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Abstract

This study examines the implications of fair value liability gains and losses arising from the adoption of Statement of Financial Accounting Standards No. 159 (hereafter FAS 159). We find a positive correspondence between a firm's FAS 159 fair value liability gains and losses and stock returns. Further analysis indicates that fair value gains and losses from liabilities attributable to the change in a firm's own credit risk, which are considered counter-intuitive by critics of fair value accounting for liabilities, are also positively related to returns. Lastly, we document that the volatility of earnings that incorporate FAS 159 liability fair value gains and losses is positively associated with market measures of firm risk. Our study contributes to the controversy over recognition of liability fair value gains and losses by providing direct empirical evidence that such gains and losses are perceived as economic income by market participants.

1. Introduction

We examine how investors perceive the valuation and risk implications of recognized fair value gains and losses attributable to fair value changes in liabilities (hereafter gains (losses) from liabilities). Statement of Financial Accounting Standards No. 159 (hereafter FAS 159), *The Fair Value Option for Financial Assets and Financial Liabilities*, allows firms to elect fair value as the measurement basis for certain financial assets and liabilities. The fair value option is applied on an instrument-by-instrument basis and the decision to elect the fair value option is irrevocable.

Because FAS 159 gives firms the option to fair value their financial liabilities, the standard has been controversial and has drawn considerable attention. This is particularly so during the financial crisis in 2008 when some banks reported greater than expected accounting income due to the application of FAS 159.[1] Particularly, the inclusion of a firm's own credit risk when measuring the fair value of liabilities remains one of the most debated aspects of fair value accounting (Barth, Hodder and Stubben 2008). In fact, because of the ongoing controversy on gains (losses) from liabilities, the FASB agreed in Jun 2012 to have firms report such gains (losses) in other comprehensive income instead of net income.[2] Notwithstanding the controversy, there is relatively little evidence regarding the implications of reported gains (losses) from liabilities. An important reason for this paucity of empirical evidence is the limited availability of data, which results from most financial liabilities not being recognized on a fair value

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[1] For example, Goldman Sachs reported US$ 845 million of income before extraordinary items in the 3rd quarter of 2008, but gains from the fair value change in liabilities were US$ 3.8 billion. Without these gains, Goldman Sachs would have reported a loss of US$ 3 billion. Similarly, JPMorgan reported a US$ 54 million loss in the same quarter, but it would have reported a US$ 13.1 billion loss without the gains from the fair value change in liabilities.

[2] FASB also plans that the other comprehensive income resulting from change in a firm's creditworthiness will be realized when firms settle the debt. However, the decision is not finalized (Whitehouse 2012).

measurement basis under existing accounting rules.[3] Fair value gains and losses arising from the adoption of FAS 159 are reported as a separate line item in the financial statements. We hand-collect these gains and losses from the financial statements and collect other, more detailed information about the nature of fair value changes in these elected instruments from the FAS 159 footnote disclosures to analyze the implications of those gains (losses) from liabilities.

We examine the implications of fair value accounting for liabilities along two dimensions. First, we investigate whether reported FAS 159 accounting gains (losses) from liabilities included in earnings are related to firm value. Economic theory suggests that there are valuation and risk implications from fair valuing a firm's liabilities.[4] If a firm's reported accounting income gains (losses) reflect economic gains (losses) to the firm's equity holders (e.g., the impact of changes in macroeconomic conditions or a firm's own credit risk), then fair value gains (losses) from a firm's liabilities should be value relevant. In contrast, critics of fair valuing liabilities view the gains (losses) from liabilities differently. Liabilities are seldom transferred but held until their maturity in most cases. Hence, the realizability of liability gains and losses can be at most theoretical. Furthermore, critics argue that deteriorating market or firm condition leading to gains does not make intuitive sense. For example, firms will recognize gains when their creditworthiness declines or when market interest rates increase because of deteriorating market conditions. If gains (losses) from liabilities are perceived as only theoretical, then they should have no practical implications and should not be value relevant.

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[3] SFAS 107 requires entities to disclose fair valued liabilities, but does not require firms to recognize the changes in fair value of liabilities as earnings. Since the amount of fair valued liabilities can change because of new issuance or settlement of liabilities, SFAS 107 disclosures do not provide information about the precise change in the fair value of liabilities.

[4] Bohn (2000) provides a survey of the relevant research pertaining to the relation between debt value, credit risk and equity value. See also Barth and Landsman (1995) for a discussion of the accounting issues pertaining to fair value accounting for liabilities.

Second, we examine the implications of FAS 159 gains (losses) from liabilities for firm risk. Prior research suggests that a full fair value financial reporting model enables investors to better assess firm risk (Hodder, Hopkins and Wahlen 2006). This is because reported fair value information informs investors about a firm's underlying economic volatility. In that regard, greater inclusion of fair value estimates for firms that elect FAS 159 adoption (or other fair value measurement standards) should result in a net income figure that better reflects the firm's riskiness. A stated objective of FAS 159 is to mitigate unnecessary volatility in reported earnings resulting from measuring related assets and liabilities differently. If this objective is achieved, we expect the earnings volatility of firms that recognize gains (losses) from liabilities to more closely reflect a firm's risk.[5] However, if gains (losses) from liabilities add noise to earnings as critics argue, then earnings that include such gains (losses) should not be incrementally relevant for firm risk over earnings that do not include these gains (losses).

Using firms that adopt FAS 159 for their liabilities, we find a positive association between a firm's stock returns and gains (losses) from financial liabilities.[6] These results extend prior research that investigates the value relevance of fair value gains and losses of financial assets (e.g., Barth 1994). We also assess the value relevance of gains (losses) from liabilities that are due to a firm's own credit risk changes and gains (losses) from liabilities that are due to changes in overall market conditions as reflected in market interest rates. To perform this test, we hand-collect the fair value gains (losses) in each liability instrument from 10Q and 10K

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[5] Prior to the adoption of FAS 159, fair value changes of certain assets were included in earnings whereas fair value changes of corresponding liabilities were not included in earnings. However, market interest rate and other macroeconomic factors affect both the fair values of assets and liabilities. Hence, the inclusion of fair value changes of assets may induce artificial earnings volatility which does not fully reflect the underlying economic risk of the firm. The adoption of FAS 159 allows firms to measure both assets and corresponding liabilities using a consistent measurement basis. The volatility of reported net income based on a single measurement basis should thus be a better reflection of the economic risk of the firm.

