Does Financial Literacy Improve Value Relevance of Accounting Numbers?

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ABSTRACT

In this study, we seek to analyze the impact of financial literacy on the value relevance of accounting information. The value relevance was determined using the Price Regression Model (PRM), which relates stock prices as a function of book value per share and earnings per share. As a proxy for financial literacy, we used the financial literacy indicator established and published by the Organization for Economic Co-operation and Development (OECD, 2016), which addresses, among other issues, financial knowledge, financial behavior and attitudes towards long term planning. Using a sample of 15,371 companies from 27 countries (out of the 30 for which the indicator was calculated), totaling 71,534 observations, it was identified that financial literacy, as measured by the OECD, did not increase the relevance of accounting information relative to the stock price, considering all countries. Segregating the sample among emerging countries, according to the International Monetary Fund (IMF) classification, and the others, it is identified that for the group of developed countries financial literacy increases the value relevance of accounting information, however for emerging countries such effect does not occur. The present study contributes to the value relevance literature, indicating other factors that may impact it, and also contributes to the discussion about the importance of accounting concepts and knowledge being included in financial education initiatives. Emerging countries can use this results to reevaluate their financial education initiatives. The increasing adoption of retirement models that include self-made savings reinforces this importance since individuals will be more responsible for their financial decisions.

Key words: value relevance; financial education; financial literacy

1. INTRODUCTION

Value relevance of accounting information can be defined as the explanatory power of accounting variables, especially earnings and book value of equity in relation to share price and returns (Ali and Hwang, 2000). From the seminal paper by Ball and Brown (1968), which presented evidence that stock returns respond to accounting information, several papers have succeeded in establishing a positive relationship between accounting information and stock prices and returns (Barth, 1994, Elliott & Hanna, 1996, Aboody & Lev, 1998).

After the initial traditional value relevance articles, studies began to evaluate the influence of other factors in this relationship, either by influencing it or by moderating it. For example, pension assets and liabilities measured by the fair value of pensions and other post-retirement obligations (Amir, 1993), the estimation of debt securities and equities by banks and insurance companies (Barth, 1994; Ahmed & Takeda, 1995, Barth, Beaver & Landsman, 1996), the fair value of derivatives (Venkatachalam, 1996), systematic changes in the value relevance of profits and book values over time (Collins, Maydew & Weiss, 1997), non-financial intangible assets (Aboody & Lev, 1998), the association between accounting profits and values (Fillip & Raffournier, 2010), the effect of concentration of ownership and firm size on the relevance of profit and book value (Chandrapala, 2013) and the effect of mandatory adoption of IFRS on value relevance of profits and the book value of equity, in the Asian and African region (Chebaane & Othman, 2014) were some papers that studied the reflection of the related variables in the value relevance.

In a recent study, Elbakry, Nwachukwu, Abdou and Elshandidy (2017) compared the value relevance of accounting information after the mandatory adoption of IFRS in Germany and in the United Kingdom. The authors, in the first moment, used the basic regression model of Ohlson (1995), considering book value per share and earnings per share. Then they modified the model including the financial leverage and dividend payment variables and, finally, applied an extended equity valuation model, adding at the same time a group of accounting and macroeconomic factors. The results differed, demonstrating that accounting and macroeconomic factors modify the value relevance.

Kimball and Shumway (2006) and Van Rooji, Lusardi and Alessie (2011) have identified that a higher degree of financial education is related to a greater propensity to invest in the stock market. In addition, Calvet, Campbell and Sodini (2007), in a study in the Swiss market, pointed out that investors with higher education tend to make better choices in the stock market. Bellofatto, D'Hondt and De Winne (2018) point out that financial education leads investors to invest more wisely, also making better choices.

Given these results, this study seeks to contribute with value relevance literature by verifying if an external factor can impact the relevance of the accounting numbers. Considering that financial education increases the propensity to invest in stocks, that education leads to better investment choices and that accounting, especially after the adoption of IFRS, reflects the economic situation of companies (Barth, Landsman & Lang, 2008). It is hypothesized that a country's financial education may influence the relevance of accounting, since the market would have more informed participants.

