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Comparative analysis of accounting information quality amongst French, Brazilian and Latin American companies

Análisis comparativo de la calidad de la información contable entre empresas francesas, brasileñas y latinoamericanas

Análise comparativa da qualidade das informações contábeis entre empresas francesas, brasileiras e latino-americanas

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Abstract

Purpose: This work aimed to compare the Accounting Information Quality (AIQ) of publicly traded companies in markets with different levels of economic development, represented by France, Brazil and other Latin American countries (these together).

Methodology: The methodological approach was quantitative, using descriptive and exploratory statistics, and regression with unbalanced panel data. The data used encompassed the following periods: between 1987 and 2017, for the French market; between 1995 and 2017, for the Brazilian market; and between 1989 and 2015, for the Latin American market.

Results: The results pointed to structural differences in AIQ in financial statements between the markets analyzed, indicating that the more developed market has better AIQ.

Contributions of the Study: As a practical contribution, this research can support investor decisions, while the academic knowledge generated reveals that markets in different economic contexts have different levels of AIQ.

Keywords: Capital markets. Earnings persistence. Price relevance. Accounting Information Quality.

Resumen

Objetivo: Este trabajo tuvo como objetivo comparar la Calidad de la Información Contable (CIC) de las empresas que cotizan en bolsa en mercados con diferentes niveles de desarrollo económico, representados por Francia, Brasil y otros países de América Latina (estos últimos en conjunto).

Metodología: El enfoque metodológico fue cuantitativo, utilizando estadística descriptiva y exploratoria, y regresión con datos de panel no balanceados. Los datos utilizados abarcaron los siguientes períodos: mercado francés, de 1987 a 2017; brasileño, de 1995 a 2017, y latinoamericano, de 1989 a 2015.

Resultados: Los resultados señalaron diferencias estructurales de CIC en los estados financieros entre los mercados analizados, indicando que el más desarrollado presenta mejor CIC.

Contribuciones del Estudio: La contribución práctica de esta investigación puede subsidiar las decisiones de los inversores, mientras que el conocimiento académico generado revela que los mercados en diversos contextos económicos presentan diferentes niveles de CIC.

Palabras clave: Mercados de capitales. Persistencia de beneficios. Relevancia del Precio. Calidad de la Información Contable.

Resumo

Objetivo: Comparar a Qualidade da Informação Contábil (QIC) de empresas de capital aberto, em mercados com níveis distintos de desenvolvimento econômico, representados pela França, Brasil e demais países latino-americanos (estes em conjunto).

Metodologia: A abordagem metodológica foi quantitativa, com uso de estatísticas descritivas e exploratórias, e regressão com dados em painéis desbalanceados. Os dados utilizados envolveram os seguintes períodos: mercado francês, entre 1987 e 2017; mercado brasileiro, entre 1995 e 2017; e mercado latino-americano, entre 1989 e 2015.

Resultados: Os resultados apontaram diferenças estruturais da QIC em demonstrações financeiras entre os mercados analisados, indicando que o mais desenvolvido apresenta melhor QIC.

Contribuições do Estudo: Como contribuição prática, esta pesquisa pode subsidiar decisões dos investidores, ao mesmo tempo que o conhecimento acadêmico gerado revela que mercados em contextos econômicos diversos apresentam diferentes níveis de QIC.

Palavras-chave: Mercado de capitais. Persistência dos lucros. Relevância do preço. Qualidade das informações contábeis.

1 Introduction

Accounting Information Quality (AIQ) enables managers to decide on the best available resource allocation in order to maximize shareholder value. Schipper and Vincent (2003) state that quality accounting information is important for those who consider financial statements to make investment decisions. AIQ reflects the company's economic and financial performance through its financial statements, which are used by investors and other stakeholders to estimate future net cash flows (Guerra, Maia, Takamatsu & Francisco, 2018). The relevance of accounting information for the stock market stands out, in this sense, for its usefulness in informing investors about asset returns, allowing them to compare their own expectations regarding the financial performance of companies with actual performance (Mazzioni & Klann, 2016), and to decide more accurately on their investments.

Since the classic works by Ball and Brown (1968) and Beaver (1968), several studies, (such as Dechow, Ge & Schrand (2010); Silva, Mazzioni & Vargas (2020); Souza, Fonseca & Martucheli, 2022) have been carried out to improve the modeling and discussions about companies' AIQ. Thus, to estimate AIQ, Dechow *et al.* (2010) reviewed and categorized its most used determinants in the estimates: (i) regarding ownership of earnings, using as metrics: earnings persistence, normal and abnormal accruals, earnings smoothness, asymmetric and timely loss recognition (conservatism and timeliness), and compliance with targets; and (ii) regarding investors' reaction to earnings, involving the use of models with return/profit significance as a proxy for earnings quality.

Silva *et al.* (2020) state that AIQ is also important for users outside the company, and must be relevant to avoid useless information that could prompt losses for investors. The authors state that companies with higher capital concentration have higher AIQ, as they need to show credibility to shareholders. In addition, internationalized companies have higher AIQ when compared to non-internationalized ones, due to the greater requirements for the

information disclosed, both in their country of origin and in the capital market in which they operate (Silva *et al.*, 2020).

