


## Persistence of earnings and the fair value in non-financial companies: evidence from Latin America


Persistência do lucro e o valor justo em empresas não financeiras: evidência da América Latina

Persistencia de la utilidad y el valor razonable en las empresas no financieras: evidencia de América Latina


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### Abstract

Previous studies that linked earnings persistence to the presence of assets measured at fair value investigated financial companies in more developed markets, who found evidence that the use of fair value improves earnings persistence. In this study, the relationship between earnings persistence and the presence of assets measured at fair value of non-financial companies in Latin America was investigated, confirming the originality of the research. Regressions with panel data were applied to a sample of non-financial companies from 2010 to 2018. The results of this work indicate that there is a lower persistence of earnings for non-financial companies that use fair value, regardless of the level of the hierarchy, resulting in loss of predictive ability of earnings when associated with fair value. These results can be useful to analysts, investors, and other stakeholders who use accounting for performance forecasting purposes. Finally, this study can further encourage the discussion about the use of fair value in accounting.

**Keywords:** Fair Value; Earnings; Persistence

### Resumo

Estudos anteriores que associaram a persistência do lucro à presença de ativos mensurados pelo valor justo investigaram empresas financeiras em mercados mais desenvolvidos, os quais encontraram evidências de que, o uso do valor justo melhora a persistência dos lucros. Neste estudo, foi investigada a relação entre a persistência do lucro e a presença de ativos mensurados pelo valor justo de empresas não financeiras da América Latina, conferindo a originalidade da pesquisa. Foram aplicadas regressões com dados em painel para uma amostra de empresas não financeiras de 2010 a 2018. Os resultados deste trabalho indicam que há uma menor persistência do lucro de empresas não financeiras que usam valor justo, independentemente do nível da hierarquia, implicando em perda da capacidade preditiva do lucro quando associado ao valor justo. Esses resultados podem ser úteis para analistas, investidores e outros *stakeholders* que usam a contabilidade para fins de previsão do desempenho. Finalmente, este estudo pode fomentar ainda mais a discussão acerca do uso do valor justo na contabilidade.

**Palavras-chave:** Valor Justo; Lucro Líquido; Persistência

## Resumen

Estudios previos que vincularon la persistencia de las ganancias con la presencia de activos medidos a valor razonable investigaron compañías financieras en mercados más desarrollados, quienes encontraron evidencia de que el uso del valor razonable mejora la persistencia de las ganancias. En este estudio se investigó la relación entre la persistencia de utilidades y la presencia de activos medidos a valor razonable de empresas no financieras en América Latina, lo que confirma la originalidad de la investigación. Se aplicaron regresiones con datos de panel a una muestra de empresas no financieras de 2010 a 2018. Los resultados de este trabajo indican que existe una menor persistencia de utilidades para las empresas no financieras que utilizan el valor razonable, independientemente del nivel de jerarquía, resultando en la pérdida de la capacidad predictiva de las ganancias cuando se asocian con el valor razonable. Estos resultados pueden ser útiles para analistas, inversores y otras partes interesadas que utilizan la contabilidad para predecir el rendimiento. Finalmente, este estudio puede fomentar aún más la discusión sobre el uso del valor razonable en la contabilidad.

**Palabras clave:** Valor Razonable; Ingresos netos; Persistencia

## 1 Introduction

The adoption of international accounting standards brought several changes in accounting practice and, consequently, in accounting information. Among the alterations, the measurement of assets at fair value is a subject that has been receiving attention from accounting research, as it allows generating information that is closer to the economic value of the asset and, also, more relevant to the users (Barth, 2018; Wukich, 2019). However, the discretion that managers have when preparing this type of information can cause a loss of reliability in the accounting reports (Ball, 2006), or, even, the non-acceptability when there is no active market (Iudícibus & Martins, 2007); the authors explain that the lack of objectivity and consistency when using discounted cash flows to measure fair value can result in high uncertainty in evaluating the information.

Some recent studies (Curtis & Raney, 2018; Ehalaiye et al., 2017; Hsu et al., 2018) have focused on investigating the relationship between the use of fair value in several aspects. For example, the study by Yao et al. (2018) provides evidence that the application of fair value to assets measured by level 1 increases the persistence of earnings in banks, while levels 2 and 3 of the fair value hierarchy do not allow the same relationship. The measurement at fair value by levels 2 or 3 requires assumptions that may or may not be publicly available, which implies greater discretion on the part of managers. If there is little or no source of validation for these assumptions, the possibility of earnings management maneuvers opens up (Alaryan et al., 2014).

Furthermore, the manager can use accounting methods that increase the result for the period aiming at higher bonuses (Watts & Zimmerman, 1986), which can occur through manipulation of discretionary accruals (Bernard & Skinner, 1996). There is still a discussion about earnings management based on the use of fair value as a measurement basis, but focused on the securitization of assets (Dechow et al., 2010; Barth & Taylor, 2010). In addition, some studies investigated how the management decisions aimed at smoothing the result can influence earnings persistence (Tucker & Zarowin, 2006; Dechow et al., 2010; Kolozsvari & Macedo, 2016; Kajimoto et al., 2019).

Regarding the persistence of profits, Brunozi Júnior et al. (2017) investigated the countries: Argentina, Brazil, Chile, Colombia, Mexico and Peru. The authors confirmed the presence of persistent earnings only for Argentina, Colombia and Mexico, and stated that the adoption of international accounting standards by itself does not increase the quality of the financial statements, and institutional factors also influence accounting information.