[6] We note that our results may not be generalizable because we only examine firms that adopted FAS159. We also note that we do not compare firms that voluntarily adopt FAS 159 to the firms that do not; consequently, endogeneity is not a significant concern in our analyses.

footnotes. We group the fair value gains (losses) from these liability instruments into two categories - gains (losses) from debt instruments (i.e., liabilities whose fair values are more likely to be affected by a firm's credit risk changes) and gains (losses) from other instruments. We find that gains (losses) from both debt and other instruments are positively associated with a firm's stock returns. These results suggest that the controversial fair value gains and losses from liabilities attributable to the change in a firm's own credit risk are value relevant.

Some firms voluntarily disclose the liability gains and losses attributable to changes in their own credit risk. These disclosures allow us to clearly distinguish gains and losses arising from a firm's own credit risk changes from gains and losses arising from changes in other factors. Using this reduced sample of hand-collected information from 10Q and 10K filings, we still find that gains and losses attributable to changes in a firm's own credit risk are value relevant.

Lastly, we examine whether the volatility of earnings that includes fair value changes of liabilities is a better proxy for firm risk. Previous research uses self-constructed income measures to compute a full fair value income measure (e.g., Hodder et al. 2006). In contrast, we use reported income measures in our risk-relevance tests.[7] First, unlike Hodder et al. (2006), we find a reduction in earnings volatility after including FAS 159 gains (losses) from liabilities. Second, consistent with Hodder et al. (2006), our results indicate that the volatility of earnings that incorporate FAS 159 fair value gains (losses) is incrementally risk relevant to investors. These results are consistent with the FASB's claim that reported earnings will have lower volatility and will better reflect market and other firm risks when firms measure both financial assets and financial liabilities at fair value.

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[7] Notwithstanding these differences, we also note that our income measure does not purport to represent a full fair value income measure. This is because many items in the balance sheet are still not recognized at fair value.

We contribute to existing research that addresses the controversy surrounding fair value accounting for liabilities. Barth et al. (2008) find that the relation between credit risk changes and equity returns is significantly less negative for firms with more debt. That is, the negative effect related to the increase in a firm's credit risk is partially offset by the gains from liabilities, indicating such gains are priced by the market. Although similar in spirit to Barth et al. (2008), our study is different in at least three important ways.

First, we examine the value relevance of overall gains and losses from liabilities resulting from the change in both the market interest rate risk (and other macroeconomic factors) and a firm's own credit risk. In contrast, Barth et al. (2008) focus only on the liability gains and losses resulting from the change in a firm's credit risk. Although this is an important issue, the debate for recognizing the fair value change in liabilities is not confined to gains (losses) from the change in a firm's own credit risk. Among the arguments in favor of recognizing gains (losses) from liabilities is that fair valuing liabilities will lead to better a match between fair valued assets and liabilities since both sides of balance sheets are affected by changes in market interest rates and other macroeconomic factors as well as by the change in an entity's creditworthiness. Second, firms did not recognize gains and losses from liabilities as earnings during Barth et al.'s (2008) sample period. As a result, they could not conduct a direct test of the value relevance of fair value gains and losses from liabilities. By using the data on firms that recognize gains and losses from liabilities in the post FAS 159 period, we are able to provide direct evidence on the value relevance of *reported* fair value gains and losses from liabilities. Third, Barth et al. (2008) study the implications for nonfinancial firms. However, the debate on the fair value gains and losses from liabilities is most relevant for financial firms because of their sizable holdings of financial assets and liabilities. In fact, it was financial institutions that triggered the controversy

regarding the recognition of fair value gains and losses from liabilities in the 2008 crisis period by reporting larger than expected earnings as a result of the liability gains recognized.

Recent experimental research suggests that market participants may not be able to fully understand the valuation and risk implications of changes in fair value of a firm's liabilities (e.g., Gaynor, McDaniel and Yohn 2011; Koonce, Nelson and Shakespeare 2011). Unlike that research, we provide direct evidence on the value and risk relevance of fair value gains and losses from liabilities of financial firms. In this regard, our study complements Barth et al. (2008). Overall, our study helps to inform standard setters on the financial reporting implications of fair value measurement of liabilities by documenting the benefits of fair value accounting for liabilities.

The remainder of the paper proceeds as follows. Section 2 develops the hypotheses. Section 3 describes the data and research design. Section 4 discusses the main results and the results of additional analyses. Section 5 presents our conclusions.

2. Literature Review and Hypothesis Development

2.1 Institutional background

FAS 159 was promulgated to permit firms the option (i.e., the "fair value option") to measure financial instruments at fair value on an instrument-by-instrument application. Under this standard, firms have the discretion to irrevocably elect fair value as the initial and subsequent measurement attribute for certain financial assets and liabilities. All fair value changes must be reflected in earnings, including fair value changes resulting from changes in market interest rates (and other macroeconomic factors) as well as changes in the firm's own creditworthiness. To improve transparency, the standard requires various disclosures, including information relating to how changes in fair values affect a firm's earnings.

The stated objective of FAS 159 is to improve financial reporting by providing firms with the opportunity to mitigate artificial volatility in reported earnings caused by measuring related assets and liabilities differently. Adopting this standard will also allow firms to apply the fair value measurement basis to designated derivative assets and liabilities without having to apply complex hedge accounting provisions. Finally, standard setters believe that this standard will expand the use of fair value measurement and help to mitigate some of the limitations of the mixed-attribute reporting model.

Because FAS 159 permits firms to fair value some of their liabilities, it has received considerable attention and resulted in much controversy over whether or not fair value gains (losses) from liabilities reflect economic income. In the following subsections, we highlight the main arguments in the debate for and against the fair value measurement of liabilities.[8]

2.1.1. Argument for recognizing the fair value gains (losses) from liabilities as income.

Better match between assets and liabilities

A central argument for fair valuing a firm's liabilities is to better align the measurement basis of a firm's liabilities with the measurement basis of its corresponding assets. Measuring liabilities at fair value will lead to a consistent measurement basis on both sides of the balance sheet if a firm has been measuring its assets at fair value. In contrast, if a firm's assets are measured at fair value but its liabilities are measured at amortized cost, changes in market interest rates or the firm's credit risk will affect only the fair value measurements of the firm's assets but will not lead to a re-measurement of its liabilities. If the measurement of liabilities does not incorporate the effect of these changes, then there is an accounting income mismatch.

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[8] See also, a discussion paper by IASB (2009) titled "Credit Risk in Liability Measurement" for an in-depth discussion of the issues pertaining to this debate.

Consequently, net income (or other comprehensive income) will be distorted by the mismatch, and will not properly reflect the underlying economics of the firm. This argument also underlies the FASB's long-term objective of measuring liabilities at fair value to be consistent with measuring assets at fair value.

