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Fair Value Accounting and the Cost of Debt[*]

Michel Magnan[†], Haiping Wang[‡], Yaqi Shi[§]

Résumé

La comptabilité à la juste valeur et le coût de la dette pour une entreprise

Cette étude examine la relation entre l'intensité de l'usage de la comptabilité à la juste valeur et le coût de financement par voie de dette. Nous évaluons également si l'engagement d'auditeurs dits experts influence cette relation. Notre échantillon comprend des émissions de titres de dette effectuées par des institutions financières américaines entre 2007 et 2014. Nos résultats indiquent que l'utilisation plus intensive de la comptabilité à la juste valeur comme base de mesure pour les états financiers est associée à des coûts de financement plus élevés. La fiabilité moins grande de la comptabilité à la juste valeur peut expliquer ce résultat. À cet égard, l'utilisation d'intrants de niveau 2 et de niveau 3 influence grandement le coût de financement par voie de dette. Contrairement à certains résultats antérieurs, nous n'observons pas que l'engagement d'auditeurs dits experts contribue à réduire l'effet de la comptabilité à la juste valeur sur le coût de financement. Ces résultats demeurent valides même après avoir contrôlé pour des variables captant le modèle d'affaires des institutions financières.

Abstract

This study examines the association between the use of fair value accounting and the cost of debt, as well as the impact of auditor industry expertise on this association. The sample comprises U.S. financial institutions' data between 2007 and 2014. Results suggest that more extensive use of fair value accounting measurement in the financial statements is generally associated with a higher cost of debt, which supports the argument that fair value accounting is perceived to exhibit lower reliability. Findings further show that greater reliance on Level 2 and Level 3 fair value inputs is related with a higher cost of debt, indicating that the reliability issue is primarily driven by Level 2 and Level 3 estimates. In addition, we do not find that auditor industry expertise improves the decision usefulness of fair value accounting information. These results hold even after controlling for variables associated with a financial institution`s business model.

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1. Introduction

This paper examines the association between fair value accounting and the cost of debt. The application of fair value accounting has been a controversial issue over the past two decades, with the recent financial crisis only exacerbating the controversy. Prior research on fair value accounting focuses mainly on the value relevance perspective, and documents that fair value-based information in the financial statements relates to a firm's stock market value (Barth 1994; Petroni and Wahlen 1995; Barth, Beaver, and Landsman 1996, 2001; Eccher, Ramesh and Thiagarajan 1996; Nelson 1996; Khurana and Kim 2003**;** Song, Thomas, and Yi 2010). In contrast, there is only scant evidence regarding the impact of fair value accounting on the debt market (e.g., Blankespoor, Linsmeirer and Petroni, 2013; Cantrell, McInnis and Yust, 2014; Ball, Li and Shivakumar, 2015), despite its critical role as the largest source of external financing in the U.S. capital market[1] (Denis and Mihov 2003).

The objective of financial reporting is to provide useful information about the reporting entity to existing and potential investors, lenders and other creditors in making capital-allocation decisions (FASB, 2010). As noted by Holthausen and Watts (2001), information relevant for equity investors may not be relevant for lenders, and vice versa. Moreover, even within specific user groups, there can be confusion as to the contribution of some disclosures to their information set. For example, focusing on disclosure arising from fair value accounting, Magnan, Menini and Parbonetti (2015) do find that some aspects of it do contribute to confusion among financial analysts. Such confusion, which manifests itself by increased earnings forecast dispersion, arises even while there is evidence that fair value accounting is value relevant.

[1]The total value of U.S. corporate debt issuance for the year 2015 amounts to $1,451 billion, while the total value of equity issuance for the same year is only $174.1 billion. A similar ratio of total debt issuance to equity issuance holds for other years over the past decade (Federal Reserve Bank of Chicago).

Extending the argument to debtholders, it is likely that insufficient information provision leads to greater information asymmetry between debtholders and the borrowing entity, resulting in higher agency conflict of debt and thus higher cost of debt. Given debtholders' asymmetric payoff function and natural information disadvantage, it is an open question as to whether fair value accounting enhances or undermines the decision usefulness of financial statements to debtholders. Moreover, given the potential latitude in measuring balance sheet accounts using fair value accounting, it is deemed that auditors play a pivotal role in reducing the uncertainty surrounding estimated values for equity holders (e.g., Song et al., 2010). We infer that their role should be comparable from a debt market perspective. Hence, to fill the void in the literature, this study addresses the following research questions: (1) Does the use of fair value accounting in financial reporting enhance or undermine debtholders' information environment, and therefore affect the cost of debt? (2) Does auditor industry expertise play a role in fair value accounting's impact on cost of debt?

We examine whether use of fair value in financial statements affects the firm's cost of debt. Our empirical results show that greater use of fair value in financial statements leads to higher cost of debt. This association is stronger for firms that use Level 2 and Level 3 fair value inputs. In addition, to address the concerns of fair value's lack of reliability, we test whether auditor industry expertise improves fair value's debt contracting value and strengthens the impact of fair value on cost of debt. We do not find support that auditors with industry expertise are able to mitigate the reliability issues of fair value accounting.

Our sample includes financial institutions in the U.S. that issued public bonds during the period 2008–2014, and our financial data is one year ahead of the bond issuance, covering 2007-2013. We focus on financial institutions for the following reasons. First, prior disclosure research

largely excludes the financial sector from analysis, leaving the research on the financial industry being underdeveloped. In fact, financial institutions have a unique capital structure and operating mode, and thus results based on non-financial industries may not be applicable to this industry. Therefore, this paper adds to the disclosure research by exploring the impact of accounting methods on the financial industry. Second, the stability of the financial industry is significantly associated with the prosperity of the economy. According to Heffernan (2005), when the stability of the financial system is threatened, the financial infrastructure could collapse in the absence of central bank intervention, leading to economic crisis. Consequently, the stability of the banking system is essential to maintaining the soundness of the macro-economy. Third, from a micro perspective, a banking crisis has a real impact on company operations. Studies show that new loans fall significantly during a financial crisis (e.g., Ivashina and Scharfstein, 2010), resulting in a great number of firms becoming financially constrained. Financially constrained firms are found to bypass attractive investment opportunities (Campello, Graham and Harvey 2010), indicating that the instability of financial institutions and related financial crises have a real effect on firm performance and growth opportunities. Therefore, if fair value contributes to the stability of the financial industry, it also has a real impact on firm performance and growth opportunities.

Fair value is a double-edged sword. On the one hand, fair value is superior to historical cost in providing greater relevance. Under a fair value accounting regime, assets and liabilities are measured by their market values, or estimated market values, which should increase transparency and encourage immediate decision corrections by providing timely information (Laux and Leuz, 2009). In this regard, fair value informs debtholders of timely updates regarding a firm's financial position and thus provides early warnings to debtholders as soon as the credit quality of

the firm deteriorates. However, historical cost and values diverge when market and economic conditions change. While historical cost does provide verifiable records for past performance, it may not satisfy the information needs of investors (i.e., shareholders and debtholders), who seek relevant information that can help predict firms' expected future performance.

On the other hand, fair value accounting does not have the quality of hardness as historical cost accounting, i.e., easy verification and low degree of susceptibility to assumptions and judgment (Ijiri, 1967).). Under a fair value accounting system, assets and liabilities are measured by their market value, or estimated market value when market value is not observable. In this regard, some fair value measures suffer from low reliability (Laux and Leuz, 2009; Ball et al., 2015). When particular assets or liabilities have no observable market value, fair value measurement for such assets or liabilities may involve managerial discretion and estimation errors. As a result, fair value's increased relevance may come at the cost of lower reliability. For instance, Dechow, Myers and Shakespeare (2010) also suggest that managers use the flexibility available in fair value accounting regime to smooth earnings for asset securitizations.

It is well accepted that debtholders price-protect themselves given low information quality. Therefore, the change of accounting disclosure regime may lead to change of quality of accounting information, which in turn affects the cost of debt for firms that has debt financing need. If a more fair value-oriented disclosure regime improves debtholders' information environment by making accounting information more relevant, we should observe a decrease in cost of debt for firms that use more fair values on their financial statements. On the contrary, if the concerns of fair value's lack of reliabilities outweigh the benefits of higher relevance, a positive association is anticipated between the use of fair value accounting and a firm's cost of debt.

This paper is motivated by the ongoing debate with respect to the pros and cons of fair value accounting as opposed to historical cost accounting. It is impossible to judge whether fair value accounting improves the overall decision usefulness of accounting information from a purely theoretical perspective, because fair value accounting trades off a loss of reliability in favor of greater relevance. Therefore, empirical evidence regarding the overall decision usefulness of fair value accounting is of great importance to standard setters, debtholders, and corporate managers, among others.

