Impairment losses in a low market-to-book ratios scenario: Brazilian Evidence

DAVI SOUZA SIMON
UNIVERSIDADE DO VALE DO RIO DOS SINOS (UNISINOS)
davi.simon.cnh@gmail.com

CLEA BEATRIZ MACAGNAN
UNIVERSIDADE DO VALE DO RIO DOS SINOS (UNISINOS)
cleabeatrizm@gmail.com

Impairment losses in a low market-to-book ratios scenario: Brazilian Evidence

1. INTRODUCTION

No asset should be reported in an entity's financial reports when its outstanding value is estimated to be unrecoverable through sale or usage (IFRS). Under the rules set by IAS 36 – Impairment of Assets, reporting entities must constantly monitor the recoverable value of their assets. While firms are required to disclose information on impairment tests, early evidence after the adoption of IFRS in 2010 shows that Brazilian firms fail to disclose complete information on impairment tests (Uliano et al. 2014; Mazzioni et al. 2014).

Due to the low level of impairment disclosure practiced by Brazilian publicly traded companies, market participants are not able to directly observe estimates made by firms on the recoverable value of their assets. Nonetheless, the market value of firms could provide an indirect aggregate estimate of their net recoverable amount. In this sense, we consider the market-to-book ratio as a potential impairment indicator, inspired by Ramanna and Watts' (2012) assertion that the market expects impairment losses on firms with book-to-market ratios higher than one for a period of at least two consecutive years.

The current Brazilian stock market provides a rich environment for testing how accounting information can absorb or ignore information available on high verifiability states. Some of the largest Brazilian publicly traded companies have been persistently showing market-to-book ratios lower than one. In contrast to the report from Oler (2015), according to whom 19% of the firm-quarter observations between 1990 and 2010 presented low market-to-book ratios, our sample from Brazilian firms from 2010 to 2015 has around 56% of firms with two-year of market-to-book ratio lower than one.

Our main hypothesis is that firms that present a market-to-book ratio below one for an extended period of time are more likely to recognize an impairment loss. Results found in a sample of 1,120 firm-years, comprised by 230 unique firms, are not favorable to this hypothesis. Despite the fact that 56% of firms are in persistently low market-to-book states, there are only 57 observations in which a given firm has recognized an impairment loss. Our analysis of the Brazilian context might contribute to the literature on the effects of IFRS adoption, as our results suggest that the learning curve for the adoption of impairment rules may be slow.

Based on the premise that market prices aggregate investor's opinions on the company's future cash flows, we argue that a persistent market cap lower than the company's book value presents a verifiable and reliable estimate of fair value of the company's net assets. This logic is similar to that presented by Danielson and Press (2003) and Oler (2015), as both papers consider a book-to-market higher than one as a signal of lack of conservatism. Under accounting conservatism, impairment tests should follow persistently low market-to-book ratios, correcting net asset's reporting value to reflect negative information already assimilated by the markets.

Considering a similar premise, Choi (2008) found that a significant portion of write-offs under US GAAP was not recorded in a timely manner. Hence, market prices over the years preceding a write-off takes into account any decline in asset value reflected later in the write-off amount. Ji (2013) presents evidence from the Australian context. Through examining the timing of goodwill impairment decisions of Australian companies during the period 2007 to 2009, the author reports that a non-trivial number of firms did not impair goodwill as called for under the standard governing asset impairment.

Our results do not indicate a positive association between the presence of persistently low market-to-book ratios and the recognition of impairment losses, indicating that firms' behavior is not responsive to market information. Adding to that, under a low market-to-book scenario,

firms with a proportion of fixed assets higher than 30% of their total assets are less likely to recognize an impairment loss.

The remainder of this paper is organized as follows. In section 2, we present the hypotheses development. In section 3, research design and sample data are detailed. Results are presented in section 4, followed by our concluding remarks in section 5.

2.   HYPOTHESES DEVELOPMENT

Under Basu's (1997) interpretation of conservatism, earnings reflects bad news more quickly than good news. Unrealized losses are typically recognized earlier than unrealized gains, resulting on systematic differences between bad news and good news periods in the timeliness and persistence of earnings. Watts (2003b) defines conservatism as the differential verifiability required for recognition of profits versus losses.

Following the work of Ball and Brown (1968), positive capital markets research has been using changes in security prices as tool to infer whether information in accounting reports is useful to market participants (Kothari, 2001). Kothari (2001) states that a temporal association between current financial performance and future cash flows, as well as a contemporaneous association between financial performance and security prices or price changes is expected. We argue that there is no strict causal relation implied in this expected temporal association. Thus, market prices could affect financial reporting as well as financial reporting can affect market prices. Market prices can provide a strong cue to managers when their assets are overvalued. Thus, a significantly low market-to-book ratio can be considered as an indirect impairment indicator.

Ball, Kothari, and Nikolaev (2013a) provide a clear explanation of the Basu (1997) model. They state that in an efficient market, stock returns reflect all new public information, being a valid proxy for economic shocks to value. A segmented regression of accounting income on fiscal-period stock return is fitted, and the incremental coefficient on negative return is taken as a valid measure of asymmetrically timely loss recognition. The primary result reported by (Ball et al., 2013a) is that the Basu regression provides valid estimates of conditional conservatism from a econometrics standpoint, identifying conditional conservatism when it is present.