In a globalized market, information asymmetry must be countered by transparency in accounting information, in an effort to minimize losses resulting from investments made “blindly”. Thus, AIQ should be evaluated based on the political and economic context, assessing the characteristics of the companies and their performance disclosed in the market (Souza *et al.*, 2022). There are difficulties in internationally standardizing the estimation of AIQ and its consequent variations between markets. Therefore, this study was motivated by the research question: **are there significant differences in the AIQ of companies in different economic development contexts?**

To answer this question, the aim of this article was to comparatively analyze the AIQ levels of publicly traded companies in the French, Brazilian, and some other Latin American markets, which have developed (France) and developing (Brazil and Latin America) levels of economic development. According to the World Bank’s Global Economic Prospects report of June 2023 (World Bank Group, 2023), developed markets are composed of countries such as the United States, Japan, the Euro area (Europe), and China. Developing and emerging markets are made up of countries such as Russia, other Southeast Asian countries, Latin America, the Caribbean, the Middle East, and North Africa (World Bank Group, 2023).

In the present study, AIQ was evaluated using models of earnings persistence and share price relevance, as used in the study by Souza *et al.* (2022) and discussed by Dechow *et al.* (2010). This study is justified by the lack of comparative analyses of the AIQ of Latin American and European companies among scientific studies in the area, especially when they are analyzed simultaneously. In addition, according to Guerra *et al.* (2018), there is no precise definition of AIQ and no metric that establishes the ideal proxies, making it relevant to carry out new analyzes and deepen the research area’s understanding of the subject, which is a theoretical contribution of this study. The practical contribution is based on the importance of acquiring reliable, trustworthy, timely, relevant and transparent accounting information for investors to make more assertive decisions, especially in emerging markets, where accounting information tends to be less transparent sometimes due to impunity for improper or even not legally identified practices (Algrari & Ahmed, 2019).

2 Literature review

2.1 Accounting Information Quality in Different Economic Contexts

Accounting information consists of a set of fundamental variables that guide the financial decision-making process (Accounting Pronouncements Committee, 2011; Jarah & Iskandar, 2019; Manchilot, 2019), portraying information about companies and supporting the evaluation of their financial performance (Algrari & Ahmed, 2019). Profits and costs reported in financial reports are the first indication of AIQ and serve as input for investment decision-making in publicly traded companies (Guerra *et al.*, 2018). For Mazzioni and Klann (2016), the AIQ analysis reduces the degree of uncertainty and information asymmetry, and is a mechanism that prevents the expropriation of resources.

Companies are motivated to disclose accounting information by incentives such as international competition, which has generated stimuli to improve AIQ, since foreign investors prefer high-quality financial statements (Mazzioni & Klann, 2018). Mazzioni and Klann (2018) analyzed international studies on factors that influence AIQ and concluded that the quality is impacted by (i) regulatory aspects (such as the IFRS – International Financial Reporting Standards); (ii) the country’s legal system; (iii) laws to protect the securities market; (iv) the

legal protection of the interests of minority shareholders; (v) accounting and auditing standards; (vi) efficiency and legal integrity in business; and, finally, (vii) the influence of the tax system on the alignment between accounting and taxable profit.

Despite the existing standards and laws, corporate managers can use their discretionary power in reporting to convey information about companies' financial performance, misusing the factors described according to their own criteria and personal interests (Mazzioni & Klann, 2018; Cappellesso, Niyama & Rodrigues, 2020). Rodrigues and Niyama (2018) explain that economic globalization, which intensified in the second half of the 20th century, demanded the internationalization of companies and the reconciliation of accounting information from foreign countries with the standards of the company's home country. The authors explain that information asymmetry arose due to non-compliance with accounting standards in several nations, resulting in data that makes reliable decisions difficult or even impossible.

In this context, leaders of the G-20 (group of the world's 20 largest economies) have asked international accounting bodies to step up their efforts to achieve the IASB's (International Accounting Standards Board) goal of improving the quality of information in terms of its standardization and usefulness (Rodrigues & Niyama, 2018). Cappellesso *et al.* (2020) state that, although accounting regulation aims to provide quality information, it is still questioned whether such regulation is necessary for mandatory disclosure. That is so because those who defend the free market argue that developed markets would encourage managers to disclose information, even without regulation. Furthermore, voluntary disclosure may not meet users' information needs, demanding state intervention, which would justify regulation (Cappellesso *et al.*, 2020).

The existence of capital market regulators, such as the Brazilian Securities and Exchange Commission (CVM), helps the disclosure of AIQ. By exercising a supervisory role, these bodies prevent fraud and manipulation and ensure that investors have access to reliable information about companies. The imposition of IFRS in several countries is another way in which regulation influences AIQ (Rodrigues & Niyama, 2018; Cappellesso *et al.*, 2020). Among the studies that analyze AIQ in the markets of different economies is the work by Houqe, Easton and Zijl (2014), which revealed that common law countries generally offered better investor protection, while Western European civil law countries' protection offer was low.