This paper contributes to the current accounting literature in several ways. First, it extends the evidence on the decision usefulness of fair value accounting to debtholders. The accounting literature mostly focuses on the value relevance of fair value accounting from the perspective of shareholders, which has been criticized by Kothari, Ramanna, and Skinner (2010) as a narrow interpretation of Generally Accepted Accounting Principles (GAAP) objectives. In essence, the role of financial reporting is to provide useful information not only to shareholders, but to debt holders, firm management, and standard setters as well. Since debt is the major source of external financing in the U.S. capital market (Denis and Mihov 2003), the information needs of debtholders are not negligible. However, in the accounting literature, especially the fair value accounting literature, debt market studies have been largely absent. Our study fills this gap by examining the decision usefulness of fair value accounting in the debt market.

Second, this study extends evidence on the impact of accounting disclosure on debt contracting to financial institutions. Financial institutions, because of their unique capital structure and operating mode, are usually excluded in general purpose accounting studies. As a result, there is a lack of evidence on how accounting methods affect the information environment of financial institutions and their relevant stakeholders. This study is among the first few to provide empirical

evidence on the decision usefulness of fair value accounting to the debtholders of financial institutions.

Third, this study also adds to the auditing literature by showing that auditor industry expertise does not help improve fair value accounting's decision usefulness to debtholders. The existence of independent auditors, especially those with industry expertise, has been documented to alleviate agency problems between management and outside investors (i.e., shareholders and debtholders). However, researchers have raised concerns that the measurements of auditor industry expertise are subject to internal and external validity issues (Audousset-Coulier, Jeny and Jiang, 2016). Our finding that auditor industry expertise does not help improve the reliability of reported fair value numbers provides support to the methodological concerns of auditor expertise.

The findings of this study also have implications for standard setters, debtholders, and bank managers, among others. While FASB and IASB have been advocating a full fair value application for the last two decades, opposing opinions have been voiced as well. Opposing views on fair value accounting became stronger during the recent financial crisis, and currently from the financial industry, claiming that fair value accounting has exacerbated the financial crisis and has put banks in trouble during economic downturns. Facing a majority of opposition from over 2,800 comment letters on its fair value proposal, the FASB recently announced a reversal on accounting for financial instruments from fair value back to amortized cost for qualifying fixed maturity instruments. Our findings that fair value accounting adds to the cost of debt cast doubt on the net benefits of implementing a full fair value accounting model.

The remainder of this paper is organized as follows. Section 2 presents the institutional background of fair value accounting and reviews the literature. Section 3 develops hypotheses. Section 4 describes research design. Section 5 shows empirical results. Section 6 conducts sensitivity tests. Section 7 concludes.

2. Fair Value Background and Prior Research

2.1 Fair Value Background

According to Statement of Financial Accounting Standards No. 157 (FAS 157), fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date (FAS 157, FASB, 2006).

Even though the definition and measurement guidelines of fair value were not formalized until 2006, fair value accounting is neither a novel concept nor a new practice (Magnan, 2009). Back in the 1920s, companies frequently appraised capital assets to market value on their books, although this practice crashed significantly in 1929, the year of the Great Depression (Scott, 2011). Accountants thereafter learnt the lesson that values are fleeting and that the value of the appraised assets can crash significantly in one day, which results in a strengthening of the historical-cost based accounting system. In the past two decades, fair value accounting has gradually re-gained the favor of standard setters as many claim that historical cost accounting no longer provides relevant information. Fair value accounting is now the measurement base for a number of financial statements' items, especially financial instruments.

FASB (2000, p.8) states that its long-term goal is to have all financial assets and liabilities (i.e., financial instruments) recognized in balance sheets at fair value rather than at amounts based on historical cost. It has issued several significant pronouncements with respect to fair value

measurement and disclosures: FAS 107, Disclosures about Fair Value of Financial Instruments (FASB, 1991), FAS 115, Accounting for Certain Investments in Debt and Equity Securities (FASB, 1993), FAS 119, Disclosure about Derivative Financial Instruments and Fair Value of Financial Instruments (FASB, 1996), FAS 133, Accounting for Derivative Instruments and Hedging Activities (FASB, 1998), FAS 157, Fair Value Measurements (FASB, 2006), and FAS 159, The Fair Value Option for Financial Assets and Financial Liabilities (FASB, 2007). Based on the above FASB pronouncements, entities are required to record the value of some of their financial instruments, especially derivatives, trading securities and available-for-sale securities, at fair value. They have the option to record the value of other financial instruments, such as held-to-maturity securities, loans, deposits and long-term debt, at fair value or amortized cost, the historical cost at which they were acquired or originated. In a recent exposure draft in 2010, FASB proposes a full fair value application to all financial instruments, although this proposal was revised later and permitted measuring loans at amortized cost. More details and illustration of fair value application is shown in appendix.

2.2 Literature Review

More recent studies on the value relevance of fair value accounting examine the three-level fair value hierarchy under the pronouncement of SFAS 157: Kolev (2008), Goh et al. (2015), Bhat and Jayaraman (2009) and Song et al. (2010). Kolev (2008) uses a sample of large financial institutions for the first two quarters of 2008 to examine the association between stock price and disclosed values of net assets recognized at fair value hierarchy on a recurring basis. He finds that even if companies use unobservable mark-to-model inputs (Level 3) to measure fair value net assets, which are based on management's own assumptions and are thus more likely to be subject to management's discretions or estimate errors, market investors still consider Level 3

estimates to be value relevant and reliable, consistent with the previous literature regarding value relevance of fair value accounting (Barth 1994; Barth et al. 1996, 2001). Song et al, (2010) also investigate the value relevance of fair value measurements under SFAS 157 using data from the first three quarters of 2008. They further examine whether strength of corporate governance can improve value relevance and reliability of mark-to-model measurements since previous literature argues that strong corporate governance mechanisms are more likely to reduce information asymmetry between managements and market investors and to mitigate the problems of management opportunistic behavior. Consistent with Kolev (2008), the authors find positive and significant coefficients on fair value Level 1, Level 2 and Level 3 measurements for assets: coefficients for liabilities are significant and negative, using share price as a dependent variable. Empirical evidence also indicates that the relevance of fair value is greater for firms with stronger corporate governance. However, a study by Goh et al. (2015) documents more market discounting for mark-to-model measurements and decline in reliability of Level 2 and Level 3 assets from Quarter 1 to Quarter 3 of 2008 as the Financial Crisis worsened. Not surprisingly, greater capital adequacy and better audit quality, proxied by Big 4 auditors, can mitigate the investors' concerns over liquidity problems and information asymmetry for mark-to-model assets. Bhat

In addition to shareholders, debtholders also demand accounting information for debt contracting purpose. According to Armstrong, Guay and Weber (2010), financial reporting provides information to debtholders regarding the downside risk and evaluation of the firms' collateral, as well as information that is useful in assessing the timing and riskiness of the firms' expected future cash flows from existing projects and anticipated investments. However, empirical evidence regarding the informativeness of fair value measures in the debt market has been scarce.

One notable exception is a study by Blankespoor et al. (2013), which studies the relation between bank credit risk exposures and bank leverage measured under various accounting systems (full fair value for financial instruments, the current GAAP accounting systems, historical cost systems, and Tier 1 capital). Their study find that bank leverage measured under a full fair value system is at least six times more highly correlated with the TED spread than is leverage measured under any other accounting model, suggesting that fair value information gives a much more accurate picture of banks' financial condition. In addition, Cantrell et al. (2014) examine the ability of loan fair values to predict credit losses relative to the ability of net historical costs currently recognized under U.S. GAAP. They find that net historical loan costs are generally a better predictor of credit losses than loan fair values. Ball et al. (2015) explore the consequence of IFRS adoption in debt contracts, and they outline that IFRS adoption is associated with a significant reduction in accounting-based covenants. Our study extends the debt-market related fair value studies by examining the impact of fair value accounting on bond yield spread, and thus provides insights to practitioners and regulators.

3. Hypothesis Development

3.1 Aggregate Fair Value and the Cost of Debt

Due to the existence of underinvestment problems and asset substitution risks (Myers, 1977; Smith and Warner, 1979), uninformed creditors face a form of systematic information risk. As a result, these creditors will charge a higher cost of capital as compensation (Francis et al., 2005). There are two lines of theories that support the association between the informativeness of accounting numbers and firms' cost of capital. Easley and O'Hara (2004) argue that high quality accounting information decreases the (information-based) systematic risk to uninformed

investors. As a result, investors demand a lower risk premium; i.e., a lower cost of capital. By contrast, Leuz, Lambert and Verrecchia (2007) consider the role of financial reporting in aligning firms and investors with respect to firms' capital investment decisions. High-quality financial reporting decreases managers' motivation to invest in risky projects, therefore investors face lower risk and charge a lower cost of capital.