Hodder et al. (2006) provide some evidence that supports this argument. They examine properties of GAAP net income, GAAP comprehensive income, and full fair value income to determine which accounting income measure best reflects firm risk, and find that investors view the volatility of full fair value income as a better measure of firm risk than the other two measures. The authors interpret their results as suggesting that greater inclusion of fair value estimates will lead to reported accounting income that better reflects a firm's underlying economic risk. Relatedly, Hirst, Hopkins and Wahlen (2004) also document that a full fair value income measurement is more likely to enable analysts to reach better informed value and risk judgments about a firm's fundamentals.

Merton's theory: Wealth transfer between equity and debt holders

Barth et al. (2008) outline the economic justification for fair value measurement of a firm's liabilities based on Merton's (1974) theoretical framework. Briefly, the equity value of a firm represents a call option on the value of its assets and the value of its debt is the strike price on the call option. Conversely, shareholders have an option to put the firm to debt holders. Hence the value of exercising that option increases when the value of the firm's assets decreases. Likewise, the value of debt will decrease when firm value decreases since debt holders wrote the put option when they lent money to the firm.[9]

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[9] The symmetric payoff between equity holders and debt holders is clearly illustrated in option pricing theory between the party that exercises the put option (i.e., the equity holders) and the party that writes the put option (i.e.,

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The above argument can also be viewed based on the classic accounting equation that assets equal liabilities plus equity, for which liabilities and equity represent two classes of claims against the firm's assets. An increase in the credit risk of the firm's liabilities represents a transfer of wealth from debt holders to equity holders in the following way. As the firm's ability to pay its liabilities diminishes, the potential loss to shareholders is limited to the amount of their investment. In contrast, debt holders may be unable to recover the principal amount they have lent to the firm since equity holders are not obligated to inject additional capital into the firm. Effectively, debt holders will "share" in the losses of the firm if the firm becomes insolvent. Therefore, the apparent gain to the firm is essentially an allocation of claims between the firm's owners and its lenders.

Supporting the above argument, Barth et al. (2008) find evidence that there are two countervailing equity value effects associated with increases in credit risk. The main effect is a decrease in equity value, arising from a decrease in asset value, and the secondary effect is an increase in equity value associated with a decrease in debt value. Barth et al. (2008) document that the relation between credit risk change and equity returns is significantly less negative when the firm has more debt. Their finding is consistent with the reasoning that debt holders subsidize wealth decreases. Hence their study indicates that debt value changes resulting from the firms' credit risk changes represent a component of a firm's economic income and should be considered for inclusion in a firm's accounting income.

2.1.2. Argument against recognizing fair value gains (losses) from liabilities as income

Realizability issue

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the debt holders). Specifically, equity holders will exercise their put option to transfer the firm to debtholders if firm value falls below the value of total debt outstanding in the firm.

While Merton's theory is theoretically sound in its reasoning, it may not incorporate some of the effects of market realities. In particular, opponents of fair valuing liabilities argue that accounting measurement of liabilities does not take into account factors such as low tradability and counterparty constraints that make realization of fair value changes in liabilities unlikely. Hence any reported profit accruing to the firm from fair valuing its liabilities is essentially theoretical.[10]

The realizability argument against fair valuing liabilities is as follows. If liabilities are seldom transferred, it is not clear whether the firm has the ability to benefit from the change in liability value, even if there is a change in its fair value. A liability transfer usually requires negotiations between the firm (i.e., the debt issuer) and its counterparties (i.e., the debt holders), which often is a lengthy process. Hence, most liabilities are typically held to maturity for redemption at their face value by the firm and typically do not involve debt renegotiation despite changes in the market value of a firm's debt. Consequently, the economic impact to a firm's equity holders attributable to changes in the fair values of a firm's liabilities is unclear.[11] In support of the above argument, Koonce et al. (2011) find that investors' fair value judgments are contingent on specific contexts even if these judgments appear inconsistent with the predictions of economic theory. Specifically, investors consider fair value changes to be less relevant for liabilities. Investors also view fair value changes as more relevant when firms anticipate selling or settling their financial instruments in the near-term compared to held-to-maturity financial

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[10] An alternative view is that realizability is irrelevant to this issue. Proponents argue that unrealized fair value gains and losses relate to forgone opportunities arising from the decision to continue to hold assets or owe liabilities. These forgone opportunities (or opportunity costs) are viewed as informative and allow investors to reassess the value of the firm.

[11] In contrast, unrealized fair value changes in assets can be recognized or disclosed in the financial statements because these assets are presumed to be readily available for disposal unless there are significant restrictions preventing the firm from disposing them.

instruments. Thus, the authors suggest that reported fair value measurements of a firm's liabilities might induce differential investor reaction compared with other financial instruments.

Counter-intuitive nature of fair value gains (losses) from liabilities

Critics argue that recognizing fair value changes in liabilities, particularly, recognizing changes in debt value arising from changes in a firm's own credit risk will lead to counterintuitive results. The counterintuitive income statement effect argument remains one of the most commonly cited objections to fair valuing liabilities. When liability measurement includes the impact of a firm's own credit risk, a firm reports an accounting gain from a decline in the credit quality of its liabilities. Opponents of fair value accounting for liabilities have argued that this gain is misleading and counterintuitive. Their basic premise is that reporting accounting gains from a firm's deteriorating fundamentals provide misleading information signals. For example, Lipe (2002) documents that accounting information might convey misleading positive signals when a firm that is approaching bankruptcy uses fair value to measure liabilities. This arises because the firm reports a gain when its financial strength deteriorates and a loss when its financial strength increases.[12]

2.2 Hypothesis development

We address the above issues by empirically examining the valuation and risk implications of fair value gains and losses attributable to fair value changes in liabilities for firms that adopt FAS 159. Our setting allows for a direct test of the above arguments about whether fair valuing

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[12] More recently, Gaynor et al. (2011) show that a majority of their survey respondents (i.e., over 70%) misinterpreted fair value gains attributable to a deterioration in a firm's creditworthiness as a positive signal and fair value losses as a negative signal. Using CPAs as survey respondents, many of these financial statement experts incorrectly assess a company's credit risk as improving (deteriorating) when a fair value gain (loss) is recognized. Their study provides evidence in support of the claim that market participants might not be able to unravel the counterintuitive income statement effect arising from changes in liability fair values due to changes in a firm's own creditworthiness.

liabilities conveys decision-relevant information to market participants. Specifically, we are interested in examining whether gains and losses from liabilities are value relevant and risk relevant.

The discussions in subsections 2.1.1 and 2.1.2 indicate that there are equally compelling arguments in favor of and against both the relevance to investors for firm value and for firm risk of gains and losses resulting from fair value changes in liabilities. Consequently, we do not make directional predictions on whether gains (losses) from liabilities are value relevant and/or risk relevant. Instead, we express our hypotheses in null form as follows, and rely on the empirical analysis to indicate the direction of these relations:

H1: FAS 159 gain and losses attributable to fair value changes in liabilities are not value relevant.