In this context, this paper seeks to elucidate the following research problem: what is the impact of financial literacy in the value relevance of accounting information? In order to do so, the model of Ohlson (1995) was used, assessing the Price Regression Model (PRM) according to Onali, Ginesti and Vasilakis (2017). As a measure of financial literacy, we used the indicator published by OECD in 2016. The sample was segregated between countries with

higher financial education and countries with lower financial education, based on the median of the 27 countries analyzed.

As a result, we identified that financial literacy, as measured by the OECD, does not increase the relevance of the accounting information (earnings per share and book value) on stock prices, considering the magnitude and significance of the parameters and the independent variables, measured by R^2, as suggested by Holthausen and Watts (2001). However, considering only the developed countries, according to International Monetary Fund (IMF) classification (2017), financial literacy increases the relevance of accounting information. For emerging countries, this effect has not been proven.

The results therefore contribute to broadening the discussion on value relevance and the various groups of financial information. It calls the attention of the scientific area in accounting to seek new and macroeconomic elements such as financial education in countries with different culture, education and financial maturity, in order to obtain a more substantial understanding of the relevance of accounting values as a tool for decision making in the financial market, which is increasingly complex and expanding.

Thus, this research is divided into 4 more sections besides this introduction. In section 2, we discuss the concepts of value relevance and financial education and their relationship with the stock market. Section 3 presents the methodology and data sample used. In section 4, the results are presented and discussed and section 5 concludes the study, presenting its limitations and suggestions for future research.

2. LITERATURE REVIEW AND HYPOTHESIS
2.1. Literatura de value relevance
According to Barth, Beaver and Landsman, (2001) value relevance is an empirical operationalization that considers and integrates the accounting criteria of relevance and reliability. The existence of a significant relationship between book value and stock prices is necessary for the values to reflect relevant information for investors to perform the valuation of the companies. In addition, the sufficiently reliable measurement of the book value reflects in the stock prices, which promotes the differential of the decisions of the users of the financial statements.

The studies that discuss value relevance are classified into three categories, according to Holthausen and Watts (2001): i) relative association - compare the association between stock market values (or changes in values) and alternative measures of the final result; ii) incremental association - investigate whether the number of interest is useful to explain values or returns, given other specified variables (this number is normally considered relevant if its estimated regression coefficient is significantly different from zero); and iii) content of marginal information - investigate whether a specific accounting number adds information to the set available to investors.

The valuation models used for structuring the tests usually consider the market value as a benchmark to assess to what extent the specific book values reflect the information used by the investors (Barth, 1994; Venkatachalam, 1996; Amir, Harris & Venuti, 1993). However, Barth, Beaver and Landsman (2001) point out that interest in value relevance may be related to the examination of price levels in order to determine what is reflected in the value of the firm or in the examination of price changes or returns for identify what is reflected in changes in value over a period of time.

An evaluation model widely applied by the scientific community is the Ohlson (1995) model and its subsequent refinements (Feltham & Ohlson, 1995; Feltham & Ohlson, 1996; Ohlson, 1999). Ohlson (1995) developed the Residual Income Valuation (RIV) model to evaluate the value of the companies by the sum of the book value of equity with the present

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value of expected (abnormal) residual profits. According to Galdi, Teixeira and Lopes (2008), the main premise of this model is the concept of clean surplus that imposes that all transactions that promote changes in the company's equity, pass through the income accounts. The model represents the value of the company as a linear function of the book value of the shareholders' equity and the present value of expected future abnormal profits. It considers perfect capital markets, but allows markets for imperfect products, for a finite number of periods.

According to Barth, Beaver and Landsman (2001), the model has additional premises of the linear dynamics of information, and the value of the company can be restated as a linear function of book value of equity, net income, dividends and other information. It also shows that the valuation based on the balance sheet and the profits represent the two extreme cases resulting from the limiting assumptions regarding the persistence of abnormal gains. There is no dependence on a concept of permanent gains or values of assets and liabilities, so the model is expressed in terms of accounting profits and book value. However, the authors point out that there is no well-accepted model of equity valuation in imperfect and incomplete markets. In this sense, the Ohlson model is used by value relevance searches as a basis for testing, with frequent modifications in the estimation of equation specifications to incorporate potential nonlinearities in the particular configuration being examined.