Beaver and Ryan (2005) separate conservatism in two facets. Under unconditional conservatism, the book value of equity is persistently understated as a consequence of predetermined aspects of the accounting process. Basu's (1997) conservatism falls under Beaver and Ryan's (2005) conditional conservatism, according to which book value is written down under sufficiently adverse circumstances, such as bad news, but not up under favorable circumstances, such as good news. This concept of conditional conservatism establishes a relationship between financial reporting behavior and real economic income (measured through stock returns) (Ball, Kothari, & Nikolaev, 2013b).

The timely recognition of asset write-offs, which are expected to be anticipated by markets, can be considered a form of conditional conservatism. In this sense, motivated by anecdotal evidence showing that managers have plenty of discretion to manage the timing of write-offs to take action related to earnings management, Choi (2008) investigates and obtains results suggesting that write-offs are recorded in a less timely manner than other components of earnings.

Watts and Zuo (2016) emphasize that conservatism in accounting does not suggest historical cost measurement over fair value measurement, since for market prices of Level 1 inputs, the recognition of both gains and losses into income statement in a timely manner is a desirable procedure. Forcing timely asset write downs and disallowing unverifiable write-ups are still present under the IFRS Conceptual Framework. One should note, that although

explicitly removed from the IFRS's Conceptual Framework for financial reporting, there are several reporting practices that are still fully consistent with accounting conservatism. Examples are the asymmetric treatment of contingent assets and liabilities (IAS 37), the need for impairment testing regarding PP&E (IAS 36) and the net recoverable amount rule applicable to the reporting of inventories (IAS 2).

Concordantly, Abdel-Khalik (2010), claims that the accounting debate is usually framed in terms of making a choice between fair value and historical cost, but this is not a correct framing of the issues, since knowledge of fair value alone is not sufficient to help investors to evaluate stewardship. Under extreme fair value accounting, Abdel-Khalik (2010) argues that investors would not know, how much resources the management had sacrificed to obtain that fair value, emphasizing the importance of an adequate reliance on both sources of measurement methods.

Banker, Basu, and Byzalov (2014) argue and report empirical confirmation to the notion that earnings exhibits asymmetric timeliness with respect to multiple signals, including stock return, sales change, and operating cash flow change. These signals differentially explain write-downs of current assets, long-lived tangible assets, and infinite-lived goodwill. The authors also find that impairment is triggered by extreme bad news, and the implicit cutoffs for recognizing bad news vary predictably across both signals and asset types. The persistent empirical evidence that some of the largest Brazilian publicly traded companies present book values of equity that are higher than their market capitalization seems to indicate that the level of unconditional conservatism is low in this companies.

Du, Li, and Xu (2014) state that US accounting rules given by FAS 157, FAS 157-3 and FAS 157-4, specify the circumstances where firms need to adjust valuation inputs to fair value measurements in response to changes in market conditions. The authors emphasize that such an adjustment is subject to a significant degree of management judgment and discretion. We emphasize that a similar level of management discretion is also allowed under IFRS, through IAS 36 – Impairment of assets. In this sense, Knauer and Wöhrmann (2015) did not find significant differences between capital markets effects deriving from write-down announcements under SFAS 142 and IAS 36.

Watts and Zuo (2016) state that for difficult-to-verify information, such as fair value estimates based on Level 2 or Level 3 inputs, conservatism requires a higher verifiability threshold for gains than for losses, and hence a lower of amortized cost or fair value model (similar to the lower of cost or market model for inventories) seems more appropriate. If the market is efficient in valuing stocks of Brazilian companies, their market capitalization could be taken as an indirect proxy for level 1 inputs for the valuation of the company's assets. Considering that level 1 inputs are hierarchically referable, these companies market capitalization should imply an upper bound for the company book value of equity.

Oler (2015) considers that firms with persistently high book-to-market ratios, mathematically equivalent to low market-to-book ratios present an anomaly, probably due to aggressive accounting practices. Based on the above discussion, we start by formulating hypothesis on factors that are potential explanatory variables regarding the probability of a given company recognizing an impairment loss. Our first two hypotheses are presented as follows (in alternative form):

H1. Firms that have market-to-book ratios lower than one should be more likely to recognize an impairment loss than firms with market-to-book ratios higher than one, ceteris paribus.

H2. Changes of state from higher than one to lower than one market-to-book ratio should result in an increased probability of recognizing an impairment loss, ceteris paribus.

The existence of conservatism is explained by the extant literature mostly on contracting considerations, taxes, shareholder litigation risk, political process and regulatory forces (Basu, 1997; Watts, 2003b; Lu & Trabels, 2013). The evidence reported by Watts (2003a) suggests the contracting and shareholder litigation explanations are the most relevant, although effects of taxation and regulation play a smaller role. Due to that, a possible explanation for persisting lower than one market-to-book ratios could be managers' resistance to reduce asset values and consequently reducing their collateral. Accordingly, our second hypothesis is stated as follows (in alternative form):

H3. The leverage level of the firms that have market-to-book ratios lower than one should be negatively related to their probability of recognizing an impairment loss, ceteris paribus.