H2: FAS 159 gain and losses attributable to fair value changes in liabilities are not risk relevant.

3. Research Design

3.1 FAS 159 sample

We use accounting data and filing dates (10-Q and 10-K) from Computstat, and stock return and price data from CRSP. We hand-collect our main variable of interest, the change in fair value of liabilities included in earnings ($\Delta LIAB$), using the following procedure. To identify firms that adopted the fair value option for their liabilities, we first select firms with non-zero change in fair value included in earnings for which the fair value option was elected (Compustat: TFVCEQ) and non-zero fair value liabilities (Compustat: TFVLQ). We then check the 10-Q and 10-K filings of these companies to confirm that these firms adopted the fair value option for their liabilities. Finally, we hand-collect fair value changes in liabilities that are included in earnings

($\Delta LIAB$).[13] We also delete observations whose beginning-of-quarter stock price is below $3 in order to mitigate the extreme (small-denominator) effects of low-priced stocks on quarterly returns. Our final sample consists of 48 firms and 379 firm-quarter observations from the 1st quarter of 2007 to the 4th quarter of 2010.[14] Of these 381 firm-quarters, 186 are from banks, 125 from financial companies, 52 from insurance companies, and 18 from non-financial industries. Thus, approximately 95% of our sample observations represent firm-quarter observations from the financial industries. We refer to this sample as the full sample.

Fair value changes in financial liabilities typically arise from either changes in a firm's own credit risk or overall market interest rate risk. Some firms in our sample provide quantitative information regarding the fair value changes in their liabilities included in earnings as a consequence of changes in the firm's own credit risk.[15] For these firms, we hand-collect this information ($\Delta LIAB\_CREDIT$) to examine the value relevance of $\Delta LIAB\_CREDIT$. After deleting firms whose quarter beginning prices are below $3, we obtain 99 firm-quarter observations with fair value gains (losses) from liabilities attributable to changes in the firm's own credit risk. These companies include American International Group, Citigroup, Goldman Sachs, JPMorgan, Merrill Lynch, Morgan Stanley, Northstar Reality Finance, PMI Group and Popular Inc. We refer to this sample as the reduced sample.

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[13] Most firms that have adopted the fair value option report the changes in the fair value of their designated liabilities either in the form of text or table format in the 10-Q and 10-K accounting footnotes. We provide some examples of fair value option tables from the 10-Q (or 10-K) notes in the Appendix.

[14] FAS 159 was officially issued in February 2007. The standard took effect for the fiscal year beginning after November 15, 2007, although early adoption was permitted. On July 1, 2009, FAS 159 was codified into Accounting Standards Codification (ASC) Topic 825, *Financial Instruments*.

[15] The following are two examples of such disclosures:

Citigroup Inc. 2008 Q3: "The estimated change in the fair value of these liabilities due to such changes in the Company's own credit risk (or instrument-specific credit risk) was a gain of $1,525 million and $112 million for the three months ended September 30, 2008 and September 30, 2007, respectively, and a gain of $2,576 million and $241 million for the nine months ended September 30, 2008 and September 30, 2007, respectively."

American International Group 2008 Q3: "During the three- and nine-month periods ended September 30, 2008, AIG recognized a loss of $184 million and a gain of $1.1 billion, respectively, attributable to the observable effect of changes in credit spreads on AIG's own liabilities for which the fair value option was elected."

3.2 Research design

We first analyze the valuation implications of the gains (losses) from the change in fair values of liabilities included in earnings. We do so by estimating the following model that relates stock return to fair value liability gains and losses:

$$SIZE\_RET_{i,t} = \alpha_0 + \alpha_1 NI\_\Delta LIAB_{i,t} + \alpha_2 \Delta LIAB_{i,t} + e_{i,t} \qquad (1)$$

where $SIZE\_RET_{i,t}$ is quarterly size-adjusted return measured from five trading days after the filing date of the quarter t-1 10Q (10K) to five trading after the filing date of quarter t 10Q (10K). We measure quarterly returns up to five trading after the 10-Q and 10-K filing dates to ensure that the returns reflect investors' responses to the information on filing dates. Consistent with Barth et al. 2008, we use size-adjusted returns.[16] $\Delta LIAB_{i,t}$ is recognized FAS 159 gains or losses from liabilities per share and $NI\_\Delta LIAB_{i,t}$ is income before extraordinary items per share excluding $\Delta LIAB_{i,t}$. Thus, $NI\_\Delta LIAB_{i,t}$ represents income that excludes of the effect of fair value changes in liabilities and $\Delta LIAB_{i,t}$ represents the incremental income statement effect from the measurement of fair value changes in liabilities. We scale each income variable by beginning of quarter stock price.

The coefficient on $\Delta LIAB_{i,t}$, our main variable of interest, will be positive if it is value relevant. In contrast, this coefficient will not be reliably different from zero if the information in fair value gains (losses) from liabilities is not valuation relevant or if there are significant reliability concerns regarding its measurement. Consistent with prior research, we expect a positive coefficient on $NI\_\Delta LIAB_{i,t}$.

Firms that adopted the fair value option are required to provide the fair value changes in liabilities on an instrument by instrument basis. As mentioned earlier, the inclusion of fair value

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[16] Using raw returns does not change our inferences in all of our analyses.

liability gains (losses) arising from changes in credit risk was one of the most controversial features of FAS 159. To provide empirical evidence regarding the value relevance of this income component, we first hand-collect the fair value gains (losses) from each instrument. Then, we classify these gains (losses) into liability gains (losses) from "debt" instruments which should be highly affected by firms' credit risk changes and gains (losses) from "other" instrument which should be more influenced by the overall market interest changes. "Debt" instruments include short-term and long-term debt, subordinated debt, and notes payables. "Other" instruments include repurchase agreement, federal home loan bank advances, borrowed funds, time deposit, etc. We examine the value relevance of these instrument-level fair value changes using the following regression model:

$$SIZE\_RET_{i,t} = \alpha_0 + \alpha_1 NI\_\Delta LIAB_{i,t} + \alpha_2 \Delta DEBT\_INST_{i,t} + \alpha_3 \Delta OTHER\_INST_{i,t} + e_{i,t,} \quad (2)$$

where $\Delta DEBT\_INST$ denotes the total gains (losses) from the fair value changes in the debt instruments and $\Delta OTHER\_INST$ denotes the total gains (losses) from the fair value change in other instruments.

