Earnings and capital management by Latin American banks through financial instruments

Gestión de resultados y capital de los bancos latinoamericanos con instrumentos financieros

Gerenciamento de resultados e de capital por bancos latino-americanos com instrumentos financeiros

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Abstract

Purpose: The purpose of this study is to assess whether banks in Latin America make use of unrealized gains and losses through financial instruments, recorded as other comprehensive income, when engaging in earnings management and capital resource allocation.

Methodology: Empirical tests were conducted that were based on data from 75 banks in 13 countries in Latin America, (from 2008 to the first quarter of 2020), and which took account of the panel data model estimates with fixed effects, devised by Barth et al. (2017).

Results: The estimates obtained revealed that, generally speaking, there is no empirical evidence that these banks made use of unrealized gains and losses through financial instruments for the purposes of earnings management. However, the empirical results showed that banks with lower capital ratios (i.e. with a lower quintile) use these profit and loss statements through the AFS or FVOCI measurements, both as a capital and earnings management mechanism.

Research Contributions: The study seeks to make a significant addition to the accounting literature on management results, which is often restricted to discretionary accruals, by evaluating earnings and capital management practices through operational activities - in the case of capital management, through the reduction of risk-weighted assets (RWA).

Keywords: Financial Instruments; Earnings Management; Capital Management.

Resumen

Objetivo: El objetivo del estudio fue evaluar si los bancos en América Latina utilizan ganancias y pérdidas no realizadas con instrumentos financieros, registrados como otro resultado integral, con el objetivo de la gestión de resultados y capital regulatorio.

Metodología: Utilizando datos de 75 bancos en 13 países de América Latina, desde 2008 hasta el primer trimestre de 2020, las pruebas empíricas comprendieron la estimación de un modelo de datos de panel con efectos fijos seccionales, siguiendo a Barth et al. (2017).

Resultados: Las estimaciones realizadas revelaron que no existe evidencia empírica de que estos bancos, en general, utilicen ganancias y pérdidas no realizadas con instrumentos financieros para fines de gestión de resultados. Por otro lado, los resultados empíricos muestran que los bancos con ratios de capital más bajos (quintil más bajo) utilizan estas participaciones de pérdidas y ganancias con los instrumentos financieros DPV o FVOCI como mecanismo de gestión de capital y de beneficios.

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Contribuciones del Estudio: El estudio contribuye al avance de la literatura contable, al evaluar el uso del enfoque de gestión de ganancias y capital a través de actividades operativas, en el caso de la gestión de capital, a través de la reducción de activos ponderados por riesgo (RWA).

Palabras clave: Instrumentos financieros. Gestión de resultados. La gestión del capital.

Resumo

Objetivo: O objetivo do estudo foi avaliar se os bancos da América Latina utilizam os ganhos e perdas não realizados com instrumentos financeiros, registrados como outros resultados abrangentes, com o objetivo de gerenciamento de resultados e de capital regulatório.

Metodologia: Utilizando dados de 75 bancos de 13 países da América Latina, de 2008 ao primeiro trimestre de 2020, os testes empíricos compreenderam a estimação de modelo de dados em painel com efeitos fixos seccionais, seguindo Barth et al. (2017).

Resultados: As estimações realizadas revelaram não haver evidências empíricas de que esses bancos, de forma geral, utilizem ganhos e perdas não realizados com instrumentos financeiros para fins de gerenciamento de resultados. Por outro lado, os resultados empíricos revelam que os bancos com menores índices de capital (menor quintil) utilizam essas parcelas de ganhos e perdas com os instrumentos financeiros DPV ou VJORA, tanto como mecanismo de gerenciamento de resultados quanto de capital.

Contribuições do estudo: O estudo contribui para o avanço da literatura contábil sobre gerenciamento de resultados, muitas vezes restritos ao uso dos *accruals* discricionários, ao avaliar a utilização da abordagem de gerenciamento de resultados e de capital por meio de atividades operacionais – no caso do gerenciamento de capital, por meio da redução dos ativos ponderados pelo risco (RWA).

Palavras chaves: Instrumentos Financeiros. Gerenciamento de Resultado. Gerenciamento de Capital.

1 Introduction

The empirical literature draws attention to the need for managerial discretion with regard to accounting expense items, for the purposes of earnings management and in the case of financial institutions, also for regulatory capital. Accounting regulation allows discretionary management to be undertaken both for the classification and measurement of financial instruments which are represented by credit operations, debt securities, shares, debentures, investment fund shares, and derivative instruments, among other areas. According to Martinez (2013), handling information about accounting can be divided into three categories: i) earnings management by means of accounting choices (*accruals*); ii) earnings management by means of operational activities; and iii) what can be characterized as tampering with financial statements.

Although a good deal of the literature on earnings management focuses on management by means of *accruals*, which concerns the kinds of accounting choices that managers might make to achieve their object of financial disclosure without affecting the cash flow (Walker, 2013), this study not only analyzes the question of earnings management but also examines

regulatory capital – a key area in the banking industry – by means of operational activities related to financial instruments in which the fair value adjustment is recognized as other comprehensive income.

According to Barth, Gomez-Biscarri, Kasznik and López-Espinosa (2017), it should be noted that the financial instruments in which the fair value adjustment is recorded as other comprehensive income, represents a significant proportion of the bank portfolio. This is why banks can use selective sales outlets of the instruments to recognize gains and improve the level of regulatory capital, among other reasons. The financial gains and losses that are not realized and arise from the fair value adjustment, are classified as other comprehensive income and do not have an immediate effect on the bank report which is only issued when the financial instrument is negotiated. Thus asset disposal – an operational procedure – results in the trading of this value through earnings. However, in the case of capital management, as the unrealized gains and losses already form the regulatory asset base, the materialization of a managerial model, through asset disposal, takes place through the reduction of risk-weighted assets (RWA) - the ¨denominator effect¨ of the capital index.

Since the 1990s, several scientific studies have examined the use of financial instruments for capital or earnings management, the most prominent being those of Moyer (1990), Shrieves and Dahl (2003), Fiechter and Meyer (2010), Barth et al. (2017) and Dong and Zhang (2017). However, in Latin America, the literature on this question is still in its early stages, even though the specific features of the banking industry in this region represent an excellent opportunity to broaden research in this field. In the case of Brazil, attention should be drawn to the studies of Fuji (2004), Zendersky and Silva (2007), Santos (2007), Goulart (2007), Gabriel and Corrar (2010) and Dantas, Medeiros, Galdi, and Costa, (2013).