Considering that the adoption of the International Financial Reporting Standards (IFRS) implies a greater use of fair value as a measurement basis, the investigation of this valuation measure in the context of earnings quality can be healthy. Although the research by Yao et al. (2018) accepted the hypothesis about the use of fair value to improve earnings persistence, its results are limited to banks. Due to their operational nature, companies in the financial sector are expected to have a greater proportion of assets measured at fair value relative to total assets. Furthermore, the banking sector is highly regulated and supervised, which has some effect on persistence (Alves & Macedo, 2020). But what about non-financial companies? Can it be said that fair value increases the persistence of earnings in non-financial companies? These doubts refer to a gap in the literature on earnings persistence associated with the measurement of fair value, notably for non-financial sectors<sup>1</sup>. In addition, the presence of incentives allied to the use of fair value on a smaller scale, characteristics of the sector, and less rigorous inspection by institutions can facilitate the opportunistic use of fair value measurement, resulting in a negative effect on earnings persistence.

Therefore, the objective of this article is to investigate the impact of measuring assets at fair value on the earnings persistence of non-financial companies in Latin America. In this sense, it is relevant to study non-financial entities, even if the use of fair value is lower in relation to banks, since IFRS apply to both groups. The study may be relevant to analysts and other investors who follow publicly traded companies, who may make their earnings forecasts for investment valuation purposes. It is noteworthy that market

analysts monitor the quality of earnings (Dechow & Schrand, 2004), which implies assessing the persistence of earnings.

The findings of this study contribute to the financial accounting literature, more specifically with regard to the use of fair value measurement, and its effect on earnings persistence. It is noteworthy that the literature on the effect of fair value on earnings persistence is still incipient, which reinforces the need for studies in this area, including for non-financial sectors. Previous studies that related the fair value and the quality of accounting information are contradictory, and the results of this work can contribute to this discussion.

## 2 Previous Studies and Theoretical Reference

The detachment of the holder of capital and its assets made up the scenario in which accounting was inserted as a mechanism of accountability through financial statements. The process of preparing the financial statements, for most Latin American countries, is in accordance with IFRS, which allows the use of fair value. However, the use of fair value allows people to prepare information to have greater discretion, affecting the qualitative characteristics of accounting information.

### 2.1 Contractual Firm Theory, Agency Theory and Accounting

The definition of a firm, proposed by Coase in the 1937 article *The Nature of the Firm*, encompasses the combination of capital and organized labor with the aim of producing and marketing goods and services. (Coase, 1937). In this sense, individuals with capital, instead of acting directly in the market, act as agents for other individuals to whom they transfer their objectives, such as profit maximization, for example.

This separation between the proprietor and the firm composes the agency's problematization scenario. The economists Jensen and Meckling (2008) showed that when hiring agents to perform the intended activities, the principals (capital holders) incur conflicts of interest and risks of information asymmetry (Jensen & Meckling, 2008). In other words, by distancing themselves from the firm, the principal incurs greater management risks, which may require monitoring costs and accountability mechanisms. From this need of those interested in obtaining information about the firm, accounting emerges as an accountability mechanism. The accounting process, by which the financial statements are prepared, comprises the steps of recognition, measurement and disclosure of economic events.

However, the Positive Accounting Theory of Watts and Zimmerman (1986) predicts that the manager exercises his discretionary power in the face of accounting alternatives, due to human, utilitarian and rational nature. The authors explain that people seek to maximize their utility function, directing choices to their preferences and goals. In this sense, when the norm allows the manager to use such discretion, so that a reliable representation of economic facts is made, the opportunist theory of Watts and Zimmerman comes up against some discussions, such as the trade-off between relevance and reliable representation<sup>ii</sup>. This is what happens, for example, with fair value.

Another trade-off occurs in the Brazilian reality for banks. According to Alves and Macedo (2020), the profit according to the COSIF-BACEN<sup>iii</sup> standard has greater persistence, while the CPC-CVM<sup>iv</sup> profit is more timely and relevant. According to the authors, this result is consistent with the strong regulation and supervision of the banking sector.

### 2.2 Fair Value

In Brazil, the formal definition of fair value is established by technical pronouncement CPC 46 (IFRS 13), being a market-based measurement and not an entity-specific measurement. However, not all these assets or liabilities have market observations. For example, an entity should use level 2 when there is information, other than level 1 quotations, observable in the market that directly or indirectly interferes with the price of the asset or liability to be measured.

However, when there is no observable market information, whether level 1 or 2, the entity shall proceed with the best measurement estimate that reliably represents the cash inflows or outflows that would be obtained from the settlement of the measured object - level 3. - . If, on the one hand, accounting for assets at fair value can increase the relevance of accounting information by bringing information closer to the market to the user, on the other hand, the discretion allowed in levels 2 and 3 of the hierarchy can reduce its reliable representation. National and international research has sought to highlight the impacts of accounting at fair value.

Ball (2006) points out criticisms of fair value accounting when considering that it can be a concern, especially in less developed economies. Firm managers face strong incentives to deliver results, and are pressured by auditors, regulators, courts and politicians, resulting in a possible change in accounting numbers. Evidence unfavorable to the use of fair value is cited by Wang and Zhang (2017). When analyzing the debt structure of US companies in the period 2008-2013, they demonstrated an association between the measurement of assets at fair value, mainly classified in hierarchies 2 and 3, and the issuance of debt

securities convertible into shares. Research findings suggest that fair value accounting increases the agency cost of contracting debt (Wang & Zhang, 2017).

The greater discretion in the measurement of fair value may imply a less reliable representation of the accounting information, which could explain the higher cost observed by the authors. According to the conceptual structure, the main characteristics of a reliable representation are: complete, neutral and error-free representation. Neutrality implies the absence of bias, that is, information that is not manipulated (PRONUNCIAMENTOS BÁSICOS, 2022).