However, the fair values of the debt instruments are also affected by the overall market interest change. To remove this concern, we use the reduced sample of firms that disclose the gains (losses) from liabilities solely due to the firms' credit risk changes. Specifically, we collect fair value liability gains (losses) per share attributable to changes in the firm's own credit risk ($\Delta LIAB\_CREDIT_{i,t}$). We employ the difference between gains and losses from liabilities ($\Delta LIAB_{i,t}$) in this reduced sample and $\Delta LIAB\_CREDIT_{i,t}$ as the fair value changes in liabilities attributable to factors other than changes in the firm's own credit risk (ΔNON_CREDIT_{it}). We examine the value relevance of $\Delta LIAB\_CREDIT_{i,t}$ using the following regression model:

$$SIZE\_RET_{i,t} = \alpha_0 + \alpha_1 \, NI\_\Delta LIAB_{i,t} + \alpha_2 \, \Delta LIAB\_CREDIT_{i,t} + \alpha_3 \, \Delta NON\_CREDIT_{i,t}$$

$$+ \, e_{i,t} \tag{3}$$

Each income variable is scaled by beginning of quarter stock price. If fair value gains (losses) from liabilities due to changes in the firm's own creditworthiness are value relevant, we expect a positive coefficient on $\Delta LIAB\_CREDIT_{i,t}$.

Our second hypothesis relates to the risk implications of FAS 159 fair value gains and losses from liabilities. We rely on the following model, adapted from Hodder et al. (2006), to test the risk relevance of these gains and losses:

$$BETA_{i,t} \, (\, STD\_RET_{i,t}) = \alpha_0 + \alpha_1 \, \sigma(NI_{i,t}) + \alpha_2 \, \sigma(NI\_\Delta LIAB_{i,t}) + e_{i,t} \tag{4}$$

where $BETA_{i,t}$ denotes market model beta estimated using firm's monthly stock returns and a value-weighted index of monthly returns , measured over 8 quarters before quarter t; $STD\_RET_{i,t}$ denotes the standard deviation of monthly returns measured over 8 quarters before quarter t;[17] $\sigma(NI_{i,t})$ denotes the standard deviation of income before extraordinary items per share; and $\sigma(NI\_\Delta LIAB_{i,t})$ denotes the standard deviation of $NI\_\Delta LIAB$. We measure these variables on a rolling basis using the 8 most recent observations, with a minimum requirement of at least 4 non-missing firm-quarter observations for each firm.[18] In this regression, we are interested in whether $\sigma(NI_{i,t})$ is incrementally associated with the market risk proxy measures. If the market perceives that the gains (losses) from liabilities add noise to earnings, then the coefficient on $\sigma(NI_{i,t})$ will not be incrementally associated with the market risk proxies after controlling for $\sigma(NI\_\Delta LIAB_{i,t})$.

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[17] Using the standard deviation of market-adjusted or size-adjusted returns does not change the results.
[18] We use the standard deviations of earnings estimated with 4, 5, 6, or 7 quarters because our sample period is relatively short. Using 8 quarters to estimate the standard deviation greatly reduces the sample size. We note that our inferences are unchanged when we use this smaller sample..

To minimize the effect of outliers, we delete observations in the top and bottom 1 percent of the distributions of *NI_ΔLIAB, ΔLIAB, ΔDEBT, ΔOTHERS, ΔLIAB_CREDIT*), and trim observations with absolute value of studentized residuals greater than 3. In all our regression tests, we use standard errors clustered by firm to account for within-firm correlations in residuals, and include year dummies to control for year fixed effects.

4. Empirical results

4.1 Univariate analyses

Table 1 presents descriptive statistics for the variables and characteristics of the sample firms used in the value relevance analyses. Specifically, Panel A provides the descriptive statistics of the variables in the full sample. The standard deviation of the gains (losses) from liabilities per share (ΔLIAB) is about 80% of the standard deviation of NI_ΔLIAB. This indicates that the impact of ΔLIAB on our sample firms' net income is not negligible.[19] To confirm the economic significance of ΔLIAB, we separate ΔLIAB into gains and losses, and investigate the magnitude of ΔLIAB when it is positive and negative. Panel B reports the frequency and the average absolute value of ΔLIAB and NI_ ΔLIAB when ΔLIAB is positive, negative and zero (GAINS, LOSSES, AND ZERO, respectively). In our sample, the fair value gains (losses) from liabilities are evenly distributed with 156 gain observations and 153 loss observations.[20] The average absolute value of ΔLIAB is 0.039 (0.038) when firms report gains (losses) for ΔLIAB. Given that the average absolute value of NI_ΔLIAB is 0.106 (0.065) when firms report gains (losses) for ΔLIAB, the average absolute value of ΔLIAB in Panel B confirms the economic significance of ΔLIAB. We also examine the average ratio of the absolute value of

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[19] The sum of the average NI_ΔLIAB and ΔLIAB is not equal to the average NI because all the income variables are trimmed at the top and bottom 1%.

[20] 70 firm-quarters have zero ΔLIAB. Although we only include firms that report fair value gains and losses from liabilities after adopting FAS 159 for their liabilities, some firms report zero ΔLIAB intermittently.

ΔLIAB to the absolute value of NI_ΔLIAB. Interestingly, the average ratio seems to be overly high. The average ratio is 1.963 in the gain cases and 0.385 in the loss cases. The unduly high average ratio in the gain cases is mainly because some firms report high fair value gains from liabilities when the absolute value of the income before such gains (NI_ ΔLIAB) is low, making the denominator of the ratio low.

We also investigate how unique our sample firms are in terms of the proportion of the fair valued assets and liabilities to the total assets. The primary objective of FAS 159 is to reduce unnecessary income volatility by applying the same measurement basis to both assets and liabilities. If so, it will be the firms with reasonable amount of fair valued assets and liabilities that benefit by adopting FAS 159. Panel C report the sample firms' leverage and the proportion of the fair valued assets and fair valued liabilities to the sample firms' total assets. The average leverage (LEVERAGE; total liability over total assets) is 82.8%. This relatively high leverage result from the fact that the sample firms are mostly in the financial industries. The average proportions of the fair valued assets and liability are 35.8% and 9%, respectively.[21] Panel D reports the proportion of the fair valued assets and fair valued liabilities to the total assets of the firms in the financial industries (after excluding our sample firms) in Compustat from the year 2007 to 2010, which is our sample period. The average proportions of the fair valued assets and liability are 16.6% and 1.1%, respectively. Panel C and D shows that our sample firms can reduce unnecessary earnings volatility by fair valuing liabilities because they have a larger base of fair valued assets and fair valued liabilities than other firms in the financial industries.[22]

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[21] Excluding non-financial firms from the sample does not change the figures in Panel C. For example, if we exclude the non-financial firms, the leverage and the proportion of the fair valued assets and liabilities in total assets become 84.9%, 36.8%, and 9.5%.