In this context, value relevance has been the object of research related to several themes. One of them is the fair value of pensions and other post-retirement obligations, mainly to verify if the social security assets and liabilities and the liabilities of the other obligations are perceived by the investors as assets and liabilities of the company. Amir (1993) perceived this relationship and complemented the finding that these assets and liabilities have different prices from other recognized assets and liabilities, and their pricing multiples tend to be lower.

Another research current is devoted to studying value relevance related to the fair values of debt and equity securities, particularly those held by banks and insurance companies (Barth, 1994; Ahmed & Takeda, 1995; Nelson, 1996; Barth & Clinch, 1998). Consistently and unanimously, studies have proven that investors perceive fair value estimates for these securities as more relevant than historical costs.

Estimates of the fair value of bank loans are also part of the value relevance studies. Barth, Beaver and Landsman (1996) find that investors have observed fair values of bank lending more relevance and reliability than historical costs, although Eccher, Ramesh, and Thiagarajan (1996) and Nelson (1996) have found different results.

Venkatachalam (1996) studied the value relevance of the fair value of derivatives, especially to verify the reliability of the estimates adopted, since the estimation technology and the markets for these instruments are in constant development. The author found that investors perceive the fair values of derivatives as reflecting the underlying economic amounts more accurately than their notional values.

Collins, Maydew, and Weiss (1997) investigated systematic changes in the value relevance of earnings and accounting values over time. Based on a sample between 1953 and 1993, the authors found that the combined relevance of the value of profits and book values did not decrease, and the results showed signs of a small increase.

Aboody and Lev (1998) discussed the relationship of value relevance with non-financial intangible assets, considering that the costs of intangible assets such as softwares and goodwill are relevant to investors and reflect the values of intangible assets implied in stock prices , with some level of reliability.

Fillip and Raffournier (2010) studied the value relevance of profits on the Bucharest Stock Exchange. They found that the association between accounting profits and stock returns

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is comparable to the levels reported by studies in mature markets, and that it is higher for securities issued by small businesses. Chandrapala (2013) examined the effect of concentration of ownership and firm size on the relevance of the value of profit and book value to companies listed on the Colombo Stock Exchange in Sri Lanka from 2005 to 2009. The results showed that the relevance of the value of the companies concentrated in the property is bigger than the one of the companies not concentrated in the property.

Chebaane and Othman (2014) studied the effect of the mandatory adoption of International Accounting Standards on the value relevance of profits and the book value of equity in the Asian and African region. Evidence has pointed out that the increase in the value level is positively influenced by a common law legal system, the high level of external economic openness, strong investor protection and full protection of minority shareholders and a sophisticated capital market.

Elbakry et al. (2017) compared the value relevance of accounting information in Germany and the United Kingdom after the mandatory adoption of IFRS under three different versions of the linear model of equity valuation. First, it used Ohlson's basic model, used as a reference model that regulates stock price or market value per share in two main financial variables: book value per share and earnings per share, as the main explanatory variables. Second, it modified this simple expression, including a set of accounting variables conditioning, such as financial leverage and dividend payment, to investigate the influence of other accounting information prices. And third, they developed an extended equity valuation model, simultaneously adding a group of accounting and macroeconomic factors to Ohlson's basic regression.

The results revealed: (i) under Ohlson's basic model, the book value-of-equity value declined, replaced by the growth of profits in both Germany and the United Kingdom; (ii) under the modified model, an increase in the value of profits and book values increased in the long run in the United Kingdom, and (iii) under the extended model, the predictive power of book value in the United Kingdom increased, however, the impact of economic indicators was more noticeable in increasing the relevance of the value of the profits reported by Germany.

Considering the extensions of the value relevance research, it is perceived the importance of knowing new factors that can influence it. Since financial literacy is directly related to the stock market, as will be seen later, it is important to know it´s impact on value relevance.