Herrmann, Saudagaran, and Thomas (2006) argue that fair value measures for property, plant, and equipment are superior to historical cost based on the characteristics of predictive value, feedback value, timeliness, neutrality, representational faithfulness, comparability, and consistency. The authors recognize that verifiability appears to be the sole qualitative characteristic favoring historical cost over fair value.

Considering the superiority of fair value measures when it comes to reporting outstanding values of long term assets, as argued by Herrmann, Saudagaran, and Thomas (2006), we propose the following hypothesis (in alternate form):

H4. When their market-to-book ratio is lower than one, firms with a higher portion of non-current assets, such as fixed and intangible assets, should be more likely to recognize an impairment loss, ceteris paribus.

Lev and Gu (2016) claim that both the "fair" values of assets and liabilities, and the consequent impairment expenses are often based on estimates that are hard to audit and easy to manipulate. The authors claim that information disclosed on an incomplete fashion, without providing investors with information about the reliability of the estimates (confidence intervals), and their impact on sales and earnings, only results on increased information noise.

Lev and Gu's (2016) argument that impairment estimates on companies with less volatile earnings are expected to be more likely to reflect economic impairment losses, due to their higher level of verifiability. Thus, we present the following hypotheses (in alternate form):

H5. Firms with a lower level of earnings volatility and persistently lower than one market-to-book ratio should present an increased probability of recognizing an impairment loss, ceteris paribus.

IAS No. 36 permits an impairment loss on a long-lived asset to be reversed if the economic value of the asset recovers. Trottier (2013) asserts that, since, permitting reversals significantly increases the likelihood that a manager will record the impairment, especially if the manager has a bonus plan. That happens due to the manager disutility from a bonus forgone should the value of the asset recovers but accounting rules prohibit him from reversing the loss. That would be the case of goodwill-related impairment losses, whose reversal is not allowed under IFRS rules.

Based on this effect, we make an additional prediction, that firms with significant goodwill amounts will be less likely to recognize an impairment loss when they have variable compensation schemes, regardless of the existence of a persistently low market-to-book ratio. This hypothesis is defined in the following alternate form:

H6. When their market-to-book ratio is lower than one, firms with a larger amount of goodwill in their assets will be less likely to recognize an impairment loss, ceteris paribus.

3.   RESEARCH DESIGN AND SAMPLE DATA

To test our hypotheses, we use a sample of firm-years with available data between 2010 (the first year of full IFRS adoption in Brazil) and 2015, We require financial data from Standardized Financial Statements available at CVM (Brazilian Securities and Exchange Commission) and at Economática System. We exclude firms in the financial services industries because of their different operating, financial and wealth generating structures. We also exclude companies with negative shareholders' equity on the previous year (for which market-to-book ratios are negative), companies with return on assets below -100% and above 100%, and companies with assets lower than one hundred thousand Brazilian Real. With this exclusion criteria, we exclude both firms that are likely to be in near-bankruptcy state and firms that experienced significant changes on their return on assets' generating processes. In our final sample, there are 1120 firm-years, with 230 unique Brazilian firms with stocks traded at the BM&FBOVESPA.

Generally, our hypotheses concern the existence of a persistently low market-to-book ratio. Hence, we test our hypotheses through a dummy variables approach. In our main specification, the dummy variable of interest takes the value 1 when the company has a market-to-book ratio lower than one for the two calendar years, and zero otherwise, following Ramanna and Watts (2012). For robustness, we run our models and report results with one and three calendar years as a cutoff for a persistent impairment indicator.

Our model is defined in the form or Eq.1. We present the definition of our variables of interest in Table 1. We first estimate a set of unbalanced Panel Data Random Effects Tobit Model, and then estimate Random Effects Logit models for robustness. The error structure regarding the term $v_{i,t}$ is dependent on the model being estimated.

$Impairment_{i,t} = \beta_0 + \beta_1 \left(Persistent\ Impairment\ Indicator_{i,t}\right) + \beta_2 \left(D\_State\_Chg_{i,t}\right) + \beta_3 \left(Leverage_{i,t}\right) +$

$\beta_4 \left(Leverage_{i,t}\right) x \left(Persistent\ Impairment\ Indicator_{i,t}\right) + \beta_5 \left(Earnings\ volatility_{i,t}\right) +$

$\beta_6 \left(Earnings\ volatility_{i,t}\right) x \left(Persistent\ Impairment\ Indicator_{i,t}\right) +$

$\beta_7 \left(Fixed\ assets\ dummyi, t_{i,t}\right) + \beta_8 \left(Fixed\ assets\ dummyi, t_{i,t}\right) x \left(Persistent\ Impairment\ Indicator_{i,t}\right) +$

$\beta_9 \left(Goodwill\ dummyi, t_{i,t}\right) + \beta_{10} \left(Goodwill\ dummyi, t_{i,t}\right) x \left(Persistent\ Impairment\ Indicator_{i,t}\right) + \sum_{k=1}^{18} \{\gamma_k Control_{k,i,t}\} + v_{i,t}$
(Eq. 1)

