The Decision Usefulness of Fair Value Accounting in the Debt Market

Haiping Wang

A Thesis

In the Department of Accounting

The John Molson School of Business

Presented in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy at Concordia University

Montreal, Quebec, Canada

October 2012

CONCORDIA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

This is to certify that the thesis prepared

By: **Haiping Wang**

Entitled: **The Decision Usefulness of Fair Value Accounting in the Debt Market**

and submitted in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY (Administration)

complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

Signed by the final examining committee:

_____ Chair
Dr. K. Argheyd

_____ External Examiner
Dr. T. Jeanjean

_____ External to Program
Dr. B. Campbell

_____ Examiner
Dr. S. Fortin

_____ Examiner
Dr. L. He

_____ Examiner
Dr. B. Song

_____ Thesis Supervisor
Dr. M. Magnan

Approved by _____ Chair of Department
Dr. H. Bhabra, Graduate Program Director

October 16, 2012 _____

Dr. S. Harvey, Dean, John Molson School of Business

Abstract

The Decision Usefulness of Fair Value Accounting in the Debt Market

Haiping WANG, Ph.D.

Concordia University, 2012

As the two major accounting standard setters, Financial Accounting Standards Board (FASB) and International Accounting Standards Board (IASB), are jointly advocating a full fair value disclosure regime, there have been heated discussions regarding the pros and cons of fair value versus historical cost among accounting researchers, practitioners, and regulators. Current accounting research basically examines the value relevance of fair value accounting from a shareholder perspective (e.g., Barth, 1994; Petroni and Wahlen, 1995; Song et al., 2010). In comparison, the impact of fair value accounting on the debt market is largely under-investigated. As noted by Baker, Greenwood and Wurgler (2003, p.262), "Relative to the literature on equity financing patterns, and relative to the actual importance of debt finance in the U.S. economy, the literature on debt financing patterns is surprisingly underdeveloped". Hence, the interface between accounting regime and debt financing has recently emerged as a fruitful area for research. In fact, creditors, especially public debtholders, have informational and pay-off disadvantages that they seek useful accounting information to compensate for.

The purpose of this dissertation is twofold: (1) to examine the impact of fair value accounting on the debt market; (2) to examine the influence of specialized auditors on the association between fair value accounting and the debt market effects. The investigation focuses on U.S. bank holding companies issuing debt as they are the reporting entities most affected by the advent of fair value accounting. The first essay focuses on the relative explanatory power of fair value accounting versus historical cost in explaining credit ratings, a common proxy for firm

credit quality. I consider both short-term and long-term credit ratings. Results show that fair value accounting outperforms historical cost in explaining firm short-term credit ratings. On the contrary, I do not find evidence that fair value accounting is a better predictor of firm long-term credit ratings. Additional tests further reveal that auditor industry expertise improves fair value's explanatory power for short-term credit risk. The second essay concentrates on the impact of fair value accounting on banks' cost of debt, proxied by yield spread. Results suggest that greater use of fair value accounting measurement in the financial statements is generally associated with a lower cost of debt, which supports the argument that fair value accounting improves the decision usefulness of accounting information. Findings further show that Level 1 and Level 2 fair value inputs are related with a lower cost of debt, while Level 3 fair value inputs are associated with a higher cost of debt. In addition, evidence suggests that auditor industry expertise improves the decision usefulness of fair value accounting information, especially of Level 3 inputs, resulting in lower cost of debt.

Overall, these results lead to the conclusion that fair value accounting is generally decision useful, although the extent of decision usefulness of fair value varies across the three tiers of fair value levels. Besides, the existence of industry specialized auditors improves the decision usefulness of fair value accounting to debtholders. However, cautions are advised with regard to the implications based on the empirical results, due to the limitations of the methodologies used in this dissertation.

Key Words: Decision Usefulness; Fair Value Accounting; Credit Ratings; Cost of Debt; Auditor Industry Expertise

Dedication

I would like to dedicate this dissertation to the memory of my beloved father, Qiusheng Wang and to my dear mother, Jiemin Wang, who taught me the value of hard work and instilled in me the importance of perseverance. I would also like to dedicate this dissertation to my dearest husband, Peng Guan, for the unconditional support and extraordinary sacrifices that he has made for me.

Acknowledgements

I would never have been able to finish my dissertation without the guidance of my committee members, help from friends, and support from my family.

I would like to express my deepest gratitude to my doctoral supervisor, Dr. Michel Magnan, for his excellent guidance, caring and patience, and for providing me with all kinds of support throughout the years of my Ph.D. study. I would like to thank Dr. Jeong-Bon Kim (prior doctoral supervisor) for leading me into the Ph.D. program, which changed my life path significantly. I would also like to thank Dr. Steve Fortin, Dr. Luo He, and Dr. Byron Song for their accessibility and patience in reviewing and commenting the draft of my dissertation. Special thanks go to Dr. Bryan Campbell and Dr. Thomas Jeanjean, who were willing to be my examiners for my final defense.

I would like to acknowledge the support from the faculty members, supporting staff in the joint program: Dr. Ibrahim Aly, Dr. Sophie Audousset-Coulier, Ms. Daniele Berthiaume, Dr. Majidul Islam, Prof. Carmen Kuczewski, Dr. Claudine Mangen, Ms. Silvana Mendicino, Dr. Li Yao, and Dr. Sanjian Zhang. I also greatly value the friendship with Jieun Chung, Ahmad Hammami, Shan He, Tiemei Li, Mingzhi Liu, Qianyin Shan, Glenn Rioux, Yaqi Shi, Hani Tadros, Jun Wang, Shuikui Wu, Bo Yu, Jun Zhan, Bo Zhang, Jing Zhang and Rui Zhong, whose company enriches my Ph.D. life.

My sincere thanks go to my husband, Peng Guan, my mother-in-law, Shuqi Ji and my daughter, Sophia Guan. My husband's endless love and support allow me to successfully finish this Ph.D. journey. I particularly thank him for being my soul mate, and for always standing by me through the good times and bad. I also owe my special

thanks to my mother-in-law for her unconditional support to come to Canada and help me with my daughter, which enabled me to concentrate on my Ph.D. study. Last but not least, I would like to thank my daughter for coming into my life. The moment I had her in my arm, I realized the responsibility as a mother, which encouraged me to try my best to be a better person every day.

Table of Contents

List of Tables

For Chapter 3 Fair Value Accounting and Credit Ratings

For Chapter 4 Fair Value Accounting and the Cost of Debt

Chapter 1 Introduction

This dissertation studies the decision usefulness of fair value accounting in the debt market. The application of fair value accounting has been a controversial issue over the past two decades, and the recent financial crisis has only exacerbated the controversy. Prior research on fair value accounting focuses mainly on the value relevance perspective, i.e., the ability of fair value accounting numbers to explain stock price. In contrast, there is only scant evidence (e.g., Blankespoor et al., 2010; Cantrell et al., 2011) regarding the impact of fair value accounting on the debt market, 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 decisions about providing resources to the entity (FASB, 2010). Debtholder needs for accounting information arise from an information asymmetry problem between debtholders and the borrowing company, and the related agency conflicts due to asymmetric information. As noted by Holthausen and Watts (2001), information relevant for equity investors may not be relevant for lenders, and vice versa. That is, debtholder information needs may be quite different from those of equity holders. As the major capital provider, then, debtholder information needs are far from negligible. Hence, to narrow the existing gap in knowledge, this dissertation generates empirical evidence regarding the decision usefulness of fair value accounting to debtholders. Specifically, I address the following research questions: (1) Does fair value accounting provide more debt contracting value

[1]The total value of U.S. corporate debt issuance for the year 2010 amounts to $1,113 trillion, while the total value of equity issuance for the same year is only $131 trillion. A similar ratio of total debt issuance to equity issuance holds for other years over the past decade (Federal Reserve Bank of Chicago).

than historical cost accounting, and if so, in what contexts? (2) Does the use of fair value accounting in financial reporting better alleviate the information asymmetry problems posed to debtholders and therefore lead to a lower cost of debt? (3) Does auditor industry expertise strengthen fair value accounting's debt contracting value and its impact on cost of debt?

Decision usefulness of accounting information is considered the overriding criterion for judging accounting choices (Concepts Statement No.2, FASB 1980, para. 30 and 32). Among the four dimensions of decision usefulness, relevance and reliability are two primary criteria that the FASB uses for choosing among accounting alternatives, as specified in its Conceptual Framework (Barth et al., 2001). Information that is both relevant and reliable is regarded as informative, or decision useful (Johnson, 2005). Decision useful accounting information serves as a solution to the information asymmetry problem and facilitates the debtholder decision-making process. Some argue that the change of disclosure regime from historical cost to fair value demonstrates that the FASB chose to accept a loss of reliability in favor of greater relevance of accounting information (e.g., Johnson, 2005). However, it is possible that while some users of financial statements prefer relevance to reliability, other users have just the opposite preference. Therefore, it is an open question which accounting method, fair value or historical cost, is more decision useful to particular groups of users (e.g., shareholders, creditors, managers).

On the one hand, historical cost accounting has the quality of hardness, i.e., easy verification and low degree of susceptibility to assumptions and judgment (Ijiri, 1967). This is one key reason why it has been the dominant method used in financial reporting

for centuries. However, historical cost and values diverge when market and economic conditions change. While reliably recording historical cost of an entity's financial position does provide verifiable records for past performance, it does 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, 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, fair value that provides timely updates of firm financial position satisfies the information needs of decision makers, so long as it is reliably measured. However, fair value also has flaws that damage its overall decision usefulness. First and foremost, some fair value measures suffer from low reliability. 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.

In addition, some stakeholders (e.g., debtholders, auditors, and regulators) have a natural preference for conservative accounting versus fair value accounting (Zhang, 2008; Kim et al., 2003; Watts, 1993). Fair value accounting contradicts the rationale of accounting conservatism. Under the fair value accounting system, the criterion for recognition of asset changes is change in market value, and fair value requires the same degree of verification for asset write-ups (good news) as for write-downs (bad news). However, conservative accounting requires greater verification for good news than for bad news (Basu, 1997). Due to the innate tendency of managers to report good news and to cover-up bad news (Burgstahler and Dichev, 1997), and to compensate for debtholder

informational disadvantage and asymmetric pay-off (Wakil, 2011), conservative accounting serves as a protective mechanism for debtholders and is documented in the literature to improve debt contracting efficiency. Therefore, to the extent that the nature of fair value is non-conservative, it may not contribute to efficient debt contracting.

This dissertation is motivated by the above-mentioned 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 sets forth empirical results regarding the impacts of fair value to debtholders, in two dimensions: debt contracting value and cost of debt. Two samples are established to test my research questions. The first covers bank holding companies in the U.S. from 2003 to 2012 that have credit ratings from at least one of the top three rating agencies, Moody's, Standard and Poor's, and Fitch. The second sample includes bank holding companies in the U.S. that issued public bonds during the period 2008–2012. I focus on bank holding companies for the following reasons. First, prior disclosure research largely excludes the financial sector from analysis, leaving the research on the banking 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 the banking industry. Therefore, this dissertation adds to the disclosure research by exploring the impact of accounting methods on the banking industry. Second, the stability

of the banking industry is significantly associated with the prosperity of the economy. According to Heffernan (2005), when the stability of the banking 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 et al. 2010), indicating that the instability of the banks and related financial crises have a real effect on firm performance and growth opportunities. Therefore, if fair value contributes to the stability of the banking industry, it also has a real impact on firm performance and growth opportunities.

First, I investigate the debt contracting value[2] of fair value accounting by examining fair value's relative explanatory power in explaining credit ratings. I find that fair value accounting has greater short-term debt contracting value. However, fair value does not outperform historical cost in predicting firms' long-term credit risk. Second, I examine whether use of fair value in financial statements leads to lower cost of debt. My empirical results show that greater use of fair value in financial statements leads to lower cost of debt. This association is stronger for firms that use Level 1 and Level 2 fair value inputs. In addition, to address concerns of fair value's lack of reliability and its lack of protection

[2] Debt contracting value of fair value accounting is defined, in Chapter 3, as the relative explanatory power of fair value information in explaining credit ratings.

for debtholders due to its non-conservative nature, I test whether auditor industry expertise improves fair value debt contracting value and strengthens the impact of fair value on cost of debt. Auditors with industry expertise are better able to detect both managerial manipulation and estimation errors of fair value measurement, if any. Besides, the non-conservative concern of fair value accounting can also be alleviated in the presence of specialized auditors, who serve as an assuring mechanism regarding the reporting quality of financial numbers and as a deterrent to opportunistic booking of gains. Consistent with my hypotheses, I find that auditor industry expertise improves fair value's debt contracting value and strengthens the association between the use of fair value and firm cost of debt.

This dissertation contributes to the current accounting literature in several important 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 et al. (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. My paper 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. To the best of my knowledge, this dissertation is the first study to provide empirical evidence on the decision usefulness of fair value accounting to the debtholders of financial institutions.

Third, this dissertation also adds to the auditing literature by showing that auditor industry expertise improves 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). As the main concern over fair value accounting is its lack of reliability, which exacerbates information asymmetry and the related agency cost, evidence on whether auditor industry expertise alleviates this reliability concern adds practical value.

The findings of this dissertation 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 banking 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. My findings that fair value accounting is decision useful to debtholders to evaluate firms' short-term risk provide some support for FASB's proposal for fair value accounting of financial instruments while also suggesting cautions when implementing a full fair value system.

The remainder of this dissertation is organized as follows. Chapter 2 presents the institutional background of fair value accounting and reviews the literature. Chapter 3 develops hypotheses, discusses methodologies, and presents empirical results for the debt contracting value of fair value accounting. Chapter 4 develops hypotheses, discusses methodologies, and presents empirical results for the impact of fair value accounting on firm cost of debt. Chapter 5 interprets the findings of this dissertation and draws and discusses conclusions.

Chapter 2 Institutional Background of Fair Value Accounting

2.1. Definition and Measurement of Fair Value

Fair value is not a new concept, but its definition was not formalized until the release of Statement of Financial Accounting Standards (SFAS) No. 157 Fair Value Measurements (Financial Accounting Standard Board, thereafter FASB, 2006a). In this statement, 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 (FASB, 2006a). In a convergence project in 2006, the International Accounting Standards Board (IASB), based on SFAS 157, developed an International Financial Reporting Standard (IFRS) on fair value measurements. The FASB/IASB concept of fair value can

be interpreted as the exit market price that would result in a transaction between knowledgeable, independent, and economically rational parties under close-to-ideal market conditions (Hitz, 2007).

The measurement of fair value follows a three-tier hierarchy, with a strict preference for market-based measures (Accounting Standard Codification [ASC] 820, 2011). According to ASC 820, Level 1 inputs are quoted prices (unadjusted) in active markets for identical assets or liabilities that the reporting entity can access at the measurement date. Level 2 inputs are quoted prices other than what are included within Level 1 that are observable for the asset or liability, either directly or indirectly. Examples of Level 2 inputs include interest rates, yield curves, credit spreads, default rates and inputs derived principally from market data via such methods as correlation (Scanlon and Lee, 2011). Level 3 inputs are characterized as unobservable data and are used where observable market inputs are not available. Unobservable inputs can involve the company's own understanding about the assumptions market participants would use in pricing the asset.

2.2. Evolution of Fair Value in Accounting Theory and Financial Reporting Regimes

Although the definition and measurement guidelines of fair value were not formalized until 2006, the concept of fair value has been in use since approximately 1440. Generally, the evolution of fair value application in accounting theory and financial reporting regimes can be divided into three phases: 1) 1440 to 1970; 2) 1970-1990; and 3) 1990 to the present.

1) 1440 to 1970: Early use of fair value in accounting theory and financial reporting regimes

Fair value had partial legitimacy at an early time, but was always superseded by historical cost accounting (HCA) or incorporated into *mixed measurement* practices (Georgiou and Jack, 2011). The earliest application of fair value can be traced back to the fifteenth century (during the period 1436-1440), when market value began to be used in accounts. During this period, the "clear gain" was recognized by totaling the market value of the increases in stocks of raw and semi-finished materials over the previous year (Crossley, 1975). References to market value, rather than cost, occurred in bookkeeping manuals from the fifteenth to the eighteenth centuries (e.g., Pacioli, 1494; Mellis, 1588; Carpenter, 1632; Dafforne, 1684; Stephens, 1735; Dodson, 1750; Hamilton, 1788).

An early version of fair value measurement on the balance sheet came into being when the Joint Stock Companies Acts of 1844 and 1856 required the "true and correct view" of a company's state of affairs to be disclosed by the valuation of assets at up-to-date prices. The basis for this requirement was that values on the balance sheet should reflect the capacity to operate the business and to meet outstanding debts (Georgiou and Jack, 2011).

The first legislated application of market values appears in Napoleon's 1807 Commercial Code, which required inventory to be recorded by its value on the balance sheet day (Walton, 2007). At that time, the banking industry measured properties particularly by current estimated valuations (Chambers and Wolnizer, 1991). However, market values were restricted to use for operating assets as opposed to long-lived assets (Walker, 1974).

The origin of the term “fair value” dates back to an 1898 U.S. Supreme Court case in which it was held that regulated industries were entitled to earn a “fair return” on the “fair value” of the entity (Lee, 2008). As a result of the judicial acceptance of current values, the practice of market value measurement of assets was used in financial reporting by U.S. utility companies in the 1920s and 1930s (Georgiou and Jack, 2011).

The Great Depression taught accountants that values are fleeting and that the value of appraised assets can decline significantly in a single day; this resulted in a strengthening of the historical-cost–based accounting system (Scott, 2011). According to Zeff (2007), the strong opposition to asset write-ups held by Robert E. Healy, one of the five Securities and Exchange Commission (SEC) founding members, dominated the Federal Trade Commission in the 1930s and 1940s and influenced an entire generation of SEC accountants. In 1941, The American Accounting Association (AAA) published an important monograph (Patton and Littleton, 1940) that set forth an elegant conceptual rationale for the use of HCA. This monograph became a standard text used in university accounting curricula and was widely read by practitioners as well (Zeff, 2007).

The concept of fair value first entered accounting theory in Bonbright (1937), in which features of fair value are used in the concept of deprival value. In addition, MacNeal (1939) proposes that balance sheet elements be measured in market values and that all changes (even unrealized) in the value of assets and liabilities be included in income. However, this author does not specify whether the market value applied is the entry or the exit price.

Post-war inflation and voices of opposition to HCA gave rise to standard setters' call for market value recognition. In 1949, the American Institute of Accountants commissioned a series of essays on business income, which included "Five Monographs on Business Income," which dealt mainly with the shortcomings of HCA in a world of changing prices (Georgiou and Jack, 2011). In 1966, the AAA committee recommended the use of both historical cost and current cost information for financial reporting (AAA: A Statement of Basic Accounting Theory-ASOBAT, pp. 30-31). However, in practice, HCA was still given prominence.

2) 1970-1990: Development of fair value in accounting regulation

In 1973, FASB succeeded the Accounting Principles Board (APB) and issued one of the earliest exposure drafts, entitled "Financial reporting in units of general purchasing power" (FASB, 1974). Shortly thereafter, in October 1973, the Trueblood Committee Report was issued, as a response to the financial scandals and continuous criticism of HCA's deficiencies. This report, titled "Objectives of Financial Statements," embraced the decision usefulness approach and provides the basis of the conceptual framework for FASB. It suggests a broad series of valuation bases such as historical cost, exit values, current replacement cost, and discounted cash flows (Georgiou and Jack, 2011). FASB first included the term "fair value" in APB Opinion 16, Business Combination, in 1970. Subsequently, the use of fair value was expanded to fixed assets, revenue recognition, and lease accounting (see, APB Opinion 29, 1973 and FASB, 1976). In 1979, the FASB issued SFAS No. 33, which required supplementary disclosure of both historical cost and current value (FASB, 1979b). However, SFAS No. 33 was withdrawn in 1986 due to doubts about comparability, relevance, and reliability, and HCA regained its dominance.

A more significant move toward fair value accounting (FVA) occurred at the beginning of the 1980s when FASB further acknowledged the deficiencies of the HCA approach and promoted the "balance sheet" approach instead (Hitz, 2007). Researchers and regulators showed concerns regarding uninformative balance sheets under HCA. As a response, FASB adopted the new asset–liability approach in their pronouncement Statement of Financial Accounting Concepts (SFAC) No. 3 in 1980, which links income strictly to changes in net assets. Since then, the debate on the merits of HCA versus FVA has been ongoing.

The Savings and Loan Crisis in the US in the 1980s accelerated the shift toward the fair value paradigm and opened the door to further unraveling the deficiencies of the historical cost-based reporting system. Accordingly, the SEC advised FASB to develop a standard on accounting for certain debt securities at market value rather than amortized cost (Wyatt, 1991; Cole, 1992; White, 2003). The rationale for this initiative was that HCA allowed for gains trading by firm managers and prohibited identification of the financial status of Savings and Loans. As Hitz (2007) comments, this initiative represents a major evolution in accounting thought on the regulatory level.

3) 1990-2007: Fair value advances

FVA saw rapid advancement during the 1990s. In 1991, FASB issued SFAS 107, *Disclosures about Fair Value of Financial Instruments*, which extends fair value disclosure practices for some instruments by requiring all entities to disclose the fair value of financial instruments. In 1993, FASB issued SFAS 115, *Accounting for Certain Investments in Debt and Equity Securities*. This statement provides guidance on the

valuation of investments in equity securities that have readily determinable fair values and for all investments in debt securities (FASB, 1993). It identifies three types of investment security: debt securities held to maturity (i.e., held-to-maturity securities), debt and equity securities used for trading (i.e., trading securities), and debt and equity securities not classified as either of the previous two types (i.e., available-for-sale securities). SFAS 115 requires that trading securities and available-for-sale securities be measured under fair value, while held-to-maturity securities are to be measured under historical cost. The realized gains and losses of held-to-maturity securities and the unrealized gains and losses of trading securities are recognized in income. By contrast, the unrealized gains and losses of available-for-sale securities are reported in other comprehensive income. In the latter years of the 1990s, FASB issued a series of statements that expanded the fair value application, including: SFAS 119 *Disclosure about Derivative Financial Instruments and Fair Value of Financial Instruments*; SFAS 121 *Accounting for the Impairment of Long-lived Assets and for Long-Lived Assets to be Disposed of*; and SFAS 123 *Accounting for Stock-Based Compensation*. During this period, accounting scholars added to the fair value debate by addressing some fundamental issues regarding the validity and relevance of FVA in the conceptual framework of financial reporting (e.g., Barth and Landsman, 1995).

By 2007, fair value had both acquired an expanded significance and generated controversy in the accounting policy-making process (Power, 2010). FVA serves as a resolution to the increasing intolerance of the incoherence of mixed measurement systems. FASB issued SFAS 157 *Fair Value Measurements*, and 159 *The Fair Value Option for Financial Assets and Financial Liabilities* in 2006 and 2007, respectively.

