stock markets because, apart from there being more public information about them in the different countries, they are better suited to the opportunism and managerial discretion that underpins the idea of EMs, particularly in the case of AEMs. Nevertheless, as mentioned above, it is also important to contextualize this phenomenon's occurrence in SMEs in emerging jurisdictions (Gómez *et al*., 2019; Habib *et al*., 2022).

To this end, observations have been processed from a sample of 3140 Colombian SMEs, which have been applying international standards since 2016, especially IFRS for SMEs, on a mandatory basis. Table 1 shows their number according to the sector of the economy to which they belong. These companies were selected because they had all the individual financial statement data required to perform the proposed analysis between 2010-2020. These data suggest a limitation of the work since it excludes companies whose low-quality accounting data could be associated with failing to report complete financial statements to the government authority in charge.

Table 1
Sample of Colombian SMEs analyzed by economic sector

Economic sector	Number of companies	Percentage (%)
Arts, entertainment, and recreation	14	0.45
Administrative and support services	124	3.95
Finance and insurance	35	1.11
Real estate	242	7.71
Professional, scientific, and technical	133	4.24
Agriculture, stockbreeding, hunting, forestry, and fishing	200	6.37
Lodging and food services	59	1.88
Wholesale and retail trade; repair of motor vehicles and motorcycles	1203	38.31
Construction	206	6.56

Schooling	19	0.61
Mining and quarrying	28	0.89
Manufacturing industries	758	24.14
Information and communications	72	2.29
Other services	17	0.54
Transportation and storage	30	0.96
Total	3140	100%

Source: created by the author based on data from the Superintendencia de Sociedades de Colombia

The data were extracted for each year from the Integrated Corporate Information System (SIIS; Spanish: *Sistema Integrado de Información Societaria*), a repository of the Superintendence of Companies of Colombia to disclose corporate and financial information of the companies in its function of inspection, surveillance, and control. Based on this, the following models are proposed and validated:

First, to estimate the AEM, as mentioned before, the modified Jones Model (Dechow *et al*., 1995) was used because, although there are a considerable number of later models that add variables to achieve more refined estimates, the results of previous studies do not show notable differences compared to this base functional specification (McNichols, 2000, 2002; Alvarado *et al*., 2015). It has been calculated in cross-sections for each year in Ordinary Least Squares (OLS) regressions, in which the errors correspond to the variable mentioned above as follows:

$$\frac{\mathrm{ADT_{i,t}}}{\mathrm{AT_{i,t-1}}} = \alpha_0 \frac{1}{\mathrm{AT_{i,t-1}}} + \beta_1 \frac{(\Delta \mathrm{I} - \Delta \mathrm{CxC})_{\mathrm{i,t}}}{\mathrm{AT_{i,t-1}}} + \beta_2 \frac{\mathrm{PPE_{i,t}}}{\mathrm{AT_{i,t-1}}} + \mathrm{e_{i,t}} \quad (1)$$

Where:

$ADT_{i,t}$= Total accrual adjustments, calculated by subtracting cash flows from operating activities from net income for the year.

$\Delta I_{i,t}$= Variation of company i's ordinary revenue between period t and t-1

$\Delta CxC_{i,t}$= Variation of current accounts receivable of company i between t and t-1

$PPE_{i,t}$= The amount of property, plant, and equipment of company i in period t

$e_{i,t}$= Residual value corresponding to the estimated subrogation of the AEMs

In order to reduce the possibility of heteroscedasticity in the modeling, all variables are deflated by the total assets at the end of the previous year ($AT_{i,t-1}$). Having the average of the AEM for each company for the period prior to the application of IFRS (2011-2015) and the subsequent one (2016-2020), it was statistically validated that the mean of these data is significantly different from zero through a t-student test. If this is the case, it would constitute evidence of alteration of the accounting numbers disclosed in the financial statements, and by comparing the two intervals, it will be possible to observe

whether there is a positive or negative change in the phenomenon derived from the convergence with IFRS (Viana & Lourenço, 2022).

