

**Value Relevance of FAS 157 Fair Value Hierarchy Information and the Impact of  
Corporate Governance Mechanisms**

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First Draft: June 2008

Current Draft: February 2009

**Acknowledgements:** \* Corresponding author. We are grateful for helpful comments received from Vicki Dickinson, Leslie Hodder, Ole-Kristian Hope, Mark Kohlbeck, Tom Linsmeier, Bharat Sarath, and participants of the 2008 Conference on Financial Economics and Accounting (University of Texas at Austin) and the 2009 International Conference on Assurance and Governance (University of Florida). We also appreciate the research assistance of Ken Bills.

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### **ABSTRACT**

Statement of Financial Accounting Standards No. 157 (FAS 157), *Fair Value Measurements*, prioritizes the source of information used in fair value measurements into three levels: (1) Level 1 (i.e., observable inputs from quoted prices in active markets), (2) Level 2 (i.e., indirectly observable inputs from quoted prices of comparable items in active markets, identical items in inactive markets, or other market-related information), and (3) Level 3 (i.e., unobservable, firm-generated inputs). Using quarterly reports of banking firms in 2008, we provide three tests. First, we examine the value relevance of fair value measurements across levels. We find that Level 1 and Level 2 fair value measurements are value relevant, while Level 3 fair value measurements are also value relevant but to a lesser degree. Second, we find that disclosures of fair values by levels under FAS 157 are somewhat incremental to existing disclosures of fair values by asset/liability types. For our third test, we find evidence that the value relevance of fair values (especially Level 3) is less evident for firms with weaker corporate governance. Overall, our results support the relevance of fair value measurements under FAS 157, but weaker corporate governance mechanisms may reduce the relevance of these measures.

**Key Words:** FAS 157, Fair Value, Value Relevance, Corporate Governance

# Value Relevance of FAS 157 Fair Value Hierarchy Information and the Impact of Corporate Governance Mechanisms

## I. INTRODUCTION

In response to users' requests for a comprehensive framework for measuring and disclosing fair value, the Financial Accounting Standards Board (FASB) issued Statement of Financial Accounting Standards No. 157, *Fair Value Measurements* (FAS 157) in 2006, effective for fiscal years beginning after November 15, 2007. FAS 157 does not increase the use of fair value measurements, but instead provides a uniform definition of fair value, establishes a framework for measuring fair value, and expands disclosure about fair value measurements.<sup>1</sup> More specifically and of particular interest to our study, FAS 157 requires existing disclosures of fair value asset and liability types to be disclosed by levels, where levels are based on inputs used to generate fair values: (1) Level 1 (i.e., observable inputs from quoted prices in active markets), (2) Level 2 (i.e., indirectly observable inputs from quoted prices of comparable items in active markets, identical items in inactive markets, or other market-related information), and (3) Level 3 (i.e., unobservable, firm-generated inputs).<sup>2</sup>

This paper addresses three important research questions related to FAS 157. First, we examine the value relevance of fair value measures for each of the three disclosure levels. A long standing debate of fair value accounting is centered on the trade-off between relevance and reliability. Proponents of fair value accounting argue that fair value information has greater

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<sup>1</sup> "Fair value is 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" (paragraph 5 of FAS 157). There is a debate as to whether exit price is an appropriate measure for shareholders when there is a significant gap between exit price and "value-in-use" of an asset (see AAA Financial Accounting Standards Committee, 2005; Penman, 2007). This issue is beyond the scope of this paper.

<sup>2</sup> The FASB Staff Position (FSP) FAS 157-3 was issued in October of 2008 to clarify the application of FAS 157. It emphasizes that when a market is in turmoil, it is not appropriate to conclude that all market activity represents forced liquidations, nor is it appropriate to assume that a market price is the fair value of the asset. Occasionally observable inputs must be adjusted to be relevant to an entity's particular asset. This would cause the input to be lowered to a Level 3 input.

relevance, more accurately reflects real volatility, and simplifies financial reporting (e.g., hedge accounting).<sup>3,4</sup> In contrast, opponents of fair value accounting argue that fair value measurements are less reliable, especially when active markets do not exist. In this situation, managers estimate fair values using subjective valuation techniques. Since managers have private information regarding appropriate input values to be used in the valuation models, they may use their private information in opportunistic ways.<sup>5</sup> This information asymmetry between investors and managers can be a serious threat to the reliability of fair values (Landsman, 2007; Penman, 2007).<sup>6</sup> Thus, we are particularly interested in examining the value relevance of Level 1 and Level 2 fair values versus Level 3 fair values.

Second, we are interested in the extent to which expanded disclosures under FAS 157 (i.e., Level information) provide incremental value relevant information beyond existing disclosure of fair values by asset and liability type (i.e., Type information). For example, investors with little Level information could make an arbitrary Level assumption for specific fair value assets and liabilities (e.g., available-for-sale securities are likely Level 1 assets). If investors' arbitrary assumptions are not significantly different from actual Level information, FAS 157's Level information would provide no incremental information beyond existing Type information. On the other hand, one can envision certain types of assets, such as derivatives, being Level 1 or Level 2 or Level 3, depending on the observability of the underlying financial

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<sup>3</sup> According to a survey of Chartered Financial Analysts (CFA) Institute members worldwide (2,006 responses), 79 percent of respondents believe that fair value requirements improve transparency and contribute to investor understanding of financial institutions' risk and 74 percent think fair value requirements will improve market integrity. The survey results are available at <http://www.cfainstitute.org/memresources/monthlyquestion/2008/march.html>.

<sup>4</sup> For example, the FASB concludes that fair value information is relevant [see paragraph C2 of FAS 157; paragraph 217 of FAS 133 (FASB, 1998)]

<sup>5</sup> Preparers such as banks also suggest that a current mixed-attribute financial reporting model is preferred because not all instruments are managed based on fair value (International Banking Federation, 2008; Leone, 2008).

<sup>6</sup> Although Level 1 and Level 2 inputs could also be subject to manager's private information, the verifiability of "mark-to-market" inputs is higher than that of "mark-to-model" inputs. For example, concerns expressed by the PCAOB chairman Mark Olson and the SEC chief economist Chester Spatt are mainly over valuations from models. See Johnson (2007).

instruments or contracts. As another example, Ryan (2008) discusses how certain existing assets, such as mortgage-backed securities during the subprime crisis, could migrate from Level 2 status to Level 3 because of deterioration in price observability. The ability to disaggregate Type information by observability of fair value inputs is now available under FAS 157. This suggests that FAS 157 has the potential to provide incremental information. Thus, the incremental value relevance of FAS 157 disclosures will depend on whether investors differentially value inputs across the three levels *and* whether firms report sufficient fair value asset and liability types (i.e., existing disclosures) where investors are not able to easily discern the level of input.

Third, we examine whether the value relevance of fair values depends on the firm's corporate governance mechanisms. The motivation for this test arises from the greater subjectivity on the part of management in measuring and reporting fair values. Although in some instances managers may use their private information to credibly report fair values (e.g., Barth, Landsman and Rendleman Jr., 1998), prior studies also provide evidence that managers may manipulate inputs for fair values for their own interests (e.g., Aboody, Barth and Kasznik, 2006; Bartov, Mohanram and Nissim, 2007). For firms with weaker corporate governance mechanisms, information asymmetry problems associated with fair values may be greater, leading to more severe moral hazard problems and therefore lower value relevance of these disclosures. Since Level 1 fair value reporting is likely to suffer the least from information asymmetry, one might expect corporate governance mechanisms to have the least impact on the valuation of these fair values. Instead, corporate governance should likely play a larger role in the valuation of Level 3 fair values where information asymmetry is likely the highest.