These two statements expand the list of items to be fair valued by adding loans receivable and payable, investments in equity securities, written loan commitments, firm commitments regarding financial instruments, rights and obligations under insurance contracts, rights and obligations related to warranty agreements and host financial instruments that are separated from embedded derivative instruments (Emerson et al., 2010). In addition, for the first time, fair value was officially defined and the fair value measurement was specified. According to FASB, these pronouncements aim to increase consistency and comparability in fair value measurements and for expanded disclosures about fair value measurements (FASB, 2006), and to improve financial reporting by reducing volatility in reported earnings caused by measuring related assets and liabilities differently (FASB, 2007). The IASB develop similar definition and measurement method in 2006, in its convergence project (IASB, 2006).

A vigorous debate on the usefulness of FVA arose in association with the financial crisis of 2007–2009. U.S. industry groups pressured the SEC and FASB to significantly alter or suspend the fair value rules, claiming they undermine the government's effort to stabilize the country's financial sector (Emerson et al., 2010). The American Bankers Association, in its letter to the SEC in September 2008, states that the problems that exist in today's financial markets can be traced to many different factors. One factor that is recognized as having exacerbated these problems is fair-value accounting" (Laux and Leuz, 2009). Meanwhile, Wallison (2008) argues that FVA has been the principal cause of an unprecedented decline in asset values and an unprecedented rise in instability among financial institutions.

Despite strong opposition from the banking industry, FASB (2010) proposed that all financial instruments be measured at fair value in financial statements. As Linsmeier (2010) argues, HCA leads to consistent and dramatic underestimation of credit and impairment losses in both the most recent crisis and in previous crises in the banking sector. However, in 2011, FASB tentatively withdrew the requirement to book loans held to maturity at fair value after receiving a large number of comment letters and strong opposition at global roundtables (Whitehouse, 2011).

FASB's most recent effort to address the measurement issues of fair value is the issuance of the ASC Topic 820 *Fair Value Measurements and Disclosures*, and its amendment, Fair Value Measurements. This statement provides more detailed guidance regarding measurement of fair value inputs. In addition, this statement requires enhanced disclosures for fair value measurements categorized within Level 3 of the fair value hierarchy.

The evolution of fair value in IASB follows a similar path compared with FASB. In 1989, the International Accounting Standards Committee (IASC) published the Framework of Principles, which has similarities to the FASB framework. The first introduction of a mixed historical cost/current value measurement system was through the pronouncement of Financial Reporting Standard (FRS) 15 Tangible Fixed Assets, which permits a choice as to whether tangible fixed assets are reported at cost or at a revalued amount. International Accounting Standard (IAS) 39 *Financial Instruments: Recognition and Measurement*, provides a full fair value option and certain provisions relating to hedge accounting, which is regarded consolidating the principles of the IASB in respect of fair values (Georgiou and Jack, 2011). In 2000, two additional innovative steps took place:

IAS 40 *Investment Property*, which applies FVA to nonfinancial assets, and IAS 41 *Agriculture*, which requires the FVA model to be implemented by all enterprises that undertake agricultural activity. In 2009, IASB published International Financial Reporting Standards (IFRS) 9 *Financial Instruments* that will replace IAS 39 in three phases: Phase 1 *Classification and measurement*, Phase 2 *Impairment Methodology,* and Phase 3 *Hedge accounting*. Other than the above-mentioned IAS pronouncements, IASC's effort in promoting FVA is in line with that of FASB.

Looking back over the development of fair value in the financial reporting regime, it is obvious that fair value is increasingly favored by standard setters. The trend toward fair value arises due to the deficiencies of the HCA method and to the demand for timely and relevant information, especially during economic downturns. However, both researchers and standard setters acknowledge that fair value has its Achilles' heels, just as does any other accounting alternative. Therefore, it would be interesting to generate evidence regarding the decision usefulness of FVA numbers to financial statement users, which is exactly the purpose of this thesis.

2.3 Theoretical Analysis on Decision Usefulness of FVA

The FASB's Conceptual Framework states that the purpose of financial reporting is to provide information that is useful for business decisions (Concepts Statement No. 1, FASB 1978, para. 34), and it considers decision usefulness the overriding criterion for judging accounting choices (Concepts Statement No.2, FASB 1980, para. 30 and 32). Decision usefulness is defined in terms of relevance, reliability, comparability, and

understandability (Spiceland et al. 2005). In this section, I provide a review of the theoretical analysis on the four dimensions of decision usefulness of fair value.

2.3.1 Relevance

Relevance is defined as the capacity of information to make a difference in a decision by helping users to form predictions about the outcomes of past, present, and future events or to confirm or correct prior expectations (FASB, 1980). Relevance is one of the fundamental qualitative characteristics of accounting information, as articulated in early conceptual frameworks (FASB, 1980). Fair value is conceptually relevant because it accurately reflects the market's assessment of current economic conditions, which is directly useful for investor decision making (Emerson et al., 2010). Investors are concerned with value, not cost. With passage of time, historical costs become irrelevant in assessing a firm's current financial position (Penman, 2007). Fair values provide up-to-date information about the value of the firm's net assets.

Note that the relevance of fair value relies on the assumption of market efficiency. If the market is efficient with respect to publicly available information at all times, observed market prices reflect true fundamental values, and in such cases fair value is relevant. However, markets are not efficient when there are transaction costs and limits to arbitrage, and market prices may be subject to behavioral biases and investor irrationality (Barberis and Thaler, 2003; Shleifer, 2000). Under such circumstances, observed market prices deviate from fundamentals. Nevertheless, even if fair value does not reflect firm underlying value, historical cost does not do a better job. Historical cost is notorious for obscuring underlying problems due to lack of updated accounting information. Therefore,

it may be better to use market values, even if the market is illiquid, and to supplement these values with additional disclosures (e.g., management estimates of fundamental values) (Laux and Leuz, 2009).

However, many bankers criticize the low relevance of fair value measurement when market prices are rapidly falling and/or when markets are illiquid. They argue that it was the FASB's fair value requirement that caused much of the problem during the recent financial crisis (King, 2009). During a financial crisis, such as that of 2007–2009, estimates of fair value are said to be distorted by forced sales, or fire sales. However, the definition of fair value applies to orderly transactions, not forced sales. In addition, even if market prices are falling, fair values are still relevant in the sense that they reflect real economic conditions (Prochazka, 2011). Proponents of fair value point to areas such as pension accounting or the savings and loans industry in North America, where fair value would have made problems (e.g., deficits, poorly performing loans) visible much earlier, thereby enabling timely corrective action. An often heard trope is that one 'should not shoot the messenger' of poor asset quality (Power, 2011). As King (2009, p. 31) comments, blaming FVA for the financial problems of banks misses the point, because "not disclosing current prices is like breaking a thermometer if you think the temperature is too hot. It is the heat, not the thermometer, that causes the discomfort." Similarly, it was low prices, not fair values, that caused the financial crisis.

2.3.2 Reliability

Reliability is defined as the quality of information that assures information is reasonably free from error and bias and faithfully represents what it purports to represent (FASB,

1980). Reliability is also one of the fundamental qualitative characteristics of accounting information as articulated in early conceptual frameworks (FASB, 1980). The traditional view of accounting reliability lies in the verifiability of accounting numbers (Barth, 2007). One of the explicit motivations for the expanded significance of the use of fair value is its perceived potential to minimize the freedom to manipulate accounting numbers (CFA, 2007). Conceptually, market-based values are free from manipulation and therefore are highly reliable. When dealing with financial assets, the HCA model allows firms to structure and account for transactions in a way that income could be easily managed, and yet remain in compliance with GAAP (e.g., cherry picking). FVA could eliminate the opportunity for management to manipulate earnings. Practically, however, only Level 1 fair values are free from manipulation. Level 2 and Level 3 fair values, which are based on managerial discretion and model estimation, are subject to estimation errors and/or manipulation. As Emerson et al. (2010) comment, manipulation of reported fair values can result in the very effect that FVA is designed to eliminate, which is evidenced by many recent large frauds that were "enabled" by the move toward FVA.[3] An effective countermeasure to the estimation/manipulation problem is increased disclosure of the underlying assumptions used when estimating fair value (Emerson et al., 2010). Luckily, such a disclosure requirement has just recently been implemented in the recent ASC 820 (FASB, 2011), in which the standard setter takes effective steps to improve the reliability of fair value measures.

As Ijiri and Jaedicke (1966) argue, definitions of accounting reliability may change over time. Barth (2007) challenges the verifiability interpretation of reliability and proposes a

[3] For example, many of Enron's valuation overstatements were based on fair value estimates (Benston, 2006).

reframing of reliability with faithful representation: "just because an amount can be calculated precisely, it is not necessarily a faithful representation of the real-world economic phenomena it purports to represent" (Barth, 2007, p. 10). The new conception of accounting reliability essentially collapses reliability into relevance, rather than trading them off one another. Jones (1988, p. 56) points out that historical cost no longer "faithfully represents the economic realities of today's complex instruments." In the sense that fair value measures provide more relevant information, they also improve faithful representation of accounting numbers.

2.3.3 Comparability

Comparability is defined as the quality of information that enables users to identify similarities in and differences between two sets of economic phenomena (FASB, 1980). Generally, the use of fair value improves the comparability of accounting information across firms. When there is an active market, the fair value of an asset depends on the market price of the asset itself, rather than within the context of the entity that owns it (Emerson, 2010). Using a single measurement attribute alleviates the problems associated with the present use of multiple measurement attributes. As a result, FVA would reduce the anomalies of the existing mixed accounting approach and the need for complex and subjective hedge accounting (Chisnall, 2000). As Barth (2006, p. 274) criticizes, the use of multiple measures for financial instrument valuation is "not only conceptually unappealing, but also creates difficulties for financial statement users."

However, problems arise when an active market does not exist and when it is necessary to use a valuation model to estimate fair value. Under such circumstances, the

comparability of financial statements may be called into question, as fair values for the same asset can differ across firms (Prochazka, 2011). Therefore, clear guidance on fair value measurement serves as an important factor in ensuring the comparability of fair values.

2.3.4 Understandability

Understandability refers to the attribute that users of financial reports will perceive the significance of a reported item to their decisions (FASB, 1980). Such perception involves understanding the economic effects of a firm's actions and their measurement. Information provided in financial statements should be readily understandable to users with reasonable knowledge. On the one hand, fair value improves the understandability of financial reporting, because using market value as the measurement basis is straight-forward to financial statement users. On the other hand, however, it is arguable that understanding some fair values requires specific knowledge that ordinary financial statement users may not have. Some bankers show their concern regarding the understandability of fair value information. As quoted in *The Wall Street Journal* (December 17, 1991), Donna Fisher, manager of accounting policy for the 9,000-member American Bankers Association commented that it is be very difficult to set a fair value on many commercial and industrial loans, which are often unique in value and lending terms. This means that it is equally difficult, if not more, for investors and regulators to understand the fair value of commercial and industrial loans.

In sum, conceptually, fair value outweighs historical cost in providing relevant, reliable, comparable and understandable accounting information. However, when active markets

do not exist, the relevance, reliability, comparability, and understandability of fair value are called into question. The net effect of the decision usefulness of FVA information is therefore an empirical question. In addition, detailed guidance regarding fair value in inactive or illiquid markets provides possible room for improving the usefulness of fair value.

2.4 Empirical Evidence on FVA

2.4.1 Value Relevance of Fair Value in the Equity Market

Accounting information is considered value relevant if it has the predicted association with market value of equity (Barth et al. 2001). Value-relevant accounting information is both relevant to investors and reliable enough to be reflected in share prices (Song et al., 2010). A large number of FVA studies focus on the value relevance of fair value information.

A major stream of the above-mentioned studies investigates the value relevance of financial instruments in the U.S. banking industry. One way to test the value relevance of fair value information is to examine whether fair value has *incremental* information content over and above historical cost. The results of these studies are mixed. Based on a sample of bank data between 1971 and 1990, Barth (1994) finds that fair value of investment securities is more value relevant than their historical cost. Similar to Barth (1994), Petroni and Wahlen (1995) investigate relevance and reliability of fair values of equity and debt securities for property-liability insurers between 1985 and 1991. These authors find that only fair values of items traded in active markets are value relevant. In addition, and inconsistent with the Barth (1994) results, Petroni and Wahlen (1995) find a

significant and positive relation between stock returns and changes in unrealized gains and losses for insurance companies, indicating that fair value securities gains and losses are value relevant in the insurance industry. This result is also supported by Ahmed and Takeda (1995), which includes more on-balance-sheet net assets in the estimation equations. Three other concurrent studies examine the relation between bank share prices and fair value of financial instruments, as required under FAS 107. Eccher et al. (1996) show that fair value of investment securities is significantly value relevant, but results on fair value of other asset and liability variables are mixed and weak. Nelson (1996) finds that over the period 1992–1993, the fair value of financial instruments had no incremental power to explain market-to-book ratio, with the exception of investment securities in 1992. On the contrary, Barth et al. (1996) provide evidence that fair value of loans over the 1992–93 period is incrementally value relevant beyond related book values. In the same vein, Park et al. (1999) show that unrealized gains and losses of available-for-sale securities, held-to-maturity securities, and loans are incrementally value relevant in explaining annual returns.

Biddle et al. (1995) point out that the mapping between an incremental and a relative information content is not one-to-one. In essence, a result that fair value is incrementally informative can imply that fair value is as informative as, or more, or less informative than historical cost. Therefore, tests for relative information content provide more direct implications regarding which measure contains more information content. Accordingly, another line of studies examines the relative explanatory power of fair value and historical cost in explaining equity values. For example, Khurana and Kim (2003) compare the relative explanatory power of fair value and historical cost in explaining

equity values, using the fair value disclosures made under FAS 107 and FAS 115. These authors find no significant difference in the informativeness of fair value measures relative to historical cost measures. However, they find for small bank holding companies and those with no analysts following, that historical cost measures of loans and deposits are more informative than fair value.

Following the issuance of SFAS 157, several studies examine the value relevance of the three tiers of fair value in the U.S. banking industry. Using similar approaches and data, Song et al. (2010), Goh et al. (2009), and Kolev (2009) all find that investors discount Level 3 fair value estimates due to reliability issues during the financial crisis. However, Song et al. (2010) show that value relevance for Level 3 estimates is greater for banks with stronger corporate governance. Kolev (2009) and Goh (2009) find that valuation coefficient of Level 1 and Level 2 assets is also significantly less than one, probably due to financial market instability and the uncertainty of investors over banks' asset values.

In addition to financial assets, several studies provide evidence on the value relevance of fair value nonfinancial assets such as pensions under SFAS 87 (Barth 1991; Barth et al. 1992), derivatives under SFAS 119 (Venkatachalam 1996; Ahmed et al. 2006), and tangible long-lived assets under SFAS 33 (Beaver and Landsman 1983; Beaver and Ryan 1985; Lobo and Song 1989). These studies show evidence that, if there are no active markets for these assets and liabilities or the estimates are determined by management, investors tend to discount recognition and disclosure of fair value and consider them to be less relevant and reliable. Management discretion and estimation errors might be the explanations for this.

Some studies also examine whether the value relevance of fair value measurements is a function of the reliability of the information. For example, both Dietrich et al. (2000) and Muller and Riedl (2002) show that the reliability of fair value estimates is positively associated with the presence of external appraisals. However, Barth and Clinch (1998) find no such association.

Fiechter and Novotny-Farkas (2011) is an international study that examines the value relevance of fair value using a global sample of 322 banks that apply IFRS during the period 2007–2009. This study applies a modified Ohlson (1995) model and finds that fair value is value relevant and that the pricing of fair value differs across firm-specific and institutional factors. In addition, this study sets forth evidence that fair value experienced a substantial discount during the financial crisis of that period.

Overall, the above value relevance studies provide generally consistent evidence that FVA is value relevant to equity holders. However, the value relevance of FVA differs across items reported in the financial statements, indicating that a full fair value application may not be a panacea to improving the decision usefulness of financial reporting. Therefore, one promising research avenue is to examine in what scenarios fair value works well. Another is to study other possible consequences of fair value application, other than the stock market effect.

2.4.2 Value Relevance of Fair Value in the Debt Market

In addition to shareholders, debtholders also demand accounting information for decision making and debt contracting purposes. According to Armstrong et al. (2010), financial reporting provides information to debtholders regarding the downside risk and evaluation

of firm collateral, as well as information useful in assessing the timing and riskiness of firms' expected future cash flows from existing projects and anticipated investments. However, there is scant empirical evidence regarding the decision usefulness of fair value measures in the debt market. One notable exception is Blankespoor et al. (2010), which examines the relation between bank credit risk exposure and bank leverage measured under various accounting systems (full fair value for financial instruments, current GAAP accounting systems, historical cost systems, and Tier 1 capital). This study finds that bank leverage measured under a full fair value system is at least six times more highly correlated with the TED spread (i.e., the difference between interest rates on interbank loans and on short-term U.S. government debt) 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. (2011) examine the ability of loan fair value to predict credit losses relative to the ability of net historical costs currently recognized under U.S. GAAP. These authors find that net historical loan costs are generally a better predictor of credit losses than loan fair values.

Based on the above review of the fair value literature, there is limited evidence regarding the impact of fair value in the debt market. According to Kothari et al. (2010), both equity holders and debt holders need verifiable accounting information for decision making. Debtholders' information needs arise from the moral hazard problems attributable to agency conflicts and asset substitution risks related to asymmetric information. FVA information has the controversial characteristic that it improves the relevance of financial reporting at the cost of lower reliability, especially for assets and liabilities measured using Levels 2 and 3. Therefore, it is unclear whether implementation

of fair value improves or worsens decision usefulness to debtholders. Therefore, in order to narrow this gap, this dissertation examines 1) the decision usefulness of fair value information relative to that of historical cost in terms of the explanatory power of credit ratings, and 2) the effect of the use of FVA on cost of debt. The evidence set forth in this dissertation adds to our understanding regarding the circumstances in which fair value outperforms historical cost as well as the impact of implementing fair value on firm borrowing.

Chapter 3 Fair Value Accounting and Credit Ratings

3.1 Theoretical Framework

The conceptual framework underlying my empirical tests is rooted in the agency problems of moral hazard and asset substitution created by the existence of information asymmetries among contracting parties. First, from the perspective put forward by Jensen and Meckling (1976), due to the existence of information asymmetry, there is an agency conflict between the principal (e.g., shareholders and debtholders) and agent (managers). Taking a debtholder perspective, there is agency cost between debtholders and managers acting on behalf of shareholders. Under such circumstances, it is generally impossible for the principal or the agent at zero cost to ensure that the agent will make optimal decisions from the principal's viewpoint, thus leading to a moral hazard problem. The moral hazard problem, which may take the form of shirking, perquisite consumption, overcompensation, or empire building by the agent, results in an increase of the agency risk and decreases the expected value of a firm's future cash flow (Ashbaugh-Skaife et al. 2006). As default risk is a negative function of a firm's future cash flow to debtholders

(Ashbaugh-Skaife et al. 2006), the existence of the moral hazard problem increases the default risk of bondholders.

Second, from the perspective put forward by Black and Scholes (1973) in their path-breaking work on option valuation, shareholders may be viewed as holding a European call option to buy back the entire firm at an exercise price equal to the face value of the debt. In the same vein, debtholders can be regarded as taking a long position in the firm assets and a short position in the call option. Because the value of the call option is an increasing function of the variance of the cash flows of the firm, stockholders have an incentive to engage in high-risk activities at the expense of debtholders. Debtholders face the risk that the debt is initially issued for engaging in low variance (low risk) activities but later on stockholders shift to high-risk projects. Debtholders do not receive a bonus for excess gains derived from investing in risky projects, but they will lose their contractual claims if the project fails. However, shareholders take all the investment gains in excess of contractual payment to debtholders, but will lose only the portion they invest in case of a failure. If both the low and high-risk projects yield the same expected return, the asset substitution does not alter the total value of the firm, but it transfers wealth from debtholders to stockholders. As a result, debtholders' asymmetric payoff function leads to greater risk bearing.

One solution to the above two agency conflicts is to provide accounting information to alleviate the information asymmetry problems. If accounting information faithfully delivers timely information to debtholders regarding the financial health (or credit risk) of the company, based on the above analysis, such information can help mitigate

information asymmetries posed to debtholders and improve the efficiency of debt contracting.

As standard setters are moving towards a full fair value based measurement regime for financial institutions, a relevant question to ask is whether fair value accounting makes financial reporting more decision-useful to debtholders? This dissertation aims to answer this question by examining the relative decision-usefulness of fair value in explaining credit ratings and bond yield spreads.

On the one hand, fair value accounting should be more decision-useful than historical cost based accounting. The merit of fair value accounting is that it reflects the true (and relevant) value of the firms' financial position, by reporting assets and liabilities directly at their current market value. Therefore, debtholders are informed of changes of firm value whenever the market value of firms' financial instruments change. This rapid information update enables debtholders and policy makers to better access firms' risk profile and to undertake more timely market discipline and corrective actions. Therefore debtholders can retrieve their claim as much as possible before further deterioration of firm value. Another advantage of fair value accounting, theoretically speaking, is its ease of verification. When firms' assets and liabilities are separable and have a liquid market, firms' value under fair value accounting is highly reliable, because the market value of each asset and liability is free of manipulation. On the contrary, historical cost accounting gives management considerable latitude in determining the carrying value of assets or liabilities (i.e., the carrying value of loans is determined by book value of loans minus loan loss provisions, the latter of which is determined by managerial estimation)(General Accounting Office, 1991). Linsmeier (2010) also points out that management-determined

impairment losses are consistently and dramatically underestimated in the most recent crisis.

On the other hand, there is concern that fair value accounting lacks reliability, is counter-conservatism, introduces excess volatility in reported financial performance, and contributes to procyclicality (see, e.g., Laux and Leuz, 2009; Penman, 2007; Plantin et al., 2007; Allan and Carletti, 2008a). First, among the three levels of fair value inputs, Level 2 and Level 3 inputs are subject to estimation errors and/or managerial manipulations. According to FASB (2006a), 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. Level 3 inputs are unobservable inputs and are developed based on the best information available in the circumstances, which might include the reporting entity's own data. As a result, managers have discretion regarding the measurement of Level 2 and Level 3 inputs, making financial reporting biased and less reliable (Menini, Parbonetti and Magnan, 2012). That is, the use of fair value accounting may make accounting information less informative to debtholders.

Second, considering debtholders' asymmetric payoff function, they care more about the lower bound of firm value. Under historical cost accounting, assets are written down when their market value goes below the book value, but are not written up when the market value reverses (i.e., accounting conservatism). Such asymmetric write-offs better protect debtholders by biasing firm value more towards its lower bound. On the contrary, fair value allows for both asset write-down and write-up. As a result, the symmetric asset write-off renders fair value less protective to debtholders.

Third, under the fair value accounting measurement regime, the value of assets and liabilities changes as their market value fluctuates. As a consequence, the value of balance sheet items may be driven by short-term fluctuations in the market that do not reflect the value of the fundamentals and the long-term values of assets and liabilities (Allen and Carletti, 2008b).

Last but not least, fair value accounting has been claimed to cause procyclicality and contagion when markets are illiquid (Allan and Carletti, 2008a). In times of financial crisis, prices in illiquid markets do not reflect future payoffs but rather reflect the amount of cash available to buyers in the market. If accounting values are based on market prices, the volatility of asset prices directly affects the value of banks' assets, which in turn leads to distortions in banks' portfolio and contagion (Allan and Carletti, 2008a).