In short, both Easley and O'Hara (2004) and Leuz et al. (2007) predict a positive association between firms' information risk and cost of capital. The information risk can be alleviated if creditors have access to timely and informative accounting information (Sengupta, 1998). According to Smith and Warner (1979), accounting numbers have been used in lending agreements and debt covenants for hundreds of years. Accounting-based numbers serve as a useful tool for creditors to assess firm financial health and viability (Anderson, Mansi and Reeb, 2003). Therefore, by reducing investors' information risk, decision useful accounting information leads to lower cost of capital.

Fair value is a double-edged sword in terms of its decision usefulness to financial statement users. As previously mentioned, decision usefulness is defined with respect to the relevance, reliability, comparability and understandability of accounting information (Spiceland, Sepe and Tomassini , 2005). On one hand, fair value is more relevant given it provides timely update regarding the company's financial position (Emerson, Karim and Stokes, 2010), sending early signals of deterioration and allowing prompt corrective actions if necessary (Linsmeier, 2011). In addition, fair value could be conceptually more reliable because, market-based numbers are free from manipulation. Further, fair value inputs, given the nature of market-based numbers, are more comparable across firms. Finally, when adopting fair value models, the exit value is more understandable than applying the complex hedge accounting. On the other hand, however, some

fair value inputs (i.e., Level 2 and Level 3 inputs) are based on estimation and managerial discretion. Consequently, these fair value inputs are subject to low reliability (Emerson et al, 2010). Besides, once fair value inputs involve discretion and/or estimation errors, their comparability and understandability are called into question. Empirically, Ball et al. (2015) find that IFRS adoption is associated with declines in accounting covenant use in banks, suggesting that fair value regime jeopardizes debt contracting usefulness. Similarly, Ball, Jayaraman and Shivakumar (2012) document that a significant increase in bid-ask spreads for banks that adopted fair value accounting compared to those that did not. Therefore, it is an open question whether further use of fair value constructs in the financial statements improves or deteriorates the decision usefulness of accounting information. Taken together, we grant our first hypothesis in null form:

H1: There is no difference in the cost of debt of firms with more use of fair value inputs and firms with less use of fair value inputs.

3.2 Distinguishing among the Fair Value Hierarchies

Because active markets do not exist for all financial statement items, fair value inputs are divided into three hierarchies: Level 1, Level 2 and Level 3 fair value inputs.

Based on the definition in SFAS 157 (FASB, 2006a), Level 1 fair value inputs are the unadjusted quoted prices in active markets for identical assets or liabilities at the measurement date. First, the market-based inputs timely reflect firms' financial condition, and are free from manipulation and estimation errors. Second, the market values of the same assets or liabilities are the same across firms. Finally, understanding the values of the Level 1 inputs requires no specific knowledge. In sum, Level 1 fair value inputs are highly relevant, reliable, comparable and

understandable, thus highly decision useful. Therefore, Level 1 inputs may help reduce the information risk facing creditors, thereby resulting in lower cost of debt.

Based on the above analysis, we state our second hypothesis as follows:

H2a: Firms with more Level 1 fair value inputs in the financial statements have lower cost of debt.

Level 2 inputs are either quoted prices of identical assets or liabilities in inactive markets or quoted prices of similar items in active or inactive markets (FASB, 2006a). However, management has the discretion in determining which are the "similar items" for price matching purposes, making Level 2 fair values subject to low reliability. Therefore, it is an empirical question whether Level 2 fair value inputs improve or deteriorate the decision-usefulness of accounting information, which will consequently influence firms' cost of debt. Thus, we propose the following hypothesis in null form:

H2b: There is no difference in the cost of debt between firms with more use of Level 2 fair value inputs and less use of Level 2 fair value inputs.

The determination of Level 3 inputs is more discretionary. Level 3 inputs are characterized as unobservable data and are used where observable market inputs are not available. The determination of the unobservable inputs involves a company's own assumptions about how market participants would price the asset, indicating that the reliability, comparability and understandability of Level 3 inputs are questionable. Therefore, Level 3 inputs may even exacerbate the information risk of debtholders, resulting in higher cost of debt. Therefore, we put forward our third hypothesis:

H2c: Firms with more Level 3 fair value inputs have higher cost of debt.

As previously analyzed, there is difference in nature across the three levels of fair value measurement. Level 1 fair value is a pure market-based measurement, which is not subject to reliability issues. Therefore, the decision-usefulness of Level 1 fair value inputs should be the greatest among the three tiers. Level 2 fair values involve certain extent of estimation and allows for managerial manipulation. Thus, compared with Level 1 fair values, the decision-usefulness of Level 2 fair values should decrease. Level 3 fair values are completely based on model estimations, thus creating potential for manipulation and estimation errors. Previous research shows that different levels of fair value measurements relate to different economic consequences. For example, Magnan, Menini and Parbonetti (2015) finds that level 2 measurement is associated with increased forecast accuracy, whereas level 3 measurement relates to enhanced forecast dispersion. By contrast, Altamuro and Zhang (2013) demonstrate that only level 3 (not level 2) fair value measurements for mortgage servicing rights are negatively related to firm risk, suggesting that managers may generate high quality fair value estimates that market inputs (level 2). Despite of the controversial results, given that in general the reliability of the three levels of fair value decreases from Level 1 to Level 3, we expect that firms' cost of debt increases accordingly. The above reasoning leads to our Hypothesis 2d:

H2d: Firms' cost of debt increases as the levels of fair value measurement increases.

3.3 Auditor Industry Expertise and the Impact of Fair Value on Cost of Debt

Fair value accounting information is less reliable when the fair value inputs are based on management's judgment and estimation. Prior auditing literature documents the effectiveness of auditor industry expertise in improving the reliability of accounting numbers (e.g., Bedard and

Biggs, 1991; Johnson, Jamal and Raman, 1991; Wright and Wright, 1997; Balsam, Krishnan and Yang, 2003; Krishnan, 2003). Specifically, Bedard and Biggs (1991) find that auditors with more industry specific experience can better identify errors in the data of clients. Similarly, Johnson et al. (1991) show that auditor industry experience is associated with enhanced ability to detect fraud. Wright and Wright (1997) observe that significant experience in the retailing industry improves auditor's ability to identify material errors.

Auditors' industry expertise improves the reliability of reported accounting numbers in two ways. First, auditors with industry expertise have more industry-specific knowledge in detecting the errors in the financial statements. Specialist auditors are likely to invest more in a specific industry in staff training, experience sharing, and state-of-the-art audit technologies than non-specialist auditors (Dopuch and Simunic, 1982). Both trainings and experiences increase the auditor's domain knowledge of a specific industry, and specialized industry knowledge reduces errors in judgment (Solomon, Shields and Whittington, 1999). As error characteristics and detection methods are different across industries (Maletta and Wright, 1996), industry-specialized auditors can better understand not only the valuation models and the management processes in determining the fair value model inputs, but management's potential biases and errors pertaining to model application, market input identification and assumptions (Martin, Rich and Wilks, 2006). Second, it is costly to build up a brand-name reputation as an industry specialist. Therefore, specialist auditors have greater incentives to conduct high-quality auditing and report truthful fair value numbers to avoid audit failures and protect reputations.

The above reasoning leads to the following hypothesis:

H3a: Auditor industry expertise lowers the cost of debt for firms that use fair value accounting.

As previously discussed, Level 1 fair value inputs are based on market prices, and understanding them does not require specific knowledge. Therefore, debtholders do not rely on specialized auditors to provide safeguard regarding the reliability of the fair value inputs. However, Level 2 and 3 fair value inputs may involve estimation errors and managerial manipulations. Industry specialized auditors have the specific knowledge to discover the problems of the Level 2 and 3 fair value inputs. Therefore, the impact of auditor industry expertise on firms' cost of debt should only apply to firms with Level 2 and 3 fair value inputs. Consequently, we put forward the following hypothesis:

H3b: Auditor industry expertise lowers the cost of debt only for firms with usage of Level 2 and 3 fair value inputs.