Using a sample of quarterly reports by banking firms in 2008, we provide the following results. First, we find evidence that fair value measurements of Level 1, Level 2, and Level 3

inputs are value relevant. We also find that the valuation coefficient of Level 3 assets is significantly less positive than those of Level 1 and Level 2 assets, consistent with investors' perceptions of Level 3 fair values being overstated. The valuation coefficient of Level 3 liabilities is significantly more negative than those of Level 1 and Level 2 liabilities, consistent with understatement risk of Level 3 liabilities being reflected in firm value. We additionally test whether the coefficient on each Level is significantly different from its theoretically predicted value of one for assets and minus one for liabilities.<sup>7</sup> In particular, if investors perceive reliability concerns for Level 3 assets (liabilities), the coefficient on these fair values could be less than one (minus one).<sup>8</sup> The results are consistent with this prediction.

Second, we find that FAS 157 disclosures provide some incremental value relevance beyond asset/liability type information. Specifically, we find that the ability of Level information provided by FAS 157 interacted with existing asset and liability Type information to explain firm value is statistically greater than the explanatory power of Type information only. This provides evidence that valuation of Level information is not simply a reordering of valuation by Type information (i.e., FAS 157 provides new information).

For our third test, we examine whether the value relevance of Level 3 inputs varies across six individual governance mechanisms (i.e., board independence, audit committee financial expertise, the frequency of annual audit committee meetings, the percent of shares held by institutional investors, the auditor's office size, and no material control weakness problem under Sections 302 and 404 of Sarbanes-Oxley Act), as well as a factor score based on these mechanisms. We find that governance has a significant impact on Level 2 and Level 3 fair values.

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<sup>7</sup> These theoretical predictions are based on implicit assumptions that (1) the valuation model is properly specified and that (2) markets are efficient. Therefore, we do not claim that estimated coefficients must be one or minus one. We merely use these theoretical values as benchmarks for our statistical testing.

<sup>8</sup> For the coefficient on Level 3 liabilities, this implies that the absolute value of the coefficient is greater than one due to the concern of general understatement.

As the strength of corporate governance increases, investors' valuation of these fair values increases. Furthermore, the impact of corporate governance is substantially greater for Level 3 fair values. These results highlight the importance of corporate governance mechanisms in mitigating the information asymmetry problem associated with Level 3 inputs. Consistent with the notion that Level 1 fair value information suffers the least from information asymmetry, we find little impact of corporate governance on these fair values.

As a final test, we consider how conclusions may have changed over time. As the economic crisis worsened in 2008, one could predict that fair values (especially Level 2 and Level 3) would become *less* meaningful because market illiquidity makes pricing less observable. FAS 157 specifically refers to fair value as the price in an "orderly transactions" (FAS 157, paragraph 5). During an economic crisis, transactions may not be orderly, and illiquidity may make it difficult for companies to derive reliable Level 2 and Level 3 fair values. In contrast to these arguments, we find no evidence of a decline in the valuation of fair values during the first three quarters of 2008. In fact, we find some evidence that the valuation of Level 3 assets and liabilities actually moved closer to their predicted values of one and minus one. In addition, we find no convincing evidence of the changing importance of corporate governance for valuation of fair value assets as the crisis worsened and market illiquidity became more severe.

Overall, we conclude that the fair value hierarchy required by FAS 157 provides useful information to investors, and the strength of corporate governance appears to mitigate the information asymmetry problem arising from relatively less reliable fair value inputs.<sup>9</sup> These

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<sup>9</sup> We are aware of concurrent studies that examine related issues addressed in this study. Using 177 financial sector firms with S&P membership firms, Kolev (2009) documents that Level 3 net assets are priced despite investors' concern of the reliability of Level 3 net assets. Clor-Proell and Warfield (2009) provide experimental evidence that the expanded disclosure format on fair value level information may improve non-professional investors' judgment performance. Using data prior to FAS 157, Bhat (2009) shows that the valuations of fair value gains and losses are greater for firms with stronger corporate governance. Using bank holding companies in 2008, Goh et al. (2009) document that valuations of fair value assets decrease over three quarters in 2008. In addition to providing some

results contribute to the literature on fair value accounting in at least three ways. First, we provide early evidence of the value relevance of new disclosures under FAS 157. Prior to FAS 157, direct tests of how the reliability of fair value information is reflected in equity prices were more difficult. Using the fair value hierarchy under FAS 157, we provide direct evidence of how more reliable (Level 1) versus less reliable (Level 3) information is priced.

Second, we examine the extent to which FAS 157 disclosures add to existing disclosures by requiring asset/liability type information to be disaggregated by FAS 157 level information (i.e., matrix format for reporting fair values based on asset/liability type and level of input).<sup>10</sup> Recognizing that fair value may affect financial statement users in contexts other than the equity pricing (Holthausen and Watts 2001), we believe that our findings provide valuable input to U.S. and international accounting standard setters in understanding not only the impact of FAS 157 disclosures, but also in deliberating how future standards can add to existing fair value disclosures (e.g., the joint IASB/FASB project on financial statement presentation).

Third, we directly examine the association between the strength of corporate governance and value relevance of fair values in the U.S. Standard setters understood that information asymmetry would be higher for Level 3 assets and that is why they required firms to provide additional disclosures for these items. Presumably these additional disclosures would reduce or even eliminate the information asymmetry problem. We find evidence consistent with the information asymmetry problem continuing to exist, but it is moderated by corporate governance.

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differences in conclusions about the value relevance of FAS 157 Level information, our study differs from these studies in that (1) we have a much larger sample size and/or longer sample period, (2) we focus on both the value relevance of fair value hierarchy information and the incremental pricing effect of expanded disclosure format under FAS 157, and (3) we consider the impact of a larger set of corporate governance mechanisms on the pricing of fair value assets under FAS 157.

<sup>10</sup> In the past, users have not always been granted their requests to have information disclosed in a matrix-type format. For example, in deliberations of segment disclosures under FAS 131, users lobbied for disclosure of industry segment information within each geographic segment. In the end, the FASB did not adopt the matrix format for segment reporting but instead required separate disclosure of industry segment and geographic segment information (Herrmann and Thomas 2000).

These results highlight the importance of the quality of internal control system and monitors on the value relevance of accounting information, especially that which is potentially less reliable.

The next section describes FAS 157, reviews relevant prior research, and develops hypotheses. Section III outlines the sample selection process and provides descriptive statistics. Section IV presents empirical results. The paper concludes with a discussion of the results.

## II. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

### FAS 157

In recent years, U.S. Generally Accepted Accounting Principles (GAAP) have evolved toward greater use of fair values for reporting assets and liabilities. However, prior to FAS 157, neither a single coherent definition for fair value nor detailed guidance for applying the fair value measurement existed. In June 2003, the FASB added the fair value measurement project to its agenda to address these issues. In September 2006, the FASB released FAS 157, *Fair Value Measurements*.<sup>11</sup> FAS 157 does not expand the use of fair value measurements, but provides a coherent framework for applying fair value measurements and enhances disclosures about the nature and source of fair value measurements to increase consistency and comparability.

The FASB has concluded that fair value information is relevant (e.g., see Paragraph 217 of FAS 133 or Paragraph C2 of FAS 157).<sup>12</sup> To the extent that there are established, active markets for assets/liabilities, fair value is likely to be the most relevant measurement attribute.

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<sup>11</sup> The FASB and International Accounting Standards Board (IASB) have been working closely towards convergence of global accounting standards. For fair value accounting, the IASB published a discussion paper on fair value measurements in November 2006 (IASB, 2006), which addresses the same issues as those prescribed in FAS 157.