In light of this, the aim of this study is to determine whether the financial institutions in Latin America make use of unrealized gains and losses, together with financial instruments recognized in other forms of comprehensive income – those classified as available-for-sale (AFS) or fair value, through other kinds of comprehensive income (FVOCI), depending on the methodological rigor of the accounting standards in force – through selective trading for the purposes of earnings management and regulatory capital.

According to Barth et al. (2017), study in this area makes at least four new research contributions to the literature. First of all, there is the research that analyzed the sale of classified instruments such as AFS (available-for-sale) or fair value through comprehensive income (FVOCI) mainly concentrated in the region of North America (Shrieves, & Dahl, 2003; Fiechter, & Meyer, 2010; Barth et al., 2017; Dong, & Zhang; 2017). The research thus succeeds in filling a gap in the literature by assessing the phenomenon in Latin America with developing markets and banks that must generally comply with the IASB (International Financial Reporting Standards) - which are either original or correlated – and are subject to the banking supervision of the Basel Committee. Second, an approach is adopted for earnings management, strategic, administrative and operating decisions, and non-discretionary *accruals*, (which is more often the case in the literature). Third, it analyzes capital management through a reduction of risk-weighted assets (RWA), whereas most of the literature is restricted to focusing on earnings management. Finally, it seeks to confirm the validity of this mechanism by ensuring it is in compliance with established international accounting standards, and determining the possible features that can justify the practice of income smoothing and capital management.

In addition, the research is justified on the grounds that financial insitutions are the cornerstone of modern economies and owing to the vital role they play during a banking crisis, (particularly in emerging countries), these companies are subject to strict regulatory control to ensure they comply with the minimum capital requirements for covering operational risks.

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However, even when closely regulated, the financial statements are unable to assess the capacity of banks to absorb losses, on account of their use of a discretionary management scheme to manage the capital (Flannery, & Giacomini, 2015).

The results of the empirical tests carried out with the quarterly figures from 2008 to the first quarter of 2020, which involved 75 banks in 13 Latin American countries, demonstrated the following: (i) the rejection of the hypothesis that AFS and FVOCI financial instruments could be used for the purposes of earnings management when employed by a consortium of banks; (ii) that this practice of earnings management could be particularly applied to banks with the lowest regulatory capital; and (iii) the confirmation of the hypothesis that Latin American banks with lower capital ratios carry out operations with these financial instruments for the purposes of capital management.

2 Review of the literature

2.1 Regulatory Capital and the Basel AML Index

Owing to the risks faced by the banking industry by virtue of its activities, it is one of the most closely regulated sectors in the economy (Mishkin, 2012). Since the establishment of the *Basel Committee on Banking Supervision* (BCBS), in 1974, regulation has evolved through the so-called Basel Accords I, II and III (BCBS, 2018), mainly through i) the minimum capital requirements for market risk, ii) the Basel Index represented by the ratio between the Reference Equity (RE) and iii) the Risk-Weighted Assets (RWA).

In light of this, the literature on Regulatory Capital Management clearly states that it can be undertaken by means of increases in the numerator and the PR, and/or by reductions in the denominator and the RWA, arising from the risk reduction of assets in the financial institution. In this way it can significantly mitigate the calculated regulatory risk, without leading to a corresponding reduction of the economic risk as a whole (Carneiro, 2002).

2.2 Unrealized gains and losses through financial instruments, and earnings and capital management

In April 2001, the *International Accounting Standards Board* (IASB) published the IAS 39 – *Financial Instruments: Recognition and Measurement* - with the aim of establishing principles for the recognition and measurement of assets and liabilities in the financial statements by dividing them into categories, as outlined in Table 1.

Table 1
Categories and criteria for the assessment of financial instruments in accordance with IAS 39

Categories	Definition	Measurement	Changes in the VJ	Gain/Loss
Fair Value through Income	Assets acquired for the purpose of being regularly sold and traded	Fair Value	SL	Revenue / Expenditure
Held to maturity investments	Assets acquired with the purpose of being held to maturity	Amortized Cost	N/A	-

Loans and Receivables	Non-derivative financial assets with fixed or determinable payments which are not quoted in the active market	Amortized Cost	N/A	-
Available –for-sale financial assets	Designated as available-for-sale and which are not covered by any of the preceding categories.	Fair Value	BV	Other Comprehenive Income

Source : *adapted from IAS 39 (2013)*

In July 2014, in response to the financial crisis of 2007-2009, the IASB issued new standards for the recognition and measurement of financial instruments (IFRS 9 – *Financial Instruments*), designed to replace those of IAS 39, and which came into force in 2018. The main alteration was the requirement that financial assets should be classified and measured on the basis of a trading model applied by the entity to the instrument, as well as the features of the cash flow statement, and no longer through financial asset trading intentions, as outlined in Table 2.

Table 2

Assessment categories and criteria for financial instruments, in accordance with IFRS 9

Categories	Definition	Measurement	Changes in the VJ	Gain/Loss
Fair Value by means of Earnings	A financial asset which is not measured at amortized cost or the fair value by means of other comprehensive income.	Fair Value Option	SL	Revenue / Expenditure
Amortized Cost	Financial asset held within the trading model with the aim of obtaining contractual cash flows (payment of the principal and interest)	Amortized Cost	N/A	-
Fair value by means of other comprehensive income	A financial asset held within the trading model; its objective can be achieved both by the receipt and sale of a contractual cash flow.	Fair Value Option	BV	Other Comprehenive Income

Source: *adapted from IFRS 9 (2014)*

Although they provide fair value measurements, the classified instruments such as AFS or FVOCI that are within the two accounting models (IAS 39 or IFRS 9), do not record the inherent fluctuations of these measurement criteria such as earnings. Thus, the unrealized gains and losses do not affect net income since they are directly recorded as other comprehensive income in net equity – there is only an awareness of the income when the financial instrument is sold at the time when the gains and losses realized in the sale are effectively recorded as revenue or expenditure. As a result, these instruments give managers the power to tamper with the figures above or below a certain limit and decide whether or not to sell them on the basis of their level of gain or loss.