Based on the above analysis, fair value accounting could also be less decision-useful to debtholders, compared to historical cost accounting. Therefore, it is an open question with respect to whether and when fair value accounting is more decision-useful than historical cost accounting for debt contracting purpose.

3.2 Hypothesis Development

In this section, I develop arguments as to whether fair value accounting has greater debt contracting value than historical cost accounting. I define that accounting information has debt contracting value if it has explanatory power in explaining credit ratings[4]. Credit ratings are used as tools for mitigating the principal-agent problems and are used as proxy

[4] According to Ball et al. (2008), accounting information has debt contracting value if current and lagged quarterly earnings can predict credit downgrades. However, their definition does not apply to my study because earnings is simply a by-product of changes of assets and liabilities under fair value measurement regime and therefore should not be used as the single predictor of credit ratings or credit downgrades.

for a firm's riskiness (Cantor, 2004) and are found to measure credit risks with reasonable accuracy (Horrigan, 1966; Cantor and Packer, 1995). Therefore, if accounting information can predict corporate credit ratings, it is decision-useful for debt contracting purpose.

I focus on the fair value of financial instruments in bank holding companies, the disclosure of which is mandated by FASB. A financial instrument is cash, evidence of an ownership interest in an entity, or a contract that both imposes on one entity a contractual obligation and conveys to that second entity a contractual right (FASB, 2009). In essence, banks are collections of financial contracts (Linsmeier, 2010), and therefore financial instruments comprise a great portion of the assets in banks' balance sheets. The value of financial instruments fluctuates as interest rates and economic conditions change, and consequently quickly alter a bank's financial profile. Measuring financial instruments under historical cost fails to capture the changes in value of financial assets and liabilities. Under historical cost accounting system, banks' management assesses the value of the financial instruments at amortized cost and books impairment charges against them only if they have suffered either an actual or an "other-than-temporary" loss in value. This assessment involves judgment, and according to Linsmeier (2010), bank managers have an extremely poor record in recognizing losses, as many banks with seemingly "healthy" balance sheets have failed all of a sudden.

In addition, as many researchers argue, fair value accounting does not work well in all situations (Allen and Carletti, 2008b). Therefore, in this study, I investigate the debt contracting value of fair value accounting in different scenarios (short-term credit ratings versus long-term credit ratings; with or without auditor industry expertise).

3.2.1 Fair Value Accounting and Short-Term Credit Risk

Credit ratings are divided into short-term and long-term categories based on the form of debt instrument concerned (Reuters Guide to Credit Ratings, 2007). According to a DBRS Rating Polices *Rating Scales* (DBRS), short-term funding exposes issuers and investors to a somewhat different set of risks and considerations than long-term funding. The difference is primarily due to liquidity considerations within the shorter maturity duration. Therefore I distinguish between short-term and long-term credit risk and develop hypotheses with respect to fair value's debt contracting value regarding the two types of credit ratings respectively.

Short-term credit ratings evaluate the credit risk of a firm's short-term debt or commercial paper[5]. A firm's short-term credit risk is associated with its ability to use short-term assets to repay short-term liabilities. When a firm's current liabilities are due, it sells its current assets at market value and uses the proceedings to repay the current liabilities. Therefore, it is easy to see that a firm's short-term credit risk is associated with the market value of its current assets. However, for the purpose of evaluating the short-term credit risk of a company, historical cost based accounting information is inappropriate, because the acquisition cost of the assets and liabilities may deviate from the price the firm can sell its assets for. The problem of historical cost accounting for predicting short-term credit risk is documented in the finance literature where researchers identify a phenomenon called incomplete accounting information around the time of default, especially on short-term debt (Beneish and Press, 1995; Duffie and Lando, 1997).

[5] Commercial paper is a short-term unsecured promissory note with a fixed maturity of 1 to 270 days (Abken, 1981).

The rationale for short-term debt default, according to Duffie and Lando (1997), is that under the historical cost-based accounting system, since information is not reflected in a timely manner, around the time of default, substantial accounting information about the issuer will be revealed to the market, causing a jump in market information. The jump caused by incomplete information substantially shocks the market and the firms' market value is greatly written down, leading to a default. If accounting information were based on fair value measurement, the negative shock would be revealed on a timely basis, thus providing an immediate signal to the market for prompt corrective actions. That is to say, fair value accounting corrects the information jump problem by providing timely updates of firms' value. As a result, at any point in time, including around the maturity of short-term debt, there will not be information shock to the market. Therefore, I argue that in terms of firms' short-term credit risk, fair value accounting provides greater debt contracting value than historical cost accounting.

H1: Fair value accounting provides greater short-term debt contracting value than historical cost accounting does.

3.2.2 Fair Value Accounting and Long-Term Credit Risk

A firm's long-term credit risk is associated with the likelihood that a firm's future cash flows will be sufficient to cover debt service costs and principal payments and are determined by the probability distribution of future cash flows to bondholders (Ashbaugh-Skaife et al., 2006). In a long-term horizon, the evolution of firm value follows a diffusion process (see, e.g., Merton, 1974, Black and Cox, 1976, Longstaff and Schwartz, 1995). Under a diffusion process, firm value is a function of discounted future

cash flows, and is almost insulated from the impact of market value fluctuations. Sudden drops in the firm value are impossible, which is consistent with the rationale of using historical cost accounting as a measurement method. In this case, fair value accounting information may not add much to the efficiency of debt contracting, because the temporary volatility of firm value is not predictive of firm value at maturity. As documented by Plantin et al. (2008), fair value increases the inefficiency of accounting information to assets that are long-lived, and the reverse is true for sufficiently short-lived assets. Therefore, I predict that in terms of firms' long-term credit risk, historical cost accounting provides greater debt contracting value than fair value accounting.

H2: Historical cost accounting provides greater long-term debt contracting value than fair value accounting does.

3.2.3 Auditor Industry Expertise and Debt Contracting Value of Fair Value Accounting

Auditors' industry expertise plays an important role in determining the debt contracting value of fair value accounting, because high quality monitoring is likely to effectively mitigate the information asymmetry problem posed by less verifiable fair values (Penman [2007]). Both training and experience increase the auditor's domain knowledge of a specific industry, and specialized industry knowledge reduces errors in judgment (Solomon, Shields, and Whittington, 1999). According to Balsam et al. (2003), firms with auditor specialists have better earnings quality than firms of non-specialists. Using the banking industry as an instrumental setting, Low (2004) provides experimental evidence that the auditors' knowledge of the client's industry improves their audit risk assessments

and the perceived quality of audit planning decisions. Krishnan (2005) finds that earnings of the firms that are audited by specialists are more timely in reflecting bad news than earnings of firms audited by non-specialist, indicating that auditor specialists play a better monitoring role than non-specialists. Therefore, auditors with industry expertise should be more capable of detecting the estimation errors and managerial manipulations of fair value measurement, and resulting in more informative accounting information. Since fair value is expected to outperform historical cost only in predicting short-term ratings, I expect the impact auditor industry expertise only applies to a short-term setting. Therefore, I propose the following hypothesis:

H3: Auditor industry expertise increases fair value's relative short-term debt contracting value over historical cost accounting.

3.3 Research Design

Consistent with prior accounting and finance literature (e.g., Horrigan, 1996; Glantz and Mun, 2008), I use credit ratings to capture banks' credit risk. Following Fortin and Pittman (2007), I convert Moody's bond ratings to an ordinal scale by assigning numeric values to the rating scales. When Moody's ratings are unavailable I use Standard & Poor's ratings. When neither of the two ratings is available, I use Fitch's. This specification allows me to conserve degrees of freedom and is commonly used in previous literature (e.g., Fortin and Pittman, 2007; Cantor, Packer, and Cole, 1997). Details of the credit rating classifications are shown in Table 1. Higher credit rating score represents higher credit quality, or lower credit risk.

Insert Table 1 here

Prior finance literature identifies a number of accounting-based constructs that determine corporate bond ratings (e.g., Horrigan, 1966; Kaplan and Urwitz, 1979; Boardman and McEnally, 1981; Lamy and Thompson, 1988; Ziebart and Reiter, 1992). Following Ashbaugh-Skaife et al. (2006), I include the following five accounting variables as the independent variables in my regression. These constructs are leverage (LEV), return-on-assets ratio (ROA), interest coverage ratio (COV), a categorical variable set to 1 if the firm reports negative income (LOSS), and firm size (SIZE). These five accounting based constructs are all used as proxy for firms' default risk. Higher leverage and lower return on asset and interest coverage ratio reflect greater default risk. Loss represents another indicator of default risk, because unprofitable firms have higher likelihood of default. Larger firms face lower risk, and therefore firm size is expected to be positively associated with credit ratings. Kaplan and Urwitz (1979) provide empirical results that these five types of accounting ratios well explain the variance of credit ratings (generalized R^2 up to 0.82). Table 2 shows the measurement of variables and their predicted association with credit ratings.

Insert Table 2 here

Similar to Ashbaugh-Skaife et al. (2006), my empirical tests are based on ordered logit model that captures credit ratings as a function of these five accounting-based variables. Ordered logit model is proper for the analysis because the credit rating scores convey ordinal risk information. Higher rating scores represent lower credit risk. However, I cannot assume uniform differences in risk between the categories. The regression model is as follows:

$$\text{RATING} = \text{f}(\text{LEV}, \text{ROA}, \text{LOSS}, \text{COV}, \text{SIZE}) \quad (1)$$

To examine the relative explanatory power of fair value accounting as opposed to historical cost accounting with respect to credit ratings, I construct the above-mentioned five accounting measures using fair value and historical cost inputs respectively. For example, to get the fair value measure of total assets, I adjust the total assets reported under U.S. GAAP (GAAP total assets) by deducting the elements that are reported at historical cost and adding the fair values of these elements. Among all the financial instruments used in my study, held-to-maturity securities and net loans are reported at historical cost. Therefore, the fair value of total assets equals the value of GAAP-based total assets minus the historical cost of held-to-maturity securities and net loans plus the fair values of these two instruments. Fair value leverage is then calculated by total fair value liabilities over total fair value assets. Similarly, in order to get the fair value measure of ROA, I adjust the reported income before extraordinary items by deducting the difference between the amount reported in the current period and that in the previous period (i.e., the unrealized gains or losses) for held-to-maturity securities, net loans, and long-term debt measured at historical cost and adding the fair values of the unrealized gains or losses for these three items. Then the fair value measure of ROA is the fair value adjusted income before extraordinary items over fair value total assets. Similarly, the historical cost ROA can be obtained by dividing the historical cost adjusted income before extraordinary items by historical cost-based total assets. In the same way, I get all the fair value and historical cost measures of the five accounting variables. Using these measures, I run horse-race tests and compare the generalized R^2 of equation 2 and that of equation 3. A greater generalized R^2 indicates greater debt contracting value.

$$\text{RATING} = \text{f}(\text{LEV\_HC}, \text{ROA\_HC}, \text{LOSS\_HC}, \text{COV\_HC}, \text{SIZE\_HC}) \quad (2)$$

$$\text{RATING} = \text{f}(\text{LEV\_FV}, \text{ROA\_FV}, \text{LOSS\_FV}, \text{COV\_FV}, \text{SIZE\_FV}) \quad (3)$$

Furthermore, to examine whether auditor industry expertise plays a role in improving fair value accounting's debt contracting value, I test the relative explanatory power of fair value accounting as opposed to historical cost accounting in explaining credit ratings by dividing the sample into two groups: auditor-expert group and non-auditor-expert group. Following prior auditing literature (e.g., Ferguson, Francis and Stokes, 2003; Hogan and Jeter, 1999; Reichelt and Wang, 2010), I measure national level auditor industry expertise based on the auditor's annual market share of audit fees within two-digit SIC category (in particular in my study, SIC=60). Table 3 shows the percentage of market share of audit fees by auditor and year. From 2003 to 2007, KPMG is the sole banking industry leader in terms of its shares of audit fees. However, from 2008 to 2010, both KPMG and PricewaterhouseCoopers are identified as having banking industry expertise. The statistics are consistent with prior auditing literature that KPMG is dominant in providing audit services to the banks.

Insert Table 3 here

3.4 Sample Selection and Empirical Results

3.4.1 Sample Selection

I focus on the U.S. bank holding companies with available credit ratings. Table 4 delineates the sample selection process. Sample firms are initially identified from the

SNL Financial database[6]. To be included in the sample, firms need to have at least one credit rating issued by one of the top 3 rating agencies, i.e., Moody's, Standard and Poor's and Fitch during the years 2003-2012. 2003 is determined as the beginning year of the sample because fair value measurements were sparkled before 2002. To avoid the confounding effect, I avoid multiple ratings issued by different ratings agencies for the same firm at a specific data point. To do this, I start by including all credit ratings of U.S. bank holding companies issued by Moody's. I complement this sample by adding credit ratings issued by Standard and Poor's that are unique firm-quarter observations. I apply the same rationale to add observations from Fitch. This process yields 1877 unique credit ratings by the three rating agencies. I also extract from the SNL database and complement by manual collection from annual reports both the fair values and the historical cost of the five financial instruments (i.e., available-for-sale securities, held-to-maturity securities, net loans, total deposits and long-term debt) for the firms in the initial sample. I merge the resulting data with the original sample requiring that both measures, i.e., fair value and historical cost, for all financial instruments be available. This process reduces the sample to 1524 observations. Since short-term credit risk differs in nature from long-term credit risk, I construct subsamples of short-term ratings and long-term ratings. The short-term credit rating group contains 898 observations and the long-term credit rating group contains 626 observations. I also examine the impact of auditor industry expertise on the debt contracting value of fair value accounting numbers. To accomplish this, I further divide the short-term credit rating sample into industry-

[6] SNL Financial database provides a wide converge of financial data of Banking, Insurance, Financial Services, Real Estate, Energy and Media & Communications.

specialized auditor group (n=173) and non-industry-specialized auditor group (n=686), while deleting the observations with no auditor information.

Insert Table 4 here

3.4.2 Descriptive Statistics

Panel A of Table 5 provides descriptive statistics on the fair value and historical cost-based accounting variables. Panel B-D of Table 5 shows the descriptive statistics for short-term credit ratings, audit-short-term ratings, non-audit-expert-short-term ratings and long-term rating subsamples. Overall, there is no severe skewness or significant outliers in my samples. Compared with firms in non-banking industries, bank holding companies exhibit higher leverage, more volatile return on assets, greater likelihood of loss, and greater size. Besides, comparing the fair value and historical cost measures of return on assets and loss, I find that on average, fair value makes earnings more volatile as opposed to the historical cost equivalents.

Insert Table 5 here

3.4.3 Correlation Matrix

Panel A to E of Table 6 show the correlation tables of test variables. The upper triangle shows the Spearman correlation and the lower triangle shows the Pearson correlation. Consistent with prior literature (e.g., Ashbaugh-Skaife et al., 2006), credit rating score is positively associated with ROA, interest coverage, and size, and negatively associated with leverage and loss at conventional significance level. In addition, the fair value and

historical cost measures of the same variable do not show exceptionally high correlation, implying that the two types of accounting information has different information content.

Insert Table 6 here

3.4.4 Empirical Results

In order to test fair value's relative short-term debt contracting value, I run the horse race tests using the short-term credit ratings sample. Table 7 Panel A shows the results. As is consistent with my first hypothesis, the generalized R^2 for historical cost model is 0.3689, while that of fair value model is 0.5525, and this difference is significant ($z=-4.4023$, $p<0.0001$) using Vuong (1989)'s test statistics. This result shows that fair value accounting has greater short-term debt contracting value than historical cost accounting. An explanation for this evidence is that firms' short-term credit risk is directly associated with the current value of firms' assets and liabilities. In terms of an immediate default, it is the difference between fair value assets and fair value liabilities that debtholders can claim. On the contrary, under such circumstances, historical cost may be distorting in presenting the values of debtholder claims. That explains why fair value accounting has more short-term debt contracting value than historical cost accounting. In addition, the coefficients for all five accounting variables are significant at the conventional levels, except the coefficient for leverage measured at historical cost. One possible explanatory is that leverage measures the company's overall capitalization status encompassing both the short-term and long-term liabilities. In addition, as opponents of historical cost accounting claim, historical cost numbers provide distorted information to investors because they do not reflect the changes in values of assets and liabilities in a timely

manner. However, since the focus of this study is to compare the relative explanatory power of historical cost and fair value in predicting firms' credit ratings, the magnitude and the significance of the coefficients of the independent variables are not my main concern.

In order to test fair value's relative long-term debt contracting value, I run the horse race tests using the long-term credit ratings sample, and the results are presented in Panel B of Table 7. Results show that fair value accounting ratios do not better capture credit risks than historical cost accounting (Vuong's Z=0.1975). This evidence is consistent with fair value's inability to predict long-term values because it is based on volatile market values with little persistence in nature. The reason why historical cost does not *significantly* outperform fair value in predicting banks' credit risks may be the lack of relevance of historical cost-based accounting numbers.

Insert Table 7 here

Next, I examine the third hypothesis that the relative debt contracting value of fair value accounting numbers is conditional on whether or not a firm hires industry-expert auditors. Table 8 presents the impact of auditor industry expertise on fair value's short-term debt contracting value. In the auditor-industry-expert group, fair value accounting ratios outperform historical cost accounting ratios in explaining credit ratings (the generalized R^2 of fair value and historical cost are 0.3655 and 0.2356). This result is consistent with the role of auditors, especially those with industry expertise, in improving the reliability of accounting numbers in the financial statements. On the contrary, in the non-expert group, historical cost accounting numbers outperform fair value accounting numbers (the

generalized R^2 of fair value and historical cost are 0.4434 and 0.5872). This finding suggests that auditors without industry expertise do not provide assurance regarding the reliability of accounting numbers, since they are less capable in detecting estimation errors and opportunistic manipulation of fair value measures. Similar tests on long-term credit ratings are lack of power (untabulated) due to insufficient number of observations in the auditor expert group (n=69).

Insert Table 8 here

3.5 Robustness Checks

In this section, I conduct a battery of sensitivity analyses to ensure the robustness of my empirical results.

3.5.1 Bootstrap as an alternative method

Instead of comparing the goodness of fit of the ordered logit models, I use bootstrap as an alternative methodology to test the relative predicting power of fair value versus historical cost in predicting credit ratings. Bootstrap methods are frequently used in simulations to calculate standard errors, confidence intervals, and significance tests (David and Hinkley, 1997). Here I compare the estimation errors of predicting credit ratings using fair value and historical cost method. I replicate the bootstrap samples for 1,000 times and calculate the mean of the mean squares of residuals resulting from regressing credit ratings on fair value accounting ratios and historical cost accounting ratios respectively. For the short-term credit ratings sample, the average square of residuals based on fair value ratios is 0.61, and that on historical costs is 0.43. For the long-term credit ratings sample, the average square of residuals based on fair value ratios

is 0.51, and on historical costs is 0.55. That is to say, fair value measurements outperform historical cost in predicting short-term credit ratings, rather than in predicting long-term credit rating. These results are consistent with the findings in the prior sections.

3.5.2 Alternative Empirical Proxies

I use common alternatives of the independent variables to check whether my results are robust to different proxies of the accounting ratios. Specifically, following Philips (1975) and Ross (1976), I use long-term debt/total assets as the proxy for leverage, and the results, shown in Table 9, Proxy (1), are consistent with my prior findings. Besides, I use cash flow before interest and taxes/total debt as an alternative proxy for interest coverage (Kaplan and Urwitz, 1979). Results reported in Proxy (2) of Table 9 indicate that my main empirical findings are robust. Furthermore, I use the total market capitalization as proxy for firm size (see, Atiase, 1985), and the results, reported in Proxy (3) of Table 9, are also consistent with my main findings. In addition, according to DBRS Rating Report (2011), efficiency ratio is also used as an important determinant for the credit ratings of banks. This ratio is measured as the non-interest expense of the banks divided by operating revenue. It reflects a bank's ability to effectively manage cost and contributes to the bank' resilient earnings power (DBRS Rating Report, 2011). Since both interest coverage ratio and the efficiency ratio capture the risk of the companies to hold debt, and the two measures are highly correlated. I replace the interest coverage ratio by the efficiency ratio and my results remain robust (see Proxy (4) of Table 9).

Insert Table 9 here

3.5.3 Possible omitted independent variables

I add variables that are commonly used by rating agencies to establish rating levels for banks (e.g., Moody's Investors Services, 2006 and DBRS Rating Report, 2011) in the regression. Specifically, I add revenues of the largest business segment scaled by total assets of the company, number of business segments and the cash flows from operations divided by total debt as additional explanatory variables. The revenues of the largest business segment over total assets and number of business segments are proxies for diversification of operations. Cash flows from operations divided by total debt measures liquidity strength of the companies as a signal of their ability to service the debt. These three variables are used in Ball et al. (2008) as additional factors that affect the debt contracting value of accounting information. The untabulated results of this specification do not violate the prior findings.

Besides, following West (1970), I add earnings variability as additional explanatory variables in the regression. I use systematic accounting risk measure and unsystematic accounting risk measure to proxy for earnings variability. The systematic risk of the firms' common stock is estimated as the standard error of the residual in the model with firm-specific earnings as the dependent variable and market annual income as the independent variables. The unsystematic risk is estimated using the market beta for each firm. This process does not alter my empirical results.

In addition, I add year dummies in the regression as a control for macro-economic factors that might affect credit ratings. According to Willson (1997a, b), macro-economic factors, such as GDP growth rate, unemployment rate, long-term interest rates, foreign exchange rates and aggregate saving rates, have impact on firms' default risk. The year dummy can capture the macro-economic factor in a specific year. Results are robust after adding the

year dummy. Note that in my main regressions, I use horse-race tests to compare the relative debt contracting value of fair value and historical cost. While the five accounting numbers differ under the two measurement systems, the economic factor is the same for every firm-quarter observation. Therefore, the omitted macro-economic factor does not affect the relative explanatory power of the two types of accounting information in explaining credit ratings, given the independence of the two variables. As a result, it is not surprising to see my results (untabulated) are robust after adding the year dummies.

3.5.4 Model Specification

As is shown in the correlation matrix of the test variables, *LOSS* and *ROA* exhibit high correlations. Highly correlated independent variables lead to misspecification of the model. Since both *Loss* and *ROA* capture the attributes of earnings, I delete *LOSS* and use *ROA* as the sole indicator of firms' earnings attributes. The results are shown in Table 10 Panel A and B. This specification does not change the main findings.

Insert Table 10 here

3.6 Synthesis

In this chapter, I investigate the debt contracting value of fair value accounting information. Specifically, I examine fair value accounting's relative explanatory power as opposed to that of historical cost accounting in explaining firms' credit ratings. I find that fair value accounting has greater explanatory power in explaining short-term credit ratings than historical cost accounting. However, I do not find the same result for long-term credit ratings. This finding is consistent with Plantin et al.'s (2008) prediction that fair value does not work well for long-lived assets. In addition, I examine the impact of

auditor industry expertise on the relative debt contracting value of fair value accounting. Empirical results show that auditor industry expertise improves fair value's decision usefulness to debtholders since they serve as good monitoring mechanisms to constrain the managerial opportunism and/or estimation errors that fair value accounting is prone to have.