The same procedure applies to the modeling of the REM, in which three residual components corresponding to discretionary adjustments to production costs (ADCP), discretionary expenditure (ADGD), and cash flows from operating activities (ADFEAO) are calculated, according to:

$$\frac{\mathrm{CP_{i,t}}}{\mathrm{AT_{i,t-1}}} = \alpha_0 \frac{1}{\mathrm{AT_{i,t-1}}} + \beta_1 \frac{\mathrm{I_{i,t}}}{\mathrm{AT_{i,t-1}}} + \beta_2 \frac{\Delta \mathrm{I_{i,t}}}{\mathrm{AT_{i,t-1}}} + \beta_3 \frac{\Delta \mathrm{I_{i,t-1}}}{\mathrm{AT_{i,t-1}}} + \mathrm{e_{i,t}} \quad (2)$$

$CP_{i,t}$ refers to the production costs of the company i in period t estimated as the sum of the cost of sales and the change in inventories between t and t-1. The other variables were explained above.

$$\frac{\mathrm{GD_{i,t}}}{\mathrm{AT_{i,t-1}}} = \alpha_0 \frac{1}{\mathrm{AT_{i,t-1}}} + \beta_1 \frac{\mathrm{I_{i,t}}}{\mathrm{AT_{i,t-1}}} + \mathrm{e_{i,t}} \quad (3)$$

GD corresponds to discretionary expenses, represented by administrative and selling expenditures in the income statement.

$$\frac{\mathrm{FEAO_{i,t}}}{\mathrm{AT_{i,t-1}}} = \alpha_0 \frac{1}{\mathrm{AT_{i,t-1}}} + \beta_1 \frac{\mathrm{I_{i,t}}}{\mathrm{AT_{i,t-1}}} + \beta_2 \frac{\Delta \mathrm{I_{i,t}}}{\mathrm{AT_{i,t-1}}} + \mathrm{e_{i,t}} \quad (4)$$

The variable FEAO refers to the cash flows from company i's operating activities in the period t¸ a value taken from the respective financial statement.

As more models are processed, the number of companies for which all information is available for the analyzed period is reduced to 2761. Subsequently, these discretionary adjustments are accumulated into a single indicator of accounting measures alterations (Zang, 2012; Ferentinou & Anagnostopoulou, 2016), which is produced according to the following criterion:

$$\mathrm{REM_{i,t}} = \left(\mathrm{ADCP_{i,t}}\right) + \left(-\mathrm{ADGD_{i,t}}\right) + \left(-\mathrm{ADFEAO_{i,t}}\right) \quad (5)$$

The above described constitutes the first axis of analysis. In the second one, the absolute value of this estimated EM (dependent variable) and a series of proxies that represent the specific factors of the companies and the convergence with IFRS (independent variables) are contrasted for the whole period studied; this is done through panel regressions of fixed effects data estimated by a two-stage Generalized Method of Moments (GMM) with Error Component Generalized Least Squares (EGLS). This type of

modeling is used since it is based on considering that the unobserved characteristics of the companies are related to the variables specified in the equation (Reis *et al.*¸2015); in addition, in the Eviews program, it was confirmed with the corresponding tests (Hausmann Test and Redundant Fixed Effects) that this option was statistically more adequate than a random effects panel or pooled data. Therefore, the formulations are:

$$|\mathrm{AEM}|_{i,t} = \widehat{\alpha_0} + \hat{\beta}_1 \mathrm{IFRS}_{i,t} + \hat{\beta}_2 \mathrm{TAM}_{i,t} + \hat{\beta}_3 \mathrm{ROA}_{i,t} + \hat{\beta}_4 \mathrm{EndF}_{i,t} + \hat{\beta}_5 \mathrm{LIQ}_{i,t} + \hat{\beta}_6\ \mathrm{Pérdida}_{i,t} + \hat{\beta}_7\ \mathrm{GI}_{i,t} + \hat{e}_{it} \quad (6)$$

$$|\mathrm{REM}|_{i,t} = \widehat{\alpha_0} + \hat{\beta}_1 \mathrm{IFRS}_{i,t} + \hat{\beta}_2 \mathrm{TAM}_{i,t} + \hat{\beta}_3 \mathrm{ROA}_{i,t} + \hat{\beta}_4 \mathrm{EndF}_{i,t} + \hat{\beta}_5 \mathrm{LIQ}_{i,t} + \hat{\beta}_6\ \mathrm{Pérdida}_{i,t} + \hat{\beta}_7\ \mathrm{GI}_{i,t} + \hat{e}_{it} \quad (7)$$

Where:

$|\mathrm{AEM}|_{i,t}$= Absolute value of estimated AEMs

$|\mathrm{REM}|_{i,t}$= Absolute value of estimated REMs

$\mathrm{IFRS}_{i,t}$= is a dummy variable that takes the value of 1 for years in which international standards are mandatorily applied and 0 for years in which they are not.