From the point of view of the accounting information user, a concern with the fair value of hierarchies 2 and 3 is related to valuation errors, resulting from the presence of some bias. This measurement technique is based on the estimation of the exit or settlement value, which would be obtained in hypothetical situations, whose parameters are established by the standard. Thus, in the absence of an active market, fair value estimates for assets without an active market may contain errors (Eckel et al., 2003).

These limitations related to the use of fair value are not recent. In fact, there is a debate in the literature between historical cost and fair value. While the first is associated with reliable representation and objectivity, the second stands out for its relevance. However, fair value measurement is criticized when there is too much subjectivity, resulting in a less reliable representation of the information.

On the other hand, recent studies reject these statements, showing that fair value represents a more adequate alternative, when compared to historical cost. One criticism of historical cost is its low relevance on the balance sheet. In addition, the revaluation of assets at fair value allows disclosing a balance sheet with economic significance of the assets (Wukich, 2019). That said, the use of fair value is expected to interfere with earnings quality.

### 2.3 Earnings Persistence

In the accounting literature, the term earnings persistence can be found in the article Earnings Persistence by Frankel and Litov (2009), defined as a statistical estimation model in which the dependent variable future earnings can be explained by current earnings. In other words, persistence is related to the predictive ability of profit. Recent studies have investigated the relationship between earnings persistence and different characteristics of financial statements.

Among the recent examples in the national literature is the research by Silva et al. (2017), who analyzed earnings persistence by measuring the ability of current earnings to predict future earnings, before and after the adoption of IFRS in Brazil. After analyzing the companies listed on B3 in the periods from 2003 to 2007 and from 2010 to 2014, the authors concluded that convergence to international accounting standards increased the persistence of earnings in Brazil.

In the same vein, the authors Santiago et al. (2015) measured the persistence of earnings in Brazil after the adoption of CPC 17, which directly impacted civil construction companies. The results indicated the presence of persistence only for the period prior to the adoption of IFRS, which means that the adoption of international standards reduced the quality of accounting information. Takamatsu (2011) observed persistence for accruals and cash flow components in the Brazilian market.

Profit smoothing is another element that may explain the persistence of the accounting result. It is known that one of the main incentives to smooth the result stems from the expectation of analysts and investors regarding the company's profits, which can lead management to make accounting choices to achieve market estimates. This is because earnings are accounting information that can contribute to predicting the company's future results (Kolozsvari & Macedo, 2016), and persistent earnings are more useful in evaluating investments. It is noteworthy that smoothing practices do not necessarily imply greater persistence of earnings (Kolozsvari & Macedo, 2016; Kajimoto et al., 2019).

For Latin America Brunozi Júnior et al. (2017) investigated the relationship between earnings management, discretionary accruals and the persistence of accounting earnings. When investigating 242 Brazilian companies from 2003 to 2015, the researchers found evidence that the management of accounting information can decrease the persistence of earnings.

Still in the international literature, Yao et al. (2018) investigated the relationship between earnings persistence and the presence of assets measured at fair value in the financial statements disclosed. The authors manually collected data from the financial statements of banks for the periods from 2009 to 2013, and concluded that the use of fair value to measure financial instruments increases the persistence of earnings. As this measurement technique can be classified into three different hierarchical levels, the researchers also investigated whether such classification interferes with persistence. The results allowed us to conclude that assets measured at fair value level 1 are associated with a positive persistence of earnings.

The research findings by Yao et al. (2018) contribute to the understanding of the relationship between fair value and earnings persistence. However, as they only analyze companies from a specific sector of the economy, the question is raised about the other sectors. Differences between the economic activities of the sectors, the composition of assets measured at fair value, and the various events that can be measured at fair value, intensify the uncertainty regarding the impact of this accounting technique on the quality of earnings.

## 2.4 Research Hypotheses

The construction of the hypotheses of this paper is based on the Positive Accounting Theory of Watts and Zimmerman (1986), in addition to the discretion allowed by CPC 46, with regard to fair value. The justification for this research is based on the understanding that the low proportion of the use of fair value in relation to total assets can also motivate the behavior of managers. It is noteworthy that all levels of the fair value hierarchy may be relevant to investors, which justifies the study of assets at fair value of low proportion (Song et al., 2010; Lu & Mande, 2014).

In addition, companies in non-financial sectors may be subject to less stringent supervision, depending on the impact of their actions on economies. For example, discontinued food and beverage companies could have some effect on the economy, but what about bank failures? The failure of banks can be explained by several factors, including the event called “systemic risk”<sup>v</sup>, which could result in an international financial crisis.

In this sense, it is necessary to create mechanisms that stop systemic risk, that is, financial regulation of the banking sector must be exercised, a task of authorities of the financial system (Alves Pinto, 2015). This figure is not present in the non-financial sectors, which are investigated by this research.

Another aspect taken into account in the construction of hypotheses is the possibility of managers being pressured to deliver results (Bernard & Skinner, 1996), motivated by the maximization of their own utility (Watts & Zimmerman, 1986). In this sense, the discretion exercised by managers can be expressed in fair value, due to possible opportunistic intentions. Thus, the biased use of fair value may be associated with a lower quality of accounting information, as measured by lower earnings persistence.

Although Yao et al. (2018) have observed greater persistence, their result is restricted to level 1 and for banks, a highly regulated sector. In the case of levels 2 and 3 of the fair value hierarchy, the presence of assumptions enables earnings management maneuvers (Alaryan et al., 2014), which contributes to reducing the predictive power of earnings.