2.2. Financial Literacy

The literature has adopted different definitions of financial literacy. Lusardi and Mitchel (2014) defined financial education as "the ability to process economic information and make informed decisions about financial planning, wealth accumulation debt and pensions". These definitions make it clear that financial literacy should not only talk about the management of personal income and expenditure in the short term, but also the long-term planning of individuals and households, including retirement. In this context, smart investment decisions are important for the well-being of society. Lusardi and Mitchell (2014) emphasize that financial education is a critical factor for security at the time of retirement.

Hastings, Madrian and Skimmyhorn (2013) emphasize that financial education is associated with (i) knowledge of financial products; (ii) knowledge of financial concepts, such as inflation, diversification, credit scores, etc. and, (iii) mathematical skills necessary to make decisions and make adequate financial planning. The authors also point out that financial literacy has gained importance as financial markets become more complex, just as the importance of the individual decision on retirement and savings has also increased. This move was accentuated after the financial crisis of 2008. Kimiyaghalam and Safari (2015) highlight

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the broad definition of the Jump $ tart Coalition for Personal Financial Literacy, which has been adopted in the literature, which covers the four topics listed above. By this definition, financial literacy would be "the ability to use knowledge and skills to manage one's financial resources effectively for lifetime financial security".

Campbell (2006) presented as one of the financial errors committed by investors the propensity to invest in local companies and in the actions of the companies of their employers, leading to an inadequate diversification of risks. Financial education, therefore, by expanding the possibility of greater diversification, can lead investors to a more adequate analysis of the actions to be invested. It would be expected that this more accurate analysis would be reflected in a higher value relevance of the accounting information.

The OECD indicator of financial literacy is based on three broad sets of questions. The first block, called financial knowledge, seeks to measure knowledge about division and proportion, value of money over time, interest rates and inflation, risk, return and diversification. In the second block, denominated financial behavior, the questions are related to planning of purchases, payment of bills in time, degree of attention of the individual financial planning and establishment of long term goals. The third and final block, called financial attitudes, covers issues related to the propensity between spending or savings, indicating whether individuals in their financial decisions focus on the short or long term. The OECD indicator, addressing three groups of issues related to three dimensions of financial education, presents a measure covering the three aspects highlighted by Hastings, Madrian and Skimmyhorn (2013). In addition, this indicator is calculated for several countries with a unique methodology. Thus, the OECD indicator can be considered as an adequate proxy for financial literacy.

2.3. Financial Literacy and stock market participation

The literature has pointed out that a greater degree of financial literacy increases the propensity of individuals to invest in the stock market. Van Rooji et al. (2011), confirmed this trend through a study in the Dutch market. In this study, the authors demonstrated that those individuals with low financial education were less likely to invest in equity.

In the same line, Bellofatto et al. (2018), in a survey in Belgium, have shown that those individuals with higher subjective (self-declared) financial education invest more intelligently, even after controlling for gender, age, investment value, formal education and negotiation experience.

Mahdzan and Tabiani (2013) and Sekita (2011) have identified similar behavior in Malaysia and Japan, respectively. These studies focused on the propensity to save, but identified that the behavior spreads in relation to the stock market, that is, a greater propensity for saving also represents greater use of the stock market. Lusardi and Mitchell (2008) identified that women with higher financial literacy tend to perform better financial planning. For the authors, a better financial planning is linked to a greater investment in the stock market aiming at retirement.

Considering the above, financial literacy can be associated with a greater and more conscious access to the capital market, including the stock market. Considering that the informational content of the financial statements reflects the financial position of the companies, the financial education can translate into a better use of the accounting information in the investment decision. With this, the research hypothesis is established below:

H_1: Countries with a higher degree of financial literacy have a higher value relevance of accounting numbers.

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3. RESEARCH DESIGN
3.1. Sample and data

We based our inferences on a sample of 15,371 firms from 27 countries, taking the period of analysis the years from 2012 to 2017, totaling 71,534 firm-year observation. The companie's data were collected from the Capital IQ database. With the exception of China and Canada, the other countries are IFRS adopters. However, the Chinese accounting standard is substantially aligned with IFRS (IFRS, 2018) and, in relation to Canada, the country has partially adopted international standards in 2011 and in full in 2015. For this reason, it is not expected that accounting standards of these two countries influence the results of the study.