4. Research Design

4.1 Sample Selection

Table 1 describes the sample selection process. The initial sample selection begins by downloading from SNL Financial Capital Offering database a list of new bonds issued from January 1, 2008 to June 30, 2015. Following previous literature (e.g., Jiang, 2008), for firms with multiple bond issuances in a given year, we only include the issue with the largest offering amount. Year 2008 is determined as the starting year for the bond data because fair value accounting data become available since 2007. 2014 is set as the ending year of the sample period because the most recent data for yield spread are June 30, 2015 and we require a one-year lag for yield spread to respond to financial statement data. We then obtain audit fee data from AuditAnalytics database to get the auditor industry expertise measure. Merging the two databases yields an initial sample of 567 bonds with issue-specific data.

We then collect credit ratings, fair value and firm-specific data from SNL Financial Companies database. We merge fair value data with credit ratings data and get 427 observations of fair value-rating data.

4.2 Empirical Models

We first examine the effect of use of fair value on yield spread. If fair value accounting improves the information quality of financial reporting, we expect fair value inputs to be significantly related to yield spread. To test this hypothesis, we estimate the following firm-level regression model:

$$\begin{aligned} YieldSpread_{it+1} = {} & \alpha_0 + \alpha_1 FairValue_{it} + \beta_1 Underwriter_{it} + \beta_2 Maturity_{it} \\ & + \beta_3 IssueSize_{it} + \beta_4 Convertible_{it} + \beta_5 Leverage_{it} + \beta_6 InterestCov_{it} \\ & + \beta_7 IssuerSize_{it} + \beta_8 ROA_{it} + \beta_9 Tier1_{it} + \beta_{10} AmortizedLoans_{it} \\ & + \gamma_{0,\dots,7} Year_{it} + \varepsilon_{it} \end{aligned} \quad (1)$$

In order to test the different impact of three levels of fair value inputs, we divide the fair value measures based on the three-level hierarchy, *Level1*, *Level2* and *Level3*, and replace them as the test variables in the regression model.

$$\begin{aligned} YieldSpread_{it+1} = {} & \alpha_0 + \alpha_1 Level1_{it} + \alpha_2 Level2_{it} + \alpha_3 Level3_{it} + \beta_1 Underwriter_{it} \\ & + \beta_2 Maturity_{it} + \beta_3 IssueSize_{it} + \beta_4 Convertible_{it} + \beta_5 Leverage_{it} \\ & + \beta_6 InterestCov_{it} + \beta_7 IssuerSize_{it} + \beta_8 ROA_{it} \\ & + \beta_9 Tier1_{it} + \beta_{10} AmortizedLoans_{it} + \gamma_{0,\dots,7} Year_{it} \\ & + \varepsilon_{it} \end{aligned} \quad (2)$$

In order to test whether the impact of Level 1 fair value measurement is different from Level 2, we restructure the above regression model as follows:

$$YieldSpread_{it+1} = \alpha_0 + \alpha_1(Level1_{it} + Level2_{it}) + \alpha_2 Level2_{it} + \alpha_3 Level3_{it} + \beta_1 Underwriter_{it} + \beta_2 Maturity_{it} + \beta_3 IssueSize_{it} + \beta_4 Convertible_{it} + \beta_5 Leverage_{it} + \beta_6 InterestCov_{it} + \beta_7 IssuerSize_{it} + \beta_8 ROA_{it} + \beta_9 Tier1_{it} + \beta_{10} AmortizedLoans_{it} + \gamma_{0,\dots,7} Year_{it} + \varepsilon_{it} \quad (3)$$

A result that coefficient $\alpha_2 = 0$ indicates that Level 1 and Level 2 fair value measurement has the same impact on yield spread. A positive coefficient ($\alpha_2 > 0$) is consistent with Hypothesis 2d that when moving from Level 1 to Level 2 fair value measurement, firms' cost of debt increases.

Similarly, a positive coefficient of Level 3 ($\alpha_3 > 0$) in Model (4) is consistent with Hypothesis 2d that as fair value measurement moves from Level 2 to Level 3, firms' cost of debt increases.

$$YieldSpread_{it+1} = \alpha_0 + \alpha_1 Level1_{it} + \alpha_2(Level2_{it} + Level3_{it}) + \alpha_3 Level3_{it} + \beta_1 Underwriter_{it} + \beta_2 Maturity_{it} + \beta_3 IssueSize_{it} + \beta_4 Convertible_{it} + \beta_5 Leverage_{it} + \beta_6 InterestCov_{it} + \beta_7 IssuerSize_{it} + \beta_8 ROA_{it} + \beta_9 Tier1_{it} + \beta_{10} AmortizedLoans_{it} + \gamma_{0,\dots,7} Year_{it} + \varepsilon_{it} \quad (4)$$

To test Hypothesis 3a and 3b, we include *Specialist* and interaction of *Specialist* and *FairValue* as additional test variables in the regression models. The focus of Hypotheses 3a and 3b is the interaction terms.

$$YieldSpread_{it+1} = \alpha_0 + \alpha_1 FairValue_{it} + \alpha_2 Specialist_{it} + \alpha_3 FairValue_{it} * Specialist_{it} + \beta_1 Underwriter_{it} + \beta_2 Maturity_{it} + \beta_3 IssueSize_{it} + \beta_4 Convertible_{it} + \beta_5 Leverage_{it} + \beta_6 InterestCov_{it} + \beta_7 IssuerSize_{it} + \beta_8 ROA_{it} + \beta_9 Tier1_{it} + \beta_{10} AmortizedLoans_{it} + \gamma_{0,\dots,7} Year_{it} + \varepsilon_{it} \quad (5)$$

$$YieldSpread_{it+1} = \alpha_0 + \alpha_1 Level1_{it} + \alpha_2 Level2_{it} + \alpha_3 Level3_{it} + \alpha_4 Specialist_{it} + \alpha_5 Level1_{it} * Specialist_{it} + \alpha_6 Level2_{it} * Specialist_{it} + \alpha_7 Level3_{it} * Specialist_{it} + \beta_1 Underwriter_{it} + \beta_2 Maturity_{it} + \beta_3 IssueSize_{it} + \beta_4 Convertible_{it} + \beta_5 Leverage_{it} + \beta_6 InterestCov_{it} + \beta_7 IssuerSize_{it} + \beta_8 ROA_{it} + \beta_9 Tier1_{it} + \beta_{10} AmortizedLoans_{it} + \gamma_{0,\dots,7} Year_{it} + \varepsilon_{it} \quad (6)$$

4.3 Measurement of Variable

YieldSpread is a common proxy for cost of debt (e.g., Fortin and Pittman, 2007; Fenn, 2000; Livingston and Zhou, 2002; Chaplinsky and Ramchand, 2004) and is the dependent variable in Model (1). It is defined as the difference in basis points between the at-issue yield to maturity on the corporate bond and that of a U.S. treasury bond issued on the same date with comparable maturity.

Our primary test variable, *FairValue*, is the percentage of assets and liabilities measured at fair value in the balance sheet over total assets reported in the balance sheet of the same year. It measures how much fair value is used for the assets and liabilities in the financial statements. Level1 (Level 2 or Level 3) is the percentage of Level 1 (Level 2 or Level 3) fair value assets and Level 1 (Level 2 or Level 3) fair value liabilities over total assets. Following prior literature, we control for other issue-level and firm-level determinants of debt pricing in our model, which are explained in the next section.

Issue-Level Control Variables

We assign the dummy variable, *Underwriter*, a value of 1 if the debt is issued by an underwriter and 0 otherwise. According to Fernando, Gatchev and Spindt (2003), the presence of an underwriter is associated with higher credit quality. Therefore, we expect that yield spreads is

negatively associated with *Underwriter*. *Maturity* is the natural logarithm of 1 plus the issue's years to maturity. We predict that yield spread is decreasing in maturity, because less risky firms tend to issue longer maturity bonds (Duffie and Lando, 2001 and Yu, 2005). *IssueSize* is the natural logarithm of the issue proceeds. We expect an inverse relation between *IssueSize* and cost of debt, because larger issues are more liquid due to the fact that they attract more investor interest and secondary market trading (Fenn, 2000 and Yu, 2005). *Convertible* is a dummy variable that takes the value 1 if the bond is convertible and 0 otherwise. Convertible bonds are expected to have a lower cost of debt because it mitigates the agency cost of debt (Sengupta, 1998). Finally, we include year dummies to reflect the changing macroeconomic conditions during our sample period.