Table 1 – Definition of variables of interest

Variable	Definition
Dependent Variable	
Impairment$_{i,t}$	impairment loss of firm $_i$ on year $_t$ scaled by total assets on year $_{t-1}$
Independent Variables	
Persistent Impairment Indicator$_{i,t}$	dummy variable that equals 1 if market to book ratio is lower than one in the last one to three calendar years;
D_State_Chg$_{i,t}$	dummy variable that equals 1 the company i changed from a Market-to-book ratio greater than one to a ratio lower than one
Leverage$_{i,t}$	leverage of the company $_i$ on year $_t$;
Fixed assets dummy$_{i,t}$	dummy variable that equals 1 if the firm has a percentage of fixed assets in excess of 30% of its total assets. zerootherwise;
Earnings volatility$_{i,t}$	volatility of the firm is quarterly earnings in the past two calendar years
Goodwill dummy$_{i,t}$	dummy variable that equals 1 if the firm has a percentage of goodwill assets in excess of 10% of its total assets. zerootherwise;
Controls$_{k\ i,t}$	Control variables from table 2

Banker, Basu, and Byzalov (2014) argue and report empirical confirmation to the notion that earnings exhibits asymmetric timeliness with respect to multiple signals, including stock return, sales change, and operating cash flow change. Banker, Basu, and Byzalov (2016), based in Basu's (1997) asymmetric timeliness model, modified the original model through the inclusion of changes in sales and operating cash flows, and the substitution of the dependent variable, earnings scaled by the beginning of year market value of the entity, by asset write-downs. The authors predicted and confirmed empirically a complex chain of interactions between indicators of changes in sales and operating cash flows. We take the variables in Banker, Basu, and Byzalov's (2016) including those from Riedl (2004), which are practicable to our analysis of Brazilian data, as control variables in order to build our model. These variables are presented in table 2.

Given that the Brazilian stock market is significantly smaller than the American stock market, and that there is significant variance on the Brazilian Companies market capitalization, we also included stock liquidity as a control variable. This inclusion was operationalized through the exchange liquidity index, provided on the Economática System, and calculated as follows:

$$ExchangeLiquidity = 100 * p/P * sqrt(n/N * v/V)$$

where:
p = number of days on which there was at least one trade with the share within the chosen period
P = total number of days in the chosen period
n = number of trades with the share within the chosen period
N = number of trades with all shares within the chosen period
v = volume in cash regarding the share within the chosen period
V = cash volume regarding all shares within the chosen period

As in Banker, Basu, and Byzalov's (2016), we consider interactions between control variables $\Delta CF_{i,t}$ and $DC_{i,t}$, $\Delta SALES_{i,t}$ and $DS_{i,t}$, and $\Delta E_{i,t}$ and $DE_{i,t}$. These interactions should capture the asymmetric timeliness of bad news, measured as negative variation on cash flows, sales and pre-impairment earnings. We also consider the payout level as a control variable. Szczesny and Valentincic (2013) analyzed private firms, and reported evidence that such firms make the decision to write off, and write off more in terms of total amount, when they are: (i) more profitable, (ii) have more financial debt, and (iii) pay dividends. In their opinion, asset write-offs as viewed as corrections of departures of book values from their underlying economic values, resulting on a potential adjustment on the stream of dividends to shareholders. Even though their study is based on private firms, we understand that firms that pay more dividends would be economically better by reporting asset write-offs, reducing current levels of dividends and smoothing future dividends (due to effects such as reduced depreciation expense).

Results reported by Wrubel, Marassi, and Klann (2015) regarding the Brazilian market show that changes in cash flow, revenue and debt, and income smoothing practices (Smooth) do determine the recognition of impairment losses. We analyze the Brazilian context regarding the recognition of an impairment loss first through Random effects tobit regressions. The choice of this approach is similar to (Riedl, 2004), and considers that in our full sample of 1120 observations, an impairment loss was recognized only on only 57 observations, resulting on a sample censored at zero.

Considering that our sample covers the period after the adoption of IFRS in Brazil, including calendar years from 2010 to 2015, we must consider that the probability of firm$_i$ recognizing an impairment loss on year$_t$ may be related to the same probability in the year$_{t-1}$. This probability arises because of characteristics that are firm-specific. Thus, our Tobit regression was estimated with panel data characteristics, following Tobin, (1958) and Woolridge (2010).

Table 2 – Definition of Control Variables

Variable	Definition and data items
$RET_{i,t}$	= stock return for the 12-month period of fiscal year t;
$DR_{i,t}$	= dummy variable that equals 1 if stock return RET_t is negative. zero otherwise;
$\Delta CF_{i,t}$	= change in operating cash flow from year $t–1$ to year t, scaled by total assets at the beginning of the year;
$DC_{i,t}$	= dummy variable that equals 1 if cash flow change ΔCF_t is negative, zero otherwise;
$\Delta SALES_{i,t}$	= change in sales from year $t–1$ to year t, scaled by total assets at the beginning of the year;
$DS_{i,t}$	= dummy variable that equals 1 if sales change $\Delta SALES_t$ is negative, zero otherwise;
$\Delta E_{i,t}$	= change in pre-writedown earnings in year t, scaled by total assets at the beginning of the year;
$DE_{i,t}$	= dummy variable that equals 1 if $\Delta E_t < 0$, zero otherwise;
ΔGDP_t	= GDP growth in year t;
$\Delta INDROA_{i,t}$	= change in median industry ROA for the industry of the firm in year t;
$BATH_{i,t}$	= ΔE_t if ΔE_t is below the median of the negative tail of ΔE_t, zero otherwise;
$SMOOTH_{i,t}$	= ΔE_t if ΔE_t is above the median of the positive tail of ΔE_t, zero otherwise;
$Liquidity_{i,t}$	= Liquidity of the stock i on year t, as previously detailed.
Log of total assets$_{i,t}$	= Total assets of firm $_i$ on year $_{t-1}$
Payout$_{i,t}$	= payout of the firm I in the year t, calculated from the firm Statement of Cash Flows