Finally, the countries investigated in this research are from Latin America, and most are of civil law origin. It is known that the legal system of these countries can influence their institutional aspects, for example, the legal protection granted to investors, the degree of enforcement, the level of capital market development, and the quality of accounting information. With regard to countries of civil law origin, La Porta et al. (1998) concluded that, on average, these environments have low legal protection for investors, which can negatively influence the quality of accounting information. Therefore, the following research hypothesis is proposed:

**H1: The measurement of assets at fair value in non-financial companies is associated with lower earnings persistence.**

The investigation of H1 may provide evidence about the impact of using fair value more generally, however, the methodological difference between the hierarchies requires separate treatment of different levels of fair value. Barth et al. (1995) carried out a review of the capital market literature and investigated the usefulness of fair value for investors. The conclusions of their paper showed that fair value is informative, but the quality of the information is affected by the amount of measurement errors and the source of the estimates (Barth et al., 1995). In this sense, given the nature of estimating the hierarchical levels of fair value, it is fair to investigate the impact on persistence individually, that is, for each of the levels.

With regard to fair value, it is known that only level 1 of the hierarchy does not allow judgment by the person responsible for the financial statements, which can increase the reliable representation of the information. However, the lack of a reliable source for estimates, necessary for the other levels, reinforces the need for separate treatment (Barth et al., 1995). Yet, Yao et al. (2018) observed that fair value level 1 is associated with a positive persistence of earnings.

To this end, the following hypothesis was proposed to analyze the impact on earnings quality caused by measuring at fair value at level 1 of the hierarchy:

**H2: The measurement of assets at fair value level 1 of the hierarchy, in non-financial companies, is associated with a greater persistence of earnings.**

On the other hand, the fair value of hierarchies 2 and 3 may be of concern to external users, as the fair value estimates without an active market may contain errors. (Eckel et al., 2003). In addition, in the case of measuring investments without an active market, managers can postpone the incorporation of new information into revaluations of assets measured at fair value, in order to smooth the results (Curtis & Raney, 2018). This expectation is consistent with the result of Yao et al. (2018), who did not observe persistence for levels 2 and 3 of the fair value hierarchy. For companies in non-financial sectors, a similar result is expected. Therefore, hypothesis 3 can be described:

### H3: The measurement of assets at fair value levels 2 and 3 of the hierarchy, in non-financial companies, is associated with lower earnings persistence.

The data and tests used to investigate these hypotheses are presented in the next section of this paper. As will be shown, for the collected sample, statistical tests were applied separately for two different models.

### 3 Data and Methodology

Using Standard Poor's Capital IQ Database®, data were collected from financial statements of non-financial companies for the period from 2010 to 2018, from Latin American countries, totaling 740 companies that made up the initial sample of this study. Asset fair value data were collected directly from the Capital IQ database, including the ones separated by levels. The tables 1 and 2 show the number of companies observed by country and by sector.

Table 1  
**Count of companies by country**

Country		
Argentina	78	10,54%
Brazil	294	39,73%
Chile	163	22,03%
Colômbia	59	7,97%
Equador	14	1,89%
Falkland Islands	1	0,14%
Peru	104	14,05%
Suriname	1	0,14%
Uruguay	3	0,41%
Venezuela	23	3,11%
Total	740	100,00%

Source: Prepared by the authors

Table 2  
**Count of companies by sector**

Sector		
Communication	35	4,73%
Basic Consumption	123	16,62%
Discretionary Consumption	125	16,89%
Energy	27	3,65%
Properties	40	5,41%
Industries	106	14,32%
Materials	138	18,65%
Health	23	3,11%
IT	12	1,62%
Utilities	106	14,32%
Unidentified	5	0,63%
Total	740	100,00%

Source: Prepared by the authors

Companies classified as “Unidentified” correspond to lines without information about the sector of the file extracted from the consulted database. As there is no significant change in the results of tests performed with and without such observations, it was decided to keep them. The collected data were organized into a panel and input into the Stata® software, in which the statistical tests summarized in the following sections were performed. Table 3 summarizes some information about this process.

Table 3

**Count of observations by period**

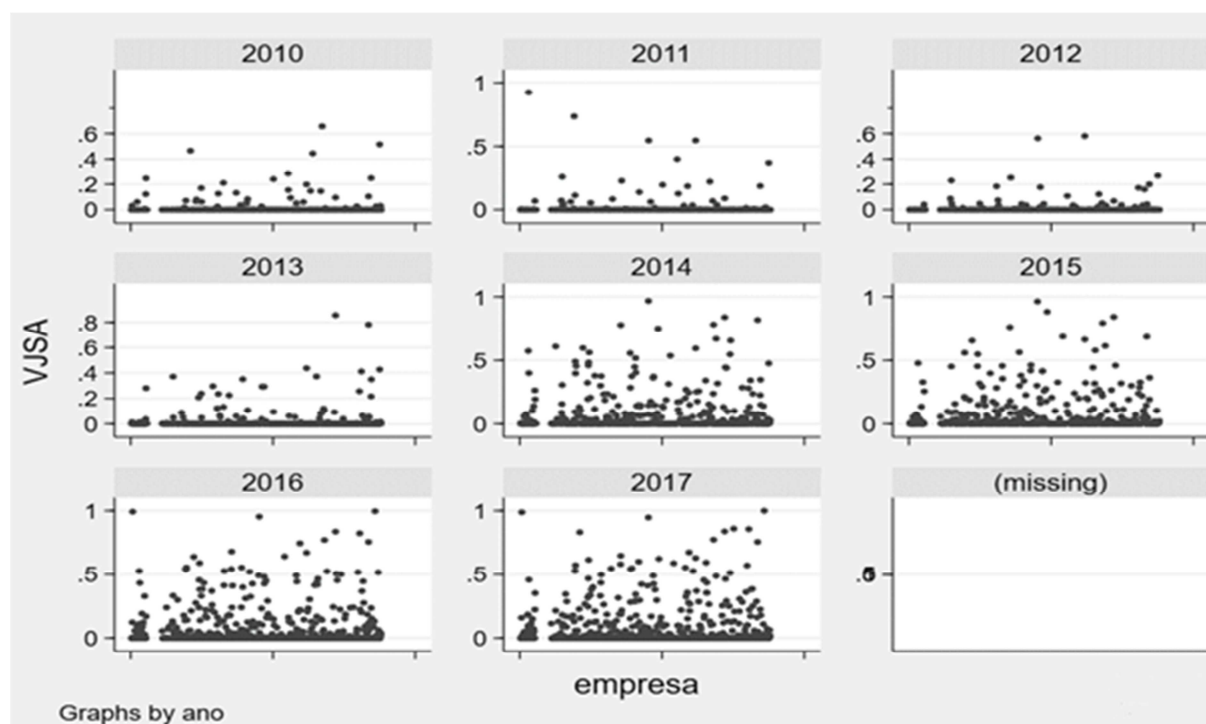
Year	Number of Observations		Fair Value Observations	
2010	626	84,59%	50	7,99%
2011	637	86,08%	47	7,38%
2012	637	86,08%	54	8,48%
2013	639	86,35%	83	12,99%
2014	645	87,16%	241	37,36%
2015	643	86,89%	245	38,10%
2016	645	87,16%	292	45,27%
2017	638	86,22%	309	48,43%
	5.110	86,32%	1.321	25,85%