Table 1 shows the countries of the sample, their OECD financial literacy indicator and the number of observations. It is perceived that the lowest level of financial literacy was attributed to Poland, while the highest index is that of France. China represents the most representative country of the sample, with 18,861 observations.

Table 1 – Information by Country

Country	Financial Literacy Index	Number of observations
Austria	14.2	270
Belgium	14.3	488
Brazil	12.1	1,151
British Virgin Islands	13	81
Canada	14.6	9,525
China	14.4	18,861
Croatia	12	286
Czech Republic	12.6	39
Estonia	13.4	86
Finland	14.8	635
France	14.9	2,706
Hong Kong	14.4	6,065
Hungary	12.4	118
Jordan	12.6	613
Latvia	13.3	96
Lithuania	13.5	127
Malaysia	12.3	4,724
Netherlands	13.4	584
New Zealand	14.4	511
Norway	14.6	705
Poland	11.6	3,119
Portugal	14	196
Russia	12.2	875
South Korea	14.4	9,883
Thailand	12.8	3,053
Turkey	12.5	1,638
United Kingdom	13.1	5,099
Total observations		**71,534**
Max	**14.9**	
Min	**11.6**	
Average	**13.4**	
Median	**13.4**	

3.1. Methodology

The general model used in the study followed Onali et al. (2017) and is detailed in Equation 1.

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$$Price_{i,t} = \beta_0 + \beta_1 Eps_{i,t} + \beta_2 BV_{i,t} + \upsilon \qquad (1)$$

Where:

$Price_{i,t}$ represents the stock price of company i on the last day of March of $t + 1$;

$Eps_{i,t}$ represents the earnings per share of company i in year t;

$BV_{i,t}$ represents the book value per share of company i in year t;

υ represents the error term.

The 27 countries were segregated among those countries that have financial education indicators above or equal to the median of 13.4 (Estonia, Netherlands, Lithuania, Portugal, Austria, Belgium, China, Hong Kong, New Zealand, South Korea, Canada, Norway, Finland and France, totaling 14 countries) and those below the median (Poland, Croatia, Brazil, Russia, Malaysia, Hungary, Turkey, Czech Republic, Jordan, Thailand, British Virgin Islands, United Kingdon and Latvia, totaling 13 countries).

The comparison of a higher or lower value relevance followed Holthausen and Watts (2001), who pointed out as a way of measuring the phenomenon through R^2. According to the authors, the accounting numbers with higher R^2 have a higher value relevance.

4. RESULTS

Table 2 shows descriptive statistics of the quantitative variables. In order to minimize the effect of outliers, the winsorization of the variables was performed at 1%. It can be seen that countries with financial education above the median presented higher average values of Book Value (BV_{it}), Earnings per share (Eps_{it}) and Price ($Price_{it}$). The number of observations from the sample of countries with the highest financial education was also higher than that of the second sample (50,642 versus 20,892 observations), since the countries with the most observations, such as China, Canada and South Korea, are part of this group.

Table 2 – Overall Descriptive Statistics of Quantitative Variables

	Book Value (BV_{it})	Earnings per Share (Eps_{it})	Price ($Price_{it}$)
Financial literacy above median n=50,642			
Mean	16.951	0.902	23.607
Median	1.89	0.06	4.55
Min	0.005	-12.20	0.028
Max	364.5	29.4	406.79
p.25	0.65	-0.036	1.11
p.75	9.48	0.408	14.43
SD	50.273	4.573	61.175
CV	2.965	5.067	2.591
Financial literacy below median n=20,892			
Mean	10.918	0.647	14.490
Median	1.45	0.047	1.78
Min	0.005	-12.2	0.028
Max	364.5	29.4	406.79
p.25	0.338	-0.009	0.43
p.75	5.46	.397	8.075
SD	41.716	3.791	47.843
CV	3.820	5.854	3.301
Full sample n=71,534			
Mean	15.189	0.828	20.945

Median	1.76	0.06	3.64
Min	0.005	-12.2	0.028
Max	364.5	29.4	406.79
p.25	0.542	-0.024	0.775
p.75	7.66	0.405	12.48
SD	48.010	4.360	57.750
CV	3.160	5.266	2.757

Note: BV_{it} represents the book value per share; Eps_{it} represents earnings per share and $Price_{it}$ represents the stock price, adjusted by dividends, 90 days after the balance sheet data. All the variables were winsorized at 1% level.