Summary statistics for the Dependent and all of the numeric explanatory variables are presented in Table 3. The Impairment$_{i,t}$ variable has a mean close to its minimum, reflecting the small number of observations with impairment losses. Considering only the 57 observations in which an impairment loss was recognized, Impairment$_{i,t}$ has a mean value of 0.03 with standard deviation of 0.06 and a maximum value of 0.43.

Table 3 – Summary Statistics of the dependent variable and numeric explanatory variables

Statistic	N	Mean	St. Dev.	Min	Max
Impairment$_{i,t}$	1,118	.0017726	.0166378	0	.4392326
Log of total assets$_{i,t}$	1,118	15.0304	15.17945	11.70378	20.49181
Payout$_{i,t}$	1,118	-.6832428	3.863771	-86.04489	11.41567
Earnings_Vol$_{i,t}$	1,118	.0172918	.0263015	.0004274	.4400728
LEV$_{i,t}$	1,118	.9072663	9.207466	-199.7381	218.2164
$RET_{i,t}$	1,118	-.1405531	.507568	-3.264293	3.454244
$\Delta CF_{i,t}$	1,118	.0045677	.0786399	-.4630538	.4575791
$\Delta SALES_{i,t}$	1,118	.0693884	.1663262	-1.028247	1.556462
$\Delta E_{i,t}$	1,118	-.0020298	.070426	-.5248144	.6907132
$\Delta INDROA_{i,t}$	1,118	-.8007062	4.105744	-41.9446	32.58654
$\Delta GDP_{i,t}$	1,118	.015	.0438455	-.06	.07
$Liquidity_{i,t}$	1,118	.3355396	.8273929	0	8.66541

Finally, we present in Table 4 the correlation matrix regarding the Dependent and all of the numeric explanatory variables, indicating that no pair of variables has correlation coefficient suggesting multicollinearity issues. Impairment$_{i,t}$ is correlated with many of the numeric explanatory variables considered in our models, suggesting that there is a statistically significant association between these variables, to be analyzed in depth in the next session.

Table 4 – Correlation Matrix

	1	2	3	4	5	6
Impairment$_{i,t}$	1.00					
Log of total assets$_{i,t}$	0.07[*]	1.00				
Payout$_{i,t}$	-0.01	-0.10[***]	1.00			
Earnings _Vol$_{i,t}$	0.10[***]	-0.20[***]	0.00	1.00		
LEV$_{i,t}$						
RET$_{i,t}$	-0.01	-0.00	0.00	-0.00	1.00	
$\Delta CF_{i,t}$	-0.13[***]	-0.03	0.04	-0.04	-0.02	1.00
$\Delta SALES_{i,t}$	0.12[***]	0.07[*]	0.01	0.02	0.00	0.06
$\Delta E_{i,t}$	-0.00	0.02	0.03	-0.01	0.01	0.30[***]
$\Delta INDROA_{i,t}$	-0.25[***]	-0.06[*]	-0.03	0.15[***]	-0.03	0.33[***]
$\Delta GDP_{i,t}$	-0.26[***]	-0.01	-0.06	0.03	-0.00	0.19[***]
Liquidity$_{i,t}$	-0.05	-0.05	0.01	-0.04	-0.05	0.27[***]
Impairment$_{i,t}$	0.12[***]	0.57[***]	-0.10[**]	-0.05	-0.01	-0.01

	7	8	9	10	11	12
Impairment$_{i,t}$						
Log of total assets$_{i,t}$						
Payout$_{i,t}$						
Earnings _Vol$_{i,t}$						
LEV$_{i,t}$						
RET$_{i,t}$						
$\Delta CF_{i,t}$						
$\Delta SALES_{i,t}$	1.00					
$\Delta E_{i,t}$	0.05	1.00				
$\Delta INDROA_{i,t}$	0.17[***]	0.27[***]	1.00			
$\Delta GDP_{i,t}$	0.13[***]	0.16[***]	0.55[***]	1.00		
Liquidity$_{i,t}$	-0.03	0.17[***]	0.13[***]	0.13[***]	1.00	
Impairment$_{i,t}$	0.05	0.02	-0.01	-0.03	0.01	1.00

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

4. RESULTS

Since we have 6 years of data for 62% of sample firms, the characteristics of our dataset lead us to an unbalanced panel dataset. With this dataset, we estimate Random Effects Tobit Models though Stata's (StataCorp, 2015) "xttobit" function, which is able to handle unbalanced panels. Firms with less than 6 years of data arise mostly because of the exclusion criteria adopted herein. Firm-years in which the shareholders' equity of the previous year became negative, with missing market value or extreme ROA were excluded from our sample.