An important contribution of my analysis is to more directly connect the existence of unresolved information asymmetries with direct measures of the debt contracting value of both fair value-based and historical cost-based accounting information. This allows me to provide textured evidence on the central role of accounting information in reflecting firms' credit risk. Second, according to Plantin et al. (2008), the choice of an accounting measurement regime for financial institutions is one of the most contentious policy issues facing financial regulators and accounting standard setters at the moment. While the fair value debate has been on for over two decades, there has been mixed results as to whether fair value or historical cost makes the disclosure regimes better. I empirically document that fair value accounting information outperforms historical cost accounting information in reflecting firms' short-term credit risk but underperforms historical cost accounting in reflecting firms' long-term credit risk. This finding helps to disentangle the mixed results by providing the scenarios when fair value accounting is more informative of firms' credit risk than historical cost accounting and vice versa.

The research design in this chapter also has some limitations. First, to test the impact of fair value on credit ratings, it would be more interesting to use the change of credit ratings as the dependent variable for the logit model. However, due to the fact that the change analysis requires stricter criteria for an observation to be selected in the sample

(i.e., the historical costs and fair values of the five financial instruments need to be available for two consecutive years, and the credit ratings need to be available for two consecutive years with a one year lag with the financial data), I cannot get decent sample size to run regression for the change analysis. Second, since the fair value and historical cost data for the financial instruments are retrieved from either the main body or the footnotes of the financial statement, the difference in the impacts of the two measures may also be driven by the difference between measurement versus recognition. For example, if a certain financial instrument is measured at historical cost in the main body of the statement, and the fair value of this instrument is disclosed in the footnote, the results that historical cost is taken into consideration when deciding a firm's credit ratings may not be due to the fact that historical cost is superior, it may just because historical cost is the one that is disclosed in the main body. I cannot control for this alternate explanation using my current methodology.

Chapter 4 Fair Value Accounting and the Cost of Debt

4.1 Hypothesis Development

4.1.1 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 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 and Verrecchia (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 health and viability (Anderson et al., 2004). 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 et al., 2005). On the one hand, fair value is more relevant in that it provides timely update regarding the company's financial position (Emerson et al., 2010), sending early signals of deterioration and allowing prompt corrective actions if necessary (Linsmeier, 2011); fair value is also conceptually more reliable because, by definition, market-based numbers are free from manipulation; fair value numbers, or market-based accounting numbers are more comparable across firms; and the exit value concept of fair

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. As a result, these fair value inputs are subject to low reliability (Emerson et al, 2010). Besides, once fair values involve discretion and/or estimation errors, their comparability and understandability are called into question. Therefore, it is an open question whether more use of fair values in the financial statements improves or decreases the decision usefulness of accounting information. As a result, I state my first hypothesis in null form:

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

4.1.2 Distinguishing among the Fair Value Hierarchies

Because active markets do not exist for all items on the financial statement, in order to measure fair values in all scenarios, the 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. The pure market-based inputs timely reflect firms' financial condition, and are free from manipulation and estimation errors. Besides, the market values of the same assets or liabilities are the same across firms. In addition, understanding the values of the Level 1 inputs requires no specific knowledge. That is to say, Level 1 fair value inputs are highly relevant, reliable, comparable and understandable, thus highly decision

useful. Therefore, the use of Level 1 inputs in the financial statements helps reduce the information risk that creditors face, resulting in lower cost of debt.

Based on the above analysis, I state my 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). That is, the determination of the amount of Level 2 inputs is mainly market-based. However, management has the discretion in determining which is the "similar item" for price matching purposes, making Level 2 fair values subject to low reliability. Therefore, it is an empirical question whether the use of Level 2 fair values improves or undermines the decision-usefulness of accounting information, and thus increases or decreases firms' cost of debt. As a result, I propose the following hypothesis in null form:

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

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. Level 3 inputs are the most problematic among the three tiers of fair value inputs. The determination of the unobservable inputs involves the company's own understanding about the assumptions market participants would use in pricing the asset, indicating that the reliability, comparability and understandability of Level 3 inputs are called into question. Therefore, the use of Level 3 inputs in the financial statements may

even exacerbate the information risk of debtholders, resulting in higher cost of debt. Therefore, my third hypothesis goes as follows:

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 leeway for managerial manipulation. Thus, compared with Level 1 fair values, the decision-usefulness of Level 2 fair values should decrease. At the other end of the spectrum, Level 3 fair values are completely based on models, leaving the greatest room for manipulation and making the measurement vulnerable to estimation errors. As the reliability of the three levels of fair value decreases from Level 1 to Level 3, I expect that firms' cost of debt increases accordingly. This analysis leads to my Hypothesis 2d:

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

4.1.3 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 et al., 1991; Wright and Wright, 1997; Balsam et al, 2003; Krishnan, 2003). Specifically, Bedard and Biggs (1991) find that auditors with more industry specific experience are better able to identify errors in the

data of clients in that industry. Similarly, Johnson et al. (1991) show that 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 nonspecialist auditors (Dopuch and Simunic, 1982). Both training and experience increase the auditor's domain knowledge of a specific industry, and specialized industry knowledge reduces errors in judgment (Solomon et al., 1999). As error characteristics and methods of detection are different across industries (Maletta and Wright, 1996), industry-specialized auditors are better able to understand not only the valuation models and the management processes that determine the fair value model inputs, but also management's potential biases and likely errors when applying models, identifying market inputs and making assumptions (Martin et al., 2008). Therefore, firms audited by industry specialists would benefit more by using fair value-based accounting numbers, because the relevance of financial reporting is improved while the reliability is also assured.

Second, auditors with industry expertise also have incentive to conduct high-quality auditing to protect their reputation. It is costly to build up a brand-name reputation as a specialist in a specific industry. Therefore, specialist auditors have greater incentive to

report questionable fair value accounting numbers, because they have more to lose in the event of audit failure.

The above analysis 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 and Level 2 fair value inputs are both based on market prices, and understanding these inputs 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 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 3 fair value inputs if there is any. Therefore, the impact of auditor industry expertise on firms' cost of debt should only apply to firms with Level 3 fair value inputs in the financial statements. Based on these analyses, I put forward the following hypothesis:

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

4.2 Research Design

4.2.1 Sample Selection

Table 11 describes the sample selection process. The initial sample selection begins by downloading from SNL Financial Capital Offering database a list bond specific data of all new bonds issued from January 1, 2008 to April 30, 2012. Year 2008 is determined as

the starting year for the bond data because fair value accounting data become available since 2007 and I require a one-year lag for yield spread to respond to financial statement data. April 30, 2012 is the most recent bond issue data available at the SNL database. This step yields an initial sample of 589 bonds with issue-specific data.

I then collect credit ratings, fair value and firm-specific data for the period between from SNL Financial Companies database during the period 2007-2011. I first merge fair value data with credit ratings data and get 252 observations of fair value-rating data. I then obtain audit fee data from AuditAnalytic database in order to get the auditor industry expertise measure. All 252 firm-year observations have auditor information at AuditAnalytic database. So the new sample with fair value, credit rating and auditor expertise information still has 252 observations. I further merge this new dataset with the bond data and the sample is reduced from 589 to 376 observations.

Insert Table 11 here

4.2.2 Empirical Models

Based on prior debt literature (Mansi et al., 2004; Anderson et al., 2004; Fortin and Pittman, 2007), I use a two-stage model to test the impact of fair value accounting numbers on firms' cost of debt. Use of fair value can affect a firm's cost of debt either through its impact on credit ratings or through its direct impact on cost of debt by reducing the information asymmetry and agency problems. I first examine the effect of use of fair value on credit ratings. Credit ratings agencies provide independent assessments of the credit quality of the firms based on their professional knowledge in interpreting firms' financial information. If fair value accounting improves the

information quality of financial reporting, I expect the use of fair value accounting numbers to be significantly related to credit ratings. To test this hypothesis, I estimate the following firm-level regression model:

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

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. I follow Mansi et al. (2004) and include *OrthRating* in the regression model of cost of debt, in which fair value is the test variable. I also control for issue level and firm level determinants of cost of debt.

$$YieldSpread_{it+1} = \alpha_0 + \alpha_1 OrthRating_{it} + \alpha_2 FairValue_{it} + \beta_1 Underwriter_{it} + \beta_2 Maturity_{it} + \beta_3 IssueSize_{it} + \beta_4 Convertible_{it} + \beta_5 Leverage_{it} + \beta_6 InterestCov_{it} + \beta_7 IssuerSize_{it} + \beta_8 ROA_{it} + \gamma_{0,\dots,5} Year_{it} + \varepsilon_{it} \quad (2)$$

In order to test the different impact of three levels of fair value inputs, I 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.

$$YieldSpread_{it+1} = \alpha_0 + \alpha_1 OrthRating_{it} + \alpha_2 Level1_{it} + \alpha_3 Level2_{it} + \alpha_4 Level3_{it} + \beta_1 Underwriter_{it} + \beta_2 Maturity_{it} + \beta_3 IssueSize_{it} + \beta_4 Convertible_{it} + \beta_5 Leverage_{it} + \beta_6 InterestCov_{it} + \beta_7 IssuerSize_{it} + \beta_8 ROA_{it} + \gamma_{0,\dots,5} Year_{it} + \varepsilon_{it} \quad (3)$$

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

$$\begin{aligned} YieldSpread_{it+1} = {} & \alpha_0 + \alpha_1 OrthRating_{it} + \alpha_2 (Level1_{it} + Level2_{it}) + \alpha_3 Level2_{it} \\ & + \alpha_4 Level3_{it} + \beta_1 Underwriter_{it} + \beta_2 Maturity_{it} \\ & + \beta_3 IssueSize_{it} + \beta_4 Convertible_{it} + \beta_5 Leverage_{it} + \beta_6 InterestCov_{it} \\ & + \beta_7 IssuerSize_{it} + \beta_8 ROA_{it} + \gamma_{0,\dots,5} Year_{it} \\ & + \varepsilon_{it} \qquad (4) \end{aligned}$$

A result that coefficient $\alpha_3 = 0$ indicates that Level 1 and Level 2 fair value measurement has the same impact on yield spread. A positive coefficient ($\alpha_3 > 0$) 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 ($\alpha_4 > 0$) in Model (5) is consistent with Hypothesis 2d that as fair value measurement moves from Level 2 to Level 3, firms' cost of debt increases.

$$\begin{aligned} YieldSpread_{it+1} = {} & \alpha_0 + \alpha_1 OrthRating_{it} + \alpha_2 Level1_{it} + \alpha_3 (Level2_{it} + Level3_{it}) \\ & + \alpha_4 Level3_{it} + \beta_1 Underwriter_{it} + \beta_2 Maturity_{it} \\ & + \beta_3 IssueSize_{it} + \beta_4 Convertible_{it} + \beta_5 Leverage_{it} + \beta_6 InterestCov_{it} \\ & + \beta_7 IssuerSize_{it} + \beta_8 ROA_{it} + \gamma_{0,\dots,5} Year_{it} \\ & + \varepsilon_{it} \qquad (5) \end{aligned}$$

Auditor industry expertise has both a direct and an indirect impact on firms' cost of debt. First, generally speaking, the presence of an industry specialist alleviates the information asymmetry and agency cost of debt, therefore debtholders charge a lower cost. Second, for firms that measure assets and liabilities at fair value, auditor industry expertise improves the reliability of fair value accounting inputs, which leads to an indirect impact

on a lower cost of debt. Therefore, I 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.

$$YieldSpread_{it+1} = \alpha_0 + \alpha_1 OrthRating_{it} + \alpha_2 FairValue_{it} + \alpha_3 Specialist_{it} + \alpha_4 FairValue_{it} * Specialist_{it} + \beta_1 Underwriter_{it} + \beta_2 Maturity_{it} + \beta_3 IssueSize_{it} + \beta_4 Convertible_{it} + \beta_5 Leverage_{it} + \beta_6 InterestCov_{it} + \beta_7 IssuerSize_{it} + \beta_8 ROA_{it} + \gamma_{0,\dots,5} Year_{it} + \varepsilon_{it} \quad (6)$$

$$YieldSpread_{it+1} = \alpha_0 + \alpha_1 OrthRating_{it} + \alpha_2 Level1_{it} + \alpha_3 Level2_{it} + \alpha_4 Level3_{it} + \alpha_5 Specialist_{it} + \alpha_6 Level1_{it} * Specialist_{it} + \alpha_7 Level2_{it} * Specialist_{it} + \alpha_8 Level3_{it} * Specialist_{it} + \beta_1 Underwriter_{it} + \beta_2 Maturity_{it} + \beta_3 IssueSize_{it} + \beta_4 Convertible_{it} + \beta_5 Leverage_{it} + \beta_6 InterestCov_{it} + \beta_7 IssuerSize_{it} + \beta_8 ROA_{it} + \gamma_{0,\dots,5} Year_{it} + \varepsilon_{it} \quad (7)$$

4.2.3 Measurement of Variable

In specifying *Rating*, the dependent variable in Model (1), I convert Moody's, Standard & Poor's and Fitch long-term bond rating symbols to an ordinal scale by assigning a value of 1 to the lowest rating, 2 to the second lowest rating, etc. I average all ratings issued by Moody's, Standard & Poor's and Fitch by firm and year in order to get the average firm-year *Rating* variable, because a number of the bonds in my sample have multiple ratings.

YieldSpread is a common proxy for cost of debt (e.g., Fortin and Pittman, 2007; Fenn, 2000; Livingston and Zhou, 2002; and Chaplinsky and Ramchand, 2004) and is the dependent variable in Model (2). 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.

My 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* (*Level2* or *Level3*) 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. I control for other issue-level and firm-level determinants of debt pricing in my model following prior debt pricing literature. In the next section, I explain the predicted influence of these control variables on at-issue yield spreads. The predictions for ratings generally go in the opposite direction.

Issue-Level Control Variables

I assign the dummy variable, *Underwriter*, a value of 1 if the debt is issued by an underwriter and 0 otherwise. According to Fernando et al. (2003), the presence of an underwriter is associated with issuers of higher credit quality. Therefore, I expect that yield spreads is negatively associated with *Underwriter*. *Maturity* is the natural logarithm of 1 plus the issue's years to maturity. I 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. I 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, I include the year dummies to reflect the changing macroeconomic conditions during my sample period.

Firm-Level Control Variables

I predict that firms' yield spreads is increasing in their *Leverage*, which is 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. I also include interest coverage, *InterestCov,* in my 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. *Loss* is expected to be positively associated with yield spread.

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 et al., 2003; Hogan and Jeter, 1999, Mayhew and Wilkins, 2003; Reichelt and Wang, 2010). An

auditor is defined as industry specialist if 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. The variable *Specialist* is a dummy variable that has the value of 1 if an auditor has industry expertise, and 0 otherwise.

4.3 Empirical Results

4.3.1 Univariate Analysis

Table 12 provides descriptive statistics of the regression variables for the rating sample and the yield spread sample. The sample period for both samples is 2007-2011. Panel A presents the statistics of continuous and discrete 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 (0.898) and median (0.896) of *Leverage* are much higher and the standard deviation (0.019) is much lower than those reported in other industries. The rating sample has only firm-level variables, while the yield spread sample is composed of both issue-level and firm-level control variables. Panel A shows that the average of yield spread is 3.05%, with a standard deviation of 2.24%. The average of total assets and liabilities measured at fair value, *FairValue*, is 89.13% and the standard deviation is 0.74. The averages of fair value breakdowns, i.e., Level1, Level2 and Level3, are 7.59% (2.09%), 76.78% (27.91%) and 6.50% (2.00%) in the yield spread (rating) sample, indicating that most of the fair value inputs are measured at Level 2 during the sample period. Panel B presents the descriptive statistics of discrete variables.

24.6% of the firms in the rating sample experienced loss. In the yield spread sample, 47.5% of auditors are banking industry experts in the yield spread sample. 32.45% of the bonds have underwriters. Only 5% of the bonds issued in the yield spread sample have convertible features.

Insert Table 12 here

Table 13 Panel A and B present the Pearson correlations of the variables in the rating sample and the yield spread sample respectively. Panel A of Table 13 shows that credit rating is positively and significantly associated with the use of total fair value (*FairValue*) and its first two levels of the breakdowns (*Level1 and Level2*). However, the association between Level 3 fair values and credit ratings is not significant. It seems that credit rating agencies do not perceive Level 3 fair value inputs informative. The correlations in Panel B of Table 13 support the argument that use of fair value lowers firm cost of debt related to Hypothesis 1 and are consistent with Hypothesis 2a. The use of fair value (*FairValue*) is significantly associated with lower cost of debt (*yieldspread*). Besides, the more assets and liabilities measured at Level 1 and Level 2 fair values (*Level1, Level2*), the lower 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. Furthermore, as is consistent with prior finance and accounting literature, the coefficients of underwriter, maturity, issue size, convertible debt, leverage, interest coverage are negative, and the coefficient of loss is positive.

Insert Table 13 here

4.3.2 Multivariate Analysis

Credit rating specifications

The use of fair value in the financial statements can affect yield spread either (1) through its impact on credit ratings or (2) through their marginal impact on cost of debt. Similar to Mansi et al. (2004), Anderson et al. (2004), and Pittman and Fortin (2007), I examine the impact of fair value on firms' cost of debt by isolating the impact of fair value on credit ratings.

To test the association between fair value and credit ratings, I regress fair value breakdowns and firm-level control variables on firm-year credit rating scores. Table 14 reports the results. The coefficient of *FairValue* is significantly positive (3.58; p=0.0004), indicating that credit rating agencies perceive the use of fair values favourably. The coefficient of auditor industry expertise (-0.45; p=0.1068) is not significant at conventional levels, suggesting that the presence of industry specialized auditor does not improve the credit ratings. In fact, all the banks in my sample are audited by Big 4 auditors. Probably credit ratings agencies do not distinguish industry expert and view all Big 4 auditors the same as providing the same level of assurance regarding the quality of financial reporting. Leverage, return on assets and firm size are all significantly associated with credit rating scores as predicted. The residual of this regression, *OrthRating*, represents the portion of credit ratings that is not explained by fair value and other control variables. It is included as a control variable in the yield spread-fair value regression model.

Insert Table 14 here

Fair Value and Yield Spread

Table 15 summarizes the OLS regression results with yield spread as a proxy for firm's cost of debt. Equation (2) is the regression model to test the first hypothesis, in which I regress fair value, issue-level control variables and firm-level control variables on corporate bond's yield spread. The coefficient of *FairValue* is significantly negative (-0.23; $p<0.001$). The standard deviation of FairValue measure is 0.11, it suggests that on average, one standard deviation increase in the use of fair value percentage will result in an decrease of 2.5 (23*0.11) basis point of firms' yield spread. The negative coefficient supports the argument that use of fair value lowers firm cost of debt related to Hypothesis 1. That is to say, generally, the use of fair value accounting numbers is perceived to be more decision-useful to debtholders.

Most of the control variables have the expected signs for their coefficients. For the issue-level controls, the coefficient for underwriter is negative (-1.12; $p<0.001$), meaning that debt issued with an underwriter has lower costs. The coefficient of maturity is negative (-0.81; $p=0.02$), indicating that firms with longer term borrowing has lower cost of debt, because these firms are of higher quality. Larger issues are associated with lower yield spread (-0.86; $p<0.001$). For the firm-level controls, firms with higher leverage have higher yield spread (11.88; $p<0.1$). The coefficients of interest coverage, issuer size and ROA are all negative (-0.05, -0.53, and -1.73; $p<0.001$).

Equation (3) is the regression model to test Hypothesis 2a and 2b, in which the test variables are the breakdowns of fair value: Level1, Level2 and Level3. The coefficients of Level1 and Level2 are significantly negative (-0.59 and -0.02, $p<0.001$ and $p=0.02$). That is, the greater proportion of Level1 fair values, the lower cost of debt, which support both Hypothesis 2a. The coefficient of Level2 is positive (0.02, $p=0.08$), supporting the

argument that Level 2 fair values are associated with lower cost of debt. Results further show that Level3 fair values, by contrast, are associated with higher cost of debt, as is evidenced by a positive coefficient of Level3 (0.02, p=0.086). This finding is consistent with Hypothesis 2c. Moreover, the coefficients of underwriter, maturity, issue size, leverage, issuer size and ROA all have the predicted signs. Results further show that the coefficients of α_3 and α_4 in the equivalent models (4) and (5) are both positive, supporting Hypothesis 2d.

Insert Table 15 here

Table 16 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 (6) shows the results for total fair value percentage and auditor industry expertise. The negative coefficient of the interaction between fair value and auditor specialists (-1.26, p=0.01) supports Hypothesis 3a. This result indicates that auditor's industry expertise works as a safeguard regarding the reliability of fair value inputs, thereby improving fair value's decision usefulness to debtholders.

Model (7) reports the results for the regression with fair value breakdowns as tests variables. As is consistent with the results in Panel A, the coefficients of Level1 and Level2 fair values are negative while that of Level3 is positive. Interestingly, the coefficient for the interaction between fair value Level1 (and Level2) and auditor industry expertise is not significant, while the coefficient of the interaction between Level3 and auditor industry expertise is significantly negative. This result means that the presence of industry specialized auditors improves the reliability of only Level3 fair

value inputs, resulting in lower information asymmetry and thus lower cost of debt. Considering that Level1 and Level2 fair values are already reliable, industry specialists do not have a material impact on the improvement of reliability of fair value numbers. Based on this result, Hypothesis 3b is also supported.

Insert Table 16 here

4.4 Robustness Checks

In order to test whether empirical results are driven by specific measurement of fair value and the breakdowns, I use alternative fair value measures as a robustness check. First, I use market capitalization to replace total assets as the denominator of the fair value measures. Market value of the firm is also a commonly used proxy for firm size. Table 17 reports the results of this test, which are consistent with the results in the main regressions.

Insert Table 17 here

Second, I split fair value into fair value assets and fair value liabilities. Specifically, A1 (A2 or A3) denotes the portion of total assets that is measured at Level 1 (Level 2 or Level 2) fair value, and L1 (L2 or L3) denotes the portion of total liabilities that is measured at Level 1 (Level 2 or Level 2) fair value. I re-run the regressions with A1, A2, A3, L1, L2 and L3 as the test variables. Table 18 shows the results. The main results still hold, as is evidenced by the negative coefficients of Level 1 and Level 2 fair value assets and Level 1 fair value liabilities and a positive coefficient of Level 3 fair values. However, due to the limited number of firms that report Level 2 and Level 3 fair values, the coefficients for these two variables are not significant.

Insert Table 18 here

In the main multivariate analysis, I use the residual of credit rating regression as a firm-level control variable. The rationale for this treatment is that credit rating is documented to be significantly correlated with many firm-level and issue-level control variables, resulting in the multi-collinearity problem with biased coefficient estimates. One way to deal with this problem is to use the residual control, as is treated in the main analysis, and the other is not to use it at all. As a sensitivity test, I exclude credit rating residual as a control variable and run the regressions again. The results are reported in Table 19, showing that my hypotheses are still robust to this specification.

Insert Table 19 here

The descriptive statistic tables indicate that only a small percentage of new bond issues have convertible features. Considering that convertible bonds are of different characteristics from straight bonds, including convertible features in the regression models may not be appropriate (Khurana and Raman, 2003). As a robustness check, I delete the new bond issues with convertible feature in the sample and re-run the regressions. The main results, reported in Table 20, remain unchanged.