[22]The average "FAIR VALUED ASSETS" and "FAIR VALUED LIAB" in Panel C (0.358 and 0.090) are significantly different from those in Panel D (0.166 and 0.011). The t-statistics of the differences are 15.38 and 20.02.

Table 2 reports Spearman and Pearson correlations for the variables used in the full sample value relevance analysis. As expected, quarterly size-adjusted returns are positively correlated with net income (Pearson and Spearman correlation = 0.169 and 0.251, respectively). When we decompose NI into NI_ΔLIAB and ΔLIAB, the correlation between returns and NI_ΔLIAB is positive and significant (Pearson correlation = 0.168) and the Pearson correlation between returns and ΔLIAB is not significant. These univariate results show that it is NI_ΔLIAB that drives the positive association between return and net income and that ΔLIAB is not value relevant. However, increase in the market overall uncertainty or deterioration of a firm's credit risk can have two offsetting effects on firm value: a direct and negative effect related to increased market or firm-specific credit risk and an indirect and mitigating effect of gains from liability (Barth et al. 2008). Thus, we should test how the result turns out after controlling for the direct effect, which will be performed in the next section.

The correlations between NI_ΔLIAB and ΔLIAB in Table 2 show a Pearson correlation between NI_ΔLIAB and ΔLIAB of -0.618 and a Spearman correlation of -0.454. The high negative correlation between NI_ΔLIAB and ΔLIAB suggests that FAS 159 may be effective at mitigating financial statement volatility caused by different measurement bases in assets and liabilities.

4.2 Value relevance - main results

Table 3 presents our main results on the value-relevance of the fair value accounting for liabilities. The positive and statistically significant coefficient (coefficient = 0.398, t = 5.33) relating quarterly net income (NI) that includes FAS 159 fair value gains and losses from liability to quarterly size-adjusted return is consistent with the results of prior research. When we decompose NI into its respective components, we find a significant positive association

(0.521, t=3.78) between SIZE_RET and net income excluding the gains (losses) from liabilities (NI_ΔLIAB). We also find a significant and positive relation between SIZE_RET and the per share fair value gains (losses) from liabilities (ΔLIAB). The coefficient on ΔLIAB is 0.279 (t=2.28). The magnitude of the coefficient on ΔLIAB is smaller than that of NI_ΔLIAB, indicating the transitory nature of ΔLIAB. These results indicate that ΔLIAB is value relevant after controlling for the information in NI_ΔLIAB. Our results suggest that investors perceive reported FAS 159 fair value liability gains and losses as value relevant.[23]

Table 4 presents the value relevance results after decomposing ΔLIAB into the fair value changes in debt instruments (ΔDEBT_INST) which include short-term and long-term debt, subordinated debt, and notes payables and other instruments (ΔOTHER_INST) which include repurchase agreements, federal home loan bank advances, borrowed funds, time deposits, etc. Given that the debt instruments are more highly influenced by a company's credit risk changes, if the market perceives the fair value changes related to the change in a firm's credit risk as value relevant, we expect the coefficient ΔDEBT_INST to be positive. We find that the both debt and other instruments are value relevant. The coefficients on ΔDEBT_INST and ΔOTHER_INST are 0.282 and 0.571 (t = 3.30 and 2.40), respectively.[24]

Panel A of Table 5 provides the descriptive statistics of the reduced sample of firms that disclose the change in fair value of liabilities per share due to changes in the firm's own credit

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[23] A concern in this analysis is that our sample period includes the crisis period. Stock returns in the crisis period can be highly affected by investor sentiment, which may affect the value relevance analysis in this period. To address this concern, we delete the year 2008 observations. We find that the results are not sensitive to deleting 2008 observations. .

[24] To ensure that the fair value change in debt instruments is primarily affected by an entity's creditworthiness, we use a reduced sample of firms that disclose the fair value gains (losses) from liabilities resulting from the change in firms' credit risk (ΔLIAB_CREDIT), which is used in Table 5. Specifically, we examine the correlation between ΔDEBT_INST and ΔLIAB_CREDIT in the sample. We find that the Pearson correlation between ΔDEBT_INST and ΔLIAB_CREDIT in this reduced sample is 92.3% (Spearman 66.5%). Although there is an issue of whether the finding in the reduced sample can be applied to the large sample, we consider this high correlations evidence that the change in creditworthiness in an entity is highly influential to the fair value changes in the "debt" instruments.

risk The results in Panel A indicate that the mean returns and *NI* for the reduced sample are negative. The mean returns and income before extraordinary items per share (*NI*) scaled by the firm's beginning of quarter stock price are negative because the reduced sample firms are mainly large banks whose performance deteriorated during the 2008 crisis which is included in our sample period. We decompose ΔLIAB into the change in fair value of liabilities per share due to changes in the firm's own credit risk (ΔLIAB_CREDIT) and other macroeconomic factors (ΔNON_CREDIT). This decomposition indicates that most of the variation in ΔLIAB (standard deviation = 0.108) is caused by ΔLIAB_CREDIT (standard deviation of ΔLIAB_CREDIT = 0.102 and standard deviation of ΔNON_CREDIT = 0.035). We therefore infer that the effect of ΔLIAB_CREDIT on net income is not negligible for these sample firms.

Panel B of Table 5 reports value relevance test results for the reduced sample. The results confirm the value relevance of liability gains (losses) arising from change in firms' credit risk. We find a significant positive coefficient on ΔLIAB_CREDIT, which indicates that investors perceive an accounting gain (loss) attributable to a change in the firm's own credit risk as value relevant.

4.3 Risk relevance

In this section, we first investigate whether the impact of FAS 159 reduces the income volatility of firms that choose to fair value their liabilities. A primary objective of FAS 159 is to reduce firms' income volatility caused by inconsistency in the measurement of assets and liabilities on the balance sheet. We compute the standard deviation of each sample company's NI [σ (NI)] and NI_ΔLIAB [σ (NI_ΔLIAB)] over our sample period. Table 6 Panel A reports the descriptive statistics of the variables used in our risk relevance analysis. The results show that the average standard deviation of NI is smaller than the average standard deviation of NI_ΔLIAB by

0.346, and the difference is statistically significant (t-stat: 7.22). This indicates that earnings volatility would have been considerably larger if ΔLIAB was not included in computing net income. Thus, it appears that the adoption of FAS 159 serves to reduce firms' income volatility.

This result differs from Hodder et al. (2006) who report a significant increase in the standard deviation of the full fair value earnings when full fair value changes are included in earnings. Thus, whether σ (NI), which is much smaller in magnitude than σ (NI_ΔLIAB), is more risk relevant than σ (NI_ΔLIAB) is not ex-ante clear. Hence, we examine this question by examining which of these measures of income volatility corresponds more closely with firm risk, proxied by beta and monthly return volatility.