Barth et. al (2017) underlined the fact that where the unrealized gains and losses are entered in the accounts of other comprehensive income, the financial instruments represent 15%

to 18% of the total assets of US [* change to ¨North-American¨ if this includes Canadian banks] banks. However, Boulland, Lobo and Paugam (2019) noted that the unrealized gains and losses through financial instruments in the banking sector tend to attract less attention from investors. There are a number of reasons for this including the following: i) the fact that these gains and losses are transitory and noisy in nature; ii) the complexity of the disclosure of other comprehensive income which makes an analysis more difficult; iii) the limited database access available with granular information which prevents a complete analysis of these instruments from being carried out; and iv) the fact that managers, investors and analysts only tend to keep their eyes fixed on profit margins.

The literature on earnings management claims that the business administration can either improve or impair the quality of financial statements by exercising discretion over the audited numbers. Martinez (2013) distinguishes between three kinds of tampering i) earnings management by means of *accruals* arising from the application of accounting standards; b) manipulation of the company´s operational activities (*real earnings management*) with the aim of attaining certain levels of income and; iii) tampering with the information in classified income statements.

The question raised in this study is whether the timely undertaking of gains and losses through classified financial instruments like AFS or FVOCI, (in accordance with the accounting standards in force), can affect earnings and regulatory capital, as shown in Figure 1.
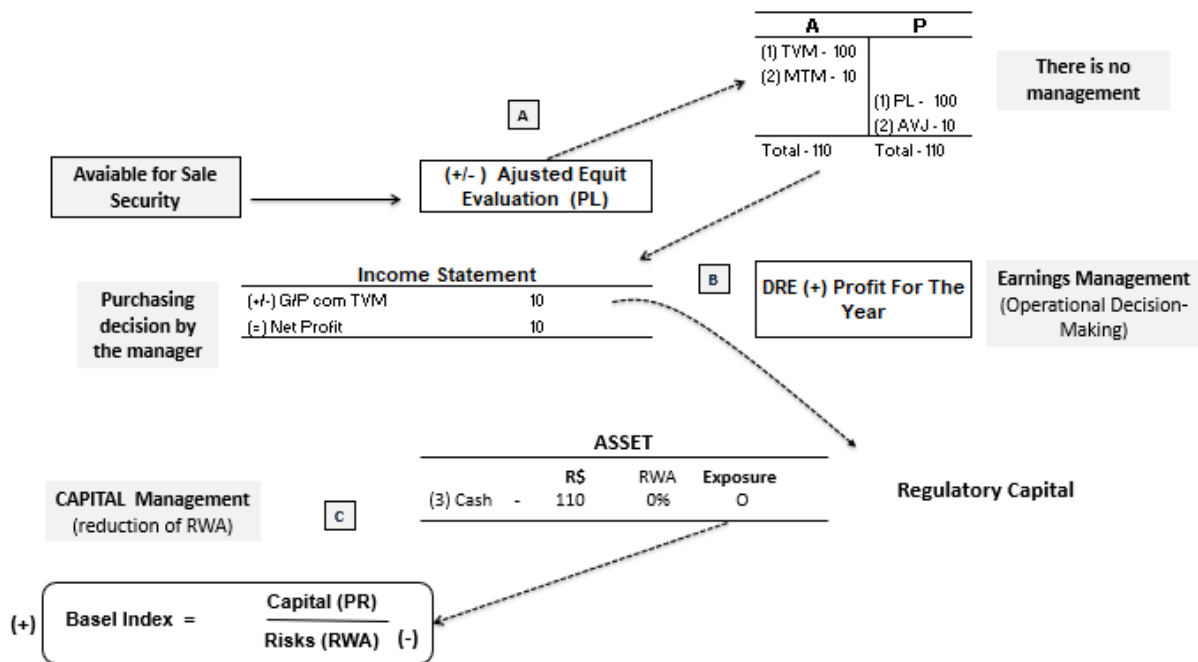

Figure 1 [In chart > Available-for-sale Security /Adjusted Equity Evaluation/ there is no management/purchasing decision by the manager /income statement/profit for the year/ Earnings management (Operational decison-making)/ Capital Management (reduction of the RWA) /asset /Cash/Exposure /Regulatory Capital / Basel Index/ Capital/Risks Dynamics of capital and earnings management through financial instruments replaced by other comprehensive income
Source: *Designed by the authors*

In line with the cashflow described, Barth et al. (2017) state that the fact that the unrealized gains and losses do not have a direct influence on the earnings is a driving-force

behind the discretionary measures of the managers of banks in the selective sale of these papers.

However, if the entity option is designed to maintain the fair value adjustment as other comprehensive income, as shown in Item A in Figure 1, there will be no evidence of strategic behavior in the sale, since the unrealized gains and losses in classified instruments such as AFS or FVOCI, are not deducted from the principal capital. This means they only affect the regulatory capital when carried out at a time when they cease to make up the assets of the institution and reduce the risk-weighted assets (RWA). Thus the operational management and decision-making with regard to the sale of these financial instruments (Item **B**) determines the time when the gains and losses relative to the fair value adjustment are included in the income statement and influence the regulatory capital (Item **C**), through a reduction of the RWA.

In view of this, from the standpoint of the administrators, the realization of gains and losses of financial instruments classified as AFS or FVOCI is a potential way of managing earnings and/or regulatory capital because it can be less burdensome than managing *accruals* or taking part in other real earnings management activities. According to Gunny (2005) and Barth et al. (2017), although the sale of these instruments incurs transactional costs, the accounting cost with regard to *accruals* is at a greater risk of inspection and surveillance by auditors and there is limited scope for tampering with the *accruals*. On account of this, Rodrigues, Paulo and Melo (2018) add a further reason which is that the managers can undertake operational activities with a view to attaining certain performance goals.

2.3 Review of the empirical literature and research hypotheses

Although a significant part of the literature provides evidence of capital and earnings management in financial institutions by means of *accruals*, in particular the ALL [Allowance for Loan Losses] (Dantas, Carvalho, & Pereira, 2018), the AFS or FVOCI financial instruments are also regarded as being capable of use by managers of financial institutions for earnings management and regulatory capital. The use of unrealized gains and losses of financial instruments can be made operational through the selective sale of classified instruments such as AFS or FVOCI, in accordance with the accounting standards in force in addition, they enable accumulated gains and losses in equity to be transferred to the comprehensive income statement for the period and thus allow the simultaneous management of earnings and regulatory capital.

According to Boulland et al. (2019), although there is an awareness that the regularization of items from other comprehensive income may be of little importance for investment decisions, it provides information about the value, uncertainty and time of the future cash flow statement of financial instruments held by a bank.