Insert Table 20 here

Fair value has been claimed to have impact on the recent financial crisis. As a result, debtholders may have different perception regarding fair value during financial crisis. I run the regression by excluding the peak crisis period (year=2008) as another robustness check. The results are summarized in Table 21, which is consistent with the main findings.

Insert Table 21 here

As the largest U.S. banks are said to be too big to fail and often receive subsidy in the form of lower cost of debt (Greeley, 2012), the size of the banks may affect fair value's impact on cost of debt. Therefore, as an additional test, I include a mega-bank dummy in the yield spread regression models that takes the value of 1 if a bank is one of the five largest banks in the U.S[7], and 0 otherwise. Results are shown in Table 22, which confirm that the impact on cost of debt is not driven by the size of the banks.

Insert Table 22 here

The control variables Leverage, ROA, IssuerSize and Interest Coverage are correlated with my main test variable FairValue. In order to deal with this multicollinearity problem, I isolate the effect of fair value on the control variables by using the orthogonal measures of these control variables with fair value. I denote the orthogonal measure of Leverage, ROA, IssuerSize and Interest Coverage after isolating the fair value effect as OrthLev, OrthROA, OrthSize, and OrthCov. I replace Leverage, ROA, IssuerSize and Interest Coverage by these four orthogonal measures and re-run the regressions. The results are shown in Table 23, which presents consistent results, although the results for the fair value breakdowns are a little weaker than the main results.

Insert Table 23 here

4.5 ~~Summary~~Synthesis

[7] The five largest U.S. banks are JP Morgan Chase, Bank of America, Citigroup, Wells Fargo, and Goldman Sachs, which take about 56 percent of the U.S. economy, according to the Federal Reserve. These mega banks are said to be "too big to fail" (Greeley, 2012).

This study focuses on the association between use of fair value and the yield spread of new bonds issued by bank holding companies. I also examine the association between use of different levels of fair value and the yield spread of bond. In addition, I study the impact of auditor industry expertise on the above relations. I find evidence that greater use of fair value in the financial statement is generally perceived as more decision-useful to debtholders. Besides, I document that Level 1 and Level 2 fair value inputs are negatively associated with firm yield spread, but Level 3 fair value inputs are positively associated with yield spread, indicating that Level 1 and 2 fair values makes accounting information more decision-useful, while Level 3 fair values decrease the decision usefulness of accounting information. Furthermore, empirical results show that auditor industry expertise improves the informativeness of fair value accounting information, especially Level 3 inputs, to debtholders. These empirical results are robust to a series of sensitivities tests: e.g., use of alternative proxies for fair value, exclusion of credit rating control variable, exclusion of convertible bonds in the sample, and controlling the effect of current financial crisis.

This study substantiates the view that the reporting regime (fair value versus historical cost) matters in the pricing of the debt. It contributes to the existing literature on the following dimensions. First, 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 perspective of shareholders. Second, this study complements the corporate bond literature by using a financial reporting attribute that directly relates fair value with bond's yield spread. Third, this

study contributes to the auditing literature by documenting that auditor industry expertise plays a moderating role in the impact of fair value on the cost of corporate debt.

This study also has some limitations. For example, I cannot rule out the possibility of the endogeneity problem that it is the bank business models that drives the results of lower cost of debt, and this type of bank model happens to use greater fair value. Besides, while the model (3) aims to measure the impact of different levels of fair value measurement on yield spread, it may also be measuring whether more liquid assets have lower yield spread, since the three-tier fair value levels are corresponded with different levels of liquidity. In addition, this study may also suffer from the disclosure versus recognition issue that is acknowledged as a limitation of methodology used in Chapter 3.

Chapter 5 Discussion and Conclusion

The controversial nature of fair value accounting has emerged as a fruitful focus for research (e.g., Barth, 1994; Barth et al., 1995; Eccher et al., 1996; Nelson, 1996; Park et al., 1999; Khurana and Kim, 2003; Song et al., 2010; Goh et al., 2009; Kolev, 2009). This stream of research provides evidence that fair value accounting information is value relevant in predicting stock prices. According to Holthausen and Watts (2001), the relevance of accounting numbers is different between equity and debt investors. However, despite the importance of public bond market for U.S. corporate financing, current accounting research, especially fair value accounting research, ignores the effect of financial reporting on debt contracting. Kothari et al. (2010) also criticize the narrow interpretation of GAAP objective by the value relevance researchers. This dissertation complements the fair value accounting literature by examining the impact of fair value

accounting on two aspects of debt financing: credit ratings and cost of debt. I also investigate the role that auditor industry expertise plays in the association between fair value and firms' debt attributes. The setting I use is the U.S. bank holding industry since banks are the reporting entities that are most affected by the advent of fair value accounting.

In Chapter 2, I discuss the institutional background of fair value accounting. Specifically, in Section 2.1, I describe the definition of fair value accounting and provide details of its measurement rules. In Section 2.2, I discuss the evolution of fair value in accounting theory and financial reporting regime. In Section 2.3, I summarize the theoretical analysis on the decision usefulness of fair value accounting and review prior literature. Over all, I conclude that the controversial nature of fair value accounting makes it an interesting question to investigate the impact of fair value on corporate debt financing.

The two empirical chapters of this dissertation, Chapter 3 and Chapter 4, take a debtholder's perspective and examine the relative predicting power of fair value accounting numbers in explaining credit ratings and the impact of use of fair value on firms' cost of debt. Accounting measurement regimes have real impact on firms' fundamental. This is so because accounting standard affects bank managers' decision whether to securitize certain portfolio before the reporting date, so that the reported accounting numbers are favourable (Plantin et al., 2008). Given an imperfectly liquid market, the aggregation of managerial decisions, in turn, impacts the yield spread of banks' asset-backed securities, which ultimately changes the accounting value of the portfolios (Plantin et al., 2008). Therefore, in this dissertation, I investigate the impact of

measurement regime (historical cost versus fair value) on firms' credit risk and cost of debt.

In Chapter 3, I examine the relative explanatory power of fair value accounting information in explaining credit ratings, i.e., the debt contracting value of fair value accounting information. In addition, I test the moderating effect of auditor industry expertise on fair value's debt contracting value. Empirical results indicate that compared to historical cost, fair value accounting information better predicts short-term credit ratings. This finding is consistent with Plantin et al. (2008)'s argument regarding the inefficiencies of historical cost accounting system within a short-term perspective. They argue that with a short time horizon, firms have incentives to sell appreciating assets because they can book gains immediately under historical cost. The historical cost system does not allow asset appreciation and, therefore, keeping these assets on the books does not lead to better-looking financial statement. A direct consequence of the historical cost system, therefore, is that it leads to inefficient sales. A natural remedy to the inefficiency in the historical cost regime is to shift to a fair value regime in which the book values of assets are reevaluated in case of an upward market trend. In contrast, the empirical results show that, in the long run, fair value accounting does not outperform historical cost in providing debt-contracting value, as proxied by its ability to predict long-term credit ratings. This evidence is consistent with opponents' argument that long-term assets, compared with short-term assets, are difficult to evaluate under fair value (Wang et al., 2005). This result indicates that the Achilles' heel of fair value is its application to long-term assets. In addition, additional tests reveal that auditor industry expertise improves fair value's debt contracting value. This finding shows that hiring an industry specialized

auditor is helpful to address the reliability concern of fair value accounting information. One implication of this evidence is that professional knowledge and strong monitoring, as industry specialized auditors provide, are useful remedy to alleviate the reliability concern of fair value accounting information.

In Chapter 4, I investigate how use of fair value in the financial statements affects banks' cost of debt. Measurement regimes impact the cost of debt via the elimination of the opportunities for managers to realize "gains trading" under a historical cost accounting system (Plantin et al., 2008). Empirical results show that greater use of fair value accounting in the financial statements generally leads to a lower cost of debt, which supports proponents' argument that fair value accounting improves the decision usefulness of accounting information. One possible reason is that debtholder's regard the use of fair value as an overall positive signal to alleviate the information asymmetry problems due to lack of inside information. Market-based fair value numbers are perceived to be subject to less manipulation. Results further show that among the fair value breakdowns, more use of Level 1 and Level 2 fair values are associated with a lower cost of debt, while more use of Level 3 fair values is related to a higher cost of debt. This finding suggests that debt holders appreciate the improved relevance of fair value due to Level 1 and 2 inputs but penalize a firm for the reduced reliability caused by Level 3 inputs. In addition, evidence shows that auditor industry expertise improves the decision usefulness of fair value accounting information, especially Level 3 inputs, to debtholders, resulting in a lower cost of debt. Among the three levels of fair value inputs, Level 3 inputs are most subject to estimation errors and/or managerial manipulations. That is why industry specialized auditors impact Level 3 fair value inputs the most.

Besides the contribution to the academic literature, this dissertation has the following practical implications. From a standard setter's perspective, the finding that fair value accounting improves the short-term debt contracting value of accounting information and benefits the firms through a lower cost of borrowing give support to FASB's fair value proposal. However, based on the evidence that fair value does not dominate historical cost accounting in predicting firms' long-term credit risk, standard setters should be cautious when implementing a full fair value accounting system. Also, policymakers may use the empirical evidence that auditor industry expertise improves fair value accounting's decision usefulness to increase the decision usefulness of fair value accounting information. Given that the major concerns regarding fair value revolve around its reliability, improving auditors' knowledge of fair value inputs seems to be one of the solutions to resolve the low reliability issue of fair value accounting. From a bond issuer and broker perspective, empirical results implicitly suggest that when negotiating the yield spread of new corporate bond issues, related parties may take issuers' use of fair value and auditor specialists into consideration.

This dissertation is subject to limitations. First, my sample may not be representative of all bank holding companies in the United States. However, I am not aware of any particular bias in the attributes of the sample firms. Second, the time period for the yield spread sample is relatively short. However, due to the restriction that fair value disclosure is only mandatory since fiscal year 2007, there is not much room for improvement. Third, I only focus on the credit ratings and yield spread of corporate bond issues, which are but two attributes of firms' credit risks. Forth, I try to control for the endogenous issue in my

second essay by using a two-stage model, which is not a perfect solution to address endogeneity. This is a caveat of this dissertation.

Future research can extend the analysis to the relation between fair value accounting and other bond market attributes, such as the liquidity and abnormal return of corporate bond, the maturity and issue amount of bond issue terms. Besides, given sufficient data, conducting a change analysis to compare the relative explanatory power of fair value in explaining credit ratings adds greater insights. In addition, more effort can be call for to resolve the endogeneity issues in the research methodology in this study.

References

Abken, P. A., 1981. Commercial paper, *Federal Reserve Bank of Richmond Economic Review*, March/April, 11-21.

Accounting Principles Board Opinion No. 29. 1973. Accounting for nonmonetary transactions. Accounting Principles Board of the American Institute of Certified Public Accountants.

Accounting Standards Update No. 2011-04, Fair value measurement (Topic 820): Amendments to achieve common fair value measurement and disclosure requirements in U.S. GAAP and IFRSs. 2011. Norwalk, CT: FASB.

Ahmed, A. S. and Takeda, C. 1995. Stock market valuation of gains and losses on commercial banks' investment securities: An empirical analysis. *Journal of Accounting and Economics* 20 (September): 207‐225.

Ahmed, A., Kilic, E. and Lobo, G. 2006. Does recognition versus disclosure matter? Evidence from value-relevance of banks' recognized and disclosed derivative financial instruments. *The Accounting Review* 81 (3): 567‐88.

Allen, F., and E. Carletti. 2008a. Mark-to-market accounting and liquidity pricing. *Journal of Accounting and Economics 45*: 358 – 78.

Allen, F., and E. Carletti. 2008b. Should financial institutions mark-to-market? *Financial Stability Review* 12: 1 – 6.

American Accounting Association. 1966. A Statement of Basic Accounting Theory. Evanston, IL: AAA.

Anderson, R. C., Mansi, S. A. and Reeb, D. M. 2004. Board Characteristics, Accounting Report Integrity, and the Cost of Debt. *Journal of Accounting and Economics* 37: 315-342.

Anderson, R., Mansi, S. and Reeb. D. 2003. Founding Family Ownership and the Agency Cost of Debt. *Journal of Financial Economics* 68: 263–285.

Ang, S., S. Slaughter, and K. Ng. 2002. Human Capital and Institutional Determinants of Information Technology Compensation: Modeling Multilevel and Cross-Level Interactions. *Management Science* 48(11): 1427-1445.

Armstrong, C. S., Guay, W. R. and Weber, J. P. 2010. The role of information and financial reporting in corporate governance and debt contracting. *Journal of Accounting and Economics* 50: 179-234.

Ashbaugh-Skaife, H., Collins, D.W., LaFond, R., 2006.The effects of corporate governance on firms' credit ratings. *Journal of Accounting and Economics* 42: 203-243.

Atiase, R. K. 1985. Predisclosure information, firm capitalization, and security price behavior around earnings announcements. *Journal of Accounting Research* 23 (1): 21-36.

Ball, R., Bushman, R. M., and Vasvari, F. P. 2008. The Debt-Contracting Value of Accounting Information and Loan Syndicate Structure. *Journal of Accounting Research*. 46 (2): 247-287.

Balsam, S., Krishnan, J. and Yang, J. S. 2003. Auditor Industry Specialization and Earnings Quality. *Auditing: A Journal of Practice and Theory* 22: 71–97.

Barberis, N. and Thaler, R. 2003. A survey of behavioral finance. In Constantinides, G. M., Harris, M.and Stulz, R. M. (Eds.), *Handbook of the Economics of Finance*, Vol. 1, North Holland, Amsterdam: Elsevier: 1053-1128.

Barth, M. E. 2007. Standard-setting measurement issues and the relevance of research. *Accounting and Business Research* (Special Issue): 7-15.

Barth, M. E. and Clinch, G. 1998. Revalued financial, tangible, and intangible assets: Associations with share prices and non-market-based value estimates. *Journal of Accounting Research (January)*: 199-233.

Barth, M. E. 1991. Relative measurement errors among alternative pension asset and liability measures. *The Accounting Review* 66 (July): 433-463.

Barth, M. E. 1994. Fair value accounting: Evidence from investment securities and the market valuation of banks. *The Accounting Review* 69 (1): 1-25.

Barth, M. E. 2006. Including estimates of the future in today's financial statements. *Accounting Horizons* 20 (3): 271-285.

Barth, M. E. and Landsman, W. R. 1995. Fundamental issues relating to using fair value accounting for financial reporting, *Accounting Horizons* 9 (4): 97-107.

Barth, M. E., Beaver, W. H. and Landsman, W. R. 2001. The relevance of the value relevance literature for accounting standard setting: Another view. *Journal of Accounting and Economics* 31 (1–3): 77-104.

Barth, M.E., Beaver, W.H. and Landsman, W.R. 1992. The market valuation implications of net periodic pension cost components. *Journal of Accounting and Economics* 15, 27-62.

Basu, S. 1997. The conservatism principle and the asymmetric timeliness of earnings. *Journal of Accounting and Economics* 24 (1): 3-37.

Beaver, W.H. and Landsman, W.R. 1983. Incremental information content of Statement No. 33 disclosures. FASB, Stamford, Connecticut.

Beaver, W.H. and Ryan, S.G. 1985. How well do Statement No. 33 earnings explain stock returns? *Financial Analysts Journal* 41: 66-71.

Bedard, J. and Biggs, S. 1991. The Effect of Domain-Specific Experience on Evaluation of Management Representation in Analytical Procedures. *Auditing: A Journal of Practice & Theory (Supplement)*: 77-95.

Beneish, M., and E. Press. 1995. The resolution of technical default. *The Accounting Review* 70 (April): 337-353.

Biddle, G., Seow, G. and Siegel, A. 1995. Relative versus incremental information content. *Contemporary Accounting Research* 12 (1), 1-23.

Black, Fisher and John C. Cox, 1976, Valuing corporate securities: Some effects of bond indenture provisions, *Journal of Finance* 31: 351-367.

Black. F. and M. Scholcs. 1973. The pricing of options and corporate liabilities, *Journal of Political Economy* 81 (3): 637-656.

Blankespoor, E., Linsmeirer, T. J. and Petroni, K. 2012. Fair value accounting for financial instruments: Does it improve the association between bank leverage and credit risk? Working paper.

Boardman, C., McEnally, R., 1981. Factors affecting seasoned corporate bond prices. *Journal of Financial and Quantitative Analysis* 16: 207–216.

Bonbright, J. C. 1937. *The Valuation of Property*. Charlottesville, VA: Michie.

Burgstahler, D. and Dichev, I. 1997. Earnings management to avoid earnings decreases and losses. *Journal of Accounting and Economics* 24 (1): 99-126.

Campello, M, Graham, J. R. and Harvey, C. R. 2010. The real effect of financial constraints: Evidence from a financial crisis. *Journal of Financial Economics* 97: 470-487.

Cantor, R., and Packer, F. 1995. The Credit Rating Industry. *The Journal of Fixed Income* 5 (3): 10-34.

Cantor, R., Packer, F and Cole, K. 1997. Split Ratings and the Pricing of Credit Risk. *The Journal of Fixed Income* 7 (3): 72-82.

Cantor, R. 2004. An Introduction to Recent Research on Credit Ratings. *Journal of Banking & Finance* 28: 2565-73.

Cantrell, B. W., McInnis, J. M. and Yust, C. G. 2011. Predicting Credit Losses: Loan Fair Values Versus Historical Costs. Working Paper.

Carpenter, J. 1632. *A Most Excellent Instruction for the Exact and Perfect Keeping Merchants Bookes of Accounts*. London: Boler.

CFA. 2007. *A Comprehensive Business Reporting Model: Financial Reporting for Investors*. New York, NY: CFA Institute.

Chambers, R. J. and Wolnizer, P. W. 1991. A true and fair view of position and results: the historical background. *Accounting, Business and Financial History* 1 (2): 197-213.

Chaplinsky, S., and L. Ramchand. 2004. The Impact of SEC Rule 144A on Corporate Debt Issuance by International Firms. *Journal of Business* 77 (4): 1073–1097.

Chisnall, P. 2000. Fair value accounting—An industry view. *Balance Sheet* 9 (1): 27-33.

Cole, C. 1992. Moving toward market value accounting, *Journal of Corporate Accounting and Finance* 3 (3): 537-544.

Crossley, D. W. (Ed.) 1975. *Sidney Ironworks Accounts*, 1541-1573 (Camden fourth series). London, Royal Historical Society: 27.

Dafforne, R. 1684. *The Merchants Mirrour* (Journal B) London: Home: 46-47.

David, A. C. and Hinkley, D. V. 1997. *Bootstrap Methods and Their Applications*. Cambridge University Press.

DBRS Rating Report. *Bank of America*. October 7, 2011. DBRS

DBRS Rating Scales. Short-term and Long-term Rating Relationships. DBRS.

Denis, D. and Mihov, V. 2003. The choice among bank debt, non-bank private debt, and public debt: Evidence from new corporate borrowings. *Journal of Financial Economics* 70 (1): 3-28.

Dietrich, R., Harris, M. and Muller, K. 2000. The reliability of investment property fair value estimates. *Journal of Accounting and Economics (October)*: 125-158.

Dodson, J. 1750. *The Accountant, or the Method of Accounting Deduced from Clear Principles.* London: Nourse: viii.

Dopuch, N. and Simunic, D. 1982. The Competition on Auditing: An Assessment. *In Fourth Symposium on Auditing Research*. Urbana, IL: University of Illinois at Urbana-Champaign.

Duffie, D. and Lando, D. 2001. Term Structure of Credit Spreads with Incomplete Accounting Information. *Econometrica* 69 (3): 633–664.

Easley, D., O'Hara, M. 2004. Information and the cost of capital. *Journal of Finance* (August): 1553–1583.

Eccher, E. A., Ramesh, K. and Thiagarajan, S. R. 1996. Fair value disclosures by bank holding companies. *Journal of Accounting and Economics* 22 (1–3): 79-117.

Emerson, D. J., Karim, K. E. and Rutledge, R. W. 2010. Fair value accounting: A historical review of the most controversial accounting issue in decades. *Journal of Business & Economic Research* 8 (4): 77-86.

Enterprise Institute for Public Policy Research. 2008. AEI Outlook Series, Enterprise Institute for Public Policy Research, July, [on-line], http://www.aei.org/docLib/20080728_23336JulyFSOg.pdf.

Fenn, G. W. 2000. Speed of Issuance and the Adequacy of Disclosure in the 144A High-Yield Debt Market. *Journal of Financial Economics* 56 (3): 383–405.

Ferguson, A, Francis, J. R. and Stokes, D. J. 2003. The Effects of Firm-Wide and Office-Level Industry Expertise on Audit Pricing. *The Accounting Review* 78: 429–448.

Ferguson, A., Francis, J. R. and Stokes, D. J. 2003. The Effects of Firm-Wide and Office-Level Industry Expertise on Audit Pricing. *The Accounting Review* 78 (2): 429-448.

Fernado, C. S., V. A. Gatchev, and P. A. Spindt. 2003. Wanna Dance? How Firms and Underwriters Choose Each Other. Working paper, Tulane University.

Fiechter, P. and Novotny-Farkas, Z. 2011. Pricing of fair values during the financial crisis: International evidence. Working paper.

Financial Accounting Standards Board (FASB). 1974. Financial reporting in units of general purchasing power. Exposure draft, December 31. Stamford, CT: FASB.

Financial Accounting Standards Board (FASB). 1976. Accounting for Leases. Statement of Financial Accounting Standards No. 13. Stamford, CT: FASB.

Financial Accounting Standards Board (FASB). 1978. Concepts Statement No. 1. Objectives of Financial Reporting by Business Enterprises. CT: FASB.

Financial Accounting Standards Board (FASB). 1979. Financial Reporting for Changing Prices. Statement of Financial Accounting Standards No. 33. Stamford, CT: FASB.

Financial Accounting Standards Board (FASB). 1980. Concepts Statement No. 2. Qualitative Characteristics of Accounting Information. CT: FASB.

Financial Accounting Standards Board (FASB). 1980. Concepts Statement No. 2. Qualitative Characteristics of Accounting Information. Norwalk, CT: FASB.

Financial Accounting Standards Board (FASB). 1993. Statement of Financial Accounting Standards No. 115: Accounting for Certain Investments in Debt and Equity Securities. Norwalk, CT: FASB.

Financial Accounting Standards Board (FASB). 1994. Statement of Financial Accounting Standards No. 119: Disclosure about Derivative Financial Instruments and Fair Value of Financial Instruments. Norwalk, CT: FASB.

Financial Accounting Standards Board (FASB). 1995a. Statement of Financial Accounting Standards No. 121: Accounting for the Impairment of Long-lived Assets and for Long-Lived Assets to be Disposed of. Norwalk, CT: FASB.

Financial Accounting Standards Board (FASB). 1995b. Statement of Financial Accounting Standards No. 123: Accounting for Stock-Based Compensation. Norwalk, CT: FASB.

Financial Accounting Standards Board (FASB). 2006a. Statement of Financial Accounting Standards No. 157: Fair Value Measurements. Norwalk, CT: FASB.