<sup>12</sup> There are claims that fair value may not be the most relevant measurement attribute. For example, one claim is that fair value may misrepresent management's intent (e.g., intent to hold/owe an asset/a liability to its maturity). However, fair value measurements allow shareholders to assess whether holding an asset or owing a liability is appropriate by providing *timely* value change information. See Ryan (2007, Ch.6) for other claims and related discussions. Also see Ramesh and Graziano (2004) for various discussions around the benefits and costs of historical cost vs. fair value accounting.

However, fair value measurements in the absence of observed prices might be unreliable due to intrinsic measurement error (noise) and management-induced error (bias). FAS 157 establishes a fair value hierarchy that prioritizes the inputs used to measure fair values into three broad levels, considering the relative reliability of the inputs to fair value measurements. Level 1 inputs are quoted prices in active markets. Since a quoted price is a single primary basis for the fair value measurement, the information asymmetry between preparers and users regarding fair value estimates from Level 1 inputs is very low. Level 2 inputs include either observable prices in active market for comparable assets and liabilities or observable market prices in inactive markets for identical assets and liabilities. Level 2 inputs could also include prices corroborated by market-based measures (e.g., correlation with the yield curve). Level 3 inputs are not observable from the market and reflect management’s assumptions about the assumptions market participants would use in pricing the asset or liability.<sup>13</sup>

The key distinction between Level 2 inputs and Level 3 inputs is whether inputs are observable or not.<sup>14</sup> This distinction is important for verifiability of fair values. Therefore, the Level 3 inputs are subject to the highest degree of information asymmetry between preparers and users. FAS 157 enhances fair value disclosure by requiring firms to provide fair value measurements by input levels in the hierarchy, enabling users to assess the relative reliability of fair value measurements. Appendix A provides an example of FAS 157 fair value measurements disclosures from a quarterly report filed by Wells Fargo & Company.

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<sup>13</sup> However, paragraph 30 of FAS 157 states “the reporting entity’s own data used to develop unobservable inputs shall be adjusted if information is reasonably available without undue cost and effort that indicates that market participants would use different assumptions.”

<sup>14</sup> Paragraph C82 of FAS 157 states “The Board concluded that market-corroborated inputs are observable inputs and that fair value measurements using market-corroborated inputs (within Level 2) should be distinguished from fair value measurements using unobservable inputs (within Level 3).” However, due to the swiftly changing market conditions, this distinction could become blurred. For example, Ryan (2008) articulates the possibility that many sub-prime related positions by Level 2 could now fall in fair value estimates by Level 3 inputs due to the collapse of the market.

## **Value Relevance of Fair Value Hierarchy**

Accounting information is considered to be *value relevant* when it has the predicted association with market value of equity (Barth, Beaver, and Landsman 2001). Generally, studies examining value relevance use statistical models to test whether accounting information of research interest (e.g., fair value of assets and liabilities) is associated with market value of equity. If empirical evidence is found to be value relevant, then it is assumed that the accounting information of research interest is relevant to investors *and* reliable enough to be reflected in share prices. However, it should be noted that the fair value measurements used in existing accounting literature are not necessarily consistent with FAS 157 because there was no single source of fair value definition prior to FAS 157.

Several studies find that fair values of investment securities of banks and property-liability insurers are value relevant (Barth, 1994; Petroni and Wahlen, 1995; Barth, Beaver and Landsman, 1996; Eccher, Ramesh, and Thiagarajan, 1996; Nelson, 1996; Carroll, Linsmeier, and Petroni 2003). Petroni and Wahlen (1995) find that fair values for equities and Treasury securities are value relevant, but fair values of municipal and corporate bonds are not, suggesting securities actively traded in the market are more reliably associated with market value of equity. In contrast, using a sample of closed-end mutual funds, Carroll, Linsmeier, and Petroni (2003) find that fair values of securities thinly traded are value relevant.

When there is no established market available, the evidence of value relevance of other financial instruments is mixed. For example, Nelson (1996) finds that fair values of loans, deposits, and long-term debt are not value relevant. In contrast, Barth, Beaver and Landsman (1996) find that fair values of loans are value relevant, while Eccher, Ramesh, and Thiagarajan

(1996) find the value relevance of fair values of loans only in limited settings. Finally, Venkatachalam (1996) examines the value relevance of fair values of derivatives and finds that these fair values are positively associated with market values of equity.

Another stream of fair value accounting research examines the effect of managerial opportunism in the fair value measurements. For example, Nissim (2003) examines whether the U.S. bank managers strategically overstate bank loans, finding that the estimated degree of overstatement systematically varies with regulatory capital requirements and the change in the rate of credit losses. Beaver and Venkatachalam (2003) partition U.S. bank loan fair values into three categories (i.e., non-discretionary, discretionary, and noisy components) and show that the pricing coefficient of the discretionary loan component is negative if the managerial intent for the discretion is likely opportunistic.<sup>15</sup> Studies also examine whether managers use private information for inputs to option valuation models to help or hurt information users in the U.S. setting. For example, in the case of stock option expense reporting under FAS 123<sup>16</sup>, Aboody, Barth and Kasznik (2006) and Bartov, Mohanram and Nissim (2007) show that managerial incentives induce managers' discretion over model assumptions (e.g., the expected option life and stock volatility input assumptions), lowering option values.<sup>17</sup>

The value relevance of non-financial assets has also been examined. Since upward asset revaluations are not allowed under U.S. GAAP, several studies examine value relevance of revaluation of fixed assets using other countries' data, such as Australia and the United Kingdom. For example, using a sample of Australian companies, Barth and Clinch (1998) find that fair

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<sup>15</sup> In contrast, Bernard, Merton and Palepu (1995) examine whether Danish bank managers manage fair value estimates to meet the mark-to-market based regulatory capital requirement in Denmark, but find no such evidence.

<sup>16</sup> Note that FAS 157 does not apply to stock option compensation measurements in FAS 123 (R). However, these studies are relevant, showing managerial discretion over input values in option value models.

<sup>17</sup> In contrast, Hodder, Mayew, McAnally and Weaver (2006) find that a large proportion of firms use value-increasing discretion in their valuation model inputs.

values of investment and intangible assets are value relevant, but fair values of property, plant and equipment (PPE) are not. In contrast, Aboody, Barth and Kasznik (1999) find that U.K. firms' revaluation balances of PPE are positively associated with prices. Also, they find that upward revaluations of PPE are associated with future operating performance. Similarly, Easton, Eddey, and Harris (1993) find that the level of asset revaluation reserve has significant explanatory power for price-to-book ratios. Dietrich, Harris and Muller (2001) examine the fair values estimates for U.K. investment properties and find that fair values estimates are less biased and more accurate measures of selling prices than historical costs.

These studies also examine whether the reliability of fair value measurements varies with the source of information. For example, Barth and Clinch (1998) find no difference in reliability between internal and external appraisals. However, Dietrich, Harris and Muller (2001) find the reliability of fair value estimates is an increasing function of the presence of monitoring of external appraisers. Similarly, Muller and Riedl (2002) provide evidence that market participants appear to find external appraisals to be more reliable.

In sum, evidence of the value relevance of fair values is mixed, with the exception of investment securities. Prior research also suggests that the reliability of fair value measures varies with the source of information, such as market-based information (Level 1) versus management-estimated information (Level 3). Therefore, FAS 157's fair value hierarchy has the opportunity to be useful in investors' valuation decisions by explicitly categorizing the inputs to fair value measurements.

Our first research question focuses on determining whether fair value measurements in each fair value hierarchy are value relevant. We are particularly interested in the value relevance of Level 2 and especially Level 3 fair values. This information may not be value relevant if

investors consider it to be less reliable due to managerial discretion.<sup>18</sup> Alternatively, consistent with prior non-U.S.-based research, Level 3 information could be value relevant if investors consider that managers' private information about fair values outweighs potential cost of managers' self-interest reporting. This leads to our first hypothesis (stated in alternative form).