Source: Prepared by the authors

Of the 740 companies observed in each period, only 626, in 2010, had available information, which corresponds to 84.59%. 5,920 observations were expected, 740 companies times 8 years, however only 5,110 were actually observed (86.32%). As the number of observations is not constant over the periods, the constructed panel can be classified as unbalanced and, as the number of periods studied is smaller than the number of observations collected, also as short.

The application of the model, as will become clear in the following sections, requires the use of a lagged variable and, therefore, the 2018 period was excluded from the panel, only the variable used in the model being preserved. However, not all companies observed in each period had assets measured at fair value on their balance sheets. Of the 5,110 observations collected, 1,321 contained some asset measured at fair value, which corresponds to 25.85% of the observations.

To measure the proportion of assets measured at fair value, the variable VJSA was created, which corresponds to the result of dividing assets measured at fair value by total assets. As discussed in the previous sections, the proportion of assets measured at fair value is expected to be lower in companies in non-financial sectors. Figure 1 summarizes the observations of the VJSA variable for each company over the years studied.



**Figure 1 - Dispersion of Proportions of Assets Measured by Fair Value of Latin American Companies from 2010 to 2018**

Source: Prepared by the authors with the help of Stata software.

As expected, the observations are concentrated in low proportions, close to zero, especially in the years 2010 to 2013. This may justify the construction of the variable of interest in this study, which takes into account the presence or not of assets measured by FV in the disclosed balance sheet. Considering that the studied sample is predominantly composed of observations in which this proportion is low, close to zero, a statistical model that considers this ratio could have little statistical significance and coefficients closer to

zero. Therefore, in this study, the dummy variable, which will be discussed in more detail in the following parts of this article, presents results that are more suitable for the analysis.

To assess the effect of fair value on earnings persistence, a methodology based on studies by Yao et al. (2018). The following model was used to examine whether fair value exposure is related to earnings persistence (Research Hypothesis 1) (Yao et al., 2018):

#### Model 1:

$$LSA_{i,t+1} = \alpha + \beta_1 LSA_{it} + \beta_2 VJ_{it} + \beta_3 LSA\_VJ_{it} + \beta_4 SIZE_{it} + \varepsilon_t$$

Where:

$\alpha$  is the constant or intercept,  $LSA_{i,t+1}$  is the profit on total assets in the period immediately after the one being analyzed,  $LSA_{i,t}$  is the profit on total assets in the analyzed period,  $VJ$  is the dummy variable that receives 1 when the company has an asset measured at fair value at that time, and zero for the other cases,  $LSA\_VJ$  is the interaction between the variables  $LSA$  and  $VJ$ ,  $Size$  is the natural logarithm of total assets, and  $\varepsilon$  is the error term.

Earnings persistence will be identified and estimated by the  $\beta_1$  coefficient. The variable of interest,  $LSA\_VJ$ , consists of the interaction between  $LSA$  and  $VJ$ . It reveals the effect of fair value on earnings persistence, which can be visualized by simplifying and reorganizing model 1:

$$(i) \quad \beta_1 LSA_{it} + \beta_2 VJ_{it} + \beta_3 LSA\_VJ_{it}$$

$$(ii) \quad LSA_{it}(\beta_1 + \beta_3 VJ_{it}) + \beta_2 VJ_{it}$$

$$(iii) \quad LSA_{it}(\beta_1 + \beta_3 \times 1) + \beta_2 VJ_{it}$$

$$(iv) \quad LSA_{it}(\beta_1 + \beta_3) + \beta_2 VJ_{it}$$

Equation (ii) highlights  $LSA$ , and for cases of measurement at fair value, the dummy variable  $VJ$  assumes 1, as observed in (iii). Therefore, the effect of fair value on earnings persistence is given by  $(\beta_1 + \beta_3)$ . Given that the circumstances of opportunistic management would reflect a worsening in the quality of accounting information, the negative sign for the coefficient of the variable of interest,  $LSA\_VJ$ , would validate Research Hypothesis 1.