Table 6 Panel C presents our risk-relevance analyses. We find that both σ (NI) and σ (NI_ΔLIAB) are risk-relevant when we do not control for each other in the same regression. When the dependent variable is BETA, the coefficient on σ (NI) and σ (NI_ΔLIAB) are 0.264 and 0.201 (t = 4.26 and 3.46), respectively. When we include both σ (NI) and σ (NI_ΔLIAB) in the regression model, we find that only the coefficient on σ (NI) loads (0.283; t= 2.10). We obtain similar results when we use standard deviation of the returns (STD_RET) as the dependent variable. Hence, our results suggest that ΔLIAB is incrementally informative to investors when assessing the underlying economic risk of the firm.

5. Conclusion

This study examines how investors perceive fair value liability gains and losses arising from FAS 159 adoption. Consistent with the objectives of standard setters, we find that there is a positive association between a firm's stock returns and FAS 159 gains and losses from liabilities. We also find that the controversial gains and losses from liability due to a firm's credit risk change are positively related to the stock returns after controlling for the income before such

gains and losses. The results suggest that these reported gains and losses from liabilities are value-relevant to investors in making their investment decisions. We also find that there is a positive association between market-based risk measures and income volatility that incorporated FAS 159 gains and losses. These findings indicate that these fair value measurements are risk-relevant to investors in assessing the economic volatility of the firm.

Overall, our study provides empirical evidence that examine how investors assess the impact of fair value gains and losses from liabilities. Our study should be of interest to standard setters and regulators with regard to whether firms should fair value their liabilities and whether fair value gains and losses from liabilities should be treated differently. Our study thus provides interesting evidence that contributes to the debate and controversy surrounding the fair value accounting for liabilities.

Appendix

Example of a fair value option table in the 10-Q and 10-K notes

Goldman Sachs 2010 1Q note

The Fair Value Option Gains / (Losses)

The following table sets forth the gains/(losses) included in earnings for the three months ended March 2010 and March 2009 as a result of the firm electing to apply the fair value option to certain financial assets and financial liabilities, as described in Note 2.

	Three Months Ended March	
	2010	**2009**
	(in millions)	
Unsecured long-term borrowings	$ 84	$ (135)
Other secured financings	(4)	25
Unsecured short-term borrowings	13	(67)
Receivables from customers and counterparties	(38)	(2)
Other liabilities and accrued expenses	69	82
Other	(3)	(26)
Total	$ 121	$ (123)

The effect of the firm's own credit spread on income

The following table sets forth the net gains/(losses) attributable to the impact of changes in the *firm's own credit spreads* on borrowings for which the fair value option was elected.

	Three Months Ended March	
	2010	**2009**
	(in millions)	
Net gains/(losses) including hedges	$ 107	$ (197.00)
Net gains/(losses) excluding hedges	109	(192.00)

The net gain/(loss) attributable to changes in instrument-specific credit spreads on loans and loan commitments for which the fair value option was elected was $1.07 billion and $(1.21) billion for the three months ended March 2010 and March 2009, respectively. The firm attributes changes in the fair value of floating rate loans and loan commitments to changes in instrument-specific credit spreads. For fixed rate loans and loan commitments, the firm allocates changes in fair value between interest rate-related changes and credit spread-related changes based on changes in interest rates. See below for additional details regarding the fair value option.

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TABLE 1

Panel A: Descriptive statistics of full sample for value relevance analysis

This panel presents the full sample descriptive statistics of the variables that are used in the value relevance analysis.

	Mean	Std Dev	5th %	Median	95th %
SIZE_RET	-0.009	0.386	-0.483	-0.037	0.402
NI	-0.030	0.169	-0.317	0.010	0.067
NI_ΔLIAB	-0.026	0.172	-0.292	0.011	0.092
ΔLIAB	0.001	0.139	-0.042	0.000	0.068
ΔDEBT_INST	0.015	0.124	-0.023	0.000	0.068
ΔOTHER_INST	0.008	0.082	-0.010	0.000	0.017

SIZE_RET = quarterly size-adjusted return measured from five trading after the filing date of quarter t-1 up to five trading days after the filing date of quarter t

NI = income before extraordinary items per share for quarter t, scaled by the beginning-of-quarter stock price

NI_ΔLIAB = income before extraordinary items per share minus the change in fair value of liabilities included in earnings for which the fair value option was elected, scaled by beginning-of-quarter stock price

ΔLIAB = the change in fair value of liabilities per share included in earnings for which the fair value option was elected, scaled by beginning-of-quarter stock price

ΔDEBT_INST = the per share change in fair value of total debt instruments included in earnings for which the fair value option was elected, scaled by beginning-of-quarter stock price. The instruments include short-term borrowings such as the current portion of long-term debt, subordinated debt, long-term debt, and notes payable.

ΔOTHER_INST = the per share change in fair value of other instruments which are not debt instruments included in earnings for which the fair value option was elected, scaled by beginning-of-quarter stock price. The instruments include repurchase agreement, federal home loan bank advances, borrowed funds, time deposit, etc.

TABLE 1 (continued)

Panel B: Gains and losses from the change in the fair value of liabilities

This panel presents the frequency and the average absolute value of gains and losses from liabilities (ΔLIAB) and income before such gains and losses (NI_ ΔLIAB) when sample firms report positive, negative, and zero ΔLIAB (GAINS, LOSSES, and ZERO, respectively).

	GAINS	LOSSES	ZERO
FREQUENCY	156	153	70
PERCENTAGE	41.16	40.37	18.47
MEAN [ABS (ΔLIAB)]	0.039	0.038	0.000
MEAN [ABS (NI_ΔLIAB)]	0.106	0.065	0.052
MEAN [ABS (ΔLIAB) / ABS (NI_ΔLIAB)]	1.963	0.385	0.000

Panel C: Fair value assets and liabilities of the full sample

This panel presents the average leverage and fair value assets (fair value liabilities) relative to the total assets of the sample firms. Leverage is measured as firms' total liabilities over total assets.

	LEVERAGE	FAIR VALUE ASSETS	FAIR VALUE LIAB
Mean	0.828	0.358	0.090
Std Dev	0.177	0.248	0.127

Panel D: Fair value assets and liabilities of financial institutions (excluding the sample firms) in Compustat during the sample period

This panel presents the average leverage and fair value assets (fair value liabilities) relative to the total assets of the firms in the financial industries (excluding the sample firms) in the Computstat from 2007 to 2010.

	LEVERAGE	FAIR VALUE ASSETS	FAIR VALUE LIAB
Mean	0.749	0.166	0.011
Std Dev	0.249	0.241	0.074

TABLE 2

Correlation matrix

Table 2 presents the correlations among the key variables used in our value relevance analyses. Pearson and Spearman correlations are reported, respectively, above and below the diagonal. P-values are reported based on two-tailed tests (in parentheses). See Table 1 for variable definition.