*H1: Fair value measurements under FAS 157's hierarchy are value relevant.*

### **Incremental Value Relevance of Fair Value Hierarchy**

Our second research question considers whether FAS 157 brings new information to investors. Prior to FAS 157, investors had access to fair value measurements based on asset/liability types (Type information). For example, investors may value a firm assuming that fair values of investment securities are all from active markets. However, after adoption of FAS 157, the fair value hierarchy information (Level information) is available in addition to Type information. Therefore, FAS 157 enables investors to further disaggregate Type information into Level information. We are interested in whether FAS 157's enhanced disclosure of disaggregated Type information provides investors incremental information.

The Level information could be incrementally value relevant because the Level information explicitly provides disaggregated information of relative reliability of fair value measurements within each asset or liability type. Alternatively, the Level information may not have incremental value relevance if the Level information is somewhat redundant with the Type information. This could be possible if investors are able to estimate, albeit imperfectly, the Level

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<sup>18</sup> For example, in a Fortune magazine article, Eavis (2007) states that "investors have long been skeptical about the values that banks themselves place on their level three assets."

information using existing Type information. This leads to our second hypothesis (stated in alternative form).

*H2: Fair value measurements under FAS 157's hierarchy (Level information) are incrementally value relevant to asset/liability type (Type information).*

## **The Effect of Corporate Governance on Value Relevance of Fair Values**

In the previous section, we summarize previous studies examining the managerial opportunism in fair value measurements. However, strong corporate governance mechanisms have the potential to mitigate the problem of managerial opportunistic behavior. For example, Aboody, Barth and Kasznik (2006) find firms with weaker governance have more understatement of option value estimates.

Our final question focuses on examining whether the value relevance of fair values varies with the strength of corporate governance. The information asymmetry inherent in the reliability of fair value measurements inputs might induce biases. These biases include both intrinsic estimation error (noise) and management-induced error (bias). The latter form of bias is a moral hazard problem. These biases are likely to be more severe for inputs without observable prices (Level 3 and perhaps Level 2) than for inputs that are directly observable in active markets (Level 1). Prior studies show that weak corporate governance mechanisms are less likely to mitigate the moral hazard problem.<sup>19</sup> In particular, Penman (2007) discusses the importance of both the competence and independence of monitors and the effectiveness of internal control systems in minimizing biases in Level 3 fair value estimates. To the extent that weak corporate

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<sup>19</sup> See Shleifer and Vishny (1997), Becht, Bolton, and Roell (2003) and Gillan (2006) for reviews of this literature. Bhat (2009) provides evidence over the 2003-2005 period that market participants perceive fair value gains and losses of banks that have stronger corporate governance as more relevant and reliable. She interprets these results to mean that corporate governance aids market participants in evaluating the quality of fair value estimates.

governance mechanisms fail to reduce reliability concerns relating to estimation error and management induced bias in Level 3 fair values, investors are less likely to view Level 3 fair values as relevant. This leads to our final hypothesis (stated in alternative form).

*H3: The value relevance of fair value measurements under FAS 157's hierarchy is less evident for firms with weaker corporate governance.*

### **III. SAMPLE SELECTION AND DESCRIPTIVE STATISTICS**

#### **Sample Selection**

To maximize the power of our test (i.e., the relation between price and fair values), we focus on the banking industry where firms have significant amounts of fair value assets and liabilities. Table 1 delineates the sample selection process. The sample firms were initially identified from Compustat Bank Fundamentals Quarterly Research File. To be included in the sample, firms should provide the first quarter FAS 157 fair value hierarchy disclosure after November 15, 2007 (N=522). To avoid the confounding effect of prices from different macroeconomic events, we focus on firms that end the first quarter on March 31, 2008, eliminating 10 non-March 31 quarter firms (N=512). We further require firms to have price information in the Center for Research in Security Prices (CRSP) database (N=452). To avoid the effect from extreme outliers, we follow Belsley, Kuh and Welsch (1980) and Fox (1991), eliminating 20 observations that have studentized residuals greater than 2 in the estimation of equation (1) below. This procedure yields an initial sample of 431 firms.

We test H1 for the first three quarters of 2008. Because some firms fall from the sample, the number of firms in the second and third quarters is reduced, resulting in a total of 1,260

firms-quarter observations for tests of H1.<sup>20</sup> As discussed in more detail below, tests of H2 require hand collected data. Thus, we provide these tests only for the first quarter of 2008 (i.e., using the initial 431 firms). For tests of H3, sample firms are required to have valid governance variables in their 2007 proxy statements. This results in an additional 26 firms in the first quarter being eliminated due to missing proxy statements or incomplete proxy statements to determine the value of corporate governance variables. The final number of firm-quarter observations for tests of H3 over the first three quarters of 2008 equals 1,195.

### **Descriptive Statistics**

Panel A of Table 2 provides descriptive statistics on the relative size of fair value assets and liabilities from 1,260 firm-quarters. Compared to total assets and total liabilities, the mean total fair value assets and liabilities are about 15% and 0.4% respectively. The fair value amounts under Level 2 inputs account for most fair values.

Panel B of Table 2 presents descriptive statistics of variables used to test for the value relevance of Level information under FAS 157. All variables are per-share numbers. The mean share price (*PRC*) is 14.024. While the mean value of non-fair value assets (*NFVA*) is 133.606, the mean fair values of assets using Level 1 inputs (*FVA1*), Level 2 inputs (*FVA2*), and Level 3 inputs (*FVA3*) are 1.842, 21.150, and 0.889, respectively. Similarly, the mean value of non-fair value liabilities (*NFVL*) is 142.619, while the mean fair values of liabilities using Level 1 inputs (*FVL1*), Level 2 inputs (*FVL2*), and Level 3 inputs (*FVL3*) are 0.071, 0.783, and 0.044, respectively.

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<sup>20</sup> In sensitivity tests discussed below, we rerun all tests using a constant sample of firms (i.e., firms that have complete data for the first three quarters of 2008). None of our inferences are affected when using this slightly reduced sample.

In Panel C of Table 2 we provide a matrix of the reporting frequency of fair value Levels by hand-collected Type information from the first quarter 10Qs of 431 sample firms. For Type information, we classify fair value assets and liabilities into the following categories: (1) investment securities (*INVSEC*) including trading securities and available-for-sale securities, (2) derivative assets (*ADEV*), (3) loans (*LOAN*), (4) other assets (*AOTHER*) including mortgage service rights, federal funds sold, asset-backed securities, and other investments (5) trading liabilities (*TRDL*), (6) long-term debt (*LTDEBT*), (7) derivative liabilities (*LDEV*), and (8) other liabilities (*LOTHER*).

Overall, both the amount and the frequency of fair values are much greater for assets than for liabilities. Across the four asset types, a reasonable number of firms disclose fair values at all three values, with just a few exceptions. The average frequency across the 12 cells is 21.75%. However, for liabilities, the average frequency across the 12 cells is only 3.85%, and only for one cell (Level 2 derivative liabilities, *LDEV*) is there a reasonable number of observations. Nevertheless, the fact that all asset/liability types are represented in all levels of FAS 157's hierarchy provides evidence of the potential usefulness of these expanded disclosures.

