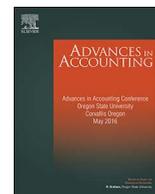




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Effects of IFRS-13 on the relevance of fair value adjusted by credit risk: Evidence from Europe

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ABSTRACT

Accounting harmonization in Europe by International Financial Reporting Standard adoption is a recurrent object of study in the accounting literature. In this paper the consequences of the adoption of Standard-13 are analyzed. In particular, this research analyzes the effects on the implied volatility option (risk) for non-financial companies of three variables: financial leverage, own probability default (Debt Value Adjusted) and financial institutions credit risk (Credit Value Adjusted), before and after the adoption of the accounting standard on fair value. The empirical study focuses on member companies of the European Monetary Union zone to avoid other risk factors different to market risk (such as exchange rate or different risk free rate) and at the same time, easily identify the market portfolio (EUROSTOXX-50). To overcome the problems of endogeneity in the panel data, we use the technique System Generalized Method of Moments with instrumental variables to estimate the parameters. The results show that the leverage effect on excess risk does not change after adopting the Standard, however, its own and the financial institutions default probabilities become statistically significant. Furthermore, this novel methodology allows estimate industry asset betas and, in all cases the asset betas were lower than equity betas and, found an average debt beta of 0.4 for the sample period.

1. Introduction

Since the beginning of the accounting harmonization process in Europe, many studies have analyzed the impacts of International Financial Reporting Standard (IFRS) adoption. Mostly, these works seek evidence of improvement in the usefulness of accounting information. Some studies materialize its objective in checking the quality of the financial information from companies. Therefore, [Chen, Tang, Jiang, and Lin \(2010\)](#) observed that improving accounting quality is attributable to IFRS, rather than the changes in managerial incentives, the institutional features of capital markets, and the general business environment, among others.

Other empirical works identify the usefulness of the accounting information influence on the capital market, or if normative changes, which have meant the replacement of historical cost by fair value, have increased the contagion between market and accounting (see [Laux & Leuz, 2009](#)). For example, [Devalle, Onali, and Magarini \(2010\)](#) show that, after IFRS adoption, the influence of earnings and equity book values has increased and decreased, respectively. In this line, [Aubert and Grudnitski \(2011\)](#) found a statistically significant relationship between accounting information and market returns. [Chen, Chin, Wang, and Yao \(2015\)](#) found that mandatory IFRS adoption is associated with increases in interest rates in syndicated bank loans. In contrast, [Florou](#)

and [Kosi \(2015\)](#) find that interest rates are lower for public bonds issued after mandatory IFRS adoption.

Thus the first arising question, as proposed by [Laux and Leuz \(2009\)](#), is to analyze the mechanisms of interrelationship between accounting and the markets after adopting the IFRS on fair value.

Through IFRS-13, the International Accounting Standard Board (IASB) provides, for all fiscal years ending 1 January 2013, the way for estimating the fair value of assets and liabilities. Therefore, IASB supplements the International Accounting Standard 39 (IAS-39) on financial assets and liabilities.

Besides, while there are empirical studies on fair value accounting effects for the banking industry ([Allen & Carletti, 2008](#); [Barth, Gomez-Biscarri, Kasznik, & Lopez-Espinosa, 2012](#)). Or, more recently, the accounting literature analysis the effects of fair value accounting standards (SFAS-157 and 159) on US non-financial companies ([Ayes, 2016](#); [Ayes, Huang, & Myring, 2017](#); [Demerjian, Donovan, & Larson, 2016](#); [Elbannan & Elbannan, 2015](#) and [Lin, Lin, Fornaro, & Huang, 2017](#)). There are no studies that show the results of the application of fair value (IFRS-13) for the European non-financial companies. For that, this empirical research is the first analysis on the effects of IFRS-13 adoption by European Monetary Union (EMU).

This Standard has two notable aspects for the purposes of this work: first, it defines the category of variables to use in estimating fair value.

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Second, IFRS-13 requires credit risk as a factor to be included in the estimate of fair value.

Regarding the variables used to estimate fair value, this Standard establishes three levels: level 1, reflecting observable inputs consisting of quoted prices in active markets for identical assets or liabilities; level 2, reflecting observable inputs other than quoted prices; and level 3, reflecting unobservable inputs. Logically, the rule gives more prominence to market information, and as levels descend, the information required is greater.

To incorporate credit risk, the Standard requires an adjustment in the valuation of financial assets and liabilities, i.e., counterparty risks on asset or Credit Value Adjusted (CVA), and own credit risks on liabilities or Debt Value Adjusted (DVA).

Thereby, this work studies the effects of fair value application on the relation between the market and accounting figures. So, the aim is a novel contribution, since this empirical research tests whether the relevance of financial information on credit risk adjustment of fair value has changed for investors after the effective date for IFRS-13 by EMU zone.

The rest of the paper is structured as follows. Section 2 shows the background and hypotheses development. Section 3 exposes the research design. Section 4 displays the data. Section 5 provides the empirical results. Section 6 exhibits robustness analysis, and Section 7 offers concluding remarks.