Then, to identify whether the different levels of the fair value hierarchy interfere with earnings persistence (Research hypotheses 2 and 3), the following model was applied:

#### Model 2:

$$LSA_{i,t+1} = \alpha + \beta_1 LSA_{it} + \beta_2 VJn1_{it} + \beta_3 VJn2_{it} + \beta_4 VJn3_{it} + \beta_5 LSA\_VJn1_{it} + \beta_6 LSA\_VJn2_{it} + \beta_7 LSA\_VJn3_{it} + \beta_8 SIZE_{it} + \varepsilon_t$$

Where:

$\alpha$  is the model constant or intercept,  $LSA_{i,t+1}$  is the profit on total assets in the period immediately after the one being analyzed,  $LSA_{i,t}$  is the profit on total assets in the analyzed period,  $VJn1$  is the dummy variable which receives 1 when the company has an asset measured at fair value level 1 of the hierarchy at that time, and zero for the other cases, similar reasoning was applied to levels 2 and 3, represented in the model by  $VJn2$  and  $VJn3$ .  $LSA\_VJn1$  is the interaction between the variables  $LSA$  and  $VJn1$ . Again, the same reasoning was applied, and the interaction of the variables that represent the other levels of fair value are  $LSA\_VJn2$  and  $LSA\_VJn3$ .  $Size$  is the natural logarithm of total assets, and  $\varepsilon$  is the error term. The size variable is a characteristic that can influence earnings persistence (Yao et al., 2018).

The analysis of Model 2 is performed in a similar way to that of Model 1, with the variables of interest being:  $LSA\_VJn1$ ,  $LSA\_VJn2$  and  $LSA\_VJn3$ . The signs of the coefficients  $\beta_5$ ,  $\beta_6$ ,  $\beta_7$  will indicate the increase or decrease in earnings persistence caused by the presence of assets measured at fair value in their different hierarchical levels, provided they are statistically significant. Hypothesis 2 will be validated if the  $\beta_5$  coefficient is statistically significant and positive. The application of fair value level 1 of the hierarchy can result in higher quality information for investors (Barth et al., 1995; Yao et al., 2018).

The test of hypothesis 3 will be done by the combined analysis of the coefficients  $\beta_6$  and  $\beta_7$ , and it is expected that both have negative signs for validation, or even a reduction of the coefficients. This expectation is explained by the possibility of measurement errors (Eckel et al., 2003; Alaryan et al., 2014), and a weak institutional environment in civil law countries. (La Porta et al, 1998). The countries investigated in this research are from Latin America, and most are of civil law origin. The legal system of these countries can influence their institutional aspects, including the quality of accounting information (La Porta et al., 1998; Armstrong et al., 2010). In the case of countries with lower levels of enforcement, the opportunistic behavior of managers is more pronounced in relation to other countries. One explanation may be institutional differences between countries, which can influence the results (Pirveli & Zimmermann, 2019).

Then, the investigation of some statistical assumptions was carried out. To test the omission of a relevant variable, the Regression Specification-Error Test (RESET) test was applied, which indicated



consistency in this sense. Additionally, the Breusch-Pagan test was applied, which indicated constancy of variance, and the VIF statistic, Variance Inflation Factor, which resulted in a mean equal to 1.04 for the variables, suggesting the absence of multicollinearity. The regression was operationalized with the data organized in a panel, fixed and random effects estimators were applied.

As the number of observations is relatively high, more than five thousand, to test the normality of the residuals, the Shapiro Francia test was applied, which allowed accepting the hypothesis that the sample comes from a normal population, which is the test chosen for its compliance with the amount of observations collected and analyzed.

#### 4 Results and Discussions

Initially, the descriptive statistics table for LSA and Size is presented (table 4), in order to have knowledge of the behavior of these variables over the period studied.

Table 4

##### Descriptive statistics

	Average		Standard deviation	
	LSA	Size	LSA	Size
2010	-0,03	7,97	1,36	3,22
2011	-0,18	8,02	2,90	3,30
2012	-0,04	8,17	0,88	3,22
2013	-0,05	8,37	0,79	3,14
2014	0,00	8,45	0,74	3,14
2015	-0,06	8,53	0,99	3,19
2016	-0,14	8,52	2,37	3,22
2017	-0,01	8,64	0,36	3,14
2018	-0,01	8,69	0,51	3,19

Source: Prepared by the authors.

Caption: LSA is earnings on total assets, and Size is the natural logarithm of total assets.

Finally, pooled regressions, fixed effects and random effects to the sample were tested. To guide the choice of the model used in this study, the Chow and Hausman tests were applied, both of which indicated better statistical qualities for the regression model with fixed effects. Table 5 summarizes the results of the model used to investigate H1.

Table 5

##### Test Results - Model 1

Variable	Signal	Coefficient		t	P>t
LSA	+	0.156033	***	17.13	0.000
VJ	-	0.030356		-1.41	0.160
LSA_VJ	-	0.250014	***	-3.67	0.000
Size	+	0.04526	***	2.87	0.004
Constant	-	0.482904	***	-3.98	0.000

Source: Prepared by the authors with the help of Stata ©

Caption: LSA is earnings on total assets, VJ is the dummy variable that receives 1 when the company has an asset measured at fair value at that time, and zero for other cases, LSA\_VJ is the interaction between the LSA and VJ variables, and Size is the natural logarithm of total assets. \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%

Unlike the results found by Yao et al. (2018) the applied statistical tests indicate a negative association between the presence of VJ and the persistence of profit. The positive sign and statistical significance of the coefficient of the variable LSA (0.156033) indicate the presence of earnings persistence, however, it is possible to make some considerations about the magnitude of such coefficient. Previous studies that observed persistence found coefficients with higher values. For example, Sloan (1996) evaluated the earnings persistence of US companies in the period from 1962 to 1991 and found a coefficient close to 0.8. With regard to studies concentrated in Latin American countries, the coefficients are lower. For example, Brunozi Júnior et al. (2017), who investigated some Latin American countries, from 2003 to 2015, found coefficients lower than 0.1, which is consistent with the results of this paper.