Financial Accounting Standards Board (FASB). 2006b. Financial Accounting Standards No. 159: The Fair Value Option for Financial Assets and Financial Liabilities. Norwalk, CT: FASB.

Financial Accounting Standards Board (FASB). 2009. Board Meeting Handout Accounting for Financial Instruments. Norwalk, CT: FASB.

Financial Accounting Standards Board (FASB). 2010. Conceptual Framework. Statement of Financial Accounting Concepts No. 8. Norwalk, CT: FASB.

Fortin, S. and Pittman, J. A. 2007. The Role of Auditor Choice in Debt Pricing in Private Firms. *Contemporary Accounting Research* 24 (3): 859-896.

Fransic, J., LaFond, R., Olsson, P. and Schipper, K. 2005. The Market Pricing of Accruals Quality. *Journal of Accounting and Economics* 39: 295-327.

General Accounting Office. 1991. Failed Banks, Accounting and Auditing Reforms Urgently Needed.

Georgiou, O. and Jack, L. 2011. In pursuit of legitimacy: A history behind fair value accounting. *The British Accounting Review* 43: 311-323.

Glantz, M. and Mun, J. 2008. *The Banker's Handbook on Credit Risk: Implementing Basel II*. Elsevier Academic Press.

Goh, B., Ng, J. and Yong, K. 2009. Market pricing of banks' fair value assets reported under SFAS 157 during the 2008 economic crisis. Working paper. Singapore Management University.

Greeley, B. 2012. The Price of Too Big to Fail. Bloomberg Businessweek July 05, 2012.

Hamilton, R. 1788. *An Introduction to Merchandize*. Edinburgh: Elliot: 285.

Heffernan, S. 2005. *Modern Banking in Theory and Practice*. John Wiley and Sons.

Hitz, J.-M. 2007. The decision usefulness of fair value accounting—A theoretical perspective. *European Accounting Review* 16 (2): 323-362.

Hogan, C. E., and Jeter, D. C. . 1999. Industry Specialization by Auditors. *Auditing: A Journal of Practice & Theory* 18 (1): 1–17.

Holthausen, R. and Watts, R. 2001. The relevance of the value-relevance literature for financial accounting standard setting. *Journal of Accounting and Economics* 31 (1-3): 3-75.

Horrigan, J., 1966. The determinants of long-term credit standing with financial ratios. *Journal of Accounting Research* 4, 44–62.

Ijiri, Y. 1967. *The Foundations of Accounting Measurement*. Englewood Cliffs, NJ: Prentice-Hall.

Ijiri, Y. and Jaedicke, R. 1966. Reliability and objectivity of accounting measurements. *The Accounting Review* 41 (3): 471-483.

International Accounting Standards Board (IASB). 2006. Fair value measurements. Part 1: Invitation to comment and relevant IFRS guidance, Discussion Paper, London.

Ivashina, V. and Scharfstein, D. 2010. Bank lending during the financial crisis of 2008. *Journal of Financial Economics* 97: 319-338.

Jensen, M. C., and W. H. Meckling. 1976. Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure. *Journal of Financial Economics* 3 (4): 305–60.

Johnson, L. T. 2005. Relevance and Reliability. *The FASB Report* February 28, 2005.

Johnson, P., Jamal, K. and Berryman, R. 1991. Effects of Framing on Auditor Decisions. *Organization Behavior and Human Decision Progresses* 50:75-105.

Jones, J. C. 1988. Financial instruments: Historical cost v. fair value. *The CPA Journal* 58 (8): 56-63.

Kaplan, R., Urwitz, G., 1979. Statistical models of bond ratings: a methodological inquiry. *Journal of Business* 52: 231–261.

Khurana, I. K. and Kim, M.-S. 2003. Relative value relevance of historical cost vs. fair value: Evidence from bank holding companies. *Journal of Accounting and Public Policy* 22: 19-42.

Khurana, I., and K. Raman. 2003. Are Fundamentals Priced in the Bond Market? *Contemporary Accounting Research* 20(3): 465-494.

Kim, J.B., Chung, R. and Firth, M. 2003. Auditor conservatism, asymmetric monitoring, and earnings management. *Contemporary Accounting Research* 20 (2): 323-359.

King, A. M. 2009. Determining Fair Value. *Strategic Finance* 90 (7): 27-34.

Kolev, K. 2009. Do investors perceive marking-to-model as marking-to-myth? Early evidence from FAS 157 Disclosure. Working paper, New York University.

Kothari, S. P., Ramanna, K. and Skinner, D. J. 2010. Implications for GAAP from an analysis of positive research in accounting. *Journal of Accounting and Economics* 50: 246-286.

Krishnan, G. V. 2003. Does Big 6 Auditor Industry Expertise Constrain Earnings Management? *Accounting Horizons* 17: 1–16.

Krishnan, G., 2005. The Association Between Big 6 Auditor Industry Expertise and Asymmetric Timeliness of Earnings, *Journal of Accounting Auditing & Finance* 20: 209-228.

Lamy, R., Thompson, R., 1988. Risk premia and the pricing of primary issue bonds. *Journal of Banking and Finance* 12: 585–601.

Laux, C. and Leuz., C. 2009. The crisis of fair value accounting: Making sense of the recent debate. *Accounting, Organizations and Society* 34 (6–7): 826-31.

Lee, T. A. 2008. Review of "The Routledge Companion to Fair Value and Financial Reporting." *Accounting and Business Research* 38 (1): 93-96.

Leuz, C., R. Lambert and R. Verrecchia. 2007. Accounting Information, Disclosure and the Cost of Capital. *Journal of Accounting Research* 45: 385-420.

Linsmeier, T. J. 2010. Financial Reporting and Financial Crises: The Case for Measuring Financial Instruments at Fair Value in the Financial Statements. *Accounting Horizons*, Forthcoming.

Liu, M. 2011. Financial Reporting Quality and Corporate Bond Markets. *Doctoral Thesis in Concordia University*.

Livingston, M., and L. Zhou. 2002. The Impact of Rule 144A Debt Offerings Upon Bond Yields and Underwriter Fees. *Financial Management* 31 (4): 5–27.

Lobo, G.J., and Song, I.M. 1989. The incremental information in SFAS No. 33 income disclosures over historical cost income and its cash and accrual components. *The Accounting Review* 64: 329-343.

Longstaff, F., and E. Schwartz, 1995, A simple approach to valuing risky fixed and floating rate debt, *Journal of Finance* 50: 789-819.

Low, K-Y. 2004. The Effects of Industry Specialization on Audit Risk Assessments and Audit-Planning Decisions. *The Accounting Review* 79 (1): 201-219.

MacNeal, K. 1939. *Truth in Accounting*. Houston, TX: Scholars Books, 1979 (reprinted).

Maletta, M. and Wright, A. 1996. Audit Evidence Planning: An Examination of Industry Error Characteristics. *Auditing: A Journal of Practice & Theory (Spring)*: 71-86.

Mansi, S. A., Maxwell, W. F. and Miller, D. P. 2004. Does Auditor Quality and Tenure Matter to Investors? Evidence from the Bond Market. *Journal of Accounting Research* 42(4): 755-793.

Martin, R. D., Rich, J. S. and Wilks, T. J. 2006. Auditing Fair Value Measurements: A Synthesis of Relevant Research. *Accounting Horizons* 20(3): 287-303.

Mayhew, B. W., and Wilkins, M. S. 2003. Audit Firm Industry Specialization as a Differentiation Strategy: Evidence from Fees Charged to Firms Going Public. *Auditing: A Journal of Practice & Theory 22*: 33–52.

Mellis, J. 1588. *A Briefe Instruction and Maner How to Keepe Bookes of Accompts (edition of Oldcastle, 1543)*. London: Singleton: ch. 3.

Menini, A, Parbonetti, A, and Magnan, M. 2012. Fair Value Accounting: A Source of Information or of Confusion for Financial Markets? Working Paper.

Merton, R., 1974, On the pricing of corporate debt: The risk structure of interest rates, *Journal of Finance* 29: 449-470.

Muller, K. and Riedl, E. 2002. External monitoring of property appraisal estimates and information asymmetry. *Journal of Accounting Research* (June): 865-881.

Nelson, K. 1996. Fair value accounting for commercial banks: An empirical analysis of FAS No.107. *The Accounting Review* 71 (2): 161-182.

Ohlson, J. 1995. Earnings, book value and dividends in security valuation. *Contemporary Accounting Research* 11 (2): 661-687.

Pacioli, L. 1494. Particularis de computis et scripturis. *In Paciolo on Accounting*. R. G. Brown and K. S. Johnston. New York: McGraw-Hill, 1963.

Park, M., Park, T. and Ro, B. 1999. Fair value disclosures for investment securities and bank equity: evidence from SFAS No. 115. *Journal of Accounting, Auditing, and Finance* 14 (3), 347-370.

Penman, S. H. 2007. Financial reporting quality: Is fair value a plus or a minus? *Accounting and Business Research Special Issue: International Accounting Policy Forum*: 33-44.

Petroni, K. and Wahlen, J. M. 1995. Fair values of equity and debt securities and share prices of property-liability insurers. *The Journal of Risk and Insurance* 62 (4): 719-737.

Philips, J. 1975. Analysis and ratings of Financial Analyst's Handbook. Vol. 1. *Homewood, Ill: Dow Jones-Irwin.corporate bonds*. In Sumner N. Levine (ed.),

Plantin, G., H. Sapra, and H. S. Shin. 2008. Marking-to-market: Panacea or Pandora's box? *Journal of Accounting Research* 46 (2): 435 – 46.

Power, M. 201). Fair value accounting, financial economics and the transformation of reliability. *Accounting and Business Research* 40 (3): 197-210.

Prochazka, D. 2011. The role of fair value measurement in the recent financial crunch. *Economic, Management, and Financial Markets* 6 (1): 989-1001.

Reilchelt, K. J. and Wang, D. 2010. National and Office-Specific Measures of Auditor Industry Expertise and Effects on Audit Quality. *Journal of Accounting Research* 48 (3): 647-686.

Reuters Guide to Credit Ratings. 2007. Reuters Articles. Thursday April 12, 2007.

Ross, I. 1976. Higher stakes in the bond-rating game. *Fortune* (April): 133-42.

Scanlon, M. J. and Lee, L. Y. 2011. Earnings per share. *Insights* 25 (7): 33-35.

Scott, W. R. 2011. *Financial Accounting Theory*. Sixth Edition. Toronto: Prentice Hall.

Seibert, S., S. Silver, and A. Randolph. 2004. Taking Empowerment to the Next Level: A Multiple-Level Model of Empowerment, Performance, and Satisfaction. *Academy of Management Journal* 47(3): 332-349.

Sengupta, P. 1998. Corporate disclosure quality and the cost of debt. *The Accounting Review* 73: 459–474.

Shleifer, A. 2000. *Inefficient Markets: An Introduction to Behavioral Finance*. Oxford: Oxford University Press.

Smith, C., Warner, J., 1979. On Financial Contracting: An Analysis of Bond Covenants. *Journal of Financial Economics* 7, 117–161.

Solomon, I, Shields, M. D. and Whittington, O. R. 1999. What Do Industry-Specialist Auditors Know? *Journal of Accounting Research* 37 (1): 191-208

Song, C. J. and Thomas, W. B. 2010. Value relevance of FAS No. 156 fair value hierarchy information and the impact of corporate governance mechanisms. *The Accounting Review* 85 (4): 1375-1410.

Spiceland, J. D., Sepe, J. and Tomassini, L. A. 2005. *Intermediate Accounting*. New York, NY: McGraw-Hill.

Stephens, H. 1735. *Italian Bookkeeping*. London: Mears: 4.

Venkatachalam, M. 1996. Value-relevance of banks derivatives disclosures. *Journal of Accounting and Economics* 22: 327-355.

Wakil, G. 2011. Conservatism, earnings persistence, and the accruals anomaly. Unpublished dissertation, Kent State University Graduate School of Management.

Walker, R. G. 1974. Asset classification and asset valuation. *Accounting and Business Research*, 286-296.

Wallison, P. J. 2008. Fair Value Accounting: A Critique. *American Enterprise Institute for Public Policy Research Outlook Series*, July.

Walton, P. 2007. The nature of fair value. In P. Walton (Ed.), *The Routledge Companion to Fair Value and Financial Reporting*. Oxon: Routledge: 3-8.

Watts, R. L. 1993. A proposal for research on conservatism. Unpublished working paper, University of Rochester.

West, R. R. 1970. An alternative approach to predicting corporate bond rations. *Journal of Accounting Research* 7 (Spring): 118-27.

White, L. J. 2003. The savings and loan debacle: A perspective from the early twenty-first century. New York University Salomon Center, Working paper series, Nr. S-03-1.

Whitehouse, T. 2011. FASB reverses on fair value for loans held to maturity. *Compliance Week*. March: 6-7.

Wilson, T., 1997a. Portfolio credit risk (1). *Risk* 10 (9): 111-116.

Wilson, T., 1997b. Portfolio credit risk (2). *Risk* 10 (10): 56-61.

Wright, S. and Wright, A. 1997. The Effect of Industry Specialization on Hypothesis Generation and Audit Planning Decisions. *Behavioral Research in Accounting* 9: 273-294.

Wyatt, A. 1991. The SEC says: Mark to market! *Accounting Horizons* 5 (1): 80-84.

Yu, F. 2005. Accounting Transparency and the Term Structure of Credit Spreads. *Journal of Financial Economics* 75 (1): 53–84.

Zeff, S.A. 2007. The SEC rules on historic cost accounting: 1934 to the 1970s. *Accounting and Business Research, Special Issue: International Accounting Policy Forum* 48-62.

Zhang, J. 2008. The contracting benefits of accounting conservatism to lenders and borrowers. *Journal of Accounting and Economics* 45 (1), 27-54.

Ziebart, D. and Reiter, S. 1992. Bond ratings, bond yields and financial information. *Contemporary Accounting Research* 9: 252–282.

Table 1

Credit Rating Score Assignment
Panel A: Short-term credit rating scores

Moody's	S&P	Fitch	Assigned rating score
P-1	A-1+	F1+	5
-	A-1	F1	4
P-2	A-2	F2	3
P-3	A-3	F3	2
Not prime	B	B	1

Panel B: Long-term credit rating scores

Moody's	S&P	Fitch	Assigned rating score
A1 and above	A+ and above	A+ and above	13
A2	A	A	12
A3	A-	A-	11
BAA1	BBB+	BBB+	10
BAA2	BBB	BBB	9
BAA3	BBB-	BBB-	8
BA1	BB+	BB+	7
BA2	BB	BB	6
BA3	BB-	BB-	5
B1	B+	B+	4
B2	B	B	3
B3	B-	B-	2
below	below	below	1

Notes: This table presents details of credit ratings score assignment for the three credit ratings agencies: Moody's, Stand & Poor's (S&P), and Fitch. The credit ratings provided by the three credit ratings agencies are structured in a consistent way. Panel A shows the rating score assignment for short-term credit ratings and Panel B shows the rating score assignment for long-term credit ratings. The credit ratings are at the firm level, rather than the issue level.

Table 2

Accounting Variables That Explain Credit Ratings

Variables	Label	Predicted sign	Definitions
LEV	leverage	-	Total liabilities divided by total assets
ROA	return on assets	+	Income before extraordinary items divided by total assets
LOSS	loss	-	One if the income before extraordinary items is negative, zero otherwise
COV	interest coverage	+	operating income before depreciation divided by interest expense
SIZE	firm size	+	natural log of total assets

Notes: This table provides definitions of the independent variables in the regression model. LEV represents leverage, and is defined as total liabilities over total assets. It is expected to be negatively associated with firms' credit rating scores. ROA represents return on assets, and is defined as income before extraordinary items over total assets. It is expected to be positively associated with credit rating scores. Loss is an indicator variable that equals to one if the income before extraordinary items is negative, and zero otherwise. It is expected to be negatively associated with credit rating scores. COV represents interest coverage, and is defined as operating income before depreciation over interest expense. It is expected to be positively associated with credit rating score. Size represents firm size, and is defined as the natural log of total assets. It is expected to be positively associated with credit rating score.

Table 3

Percentage of Audit Fees Earned by Big 4 Auditors in banking industry (two-digit sic code=60)

	KPMG	PricewaterhouseCoopers	Ernst & Young	Deloitte & Touche	Total
2003	37	18	20	15	90
2004	43	18	15	13	89
2005	42	20	14	10	86
2006	39	19	15	10	83
2007	36	20	16	9	81
2008	32	27	15	7	81
2009	31	30	14	6	81
2010	33	31	6	14	84
2011	32	30	5	16	83

Notes: The numbers reported in this table represents the percentage of audit fees earned by Big 4 auditors in the banking industry for a specific year. For example, in 2003, 37% of the audit fees in the banking industry are earned by KPMG.

Table 4
Sample Selection Process

Process	# of Firms
Firms with credit ratings issued by one of the three rating agencies between 2003 and 2010	1877
Less: observations with missing value of at least one measure of fair value or historical cost components for the five accounting variables	353
full sample	1524
Sample for short-term credit ratings	898
Less: firms that auditor information is missing	39
Subsample for auditor industry expertise	173
Subsample for non-auditor industry expertise	686
Sample for long-term credit ratings	626

Table 5
Descriptive Statistics

Panel A: Full Sample (N = 1524)

Variable	Mean	Std Dev	Minimum	25th Pctl	Median	75th Pctl	Maximum
LEV_HC	0.892709	0.017032	0.813062	0.87837	0.892286	0.900073	0.981431
LEV_FV	0.870508	0.059683	0.664444	0.852086	0.871505	0.896395	0.991415
ROA_HC	0.004835	0.012525	-0.07961	-0.00137	0.008103	0.013362	0.072677
ROA_FV	-0.04889	0.066056	-0.30178	-0.06469	-0.05703	0.009672	0.104743
LOSS_HC	0.386300	0.486958	0	0	0	1	1
LOSS_FV	0.694548	0.460652	0	0	1	1	1
COV_HC	0.889956	0.982921	-2.99355	0.488157	0.860159	1.237283	12.66776
COV_FV	0.889956	0.982921	-2.99355	0.488157	0.860159	1.237283	12.66776
SIZE_HC	17.85095	1.233817	13.57368	17.66573	17.78825	17.82808	21.53560
SIZE_FV	17.83489	1.226773	13.57135	17.66512	17.7913	17.80856	21.50853

Panel B: Sample for short-term credit ratings (N = 898)

Variable	Mean	Std Dev	Minimum	25th Pctl	Median	75th Pctl	Maximum
SCORE	4.035635	1.278787	1	4	4	5	5
LEV_HC	0.893550	0.017280	0.813062	0.87837	0.892286	0.899463	0.981431
LEV_FV	0.871310	0.056320	0.664444	0.852086	0.880385	0.894943	0.991415
ROA_HC	0.006162	0.012567	-0.07961	-0.00137	0.012877	0.013362	0.072677
ROA_FV	-0.04321	0.062042	-0.30178	-0.06469	-0.05703	0.013277	0.048485
LOSS_HC	0.324054	0.468281	0	0	0	1	1
LOSS_FV	0.655902	0.475338	0	0	1	1	1
COV_HC	0.931639	1.018646	-2.99355	0.488157	0.860159	1.237283	12.66776
COV_FV	0.931639	1.018646	-2.99355	0.488157	0.860159	1.237283	12.66776
SIZE_HC	17.71021	1.258115	13.57368	17.66573	17.78825	17.82808	21.53560
SIZE_FV	17.69638	1.251522	13.57135	17.66512	17.7913	17.80856	21.50853

(This table is continued on the next page)

(Table 5 Continued)

Panel C: Subsample for short-term credit ratings with auditor industry expertise (N=173)

Variable	Mean	Std Dev	Minimum	25th Pctl	Median	75th Pctl	Maximum
SCORE	4.358382	1.270827	1	4	5	5	5
LEV_HC	0.899652	0.025871	0.813062	0.886185	0.900052	0.916877	0.981431
LEV_FV	0.893900	0.068109	0.738032	0.861919	0.892377	0.918195	0.991415
ROA_HC	0.006634	0.016789	-0.06579	0.001756	0.010628	0.015164	0.072677
ROA_FV	-0.0431	0.077282	-0.27089	-0.07639	-0.01401	0.013288	0.048485
LOSS_HC	0.202312	0.402890	0	0	0	0	1
LOSS_FV	0.606936	0.489849	0	0	1	1	1
COV_HC	1.341578	1.796675	-2.99355	0.650414	1.05132	1.544678	12.66776
COV_FV	1.341578	1.796675	-2.99355	0.650414	1.05132	1.544678	12.66776
SIZE_HC	17.53969	1.995803	14.8355	15.94933	16.89567	19.05049	21.53560
SIZE_FV	17.51766	1.983512	14.84858	15.93661	16.88292	18.98251	21.50853

Panel D: Subsample for short-term credit ratings without auditor industry expertise (N=686)

Variable	Mean	Std Dev	Minimum	25th Pctl	Median	75th Pctl	Maximum
SCORE	3.937318	1.295869	1	4	4	5	5
LEV_HC	0.892495	0.014236	0.851215	0.87837	0.892286	0.896365	0.97259
LEV_FV	0.865455	0.052862	0.664444	0.820716	0.85363	0.893795	0.985838
ROA_HC	0.00616	0.011458	-0.07961	-0.00137	0.012877	0.013362	0.024952
ROA_FV	-0.04389	0.058985	-0.30178	-0.06469	-0.05703	0.013277	0.040418
LOSS_HC	0.342566	0.474914	0	0	0	1	1
LOSS_FV	0.664723	0.472432	0	0	1	1	1
COV_HC	0.823199	0.64975	-1.73808	0.488157	0.860159	1.237283	7.822457
COV_FV	0.823199	0.64975	-1.73808	0.488157	0.860159	1.237283	7.822457
SIZE_HC	17.77909	0.986008	13.71485	17.66573	17.78825	17.82808	21.25713
SIZE_FV	17.7673	0.981108	13.70362	17.66512	17.7913	17.80856	21.23247

(This table is continued on the next page)

(Table 5 Continued)

Panel E: Sample for long-term credit rating (N=626)

Variable	Mean	Std Dev	Minimum	25th Pctl	Median	75th Pctl	Maximum
SCORE	9.795786	2.561031	1	9	10	11	13
LEV_HC	0.897617	0.021272	0.813062	0.882319	0.897175	0.913273	0.981431
LEV_FV	0.885357	0.067585	0.664444	0.852086	0.89454	0.919317	0.991415
ROA_HC	0.004387	0.015626	-0.07961	-0.00137	0.007465	0.014194	0.072677
ROA_FV	-0.04374	0.075605	-0.30178	-0.06469	-0.02007	0.012175	0.104743
LOSS_HC	0.319871	0.466804	0	0	0	1	1
LOSS_FV	0.605816	0.48907	0	0	1	1	1
COV_HC	1.099591	1.360205	-2.99355	0.488157	0.894284	1.517712	12.66776
COV_FV	1.099591	1.360205	-2.99355	0.488157	0.894284	1.517712	12.66776
SIZE_HC	17.55240	1.625883	13.57368	16.33109	17.76404	18.46317	21.53560
SIZE_FV	17.53425	1.616507	13.57135	16.28736	17.73899	18.39936	21.50853

Notes: *SCORE* represents credit rating scores. It is an ordinal variable that takes a value from 1 to 13 for long-term ratings and 1 to 5 for short-term ratings. *LEV_HC* represents the historical cost measure of *LEV*. *LEV_FV* represents the fair value measure of *LEV*. *LEV* represents leverage, and is defined as total liabilities over total assets. It is expected to be negatively associated with firms' credit rating scores. *ROA* represents return on assets, and is defined as income before extraordinary items over total assets. It is expected to be positively associated with credit rating scores. *LOSS* is an indicator variable that equals to one if the income before extraordinary items is negative, and zero otherwise. It is expected to be negatively associated with credit rating scores. *COV* represents interest coverage, and is defined as operating income before depreciation over interest expense. It is expected to be positively associated with credit rating score. *SIZE* represents firm size, and is defined as the natural log of total assets. It is expected to be positively associated with credit rating score.