In Table 5, we report the results of our set of Tobit regressions based on Eq.1 with panel data treatment. Through models (1) to (3), we estimate Random Effects Tobit Regressions considering respectively 1 to 3 calendar years as a cutoff for the definition of a persistently low market to boo ratio (Persistent Impairment Indicator$_{i,t}$). The same cutoff was considered on determining the value of the variable D_State_Chg$_{i,t}$. The Constant and sigma terms are omitted for brevity.

Results reported in table 5 show no statistical significance for Persistent Impairment Indicator$_{i,t}$ (although the coefficient's p-value for the 3-year cutoff specification is close to 0.05). The variable D_State_Chg$_{i,t}$, however, is significant for the 3-year cutoff specification. Our interactions terms of interest are not statistically significant with the exception of Earnings Volatility$_{i,t}$ x Persistent Impairment Indicator$_{i,t}$ and Leverage$_{i,t}$ x Persistent Impairment Indicator$_{i,t}$. Both interaction variables, however, are only significant for the1-year cutoff period.

Table 5 – Random Effects Tobit Models - Dependent Variable = Impairment$_{i,t}$

	(1)		(2)		(3)	
Persistent Impairment Indicator$_{i,t}$	-0.00940	(0.04440)	-0.03340	(0.04902)	0.09783$^+$	(0.05305)
D_State_Chg$_{i,t}$	-0.01163	(0.00875)	-0.01853$^+$	(0.00957)	**-0.01693***	**(0.00752)**
Earnings volatility$_{i,t}$	**-1.93852****	**(0.65692)**	-0.88456	(0.80183)	**1.74144***	**(0.77380)**
Leverage$_{i,t}$	**-0.01397****	**(0.00474)**	-0.00157$^+$	(0.00094)	**-0.00121***	**(0.00058)**
Fixed assets dummy$_{i,t}$	0.01578	(0.03113)	0.04949$^+$	(0.02917)	0.03009	(0.03622)
Goodwill dummy$_{i,t}$	-0.05395	(0.04651)	**-0.14484***	**(0.06001)**	0.08628	(0.07937)
Earnings Volatility$_{i,t}$ x Persistent Impairment Indicator$_{i,t}$	**1.12325****	**(0.36419)**	0.53872	(0.47904)	-1.10094$^+$	(0.58374)
Leverage$_{i,t}$ x Persistent Impairment Indicator$_{i,t}$	**0.00691****	**(0.00238)**	0.00082	(0.00057)	0.00067$^+$	(0.00037)
Fixed assets dummy$_{i,t}$ x Persistent Impairment Indicator$_{i,t}$	-0.01079	(0.01784)	-0.03079$^+$	(0.01773)	-0.03146	(0.02214)
Goodwill dummy$_{i,t}$ x Persistent Impairment Indicator$_{i,t}$	0.01578	(0.03388)	0.07560$^+$	(0.04185)	-0.03656	(0.04433)
AIC	-8.89126		1.15036		-2.19953	
BIC	151.72623		161.10267		151.54813	
Log likelihood	36.446		31.425		33.100	
chi2	127.325		118.066		83.913	
p value	0.000		0.000		0.000	
Observations	1118		1095		902	

Standard errors in parentheses. Control variables omitted for brevity.
$^+$ p<0.1 * p<0.05, ** p<0.01, *** p<0.001

Although the results presented in Table 5 show no response to market indicators of impairment, measured through the persistently low market to book ratio, one must take these results with caution. An analysis of the residuals from models presented in both tables shows that these residuals are not normally distributed, which could impair the ability of making statistical inferences about the coefficients.

In order to test the robustness of our results, we estimate a Random Effects Logistic Regression, using a Dummy variable that takes the value of 1 when a firm registered an impairment loss and zero otherwise. Results are reported in table 6.

Table 6 – Random Effects Tobit Models - Dependent Variable = Dummy_Impairment$_{i,t}$

	(1)		(2)		(3)	
Persistent Impairment Indicator$_{i,t}$	-2.98025	(4.54047)	-3.95687	(3.32715)	10.78289	(10.93146)
D_State_Chg$_{i,t}$	-0.83322	(1.28037)	-0.91221	(0.93430)	-3.18028	(2.81932)
Earnings volatility$_{i,t}$	-70.72578	(170.59304)	-25.42843	(46.63724)	105.53055	(.)
Leverage$_{i,t}$	-1.86240	(0.97271)	-0.02382	(0.04318)	0.05880	(0.58037)
Fixed assets dummy$_{i,t}$	-4.27928	(4.19785)	-1.38803	(2.26561)	3.01389	(35.17448)
Goodwill dummy$_{i,t}$	-1.98366	(4.66346)	-6.47122	(4.73141)	9.97486	(21.31874)
Earnings Volatility$_{i,t}$ x Persistent Impairment Indicator$_{i,t}$	39.41793	(107.48051)	18.70766	(27.96924)	-1.08e+02	(327.04487)
Leverage$_{i,t}$ x Persistent Impairment Indicator$_{i,t}$	0.92052	(0.47691)	0.00812	(0.03899)	-0.08289	(0.44971)
Fixed assets dummy$_{i,t}$ x Persistent Impairment Indicator$_{i,t}$	1.73205	(2.04907)	0.39386	(1.37460)	-4.95619	(19.74911)
Goodwill dummy$_{i,t}$ x Persistent Impairment Indicator$_{i,t}$	0.17618	(3.30852)	3.72169	(3.28624)	-3.77187	(8.93864)
AIC	289.78656		293.81715		220.35206	
BIC	445.38476		448.77095		354.88126	
Log likelihood	-113.893		-115.909		-82.176	
Observations	1118		1095		902	