Rathke, Santana, Lourenço and Dalmácio (2016) analyzed the level of earnings management after the adoption of IFRS in Latin America, comparing it with that of Anglo-Saxon and European countries. The results showed that Latin American markets had a higher level of earnings management than Anglo-Saxon and European-Continental markets. The authors concluded that, even when there are incentives for high-quality information, the characteristics of the country of origin still influenced AIQ, which was also confirmed by the study conducted by Mazzioni and Klann (2018).

Bourkhis and Najjar (2017) investigated the impact of regulation on AIQ in emerging economies and found that there were improvements in information due to a reduction in earnings management. Di Martino, Dicuonzo, Galeone and Dell'Atti (2017) reported a reduction in discretionary practices in European banks following the implementation of stricter regulations. The research by Carneiro, Rodrigues and Craig (2017) evaluated the international accounting harmonization of the 13 countries (at the time of the study) of the Latin American Accounting Standards Group (GLASS or GLENIF), the result of which showed that the obstacles faced by GLENIF covered factors such as a lack of trained accountants, unreliable supervision, technical complexity and cultural barriers to understanding the Anglo-Saxon accounting model, which made it difficult to produce good quality accounting information.

Li (2021) pointed out the importance of AIQ in the Chinese market, in which the reliability of accounting information disclosure plays a relevant role in the country's economic

development, since it affects macroeconomic regulation, impacting the securities market. According to the author, the China Securities Regulatory Commission (CSRC) has been improving its accounting disclosure system and reinforcing its regulatory responsibility, with the aim of reducing problems such as: (i) untimely disclosure of accounting information; (ii) disclosure of false accounting information, resulting in risks for investors and the market; and (iii) lack of professionals trained to correctly disclose accounting information.

The study developed by Daradkeh and Atta (2021) associated poor AIQ with financial losses for 157 industrial companies in northern Turkey. The authors suggested improvements for companies, such as the regular provision of better AIQ with predictive value, the use of more efficient accounting information systems, periodic monitoring of accounting, and training of AIQ producers and users.

2.2 Measuring Accounting Information Quality

2.2.1 Profit Persistence

AIQ has been empirically considered as an impact factor on asset prices, when associated with the persistence and predictability of earnings (profits), as well as forecast errors (Dechow *et al.*, 2010; Dang, Li & Yang, 2018). AIQ can be measured indirectly by variables developed in the literature, grouped into categories, such as earnings persistence, timely recognition of losses, loss distortion indicators and other corporate characteristics (Dechow *et al.*, 2010).

Ball and Brown (1968) observed that a company's earnings can provide relevant information about its future financial performance, as they are associated with the return on shares. Dechow *et al.* (2010) state that high-quality earnings provide more reliable information on performance, as they are better predictors of future dividend flows, and therefore of the value of the share or company value. The authors coincide with Kajimoto and Nakao (2018) when they state that the greater the persistence of profits, the better the AIQ and the more sustainable future profits and cash flows will be, enabling a better equity valuation and return on shares.

For Mazzioni and Klann (2018), the persistence of earnings is directly related to the lower risk of poor accounting information, since investors show less concern about changes in these earnings in the future, as they generate smaller valuation errors. Nardi, Amadi and Silva (2019) concur with Mazzioni and Klann (2018) when they contend that earnings persistence serves as an indication of the permanence of its variations, suggesting that more persistent earnings are more sustainable and perceived as high quality, which offers a better basis for investment decisions.

2.2.2 Relevance of Share Prices

Nardi *et al.* (2019) state that investors are concerned with identifying the sources of information that influence stock prices, as well as the risks of not obtaining the desired return. To do this, they need timely information that is useful and relevant to their decisions. In this context, AIQ should be conservative, so that there is a balance between the optimism of managers and the reality of the company, in order to ensure that excessively optimistic information is not reported to investors, whose decisions would be negatively influenced (Nardi *et al.*, 2019).

The following section describes the AIQ measurement models. For the earnings persistence model, it was assumed that non-random earnings are more useful for evaluating companies (Kolozvari & Macedo, 2016) and that their persistence can be expressed by the beta (β) of the cross-section earnings regression line.

3 Methodological procedures

What sets this research apart is that it evaluates AIQ from three different market contexts for publicly traded companies: France, Brazil and other Latin American countries. All the data collection periods were defined according to their availability and were obtained from the Osiris, Thomson Reuters and Economatica databases. The choice of France as the only country representing developed markets was due to the fact that one of the authors of this study had access to the financial data of companies in that country during his post-doctoral studies at the University of Grenoble. In addition, France had a number of companies listed on its stock exchange that was close to Brazil's during data collection.

The survey involved 592 French companies, with data collected between 1987 and 2017; 222 Brazilian companies, with data between 1995 and 2017; and 44 Latin American companies (countries analyzed: Argentina, Bolivia, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay, and Venezuela), with data between 1989 and 2015; the data for Uruguayan companies corresponded to the period between 1987 and 2017. For the Latin American countries, only the share price relevance model was estimated, since there was no data available for estimating earnings persistence.