In previous studies carried out on the US market, it was argued that banks sold financial instruments classified as AFS to allow income smoothing by anticipating the *big bath* accounting of the current year and meeting or surpassing the forecasts of the analysts (Dong, & Zhang, 2017; Barth, et al., 2017). Aland e Burks (2019) claimed that this practice is not very common and occurs in banks with lower profits and usually with the aim of avoiding harmful disclosure of information (by turning negative income into positive) rather than engaging in income smoothing. In more profitable banks, the authors did not find any significant evidence of gains and losses being used with AFS or FVOCI instruments for earnings management.

In Brazilian studies, it was confirmed that the practice of capital or earnings management by means of *accruals* predominated, in particular the ALL (Bortoluzzo, Cheng, & Gomes, 2016; Dantas et al., 2018; Silva, & Niyama., 2018). However, there are also studies that lay emphasis on the use of unrealized gains and losses with financial instruments for

earnings management, especially the practice of income smoothing (Goulart, 2007; Santos 2007; Gabriel, & Corrar 2010).

Since unrealized gains and losses through the AFS or FVOCI financial instruments, that appear in the accounts of other comprehensive income, only affects the income of the bank when these instruments are sold, the review of the literature points out that the managers of banks have an incentive to make use of them for earnings management and for trading these instruments in a timely manner. Barth et al. (2017), Dong and Zhang (2017) and Aland and Burks (2019) found evidence that the US commercial banks employ the selective sale of these types of selective instruments for earnings management. In light of this, the first hypothesis can be formulated and tested empirically:

H_1: *Latin American banks make use of the unrealized gains and losses of financial instruments such as AFS or FVOCI for the purposes of earnings management.*

Some studies, (mainly those carried out in the US Market) have shown that banks (mainly those that had a low regulatory capital) used gains and losses through financial instruments for the management of capital in a way that meets the requirements of the regulator. (Moyer, 1990; Scholes, Wilson, & Wolfson, 1990; Beatty, Chamberlain, & Magliolo, 1995; Shrieves, & Dahl, 2003; Fiechter & Meyer, 2010; Barth et al., 2017).

With regard to Latin-American banks, Rojas-Suarez, Del Valle and Galindo (2012), set out from the position found among emerging economies which had banking systems that were adequately capitalized and noted that they did not have difficulties over the additional requirements arising from the implementation of Basel III. This allowed these authors to assess the effects of these changes on bank practices in the four Andean countries, Bolivia, Columbia, Ecuador and Peru. The authors concluded that the banks located in these countries are complying with the new guidelines and keeping to Level 1 in the Capital Index for risk-weighted assets - above what is required by Basel III - and hence, in terms of both quality and quantity, have sufficient capital to cover risks.

However, it should be pointed out that the accounting statements can experience interference through the use of available discretion by the manager in the application of accounting standards which provides an incentive for the management of regulatory capital (Flannery & Giacomini, 2015).

More recent studies carried out in the US banking sector have found contradictory evidence regarding the use of unrealized gains and losses through financial instruments for the purposes of managing regulatory capital in financial institutions. Dong and Zhang (2017) did not support capital management, owing to the fact that the sales of financial instruments that might result from capital charges caused by fair value accounting, are economically insignificant. However, Barth et al. (2017) found there was a positive relationship between the coefficient variable for calculating regulatory capital and the dependent variable (unrealized gains and losses through financial instruments), that support their use for the purposes of capital management.

Within the domain of Brazilian financial institutions, Santos (2007) found evidence that the financial conglomerates make use of unrealized losses through AFS financial instruments to manage capital. A little later, Gabriel and Corrar (2010) found evidence that the market value adjustment directly recorded in the liquid assets, are employed as instruments for earnings management and that in these situations, the variation in liquid assets acts as an explanatory supplementary variable for adjustment, which shows that the banks can manage regulatory capital in an indirect manner.

The second hypothesis was formulated on the basis of the assumption that banks with a low level of regulatory capital (and seeking to avoid capital constraints and signs of an increased risk in the market) can take advantage of the selective sale of financial instruments classified as AFS or FVOCI to recognize gains, improve their level of regulatory capital and reduce any perceived risk in marketing strategy. This hypothesis will be tested empirically and can be expressed as follows:

H_2: *Latin American banks with low regulatory capital use unrealized gain and loss values through financial instruments classified as AFS or FVOCI for the purposes of capital management.*

3 Methodological procedures

3.1 Definition of the model

When conducting the empirical tests by following Barth et al. (2017), the model (3.1) is used to test the **H_1** and **H_2** research hypotheses with the aid of the panel data model.

$$\Delta GPNR_{it} = \beta_0 + \beta_1 LAIRaj_{it} + \beta_2 CapInf_{it} + \beta_3 LAIRaj_{it} * CapInf_{it} + \beta_4 IFin_{it} + \beta_5 Tam_{it} + \beta_6 IFRS9_t + \beta_7 Hiato_t + \varepsilon_{it} \quad \textbf{(3.1)}$$

In this:

$\Delta GPNR_{it}$: corresponds to the financial settlement of the unrealized gains and losses recorded as other comprehensive income, relative to the financial instruments classified as the AFS or FVOCI, of bank *i*, in the quarterly period *t*, divided by total assets.

$LAIRaj_{it}$: corresponds to the pre-tax profits, after the exclusion of adjustments made to the financial settlement of the unrealized gains and losses recorded as other comprehensive income of bank *i*, in the quarterly period *t*; divided by the total assets.

$CapInf_{it}$: the *dummy* variable, assuming 1 for the banks *i* which at the time *t*, record the capital index (the relationship between net equity and total assets) which is found in the lower quintile, and 0 for the others;

$IFin_{it}$: total number of financial instruments, excluding loans and funding from bank *i*, at time *t*, divided by the toal assets.

Tam_{it}: natural logarithm of the total assets, of bank i, at the beginning of the quarter *t*.

$IFRS9_t$: *dummy* variable which represents the period for the implementation of IFRS9, assuming 1 for the 1st quarter of 2018 to the 1st quarter of 2020, and 0 for the others;

$Hiato_t$: corresponds to the output gap, calculated by the application of the Hodrick-Prescott filter to the quarterly average of the Real GNP in terms of market prices;

ε_{it}: error term in the regression model, based on the normality (of residuals) assumption, or in other words, $\sim N(0, \sigma2)$.

