Implications of Economic Crises on the Value Relevance of Accounting Information in Brazilian Companies

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Abstract

This papers investigates the impact of financial crises occurred in Brazil (1997-1999, 2002 and 2007-2008) on the value relevance of book value and earnings. The final sample comprised 1,904 observations from Brazilian listed companies, from 1997 till 2010. It is an empirical study based on panel data regression. To answer the research question, a dummy was applied for each year of negative macroeconomic shocks and how they affected the relation between market prices and accounting variables. Empirical evidence indicates that financial crises affected the value relevance of book value positively and the value relevance of earnings negatively, similarly to other countries like Thailand and Mexico. Therefore, macroeconomic factors should be taken into consideration when analyzing how accounting information captures the underlying characteristics of a firm. Future research could consider companies from other countries in Latin America and evaluate if the effects are similar or not. This is important because macroeconomic policies implemented to mitigate the effects of a crisis could lead to different impacts on the relevance of accounting information.

Keywords: Crisis; Value relevance of accounting information; Ohlson Model.

1. INTRODUCTION

The spreading of the real-estate market crisis that started in the United States in 2007 entailed a demand for studies that help to interpret and better understand its effects in the financial market. The aim of this study is to assess whether the relevance of accounting information is affected at times macroeconomic crises.

Financial information disclosure is aimed at reducing information asymmetry and helping to monitor contracts (LOPES and MARTINS: 2005). Hence, information is considered relevant when it helps market users with their predictions and, consequently, is related to stock prices.

Empirically, the "relevance" construct has usually been tested through the association of market variables, mainly after the development of Ohlson's model (1995). In the *conceptual framework* of *the International Accounting Standards Board, which has been adopted in Brazil, relevance is considered* a fundamental qualitative characteristic of financial information.

Asset price valuation models have been widely used in Accounting research to examine information relevance (COLLINS, PINCUS and XIE, 1999). Generally, value relevance studies specifically measure an explicit assessment model, involving regressions that use stock market value as the dependent variable and earnings as the explanatory variable (HOLTHAUSEN and WATTS, 2001).

In general, research evidence shows that financial information is relevant and permits comprehensive assessments (FELTHAM and OHLSON, 1995; MYERS, 1999; OHLSON and JUETTNER-NAROUTH, 2005) or a focus on specific items, like inflation-adjustment aspects (DYCKMAN, 1975) or intangible assets (AMIR and LEV, 1996).

In Brazil, Lopes (2001) was the first to apply Ohlson's model (1995) to companies traded on the São Paulo Stock Exchange (Bovespa), showing that book value and earnings information is relevant to explain stock prices. The results showed that, for many of the years analyzed, the value relevance model (OHLSON, 1995) outperformed the traditional discounted dividend model.

Other value relevance studies were developed in special market conditions: in Basu's study (1997), focused on the existence of conditional conservatism, the author presented results that reinforce value relevance for the capital market, concluding that "bad news" are more timely recognized in earnings than "good news".

Differences in countries' institutional environmental, accounting regime and corporate governance structure are research themes associated with value relevance nowadays. Evidence appoints that, in developed capital markets with decentralized stock control and better governance practices, accounting figures tend to be more relevant for investors (LOPES and WALKER, 2011).

In the international context, however, most studies are based on data from developed countries, mainly North American, English, Australian and Canadian research (MEEK and THOMAS, 2004). Hence, research on the value relevance of specific information, mainly in emerging countries, still represents fertile ground for further evidence production. In that sense, a recurring item in the reality of a range of developing countries is their vulnerability to macroeconomic crises, as illustrated by the instability in the last 15 years: Mexico, South Korea, Indonesia, Malaysia, Thailand, Russia, Brazil and Argentina.

As scientific studies usually measure the association level between accounting and market variables, it can be questioned whether macroeconomic crises can affect the value relevance of accounting information (GRAHAM and KING, 2000).