However, given the statistical significance and the sign of the coefficient of the variable of interest, LSA\_VJ, the presence of assets measured by VJ can decrease the persistence coefficient by -0.250014, as can be seen below:

$$(i) \quad LSA_{it}(\beta_1 + \beta_3 \times 1) + \beta_2 VJ_{it}$$

$$(ii) \quad LSA_{it}(\beta_1 + \beta_3) + \beta_2 VJ_{it}$$

$$(iii) \quad LSA_{it}(0.156 - 0.250) + \beta_2 VJ_{it}$$

$$(iv) \quad -0.094 LSA_{it} + \beta_2 VJ_{it}$$

As shown, the presence of assets measured at fair value is associated with a loss of earnings persistence, as the coefficient became negative (-0.094). The combined analysis of the variables LSA and LSA\_VJ allows us to conclude that, although persistence in the profits of the companies studied is observed, when selecting only those that have fair value in their assets, there is no evidence of persistence, which is inconsistent with the results shown by Yao et al. (2018).

An explanation for this result may be the set of countries studied, while Yao et al. (2018) analyzed companies in the financial sector, mainly from European and North American countries, this study investigated non-financial companies in Latin America. In this sense, Brown et al. (2014) point out differences in auditing and enforcement, associated with the origin of the legal system (common vs. civil law), which could justify such a difference. It is known that countries of civil law origin have low legal protection for investors, which can negatively influence the quality of accounting information in some jurisdictions that adopt IFRS (La Porta et al., 1998; Armstrong et al., 2010).

Continuing with the proposed investigation, the same statistical tests were applied to Model 2, in order to investigate hypotheses 2 and 3. The results are presented in table 6.

Table 6  
Test Results - Model 2

Variable	Signal	Coefficient		t	P>t
LSA	+	0.1554119	***	16.96	0.000
VJn1	-	0.323944		-1.11	0.267
VJn2	-	0.0036959		-0.13	0.894
VJn3	-	0.008372		-0.18	0.861
VJn1_LSA	-	0.1422999		-1.53	0.127
VJn2_LSA	-	0.1737642	*	-1.80	0.072
VJn3_LSA	-	0.3387901		-0.69	0.492
Size	+	0.0436041	***	2.77	0.006
Constant	-	0.4702791	***	-3.86	0.000

Source: Prepared by the authors with the help of Stata ®

Caption: LSA is profit on total assets, VJn1 is the dummy variable that receives 1 when the company has an asset measured at fair value level 1, and zero for the other cases, similar reasoning was applied to levels 2 and 3, represented in the model by VJn2 and VJn3, LSA\_VJn1 is the interaction between the variables LSA and VJn1. The same reasoning was applied, being the interaction of the variables that represent the other levels of fair value are LSA\_VJn2 and LSA\_VJn3. Size is the natural logarithm of total assets. \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%

For the investigation of hypotheses 2 and 3, the variables VJn1\_LSA, VJn2\_LSA and VJn3\_LSA were observed, whose coefficients are: 0.1422999, 0.1737642 and 0.3387901, respectively. Again, the results differ from those found in the research by Yao et al (2018), since all the observed signs are negative, suggesting that, regardless of the level of the fair value hierarchy used by non-financial companies, the effect on earnings persistence is negative. Furthermore, no statistical significance was observed for any of these variables.

An explanation for the lack of significance of the model may be the low presence of fair value in the sample. In this research, 5,110 financial statements were analyzed, of which only 1,321 (26%) had fair value. To illustrate the dimension and distribution of fair value observations in levels, table 7 has been organized

Table 7  
Fair Value by Levels Collected from Latin American Companies from 2010 to 2018

Year	Level 1	Level 2	Level 3	Levels 1 e 2	Levels 1 e 3	Levels 2 e 3	All levels	Total
2010	7	18	1	17	1	0	6	50
2011	5	15	0	20	0	0	7	47
2012	11	9	1	26	0	0	7	54
2013	16	30	1	27	0	0	9	83
2014	56	68	8	75	5	12	17	241
2015	52	70	5	80	9	12	17	245
2016	68	80	11	83	6	24	20	292
2017	75	85	8	91	6	28	16	309
Total	290	375	35	419	27	76	99	1.321
%	22%	28%	3%	32%	2%	6%	7%	100%

Source: Prepared by the authors

The highest concentration of fair value is composed of companies that held assets measured at levels 1 and 2 simultaneously (32%), followed by only level 2 (28%) and level 1 (22%). Consistent with the previous explanation, it is observed that the variable VJn2\_LSA showed weak significance (significant at 10%), reinforcing the need for more fair value observations, which could be done in future studies.

Therefore, the statistical tests applied to model 2 allow us to reject the hypotheses that the different levels of fair value have a different impact on the persistence of earnings of non-financial companies (Hypotheses 2 and 3), due to the lack of statistical significance. However, the unanimity of the negative signs of the coefficients suggests that, regardless of the level applied, the presence of fair value is associated with a worsening in earnings persistence.

The findings of this research suggest that the assets measured at fair value are associated with a lower persistence of accounting earnings. An explanation for this relationship is based on the opportunistic bias on the part of managers allowed by the discretion of the fair value norm according to the studies of Watts and Zimmerman (1986) and Bernard and Skinner (1996)<sup>vi</sup>. This result can be useful for investors, analysts and other users interested in evaluating the effect of fair value on the predictive capacity of earnings, since accounting information can be used for company valuation purposes. Finally, this paper can bring reflections about the qualitative characteristics of accounting information, especially the expectation of generating information with predictive value. In this case, empirical evidence of the absence of predictive value was presented for the presence of fair value in the earnings of non-financial companies in Latin American countries. With this, the following summary of the results can be presented in Table 8.