2. Background and hypotheses development

The accounting literature has examined the relevance of the accounting information from these adjustments for credit risk in different ways. For example, Gaynor, McDaniel, and Yohn (2011) carried out an experiment to test whether users of financial information have an asymmetric interpretation between increases and decreases of its own credit risk and the effects on the income statement that it causes through changes in the value of liabilities. They found that financial information users were unable to associate a gain (loss) arising from a change in the fair value with the liability to an increase (decrease) in credit risk. Additionally, Koonce, Nelson, and Shakespeare (2011), through several experiments, discussed the importance that investors attach to the endpoint using fair value. They found that investors consider fair value more relevant to assets than to liabilities and that the relevance of the differential fair values is translated into differences of firm value, but they observe no difference in fair value relevance between gains and losses. However, there is no consensus, for while Koonce et al. (2011) showed that investors give more importance to fair value in transactions not held to maturity, Linsmeier (2011) indicates that the amortized cost model is adjusted only when management determines credit losses are probable or that the assets are otherwise impaired.

Another research line focuses on financial institutions, as they negotiate directly with credit risk and are subject to specific rules on it (BIS-II and BIS-III). Therefore, Allen and Carletti (2008) showed, by a model, that a shock in the insurance sector can cause the current value of banks' assets to be less than the current value of their liabilities so that the banks are insolvent. In contrast, if historic cost accounting is used, banks are allowed to continue and can meet all their future liabilities. Thus, mark-to-market accounting can lead to a contagion where none would occur with historic cost accounting. Barth et al. (2012) analyzed the effects of fair value accounting in banking: the increased volatility that it generates in some accounting variables and whether it reduces the possibility of discretionary earnings management. Their results show evidence of earnings management related to regulatory capital requirements and the availability of for sale securities in banks with positive earnings. Blankespoor, Linsmeier, Petroni, and Shakespeare (2013) studied whether financial statements using fair values for financial instruments suitably describe banks' credit risks. They found that leverage measured using the fair values of financial

instruments explains more variations of credit risk (bond yield spreads) than other measures.

Finally, papers that analyze the effects of credit risk adjustments on capital markets for non-financial companies are highlighted. Within this body of work, it is necessary to differentiate those that employ level-1 variables (market data) versus those that do not. In this last group, Jung, Sivaramakrishnan, and Soderstrom (2016) studied the importance of credit rating changes (variable level-3 with limitations) as an information source for equity analysts forecasting corporate earnings and found that, after Regulation Fair Disclosure, equity analysts appear to place more weight on rating downgrades in revising their earnings forecasts, but they did not find a similar effect for upgrades. Wang and Zhang (2017) find a negative association between the use of Level 3 fair value measures and the debt conversion privilege or debt maturity term is more pronounced for high-performance firms.

For those who use data from liquid markets (level-1), it is necessary to distinguish those using market risk models (mainly the Capital Asset Pricing Model, CAPM) from those using credit risk models. In the first group, Riedl and Serafeim (2011) test whether higher-quality information about a firm's future cash flow (depending on the level of the variables used) lowers the cost of capital through a reduction in the risk and, using equity beta (CAPM) weighted by the equity asset ratio, as a measure of risk. Additionally, Ow Yong, Chung, and Lobo (2012) found a positive correspondence between fair value liability gains, losses and stock returns; such gains and losses, by the inclusion of a firm's own credit risk when measuring the fair value of liabilities, are perceived as economic income by investors. In addition, they observed a positive relation between fair value liability results and the firm's beta (from CAPM) as a market risk proxy.

Finally, Ayres (2016) explores whether a firm's holdings of SFAS 157 level three fair value assets (level three assets) have an impact upon corporate credit ratings and, find a negative impact. But previously, Barth, Hodder, and Stubben (2008) tests whether equity value changes associated with credit risk changes are attenuated by debt value changes associated with credit risk changes.

But, in contrasting any hypothesis that involved market information as a measure of investor expectations, it is necessary to implement the study under some theoretical model to explain the relationships among variables, otherwise it would simply be a statistical analysis with invalid results out of the sample. In this context, Barth et al. (2008) makes a fundamental contribution, since this study lies in the theoretical environment defined by the Merton (1974) model.

The Merton (1974) model defined equity as a call option issued by creditors. To exercise the option, shareholders have to pay the strike price (face value of debts). Merton (1974) found that the relation between equity returns and credit risk changes is significantly less negative or firms with more debt.

But, Barth et al. (2008) and similar works are controversial for using the credit rating built by rating agencies (non level-1, while Merton, 1974 was formulated in terms of market prices or level-1) as a credit risk proxy, although the recent crisis has demonstrated the lack of predictability of such ratings.

Instead, Bhat, Callen, and Segal (2014) used a level-1 variable to compare the pricing of credit risk information conveyed by accounting numbers under IFRS. They found that the adoption of IFRS did not change the credit risk informativeness of accounting variables as reflected in CDS (Credit Default Swap) spreads, whose quotes show the market price of credit risk hedging (level-1).

At this point, it is necessary to summarize the situation and rethink the issue. The main objective, as seen in Laux and Leuz (2009), is to analyze the reactions of the market to changes resulting from IFRS-13 adoption but that are related to the adjustment for credit risk (CVA and DVA). And, for this purpose, it is not possible to use only market models (CAPM) to explain the abnormal stock price reactions, unlike Christensen, Lee, and Walker (2009). Thus, the study should be based on a credit risk model, such as the Merton (1974), and use as input only level-1 variables.

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