Research in Asian countries and Mexico (GRAHAM and KING, 2000; HO et al., 2001; DAVIS-FRIDAY et al., 2006; DAVIS-FRIDAY and GORDON, 2005) has demonstrated that, at times of economic crises, evidence indicate that they have influence on the value relevance of accounting information. One important piece of evidence in these studies is that, generally, in countries where accounting is based on code law[1], during crisis periods, book value becomes more relevant, while the relevance of earnings decreases. Due to its high level of regulation, Brazil is considered a code-law country (COSTA,

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1 Countries with more regulated general organization structures, where tax legislation strongly interferes in Accounting, where companies' corporate structure is concentrated in the hands of few stockholders, normally the managers.

LOPES and COSTA, 2006). In recent years, however, changes in the accounting (Law No. 11.638/2007 and International Accounting Standards Board pronouncements) and tax model (Law No. 11.941/2009) involved the implementation of a philosophy closer to that of common-law countries.

In this study, 1997, 1998, 1999, 2002, 2007 and 2008 were considered crisis years in the Brazilian economy. 1997 and 1998 reflected external crises (Asia and Russia); 1999 and 2002 were related to the Brazilian currency's devaluation in relation to American dollars; 2007 and 2008 were related to the effects of the North American subprime crisis on the enhanced drop of the Brazilian Stock Exchange. In all these years, macroeconomic distortions took place that triggered government and Central Bank actions to stabilize the economy.

In view of the results by Lopes (2001) and Costa (2005), showing the utility of Accounting information for the Brazilian capital market and of evidence that the value relevance of accounting information changes at times of crisis, in this study, it is investigated whether macroeconomic crises affect the value relevance of financial information in Brazilian publicly-traded companies. The aim is to examine whether the way accounting information captures a certain company's economic reality is affected.

The results confirm the distinctive influence of the crises on value relevance in Brazil: the relevance of book value increased, while that of earnings was reduced. Thus, this study contributes to understand how macroeconomic factors affect the relation between accounting information and market prices.

2. LITERATURE REVIEW

Economists like Smith, Say, David Ricardo, Malthus and Marshall referred to or used financial data to validate their research. The use of accounting information to validate the Theory of the Firm was a primary theoretical gain from the existing relation between Microeconomics and Accounting (YU, 1966, p. 11).

While Microeconomics studies the company from an individual perspective, analyzing its activity in private markets through the balance point between price and quantities, Macroeconomics analyzes the economy as a whole. Macroeconomic aggregates represent the sum of all individual activities in the market.

In macroeconomic terms, the interest rate level and trajectory, as well as exchange rate variations, influence individual and firm actions. Monetary policy measures can influence individual saving and corporate investment decisions (ARAÚJO and GUILLÉN, 2002). Hence, a company that decides to invest, using capital from third parties of foreign origin, is susceptible to gains or losses due to exchange rate variations, which will affect their financial statements.

Macroeconomics looks at aggregates or total inputs and products, while Accounting studies their composition. Generically, it is considered that Macroeconomics studies consolidated data of individual economic transactions in the entire economy.

One important aspect of the relation between Economics and Accounting is the timeliness of the information Accounting produces. Accounting is timely when it reflects the economic reality faster. Accounting information needs to reflect economic reality or users will not use it, so that it loses its rationale (LOPES and MARTINS, 2005, p. 61).

Ball, Kothari and Robim (2000) compared the timeliness of earnings, relating accounting results (dependent variable) and economic results (independent variable). The authors observed that the explanatory power of this regression is timelier in common-law countries. In common-law countries, earnings effectively recognize economic results with great explanatory power, which is not the use in code-law countries.

2.1 Value relevance of accounting information

Academic research with a value relevance focus usually adopt the investor's perspective. This group would be the first stakeholder, as this information can help with company valuation for choice and decision-making purposes (BARTH, 2000, p. 10). Essentially, value relevance studies imply Accounting's role to estimate the market value of stocks or its linear transformations (HOLTHAUSEN e WATTS, 2001).

Research by Ohlson (1995), Feltham and Ohlson (1995), Myers (1999), Lopes (2001) and Ohlson and Juettner-Nauroth (2005) continued testing the value relevance of accounting information for capital market prices.

Barth, Beaver and Landsman (2001) consider that Ohlson's model (1995) and its updates have been widely disseminated and accepted in studies on the relevance of accounting variables. Generally, value relevance research specifically measures an explanatory valuation model. These studies involve regressions of stocks' market value and earnings, in which expected future earnings are discounted at an estimated rate (HOLTHAUSEN and WATTS, 2001).