To conclude this account of the **H_1** hypothesis, the variable of interest is **$LAIRaj$**. The empirical literature states that the banks use unrealized gains and losses through the AFS or FVOCI financial instruments for profit smoothing or to increase the regulatory capital when it is low. If the banks employ classified financial instruments where the fair value adjustment is recorded as comprehensive income for income smoothing, a negative signal can be expected for the **$LAIRaj$**, variable, in accordance with Barth et al. (2017) and Aland and Burks (2019). The negative relationship can be interpreted as resulting from the decision-making of the bank

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managers with regard to the selling of financial instruments. This is a means of offsetting or restricting the profit margins, or in other words, the less (or greater) the profit without the effects of a financial settlement of these instruments, the greater (or less) the prospect of avoiding this practice of income smoothing. Thus, the proof of the hypothesis that Latin-American banks make use of unrealized gains and losses through financial instruments for the purpose of earnings management, depends on the confirmation of the hypothesis that Latin-American banks make use of unrealized gains and losses through financial instruments for the purpose of earnings management. It also depends on the validation of the negative and statistically significant coefficient for the *LAIRaj* variable.

Another variable of interest that can be employed for research purposes is ***CapInf***. As Barth et al. (2017) and Dong and Zhang (2017) make clear, it is expected that the coefficient of the variable of interest will be positive and significant if the banks with a lower level of regulatory capital employ financial instruments in which the unrealized gains and losses are recorded as other comprehensive income and, as a result, increase their levels of capital. This would represent the confirmation of the H_2 research hypothesis, or in other words, banks with a lower degree of capitalization tend to record greater values in the financial settlement of gains and losses recognized as other comprehensive income and when these instruments serve the purposes of capital management.

When analyzing the interaction between earnings and capital management, the expected regression coefficient for the interaction variable *LAIRaj*CapInf (β3)* depends on whether the earnings management which predominates in banks is positive or negative for *LAIRaj*. If it is positive and recognizes more losses and fewer gains, it is expected that the β_3 coefficient will be positive. However, if the predominance of earnings management in banks with *LAIRaj* is negative, the reverse occurs and β_3 will be negative. The underlying assumption of an interaction with a *proxy* is that banks with lower levels of capital have a greater incentive to achieve gains with classified instruments such as AFS or FVOCI, regardless of the *LAIRaj* signal which heightens the incentive of banks with a positive *LAIRaj* to achieve greater losses and fewer gains or vice-versa. This kind of result strengthens the findings with regard to the H_2 hypothesis

Variables of the control model (3.1), peculiar to the banking sector and probably linked to the realization of gains and losses through classified financial instruments such as AFS or FVOCI were expanded with a view to ensuring the robustness of the findings, as well as the explanatory variables of interest described earlier. The *IFin* variable corresponds to the sum total of the instruments, apart from the loans and funding, and there is thus expected to be a positive relationship with the realization of gains and losses through the financial instruments classified as AFS or FVOCI, in line with the forecasts of Barth et al. (2017) and Aland and Burks (2019). This is based on the assumption that the larger the portfolio of financial instruments, the greater will be the tendency to achieve a greater volume of realized gains and losses through the AFS or FVOCI financial instruments.

In the case of the *Tam* variable, a positive relationship is expected with the achievement of gains and losses through financial instruments classified as AFS or FVOCI, in line with the forecasts of Barth et al. (2017), Dong and Zhang (2017) and Aland and Burks (2019). These predict that the more established banks are in a better condition and have more *expertise* to make use of their financial instruments for risk management strategies.

Another control variable employed in the model seeks to determine the effects of adopting the accounting standards which have been in force at the IFRS 9 since 2018. According to Lejard (2016), a negative relationship between *IFRS9* and the dependent variable is based on the assumption that international standards are expected to reduce discretionary powers when measuring financial instruments.

Finally, in view of the fact that gains and losses relative to the fair value adjustment of financial instruments depend on economic factors, a control variable of a macroeconomic nature is used called **Hiato [the Gap]**, which represents the output gap, and corresponds to the difference between the Gross Domestic Product (GDP) and the Potential GDP, measured by the quarterly average of the real GDP and the serial correlation of market prices. Owing to the particular macroeconomic conditions of Latin America, in this study a negative realtionship is expected between this macroeconomic variable and the financial settlement of gains and losses through the AFS or FVOCI financial instruments.

3.2 Population or sample

The empirical tests were based on quarterly data from 2008 to the first quarter of 2020, and taken from the financial conglomerates and independent institutions of Latin America, categorized as financial companies by the Thomson Reuters® D&I Index. The year 2008 was chosen as the starting-point of the period because this was the year when the Basel II Accord was introduced, which led to significant changes in regulatory capital requirements.

The sample is made up of 75 banks, since those that lacked information about the realization of gains and losses through financial instruments recorded as other comprehensive income, were eliminated from the database. The entities included 13 countries in the region: Argentina (5), Bolívia (2), Brazil (19), Chile (5), Columbia (8), Costa Rica (2), Ecuador (5), Jamaica (2), Mexico (4), Panama (1), Peru (19), Trindad and Tobago (1) and Venezuela (2). Thus the database had 3,600 observations.

The financial information from the banks in the sample was obtained from the Thomson Reuters® Index. Since the database included different countries and hence different currencies, the American dollar was used as the standard currency. The research relied on the GDP figures of the Economic Commission for Latin America (CEPAL), which represents the quarterly GDP constant prices in the quarterly frequency chart of the period 2008-2020.

4 Results and analyses

4.1 Descriptive statistics

At first, owing to the presence of significant *outliers* in the sample, winsorization of the **LAIRaj** variable was carried out in 1% and 99%, following the method of Brooks (2014) and Kothari, Leone and Wasley (2005). The reason for adopting this measurement is that the extreme values are often linked to seasonal factors at the begining or completion of the operations or to particular features of banks which can cause distortions with regard to the datasets in the accounting and capital variables used in the model. The descriptive statistics of the model are outlined in Table 1.