## IV. RESULTS

### Value Relevance of Fair Value Hierarchy (H1)

To test the value relevance of FAS 157's fair value hierarchy, we estimate the association between share prices and fair values of assets and liabilities per share using a modified Ohlson (1995) model, which has been extensively employed in the literature. We partition book value into non-fair value assets and liabilities and each of the fair value levels.<sup>21</sup>

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<sup>21</sup> We believe that a price model rather than a returns model is appropriate for testing our hypotheses because our research question is to determine whether fair value hierarchy is reflected in firm value (i.e., value relevance),

$$\begin{aligned}
PRC_{it} = & \alpha_0 + \alpha_1 NFVA_{it} + \alpha_2 FVA1_{it} + \alpha_3 FVA2_{it} + \alpha_4 FVA3_{it} \\
& + \alpha_5 NFVL_{it} + \alpha_6 FVL12_{it} + \alpha_7 FVL3_{it} \\
& + \beta_1 NI + \varepsilon_{it}
\end{aligned} \tag{1}$$

Because of the low frequency of fair value liability reporting in our sample (see Table 2), we combine Level 1 and Level 2 liabilities (*FVL12*). The dependent variable, *PRC*, is per share price measured on the 10-Q filing month end for firm *i* in quarter *t*. Other variables are as defined previously on a per share basis. Barth and Clinch (2009) provide evidence that share-deflated specifications (as opposed to equity book value-deflated, lagged price-deflated, returns, or equity market value-deflated specifications) perform the best in reducing scale effects in the modified Ohlson (1995) model.

In estimating equation (1), we pool observations from the first three quarters of 2008 for each firm. Since residuals could be correlated across quarters or across firms, we correct standard errors and related t-statistics based on two dimensions (i.e., firms and quarters) following Peterson (2009).<sup>22</sup> Peterson (2009) shows that this standard error adjustment (or clustering by two dimensions) produces less biased standard errors.<sup>23</sup>

H1 examines whether the fair value hierarchy is value relevant. Given the relative greater reliability in Level 1 and Level 2 inputs, we expect coefficients on *FVA1* and *FVA2* to be positive and the coefficient on *FVL12* to be negative. In addition, to the extent that coefficients on Level

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rather than testing whether fair value hierarchy is reflected in changes in firm value “over a specific period of time” (see Barth, Beaver and Landsman 2001).

<sup>22</sup> We used *cluster2* command in STATA provided by Mitchell Peterson with *fcluster(GVKEY)* and *tcluster(FQTR)* options. Our results are robust to alternative panel data model specifications such as the firm fixed effect model.

<sup>23</sup> As an example of how failure to adjust standard errors in this manner can affect inferences in accounting research, see Gow, Ormazabal, and Taylor (2009).

estimates are significantly different from zero, we further test whether the coefficient on each Level of asset (liability) is different from its theoretical value of one (minus one).

In Table 3 we report results of equation (1) and test whether the valuation coefficient is zero (Column A), whether it is different from one for assets (Column B), and whether it is different from minus one for liabilities (Column C). The results indicate that the estimated coefficients for both non-fair value assets/liabilities and fair value assets/liabilities are different from zero, indicating their value relevance. In addition, we find that the coefficients on *FVA1* and *FVA2* are not different from their theoretically predicted value of one. However, the coefficient on *FVA3* is significantly less than one, meaning that investors place less weight on Level 3 fair value assets relative to Levels 1 and 2.

As for liabilities, the coefficient on *FVL12* is not statistically different from its predicted value of minus one. For *FVL3*, we find the valuation coefficient to be significantly less than minus one (or greater than one in absolute terms). The coefficient's magnitude is consistent with investors perceiving Level 3 fair value liabilities to be understated. In summary, Level 1 and Level 2 fair value estimates are value relevant and valuation coefficients are not statistically different from their theoretical values of one or minus one. For Level 3 fair values, valuation coefficients suggest that investors adjust for managerial overstatement of Level 3 assets and understatement of Level 3 liabilities.<sup>24</sup>

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<sup>24</sup> Recall from Table 1 that the number of firms in the sample decreases from 431 in the first quarter to 410 by the third quarter for tests of H1. We repeat tests using only the 410 firms that have data for all three quarters (i.e., 1,230 firm-quarter observations). We find results nearly identical to those reported in Table 3. Coefficients for *FVA1*, *FVA2*, and *FVL12* (0.958, 0.962, and -1.003) are not significantly different from one or minus one, the coefficient on *FVA3* is less than one (0.611) and significant at the 0.01 level, and the coefficient on *FVL3* is less than minus one (-1.983) and significant at the 0.01 level.

## Incremental Value Relevance of Fair Value Hierarchy (H2)

To determine the extent to which FAS 157's Level information is incremental to existing Type information, we first estimate the value relevance of Type information in equation (2).

$$\begin{aligned}
 PRC_{it} = & \delta_0 + \delta_1 NFVA_{it} + \delta_2 INVSEC_{it} + \delta_3 LOAN_{it} + \delta_4 ADEV_{it} + \delta_5 AOTHER_{it} \\
 & + \delta_6 NFVL_{it} + \delta_7 TRDL_{it} + \delta_8 LTDEBT_{it} + \delta_9 LDEV_{it} + \delta_{10} LOTHER_{it} + \varepsilon_{it}
 \end{aligned} \tag{2}$$

where  $PRC$  is share price of equity;  $NFVA$  ( $NFVL$ ) is assets (liabilities) recorded at historical cost;  $INVSEC$  is fair values of investment securities;  $LOAN$  is fair values of loan;  $ADEV$  and  $AOTHER$  are fair values of derivative assets and other assets, respectively;  $TRDL$  is fair values of trading liabilities;  $LTDEBT$  is fair values of long-term debt;  $LDEV$  and  $LOTHER$  are fair values of derivative liabilities and other liabilities, respectively. All values are per share numbers.

Next, we decompose each variable in equation (2) into Level information and estimate equation (3).

$$\begin{aligned}
 PRC_{it} = & \phi_0 + \phi_1 NFVA_{it} + \sum_{A=1}^3 \eta_A INVSEC \text{ by Each Level}_{it} + \sum_{B=1}^3 \mu_B LOAN \text{ by Each Level}_{it} \\
 & + \sum_{C=1}^3 \omega_C ADEV \text{ by Each Level}_{it} + \sum_{D=1}^3 \sigma_D AOTHER \text{ by Each Level}_{it} \\
 & + \alpha NFVL_{it} + \sum_{E=1}^2 \kappa_E TRDL \text{ by Each Level}_{it} + \sum_{F=1}^2 \theta_F LTDEBT \text{ by Each Level}_{it} \\
 & + \sum_{G=1}^2 \zeta_G LDEV \text{ by Each Level}_{it} + \sum_{H=1}^2 \psi_H LOTHER \text{ by Each Level}_{it} + \varepsilon_{it}
 \end{aligned} \tag{3}$$

We assess the incremental value relevance of the fair value hierarchy by comparing the explanatory powers of equation (2) versus (3). If the Level information is incrementally value

relevant to Type information, the  $R^2$  of equation (3) will be significantly greater than the  $R^2$  of equation (2). For this test, we hand collect data on fair value Type within each Level (see Panel B of Table 2). Because of this, we restrict our analysis to the first quarter of 2008.

Table 4 provides results of equations (2) and (3). The left column provides the results of equation (2) of prices on asset/liability types (i.e., Type information). The  $R^2$  from the model is 67.75% and most coefficients have their predicted sign and are statistically significant. The right side provides results of equation (3). For this equation we do not interpret coefficients. Given the large number of fair value components, the relatively low number of observations in each cell, and the potential for high collinearity among variables, coefficients are likely unreliable.<sup>25</sup> Instead, we are interested in the total explanatory power of these variables for share prices. The  $R^2$  is 69.6% when the Type and Level information are both included in the model. We formally test whether these two  $R^2$ s are statistically different. The Vuong's Z-statistic (Vuong 1989) is 2.22 with a p-value of 0.01. This suggests that when the Level information is used together with the Type information, FAS 157 Level information is incrementally value relevant. We caution that the economic significance may be small since the increase in  $R^2$  is relatively small.<sup>26</sup> However, given that most assets and liabilities for our banking sample are not reported at fair values, the small increase in explanatory power should not be surprising.<sup>27</sup>

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<sup>25</sup> Note, however, that the sign and the magnitude of coefficients appear to be appropriate as long as the coefficients are statistically significant at the conventional level.