In an analysis of value relevance research, Barth, Beaver and Landsman (2001), concluded that various fair value estimates of pension funds' assets and liabilities, fair value of bonds, bank loans, derivatives, long-term intangible and tangible non-financial assets are relevant values.

Asset pricing models have been extensively used in Accounting research to examine the value relevance of financial information (COLLINS, PINCUS and XIE, 1999). In Brazil, Lopes (2001) applied Ohlson's model (1995) in companies traded on Bovespa. Satisfactory results were obtained, but the model's explanatory power is concentrated on the book value, and not on abnormal future earnings. Further support for these results can be found in Costa (2005), focusing on the comparison between the informational contents of earnings based on the Brazilian GAAP and the US GAAP of Brazilian companies with ADRs traded on the New York Stock Exchange.

After a general review on the theme, Lopes (2001, p. 90) concludes that "earnings are relevant, but their explanatory power is limited". The authors affirms that the "relevance of financial results also depends on general conditions of market functioning and on the market's efficiency level" (LOPES, 2001, p. 90). Hendriksen and Breda (1999, p. 206) affirm that an imperfect correlation exists between earnings and price, due to the "fact that prices capture the impact of a much broader information set than what earnings represent only" and due to the fact that some earnings variables result from changes in accounting standards, without any immediate economic impact.

Ohlson (1995) shows that, when assuming the clean surplus relation (CSR) and specific linear dynamic information, price can be represented as a linear function of earnings and book value.

> The Ohlson (1995) model suggests that book value of equity reflects the present value of expected future normal earnings since a firm can be expected to generate a return on its net assets that equals its expected cost of equity capital (COLLINS, PINCUS E XIE, 1999).

2.1.1 Relevance of financial information and economic crises

Graham and King (2000), Ho et al. (2001), Davis-Friday et al. (2006) and Davis-Friday and Gordon (2005) studied the association between economic crises and the explanatory power of financial information. These studies suggest that an economic crisis can affect countries differently, as a result of monetary market (domestic currency devaluation) and capital market (decline in stock prices) problems.

Graham and King (2000) found that, in Thailand, in 1997, the devaluation of the Thai Baht led to a decline in the relevance of earnings, while that of the book value increased. High levels of exchange rate volatility accompanied the devaluation. The initial recognition of exchange rate variation losses and the subsequent recognition of exchange rate variation gains, when rates dropped and then recovered, can explain changes in the value relevance of Accounting information after the devaluation.

In Korea, according to Ho et al. (2001) *apud* Davis-Friday and Gordon (2005), The results indicated that the value relevance of accounting earnings significantly declined between the pre-crisis (1995-1996) and crisis periods (1997-1998). This drop in earnings was not replaced by a significant rise in net equity though.

Davis-Friday and Gordon (2005) focused on the 1994 monetary crisis in Mexico and analyzed the relation between companies' stock prices and their book values, earnings and cash flows. The results demonstrated that the value relevance of book value did not significantly change during the crisis period,

while its incremental explanatory power increased. As for earnings, their relevance and explanatory power significantly decreased during the crisis.

Davis-Friday et al. (2006) analyzed the relevance of earnings and book value in four countries on the Asian continent (South Korea, Indonesia, Malaysia and Thailand) during the 1997 crisis and found evidence that, generally, during crisis periods, the information relevance of earnings drops and that of the book value increases, depending on corporate governance mechanisms and the country's accounting system. At times of crises, the value relevance of the book value increases in countries whose accounting is based on the code-law regime, while the relevance of earnings decreases.

2.2 The asian crisis and the russian crisis: contagion effect

Different authors have described the occurrence of simultaneous or sequential exchange crises and speculative attacks in different countries that demonstrated some relation with Brazilian economic figures as contagion effect.

According to Gremaud, Vasconcelos and Toneto Júnior (2004), the contagion effect happened between 1997 and 1998, during the Asian and Russian crises, with increased public debts and higher interest rates as immediate consequences.

In 1997, the Brazilian economy showed that approximately US$ 20 billion left the country. The economy reacted to fiscal measures and increased interest rates and reserves were reestablished. In 1998, however, about US$ 30 billion in reserves were lost between August and September and, despite higher interest rates and fiscal measures, these were not recovered. To solve this problem of lost reserves, Brazil closed a US$ 42 billion agreement with the International Monetary Fund (IMF) (LANZANA, 2001).