	A	B	C	D
SIZE_RET (A)		0.169 (0.001)	0.168 (0.001)	-0.040 (0.445)
NI (B)	0.251 (0.000)		0.626 (0.000)	0.226 (0.000)
NI_ΔLIAB (C)	0.258 (0.000)	0.853 (0.000)		-0.618 (0.000)
ΔLIAB (D)	-0.093 (0.072)	-0.147 (0.004)	-0.454 (0.000)	

TABLE 3

Regression of returns on the change in fair value of liabilities included in earnings

Table 3 presents the main results of our regression analyses examining the association between quarterly returns and the change in fair value of liabilities included in earnings for which the fair value option was elected. The dependent variable is quarterly size-adjusted return. All variables are defined in Table 1. The standard errors are clustered by firm to account for within-firm correlations in residuals, and year dummies are used to control for year fixed effects. The t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10, 5, and 1 percent levels, respectively.

NI	0.398***	
	(5.33)	
NI_ΔLIAB		0.521***
		(3.78)
ΔLIAB		0.279**
		(2.28)
Intercept	-0.088***	-0.090***
	(-4.46)	(-4.68)
Year controls	Yes	Yes
Observations	377	374
Adj. R^2	0.090	0.087

TABLE 4

Regression of returns on the change in fair value of liabilities included in earnings: Instrument by instrument

Table 4 presents the main results of our regression analyses examining the association between quarterly returns and the change in fair value of liabilities, instrument by instrument. The dependent variable is quarterly size-adjusted return. The standard errors are clustered by firm to account for within-firm correlations in residuals, and year dummies are used to control for year fixed effects. The t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10, 5, and 1 percent levels, respectively.

NI_ΔLIAB	0.643***
	(4.66)
ΔDEBT_INST	0.282***
	(3.30)
ΔOTHER_INST	0.571**
	(2.40)
Intercept	-0.091***
	(-4.91)
Year controls	Yes
Observations	368
Adj. R^2	0.136

TABLE 5

Descriptive statistics

Panel A: Descriptive statistics of reduced sample for value relevance analysis

This panel presents the reduced sample descriptive statistics based on the nine firms that voluntarily provide changes in fair value of liabilities due to changes in a firm's own credit risk. These firms are American International Group, Citigroup, Goldman Sachs, JPMorgan, Merrill Lynch, Morgan Stanley, Northstar Reality Finance, PMI Group, and Popular Inc. ΔLIAB_CREDIT is the change in fair value of liabilities per share due to such changes in the Company's own credit risk included in earnings, scaled by beginning-of-quarter stock price. ΔNON_CREDIT is ΔLIAB - ΔLIAB_CREDIT. All other variables are defined in Table 1.

	Mean	Std Dev	5th %	Median	95th %
SIZE_RET	-0.024	0.327	-0.395	-0.047	0.402
NI	-0.026	0.173	-0.340	0.018	0.103
NI_ΔLIAB	-0.035	0.170	-0.324	0.017	0.107
ΔLIAB	0.009	0.108	-0.102	0.000	0.177
ΔLIAB_CREDIT	0.004	0.102	-0.081	0.000	0.101
ΔNON_CREDIT	0.005	0.035	-0.033	0.000	0.055

TABLE 5 (continued)

Panel B: Regression of returns on the change in fair value of liabilities resulting from the change in firms' credit risk

This panel presents the main results of our regression analyses examining the association between quarterly returns and the change in fair value of liabilities included in earnings for which the fair value option was elected. The dependent variable is quarterly size-adjusted return. All variables are defined in Table 1. The standard errors are clustered by firm to account for within-firm correlations in residuals, and year dummies are used to control for year fixed effects. The t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10, 5, and 1 percent levels, respectively.

NI	0.464***	
	(3.74)	
NI_ΔLIAB		0.484**
		(2.93)
ΔLIAB_CREDIT		0.401**
		(2.72)
ΔNON_CREDIT		0.528
		(0.87)
Intercept	-0.098**	-0.100**
	(-2.63)	(-2.76)
Year controls	Yes	Yes
Observations	95	95
Adj. R^2	0.120	0.101

TABLE 6

Descriptive statistics

Panel A: Descriptive statistics of the variables for risk relevance analysis

This panel presents the full sample descriptive statistics of the variables that are used in the risk relevance analysis. We estimate the risk proxies and the two quarterly income measure volatilities over rolling eight-quarter periods, each ending with years from 2007 to 2010. We impose a minimum requirement of 4 firm-quarter observations for these measures. σ (NI_ΔLIAB) - σ (NI) shows the difference between the standard deviations of the incomes with and without FAS 159 liability gains and losses. The t-statistic of the difference is in parenthesis.

	Mean	Std Dev	5th %	Median	95th %
BETA	0.202	0.147	0.059	0.156	0.562
STD_RET	1.508	1.117	0.217	1.238	3.831
σ (NI)	1.467	1.956	0.049	0.769	5.873
σ (NI_ΔLIAB)	1.850	2.356	0.083	0.879	7.892
σ (NI_ΔLIAB) - σ (NI)	**0.346**				
	(t: 7.22)				

BETA = market model beta estimated using firm's monthly stock returns and a value-weighted index of monthly returns, measured over 8 quarters before quarter t

STD_RET = standard deviation of monthly returns measured over 8 quarters before quarter t

σ (NI) = the standard deviation of income before extraordinary items per share where income is measured over 8 quarters before quarter t

σ (NI_ΔLIAB) = the standard deviation of NI_ΔLIAB where NI_ΔLIAB is measured over 8 quarters before quarter t

TABLE 6 (continued)

Panel B: Regression of beta and standard deviation of returns on the standard deviation of each income measure

This panel presents the results of regression analyses examining the association between beta (and standard deviation of the monthly returns) and each income volatility measures. All variables are defined in Panel B. The standard errors are clustered by firm to account for within-firm correlations in residuals, and year dummies are used to control for year fixed effects. The t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10, 5, and 1 percent levels, respectively.

	BETA			STD_RET		
σ (NI)	0.264***		0.283**	0.044***		0.059***
	(4.26)		(2.10)	(4.17)		(2.77)
σ (NI_ΔLIAB)		0.201***	-0.056		0.030***	-0.014
		(3.46)	(-0.27)		(2.84)	(-0.79)
Intercept	0.120***	1.404***	0.593***	1.346***	0.132***	0.058***
	(6.63)	(7.37)	(3.19)	(7.21)	(6.96)	(2.82)
Year controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	314	318	317	318	316	313
Adj. R^2	0.482	0.227	0.259	0.263	0.344	0.487