3.1 Models for Measuring Accounting Information Quality

The measurement of AIQ was based on the metrics of share price relevance and earnings persistence, selected by recurrence in studies in the literature, according to the models described below. To estimate earnings persistence, the model was based on Frankel and Litov (2009), paying attention to beta to estimate earnings persistence (Shiri, Vaghfi, Soltani & Esmaeli, 2012). Cash flow was used as a proxy for profit, as it is more predictive of the company's ability to generate cash from operating activities and is not influenced by aspects such as financial expenses or equity equivalence.

The model, described in equation (1), used data organized in unbalanced panels, in cross-sections with combination in time series, and with pooled, fixed, and random effects tests (Heij *et al.*, 2004).

$$CF_{it} = \alpha + \beta CF_{i,t-1} + \varepsilon_t \quad (1)$$

The variables are – CF_{it} : cash flow of company i in period t ; α : regression intercept; β regression beta and persistence metric; $CF_{i,t-1}$: cash flow of company i in period $t-1$; and ε_t : residual in period t . According to Shiri *et al.* (2012), the difference in profits indicates their persistence over time. The closer the estimated coefficient is to 1, the more persistent companies' profits tend to be, and the closer it is to 0, the more occasional and momentary they are. The persistence of profits was measured with the samples from France and Brazil. In the case of publicly traded companies in the Brazilian market, a high level of discrepancy was identified in the data relating to persistence, and the variable was standardized by subtracting the mean and dividing by the standard deviation of the column (Heij *et al.*, 2004).

The share price relevance model, regarding accounting information, was estimated and evaluated for France, Brazil and some Latin American countries (Argentina, Bolivia, Chile, Colombia, Ecuador, Paraguay, Peru, Venezuela, and Uruguay), based on the available variables of price, profit and equity of the shares of publicly traded companies in these markets. The reference in the literature on AIQ linked to company valuation consists of the Ohlson (1995)

model, described in equation (2), considering the price and equity value measures referenced per share of the companies analyzed.

Ohlson (1995) states that accounting variables are related to the company's market value and that the regularity of shareholders' equity indicates a relationship between price, earnings, dividends and book value, and although dividends reduce book value, they do not affect earnings. Thus, the earnings and equity value proxies used consisted of the companies' net income per share and equity per share, given the emphasis found in the literature (Gonçalves, Batista, Macedo & Marques, 2014; Black & Nakao, 2017; Santos, Costa, & Gonçalves, 2018).

$$MP_{it} = \alpha + \beta_e EPS_{i,t-1} + \beta_{bv} BVS_{i,t-1} + \varepsilon_t \quad (2)$$

The variables are – MP_{it} : market price of company i 's share reported in period t ; α : regression intercept; β_e : beta of the earnings per share measure; $EPS_{i,t-1}$: earnings per share of company i reported in period $t-1$; β_{bv} : beta of the book value measure of company i 's share reported at time t ; $BVS_{i,t-1}$: book value per share of company i reported in period $t-1$; and ε_t : residual. In addition to modeling the relevance of the share price, we also evaluated the incremental influence of earnings and equity for each sample, following Collins, Maydew and Weiss (1997), according to equations (3) and (4), which are breakdowns of the relevance model described in equation (2).

$$MP_{it} = \alpha + \beta_e EPS_{i,t-1} + \varepsilon_t \quad (3)$$

$$MP_{it} = \alpha + \beta_{bv} BVS_{i,t-1} + \varepsilon_t \quad (4)$$

The models of earnings persistence and stock price relevance were estimated using data organized in unbalanced panels, using the statistical software R. The advantage of using panel data is that it longitudinally considers the heterogeneity of the group of individuals, and the variables are regarded as specific to each individual, as well as over time (Heij *et al.*, 2004). The statistical measures applied in the analyses were: (i) descriptive; (ii) regression; (iii) t ; and F mean tests. Data from companies in France, Brazil and selected Latin American countries were treated as separate samples, due to the legislative specificities of the respective markets.

4 Results and Analysis

4.1 Results of the Profit Persistence Model

The earnings persistence models estimated from the data of French and Brazilian companies consisted of regressing operating cash flow, adjusted cash flow and net assets against their one-period lag (Dechow *et al.*, 2010; Shiri *et al.*, 2012; Mazzioni & Klann, 2016). Table 1 shows the descriptive statistics for the French data. The average adjusted cash flow of the companies, according to size, was positive and close to zero, indicating that this flow did not change significantly between the companies analyzed. This can be confirmed by the small standard deviation (1%), indicating low variability of the adjusted cash flow around zero, upon adjustment.