$\mathrm{TAM}_{i,t}$= Neperian logarithm of total assets of company i in period t

$\mathrm{ROA}_{i,t}$= Return on assets of company, reflecting its profitability

$\mathrm{EndF}_{i,t}$= Financial indebtedness, corresponding to the ratio of financial liabilities and total assets of company i in period t

$\mathrm{LIQ}_{i,t}$= The liquidity of the company calculated as cash flows from operating activities divided by total assets of company i in period t-1

$\mathrm{Pérdida}_{i,t}$= is a dummy variable that takes the value of 1 for years with negative net results and 0 for positive net results

$\mathrm{GI}_{i,t}$= Corresponds to the ratio of tax expenses and total assets of company i in period t-1

$\hat{e}_{i,t}$= Modeling error

These variables were defined based on the fact that the data necessary for their construction were also derived from the database of the superintendency mentioned above and because of their relevance in the literature of positive accounting theory. For example, within this analytical perspective, previous studies have shown that aspects such as higher bank indebtedness, tax burden, and pressure not to report losses encourage the use of EM (Watts & Zimmerman, 1986; Xu *et al*., 2007; Alvarado *et al*., 2015; Sánchez & Yagüe, 2022).

Likewise, when companies have low profitability and liquidity levels, the propensity to employ these measures increases. In terms of the size of the companies, there are different trends: several papers show that as they grow in terms of their assets and sales, there are fewer discretionary alterations, although other research is not conclusive in this regard (Iatridis & Kadorinis, 2009; Saona & Muro, 2018; Habib *et al*., 2022). In general, from the described tests on the indicated data, the following is obtained.

Results

Table 2 shows the descriptive statistics corresponding to the variables associated with the company-specific factors used to explain the causality of the discretionary changes in accounting numbers at the organizational level, as well as the EM estimated in the AEM and REM modeling indicated above between 2011 and 2020.

Table 2
Descriptive statistics

	Variable	Sample Size	Minimum	Mean	Median	Maximum	Standard deviation
Specific Factors	TAM	3140	11.0817	16.0965	16.0604	20.4846	1.0205
	ROA	3140	-3.4965	0.0630	0.0407	12.9270	0.1403
	EndF	3140	0.0000	0.2396	0.1341	30.3771	0.3929
	LIQ	3140	-3.9110	0.0721	0.0492	12.5899	0.1944
	GI	3140	-0.8965	0.0354	0.0225	1.1632	0.0487
EM	AEM	3140	-0.4939	0.0024	0.0025	0.3298	0.0537
	ADCP	2761	-4.2751	-0.0810	-0.0491	2.1623	0.3449
	ADGD	2761	-2.1184	0.0712	0.0391	4.2859	0.3298
	ADFEAO	2761	-0.3198	0.0316	0.0225	1.2355	0.0899
	REM	2761	-8.3542	-0.1838	-0.1277	4.3941	0.6834

Source: created by the author

As a statistical characterization of the specific factors of the companies, it can be seen that the average financial indebtedness of the Colombian SMEs analyzed is acceptable since it corresponds to 0.23, which would not generate an incentive to use EM for this item. Mean profitability (0.06) and operating cash flows (0.07) are reasonably small in proportion to total assets, which could be a motivation to use discretionary alterations of accounting numbers, in line with theory.

The means and medians of the EMs present values close to zero, in agreement with previous literature (Ferentinou & Anagnostopoulou, 2016; Habib *et al*., 2022). In this respect, a striking aspect is that the AEMs have a very small mean (0.002) and standard deviation (0.05). This aspect is a relevant indicator that in this group of companies, the alteration of the accounting data through accruals has a slightly significant magnitude. A similar trend follows for REM, although the mean is more distant from

zero (-0.18), and in the particular case of ADCP and ADGD, the standard deviation is more pronounced: 0.34 and 0.32, respectively. These data suggest that when an SME resorts to manipulating the figures, it is more likely to do so through REMs than AEMs.