Firm-Level Control Variables

We predict that firms' yield spreads are increasing with their *Leverage*, measured as total liabilities scaled by total assets at the end of the fiscal year immediately prior to the corporate bond issuance date. Based on Jensen and Meckling (1976), high leverage causes agency problems by generating incentives for risk shifting and asset substitution. We also include interest coverage, *InterestCov*, in our debt-pricing regression. It is defined as income before extraordinary items divided by interest expense for the year immediately prior to the bond issuance date. Better *InterestCov* is expected to be associated with lower cost of debt, because firms that generate more cash internally are in better position to service their debts (Pittman and Fortin, 2004). *IssuerSize* is measured as the natural log of an issuer's assets at the end of the fiscal year immediately prior to the corporate bond issuance date. Issuers with larger assets are less risky compared with those with smaller assets. Hence, it is expected to be negatively related to yield spread. *ROA* is the return on assets of the issuers, defined as the net income divided by

total assets at the end of the fiscal year immediately prior to the corporate bond issuance date. A higher *ROA* generally indicates greater profitability and is thus expected to be negatively associated with yield spread. *Loss* is a dummy variable that takes the value of 1 if a firm's ROA is negative and 0 otherwise. *Tier1* is the tier1 capital ratio for a particular financial institution, and we expect it is negatively associated with yield spread because financial institutions with higher tier1 capital ratios are less risky (Magnan et al., 2015). *AmortizedLoans* is loans at amortized cost scaled by total book value of assets. It is a proxy for historical cost (Magnan et al., 2015) and we make no prediction on the association between this variable and yield spread because amortized historical cost may not provide relevant information either.

Auditor Industry Expertise

Following prior auditing literature, auditor industry expertise is based on the auditor's annual market share of audit fees within a two-digit SIC category (see Ferguson, Francis and Stokes, 2003; Hogan and Jeter, 1999, Mayhew and Wilkins, 2003; Reichelt and Wang, 2010). An auditor is defined as industry specialist if 1) in a particular year the auditor has the largest market share in a two-digit SIC category and if its market share is at least 10% points greater than the second largest industry leader in the audit market, or 2) the auditor has at least 30% industry market share. The variable *Specialist* is a dummy variable that has the value of 1 if an auditor has industry expertise, and 0 otherwise.

5. Empirical Results

5.1 Univariate Analysis

Table 1 provides descriptive statistics of the regression variables. The sample period for both samples is 2007-2014. Panel A presents the statistics of continuous variables and Panel B shows

the statistics of dummy variables. Overall, there is good variation across all continuous variables except *Leverage*. Financial institutions are generally highly levered due to their nature of business. Therefore, the mean (0.8054) of *Leverage* in banking industry is much higher and the standard deviation (0.1834) is lower than those in other industries. Panel A shows that the average of yield spread is 2.4695%, with a standard deviation of 1.69%. The average of total assets and liabilities measured at fair value, *FairValue*, is 50.86% and the standard deviation is 46%. The averages of fair value breakdowns, i.e., Level1, Level2 and Level3, are 8.79%, 33.07% and 9.00%, indicating that most of the fair value inputs are measured at Level 2. Panel B presents the descriptive statistics of discrete variables. 9.6% of the firms in the rating sample experienced loss. 40% of auditors are banking industry experts. 93% of the bonds have underwriters. Only 5.64% of the bonds issued have convertible features.

Insert Table 1 here

Table 2 presents the Pearson correlations of the variables in the sample. The correlations in Table 2 show that the use of fair value (*FairValue*) is not significantly associated with lower cost of debt (*yieldspread*). However, the more assets and liabilities measured at Level 2 (Level 3) fair values, the lower (higher) the yield spread. Existence of auditor industry expert lowers the borrowing cost, as is supported by a significantly negative association between yield spread and auditor industry expertise.

Insert Table 2 here

5.2 Multivariate Analysis

Fair Value and Yield Spread

Table 3 summarizes the OLS regression results with yield spread as a proxy for firm's cost of debt. Model (1) is the regression model to test the first hypothesis, in which we regress fair value, issue-level control variables and firm-level control variables on corporate bond's yield spread. The coefficient of *FairValue* is positive and significant, indicating that fair value measures in general are associated with higher yield spread. Some of the control variables have the expected signs for their coefficients. For the issue-level controls, the coefficient of issue size is significantly negative (-0.57, p=0.0016), meaning that debt issued with a larger size has lower costs. The coefficient of convertible is negative (-1.49, p<0.001), indicating that debt with convertible features has lower cost. For the firm-level controls, firms with higher interest coverage have lower yield spread (0.02, p=0.001) and the coefficients of issuer size, ROA and Tier1 capital are all negative (-0.43, -2.00, and -0.04, p<0.001).

Model (2) is the regression model to test Hypothesis 2a – 2c, in which the test variables are the breakdowns of fair value: Level1, Level2 and Level3. The coefficients of Level2 and Level3 are significantly positive (0.7461 and 1.0132, p=0.0001 and p=0.0004), while the coefficient of Level1 is significant only at 0.08 level. Put differently, the greater proportion of Level2 and Level3 fair values used in the financial statement, the higher the cost of debt.

Insert Table 3 here

Table 4 shows the results of the incremental effects of three levels of fair value inputs. We do not find that the change from Level 1 to Level 2 fair values leads to a significant increase in our cost of debt proxy, as evidenced by the insignificant α_2. In a similar fashion, the change from Level 2 to Level 3 fair value inputs is not associated with an increase in yield spread given that $\alpha_3$is not statistically significant.

Insert Table 4 here

Table 5 shows the results of the OLS regression for the moderating effect of auditor specialists on the association between firms' use of fair value and yield spread. Model (5) and (6) show the results for total fair value percentage and their breakdowns and auditor industry expertise. Contrary to our hypotheses, the coefficient of the interaction between fair value and auditor specialists is not significant. Similarly, the coefficients for the interaction terms between Level 1, 2, 3 fair value and auditor expertise are not significant as well. It appears that auditor industry experts cannot help improve the usefulness of fair value to debtholders. One explanation is that auditors, even as industry experts, may not have better knowledge regarding the estimation methods of fair values. Thus, enhanced measurement guidance from standard setters can help improve firms' and auditor's capability in fair value estimates when the market values are not directly observable. However, it is also plausible that the results are due to measurement errors of the auditor industry experts construct. As Audousset-Coulier et al. (2016) point out, among the 30 existing industry specialization measures that they identify from existing accounting research, different proxies result in inconsistent classifications of auditor specialists. Therefore, our results cast doubt on the robustness of prior empirical evidence in auditor industry specialization research.

Insert Table 5 here

6. Robustness Checks

First, following Mansi, Maxwell and Miller (2004), we include credit rating in the regression model. Specifically, we estimate the following firm-level regression model:

$$Rating_{it+1} = \alpha_0 + \alpha_1 FairValue_{it} + \alpha_2 Specialist_{it} + \beta_1 Leverage_{it} + \beta_2 InterestCov_{it} + \beta_3 IssuerSize_{it} + \beta_4 Loss_{it} + \beta_5 ROA_{it} + \gamma_{0,\ldots,5} Year_{it} + \varepsilon_{it} \quad (7)$$

The above regression tests the impact of fair value accounting on credit ratings. The residual of the regression, denoted as *OrthRating*, captures the portion of credit ratings that is not driven by fair value and other control variables. We then include *OrthRating* in our models on the cost of debt. Table 6 reports the results of this test. As indicated in Model (1) and (2), the coefficients for *FairValue, Level2* and *Level3* are significant and positive. Likewise, Model (5) and (6) show that the interaction terms between *FairValue (Level1,2, and 3)* and *Specialist* are not significant. In general, our sensitivity results support our primary findings.

Insert Table 6 here

Second, fair value has been claimed to impact the recent financial crisis. Hence, debtholders may have different perceptions with regards to fair value during the financial crisis (Laux and Leuz, 2009). We run the regression by excluding the crisis period (year=2008 and 2009) as another robustness check. The results are summarized in Table 7, which is consistent with the main findings.

Insert Table 7 here

Third, we split fair value into fair value assets and liabilities. Specifically, *FVA1* (*FVA2* or *FVA3*) denotes the percentage of Level1 (Level2 or Level3) assets over total assets, whereas *FVL1* (*FVL2* or *FVL3*) denotes the percentage of Level1 (Level2 or Level3) liabilities over total assets. We re-run the regressions with *FVA1*, *FVA2*, *FVA3*, *FVL1*, *FVL2* and *FVL3* as the test variables. Table 8 reports the results. The main results still hold, as is evidenced by the positive coefficients of Level 3 fair value assets (*FVA3*) and Level 2 fair value liability (*FVL2*).