Table 1

Descriptive statistics for the variables in the earnings persistence model for French companies (1987 and 2017)

Variable	No. of obs.	Average	DP	Minimum	1Q	2Q	3Q	Maximum
Adjusted cash flow	6.640,00	0,00 ¹	0,01	-0,28	0,00 ¹	0,00 ¹	0,00 ¹	0,36
Operational cash flow	6.740,00	306,37	1.468,32	-2.158,00	0,40	7,04	65,22	29.636,36
Net assets	10.990,00	1.087,19	4.696,19	-2.281,00	8,84	45,46	294,32	103.379,00

Note: ¹ Virtually zero values, the result of standardization.

Source: research data.

As for the models with pooled panel regression, fixed effects and random effects, all showed statistical significance of the lagged variable, corroborating the low variation between the adjusted cash flows. However, French companies showed high variations in operating cash flow and net assets, indicating a lack of earnings persistence.

Table 2 shows the results of the first difference model, with an explanatory power of 0.50 (R^2), indicating that past cash flow explains up to 50% of the variations in the present cash flow of French companies. In addition, the beta of the regression was -0.78 (close to -1), an indication of the absence of earnings persistence over the years (Dechow *et al.*, 2010; Shiri *et al.*, 2012; Mazzioni & Klann, 2016).

Table 3 shows the persistence model for Brazil, with panel data, estimated both with cash flow adjusted for assets and with the same variable standardized, due to the high variability of the data. The standardization generated an inversion of the frequency proportions of positive and negative adjusted cash flow, indicating a probable poor (low) adjusted financial performance.

Table 2

France's profit persistence model (1987 and 2017)

First difference model - France				
	Coefficients	Deviation	Statistics T	P-value
Intercept	0,03	0,10	0,31	0,76
$\beta_{FCO_{t-1}}$	-0,78	0,01	-72,41	< 0,001***
Sum of the squares of the treatments	509.080,00			
Sum of squares of residuals	255.640,00			
R-squared	0,50			
Adjusted R-squared	0,50			
F-statistics	5.242,68		p-value	< 0,001***

Note: ***, **, * statistical significance at 1%, 5% and 10%.

Source: research data.

Table 3

Descriptive statistics of the variables of the earnings persistence model of Brazilian companies (1995 to 2017)

Variable	No. of obs.	Average	DP	Minimum	1Q	2Q	3Q	Maximum
Adjusted cash flow	1.080,00	0,00	0,00 ¹	0,00 ¹	0,00 ¹	0,00 ¹	0,00 ¹	0,03
Operational cash flow	4.480,00	1.389,89	7.464,57	-6.859,65	7,74	115,03	686,78	263.985,00
Net assets	1.090,00	1.041,31	4.909,64	-1.481,48	22,86	177,80	716,15	98.677,00

Note: ¹ Non-zero values.

Source: research data.

The pooled, fixed-effect and random-effect models estimated with the cash flow without standardization did not result in the lag being statistically significant and had low explanatory power (Table 4), with an adjusted R^2 of practically zero. The only model in which the lag was found to be statistically significant was the first difference model; however, the model does not indicate persistence of profits, since the beta was negative and close to zero (-0.04), as well as

having extremely low explanatory power (R^2 of 0.02), F-statistic of 12.58 and p-value of 0.0004.

Table 4

Brazil's profit persistence model (1995 to 2017)

First difference model - Brazil				
	Coefficients	Deviation	Statistics T	P-value
Intercept	-0,42	0,97	-0,44	0,66
$\beta_{FCO_{t-1}}$	-0,04	0,01	-3,55	< 0,001***
Sum of the squares of the treatments	340.860,00			
Sum of squares of residuals	333.790,00			
R-squared	0,02			
Adjusted R-squared	0,02			
F-statistics	12,59		p-value	< 0,001***

Note: ***, **, * statistical significance at 1%, 5% and 10%.

Source: research data.

Shiri *et al.* (2012) state that the closer the beta is to zero, the more temporary corporate earnings tend to be. Thus, it can be said that companies in the French market tended to have more recurring and persistent earnings, while Brazilian companies tended to have more temporary and less persistent earnings. In this sense, the Brazilian model showed worse results than the French, suggesting a lower level of AIQ, agreeing with Dechow *et al.* (2010) when they reported that earnings persistence is directly associated with AIQ.

4.2 Results of the Share Price Relevance Model

AIQ is also relevant to the capital market because of the information contained in companies' share prices, which supports investors' decision-making process (Francis, Olsson & Schipper, 2008; Gonçalves *et al.*, 2014; Black & Nakao, 2017; Santos *et al.*, 2018). Thus, companies' earnings and shareholders' equity are important variables for the information contained in share prices (Ohlson, 1995; Collins, Maydew & Weiss, 1997; Francis *et al.*, 2008). Table 5 shows the statistics for these variables for French companies, excluding negative values for profit and equity, since uncovered liabilities are exceptional and should be treated separately, according to Macedo, Romana and Silva (2014). Habib and Azim (2008), Beisland (2009), and Filip and Raffournier (2010) all agree that losses have less informational power in the view of investors, due to their expectedly temporary nature.