Table 3, in turn, presents the correlation matrix between the variables. The data show a high, positive and significant correlation between the main variables of the model, namely Book Value (BV_{it}), Earnings per share (Eps_{it}) and Price ($Price_{it}$). The variable financial literacy, fixed by country, presents, as expected, low, although positive and significant correlation.

Table 3 – Correlation matrix

Variables	Book Value	Eps	Price
Earnings per share (EPS)	0.6424***		
Price	0.8055***	0.6823***	
Fined	0.0509***	0.0230***	0.0722***

Note: BV_{it} represents the book value per share; Eps_{it} represents earnings per share and $Price_{it}$ represents the stock price, adjusted by dividends, 90 days after the balance sheet data. Those variables were winsorized at 1% level. *Fined* represents the financial literacy index. *, **, and *** denote significance at 10%, 5%, and 1%, respectively.

Table 4 shows the result of the model estimates considering the 27 countries segregated between those with higher and lower degree of financial education having the cutoff point the median. Following Onali et al. (2017) the Hausman tests were performed to identify the most appropriate between the fixed effects and random effects models and the Breusch-Pagan test, comparing the random effects and OLS models. The tests indicated that the fixed effects offers the best estimation.

In all cases (below the median, above the median and the complete sample) the results demonstrate the existence of value relevance of the accounting numbers, since the parameters associated with the explanatory variables BV_{it} and Eps_{it} are positive and significants.

Table 4 – Regression results – all countries

Variables	(a) Above Median	(b) Below Median	(c) Full Sample
Book Value (BV_{it})	0.69544***	0.5483***	0.6699***
	(103.35)	(53.03)	(118.63)
Earnings per share (Eps_{it})	1.54196***	1.4142***	1.5081***
	(43.24)	(27.96)	(51.19)
Dummies Years	*included*	*Included*	*included*

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No obs.	50,642	20,892	71.534
R^2 Within	0.3160	0.2285	0.2961
R^2 Between	0.6849	0.7531	0.6981
R^2 Overall	0.6748	0.7323	0.6865

Note: BV_{it} represents the book value per share; Eps_{it} represents earnings per share and $Price_{it}$ represents the stock price, adjusted by dividends, 90 days after the balance sheet data. Those variables were winsorized at 1% level. *Fined* represents the financial literacy index. Model (a) includes the countries whose financial literacy index *(Fined)* are above the median; model (b) includes the countries whose financial literacy index *(Fined)* are under the median; model (c) includes all the 27 countries.

*, **, and *** denote significance at 10%, 5%, and 1%, respectively.

However, the results indicate that financial education has not improved the value relevance of accounting information. For the countries with the highest financial education, the explanatory power of the variables BV_{it} and Eps_{it}, as measured by the R^2 of the regression, was even lower than that found in the sample with countries with lower financial education, differently than expected.

The absence of significant difference in the value relevance of the accounting numbers in the two groups of countries can be attributed to some factors. Firstly, the greater or lesser share of foreign investors in a country's stock market may influence this relevance, since foreign investors may have a financial literacy greater or lower than that attributed to the country of share trading.

In addition, the indicator of financial education, while encompassing aspects of financial knowledge and accumulation of wealth, is not directly associated with even elementary accounting knowledge. This possibility leads to the discussion that financial education initiatives, since they aim to help individuals better decide on their future investments and savings, could cover accounting knowledge.

In order to better understand the phenomenon, we carried out additional analyzes in relation to the group of countries for which the financial education indicator was calculated. We segregate the sample between emerging countries and developing countries, according to the classification of the International Monetary Fund - IMF.