Insert Table 8 here

Finally, we use *RATING* (credit rating) as an alternative proxy for the cost of debt, and the results are reported in table 9. Model (1) of table 9 shows that *FairValue* in general are associated with lower credit rating (i.e., higher cost of debt), whereas model (2) indicates that *Level3* fair value measurements drive this result. Model (5) and (6) demonstrate that financial institutions hiring auditor specialists have higher credit ratings. However, surprisingly, the interactions between *FairValue* and *Specialist* are negative and significant, indicating that the uncertainty pertaining to fair value measurements lower the benefits of auditor expertise.

Insert Table 9 here

7. Conclusion

This study investigates how fair value accounting impacts the cost of debt, proxied by bond yield spread. We also examine the association between different levels of fair value measurements and bond yield spread. In addition, we explore the impact of auditor industry expertise on the above relations. We find evidence that fair value is associated with higher cost of debt, driven by Level 2 and Level 3 measurements. Furthermore, our empirical results show that auditor industry expertise does not improve the informativeness of fair value accounting information to debtholders, casting doubt on the role of auditor specialists in mitigating the reliability concerns of fair value measurements. Our results are robust to a series of sensitivities tests: e.g., the inclusion of orthogonalized credit ratings, exclusion of crisis period, using fair value assets and liabilities as independent variables, as well as adopting an alternate proxy for cost of debt.

This study substantiates the view that disclosure regime (fair value versus historical cost) matters in the pricing of the debt. It extends the fair value literature by providing theoretical arguments

and empirical evidence regarding the decision-usefulness of fair value accounting information in the debt market. Prior fair value studies mainly focus on the value relevance of fair value accounting information in the equity market Second, this study complements the corporate bond literature by indicating that fair value constructs influence bond yield spread. Our finding is important for future research in modeling the determinants of bond spread. Third, this research enhances our understanding of the role that auditor industry expertise plays on safeguarding the reliability of accounting measures.

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Table 1 Descriptive Statistics of Variables

Panel A: Continuous and Discrete Variables

Yield Spread Sample

Variable	N	Mean	Std Dev	Minimum	Median	Maximum
YieldSpread	567	2.4695	1.6899	-2.1770	2.3000	8.9700
FairValue	567	0.5086	0.4646	0	0.3980	3.8415
Level1	567	0.0879	0.1705	0	0.0233	2.7114
Level2	567	0.3307	0.3581	0	0.2416	2.5910
Level3	567	0.0900	0.2278	0	0.0188	1.5428
Maturity	567	0.9367	0.2413	0.3040	0.9061	1.7855
IssueSize	567	5.6737	0.5201	0.4771	5.6990	7.1761
Leverage	567	0.8054	0.1834	0.0113	0.8774	1.6014
InterestCov	567	4.9434	9.4936	-9.6158	2.4058	105.8125
IssuerSize	567	17.6699	2.2587	11.5074	17.6900	21.9081
ROA	567	0.0236	0.0530	-0.1672	0.0101	0.8680
Amortized Loans	567	0.2207	0.3039	0	0	0.9317
Tier1	567	0.0345	0.0566	0	0	0.1915
OrthRating	427	0	2.0415	-10.2092	0.1299	5.9974

Panel B: Dummy Variables

Variable	N	Percent
Loss	479	9.6
Specialist	567	40
Underwritten	567	93
Convertible	567	5.64

Refer to Appendix 2 for variable definitions

Table 2 Correlation Matrix

	Spread	FairValue	Level1	Level2	Level3	Specialist	Underwriter	Maturity	IssueSize	Convertible	Leverage	InterestCov	IssuerSize	AmortizedLoans	Tier1
Spread	1														
FairValue	0.04	1													
Level1	0.001	0.49***	1												
Level2	-0.11***	0.81***	0.20***	1											
Level3	0.25***	0.41***	-0.06	-0.08*	1										
Specialist	-0.09**	0.10**	0.02	0.14***	-0.03	1									
Underwriter	0.07	0.05	-0.02	0.04*	0.01	0.09**	1								
Maturity	0.08**	0.08**	0.04	0.11***	-0.05	0.10**	0.07*	1							
IssueSize	-0.45***	0.12***	0.04	0.32***	-0.28***	0.11***	0.11***	-0.20***	1						
Convertible	-0.04	0.02	-0.07*	-0.03	0.15***	-0.06	0.01	0.02	-0.18***	1					
Leverage	-0.17***	-0.004	0.02	0.30***	-0.49***	-0.06	-0.05	-0.10**	0.37***	-0.15***	1				
InterestCov	-0.08**	-0.02	0.08*	-0.09**	0.04	0.01	0.06	0.14***	-0.08**	-0.09**	-0.34***	1			
IssuerSize	-0.48***	0.23***	0.10**	0.47***	-0.35**	0.15***	-0.08**	-0.13***	0.76***	-0.24***	0.55***	-0.19***	1		
AmortizedLoans	-0.06	-0.27***	-0.24***	-0.14***	-0.14***	-0.02	-0.17***	-0.25***	0.16	-0.12***	0.35***	-0.24***	0.28***	1	
Tier1	-0.15***	-0.07*	-0.15***	0.10**	-0.19***	0.12***	-0.02	-0.19***	0.09**	-0.15***	0.31***	-0.18***	0.28***	0.58***	1

Note: *, **, and *** significant at the 0.1, 0.05 and 0.01 level respectively.

Table 3 Yield Spread Model

$$YieldSpread_{it+1} = \alpha_0 + \alpha_1 FairValue_{it} + \beta_1 Underwriter_{it} + \beta_2 Maturity_{it} + \beta_3 IssueSize_{it} + \beta_4 Convertible_{it} + \beta_5 Leverage_{it} + \beta_6 InterestCov_{it} + \beta_7 IssuerSize_{it} + \beta_8 ROA_{it} + \beta_9 Tier1_{it} + \beta_{10} AmortizedLoans_{it} + \gamma_{0,\dots,7} Year_{it} + \varepsilon_{it} \quad (1)$$

$$YieldSpread_{it+1} = \alpha_0 + \alpha_1 Level1_{it} + \alpha_2 Level2_{it} + \alpha_3 Level3_{it} + \beta_1 Underwriter_{it} + \beta_2 Maturity_{it} + \beta_3 IssueSize_{it} + \beta_4 Convertible_{it} + \beta_5 Leverage_{it} + \beta_6 InterestCov_{it} + \beta_7 IssuerSize_{it} + \beta_8 ROA_{it} + \beta_9 Tier1_{it} + \beta_{10} AmortizedLoans_{it} + \gamma_{0,\dots,7} Year_{it} + \varepsilon_{it} \quad (2)$$

	Model (1)			Model (2)		
Explanatory Variable	**Coefficient**	**T-Value**	**P-Value**	**Coefficient**	**T-Value**	**P-Value**
Intercept	11.7558	16.38	<.0001	11.5006	13.95	<.0001
FairValue	0.7872	6.13	<.0001			
Level1				0.5805	1.74	0.0819
Level2				0.7461	3.88	0.0001
Level3				1.0132	3.55	0.0004
Underwriter	0.4580	2.03	0.0431	0.4541	2.00	0.0457
Maturity	0.1265	0.52	0.6015	0.1523	0.61	0.5388
IssueSize	-0.5683	-3.17	0.0016	-0.5675	-3.16	0.0017
Convertible	-1.4890	-6.07	<.0001	-1.5085	-6.10	<.0001
Leverage	0.3633	0.96	0.3373	0.5179	1.24	0.2155
InterestCov	-0.0216	-3.31	0.001	-0.0206	-3.11	0.0020
IssuerSize	-0.4265	-8.84	<.0001	-0.4197	-8.51	<.0001
ROA	-1.9973	-1.69	0.0917	-2.1220	-1.78	0.0749
Tier1	-0.0434	-3.57	0.0004	-0.0428	-3.45	0.0006
AmortizedLoans	0.0115	4.78	<.0001	0.0109	4.40	<.0001
Year Dummies	YES					
Adjusted R2	0.44			0.44		
F-Statistics	24.43			22.11		
Number of Observations	567			567		