Table 5

Descriptive statistics for the variables in the share price relevance model for French companies (1987 and 2017)

Variable	No. of obs.	Average	DP	Minimum	1Q	2Q	3Q	Maximum
Price	5.693,00	51,24	172,51	0,10	5,80	16,47	41,50	3.450,00
Profit	6.681,00	9,54	103,38	0,00	0,16	0,81	3,04	5.748,00
Assets	6.592,00	66,80	315,42	0,01	6,80	18,97	47,20	17.015,54

Source: research data.

The average share price was lower than shareholders' equity, indicating that the shares would be good acquisition opportunities for investors. The model was estimated using the following variables as proxies for earnings per share: income, net income, cash, and revenues. There was statistical significance of earnings and equity per share in terms of AIQ, converging with the literature (Gonçalves *et al.*, 2014; Black & Nakao, 2017; Santos *et al.*, 2018). However,

in Table 6, the beta of the average influence of profit in the model had a negative sign ($\beta_{LPA\ t-1} = -2.59$), indicating that the higher the profit, the less relevant this type of information tends to be for the share price of French companies in the following period. Thus, accounting information relating to profit does not significantly affect results.

Table 6*Relevance model for the share price of French companies (1987 and 2017)*

Model between - France				
	Coefficients	Deviation	Statistics T	P-value
Intercept	27,68	3,73	7,41	< 0,001***
$\beta_{LPA\ t-1}$	-2,59	0,28	-9,18	< 0,001***
$\beta_{PLA\ t-1}$	0,59	0,02	20,54	< 0,001***
Sum of the squares of the treatments	4.902.100,00			
Sum of squares of residuals	1.982.700,00			
R-squared	0,59			
Adjusted R-squared	0,59			
F-statistics	286,38		p-value	< 0,001***

Note: ***, **, * statistical significance at 1%, 5% and 10%.

Source: research data.

On the other hand, the beta of average equity ($\beta_{PLA\ t-1} = 0.59$) indicates a positive influence of equity on share price relevance, i.e. higher equity (book value) tends to be more relevant to the share price of French companies. The model had an explanatory power of 0.59 (R^2), indicating that earnings and equity per share explain up to 59% of the variations in the share prices of French companies. Although the sums of the squares of the residuals and the regression squares were high, the F-statistic of 286.38 and the low p-value suggest a good model specification.

The profitability and size of French companies, expressed respectively by profit and equity per share, also have a statistically significant impact on share prices when evaluated individually. The model of the incremental influence of profit in Table 7 shows that profit, individually, has a positive and statistically significant impact on the share price of companies ($\beta_{LPA\ t-1} = 2.05$). This coefficient did not maintain the same sign as the traditional relevance model, and it can be said that, considering profitability alone, companies tend to be well priced, i.e. profit alone represents a good AIQ. The Breusch-Pagan and Shapiro-Wilk tests resulted in low p-values, rejecting the respective null hypotheses of homoscedasticity and normality of residuals (Gonçalves *et al.*, 2014).

Table 7*Incremental influence of profit on the share price of French companies (1987 and 2017)*

Model between (individual) - France				
	Coefficients	Deviation	Statistics T	P-value
Intercept	34,85	5,45	6,39	< 0,001***
$\beta_{LPA\ t-1}$	2,05	0,24	8,29	< 0,001***
Sum of the squares of the treatments	5.091.300,00			
Sum of squares of residuals	4.333.400,00			
R-squared	0,14			
Adjusted R-squared	0,14			
F-statistics	68,73			< 0,001***

Note: ***, **, * statistical significance at 1%, 5% and 10%.

Source: research data.

Table 8 shows the results of the model of incremental influence of equity per share on the price of French companies. The modeling showed that equity, individually, also has a

positive and statistically significant impact on the value of companies. Again, homoscedasticity and normality of residuals are assumptions rejected by the statistical tests. Book value can explain up to 52% (R^2) of price variations, compared to the explanatory capacity of up to 14% (R^2) of profits (Table 7), and up to 59% of both variables in the traditional model (Table 6). In the three price relevance models, the intercepts were statistically significant, indicating that this proxy represents a good AIQ for French companies.

Table 9 shows the descriptive statistics of the share price relevance model for Brazilian companies. The companies' profits were not maintained (there was no significance), but there was significance in shareholders' equity, the proxy used for the companies' book value per share, being an indication of price relevance in relation to AIQ (Gonçalves *et al.*, 2014; Black & Nakao, 2017; Santos *et al.*, 2018). Negative profit and equity values were also excluded here, for the same reasons explained above.

Table 8

Incremental influence of equity on the share price of French companies (1987 and 2017)

Model between (individual) - France				
	Coefficients	Deviation	Statistics T	P-value
Intercept	21,77	3,85	5,65	< 0,001***
$\beta_{PLA_{t-1}}$	0,42	0,02	21,25	< 0,001***
Sum of the squares of the treatments	4.768.700,00			
Sum of squares of residuals	224.220,00			
R-squared	0,52			
Adjusted R-squared	0,52			
F-statistics	451,84			< 0,001***

Note: ***, **, * statistical significance at 1%, 5% and 10%.

Source: research data.