Table 5 shows the segregation of countries with their financial literacy indicator. It can be seen that emerging countries such as China have an indicator comparable to developed countries, while the Czech Republic, for example, has an opposite phenomenon (a developed country with a similar financial literacy index for developing countries).

Table 5 – Information by Country

Developed countries	Financial Literacy Index (Fined)	Emerging Countries	Financial Education Index (Fined)
Austria	14.2	Brazil	12.1
Belgium	14.3	China	14.4
British Virgin Islands	13	Croatia	12
Canada	14.6	Hungary	12.4
Czech Republic	12.6	Jordan	12.6
Estonia	13.4	Poland	11.6
Finland	14.8	Russia	12.2
France	14.9	Thailand	12.8
Hong Kong	14.4	Turkey	12.5
Latvia	13.3		
Lithuania	13.5		

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Malaysia	12.3		
Netherlands	13.4		
New Zealand	14.4		
Norway	14.6		
Portugal	14		
South Korea	14.4		
United Kingdom	13.1		
Max	**14.9**	**Max**	**14.4**
Min	**12.3**	**Min**	**11.6**
Average	**13.84**	**Mean**	**12.51**
Median	**14.1**	**Median**	**12.4**

After segregating the two groups, new medians were calculated considering the countries present in each of them. These values are also presented in table 5.

The same model presented in section 3 was calculated for the group of emerging countries and the regression result is presented in Table 6.

Table 6 – Regression results – developed countries

Variables	(a) Above Median	(b) Below Median	(c) All developed countries
Book Value (BV_{it})	**0.7083*****	**0.5569*****	**0.6980*****
	(82.37)	(34.60)	(94.11)
Earnings per share (Eps_{it})	**1.4655*****	**1.5012*****	**1.4722*****
	(32.41)	(18.96)	(37.76)
Dummies Years	*included*	*included*	*included*
No obs.	30,788	11,032	41,820
R^2 Within	0.3282	0.2190	0.3147
R^2 Between	0.6986	0.5307	0.6886
R^2 Overall	0.6806	0.5404	0.6726

Note: BV_{it} represents the book value per share; Eps_{it} represents earnings per share and $Price_{it}$ represents the stock price, adjusted by dividends, 90 days after the balance sheet data. Those variables were winsorized at 1% level. *Fined* represents the financial literacy index. Model (a) includes the countries whose financial literacy index *(Fined)* are above the median; model (b) includes the countries whose financial literacy index *(Fined)* are under the median; model (c) includes all the 18 developed countries. *, **, and *** denote significance at 10%, 5%, and 1%, respectively.

The results show that, in all cases, the value relevance phenomenon is present, since the parameters associated to the accounting variables were positive and significant, demonstrating that they influence the share price. Analyzing the models in a segregated way, it can be observed that, for the group of developing countries, the model presents a superior value relevance for countries with financial education above the median (model a), as shown by the R^2 of 68% in this group against R^2 of 54% in the group of countries with lower financial literacy (model b). In this sample of countries, the results indicate, therefore, that a greater financial literacy can be reflected in a greater use of accounting information for investment decision making.

It is important to note that Canada represents a large volume of observations in the group of developed countries. In addition, in the period under review, its accounting standard was not fully compliant with IFRS. Excluding Canada from the sample and finding a new

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median, the model does not present significant differences, proving that it is a common effect in the sample of developed countries.[i]

The same approach was then applied to the emerging countries in the group of countries for which the OECD has established the financial literacy indicator. Table 7 presents the results of the models.

Table 7 – Regression results – emerging countries

Variables	(a) Above Median	(b) Below Median	(c) All emerging countries
Book Value (BV_{it})	**0.5668*****	**0.5107*****	**0.5200*****
	(42.94)	(28.34)	(60.97)
Earnings per share (Eps_{it})	**1.6376*****	**1.5900*****	**1.6228*****
	(30.08)	(16.75)	(37.93)
Dummies Years	*included*	*included*	*included*
No obs.	24,283	5,431	29,714
R^2 Within	0.2294	0.2542	0.2424
R^2 Between	0.3921	0.8010	0.7237
R^2 Overall	0.4327	0.7803	0.7253

Note: BV_{it} represents the book value per share; Eps_{it} represents earnings per share and $Price_{it}$ represents the stock price, adjusted by dividends, 90 days after the balance sheet data. Those variables were winsorized at 1% level. *Fined* represents the financial literacy index. Model (a) includes the countries whose financial literacy index *(Fined)* are above the median; model (b) includes the countries whose financial literacy index *(Fined)* are under the median; model (c) includes all the 9 emerging countries.
*, **, and *** denote significance at 10%, 5%, and 1%, respectively.