Table 4 The Incremental Effects of Level1, Level2, and Level3

Fair Value Measurements on Bond Yield Spread

$$YieldSpread_{it+1} = \alpha_0 + \alpha_1(Level1_{it} + Level2_{it}) + \alpha_2 Level2_{it} + \alpha_3 Level3_{it} + \beta_1 Underwriter_{it} + \beta_2 Maturity_{it} + \beta_3 IssueSize_{it} + \beta_4 Convertible_{it} + \beta_5 Leverage_{it} + \beta_6 InterestCov_{it} + \beta_7 IssuerSize_{it} + \beta_8 ROA_{it} + \beta_9 Tier1_{it} + \beta_{10} AmortizedLoans_{it} + \gamma_{0,\dots,7} Year_{it} + \varepsilon_{it} \quad (3)$$

$$YieldSpread_{it+1} = \alpha_0 + \alpha_1 Level1_{it} + \alpha_2(Level2_{it} + Level3_{it}) + \alpha_3 Level3_{it} + \beta_1 Underwriter_{it} + \beta_2 Maturity_{it} + \beta_3 IssueSize_{it} + \beta_4 Convertible_{it} + \beta_5 Leverage_{it} + \beta_6 InterestCov_{it} + \beta_7 IssuerSize_{it} + \beta_8 ROA_{it} + \beta_9 Tier1_{it} + \beta_{10} AmortizedLoans_{it} + \gamma_{0,\dots,7} Year_{it} + \varepsilon_{it} \quad (4)$$

	Model (3)			Model (4)		
Explanatory Variable	**Coefficient**	**T-Value**	**P-Value**	**Coefficient**	**T-Value**	**P-Value**
Intercept	11.2005	13.71	<.0001	11.2005	13.71	<.0001
Level1+Level2	0.6039	1.81	0.0710			
Level2	0.1441	0.36	0.7227			
Level1				0.6039	1.81	0.0710
Level2+Level3				0.7480	3.88	0.0001
Level3	1.0221	3.57	0.0004	0.2741	0.73	0.4651
Underwriter	0.4595	2.02	0.0434	0.4595	2.02	0.0434
Maturity	0.1656	0.67	0.5025	0.1656	0.67	0.5025
IssueSize	-0.5804	-3.27	0.0012	-0.5804	-3.27	0.0012
Convertible	-1.5267	-6.16	<.0001	-1.5267	-6.16	<.0001
Leverage	0.5691	1.36	0.1744	0.5691	1.36	0.1744
InterestCov	-0.0212	-3.19	0.0015	-0.0212	-3.19	0.0015
IssuerSize	-0.4112	-8.35	<.0001	-0.4111	-8.35	<.0001
ROA	-1.9908	-1.67	0.0953	-1.9908	-1.67	0.0953
Tier1	-0.0438	-3.53	0.0005	-0.0438	-3.53	0.0005
AmortizedLoans	0.0110	4.40	<.0001	0.0110	4.40	<.0001
Year Dummies	YES					
Adjusted R2	0.44			0.44		
F-Statistics	22.11			23.99		
Number of Observations	567			567		

Table 5 Yield Spread Model with Auditor Industry Expertise

$$YieldSpread_{it+1} = \alpha_0 + \alpha_1 FairValue_{it} + \alpha_2 Specialist_{it} + \alpha_3 FairValue_{it} * Specialist_{it} + \beta_1 Underwriter_{it} + \beta_2 Maturity_{it} + \beta_3 IssueSize_{it} + \beta_4 Convertible_{it} + \beta_5 Leverage_{it} + \beta_6 InterestCov_{it} + \beta_7 IssuerSize_{it} + \beta_8 ROA_{it} + \beta_9 Tier1_{it} + \beta_{10} AmortizedLoans_{it} + \gamma_{0,\dots,7} Year_{it} + \varepsilon_{it} \quad (5)$$

$$YieldSpread_{it+1} = \alpha_0 + \alpha_1 Level1_{it} + \alpha_2 Level2_{it} + \alpha_3 Level3_{it} + \alpha_4 Specialist_{it} + \alpha_5 Level1_{it} * Specialist_{it} + \alpha_6 Level2_{it} * Specialist_{it} + \alpha_7 Level3_{it} * Specialist_{it} + \beta_1 Underwriter_{it} + \beta_2 Maturity_{it} + \beta_3 IssueSize_{it} + \beta_4 Convertible_{it} + \beta_5 Leverage_{it} + \beta_6 InterestCov_{it} + \beta_7 IssuerSize_{it} + \beta_8 ROA_{it} + \beta_9 Tier1_{it} + \beta_{10} AmortizedLoans_{it} + \gamma_{0,\dots,7} Year_{it} + \varepsilon_{it} \quad (6)$$

	Model (5)			Model (6)		
Explanatory Variable	**Coefficient**	**T-Value**	**P-Value**	**Coefficient**	**T-Value**	**P-Value**
Intercept	11.9121	16.28	<.0001	11.5286	13.89	<.0001
FairValue	0.6959	4.20	<.0001			
Level1				0.5556	1.51	0.1320
Level2				0.6147	2.21	0.0278
Level3				0.9332	2.93	0.0035
Specialist	-0.0155	-0.09	0.9262	-0.0212	-0.12	0.9023
FairValue*Specialist	0.2034	0.86	0.39			
Level1*Specialist				0.2552	0.32	0.7518
Level2*Specialist				0.1889	0.58	0.5607
Level3*Specialist				0.3602	0.69	0.4902
Underwriter	0.4563	2.01	0.0452	0.4566	1.99	0.0474
Maturity	0.0954	0.39	0.6961	0.1382	0.55	0.5804
IssueSize	-0.5759	-3.21	0.0014	-0.5714	-3.17	0.0016
Convertible	-1.4820	-6.04	<.0001	-1.4916	-6.01	<.0001
Leverage	0.4144	1.08	0.2822	0.6163	1.44	0.1505
InterestCov	-0.0210	-3.20	0.0015	-0.0197	-2.96	0.0033
IssuerSize	-0.4338	-8.89	<.0001	-0.4242	-8.51	<.0001
ROA	-2.0907	-1.76	0.0785	-2.2546	-1.88	0.0604
Tier1	-0.0454	-3.69	0.0003	-0.0440	-3.50	0.0005
AmortizedLoans	0.0117	4.83	<.0001	0.0110	4.37	<.0001
Adjusted R2	0.44			0.44		
F-Statistics	22.13			18.56		
Number of Observations	567			567		

Table 6 Robustness Check with Including Credit Rating Residuals

	Model (1)	Model (2)	Model (5)	Model (6)
Explanatory Variable	**Coefficient**	**Coefficient**	**Coefficient**	**Coefficient**
Intercept	10.68***	9.08***	10.64***	9.06***
OrthRating	-0.29***	-0.29***	-0.29***	-0.29***
FairValue	0.80***		0.79***	
Level1		-0.06		-0.18
Level2		0.47***		0.41*
Level3		1.93***		1.73***
Specialist			-0.09	-0.16
FairValue*Specialist			0.02	
Level1*Specialist				0.42
Level2*Specialist				0.07
Level3*Specialist				0.94
Underwriter	-0.32	-0.27	-0.31	-0.25
Maturity	0.57**	0.74***	0.59***	0.77***
IssueSize	-0.32	-0.28	-0.31	-0.27
Convertible	-2.43***	-2.65***	-2.41***	-2.67***
Leverage	0.23	0.84**	0.18	0.85**
InterestCov	-0.02***	-0.02**	-0.02***	-0.02**
IssuerSize	-0.44***	-0.40***	-0.43***	-0.40***
ROA	-3.54*	-4.67***	-3.53*	-4.86***
Tier1	-0.02	-0.01	-0.01	-0.01
AmortizedLoans	0.004	0.0005	0.004	0.0003
Adjusted R2	0.57	0.59	0.57	0.58
F-Statistics	30.43	29.77	27.46	24.88
Number of Observations	427	427	427	427

Note: *, **, and *** significant at the 0.1, 0.05 and 0.01 level respectively.

Table 7 Robustness Check with Excluding Financial Crisis Period (Year 2008&2009)

	Model (1)	Model (2)	Model (5)	Model (6)
Explanatory Variable	**Coefficient**	**Coefficient**	**Coefficient**	**Coefficient**
Intercept	12.10***	12.15***	12.31***	12.17***
FairValue	0.87***		0.75***	
Level1		0.55*		0.56
Level2		0.96***		0.78**
Level3		0.94***		0.87***
Specialist			-0.03	-0.01
FairValue*Specialist			0.27	
Level1*Specialist				0.11
Level2*Specialist				0.24
Level3*Specialist				0.31
Underwriter	0.25	0.23	0.26	0.24
Maturity	-0.26	-0.28	-0.29	-0.29
IssueSize	-0.46**	-0.46**	-0.48**	-0.47***
Convertible	-1.20***	-1.24***	-1.19***	-1.21***
Leverage	0.38	0.42	0.43	0.53
InterestCov	-0.02***	-0.02***	-0.02***	-0.02**
IssuerSize	-0.45***	-0.45***	-0.45***	-0.45***
ROA	-2.76**	-2.84**	-2.84**	-2.95***
Tier1	-0.04***	-0.04***	-0.04***	-0.04***
AmortizedLoans	0.01***	0.01***	0.01***	0.01***
Adjusted R2	0.46	0.46	0.46	0.46
F-Statistics	25.98	23.26	23.34	19.18
Number of Observations	497	497	497	497

Note: *, **, and *** significant at the 0.1, 0.05 and 0.01 level respectively.