Table 3
Descriptive statistics of the continuous variables of the model (3.1)

Variable	Average	Median	Standard Deviation	Mínimum	Maximum	Nº Obs.
$\Delta GPNR$	0.0025	0.0005	0.0061	-0.1305	0.0750	1.958
LAIRaj	0.0086	0.0070	0.0107	-0.0200	0.0515	3.005
LAIRaj * CapInf	0.0007	0.0000	0.0044	-0.0200	0.0515	3.005
IFin	0.1243	0.0924	0.1218	0.0000	0.8482	2.764
Tam	9.6887	9.6818	0.9143	6.4645	12.136	3.005

IFRS9	0.1875	0.0000	0.3904	0.0000	1.0000	3.600
Hiato	0.0063	0.0072	0.0064	-0.0364	0.0189	3.600

In which $\Delta GPNR$ is the financial settlement of unrealized gains and losses recorded as other comprehensive income, relative to the financial instruments classified as AFS or FVOCI, of bank i, in the quarterly period t, divided by the total assets; LAIRaj is the pre-tax profit adjusted for the exclusion of the effects of the financial settlement of unrealized gains and losses recorded as other comprehensive income of bank i, in quarter t; divided by the total assets; CapInf is the dummy variable assuming 1 for the banks i which at the time t, records the Regulatory Capital Disclosures Index (the relationship between net equity and total assets) which is found in the lower quintile, and 0 for the others; IFin total number of financial instruments, excluding loans and funding, of bank i, at time t, divided by the total assets; Tam is the natural logarithm of the total assets at the beginning of the quarter for the institution i, at the time t; IFRS9 is the dummy variable which represents the period of implementing IFRS9, assuming 1 from the 1st quarter of 2018 to the 1st quarter of 2020, and 0 for the others; Hiato [Gap] corresponds to the output gap, calculated by the application of the Hodrick-Prescott filter to the quarterly average of the real GDP for market prices.
Source: *Research data*

At first, the descriptive statistics reveal that the financial settlement of gains and losses through financial instruments classified as AFS or FVOCI (**$\Delta GPNR$**) of the banks of Latin America represent, on average, 0.25% of total assets, with a peak of 7.5% of total assets as gain and 13.05% of loss. When the mean is combined with the median, it can be concluded that the average values involved are not very representative with regard to the equity structure of the noncorporate entities. 1,958 observations (54.38%) of the initial sample provided information about gains or losses through these financial instruments, whereas in the case of the other 1,642 observations, the lack of information can be attributed to the fact that transactions were not undertaken in the period or that the information was unavailable in the database. Since it was uncertain if this lack of information represented a zero value or an accounting inconsistency, it was decided to exclude these data from the sample.

With regard to **LAIRaj**, the data showed an average return of 0.86% for the total assets of the banks in the sample, with a median of 0.70%. It should be pointed out that owing to the leverage security features inherent in the banking sector, determining whether this return threshold is high or low should be treated with care. In the case of the total shareholder return of these entities, for example, account should be taken of the *Return on Equity* (ROE), which is already adjusted by the leverage effect. Whateever the way, regarding the measure of return represented by the **LAIRaj** variable together with the **$\Delta GPNR$** dependent variable, there are clear signs that the realization of gains and losses recorded in the equity capital might well mitigate the effect of the measurement of profit, since the extreme values for the measurement of profit are lower than the unrealized gains and losses, which suggests that these are used with the aim of reducing the extreme values, (which is compatible with the practice of income smoothing).

An analysis of the average value of the (**LAIRaj * CapInf**), which is the interaction value for investigating the substrate of the lowest quintile, showed it has an average value of 0.07%. This means that unless account is taken of the effects of realizing gains and losses through financial instruments classified as AFS or FVOCI, the group of banks with the lowest level of regulatory capital, records a rate of profitability that is eight times lower than the entire consortium. This can be expected because these banks are highly regulated and operate at a loss, as well as being prone to having penalties imposed on them on account of a reduction of regulatory capital. Furthermore, it should be noted that the extreme values (maximum and minimum) of the **LAIRaj** variable apply to the banks in this group that are characterized as having a lower level of capital.

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In the case of the ***IFin*** variable, the calculated figures reveal that the financial instruments, excluding loans and funding, are, on average, about 12% of the assets of the Latin-American banks, and it is worth pointing out that some of them record a share of assets that is higher than 80% – this threlhod of relevance caracterizes entities such as banks with a cash-flow profile but are not very involved in the credit market.

With regard to the ***Tam*** control variable, it was confirmed that the banks in the sample showed significant cost dispersion in terms of their size, which can be explained by the differences between the Latin-American countries. In the case of the ***Hiato*** [Gap] variable, there was an average of 0.0063, with a maximum of 0.0189 and minimum of - 0.0364, which were the values expected given the characteristic features of Latin-American countries that have uneven growth patterns and frequent alternating periods of high and low GDP.

4.2 Robustness tests

Before the estimation of the model (3.1), Im, Pesaran and Shin (I.P.S.), ADF-Fisher and PPFisher tests were conducted to determine whether there were unit roots in the non-dichotomous series, and check if the principle of stationarity was met, since the null hypothesis of the presence of the unit root was rejected, as shown in the data of Table 4.

Table 4
Results of the I.P.S., ADF-Fisher and PP-Fisher tests for the unit roots of the non-dichotomous series

Variable	I.P.S. Test		ADF-Fisher Test		PP-Fisher Test	
	Statistics	p-value	Statistics	p-value	Statistics	p-value
$\Delta GPNR$	-22.6748	0.0000	935.8510	0.0000	962.1120	0.0000
LAIRaj	-23.1417	0.0000	910.1100	0.0000	917.9860	0.0000
CapInf	-13.1334	0.0000	294.4560	0.0000	303.4440	0.0000
*LAIRaj * CapInf*	-22.4679	0.0000	566.7310	0.0000	563.4480	0.0000
IFin	-7.4758	0.0000	366.0257	0.0000	366.8024	0.0000
Tam	-46.6427	0.0000	1796.0900	0.0000	1857.7900	0.0000
Hiato	-7.4672	0.0000	1172.4200	0.0000	296.8360	0.0000

*In which $\Delta GPNR$ is the financial settlement of the unrealized gains and losses, recorded as other comprehensive income, relative to the financial instruments classified as AFS or FVOCI, of bank i, in the quarterly period t, divided by the total assets; **LAIRaj** is pre-tax profits adjusted by the exclusion of the effects of the financial settlement of unrealized gains and losses recorded as other comprehensive income of bank i, in the quarterly period t; divided by the total assets; **CapInf** is a dummy variable, that assumes 1 for the banks i which, at the time t, record the regulatory capital index (the relationship between net equity and total assets) which is found in the lower quintile, and 0 for the others; **IFin** total of financial instruments, excluding loans and funding, from bank i, at the time t, divided by the total assets; **Tam** is the natural logarithm of the total assets at the beginning of the quarter for institution i, at time t; **IFRS9** is the dummy variable which represents the period when IFRS9 is implemented, assuming 1 from the 1st quarter of 2018 to the 1st quarter of 2020, and 0 for the others; **Hiato** [Gap] corresponds to the output gap, calculated by the application of the Hodrick-Prescott filter to the quarterly average of the real PIB for market prices.*
Source: *Research data*

In the aftermath, the *Variance Inflation Factor* (VIF) test was conducted with the aim of determining whether there was a correlatioin between the explanatory variables, which completely removed the risk of multicollinearity among the series, with indicators lower than 10, as can be seen in Table 5.