The Brazilian economy's performance in 1997 and 1998 evidenced that the Brazilian economy is susceptible to macroeconomic shocks produced in other countries.

Another relevant point is that external crises can affect future periods. Baer (2002, p. 237) affirms that the Asian and Russian crises led the *Real* Plan to a critical point in 1999. In this study, 1997 and 1998 were considered crisis years due to the observed contagion effect.

2.3 Brazil and the 1999 and 2002 financial crises

the *Real* Plan presented a significant innovation in the stabilization policy, to the extent that it was able to use new macroeconomic instruments that had not been available in previous plans. Since the *Cruzado* Plan, the elements used to interrupt accelerated inflation were: monetary reforms, contract deindexation, price freezing and financial asset sequestering. The *Real* Plan represents a watershed in these procedures to the extent that it starts to use exchange and interest rates as key instruments for stabilization purposes.

Before the change in the exchange rate regime, any more significant short-term capital exit movements reflected in the Brazilian Central Bank's (BCB) loss of reserves, threatening with the maintenance of the semi-fixed exchange regime, which obliged the BCB to raise domestic exchange rates to induce a refers in the capital exit movement. After the exchange regime had changed, capital exit movements also started to influence exchange rates, whose devaluation would put the stability of inflation rates at risk. Gremaud, Vasconcelos and Toneto Júnior (2004, p.489) demonstrated that the exchange rate devaluation in January 1999 amounted to about 65% and that, in that month alone, for the National Treasury, public debt increased by approximately R$ 50 billion.

Therefore, the government and BCB were obliged to adopt restrictive measures that accompanied the devaluation: in the fiscal area, public spending dropped and taxes increased and, in the monetary area, a strong rise in interest rates happened, reaching 42% per year at the start of 1999 (LANZANA, 2001). The repeated interest rate rises to revert the capital exit flow and impeded higher inflation rates affected both inflation rates and public debt volumes.

Cardoso e Helwege (1999), Miranda (1999), *Murta et al.* (2003) observed that the main cause of the 1999 Brazilian crisis is associated with worse economic foundations, particularly higher exchange rates, current account deficits and strongly increased public debt levels.

The changes that were made as from 1999 were aimed at changing the economic trajectory and recovering external and public funding capacities. The three main economic policy changes that started to condition the Brazilian economy's future scenarios were: fiscal adjustment program, modified exchange regime and inflation target program.

The fiscal adjustment program, aimed at reverting the explosive trajectory of internal deficits and public debts, was one of the most ambitious fiscal deficit reduction programs countries with a payment balance crisis had ever agreed upon with the IMF, involving a fiscal adjustment of about 4% of GDP. In the inflation target program, inaugurated in the middle of 1999, the Central Bank's discretionary power was aimed at coordinating economic agents' expectations through downward inflation targets. The program was only able to keep inflation within targeted limits in the first two years. As from 2002, inflation rates surpassed the target's upper limit and jeopardized the program's credibility.

The country's external vulnerability and the public sector's financial fragility marked 2002. The exchange rate devaluation and high levels of dollars leaving the country made the government adopt, once again, restrictive measures like public spending cuts and tax rises; in the monetary area, the Central Bank increased interest rates. These measures were used to inhibit rising inflation rates. Therefore, the Brazilian economy's performance level was low.

Nevertheless, increasing exportation levels marked 2002, enhanced by the devaluation of the *Real* and reduced importation. "The trade surplus reached US$ 13.1 billion (increase by more than 400%), favoring the best balance achieved since 1993" (FILGUEIRAS, 2003, p. 241).

2.4. The subprime crisis

The drop in real-estate prices in the United States triggered a domino effect in the financial market and, later, in the actual economy. Derivatives operations and large investment banks' bankruptcy constrained credit and negatively affected the main global economies (CROUHY, JARROW and TURNBULL, 2008). The effect hit Brazil already in 2007: at a level of more than 60,000 points, Ibovespa dropped below 30,000 points. The Brazilian government had to establish a range of policies to avoid, for example, exchange and tax rate changes. It was only in 2009 that the main BM&FBovespa index returned to levels close to the pre-crisis period.