Standard errors in parentheses. Control variables omitted for brevity.
* p<0.05, ** p<0.01, *** p<0.001

As seen in Table 6, none of our variables of interest is statistically significant. The existence of a persistent impairment indicator does not explain the likelihood of an impairment loss being recognized, either taking this indicator alone, or considering its interaction with other predictors suggested by the extant literature. These results, considered together with our Random Effects Tobit estimation (reported in Table 5) suggest that Brazilian firms' decision of

recognizing an impairment loss is not affected by its shares market prices, particularly when their market-to-book ratios are low for extended periods of time.

5.   CONCLUSION

The persistent observation of Brazilian firms with low market-to-book ratios contrasted with the low frequency of impairment losses recognition is puzzling. As of December 31st, 2015, more than 50% of the publicly traded companies in our sample have market-to-book ratio lower than one. Among these companies, 72% have market-to-book ratios of 0.6 or lower. Although our study is performed on a large number of firm-year observations, our sample do suffer from a small number of impairment recognizing firms. Despite this caveats, our results show the lack of a statistically significant relation between the persistent impairment indicator (low market-to-book ratio) and the recognition of impairment losses. This result is contrary to the findings of Ramanna and Watts (2012) in the American market.

IFRS commands that, whenever there is any indication that an impairment loss has occurred, an impairment test should be carried out, and a loss should be recognized when the assets are no longer recoverable. When the market price of a firm is lower than its book value of shareholders' equity, the market indicates that assets are no longer recoverable at their accounting outstanding value. Firms with a book value of assets in excess to their market value can be considered as examples of lack of accounting conservatism. Watts and Zuo (2016), in their historical account of the development of the accounting profession, argue that accounting conservatism is a critical information control and governance mechanism that should be reintroduced explicitly by standard setters into the Conceptual Framework for financial reporting.

Our results are supportive of the claim that Brazilian firms do not adopt conservative accounting behavior regarding the impairment of their assets. Some of our sample firms do recognize impairment losses when their market-to-book ratios remain persistently low. However, in 61% of our firm-year observations, firms do not recognize impairment losses in contradiction with market expectations. Why Brazilian firms collectively fail to recognize impairment losses in such scenario is an interesting question still to be addressed by future research.

As the period of IFRS adoption in Brazil grows, we will be able to collect further data in order to increase the number of observations in which a firm has effectively recognized an impairment loss. We expect an increase in sample size to result in a significant increase of the explanatory power of econometric tests. In addition to that possibility, researchers will be able to test whether the lack of impairment puzzle can be attributed to a difficult learning curve faced by Brazilian firms. The impairment related policies of these firms could also be compared with the corresponding policies of firms from other IFRS countries, in order to investigate the role played by different institutional settings in the phenomenon we observe in Brazil.

The widespread presence of the low market-to-book ratio firms in the Brazilian stock market may indicate that firms are not conservative enough regarding their impairment-related practices. We believe that there is a fertile avenue for future research on the level of disclosure of impairment tests, its methodology, and its subjectivity. In this sense, firms with low market-to-book ratio should consider providing detailed and convincing disclosure of the reason their net assets are stated by amounts not supported by the market view of the firms' future cash flows. An approach with multiple case-studies, including the analysis of the disclosure of impairment tests of firms on variable states of their market-to-book ratio should contribute further to the understanding of the complex phenomenon of impairment losses.

6. REFERENCES

Ball, R., & Brown, P. (1968). An Empirical Evaluation of Accounting Income Numbers. *Journal of Accounting Research*, *6*(2), 159–178.

Ball, R., Kothari, S. P., & Nikolaev, V. V. (2013a). Econometrics of the basu asymmetric timeliness coefficient and accounting conservatism. *Journal of Accounting Research*, *51*(5), 1071–1097. https://doi.org/10.1111/1475-679X.12026

Ball, R., Kothari, S. P., & Nikolaev, V. V. (2013b). On estimating conditional conservatism. *Accounting Review*, *88*(3), 755–787. https://doi.org/10.2308/accr-50371

Banker, R., Basu, S., & Byzalov, D. (2014). The Role of Multiple Impairment Indicators in Conditional Conservatism. *SSRN Working Paper*, 1–50. https://doi.org/10.2139/ssrn.2400812

Banker, R. D., Basu, S., & Byzalov, D. (2016). Implications of impairment decisions and assets' cash-flow horizons for conservatism research. *The Accounting Review*, *forthcomin*, 1–49.