<sup>26</sup> In comparison, the  $R^2$  in a Levels only model (i.e., equation (1)) for these observations is 67.57%. Thus, Level and Type information are incremental to one another but the increase in explanatory value is relatively small.

<sup>27</sup> For our sample, approximately 85% of assets are not reported at fair value and 99% of liabilities are not reported at fair value.

### **The Effect of Corporate Governance on Value Relevance Fair Values (H3)**

Results so far indicate that FAS 157 Level information is value relevant and somewhat incrementally useful for explaining share prices. Given the high level of information asymmetry between managers and investors relating to reliability of Level 3 and perhaps Level 2 inputs, H3 tests whether investors place differential weights on fair values across Levels based on the firm's corporate governance mechanisms. Based on prior literature, we use six measures of corporate governance mechanisms that are germane to the reliability of Level 3 fair value estimates. The six governance measures include (1) board independence (*BDIND*)<sup>28</sup> measured by the number of independent board members divided by the number of total board members, (2) audit committee financial expertise (*ACFE*)<sup>29</sup> measured by number of audit committee members with financial expertise divided by the number of total audit committee members, (3) the frequency of annual audit committee meetings (*ACMEET*), (4) total percent of shares held by institutional investors (*INSTHOLDPCT*)<sup>30</sup> calculated from 13-F filings, (5) size of audit engagement office (*AUDITOFFICESIZE*),<sup>31</sup> and (6) no material control weaknesses problem (*NOMCW*)<sup>32</sup> under

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<sup>28</sup> Dechow, Sloan and Sweeney (1996) and Beasley (1996) show that firms that are investigated by the SEC had boards with significantly lower percentages of outside members. Similarly, both Klein (2002) and Peasnell, Pope and Young (2000) find a negative relation between board independence and earnings management. Ajinkya, Bhojraj and Sengupta (2005) provide evidence that the percentage of outside directors on the board is negatively associated with optimistic biases in management forecasts.

<sup>29</sup> Section 407 of SOX required the SEC to issue a rule requiring public companies to disclose whether their audit committee has at least one financial expert. Additionally, if companies do not have financial experts on their audit committees, they are required to disclose that fact. Recent studies provide evidence that audit committees with more financial expertise and activities are less likely to manage earnings and to issue restatements (Abbott and Parker, 2000; Agrawal and Chadha, 2005; Bedard, Chtourou, and Courteau, 2004).

<sup>30</sup> Institutional investors appear to play a monitoring role over corporate financial reporting. Chung, Firth and Kim (2002) find a negative association between earnings management and the presence of institutional investors. Bushee (1998) and Bange and DeBondt (1998) find that the presence of institutional investors with a long-term investment horizon reduces the level of earnings management through R&D activities. Ajinkya, Bhojraj and Sengupta (2005) provide evidence that institutional ownership has a favorable effect on the likelihood of forecast occurrence as well as the frequency of issuance.

<sup>31</sup> Previous studies use a dichotomous variable (e.g., Big N auditors) to measure the quality of the auditor. Recent studies (Francis and Yu 2009, Choi et al. 2008) further show that even within brand name auditors, the size of a specific engagement office matters for the audit quality and audit fees. Thus, following Francis and Yu (2009), we calculate the auditor size of our sample firms based on their 2007 audit fee revenues to proxy for the quality of audit provided for our sample firms.

Sarbanes-Oxley Act (SOX) 302 or 404.<sup>33</sup> Prior studies indicate that firms with independent boards, highly financially literate audit committees, active audit committees, the presence of institutional investors, audits by auditors from larger offices, and no material control weaknesses are less likely to engage in financial reporting biases.

Panel A of Table 5 provides the descriptive statistics for the six attributes of corporate governance. The median value of *BDIND* is 0.78, reflecting the improved board independence after SOX. The median of *ACFE* is 0.32, indicating that one-third of the audit committee members are classified as financial experts under SOX. Audit committees in our sample meet eight times annually. On average, 30 percent of shares of sample firms are held by institutional investors and the average log of audit office committee revenues is 15.04. Finally, 82 percent of our sample firms do not report any material control weakness problem (*NOMCW*) prior to 2007. Panel B of Table 5 provides the correlation coefficients among corporate governance variables.

To reduce the random measurement error of individual governance variables and parsimoniously summarize the underlying latent construct (i.e., governance), we create a standardized governance score (*GOVSCORE*) based on the principal-component factor analysis of six aforementioned governance variables.<sup>34</sup> The factor loadings for the varimax orthogonal rotation are shown in the first column of Panel C of Table 5, representing how individual

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<sup>32</sup> Ashbaugh-Skaife, Collins, Kinney and LaFond (2008) and Doyle, McVay and Ge (2007) document a negative association between disclosed control weaknesses and earnings quality. Similarly, Feng, Li and McVay (2008) show that ineffective internal controls are likely to induce less accurate management earnings forecasts.

<sup>33</sup> Section 302 of SOX (Title III, Corporate Responsibility for Financial Reports), implemented by the SEC on August 27, 2002, requires all public companies to evaluate the firm's internal controls and disclose a list of all deficiencies in the internal controls and information on any fraud in quarterly filings from August 29, 2002 (see SEC 2003). Section 404 of SOX (Title IV, Enhanced Financial Disclosures) requires accelerated filers to assess and report on the effectiveness of internal controls over financial reporting and to have their independent accounting firms opine on the effectiveness of internal controls in annual filings for fiscal years ending after November 15, 2004. Para.10 of PCAOB AS No. 2 states "A material weakness is a significant deficiency, or combination of significant deficiencies, that results in more than a remote likelihood that a material misstatement of the annual or interim financial statements will not be prevented or detected."

<sup>34</sup> Archival accounting research often uses this methodology to summarize investor characteristics (e.g., Bonner, Walther, and Young 2003) or firm characteristics (e.g., Baik, Farber, and Petroni 2009).

governance variables are weighted for (i.e., correlated with) *GOVSCORE*. Consistent with our intuition, all governance variables are positively loaded in generating *GOVSCORE*. The factor analysis generates a factor with the eigenvalue of 1.878, which accounts for about 39% of the total variations in the original variables. The second column provides the Kaiser-Meyer-Olkin measure of sampling adequacy (Kaiser 1974). The mean of this statistic (0.62) is greater than 0.5, indicating that *GOVSCORE* well captures the underlying common factor of six individual variables (Stewart 1981). Panel D of Table 5 shows the distribution of *GOVSCORE*. Due to the standardization, the mean and the standard deviation of *GOVSCORE* are 0 and 1, respectively. Based on *GOVSCORE*, we create the decile rank (*GOVRANK*) from zero to nine, and then scale by nine. To test H3, we estimate equation (4).

$$\begin{aligned}
 PRC_{it} = & \alpha_0 + \alpha_1 NFVA_{it} + \alpha_2 FVA1_{it} + \alpha_3 FVA2_{it} + \alpha_4 FVA3_{it} \\
 & + \alpha_{2a} FVA1_{it} * GOVRANK + \alpha_{3a} FVA2_{it} * GOVRANK + \alpha_{4a} FVA3_{it} * GOVRANK \\
 & + \alpha_5 NFVL_{it} + \alpha_6 FVL12_{it} + \alpha_7 FVL3_{it} \\
 & + \beta_1 NI + \beta_2 GOVRANK + \varepsilon_{it}
 \end{aligned} \tag{4}$$

Equation (4) is essentially identical to the equation (1) with the exception that all levels of fair value assets are also interacted with *GOVRANK*. Since the frequency and amount of fair value assets greatly exceeds those of fair value liabilities, we limit our design to fair value assets. If investors consider that high quality corporate governance can mitigate the concerns of managers' opportunistic reporting, we predict the coefficients on the interaction with *GOVRANK* to be positive.