This information is more concretely validated and reaffirmed when comparing the EMs of the previous period and the period of mandatory application of IFRS (Ferentinou & Anagnostopoulou, 2016), Table 3. As observed for both intervals, almost all the outputs of the t-student tests indicate a probability of alteration of the accounting numbers in the set of samples since the means of the variables are statistically different from zero. Nevertheless, it can also be observed that these average indicators are not very far from this point, implying that their occurrence is infrequent and occurs only in some elements of the sample.

Table 3
Statistical significance of EMs comparing the period before and after mandatory application of IFRSs

		Previous IFRS period 2011-2015				Mandatory application period IFRS 2016-2020			
EM	Sample Size	Mean	Standard deviation	t-student	Prob.	Mean	Standard deviation	t-student	Prob.
AEM	3140	0.0051	0.0656	4.3148	0.0000	-0.0002	0.0765	-0.1161	0.9076
ADCP	2761	-0.0786	0.3665	-11.2725	0.0000	-0.0834	0.3539	-12.3822	0.0000
ADGD	2761	0.0774	0.3609	11.2749	0.0000	0.0650	0.3260	10.4812	0.0000
ADFEAO	2761	0.0297	0.1013	15.4249	0.0000	0.0334	0.1142	15.3758	0.0000
REM	2761	-0.1858	0.7339	-13.3042	0.0000	-0.1818	0.6892	-13.8632	0.0000

Source: created by the author

The means and standard deviations of the EMs in the two periods do not have substantial modifications; there are even slight increases in the discretionary alterations of the accounting numbers in the means of the variables ADCP, ADFEAO, and REM during the period with IFRS, contrary to the purpose of their incorporation in Colombian regulations. Therefore, in terms of this type of EM there is no progress associated with the introduction of international standards in the preparation and presentation of financial information of Colombian SMEs. The exception, although very little pronounced, is the ADGD, whose mean decreases from 0.0774 to 0.065 and has a lower dispersion of data. This implies some increase in the quality associated with discretionary expenditure.

The variable of AEMs in the IFRS cycle is not statistically significant. Moreover, the mean is the closest to zero (-0.0002). This result can be interpreted as an improvement in the quality of accruals, in line with what was found before by Cardona (2018) and Contreras *et al*. (2019), who also validated fewer of these EMs in Colombian companies listed on the stock exchange, under international standards. Likewise, this evidence is consistent with studies by Palacio and Martínez (2014), Pelucio *et al*. (2014), and Rathke and Santana (2015) that indicate parallel advances in the qualitative characteristic of the

comparability of financial information of Latin American companies as a result of fewer biases in their preparation and reporting.

To complement the empirical analysis, Table 4 presents the results of the panel data with fixed effects, in which the absolute values of the AEM and REM variables were tested against a series of company-specific factors and also the institutional factor related to IFRS (Ferentinou & Anagnostopoulou, 2016). These outputs correspond to the modelings once adjusted to solve endogeneity, heteroscedasticity, and autocorrelation problems identified in their initial processing. To this end, first- and second-order autoregressive (AR) instrumental variables were introduced as instrumental variables (Elleuch & Kortas, 2019).

Table 4
Outputs of the GMM-EGLS fixed-effects panel data model of SME-specific factors and IFRS and their effect on AEM and REM

Variable	AEM				REM			
	Coefficient	Standard Error	t-statistic	Prob.	Coefficient	Standard Error	t-statistic	Prob.
$\widehat{\alpha_0}$	0.737398	0.087905	8.388610	0.0000	0.575839	0.478690	1.202949	0.2290
IFRS	0.030587	0.003016	10.14005	0.0000	-0.017741	0.015592	-1.137849	0.2552
TAM	-0.046576	0.005520	-8.437358	0.0000	-0.031002	0.030110	-1.029617	0.3032
ROA	0.081576	0.127953	0.637552	0.5238	1.759964	0.255291	6.893.950	0.0000
EndF	0.040886	0.010592	3.860201	0.0001	-0.121420	0.055518	-2.187054	0.0288
LIQ	0.111499	0.046019	2.422879	0.0154	0.175029	0.050350	3.476270	0.0005
Pérdida	0.084302	0.014711	5.730528	0.0000	0.430751	0.123273	3.494283	0.0005
GI	1.658859	0.245600	6.754312	0.0000	7.578458	0.531269	14.26483	0.0000
AR (1)	-0.069433	0.007351	-9.445608	0.0000	0.098054	0.007683	12.76290	0.0000
AR (2)	-0.073121	0.006136	-1.191698	0.0000	-0.023510	0.006571	-3.578054	0.0003
R2 adjusted				0.12				0.56
Sample				3140				2761