Basu, S. (1997). The conservatism principle and the asymmetric timeliness of earnings: An event-based approach. *Journal of Accounting and Economics*, (24), 3–37. https://doi.org/10.1111/j.1911-3846.2011.01151.x

Beaver, W. H., & Ryan, S. G. (2005). Conditional and Unconditional Conservatism:Concepts and Modeling. *Review of Accounting Studies*, *10*(2/3), 269–309. https://doi.org/10.1007/s11142-005-1532-6

Choi, T. H. (2008). Asset Write-offs: An Empirical Investigation of Timeliness. *Asia-Pacific Journal of Accounting & Economics*, *15*(1), 11–27. https://doi.org/10.1080/16081625.2008.9720806

Danielson, M. G., & Press, E. (2002). Accounting Returns Revisited : Evidence of their Usefulness in Estimating Economic Returns. *Review of Accounting Studies*, (February), 493–530.

Du, H., Li, S. F., & Xu, R. Z. (2014). Adjustment of valuation inputs and its effect on value relevance of fair value measurement. *Research in Accounting Regulation*, *26*(1), 54–66. https://doi.org/10.1016/j.racreg.2014.02.005

Herrmann, D., Saudagaran, S. M., & Thomas, W. B. (2006). The quality of fair value measures for property, plant, and equipment. *Accounting Forum*, *30*(1), 43–59. https://doi.org/10.1016/j.accfor.2005.09.001

Ji, K. (2013). Better late than never, the timing of goodwill impairment testing in Australia. *Australian Accounting Review*, *23*(4), 369–379. https://doi.org/10.1111/auar.12036

Kothari, S. . (2001). Capital markets research in accounting. *Journal of Accounting and Economics*, *31*(1–3), 105–231. https://doi.org/10.1016/S0165-4101(01)00030-1

Lev, B., & Gu, F. (2016). *The End of Accounting and the Path Forward for Investors and Managers*. John Wiley & Sons, Inc.

Lu, C., & Trabelsi, S. (2013). Information Asymmetry and Accounting Conservatism under IFRS Adoption. *SSRN Working Paper*. https://doi.org/10.1017/CBO9781107415324.004

Mazzioni, S., Politelo, L., Moreira, W. J., & Klann, R. C. (2014). Fatores Determinantes Na Evidenciação Da Re Dução Ao Valor Recuperável De Ativos (Impairment Test) Em Empresas Listadas Na Bm&Fbovespa. *BASE - Revista de Administração E Contabilidade Da Unisinos*, *11*(4), 276–291. https://doi.org/10.4013/base.2014.114.01

Oler, M. (2015). Determinants of the length of time a firm ' s book-to-market ratio is greater than one. *Review of Quantitative Financial Accounting*, *45*, 509–539. https://doi.org/10.1007/s11156-014-0445-5

Ramanna, K., & Watts, R. L. (2012). Evidence on the use of unverifiable estimates in

required goodwill impairment. *Review of Accounting Studies*, *17*(4), 749–780. https://doi.org/10.1007/s11142-012-9188-5

Riedl, E. J. (2004). An Examination of Long-Lived Asset Impairments. *The Accounting Review*, *79*(3), 823–852.

StataCorp. (2015). Stata Statistical Software: Release 14. College Station, TX: StataCorp LP.

Szczesny, A., & Valentincic, A. (2013). Asset Write-offs in Private Firms - The Case of German SMEs. *Journal of Business Finance and Accounting*, *40*(3–4), 285–317. https://doi.org/10.1111/jbfa.12017

Tobin, J. (1958). Estimation of Relationships for Limited Dependent Variables. *Econometrica*, *26*(1), 24–36. https://doi.org/10.2307/1907382

Trottier, K. (2013). The effect of reversibility on a manager's decision to record asset impairments. *Accounting Perspectives*, *12*(1), 1–22. https://doi.org/10.1111/1911-3838.12005

Uliano, A. L. P., Doná, A. L., & Gonçalves, M. N. (2014). Disclusore of loss by the impairment applied to fixed assets: analysis of the IBrX-50 companies. *Enfoque: Reflexão Contábil*, *33*(1), 1–18. https://doi.org/10.4025/enfoque.v33i1.21557

Watts, R. L. (2003a). Conservatism in Accounting. Part II: Evidence and Research Opportunities. *Accounting Horizons*, *17*(4), 287–301.

Watts, R. L. (2003b). Conservatism in accounting part I: Explanations and implications. *Accounting Horizons*, *17*(3), 207–221. https://doi.org/10.2308/acch.2003.17.3.207

Watts, R. L., & Zuo, L. (2016). Understanding Practice and Institutions: A Historical Perspective. *Accounting Horizons*, *30*(3), acch-51498. https://doi.org/10.2308/acch-51498

Woolridge, J. M. (2010). *Econometric Analysis of Cross Section and Panel Data* (second). Massachussets Institute of Technology.

Wrubel, F., Marassi, R. B., & Klann, R. C. (2015). DETERMINANTES DO RECONHECIMENTO DE PERDAS. *RACEF – Revista de Administração, Contabilidade E Economia Da Fundace.*, *6*(1), 112–128.