Table 9

Descriptive statistics of the variables in the share price relevance model of Brazilian companies (1995 to 2017)

Variable	No. of obs.	Average	DP	Minimum	1Q	2Q	3Q	Maximum
Price	7.933,00	20,84	190,54	0,15	1,13	2,67	5,84	2.893,40
Profit	2.844,00	37,03	764,71	0,00	0,41	1,24	3,40	37.578,00
Assets	6.962,00	22,14	119,17	0,18	1,62	3,47	8,63	1.313,13

Source: research data.

Table 10 shows the pooled (MQO) model, which had greater explanatory power than the between model. This model explains up to 44% (R^2) of the variations in share prices of companies in the Brazilian market, using earnings and equity per share. Even though they are high, the sum of the squares of the residuals and the total sum of the squares of the regression, the F-statistic of 719.52 and the null p-value indicate a good specification of the model.

The multicollinearity test using the Variance Inflation Factor (VIF) indicated a result close to 1, which does not indicate multicollinearity between earnings and equity per share. These results, except for the fact that profit was not significant for these companies, were very similar to those for French companies and corroborate the literature (Gonçalves *et al.*, 2014; Black & Nakao, 2017; Santos *et al.*, 2018).

Table 10*Share price relevance model for Brazilian companies (1995 to 2017)*

Pooled model - Brazil				
	Coefficients	Deviation	Statistics T	P-value
Intercept	2,32	1,99	1,16	0,24
$\beta_{LPA_{t-1}}$	0,00 ¹	0,00 ²	0,42	0,67
$\beta_{PLA_{t-1}}$	0,50	0,01	37,92	< 0,001***
Sum of the squares of the treatments	22.857.000,00			
Sum of squares of residuals	12.798.000,00			
R-squared	0,44			
Adjusted R-squared	0,43			
F-statistics	719,52		p-value	< 0,001***

Note: ***, **, * statistical significance at 1%, 5% and 10%.

¹ A value of 0.00092242 would only be zero up to the third decimal place.

² A value of 0.00219641 would only be zero up to the second decimal place.

Source: research data.

Profit was not statistically significant in Ohlson's (1995) model, and the beta of the variable was practically zero, with a p-value of 0.67. Equity per share was statistically significant, with $\beta_{PLA_{t-1}} = 0.50$, indicating a positive and significant influence of this variable on the share price of Brazilian companies. Thus, as equity increases, there are tendencies for the company to grow and for the market to perceive value, both of which are expressed in share price fluctuations. In this sense, AIQ in Brazilian companies is relevant for evaluating shareholders' equity.

The model of the incremental influence of shareholders' equity on share prices described in Table 11 confirms the relationship between the size/solidity of companies and the perception of the Brazilian market in the variation of share prices ($\beta_{PLA_{t-1}} = 0.44$ and p-value < 0.001). The model reinforces the statistical significance of shareholders' equity found in the traditional price relevance model. Size/solidity has a positive individual impact on share price. The incremental equity influence model explains up to 39% (R^2) of share price variations. The residuals are not homoscedastic and do not follow a normal distribution, according to the Breusch-Pagan and Shapiro-Wilk tests.

Table 11*Incremental influence of equity on the share price of Brazilian companies (1995 to 2017)*

Pooled model - Brazil				
	Coefficients	Deviation	Statistics T	P-value
Intercept	1,95	0,81	2,39	0,01**
$\beta_{PLA_{t-1}}$	0,44	0,00 ¹	65,67	< 0,001***
Sum of the squares of the treatments	47.690.000			
Sum of squares of residuals	29.006.000			
R-squared	0,39			
Adjusted R-squared	0,39			
F-statistics	4.313,01		p-value	< 0,001***

Note: ***, **, * statistical significance at 1%, 5% and 10%.

¹ A value of 0.0067331 would be null only up to the second decimal place.

Source: research data.

For Gonçalves *et al.* (2014), profit is more important than equity in AIQ, which differs from the results found for Brazilian companies. However, the authors used fewer companies and a smaller time universe in their analysis than this study. Santos *et al.* (2018) also used a smaller database of four years, attesting to the positive and negative relevance of earnings and shareholders' equity in the share price variation of Brazilian companies.

Table 12

Descriptive statistics of the variables of the price relevance model of Latin companies (1989 to 2015, and Uruguay: 1987 to 2017)

Variable	No. of obs.	Average	DP	Minimum	1Q	2Q	3Q	Maximum
Price	11.044,00	39,64	293,09	0,11	0,39	0,93	3,36	4.268,00
Profit	7.799,00	243,02	3.420,58	0,10	0,22	0,39	0,78	65.390,00
Assets	9.978,00	325,00	4.030,51	0,11	0,46	1,33	4,78	79.480,00

Source: research data.

The model's results in Table 12 were estimated using the price, profit and equity per share of other publicly traded companies in Latin America. On average, the trading price of the shares was lower than the companies' equity per share, indicating that the shares were good investments in the period analyzed. In addition, the high standard deviations of price, earnings and equity indicate high variation over the years, which are more common characteristics in countries with underdeveloped and emerging economies (Rathke *et al.*, 2016; Mazzioni & Klann, 2018).