Panel A of Table 6 provides the results of estimation of equation (4). The coefficient on fair value assets alone (i.e., *FVA1*, *FVA2*, and *FVA3*) can be interpreted as the valuation of fair

value assets for firms in the lowest governance decile. The coefficients on the interaction terms are the *incremental* valuations when moving from the lowest decile to the highest decile. As shown in the table, the coefficients on all three non-interaction terms are positive, but only *FVA1* and *FVA2* are significantly different from zero. This suggests that Level 1 and Level 2 fair values of low governance firms are value relevant but Level 3 fair values are not. It is also worthy to note that the coefficients on Level 1 and Level 2 assets (0.81 and 0.83) are less than one at marginal significance levels (0.15 level, two-tailed).

The interaction terms are positive for all three levels but only Level 2 and Level 3 are significant.<sup>35</sup> By adding the coefficient of the interaction term (e.g., *FVA1\*GOVRANK*) with that of the non-interaction term (e.g., *FVA1*), we can determine the valuation coefficient for the highest decile (i.e., firms with strongest corporate governance). For the highest decile, the valuations of Level 1 and Level 2 assets increase to near one (1.01 and 0.97). Furthermore, the level of corporate governance has the greatest impact on valuation of Level 3 fair value assets. The coefficient on the lowest decile (i.e., the *FVA3* term) is 0.06 and increases by 0.76 (i.e., the *FVA3\*GOVRANK* term) to 0.82 for the highest decile. Overall, these findings support the importance of corporate governance in valuing all levels of fair values, but especially Level 3 fair values which likely represent the values with greatest information asymmetry.<sup>36,37</sup>

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<sup>35</sup> It should be noted that while the coefficient for *FVA2\*GOVRANK* is significant and *FVA1\*GOVRANK* is not, the two coefficients have similar magnitudes and are not significantly different. Thus, we do not rule out the possibility that the insignificance of *FVA1\*GOVRANK* is due to lower power tests of fewer Level 1 assets being reported (see Table 2).

<sup>36</sup> When we restrict the sample to the 392 firms that have data for all three quarters, we find similar results. Specifically, for tests of H3, the coefficients on *FVA2\*GOVRANK* and *FVA3\*GOVRANK* are positive (0.140 and 0.441) and significant at the 0.05 level, while the coefficient on *FVA1\*GOVRANK* is positive (0.194) but not significant.

<sup>37</sup> As a sensitivity test, we examine the impact of corporate governance on the valuation of fair value liabilities. As discussed previously, results related to fair value liabilities should be considered exploratory. The low frequency of reported fair value liabilities (see Table 2) makes it difficult to draw reliable conclusions. Nevertheless, we interact *GOVRANK* with *FVL12* and *FVL3* in equation (4) to test H3. First, we note that none of our inferences regarding the impact of corporate governance on fair value assets changes. Second, we find no impact of *GOVRANK* on *FVL12*. Third, we find that the coefficient on *FVL3\*GOVRANK* is significantly negative at the

For completeness, we also examine each of the six corporate governance measures. Given that each measure in isolation provides a limited picture of a firm's overall corporate governance, we view these results as exploratory for the interested reader. We find that the coefficient on *FVA2\*GOVRANK* is positive for five of our six corporate governance measures and significant for three (audit committee meetings, institutional holding, and no material control weaknesses problems). The coefficient on *FVA3\*GOVRANK* is also positive for five of the six governance measures and significant for three (board independence, auditor office size, and no material control weaknesses problem). The coefficient on *FVA1\*GOVRANK* is positive only for four of the governance measures and significant for two (audit committee meetings and no material control weaknesses problem).<sup>38</sup> Overall, the analyses of individual measures continue to support the greater impact of governance on valuation of Level 2 and Level 3 assets.<sup>39</sup>

### **Tests of H1 and H3 Over Time**

To test for the impact of the worsening economic crisis in 2008 on the valuation of FAS 157 fair value measures, we estimate equation (1) for each of the first three quarters. The first (untabulated) result to note is the decrease in  $R^2$  of the model over time. In the first quarter, the  $R^2$  equals 67.57% but falls to 50.91% by the third quarter. This result likely reflects the greater noise in stock prices as the economic crisis deepened. Second, we find that the valuation

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0.10 level. This result suggests that firms with higher governance have lower firm value per dollar of Level 3 liabilities.

<sup>38</sup> Unlike Kolev (2009), we find no evidence that the value relevance of fair values varies based on audit committee financial expertise. His sample includes a small number of banks (88), financial services firms (35), and insurance companies (54). Kolev (2009) also finds that valuations of fair values are lower for firm with lower equity capital and firms that develop their mark-to-model internally.

<sup>39</sup> Our results are consistent with Bhat (2009). For the 2003-2005 period, she provides evidence that market participants perceive fair value gains and losses of banks that have high level of corporate governance as more relevant and reliable. One potential interpretation is that disclosure and corporate governance aid market participants in evaluating the quality of fair value estimates.

coefficients of *FVA1* and *FVA2* are insignificantly different from one for all three quarters. *FVL12* is approximately minus one for the first and second quarters and then becomes slightly less than minus one (i.e., absolute value greater than one) and significant at the 0.10 level in the third quarter. Finally, the coefficient on *FVA3* moves slightly closer to one as the year proceeds (from 0.615 in the first quarter to 0.766 in the third quarter). Similar, *FVL3* moves closer to minus one (-2.302 in the first quarter to -1.669 in the third quarter). Thus, if anything, valuations of Level 3 assets and liabilities moved closer to their theoretically predicted values of one and minus one as the crisis worsened.<sup>40</sup> While these results should be viewed as preliminary, they provide some initial interesting evidence of investors' perceptions of fair values during an economic crisis.

For tests of H3, the second quarter seems to be the quarter that best distinguishes the impact of corporate governance on that the valuation of fair value assets. Only in this quarter is the valuation of all three Levels significantly greater for strong corporate governance firms compared to low governance firms. Given that the economic crisis seemed to steadily worsen as the year progressed, it is difficult to draw definitive conclusions on the joint effect of corporate governance and market liquidity on valuations of fair value assets. Clearly, this is a fruitful area for future research as more data become available and tests are refined.

## V. CONCLUSIONS

Under FAS 157, firms are required to disclose fair values of asset and liability types by levels, where levels are based on inputs used to generate fair values: (1) Level 1 (i.e., observable inputs from quoted prices in active markets), (2) Level 2 (i.e., indirectly observable inputs from

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<sup>40</sup> Goh et al. (2009) conclude the opposite. For their smaller sample of banks and with a different valuation model than ours, they find that the valuation of fair value assets declines over the first three quarters of 2008.

quoted prices of comparable items in active markets, identical items in inactive markets, or other market-related information), and (3) Level 3 (i.e., unobservable, firm-generated inputs). Using banking firm data from the first three quarters of 2008, we examine three important research questions related to fair value information provided by banks under FAS 157. First, we examine whether the fair value hierarchy, especially Level 3 fair values, are value relevant. Second, we examine the incremental value relevance of the fair value hierarchy in addition to asset/liability type information which existed prior to FAS 157. Finally, we examine whether the value relevance of fair values varies with the strength of the firm's corporate governance mechanisms.

We find the following. First, the fair value hierarchy is value relevant. Level 1 and Level 2 assets (liabilities) are value relevant and have valuation coefficients close to their theoretically predicted value of one (minus one). However, Level 3 assets are valued significantly less than one, while Level 3 liabilities have a valuation coefficient less than minus one (i.e., absolute value greater than one). Because of the greater information asymmetry associated with Level 3 fair values, a reasonable interpretation of these results is that investors perceive the reported (firm-generated) amounts of Level 3 assets as overstated and Level 3 liabilities as understated.