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Table 5

Results of the variance inflation tests between the independent variables

Variable	ΔGPNR	
	Test	Coefficient
LAIRaj	2.9335	0.0025
CapInf	4.3321	0.0000
LAIRaj * CapInf	5.5517	0.0022
IFin	1.3425	0.0000
Tam	1.8107	0.0000
Hiato	1.5897	0.0005

*In which **ΔGPNR** is the financial settlement of the unrealized gainns and losses recorded as other comprehensive income realtive to the financial instruments classified as AFS or FVOCI, of bank i, in the quarterly period t, divided by the total assets; **LAIRaj** is the pre-tax profit adjusted by the exclusion effects of the financial settlement of unrealized gains and losses recorded as other comprehensive income of bank i, in the quarterly period t; divided by total assets ; **CapInf** is the dummy variable, assuming 1 for the banks i which at the time t, record the regulatory capital index (the relation between net equity and total assets) which are found in the lower quintile, and 0 for the others; **IFin** is the total number of financial instruments, excluding loans and funding , of bank i, at the time t, divided by the total assets; **Tam** is the natural logarithm of the total assets at the beginning of the quarter for institution i, at the time t; **IFRS9** is the dummy variable, which representes the period when the IFRS9 is implemented , assuming 1 from the 1st quarter of 2018 to the 1st quarter of 2020 and 0 for the others; **Hiato [Gap]** corresponds to the output gap, calculated by the application of the Hodrick-Prescott filter to the quarterly average of the real GDP in terms of market prices.*
Source: *Research data*

Following the recommendations of Baltagi (2008), a Chow test was conducted with the aim of assessing whether the presence of individual effects of banks explains why the use of panel data provides more valuable information to the reference model under study. On this basis, the Hausman test was carried out; this seeks to define what will be most recommended by the regression model, (either the fixed effects or random effects). The model with fixed effects is recommended owing to the rejection of the null hypothesis as a result of the presence of the low *p-value* found in the test.

Finally, since there was evidence of autocorrelation in the model residuals, which was determined in the Durbin-Watson and Lagrange Multiplier (LM) Breusch-Godfrey tests, it was decided to overcome the problem of heteroscedasticity detected in the residuals, by means of an estimated version of the model (3.1). This involved employing the panel corrected standard errors (PCSE) method, for robust parametric estimation, based on the assumption that there is heteroscedasticity and autocorrelation in the residuals. The results calculated for the four tests are listed in Table 6.

Table 6

Results of the Chow, Hausman, Durbin-Watson and LM de Breusch-Godfrey tests

Variable		ΔGPNR				
Chow Test		Hausman Test		Durbin-Watson	LM de Breusch-Godfrey	
Statistics	Prob(F-statistic)	Statistics	p-value	Statistics	Statistics	Prob(F-statistic)
13.2165	0.0000	49.8050	0.0000	1.7439	36.4952	0.0000

*In which **ΔGPNR** is the financial settlement of unrealized gains and losses recorded as other comprehensive income, relative to the financial instruments classified as AFS or FVOCI, of bank i ,in the quarterly period t, divided by the total assets.*
Source: *Research data*

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4.3 Estimated version of the model

Thre model (3.1) was estimated when conducting the empirical tests to reach a conclusion about the H_1 and H_2 research hypothesis. Following the robustness tests outlined in Section 4.2, the estimate can be made with the aid of panel data, fixed effects in cross-sectional data and the panel corrected standard errors (PCSE) method. The results of the estimates are summarized in Table 4.

Table 7

Results of the estimated version of the model (3.1)

Model tested:
$\Delta GPNR_{it} = \beta_0 + \beta_1 LAIRaj_{it} + \beta_2 CapInf_{it} + \beta_3 LAIRaj_{it} * CapInf_{it} + \beta_4 IFin_{it} + \beta_5 Tam_{it} + \beta_6 IFRS9_t + \beta_7 Hiato_t + \varepsilon_{it}$ [* change punctuation of fractions below e.g.> 0.046/ 0.00061

Regressors	Coefficient	p-value
C	0,0461***	0,0006
LAIRaj	- 0,0537	0,2811
CapInf	0,0011***	0,0021
*LAIRaj * CapInf*	- 0,1902***	0,0001
Ifin	- 0,0024**	0,0705
Tam	- 0,0044***	0,0013
IFRS9	- 0,0003	0,3539
Hiato	0,0970***	0,0000
Nº observations		1.871
R2		0,4686
R2 Adjusted		0,4454
F statistic		20,2566
Prob(F-statistic)		0,0000

*In which $\Delta GPNR$ is the financial settlement of unrealized gains and losses recorded as other comprehensive income, relative to financial instruments classified as AFS or FVOCI, of bank i, in the quarterly period t, divided by total assets; **LAIRaj** is pre-tax profits adjusted by the exclusion of the effects of the financial settlement of the unrealized gains and losses recorded as other comprehensive income, of bank i, in the quarterly period t; divided by total assets; **CapInf** is the dummy variable, assuming 1 for the banks i, which, at the time t, record the regulatory capital index (the relation between net equity and total assets) which can be found in the lower quintile and 0 for the others; **IFin** total of financial instruments excluding loans and funding, of bank i, at the time t, divided by the total assets; **Tam** is the natural logarithm of the total assets at the beginning of the quarter for institution i, at time t; **IFRS9** is the dummy variable which represents the period when the IFRS9 is implemented assuming 1 from the 1st quarter of 2018 to the 1st quarter of 2020 and 0 for the others; **Hiato [Gap]** corresponds to the output gap, calculated by the application of the Hodrick-Prescott filter to the quarterly average of the real GDP at market prices.*
*Levels of Significance: *** to 1%; ** to 5%; e * to 10%*
Source: *Research data*

In contrast with the findings of Barth et al. (2017), Dong and Zhang (2017) and Aland and Burks (2019), the results of the estimated version of the model provide evidence that, in the case of the consortium of Latin-American banks in the sample under study, it cannot be stated that the gains and losses through financial instruments carried forward to other comprehensive income can be used for the purposes of earnings management since there is a lack of statistical significance for the **LAIRaj** variable In light of this, the H_1 research hypothesis that Latin American banks use these transactions for earnings management can be refuted.