3. DEVELOPMENT OF RESEARCH HYPOTHESIS

Evidence by Barth et al. (1998), Davis-Friday and Gordon (2005) and Davis-Friday et al. (2006) indicates that, at times of crisis, the value relevance of earnings and book value is affected. In addition, Davis-Friday, Eng and Liu (2006) argue that distinctive impacts may occur on the relevance of accounting variables: the relevance of book value would increase, as it is a proxy of the companies' settlement value. Earnings, on the other hand, would become less relevant, as instability could affect their use to project future results (DAVIS-FRIDAY, ENG and LIU, 2006). Thus, the following hypothesis will be tested in this study:

> **H1.** Economic crises affect the value relevance of Brazilian publicly-traded companies' book value and earnings.

4. METHOD

To answer the research question, a regression was used to assess whether the macroeconomic shocks in crisis years (1997, 1998, 1999, 2002, 2007 and 2008) affected Brazilian companies' accounting information value relevance. In addition, it was also assessed whether the value relevance of Brazilian companies' book value increased and that of earnings decreased as a result of these shocks.

The method adopted in this study is similar to that Barth (1998) and Davis-Friday et al. (2006) used to examine the value relevance of book value and earnings, both based on Ohlson's model (1995).

The market value of stocks is the dependent variable in the model, while earnings and book value are the explanatory variables. The model also includes a dummy variable to examine the effect of the crisis on the relevance of earnings and book value.

Ohlson's model (1995) considers that "a firm's market value is a function of its earnings and book value" (CARDOSO and MARTINS, 2004). According to the model, equation 1 can be used to represent company value. Equation 1 was tested in this study to ascertain the explanatory power of book value and equity in the Brazilian market. All variables are divided by the company's market value in the previous year.

$$VM_{it} = \beta_0 + \beta_1 PL_{it} + \beta_2 LUC_{it} + \varepsilon_{it} \quad \textbf{(1)}$$

Where:
VM_{ij} = Market value of company i, after the closure of year t;
PL_{ij} = Book value of company i in year t;
LUC_{ij} = Earnings of company i in year t;
ε_{ij} = other relevant information.

In equation 2, tested in this study, the market value of the share in April of year t serves as the dependent variable (divided by the market value of year t-1), and the book value of the share and earnings per share serve as explanatory variables (divided by the market value of year t-1). In addition, with a view to more solid results, panel data analysis with a double fixed effect will be applied (per company and per year). Hence, the following equation was used in this study:

$$VM_{it} = \beta_0 + \beta_i + \beta_j + \beta_1 CR_i + \beta_2 PL_{it} + \beta_3 CR \times PL_{it} + \beta_4 LUC_{it} + \beta_5 CR \times LUC_{it} + \varepsilon_{it} \quad \textbf{(2)}$$

Where:
CR_i = dummy variables, equaling 0 for the crisis period and 1 for the crisis years: 1997, 1998, 1999, 2002 and 2008;
VM_{ij} = Market value of company i on April 30th in year t+1;
PL_{ij} = Book value of company i in year t;
LUC_{ij} = Earnings of company i in year t;
ε_{ij} = Error term of regression.

Based on the literature review, the following results are expected: negative sign of β_1, demonstrating the negative effect of the crisis on market value; positive signs of β_2 and β_4, according to Ohlson's model (1995); positive sign of β_3, demonstrating the relevance of book value in crisis periods; and negative sign of β_5.

4.1 Sample

This research was developed using annual data for companies traded on BM&FBovespa, covering the period from 1997 to 2010. Data were collected in the database Economática.

Initially, the company's market values were selected on April 30th of each year, given that financial statements can be published until April 30th of each subsequent year. The aim of this specification is to avoid periods when more than one annual financial statement has been published and achieve correspondence with earlier studies (COSTA, 2005, for example). Book value and earnings data were collected from consolidated balance sheets in December of each year.

The panel data technique with fixed effect for companies (cross-section) will be applied for the regression of Equation 2. The aim is to control for each company's specific characteristics. The fixed effect was not used for the "year" variable, with a view to avoiding specification problems because of the inclusion of the CR variable (dummy for crisis years).