Table 8  
Summary of Results

Research hypotheses	Results	Justification
H1: The measurement of assets at fair value in non-financial companies is associated with lower earnings persistence	Hypothesis 1 is accepted, therefore, there is evidence of lower earnings persistence of non-financial companies that use fair value, regardless of the hierarchy level	The discretion allowed by the standard combined with the strong incentives under which managers are subject makes it possible for fair value accounting to be applied in a biased manner, reflecting a worsening in the quality of accounting information.
H2: The measurement of assets at fair value level 1 of the hierarchy, in non-financial companies, is associated with a greater persistence of earnings.	Hypothesis 2 is rejected, therefore, no distinct association is observed for the different hierarchical levels of fair value	Because there is no association between the variables, it is not possible to establish the proposed construction in the hypothesis
H3: The measurement of assets at fair value levels 2 and 3 of the hierarchy, in non-financial companies, is associated with lower earnings persistence	Idem H2	Idem H2

Source: Prepared by the authors

Finally, the results reveal the absence of predictive ability of earnings when associated with fair value, revealing a worsening in earnings persistence in Latin American companies, a weaker legal environment. However, the lack of persistence does not imply low relevance or reliable representation of accounting information, since the attributes of accounting information cannot be maximized equally. Therefore, it is recommended to extend this study to include other qualitative characteristics of financial information, for example, the relevance of accounting information.

These results can be useful to analysts, investors, and other stakeholders who use accounting to predict the performance of companies. In addition, this study can further the discussion about the use of fair value in accounting. The results of this research reveal that the application of fair value requires critical reflection, as the standards are constantly reviewed by the Board, consistent with the view that the set of international accounting standards can still be improved. Considering the recent example of the Post-implementation Review, IFRS 9 Financial Instruments, Classification and Measurement, there was a concern on the part of the Board to revise IFRS 9. Although the focus of the document has not been to discuss fair value per se, it is assumed that, in the Basis for Conclusions of IFRS 9, fair value provides the most useful information about the value, timing and uncertainty of cash flows arising from investments. However, this study reveals that fair value reduces the predictive capacity of profit in Latin America, which requires a critical assessment of the objectives of the standards and whether they are being achieved.

## 5 Final Considerations

With the adoption of IFRS, many studies began an investigation regarding the qualitative characteristics of accounting information. For example, Yao et al. (2018) found evidence that the use of fair value is associated with greater persistence of earnings in financial companies. However, the literature indicates that the quality of accounting information may be different, depending on the legal environment analyzed, in addition to other aspects. The objective of this study is to investigate whether the use of asset measurement at fair value impacts the persistence of accounting earnings in non-financial companies in Latin American countries. Despite observing a lower proportion of assets measured at fair value for non-financial companies, incentives for earnings management maneuvers may be present, which justifies further studies on this topic. Furthermore, companies in non-financial sectors may have less oversight, which can also influence the predictive power of earnings and fair value.

The results suggest a lower persistence of earnings in non-financial companies that use fair value, regardless of the hierarchy level. In addition, no distinct association is observed for the different hierarchical levels of fair value. The results of this research can contribute to the understanding of the effects of the use of fair value by non-financial companies, more specifically in Latin American countries. Considering the effect of fair value on the persistence of accounting earnings, it is proposed that investors and market analysts can benefit from the findings of this study, since persistence is related to the predictive capacity of earnings. In this sense, by demonstrating that fair value is associated with a lower persistence of earnings in non-financial companies in civil law countries, it is possible to raise questions about the reliable representation and relevance of the figures disclosed.

Future research can improve the understanding of the proposed construction, expanding the number of observations and testing other variables, for example, the variation in the fair value of the assets. The persistence of earnings in financial institutions in Latin America can still be investigated. In addition, future studies could apply the model considering Earnings Before Interest, Taxes and Amortizations, given that, for reasons of data availability, this study used the Net Income reported in the Income Statement for the year. This information may be subject to variations in the tax systems and interest curves characteristic of each country. Finally, a larger sample to cover countries of different systemic origins (common and civil law) would allow the application of segregated analysis, favoring the direct comparison of this effect.

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## NOTES

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The dataset that supports the results of this study is not publicly available.

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<sup>i</sup> A global study by Thomson Reuters Eikon found that the revenue of non-financial companies represents 84% of companies in all sectors except the energy sector, which shows the economic relevance of non-financial firms.

<sup>ii</sup> Management can use its judgment to provide more relevant information from an evaluation point of view, but as internal assumptions are used, the information can lose its reliable representation (Scott, 2012). The same discussion can be made from the conceptual structure through the qualitative characteristics relevance and reliable representation (PRONUNCIAMENTOS BÁSICOS, 2022).

<sup>iii</sup> Accounting Standard of Institutions Regulated by the Central Bank of Brazil.

<sup>iv</sup> Profit in accordance with International Financial Reporting Standards – IFRS.

<sup>v</sup> Systemic risk is associated with the risk that several banks will fail due to some specific event, for example, a bank run. In this case, the bank would not be able to satisfy the withdrawal demand of its account holders, causing its bankruptcy (Alves Pinto, 2015).

<sup>vi</sup> There is a difficulty in attesting to the quality of fair value, due to errors, existence of bias and randomness in estimates (Penman, 2007; Song, Thomas & Yi, 2010).