Table 6 Correlation Tables

Panel A: Sample for short-term credit ratings

	SCORE	LEV_HC	LEV_FV	ROA_HC	ROA_FV	LOSS_HC	LOSS_FV	COV_HC	COV_FV	SIZE_HC	SIZE_FV
SCORE	1	-0.30181***	-0.13962***	0.62958***	0.32049***	-0.59025***	-0.47146***	0.75809***	0.75809***	0.15444***	0.15773***
		<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
LEV_HC	-0.18439***	1	0.16562***	-0.33882***	-0.15506***	0.52608***	0.15657***	-0.33072***	-0.33072***	-0.14118***	-0.1323***
	<.0001		<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
LEV_FV	-0.07484**	0.16707***	1	-0.01332	-0.41459***	0.03467	0.49052***	-0.16189***	-0.16189***	-0.37011***	-0.38359***
	0.0249	<.0001		0.6901	<.0001	0.2994	<.0001	<.0001	<.0001	<.0001	<.0001
ROA_HC	0.54206***	0.04111	-0.2617***	1	0.48898***	-0.81698***	-0.50985***	0.79627***	0.79627***	-0.18566***	-0.17943***
	<.0001	0.2185	<.0001		<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
ROA_FV	0.11398***	-0.0365	-0.44171***	0.31648***	1	-0.49443***	-0.82929***	0.49702***	0.49702***	-0.58922***	-0.57626***
	0.0006	0.2745	<.0001	<.0001		<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
LOSS_HC	-0.60387***	0.34607***	0.13674***	-0.75669***	-0.26698***	1	0.46144***	-0.7378***	-0.7378***	0.23464***	0.22835***
	<.0001	<.0001	<.0001	<.0001	<.0001		<.0001	<.0001	<.0001	<.0001	<.0001
LOSS_FV	-0.38513***	0.12687***	0.33035***	-0.39374***	-0.67441***	0.46144***	1	-0.57631***	-0.57631***	0.47894***	0.47536***
	<.0001	0.0001	<.0001	<.0001	<.0001	<.0001		<.0001	<.0001	<.0001	<.0001
COV_HC	0.47072***	-0.0585*	-0.0168	0.4995***	0.22431***	-0.45521***	-0.36451***	1	1.00000***	-0.11606***	-0.11025***
	<.0001	0.0798	0.6152	<.0001	<.0001	<.0001	<.0001		<.0001	0.0005	0.0009
COV_FV	0.47072***	-0.0585*	-0.0168	0.4995***	0.22431***	-0.45521***	-0.36451***	1.00000***	1	-0.11606***	-0.11025***
	<.0001	0.0798	0.6152	<.0001	<.0001	<.0001	<.0001	<.0001		0.0005	0.0009
SIZE_HC	0.29992***	-0.056*	-0.45525***	0.033	-0.60499***	-0.00145	0.3491***	0.02003	0.02003	1	0.99695***
	<.0001	0.0935	<.0001	0.3232	<.0001	0.9653	<.0001	0.5488	0.5488		<.0001
SIZE_FV	0.30459***	-0.05402	-0.46643***	0.04212	-0.59513***	-0.00993	0.34257***	0.02325	0.02325	0.99977***	1
	<.0001	0.1057	<.0001	0.2073	<.0001	0.7663	<.0001	0.4865	0.4865	<.0001	

(This table is continued on the next page)

Panel B: Subsample for short-term credit ratings with auditor industry expertise

	SCORE	LEV_HC	LEV_FV	ROA_HC	ROA_FV	LOSS_HC	LOSS_FV	COV_HC	COV_FV	SIZE_HC	SIZE_FV
SCORE	1	-0.36872***	-0.21039***	0.68041***	0.47384***	-0.58952***	-0.63474***	0.79445***	0.79445***	0.03581	0.02861
		<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.349	0.4544
LEV_HC	-0.33707***	1	0.00295	-0.46577***	-0.29442***	0.67147***	0.23391***	-0.44918***	-0.44918***	-0.14143***	-0.12307***
	<.0001		0.9384	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.0002	0.0012
LEV_FV	-0.04119	-0.04282	1	-0.00939	-0.45009***	0.07814**	0.6013***	-0.14564***	-0.14564***	-0.29315***	-0.31105***
	0.2814	0.2627		0.806	<.0001	0.0408	<.0001	0.0001	0.0001	<.0001	<.0001
ROA_HC	0.52647***	-0.28377***	-0.32265***	1	0.56674***	-0.83427***	-0.58071***	0.83939***	0.83939***	-0.32031***	-0.31108***
	<.0001	<.0001	<.0001		<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
ROA_FV	0.1789***	-0.07361*	-0.56107***	0.32185***	1	-0.5814***	-0.82991***	0.61256***	0.61256***	-0.61603***	-0.59558***
	<.0001	0.054	<.0001	<.0001		<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
LOSS_HC	-0.60315***	0.56004***	0.16773***	-0.7955***	-0.29736***	1	0.49314***	-0.75697***	-0.75697***	0.38581***	0.37699***
	<.0001	<.0001	<.0001	<.0001	<.0001		<.0001	<.0001	<.0001	<.0001	<.0001
LOSS_FV	-0.48745***	0.29398***	0.44645***	-0.40921***	-0.69145***	0.49314***	1	-0.68293***	-0.68293***	0.45018***	0.44618***
	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001		<.0001	<.0001	<.0001	<.0001
COV_HC	0.59648***	-0.30241***	-0.03005	0.60186***	0.28612***	-0.58047***	-0.50922***	1	1.00000***	-0.24557***	-0.23353***
	<.0001	<.0001	0.4319	<.0001	<.0001	<.0001	<.0001		<.0001	<.0001	<.0001
COV_FV	0.59648***	-0.30241***	-0.03005	0.60186***	0.28612***	-0.58047***	-0.50922***	1.00000***	1	-0.24557***	-0.23353***
	<.0001	<.0001	0.4319	<.0001	<.0001	<.0001	<.0001	<.0001		<.0001	<.0001
SIZE_HC	0.249***	-0.04763***	-0.47838***	0.01209	-0.5869***	0.04619	0.25375***	0.02499	0.02499	1	0.9944***
	<.0001	0.2128	<.0001	0.7518	<.0001	0.227	<.0001	0.5135	0.5135		<.0001
SIZE_FV	0.25631***	-0.03864	-0.48919***	0.02688	-0.57603***	0.03316	0.24629***	0.03342	0.03342	0.9997***	1
	<.0001	0.3122	<.0001	0.4822	<.0001	0.3858	<.0001	0.3822	0.3822	<.0001	

(This table is continued on the next page)

Panel C: Subsample for short-term credit ratings without auditor industry expertise

	SCORE	LEV_HC	LEV_FV	ROA_HC	ROA_FV	LOSS_HC	LOSS_FV	COV_HC	COV_FV	SIZE_HC	SIZE_FV
SCORE	1	-0.10175	-0.39439***	0.36952***	-0.19264	-0.47077***	0.1186	0.56387***	0.56387***	0.63517***	0.63932***
		0.1828	<.0001	<.0001	0.0111	<.0001	0.1202	<.0001	<.0001	<.0001	<.0001
LEV_HC	-0.21115***	1	0.44823***	-0.20502***	-0.32079***	0.23112***	0.27305***	-0.20672***	-0.20672***	-0.07268	-0.07827
	0.0053		<.0001	0.0068	<.0001	0.0022	0.0003	0.0064	0.0064	0.3419	0.3061
LEV_FV	-0.36057***	0.43584***	1	-0.16285**	-0.1027	0.41757***	0.04977	-0.21802***	-0.21802***	-0.4102***	-0.4211***
	<.0001	<.0001		0.0323	0.1788	<.0001	0.5155	0.004	0.004	<.0001	<.0001
ROA_HC	0.58363***	-0.37812***	-0.23203***	1	0.39218***	-0.69595***	-0.39724***	0.64047***	0.64047***	-0.11552	-0.11047
	<.0001	<.0001	0.0021		<.0001	<.0001	<.0001	<.0001	<.0001	0.1301	0.1479
ROA_FV	0.1238	-0.25089***	-0.1579**	0.3019***	1	-0.25763***	-0.84616***	0.16907**	0.16907**	-0.62788***	-0.61693***
	0.1046	0.0009	0.038	<.0001		0.0006	<.0001	0.0262	0.0262	<.0001	<.0001
LOSS_HC	0.53987***	0.27757***	0.34804***	-0.72514***	-0.17014**	1	0.28744***	-0.56627***	-0.56627***	-0.11297	-0.11844
	<.0001	0.0002	<.0001	<.0001	0.0252		0.0001	<.0001	<.0001	0.1389	0.1207
LOSS_FV	0.05015	0.29044***	0.0255	-0.36098***	-0.63447***	0.28744***	1	-0.18748**	-0.18748**	0.55178***	0.54277***
	0.5123	0.0001	0.7392	<.0001	<.0001	0.0001		0.0135	0.0135	<.0001	<.0001
COV_HC	0.392***	-0.2501***	-0.07573	0.44188***	0.17252**	-0.34763***	-0.2286***	1	1.00000***	0.13768*	0.14114*
	<.0001	0.0009	0.3221	<.0001	0.0232	<.0001	0.0025		<.0001	0.0709	0.064
COV_FV	0.392***	-0.2501***	-0.07573	0.44188***	0.17252**	-0.34763***	-0.2286***	1.00000***	1	0.13768*	0.14114*
	<.0001	0.0009	0.3221	<.0001	0.0232	<.0001	0.0025	<.0001		0.0709	0.064
SIZE_HC	0.57063***	-0.01854	-0.43541***	0.05766	-0.67936***	-0.12916*	0.54894***	0.1145	0.1145	1	0.99931***
	<.0001	0.8086	<.0001	0.4511	<.0001	0.0903	<.0001	0.1336	0.1336		<.0001
SIZE_FV	0.57376***	-0.02273	-0.44772***	0.06086	-0.66993***	-0.1341*	0.54291***	0.11625	0.11625	0.99983***	1
	<.0001	0.7666	<.0001	0.4264	<.0001	0.0786	<.0001	0.1277	0.1277	<.0001	

(This table is continued on the next page)

Panel D: Sample for long-term credit rating

	score	LEV_HC	LEV_FV	ROA_HC	ROA_FV	LOSS_HC	LOSS_FV	COV_HC	COV_FV	SIZE_HC	SIZE_FV
SCORE	1	0.12882***	-0.24438***	0.51044***	0.03796	-0.54131***	-0.21643***	0.62024***	0.62024***	0.48958***	0.49653***
		0.0013	<.0001	<.0001	0.3466	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
LEV_HC	-0.10946***	1	0.36686***	-0.18593***	-0.09334**	0.28177***	0.15609***	-0.09132**	-0.09132**	-0.13418***	-0.13319***
	0.0065		<.0001	<.0001	0.0202	<.0001	<.0001	0.0231	0.0231	0.0008	0.0009
LEV_FV	-0.35342***	0.21169***	1	-0.15723***	-0.19705***	0.15572***	0.18565***	-0.08888**	-0.08888**	-0.32879***	-0.34038***
	<.0001	<.0001		<.0001	<.0001	0.0001	<.0001	0.027	0.027	<.0001	<.0001
ROA_HC	0.59737***	-0.06973*	-0.27621***	1	0.36676***	-0.80824***	-0.4055***	0.70364***	0.70364***	-0.00019	0.00611
	<.0001	0.083	<.0001		<.0001	<.0001	<.0001	<.0001	<.0001	0.9962	0.8793
ROA_FV	0.06463	-0.05477	-0.45591***	0.24629***	1	-0.41258***	-0.84679***	0.36312***	0.36312***	-0.53416***	-0.52056***
	0.1088	0.1735	<.0001	<.0001		<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
LOSS_HC	-0.51322***	0.17026***	0.22025***	-0.74087***	-0.20256***	1	0.48231***	-0.67461***	-0.67461***	0.03173	0.02414
	<.0001	<.0001	<.0001	<.0001	<.0001		<.0001	<.0001	<.0001	0.4307	0.5488
LOSS_FV	-0.23544***	0.08991**	0.16904***	-0.39412***	-0.64025***	0.48231***	1	-0.4564***	-0.4564***	0.40581***	0.39558***
	<.0001	0.0253	<.0001	<.0001	<.0001	<.0001		<.0001	<.0001	<.0001	<.0001
COV_HC	0.45643***	-0.07569*	-0.06495	0.50786***	0.19773***	-0.4576***	-0.34843***	1	1.00000***	0.06395	0.06969*
	<.0001	0.0598	0.1065	<.0001	<.0001	<.0001	<.0001		<.0001	0.112	0.0832
COV_FV	0.45643***	-0.07569*	-0.06495	0.50786***	0.19773***	-0.4576***	-0.34843***	1.0000***	1	0.06395	0.06969*
	<.0001	0.0598	0.1065	<.0001	<.0001	<.0001	<.0001	<.0001		0.112	0.0832
SIZE_HC	0.47048***	-0.05731	-0.49708***	0.07112*	-0.66062***	-0.03563	0.40655***	0.02401	0.02401	1	0.9992***
	<.0001	0.1544	<.0001	0.0771	<.0001	0.3761	<.0001	0.551	0.551		<.0001
SIZE_FV	0.47541***	-0.05628	-0.50718***	0.07762*	-0.65209***	-0.04275	0.39858***	0.02717	0.02717	0.99981***	1
	<.0001	0.1619	<.0001	0.0536	<.0001	0.2883	<.0001	0.4999	0.4999	<.0001	

Notes: *SCORE* represents credit rating scores. It is an ordinal variable that takes a value from 1 to 13. *LEV_HC* represents the historical cost measure of *LEV*. *LEV_FV* represents the fair value measure of *LEV*. *LEV* represents leverage, and is defined as total liabilities over total assets. It is expected to be negatively associated with firms' credit rating scores. *ROA* represents return on assets, and is defined as income before extraordinary items over total assets. It is expected to be positively associated with credit rating scores. *LOSS* is an indicator variable that equals to one if the income before extraordinary items is negative, and zero otherwise. It is expected to be negatively associated with credit rating scores. *COV* represents interest coverage, and is defined as operating income before depreciation over interest expense. It is expected to be positively associated with credit rating score. *SIZE* represents firm size, and is defined as the natural log of total assets. It is expected to be positively associated with credit rating score.

Table 7 Ordered logit models for short-term and long-term debt contracting value

Panel A: short-term debt contracting value

Variables	historical cost		fair value	
	Coefficient	P-Value	Coefficient	P-Value
LEV	-0.4475	0.6680	-2.1363**	0.0286
ROA	3.5610***	0.0074	0.563***	<.0001
LOSS	-2.3838***	<.0001	-2.704***	<.0001
COV	1.3897***	<.0001	1.515***	<.0001
SIZE	0.9029***	<.0001	1.686***	<.0001
Observations		898		898
Generalized-Rsquare		0.3689		0.5525
Vuong Z				**-4.4023**
				<.0001

Panel B: Long- term debt contracting value

Variables	historical cost		fair value	
	Coefficient	P-Value	Coefficient	P-Value
LEV	-3.2799***	<.0001	-3.6429***	<.0001
ROA	3.7826***	<.0001	3.0578***	<.0001
LOSS	-1.9677***	<.0001	-1.7508***	<.0001
COV	0.4729***	<.0001	0.0871***	<.0001
SIZE	0.9674***	<.0001	0.0704***	<.0001
Observations		626		626
Generalized-Rsquare		0.4444		0.4238
Vuong Z				1.2888
				0.1975

Notes: Dependent variable is *SCORE*, credit rating score. The first two columns show the estimated coefficients and the P-value of independent variables for the historical cost model. The last two columns present the estimated coefficients and the P-value of independent variables for the fair value model. All variables are defined in Table 1.

***, **, and * indicate significance at the 1%, 5% and 10% levels, respectively.

G-Rsquare represents the generalized R^2 of the ordered logit model.

Table 8 Ordered logit models for debt contracting value and auditor industry expertise

Panel A: Sample for auditor industry expertise

Variables	historical cost		fair value	
	Coefficient	P-Value	Coefficient	P-Value
LEV	-3.8334**	0.0180	-3.6889**	0.0270
ROA	39.1187**	0.0200	5.2407***	<.0001
LOSS	-0.4346***	<.0001	-3.6937***	<.0001
COV	0.2545**	0.0453	1.4845**	0.0356
SIZE	1.0800***	<.0001	1.8916**	0.0428
Observations		173		173
Generalized-Rsquare		0.2356		0.3655
Vuong Z				**-3.323**
				<.0001

Panel B: Sample for non-auditor industry expertise

Variables	historical cost		fair value	
	Coefficient	P-Value	Coefficient	P-Value
LEV	-3.2608***	<.0001	-3.2877*	0.0867
ROA	64.2736***	<.0001	12.5440***	<.0001
LOSS	-1.1655***	<.0001	-0.5697*	0.0684
COV	0.1837***	<.0001	0.4283***	<.0001
SIZE	1.1182***	<.0001	1.4387***	<.0001
Observations		686		686
Generalized-Rsquare		0.5872		0.4434
Vuong Z				**-4.4023**
				<.0001

Notes: Dependent variable is *SCORE*, credit rating score. The first two columns show the estimated coefficients and the P-value of independent variables for the historical cost model. The last two columns present the estimated coefficients and the P-value of independent variables for the fair value model. All variables are defined in Table 1.

***, **, and * indicate significance at the 1%, 5% and 10% levels, respectively.

G-Rsquare represents the generalized R^2 of the ordered logit model.

Table 9 Robustness Check with Alternative Proxies

	Proxy	Short-term		Long-term	
		Historical Cost	Fair Value	Historical Cost	Fair Value
Generalized-Rsquare	(1)	0.3568	0.5236	0.4562	0.3951
	(2)	0.3789	0.5324	0.4358	0.3845
	(3)	0.4012	0.5321	0.4216	0.3915
	(4)	0.3156	0.5455	0.4421	0.4123

Notes: Proxy (1) shows the results of empirical analysis with long-term debt/total assets as an alternative proxy for leverage. Proxy (2) reports the results with cash flow before interest and taxes/total debt as an alternative proxy for interest coverage. Proxy (3) lists the results of total market capitalization as an alternative proxy for firm size. Proxy (4) shows the results with the efficiency ratio, defined as the non-interest expense of the banks divided by operating revenue, as an alternative proxy for interest coverage ratio.

Table 10 Robustness Checks with Exclusion of Loss

Panel A: short-term debt contracting value

Variables	historical cost		fair value	
	Coefficient	P-Value	Coefficient	P-Value
LEV	-0.615**	0.0321	-2.845**	0.0186
ROA	5.123***	<.0001	0.632***	<.0001
COV	1.845***	<.0001	1.985***	<.0001
SIZE	1.052***	<.0001	2.354***	<.0001
Observations		898		898
Generalized-Rsquare		0.3512		0.5325

Panel B: Long- term debt contracting value

Variables	historical cost		fair value	
	Coefficient	P-Value	Coefficient	P-Value
LEV	-3.987***	<.0001	-3.785***	<.0001
ROA	39.146***	<.0001	10.526***	<.0001
COV	0.987***	<.0001	0.098***	<.0001
SIZE	0.995***	<.0001	0.072***	<.0001
Observations		626		626
Generalized-Rsquare		0.3045		0.2951

Notes: Dependent variable is *SCORE*, credit rating score. The first two columns show the estimated coefficients and the P-value of independent variables for the historical cost model. The last two columns present the estimated coefficients and the P-value of independent variables for the fair value model. All variables are defined in Table 1.

***, **, and * indicate significance at the 1%, 5% and 10% levels, respectively.

G-Rsquare represents the generalized R^2 of the ordered logit model.

Table 11 Sample Selection Process

Process	# of Obs.
Sample A: Bond-year data from SNL Financial Capital Offering database from January 1, 2008 to April 30, 2012.	589
Sample B: (1) Retrieve bank-year credit ratings data from SNL Financial Companies where the rated firms have fair value data. Sample period is 2007-2011.	252
(2) Less: firms that firm-year auditor information is missing in the same period	0
Merge Sample A with Sample B	376

Table 12 Descriptive Statistics of Variables

Panel A: Continuous and Discrete Variables

Rating Sample (N=252)

Variable	Mean	Std Dev	Minimum	Median	Maximum
Rating	9.0667543	3.522712	1	10	15.57143
FairValue	0.3239807	0.398179	0.003834	0.226025	2.840384
Level1	0.0209197	0.044508	0	0.002448	0.251749
Level2	0.2791013	0.356603	0.001422	0.191995	2.591017
Level3	0.0200496	0.042463	0	0.002777	0.248151
Leverage	0.8961955	0.030244	0.743461	0.897367	0.996731
InterestCov	0.4038754	1.620827	-5.96128	0.369751	10.48533
ROA	0.0366568	1.513731	-6.81033	0.054114	2.465794
IssuerSize	17.159674	1.704752	13.76314	16.6834	21.54119

Yield Spread Sample (N=376)

Variable	Mean	Std Dev	Minimum	Median	Maximum
YieldSpread	3.04857	2.24478	0.365	2.3	16.33
FairValue	0.89125	0.73535	0.06885	0.82203	2.04612[8]
Level1	0.0759	0.0751	0	0.07184	0.25175
Level2	0.76777	0.65548	0.04027	0.71761	1.81424
Level3	0.06497	0.06824	0	0.04451	0.2203
Maturity	0.75528	0.32373	0.28094	0.77944	1.49255
IssueSize	4.68714	1.22425	1.39794	4.50687	6.87506
Leverage	0.89781	0.01924	0.83725	0.89622	0.94571

[8] In theory, fair value percentage (FairValue) should not exceed 2. However, due to the treatment of *Netting adjustment*, Fair Value can go beyond 2. See Appendix 3 for illustration.