Table 8 Robustness Check with Fair Value Assets and Liability Measures

$$YieldSpread_{it+1} = \alpha_0 + \alpha_1 FVA1_{it} + \alpha_2 FVA2_{it} + \alpha_3 FVA3_{it} + \alpha_4 FVL1_{it} + \alpha_5 FVL2_{it} + \alpha_6 FVL3_{it} + \beta_1 Underwriter_{it} + \beta_2 Maturity_{it} + \beta_3 IssueSize_{it} + \beta_4 Convertible_{it} + \beta_5 Leverage_{it} + \beta_6 InterestCov_{it} + \beta_7 IssuerSize_{it} + \beta_8 ROA_{it} + \beta_9 Tier1_{it} + \beta_{10} AmortizedLoans_{it} + \gamma_{0,\dots,7} Year_{it} + \varepsilon_{it} \quad (7)$$

	Coefficient	**T-Value**	**P-Value**
Intercept	10.26	8.84	<.0001
FVA1	0.23	0.28	0.78
FVA2	0.35	0.96	0.34
FVA3	1.09	2.32	0.02
FVL1	0.49	0.21	0.83
FVL2	1.35	2.84	0.0005
FVL3	-1.46	-0.53	0.60
Underwriter	0.27	1.01	0.32
Maturity	0.56	1.89	0.06
IssueSize	-0.29	-1.28	0.20
Convertible	-1.52	-3.96	<.0001
Leverage	0.82	1.52	0.13
InterestCov	-0.03	-2.08	0.04
IssuerSize	-0.46	-3.49	<.0001
ROA	-9.71	-3.69	<.0001
Tier1	-0.05	-3.49	0.0006
AmortizedLoans	0.01	2.56	0.01
Adjusted R2	0.38		
F-Statistics	10.75		
Number of Observations	567		

Table 9 Robustness Check Using Credit Rating as a Proxy for the Cost of Debt

	Model (1)	Model (2)	Model (5)	Model (6)
Explanatory Variable	**Coefficient**	**Coefficient**	**Coefficient**	**Coefficient**
Intercept	-5.41***	-4.55***	-6.24***	-5.18***
FairValue	-0.44**		0.44	
Level1		0.17		0.99
Level2		0.05		1.51*
Level3		-1.36***		-0.81*
Specialist			0.72***	0.89***
FairValue*Specialist			**-1.79*** **	
Level1*Specialist				-2.81**
Level2*Specialist				-2.23***
Level3*Specialist				-1.61**
Leverage	-2.42***	-2.78***	-2.38***	-2.91***
InterestCov	0.001	0.0004	0.0006	0.0004
IssuerSize	1.13***	1.09***	1.16***	1.10***
ROA	16.21***	16.24***	16.01***	16.00***
Tier1	0.09***	0.09***	0.09***	0.08***
AmortizedLoans	-0.02***	-0.01***	-0.02***	-0.01***
Adjusted R2	0.41	0.41	0.42	0.43
F-Statistics	55.15	48.83	50.34	41.36
Number of Observations	1,023	1,023	1,023	1,023

Note (1): *, **, and *** significant at the 0.1, 0.05 and 0.01 level respectively;

Note (2):The dependent variable is Rating (the raw values of credit rating).

Appendix 1: Fair Value Hierarchy

Level 1 inputs	Definition and Explanation	Level 1 inputs are quoted prices (unadjusted) in active markets for identical assets or liabilities that the reporting entity has the ability to access at the measurement date. A Level 1 input will be available for many financial assets and liabilities, some of which might be exchanged in multiple active markets (for example, on different exchanges).
	Example	Assume that the market price that would be received is $26, and transaction costs in that market are $3 (the net amount that would be received is $23). The fair value of the asset would be measured using the price that would be received in that market ($26).
Level 2 inputs	Definition and Explanation	Level 2 inputs are inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly through corroboration with observable market data (market-corroborated inputs). If the asset or liability has a specified (contractual) term, a Level 2 input must be observable for substantially the full term of the asset or liability. An adjustment to a Level 2 input that is significant to the fair value measurement in its entirety might render the measurement a Level 3 measurement, depending on the level in the fair value hierarchy within which the inputs used to determine the adjustment fall.
	Example	Receive-fixed, pay-variable interest rate swap based on the LIBOR swap rate. A Level 2 input would include the LIBOR swap rate if that rate is observable at commonly quoted intervals for the full term of the swap.
Level 3 inputs	Definition and Explanation	Level 3 inputs are unobservable inputs for the asset or liability, that is, inputs that reflect the reporting entity's own assumptions about the assumptions market participants would use in pricing the asset or liability (including assumptions about risk) developed based on the best information available in the circumstances. Assumptions about risk include the risk inherent in a particular valuation technique used to measure fair value (such as a pricing model) and/or the risk inherent in the inputs to the valuation technique.
	Example	Long-dated currency swap. A Level 3 input would include interest rates in a specified currency that are not observable and cannot be corroborated by observable market data at commonly quoted intervals or otherwise for substantially the full term of the currency swap. The interest rates in a currency swap are the swap rates calculated from the respective countries' yield curves.

*Note: The information in this table is adapted from the section, Fair Value Hierarchy, in Appendix A: Implementation Guidance of FAS No. 157 Fair Value Measurement (FASB 2006a, pp. 25-29).

Appendix 2 Variable Definitions

Rating	Ordinal numbers assigned to represent the rating symbols, having a value of 1 for the lowest rating, 2 for the second lowest rating, etc.
YieldSpread	The initial corporate bond yield minus the Treasury bond yield with comparable maturity.
FairValue	The percentage of assets and liabilities measured at fair value in the balance sheet over total assets reported in the balance sheet of the same year.
Level1	The percentage of Level 1 fair value assets and Level 1 fair value liabilities deflated by total assets.
Level2	The percentage of Level 2 fair value assets and Level 2 fair value liabilities deflated by total assets.
Level3	The percentage of Level 3 fair value assets and Level 3 fair value liabilities deflated by total assets.
AmortizedLoans	Loans at amortized cost scaled by total book value of assets.
Tier1	Tier 1 capital ratio.
Leverage	Total liabilities deflated by total assets at end of the fiscal year immediately prior to the new corporate bond issuance date..
InterestCov	Income before extraordinary items divided by interest expense for the year immediately prior to the bond issuance date.
ROA	Return on assets, net income deflated by total assets at the end of the fiscal year immediately prior to the corporate bond issuance date.
IssuerSize	The natural log of issuer's assets at end of the fiscal year immediately prior to the new corporate bond issuance date.
Loss	A dummy variable that takes the value of 1 if a firm's ROA is negative and 0 otherwise.
Underwriter	A dummy variable that takes the value of 1 if the debt is issued by an underwriter and 0 otherwise.
Maturity	The natural logarithm of 1 plus the issue's years to maturity
Convertible	A dummy variable that takes the value of 1 if the debt is convertible and 0 otherwise.
OrthRating	Residual of the regression with credit rating as dependent variable and FairValue, Specialist, Leverage, InterestCov, IssuerSize, Loss, ROA as independent variables.
Specialist	A dummy variable that takes the value of 1 if a firm hires an industry specialized auditor and 0 otherwise.

Appendix 3 Illustration of the Discrepancy between Sum of Fair Value Hierarchies and Total Fair Value

	Fair Value Hierarchy				
December 31, 2011 (in millions)	**Level 1**	**Level 2**	**Level 3**	**Netting Adjustments**	**Total fair value**
Total debt and equity instruments	172,073	146,446	32,967	-	351,486
Derivative receivables:					
interest rate	1,324	1,433,469	6,728	(1,395,152)	46,369
Credit	-	152,569	17,081	(162,966)	6,684
Foreign exchange	833	162,689	4,641	(150,273)	17,890
Equity	-	43,604	4,132	(40,943)	6,793
Commodity	4,561	50,409	2,459	(42,688)	14,477
Total derivative receivables	6,718	1,842,740	35,041	(1,792,022)	92,477

Note: The above table is adapted from the footnote of 2011 Annual Report of JPMorgan Chase & Co (p.189). The sum of Level 1, Level 2 and Level 3 fair value is less than *Total fair value* because of the *Netting Adjustments*.

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