It can be seen that for the group of emerging countries, the effect of financial education is even smaller when compared to the global sample. Differently than expected, the explanatory power of the variables BV_{it} and EPS_{it} were lower for countries with higher financial education. The results indicate that in these countries, financial literacy is not reflected in investment decisions based on accounting data, so that value relevance is not strengthened by this type of ability. The fact that these countries, unlike developed countries, has a smaller share of foreign investors, can also explain this result, since the behavior of the stock market is more dependent on the behavior of the investors of the country itself.

It is important to note that China represents a large volume of observations in the group of emerging countries. In addition, its accounting standard, although similar, does not fully comply with IFRS. Excluding China from the sample and finding a new median, the model does not present significant differences, proving that it is a common effect in the sample of emerging countries.[ii]

With this, we conclude that financial education is reflected in a higher value relevance in developed countries, but not in emerging countries. This second group of countries can use this result to rethink financial education efforts in their society. The inclusion of minimum accounting skills in these initiatives can help strengthen the stock market and also enhance individuals' ability to make conscious choices about their investments.

The growing importance of retirement systems based more on the individual's financial accumulation reinforces the importance of financial education, including minimum knowledge of business performance analysis.

5. CONCLUSION

The present study has shown that, different from expected, considering the group of countries for which the OECD calculates the financial literacy indicator, it is not reflected in a higher value relevance of accounting information. However, in segregating the sample between emerging and developing countries, it is evident that in developing countries this phenomenon presents itself, that is, in developed countries financial education is associated with a higher value relevance of accounting information.

Developed countries usually have a higher level of education in general. The fact that the result in developed countries has been adhering to the hypothesis that financial education shows that the phenomenon of value relevance should not be associated only with formal education but rather with additional skills related to better financial choices. Extensions of the present study may consider general education indicators in the sample segregation, in order to confirm whether financial education interferes with the value relevance of accounting information. In addition, future studies can assess which factors led emerging countries to have a lower value relevance in countries with higher financial education.

The result of the study presents complementary arguments the importance to the questions made by Hasting et. al. (2013). The authors question whether individuals can manage their finances, whether there is a role for governments to help individuals achieve better financial returns and, if so, how government intervention should be.

In this context, emerging countries can use this research results to reevaluate their financial education initiatives. The increasing adoption of pension systems based on the accumulation of resources by the individual (for example, the Chilean, Swedish, Norwegian and Italian cases) reinforces this importance since individuals will be more responsible for their retirement, demanding more conscious financial choices. Hastings et al. (2013) point out that lack of financial education prevents individuals from maximizing their well-being by making wrong financial choices. Therefore, as a result of the study, the inclusion of accounting knowledge in financial education initiatives is suggested.

The present work is not free of limitations. Despite OECD's efforts in standardizing the questionnaire and collection methods so that the indicator could be comparable across countries and therefore used in identifying weaknesses and opportunities for improvement and development of public policies related to financial education, the OECD itself (2016, p.2019) warns that sample differences and data collection between countries should be taken into account.

Another limitation of the present study is associated with that pointed out by Hasting et. al. (2013) that it is not possible to affirm a causal relationship between financial literacy and financial outcomes. The result of the study demonstrates the association between financial education and value relevance in developed countries, but it must be considered that this effect cannot be given directly. In addition, it must be considered that part of the operations of a country is given by foreign investors, who have financial education different from that of the country itself. Extensions of the present work could consider natural experiments to search for causal relationships among phenomena.

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[i] Results not reported

[ii] Results not reported