InterestCov	0.12598	1.09633	-3.80188	0.20372	4.85688
IssuerSize	19.93781	1.67316	15.91209	21.16933	21.54119
OrthRating	-0.17437	1.23517	-2.71274	-0.04917	3.53283

Panel B: Dummy Variables

Variable	**N**	**Percent**
Loss	252	24.6
Expert	252	30.7
Expert	376	47.5
Underwritten	376	32.4
Convertible	376	5.3

Refer to Appendix 2 for variable definitions

Table 13 Correlation Matrix

Panel A: Credit Rating Sample

	Rating	FairValue	Specialist	Leverage	InterestCov	ROA	Loss
FairValue	0.299***						
Specialist	-0.192***	0.791***					
Leverage	-0.170	0.177***	0.2687***				
InterestCov	0.442***	0.038	0.359***	-0.200***			
ROA	0.602***	0.053	0.201*	-0.251***	0.753***		
Loss	-0.526***	-0.061	0.312	0.063*	-0.574***	-0.770***	
Size	0.559***	0.628***	0.678***	-0.021	0.055	0.121*	-0.062

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

Table 13 (continued)

Panel B: Yield Spread Sample

	Spread	Rating	Fair Value	Level1	Level2	Level3	Specialist	Under writer	Maturity	IssueSize	Convertible	Leverage	Interest Cov	Issuer Size
Rating	0.059 ***													
Fair Value	-0.408 ***	0.533 ***												
Level1	-0.210 ***	0.530 ***	0.804 ***											
Level2	-0.370 ***	0.530 ***	0.970 ***	0.729 ***										
Level3	0.012 ***	-0.451 ***	0.686 ***	0.771 ***	0.606 ***									
Specialist	-0.397 ***	0.171 ***	0.701 ***	0.446 ***	0.685 ***	0.395 ***								
Underwriter	-0.250 ***	0.021	0.168 ***	0.153 ***	0.159 ***	0.050	0.292 ***							
Maturity	-0.417 ***	0.214 *	0.587 ***	0.309 ***	0.575 ***	0.139 ***	0.479 ***	0.211 ***						
IssueSize	-0.572 ***	-0.045	0.375 ***	0.259 ***	0.356 ***	0.108 **	0.474 ***	0.757 ***	0.432 ***					
Convertible	0.381 ***	0.359 ***	0.119	0.378 ***	0.119 **	0.316 ***	-0.223 ***	-0.165 ***	-0.280 ***	-0.363 ***				
Leverage	-0.217 ***	-0.268 ***	0.613 ***	0.669 ***	0.597 ***	0.616 ***	0.269 ***	0.247 ***	0.321 ***	0.368 ***	0.330 ***			
InterestCov	-0.510 ***	0.395 ***	0.467 ***	0.369 ***	0.496 ***	0.038	0.304 ***	0.340 ***	0.365 ***	0.475 ***	0.177 ***	0.478 ***		
IssuerSize	-0.389 ***	0.465 ***	0.898 ***	0.653 ***	0.921 ***	0.567 ***	0.668 ***	0.043	0.592 ***	0.338 ***	0.011	0.597 ***	0.380 ***	
ROA	0.488 ***	0.567 ***	-0.567 ***	-0.425 ***	-0.555 ***	-0.239 ***	-0.349	-0.208 ***	-0.467 ***	-0.425 ***	-0.185 ***	-0.516 ***	-0.845 ***	-0.537 ***

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

Table 14 Credit Rating Model

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

Explanatory Variable		T-Value	P-Value
Intercept	-0.54	-0.1	0.9177
FairValue	0.16	3.58	0.0004
Specialist	-0.45	-1.62	0.1068
Leverage	-8.88	-1.78	0.0772
InterestCov	0.094	0.7	0.4839
ROA	0.64	3.5	0.0006
Loss	-1.91	-3.99	<.0001
Size	1.09	10.59	<.0001
Year Dummies	YES		
Adjusted R2	0.6947		
F-Statistics	41.58		
Number of Observations	252		

Table 15 Yield Spread Model

$$YieldSpread_{it} = \alpha_0 + \alpha_1 OrthRating_{it} + \alpha_2 FairValue_{it} + \beta_1 Underwriter_{it} + \beta_2 Maturity_{it} + \beta_3 IssueSize_{it} + \beta_4 Convertible_{it} + \beta_5 Leverage_{it} + \beta_6 InterestCov_{it} + \beta_7 IssuerSize_{it} + \beta_8 ROA_{it} + \gamma_{0,\ldots,5} Year_{it} + \varepsilon_{it} \quad (2)$$

$$YieldSpread_{it} = \alpha_0 + \alpha_1 OrthRating_{it} + \alpha_2 Level1_{it} + \alpha_3 Level2_{it} + \alpha_4 Level3_{it} + \beta_1 Underwriter_{it} + \beta_2 Maturity_{it} + \beta_3 IssueSize_{it} + \beta_4 Convertible_{it} + \beta_5 Leverage_{it} + \beta_6 InterestCov_{it} + \beta_7 IssuerSize_{it} + \beta_8 ROA_{it} + \gamma_{0,\ldots,5} Year_{it} + \varepsilon_{it} \quad (3)$$

Explanatory Variable	Model (2)			Model (3)		
	Coefficient	**T-Value**	**P-Value**	**Coefficient**	**T-Value**	**P-Value**
Intercept	2.20095	0.37	0.7091	1.91	0.28	0.7805
OrthRating	-0.4889	-5.02	<.0001	-0.59	-5.45	<.0001
FairValue	-0.2319	-2.21	0.0274			
Level1				-0.02	-2.79	0.0168
Level2				-0.01	-2.33	0.0301
Level3				0.02	1.71	0.0857
Underwriter	-1.1244	-4.46	<.0001	-0.03	-3.13	<.0001
Maturity	-0.8065	-2.34	0.0201	-0.74	-2.11	0.0355
IssueSize	-0.8618	-7.78	<.0001	-0.17	-1.31	0.1895
Convertible	6.50818	13.28	<.0001	6.83	12.93	<.0001
Leverage	11.8847	1.69	0.0911	14.59	1.66	0.0984
InterestCov	-0.0545	-11.56	<.0001	-0.08	-0.59	0.5569
IssuerSize	-0.5292	-3.9	0.0001	-0.64	-4.1	<.0001
ROA	-1.72828	-5.83	<.0001	-1.90	-5.87	<.0001
Year	YES					
Adjusted R2	0.73			0.74		
F-Statistics	58.26			49.93		
# of Obs	376			376		

Table 16 Yield Spread Model with Auditor Industry Expertise

$$YieldSpread_{it+1} = \alpha_0+\alpha_1 OrthRating_{it} + \alpha_2 FairValue_{it}+\alpha_3 Specialist_{it} + \alpha_4 FairValue_{it} * Specialist_{it} + \beta_1 Underwriter_{it} + \beta_2 Maturity_{it} + \beta_3 IssueSize_{it}+\beta_4 Convertible_{it}+\beta_5 Leverage_{it} + \beta_6 InterestCov_{it} + \beta_7 IssuerSize_{it} + \beta_8 ROA_{it} + \gamma_{0,\dots,5} Year_{it} + \varepsilon_{it} \quad (6)$$

$$YieldSpread_{it+1} = \alpha_0+\alpha_1 OrthRating_{it} + \alpha_2 Level1_{it} + \alpha_3 Level2_{it} + \alpha_4 Level3_{it}+\alpha_5 Specialist_{it} + \alpha_6 Level1_{it} * Specialist_{it} + \alpha_7 Level2_{it} * Specialist_{it}+\alpha_8 Level3_{it} * Specialist_{it} + \beta_1 Underwriter_{it} + \beta_2 Maturity_{it} + \beta_3 IssueSize_{it}+\beta_4 Convertible_{it}+\beta_5 Leverage_{it} + \beta_6 InterestCov_{it} + \beta_7 IssuerSize_{it} + \beta_8 ROA_{it} + \gamma_{0,\dots,5} Year_{it} + \varepsilon_{it} \quad (7)$$

	Model (6)			Model (7)		
Explanatory Variable	**Coefficient**	**T-Value**	**P-Value**	**Coefficient**	**T-Value**	**P-Value**
Intercept	7.93	1.29	0.20	3.19	0.51	0.61
OrthRating	-0.53	-5.23	<0.0001	-0.48	-4.48	<.0001
FairValue	-0.73	-1.75	0.08			
Level1				-0.11	-1.73	0.08
Level2				-0.01	-1.99	0.06
Level3				0.59	-3.92	0.0001
Specialist	-0.07	-3.6	0.0004	-1.65	-2.95	0.003
FV*Specialist	-1.26	-2.57	0.01			
Level1*Specialist				-0.07	-1.05	0.29
Level2*Specialist				-0.01	-0.42	0.67
Level3*Specialist				-0.77	-4.6	<0.0001
Underwriter	0.03	0.13	0.90	0.21	0.77	0.44
Maturity	-0.75	-2.21	0.03	-0.18	-0.54	0.59
IssueSize	-0.14	-1.1	0.27	-0.49	-3.86	0.0001
Convertible	7.54	12.93	<.0001	6.62	10.3	<.0001
Leverage	9.31	1.32	0.19	15.05	1.96	0.05
InterestCov	-0.08	-0.72	0.47	-0.16	-1.32	0.19
IssuerSize	-0.66	-4.78	<.0001	-0.56	-3.56	0.0004
ROA	-1.69	-5.68	<.0001	-0.90	-3.59	0.0004
Adjusted R2	0.74			0.68		
F-Statistics	54.26			50.35		
# of Obs	376			376		

Table 17 Robustness Check with Market Capitalization as denominator of Fair Value Measures

	Model (2)	Model (3)	Model (6)	Model (7)
Explanatory Variable	**Coefficient**	**Coefficient**	**Coefficient**	**Coefficient**
Intercept	0.72	0.05	3.36	6.25
OrthRating	-0.52***	-0.54***	-0.62***	-0.55***
FairValue	-0.01**		-0.07*	
Level1		-0.06*		-0.07*
Level2		-0.02*		-0.05*
Level3		0.08**		0.11**
Specialist			0.28	0.53
FairValue*Specialist			-0.07***	
Level1*Specialist				-1.15
Level2*Specialist				-0.04
Level3*Specialist				-0.97***
Underwriter	0.10	0.12	0.03	-0.007
Maturity	-0.83**	-0.85**	0.79**	-0.76**
IssueSize	-0.23*	-0.23*	-0.17	-0.15*
Convertible	6.57***	6.64***	7.37***	7.52***
Leverage	12.65*	12.81	12.52*	3.51
InterestCov	-0.05	-0.03	-0.09	-0.15
IssuerSize	-0.48***	-0.46***	-0.58***	-0.59***
ROA	-1.74***	-1.78***	-1.85***	-1.45***
Adjusted R2	0.73	0.73	0.73	0.74
F-Statistics	58.15	51.40	53.52	44.22
Number of Observations	376	376	376	376

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

Table 18 Robustness Check with Fair Value Assets and Liability Measures

$$YieldSpread_{it} = \alpha_0+\alpha_1 OrthRating_{it} + \alpha_2 FVA1_{it}+\alpha_3 FVA2_{it} + \alpha_4 FVA3_{it}+\alpha_4 FVL1_{it}+\alpha_5 FVL2_{it} + \alpha_6 FVL3_{it}+\beta_1 Underwriter_{it} + \beta_2 Maturity_{it} + \beta_3 IssueSize_{it}+\beta_4 Convertible_{it}+\beta_5 Leverage_{it} + \beta_6 InterestCov_{it} + \beta_7 IssuerSize_{it} + \beta_8 ROA_{it} + \gamma_{0,\dots,5} Year_{it} + \varepsilon_{it} \quad (8)$$

	Coefficient	**T-Value**	**P-Value**
Intercept	2.99	0.42	0.68
OrthRating	-0.52	-4.68	<0.0001
FVA1	-0.17	-2.58	0.02
FVA2	-0.10	-2.16	0.04
FVA3	0.81	1.71	0.09
FVL1	-1.29	-1.88	0.08
FVL2	-0.05	-0.26	0.79
FVL3	-1.62	-1.63	0.10
Underwriter	0.12	0.42	0.89
Maturity	0.83	2.36	0.01
IssueSize	-0.18	-1.41	0.16
Convertible	6.89	11.63	<0.0001
Leverage	9.69	1.02	0.31
InterestCov	0.06	0.49	0.63
IssuerSize	-0.47	-2.82	0.005
ROA	-1.81	-4.83	<0.0001
Adjusted R2	0.73		
F-Statistics	44.4		
Number of Observations	376		

Table 19 Robustness Check with Exclusion of Credit Rating Residuals

	Model (2)	Model (3)	Model (6)	Model (7)
Explanatory Variable	**Coefficient**	**Coefficient**	**Coefficient**	**Coefficient**
Intercept	13.84**	17.82***	20.17***	20.19***
FairValue	-0.65**		-0.47*	
Level1		-0.05*		-0.10*
Level2		-0.01*		-0.006
Level3		0.05**		0.59***
Specialist			-0.66*	-1.65***
FairValue*Specialist			-0.41***	
Level1*Specialist				-0.07
Level2*Specialist				-0.01
Level3*Specialist				-0.77***
Underwriter	0.29	0.22	0.33	0.21
Maturity	0.42	-0.36	0.41	-0.18**
IssueSize	-0.36***	-0.39***	-0.29**	-0.48*
Convertible	6.28***	6.19***	7.40***	6.62***
Leverage	-2.34	-9.25	-6.18	15.05*
InterestCov	-0.08	-0.15	-0.05	-0.16
IssuerSize	-0.42***	-0.31***	-0.53***	-0.56***
ROA	-0.97***	-0.88***	-0.87***	-0.96***
Adjusted R2	0.71	0.71	0.71	0.68
F-Statistics	56.3	46.9	53.52	50.35
Number of Observations	376	376	376	376

Table 20 Robustness Check with Exclusion of Convertible Bonds

	Model (2)	Model (3)	Model (6)	Model (7)
Explanatory Variable	**Coefficient**	**Coefficient**	**Coefficient**	**Coefficient**
Intercept	6.08	12.06	-3.49	-3.71
OrthRating	-0.36***	-0.25*	-0.47***	-0.22*
FairValue	-1.19***		-2.37***	
Level1		-0.13***		-0.26***
Level2		-0.01*		-0.03*
Level3		0.06**		0.07***
Specialist			-1.31***	-0.61***
FairValue*Specialist			-2.18***	
Level1*Specialist				-0.21***
Level2*Specialist				-0.03**
Level3*Specialist				-0.97***
Underwriter	-0.89***	-0.87***	-0.57*	0.44
Maturity	-0.67*	-0.77**	-0.35	-0.83**
IssueSize	-0.93***	-0.98***	-0.85**	-0.99***
Leverage	17.01*	4.95	22.64***	29.88***
InterestCov	0.11	-0.11	-0.02	-0.10
IssuerSize	-0.72***	-0.44***	-0.60***	-0.76***
ROA	-1.04***	-0.70***	-1.42***	-1.07***
Adjusted R2	0.58	0.58	0.60	0.58
F-Statistics	32.75	32.66	31.46	33.11
Number of Observations	376	376	376	376

Table 21 Robustness Check with Crisis Dummy

	Model (2)	Model (3)	Model (6)	Model (7)
Explanatory Variable	**Coefficient**	**Coefficient**	**Coefficient**	**Coefficient**
Intercept	-5.94	-2.05	-7.33	-4.80
OrthRating	-0.28**	-0.53***	-0.53***	-0.22**
FairValue	-0.92**		-0.73**	
Level1		-0.02*		-0.25***
Level2		-0.01*		-0.04*
Level3		0.05**		0.78***
Specialist			-0.07*	-0.36
FairValue*Specialist			-1.25**	
Level1*Specialist				-0.19**
Level2*Specialist				-0.05*
Level3*Specialist				-0.79***
Underwriter	0.78	0.25	0.03	0.38
Maturity	-1.08***	-0.77**	-0.75*	-0.77**
IssueSize	-1.02***	-0.19***	-0.14***	-1.08*
Convertible	-6.568***	-6.80***	-7.54***	-6.62***
Leverage	27.87***	13.42	9.31	30.34***
InterestCov	0.13	-0.08	-0.08	-0.14
IssuerSize	-0.66***	-0.57***	-0.66***	-0.71***
ROA	-1.03***	-1.87***	-1.69***	-1.05***
Crisis	1.85***	0.40*	0.59*	0.53*
Adjusted R2	0.73	0.71	0.74	0.69
F-Statistics	58.26	56.81	54.26	48.63
Number of Observations	296	296	296	296

Table 22 Robustness Check with MegaBank Dummy

	Model (2)	Model (3)	Model (6)	Model (7)
Explanatory Variable	**Coefficient**	**Coefficient**	**Coefficient**	**Coefficient**
Intercept	-3.48	-1.58	-6.34	-5.21
OrthRating	-0.26**	-0.50***	-0.48***	-0.18**
FairValue	-0.90**		-0.68**	
Level1		-0.03*		-0.25***
Level2		-0.01*		-0.03*
Level3		0.04**		0.70***
Specialist			-0.05*	-0.66
FairValue*Specialist			-1.20**	
Level1*Specialist				-0.15**
Level2*Specialist				-0.05*
Level3*Specialist				-0.56***
Underwriter	0.89	0.70	0.05	0.50
Maturity	-2.01***	-1.02**	-0.98*	-0.99**
IssueSize	-2.02***	-1.21***	-1.25***	-2.03*
Convertible	-5.21***	-6.99***	-7.59***	-6.67***
Leverage	30.24***	11.21	10.23	31.02***
InterestCov	0.21	-0.09	0.05	-0.16
IssuerSize	-0.99***	-0.71***	-0.85***	-0.73***
ROA	-1.06***	-1.77***	-1.72***	-1.61***
MegaBank	-1.52***	-1.35***	-1.59***	-1.58***
Adjusted R2	0.76	0.73	0.77	0.72
F-Statistics	60.29	58.96	56.21	53.99
Number of Observations	296	296	296	296

Table 23 Robustness Check with Multicollinearity of Control Variables

	Model (2)	Model (3)	Model (6)	Model (7)
Explanatory Variable	**Coefficient**	**Coefficient**	**Coefficient**	**Coefficient**
Intercept	6.61***	7.86***	8.43***	8.72***
OrthRating	-0.29***	-0.41***	-0.37***	-0.43**
FairValue	-1.04***		-2.57**	
Level1		-0.02*		-0.15**
Level2		-0.03***		-0.01*
Level3		0.11**		0.19**
Specialist			-0.05*	-0.63
FairValue*Specialist			-1.33***	
Level1*Specialist				-0.18**
Level2*Specialist				-0.04
Level3*Specialist				-0.16*
Underwriter	0.16	0.05	0.10	0.05
Maturity	-0.61*	-0.59*	-0.57**	-0.56**
IssueSize	-0.31***	-0.27***	-0.23***	-0.26**
Convertible	-6.15***	-6.40***	-7.25***	-7.18***
OrthLev	-0.16	5.38	1.75	0.51
OrthCov	-0.01	-0.06	-0.03	-0.11
OrthSize	-0.45***	-0.58***	-0.61***	-0.78***
OrthROA	-0.65***	-0.68***	-6.29***	-0.69***
Adjusted R2	0.72	0.73	0.73	0.73
F-Statistics	55.19	47.70	51.60	43.37
Number of Observations	296	296	296	296

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.
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.
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
IssueSize	The natural logarithm of the issue proceeds
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

The following table presents the asset and liabilities measured at fair value as of December 31, 2011 and 2010 by major product category and fair value hierarchy.

Assets and liabilities measured at fair value on a recurring basis

	Fair value hierarchy				
December 31, 2011 (in millions)	Level 1[a]	Level 2[a]	Level 3[a]	Netting adjustments	Total fair value
Federal funds sold and securities purchased under resale agreements	$ –	$ 24,891	$ –	$ –	$ 24,891
Securities borrowed	–	15,308	–	–	15,308
Trading assets:					
Debt instruments:					
Mortgage-backed securities:					
U.S. government agencies[a]	27,082	7,801	86	–	34,969
Residential - nonagency	–	2,956	796	–	3,752
Commercial - nonagency	–	870	1,758	–	2,628
Total mortgage-backed securities	27,082	11,627	2,640	–	41,349
U.S. Treasury and government agencies[a]	11,508	8,391	–	–	19,899
Obligations of U.S. states and municipalities	–	15,117	1,619	–	16,736
Certificates of deposit, bankers' acceptances and commercial paper	–	2,615	–	–	2,615
Non-U.S. government debt securities	18,618	40,080	104	–	58,802
Corporate debt securities	–	33,938	6,373	–	40,311
Loans[b]	–	21,589	12,209	–	33,798
Asset-backed securities	–	2,406	7,965	–	10,371
Total debt instruments	57,208	135,763	30,910	–	223,881
Equity securities	93,799	3,502	1,177	–	98,478
Physical commodities[c]	21,066	4,898	–	–	25,964
Other	–	2,283	880	–	3,163
Total debt and equity instruments[d]	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)	14,741
Total derivative receivables[e]	6,718	1,842,740	35,041	(1,792,022)	92,477
Total trading assets	178,791	1,989,186	68,008	(1,792,022)	443,963
Available-for-sale securities:					
Mortgage-backed securities:					
U.S. government agencies[a]	92,426	14,681	–	–	107,107
Residential - nonagency	–	67,554	3	–	67,557
Commercial - nonagency	–	10,962	267	–	11,229
Total mortgage-backed securities	92,426	93,197	270	–	185,893
U.S. Treasury and government agencies[a]	3,837	4,514	–	–	8,351
Obligations of U.S. states and municipalities	36	16,246	258	–	16,540
Certificates of deposit	–	3,017	–	–	3,017
Non-U.S. government debt securities	25,381	19,884	–	–	45,265
Corporate debt securities	–	62,176	–	–	62,176
Asset-backed securities:					
Credit card receivables	–	4,655	–	–	4,655
Collateralized loan obligations	–	116	24,745	–	24,861
Other	–	11,105	213	–	11,318
Equity securities	2,667	38	–	–	2,705
Total available-for-sale securities	124,347	214,948	25,486	–	364,781
Loans	–	450	1,647	–	2,097
Mortgage servicing rights	–	–	7,223	–	7,223
Other assets:					
Private equity investments[f]	99	706	6,751	–	7,556
All other	4,336	233	4,374	–	8,943
Total other assets	4,435	939	11,125	–	16,499
Total assets measured at fair value on a recurring basis[g]	$ 307,573	$ 2,245,722	$ 113,489	$ (1,792,022)	$ 874,762
Deposits	$ –	$ 3,515	$ 1,418	$ –	$ 4,933
Federal funds purchased and securities loaned or sold under repurchase agreements	–	9,517	–	–	9,517
Other borrowed funds	–	8,069	1,507	–	9,576
Trading liabilities:					
Debt and equity instruments[d]	50,830	15,677	211	–	66,718
Derivative payables:					
Interest rate	1,537	1,395,113	3,167	(1,371,807)	28,010
Credit	–	155,772	9,349	(159,511)	5,610
Foreign exchange	846	159,258	5,904	(148,573)	17,435
Equity	–	39,129	7,237	(36,711)	9,655
Commodity	3,114	53,684	3,146	(45,677)	14,267
Total derivative payables[e]	5,497	1,802,956	28,803	(1,762,279)	74,977
Total trading liabilities	56,327	1,818,633	29,014	(1,762,279)	141,695
Accounts payable and other liabilities	–	–	51	–	51
Beneficial interests issued by consolidated VIEs	–	459	791	–	1,250
Long-term debt	–	24,410	10,310	–	34,720
Total liabilities measured at fair value on a recurring basis	$ 56,327	$ 1,864,603	$ 43,091	$ (1,762,279)	$ 201,742

JPMorgan Chase & Co./2011 Annual Report 189

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*.