To address the effect of outliers, data were "winsorized" at 1%. Descriptive statistics for the three main variables used in this study are presented next:

Table 1: Descriptive Statistics (1996 to 2005)

Year	LUC					BV					MV				
	Obs.	Means	SD	Min.	Max.	Obs.	Means	SD	Min.	Max.	Obs.	Means	SD	Min.	Max.
1997	223	75	412	(402)	3.900	223	1.051	4.967	(338)	61.600	272	988	3.638	0,16	39.100
1998	261	44	289	(2.860)	1.994	262	951	4.175	(2.635)	60.000	282	570	1.437	0,15	11.400
1999	273	41	245	(535)	1.869	273	1.032	4.115	(281)	59.400	322	1.183	3.713	0,11	46.200
2000	273	121	689	(2.085)	9.942	273	1.117	4.374	(1.342)	62.100	295	1.326	4.164	0,51	51.400
2001	277	127	711	(1.113)	9.867	277	1.206	4.572	(1.575)	64.300	290	1.349	4.394	0,15	56.400
2002	268	61	669	(1.321)	8.097	268	1.328	4.949	(2.090)	66.600	263	1.495	4.845	0,24	54.500
2003	264	221	1.198	(1.853)	17.800	264	1.517	5.571	(862)	67.800	275	2.316	7.632	0,34	88.700
2004	268	306	1.268	(490)	17.900	268	1.716	6.231	(1.091)	69.900	283	2.986	9.891	0,19	112.000
2005	262	398	1.741	(909)	23.700	262	2.033	7.364	(861)	78.800	269	4.009	14.100	0,54	171.000
2006	290	390	1.849	(1.063)	25.900	290	2.179	8.237	(1.125)	97.500	282	5.333	18.600	0,26	228.000
2007	306	456	1.897	(429)	21.500	307	2.480	9.178	(913)	114.000	346	6.558	29.300	4,28	430.000
2008	298	446	2.518	(4.213)	33.000	298	3.170	12.000	(1.145)	138.000	326	4.224	16.900	1,93	224.000
2009	293	454	2.081	(1.143)	29.000	293	3.639	13.200	(1.337)	159.000	330	6.977	27.200	1,87	347.000
2010	293	680	2.995	(630)	35.200	293	4.769	20.800	(1.613)	307.000	324	7.801	30.300	2,25	380.000
1997-2010	3.849	282	1.617	(4.213)	35.200	3851	2.066	9.335	(2.635)	307.000	4.159	3.493	16.800	0,51	430.000

Where:
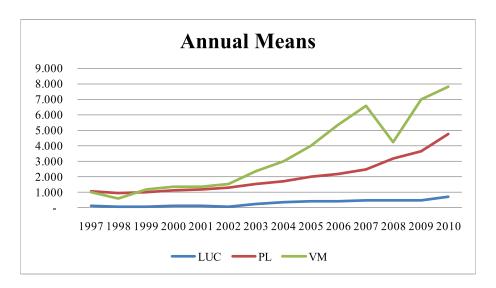LUC = earnings;
BV = book value;   SD: standard deviation;
VM = market value;   Min.: minimum;
Obs.: number of observations;   Max.: maximum

Graph 1 below displays the evolution in annual means for each of the research variables:

During the study period, the companies under analysis generally display a consecutive increase in book value and earning. Exceptions occur, like in 1999 and 2002 when, on average, earnings are lower than in the preceding year. As for book values, except in 1998, these increase continuously. One factor that should be highlighted is the significant increase in the variables' standard deviation over the years.

As opposed to the continuous rises in book value and earnings (considering exceptions), the mean market value was significantly reduced in 1998 and 2008, macroeconomic crisis years. The exception is 2002, when mean values continued their upward movement in relation to the previous year.

5. RESULTS

To assess whether the value relevance of accounting information is affected at times of macroeconomic crises, equation 2 was used. The coefficients of each company and each year's fixed effects were not presented, with a view to a more concise presentation of the results (Table 2).