Source: created by the author

As can be observed, the models are statistically relevant to explain the variation of the EMs, but they do so more significantly in the case of the REMs (R2=0.56). In other words, in these the company-specific factors are more decisive in line with what is pointed out by Mongrut and Winkelried (2019). This is not the case for the AEMs (R2=0.12), which, to be understood, would perhaps require the inclusion of more institutional-type variables, as indicated by the fact that the IFRS variable is relevant for these.

This appreciation of the general validity of the model is confirmed by the fact that most of the variables are meaningful, except for the return on company assets (ROA) for AEM and size (TAM) and IFRS for the case of REM (Prob>0.05). This implies that specific factors have some particular influence on the incentive or reduction of discretionary alterations of accounting numbers, in line with what is

indicated by positive accounting theory in previous literature (Doukakis, 2014; Campa *et al*., 2019; Contreras *et al*., 2019; Eiler *et al*., 2022).

Likewise, in both cases, it can be observed that the factor that has a greater influence on the potential occurrence of EMs in Colombian SMEs is tax expenditure (GI), 1.65 for AEMs and 7. 57 in the case of REMs; this constitutes empirical evidence of the notable influence that fiscal motivations have repeatedly been indicated to have, especially the determination of income tax, in the preparation and presentation of financial statements and the policies and procedures that underlie them at the organizational level, particularly in countries of continental European legal system oriented to meet the tax information needs of the nation-states (Arcas & Vidal, 2004; Sierra, 2008; Francis *et al*., 2016; Bonito & Pais, 2018; Gómez *et al*., 2019).

Other variables that put upward pressure on the EMs are those related to the valuation motivations of Colombian SMEs, i.e., return on company assets (ROA), which has a significant coefficient of 1.75 in the REMs, and liquidity (LIQ), which has an estimator of 0.11 in the AEMs. Similarly, losses whose disclosure is qualified in the financial information are also significant. In this case, the coefficients are 0.08 and 0.04 respectively. Therefore, in line with theory, it is found that maintaining disclosures that give an impression of constant profitability of the business, even though it is not very high, is a primary incentive in the potential occurrence of discretionary alterations of accounting data or transactions and associated contracts (Kothari *et al*., 2005).

The size variable (TAM) has a special behavior: as just indicated, it is not significant for the REM, but it is for the AEM where the coefficient has a negative sign (-0.04), which would imply that the smaller the SME is, the more motivated it is to use these EMs. This inconclusive trend has been referenced in previous positive accounting theory literature. It suggests the need to extend the analysis to the type of industry the company belongs to and the competition level in the associated market (Iatridis & Kadorinis, 2009; Saona & Muro, 2018; Muñoz *et al*., 2022).

Something similar to the latter occurs with financial indebtedness (EndF) since as its ratio to assets increases, in the case of AEMs, the coefficient is meaningful and positive (0.04) in line with what has been referenced in the academic literature (Watts & Zimmerman, 1986; Beatty *et al*., 2008; Cardona 2018). Meanwhile, in the REM, it tends to decrease (-0.12). This is because the need for bank financing in a context of scarce and costly resources—in which, in many occasions, the alternative is informal credit mechanisms (e.g., "*gota a gota*," a common form of illegal usury in Colombia)—probably inhibits SMEs from using discretionary adjustments that may be evident in production costs, flows of operating activities, and administrative and sales expenditure, and that seriously affect their credibility in the market.

As for the variable that captures the process of convergence with IFRS, although it is not statistically relevant for REMs, it is relevant for AEMs (0.03), but in line with what was stated above,

what these coefficients reflect is that the implementation of international standards does not have a determining effect on the disincentive for EMs; even the positive sign suggests that the perception that with IFRS it is easier to carry out these EM measures may have increased, This aspect may be related to greater flexibility in terms of judgment and the choice between different options for recognition and measurement of financial statement elements, examples of which are the alternatives in subsequent measurement between the cost model and revaluation or the different evaluations to be made in recognition of asset impairment (Rico *et al*., 2020; Católico, 2021).