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These results provide evidence that even though this practice is adopted by some entities, it is not something that can be generalized as a behavioral pattern.

In the case of the H_2 research hypothesis which determines whether Latin American banks use gains and losses through AFS or FVOCI financial instruments for capital management, the empirical tests revealed that the banks with smallest capital índices (**CapInf**) record realizable values of financial gains and losses which were previously accumulated as other comprehensive income. Although this financial settlement does not alter the value of the Net Equity (the regulatory capital requirement), it improves the capital indicators by reducing the total amount of risk-weighted assets (RWA), which are the denominated capital índices. In other words, the findings show that banks with smaller capital índices lead to the management of this capital through the disposal of the AFS or FVOCI instruments, as well as reducing the RWA and improving the regulatory capital indicators in line with the studies by Santos (2007), Gabriel and Corrar (2010) and Barth et al. (2017).

Additional evidence can be obtained by means of the interaction variable between **LAIRaj** and **CapInf**, which had a significant negative value. This provides evidence that in the case of banks with smaller capital índices, there are clear signs of the practice of capital management by means of unrealized gains and losses recorded as other comprehensive income through financial instruments classified as AFS or FVOCI. This evidence suggests that banks with the lowest level of capital, can be granted an opportunity to manage earnings, while seeking to signal a situation of financial stability and strength to the economic agents, including the regulators of the financial market. The negative signal that appeared confirms the findings of Barth et al. (2017) and illustrates the need for *income smoothing*, or rather, the accumulation of gains (or losses) such as other comprehensive income in periods of greater (or lower) profitability, while seeking to overturn them in the future through operational decisions for the sale of these instruments, in a way that can maintain a degree of financial stability with regard to profits.

As well as confirming the underlying assumptions of H_2 for the Latin-American banking sector, these findings corroborate the evidence provided by Barth et al. (2017) and Aland and Burks (2019) for the US environment. They also support the results obtained by Santos (2007), in the domain of Brazilian banking, where the financial instruments can be used for capital management.

With regard to the control variables, the tests at first reveal a negative link between the representative equity of the financial instruments excluding loans and funding (**Ifin**) and the dependent variable relative to the realization of gains and losses previously recorded as other comprehensive income. This suggests that the entities with a greater proportion of financial instruments depend less on these gains and losses through the AFS or FVOCI instruments, since in contrast with the findings of Barth et al. (2017) and Aland and Burks (2019), they can be combined with a larger consortium of alternative banks.

The same result can be found with regard to the variable that represents the size of the banks (**Tam**), or in other words, which states that the larger the entity, the lower the representativeness of gains and losses through financial instruments carried over to other comprehensive income. This pattern of behavior can be attributed to the fact that owing to their economies of scale and diversified portfolios, as well as their broader reach, the banks are able to make use of other instruments, operations and mechanisms to achieve their performance goals.

The lack of a statistical significance for the **IFRS9** variable is evidence that the validity of the new accounting standards for financial statements starting from 2018, has not altered the extent to which gains and losses are realized through the AFS or FVOCI instruments, unlike

the findings of Lejard (2016) for the European banking sector. Finally, the results with regard to the **HIATO [Gap]**, variable, characterized by the difference between the real and potential GDP of the countries of origin of the banks that belong to the sample, demonstrate that the financial settlement of gains and losses through financial instruments carried over to other comprehensive income, are more significant in periods of greater economic growth in terms of their potential GDP.

5 Final considerations

The objective of this study was to determine whether financial institutions in Latin America make use of unrealized gains and losses through financial instruments carried over to other comprehensive income – classified as AFS or FVOCI, in accordance with the validity of the applicable accounting standards – for the purpose of capital and earnings management and by means of a selective trading of these assets. This involved analyzing data from 75 banks located in 13 Latin-American countries from 2008 to the first quarter of 2020.

The results of the empirical tests showed that although there were no signs of Latin American banks adopting the practice of earnings management by means of the financial realization of gains and losses carried over through other comprehensive income, this strategy can be viewed as statistically relevant to those entities that have the worst regulatory capital índices. In other words, this selective trading mechanism can be deployed to encourage income smoothing and *earnings management*, which can be combined with the more powerful incentives of these entities, can be regarded as a sign of greater stability in its capacity for earnings management and the regulation of solvency and private equity.

It was also found, with a degree of consistency, that the banks that occupy the last quintile (regarding levels of regulatory capital), are those that achieve financial gains through AFS and FVOCI instruments, by reacting to the need to make an improvement in the capital indicators. Although this selective trading does not increase the value of the net assets because the other comprehensive income, (now recorded in the earnings), has already been recognized in the equity of the entity, it improves the capital index by reducing the risk-weighted assets (RWA) – the denominator of the indicator.

The research contributions made by this study to the literature include the following key factors: i) a broader investigation of earnings management in banks by means of operational choices – the most common in the banking literature being the examination of the use of discretionary *accruals* for this purpose; ii) an assessment of capital management on the basis of decisions that affect the PR denominator, represented by risk-weighted assets, and specifically concentrated on studies of earnings management; iii) the examination of a key set of banking entities from Latin America – a region which is not noted for studies of its specific features owing to the fact that studies tend to be concentrated on the US banking sector; and iv) a test of the validity of the phenomenon within the domain of international accounting standards, together with an attempt to identify possible features that can explain the practice of income smoothing and capital management.

It should be stressed that the models and variables put forward are based on the specific features of the banking sector in Latin America and that these are not applicable, in a direct way, to another context without due adjustments. For this reason, it is recommended that further tests be carried out to test the validity of the designed model and the research hypotheses in other banking markets, together with tests with other *proxies* to determine the behavior of managers when involved in the financial realization of gains and losses carried over to other comprehensive income.

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