Table 2: Regression of company Market value in function of book value and earnings, under the effect of economic crises (1997 to 2010) – double fixed effect

$$VM_{it} = \beta_0 + \beta_i + \beta_j + \beta_1 CR_i + \beta_2 PL_{it} + \beta_3 CR \times PL_{it} + \beta_4 LUC_{it} + \beta_5 CR \times LUC_{it} + \varepsilon_{it}$$

	β_0	β_1	β_2	β_3	β_4	β_5	Adjusted R^2	Observations
Coefficient	**0,83**	**-0,26**	**0,25**	**0,09**	**2,13**	**-0,67**	0,27	1.904
t-statistics	18,30	-4,00	8,80	2,50	12,70	-2,60		
p-value	0,00	0,00	0,00	0,01	0,00	0,01		
standard error	0,05	0,06	0,03	0,03	0,17	0,26	Prob > F	0,00

Where:
CR_i = dummy variables, equaling 0 for the crisis period and 1 for the crisis years: 1997, 1998, 1999, 2002 and 2008;
VM_{ij} = Market value of company i on April 30th in year t+1;
PL_{ij} = Book value of company i in year t;
LUC_{ij} = Earnings of company i in year t;

The analysis of Table 2 indicates that the Brazilian financial crises (1997, 1998, 1999, 2002, 2007 and 2008) influenced the relevance of financial information, affecting both book values and earnings[2]. The coefficient and p-value of dummy variable β_1 demonstrate the effect in the crisis year (as expected).

The values of the book value ($\beta2$) and earnings ($\beta4$) coefficients displayed positive behavior for the study intervals. Thus, it can be inferred that book value and earnings are relevant, capturing part of the company's economic reality. The results confirm what was observed through Ohlson's model (1995). Hence, the crisis condition under analysis contributes to value relevance literature in Brazil (LOPES, 2001; COSTA, 2005), demonstrating that both book value and earnings are relevant. In other words, the observed results for the book value ($\beta_2 = 0.25$) and earnings ($\beta_4 = 2.13$) coefficients comply with theoretical expectations.

The results found for the book value and earnings coefficients differ from findings by Lopes (2001) and Costa (2005). After treating outliers and using panel data with fixed effect for companies in the sample, it is observed that the earnings coefficient and significance (t-statistics) are not lower than those of the book value. The results may also be related with the data treatment method, besides the change in the Brazilian accounting model as from 2007 and its further distancing from tax income after the introduction of the Transition Tax Regime.

The impact of the financial crises can be assessed through the statistically significant coefficients of β_3 (p-value = 0.01) and β_5 (p-value = 0.01). The results support the expectation of studies in other countries (GRAHAM nd KING, 2000; HO et al., 2001; DAVIS-FRIDAY et al., 2006; DAVIS-FRIDAY and

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2   Regressions with different specifications, such as the inclusion of companies with negative net equity and/or earnings display qualitatively similar results (statistical significance and signs of the coefficients).

GORDON, 2005). The value relevance of book values increases (β_3 is positive) and that of earnings decreases ($\beta5$ is negative) in crisis years. Thus, the results confirm the research hypothesis H1.

6. CONCLUSIONS AND SUGGESTIONS

This research aimed to ascertain whether the Brazilian crises in 1997, 1998, 1999, 2002, 2007 and 2008 affected the relevance of Brazilian companies' financial information. Specifically, the intent was to verify whether the value relevance of Brazilian companies' book value increased while that of earnings decreased during the economic crises. These expectations were confirmed, ratifying research hypothesis H1.

Evidence appoints the limited utility of earnings for future cash flow projections, due to economic instability. Book value, then, could be treated as an abandonment option during crisis periods. Another factor that can also contribute to the results is the level of accounting conservatism. Hence, macroeconomic factors should also be taken into account in relevance analyses.

Further research would be interesting, considering other aspects like corporate governance mechanisms and the effect on stock liquidity, during slowdown as well as growth recovery periods. Many studies are focused on the relation between accounting and market variables, and extreme oscillations in the latter can affect conclusions and analyses. Therefore, specifications that mitigate these effects, like the implementation of models that use only accounting or even non-financial variables, can help to understand the utility of Accounting for decision-making purposes.

Finally, a sample of Latin American companies can be considered to broaden the research. The relevance of financial information can be affected because not only the institutional environments are different, but also are specific policies used to mitigate the crisis effects in each jurisdiction.

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