Table 13

Share price relevance model for Latin American companies (1989 to 2015, and Uruguay: 1987 to 2017)

Pooled model - Latin America				
	Coefficients	Deviation	Statistics T	P-value
Intercept	20,51	2,14	9,55	< 0,001***
$\beta_{LPA_{t-1}}$	0,00 ¹	0,00 ¹	-0,26	0,79
$\beta_{PLA_{t-1}}$	0,00 ¹	0,00 ¹	2,16	0,03**
Sum of the squares of the treatments	256.390.000,00			
Sum of squares of residuals	255.950.000,00			
R-squared	0,00 ¹			
Adjusted R-squared	0,00 ¹			
F-statistics	6,46		p-value	< 0,001***

Note: ***, **, * statistical significance at 1%, 5% and 10%.

¹ Non-zero values from the third decimal place.

Source: research data.

Table 14

Incremental influence of equity on the stock price of Latin companies (1989 to 2015, and Uruguay: 1987 to 2017)

Pooled model - Latin America				
	Coefficients	Deviation	Statistics T	P-value
Intercept	41,06	3,14	13,06	< 0,001***
$\beta_{PLA_{t-1}}$	0,00 ¹	0,00 ¹	1,98	0,04**
Sum of the squares of the treatments	906.750.000,00			
Sum of squares of residuals	906.370.000,00			
R-squared	0,00 ¹			
Adjusted R-squared	0,00 ¹			
F-statistics	3,59		p-value	< 0,001***

Note: ***, **, * statistical significance at 1%, 5% and 10%.

¹ Non-zero values from the third decimal place.

Source: research data.

In Table 13, the relevance model for Latin America showed similar results to those for the Brazilian market, although with practically zero explanatory power ($R^2 = 0$). The statistical significance of the intercept indicates the existence of other factors that explain price relevance. The betas of earnings and equity per share were zero ($\beta_{LPA_{t-1}} = \beta_{PLA_{t-1}} = 0$), and only the

coefficient of equity per share was significant for share price. In this model, although very weak, the statistical significance of equity on price was identified in the pooled panel regression. The incremental/individual equity influence model was therefore estimated (Table 14), which showed no individual explanatory power ($R^2 = 0$), i.e. the variation in companies' equity does not explain the variation in prices, as occurred in the modeling of French and Brazilian companies.

5 Final remarks

In order to answer the research question of this study, which is whether there are significant differences in the AIQ of companies in different economic development contexts, the objective was to analyze and compare the AIQ levels of publicly traded companies in the French (developed), Brazilian (developing) and some other Latin American (developing) markets. In order to investigate this phenomenon, cash flow was used as a proxy for profit and share price proxies were traded share price, earnings per share and shareholders' equity. These proxies were evaluated, respectively, by means of the corporate earnings persistence and share price relevance models.

The earnings persistence model for French companies showed a high variation in operating cash flow and net assets, but not in adjusted cash flow. The model also identified a lack of earnings persistence over the years. For Brazil, the persistence model showed adjusted cash flow oscillating between positive and negative, and did not indicate earnings persistence for the companies. Thus, companies in France tended to have more recurring and persistent earnings (profits), while companies in Brazil tended to have more temporary profits with less persistence. In this sense, the Brazilian model showed worse results than the French model, suggesting a worse AIQ in the case of Brazil.

With respect to share price relevance, French companies were more dispersed in terms of profits than in terms of equity, differing more in relation to profits than to size. Equity exerted a positive influence on share price relevance, showing a better AIQ than profit. Even so, considering the individual incremental model, profit had a positive impact on share price, i.e. profit alone represented a good AIQ for French companies. Brazilian and Latin American companies, on the other hand, showed greater asset dispersion and differed more in size than in profit. For Brazilian companies, only equity was relevant in explaining share price behavior and was a good representation of AIQ. On the other hand, profits were not as relevant as they were for French companies.

Companies from the other Latin American countries showed low stability in profit and equity over the period analyzed. The price relevance model for these companies had similar results to those of Brazilian companies, but indicated the existence of other factors that explain relevance. For Latin American companies, only equity per share was significant for share price. It can therefore be concluded that Latin American companies had a AIQ at the same level as Brazilian companies and lower than the AIQ of French companies. This can be explained, according to the literature, by the differences between developed, emerging and underdeveloped markets, relating to the fragility of accounting regulation, with low shareholder protection, informational asymmetry, corruption, concentration of ownership, financial leverage, and other factors.

This research contributes to the understanding of AIQ estimation through models of earnings persistence and stock price relevance in markets with different levels of economic development, presenting a comparative analysis of the AIQ of French, Brazilian and other Latin American companies, which can support the decision-making of market agents. The limitations

consisted of the lack of access to more up-to-date data from the French and Latin American markets (except Brazil). Therefore, as future research, it is suggested that this study be expanded with more up-to-date company data and even studies involving different countries, considering different economic contexts, in order to ascertain any reproducibility of the results found here.

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