In this regard, IFRS may have a greater positive effect on the EMs of large Colombian companies whose accounting policies are probably more consistent as they are exposed to the scrutiny of markets that focus on the evaluation of a short or long-run investment, but this is not the case of SMEs, where the information requirements of users are different (Gómez, 2016; Lasso *et al*., 2018; Ruano *et al*., 2018) and as shown, they are permeated by the motivations and fiscal requirements that are highly variable and the decision making of internal users and lenders related to short-run profitability.

Accordingly, it is clear that for IFRS to have a more intense effect on the reduction of EM in this type of company, they must be accompanied by governmental measures to strengthen the legal system, the protection of shareholders and the management of justice in the country, and, especially, corporate actions aimed at increasing training and managerial knowledge of the standards and consolidating their effective application through the mechanisms of internal control and corporate governance (Francis *et al*., 2008; Oz & Yelkenci, 2018; Oribio *et al*., 2018; Mongrut & Winkelried, 2019; Al-Qadasi *et al*., 2023).

Conclusions

Convergence with IFRS is a topic that has important effects on the regulation of accounting and financial auditing, as well as on other aspects such as professional management and control measures in companies and the associated education in economic sciences. For this reason, understanding it within the framework of the qualitative characteristics and quality of financial information in general is relevant and of paramount importance. Accordingly, this research has focused on analyzing this process in the case of Colombian SMEs, a crucial sector of the economy, within the framework of the concept of EMs.

Thus, within the framework of positive accounting theory and literature on this subject, the meaning of these changes in accounting figures has been contextualized in the text based on contractual and tax motivations and those related to the company's valuation. Likewise, the three most used analytical approaches to identify and measure this phenomenon have been referenced, as well as some institutional and organizational factors that explain its occurrence and variation. Specifically, the course of the studies

that have sought to contribute from an empirical and functional work base to its understanding in some Latin American countries has been described.

To this end, considering a base sample of 3140 Colombian SMEs to which the AEM and REM modeling was applied, it has been demonstrated that the EMs only have a slightly significant magnitude, both in the previous period (2011-2015) and in the subsequent one (2016-2020). This implies that the phenomenon occurs infrequently and in a few SMEs. Likewise, from this perspective, it is appreciated that the mandatory application of IFRS in national regulations has not led in the medium term to a strong improvement in the quality of the financial information of Colombian SMEs. Nonetheless, there are advances in the reduction of AEM and discretionary expenditure. It is also found that there is a greater probability that an SME chooses to manipulate accounting figures through REMs than through AEMs. Therefore, in preventing this phenomenon, it is more important to prioritize the control and supervision of operating activities than of financing and investment activities.

On the other hand, when contrasting the EM estimates with a series of organizational variables and the implementation of IFRS, it was established that company-specific factors play a significant role in explaining the REM. In contrast, institutional aspects have a greater impact on the variation of the AEM. This fact is relevant because it reinforces the argument of much of the literature, according to which it is essential to strengthen public policies with corporate measures beyond mere compliance to achieve greater effectiveness in applying a regulatory change aimed at increasing the quality of financial information of SMEs.

Contrary to theory, the company size and bank indebtedness variables were found to be of little significance in the modeling. The specific factors affecting the incentive of EMs, both AEM and REM, are tax expenditure and loss reporting; a proxy for the weight of firms' tax and valuation motivations in preparing and disclosing financial information. This empirically validates the indications of previous literature that highlight the essential role of tax calculation in developing the local accounting process and the projection of the constant financial health of SMEs.

Finally, it is essential to indicate that these arguments should continue to be contrasted in future empirical research, perhaps by developing studies in which other instruments for identifying and measuring EM are applied to the local environment, and particularly to SMEs, such as changes in particular items of the financial statements on key issues like their sources of financing, suppliers, and customers, or the analysis of the distributions of results. Similarly, it is important to test with other explanatory variables such as the type and competitiveness of the industry to which the SME belongs, the structure and concentration of ownership, corruption risks, and the strength of control and governance mechanisms, as well as other institutional elements such as economic cycles and the country's changing tax and legal structure.

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