Second, although the fair value hierarchy information could overlap the information content provided by Type information (e.g., fair values of investment securities, derivative assets and liabilities, loans, long-term debt, etc.), we find that Level information adds some incremental value relevance to existing Type information. This is consistent with the prediction that FAS 157 provides useful incremental information for investors' equity valuations.

Finally, we find evidence that the value relevance of fair value assets varies with the strength of a firm's corporate governance. For firms with low corporate governance, Level 1 and Level 2 assets are below one (0.81 and 0.83). These valuations are marginally different from one

at approximately the 0.15 level (two-tailed). We find that the valuation of Level 3 assets of low governance firms is close to zero (0.06) and not significant, suggesting no value relevance. For high governance firms, we find that the valuations of Level 1 and Level 2 assets increase to near one (1.01 and 0.97), and that of Level 3 assets increases to 0.82. The increase in asset valuations for each of the levels is consistent with strong governance reducing information asymmetry, and this is especially apparent for Level 3 assets (i.e., unobservable, firm-generated amounts) where information asymmetry is expected to be the highest.

While we recognize that fair value may affect financial statement users in contexts other than the pricing of equity securities (Holthausen and Watts 2001), we believe that our findings should be important to U.S. and international standard setters for understanding not only the effects of FAS 157 disclosures, but also how future standards (e.g., the joint IASB/FASB project on financial statement presentation) can enhance existing fair value disclosures. For example, we find that investors discount less reliable fair values possibly due to information asymmetry and moral hazard problems. However, to the extent firms have strong governance, these problems appear less severe or even nonexistent. The impact of corporate governance on the value relevance of fair values has received limited attention in academic research, especially in the U.S.

Our study is subject to a few caveats. First, our sample firms are limited to the banking industry and represent observations during the first three quarters of 2008. Until more data are analyzed, both in the cross section and over time, the results may not be generalizable. Second, we note that the current economic crisis existed and was worsening over our sample period. It is not yet clear to what extent fair value measures *should* be value relevant under the framework of FAS 157, which requires prices to be measured based on “orderly transactions,” when market liquidity is low. While standard setters likely hope that fair values are even more informative

during an economic crisis, the low liquidity in the market makes reported fair values less observable and more subjective to measure, especially for Level 2 and Level 3 items. In additional tests, we find little evidence that the value relevance of fair value levels worsened as the economic crisis deepened. In fact, we find some preliminary evidence which suggests that some fair values became even more value relevant.

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## APPENDIX A

### An Example of FAS 157 10-Q Disclosure of Wells Fargo & Company from Q1 2008

#### 13. FAIR VALUES OF ASSETS AND LIABILITIES

##### Fair Value Hierarchy

Under FAS 157, we group our assets and liabilities at fair value in three levels, based on the markets in which the assets and liabilities are traded and the reliability of the assumptions used to determine fair value. These levels are:

- Level 1 – Valuation is based upon quoted prices for identical instruments traded in active markets.
- Level 2 – Valuation is based upon quoted prices for similar instruments in active markets, quoted prices for identical or similar instruments in markets that are not active, and model based valuation techniques for which all significant assumptions are observable in the market.
- Level 3 – Valuation is generated from model-based techniques that use significant assumptions not observable in the market. These unobservable assumptions reflect our own estimates of assumptions that market participants would use in pricing the asset or liability. Valuation techniques include use of option pricing models, discounted cash flow models and similar techniques.

The table below presents the balances of assets and liabilities measured at fair value on a recurring basis.

(in millions)	Total	Level 1	Level 2	Level 3
<b>Balance at March 31, 2008</b>				
Trading assets	\$ 8,893	\$ 1,124	\$ 7,407	\$ 362
Securities available for sale	81,787	41,912	33,191	6,684 <sup>(2)</sup>
Mortgages held for sale	27,927	—	26,667	1,260
Mortgage servicing rights (residential)	14,956	—	—	14,956
Other assets <sup>(1)</sup>	3,167	2,226	893	48
Total	\$ 136,730	\$ 45,262	\$ 68,158	\$ 23,310
Other liabilities <sup>(1)</sup>	\$ (6,235)	\$ (3,597)	\$ (2,230)	\$ (408)
<b>Balance at March 31, 2007</b>				
Trading assets	\$ 6,525	\$ 1,572	\$ 4,599	\$ 354
Securities available for sale	45,443	32,412	10,223	2,808 <sup>(2)</sup>
Mortgages held for sale	25,692	—	25,692	—
Mortgage servicing rights (residential)	17,779	—	—	17,779
Other assets	538	470	58	10
Total	\$ 95,977	\$ 34,454	\$ 40,572	\$ 20,951
Other liabilities <sup>(1)</sup>	\$ (3,056)	\$ (1,285)	\$ (1,460)	\$ (311)

(1) Derivatives are included in this category.

(2) Non-rated asset-backed securities collateralized by auto leases represent substantially all of this balance.

The changes in Level 3 assets and liabilities measured at fair value on a recurring basis are summarized as follows:

(in millions)	Trading assets (excluding derivatives)	Securities available for sale	Mortgage held for sale	Mortgage servicing rights (residential)	Net derivative assets and liabilities	Other liabilities (excluding derivatives)
Quarter ended March 31, 2008						
Balance, beginning of quarter	\$ 418	\$ 5,381	\$ 146	\$ 16,763	\$ 6	\$ (280)
Total net gains (losses) for the quarter included in:						
net income	(68)	(8)	(5)	(2,564)	(179)	(66)
Other comprehensive income	—	42	—	—	—	—
Purchases, sales, issuances and settlements, net	12	1,269	27	757	142	17
Net transfer into/out of Level 3	—	—	1,092 <sup>(3)</sup>	—	—	—
Balance, end of quarter	\$ 362	\$ 6,684	\$ 1,260	\$ 14,956	\$ (31)	\$ (329)
Net unrealized losses included in net income for the quarter relating to assets and liabilities held at March 31, 2008 <sup>(1)</sup>	\$ 40 <sup>(2)</sup>	\$ (4)	\$ (5) <sup>(4)</sup>	\$ (1,794) <sup>(4)(5)</sup>	\$ (27) <sup>(4)</sup>	\$ (66) <sup>(4)</sup>
Quarter ended March 31, 2007						
Balance, beginning of quarter	\$ 360	\$ 3,447	—	\$ 17,591	\$ (68)	\$ (282)
Total net gains (losses) included in:						
net income	(41)	—	—	(799)	17	(6)
Purchase, sales, issuances and settlements, net	34	(639)	—	987	—	39
Balance, end of quarter	\$ 353	\$ 2,808	\$ —	\$ 17,779	\$ (51)	\$ (249)
Net losses included in net income relating to assets held at March 31, 2007 <sup>(1)</sup>	\$ (25) <sup>(2)</sup>	\$ —	—	\$ (10) <sup>(4)(5)</sup>	\$ (43) <sup>(4)</sup>	\$ (6) <sup>(4)</sup>

(1) Represents only net losses that are due to changes in economic conditions and management's estimates of fair value and excludes changes due to the collection/realization of cash flows over time.

(2) Included in other noninterest income in the income statement.

(3) Represents mortgages held for sale that were transferred from Level 2 to Level 3 due to reduced levels of market liquidity for certain residential mortgage loans.

(4) Included in mortgage banking in the income statement.

(5) Represents total unrealized losses of \$1,798 million and \$11 million, net of losses of \$4 million and \$1 million related to sales, for first quarter 2008 and 2007, respectively.

We may be required, from time to time, to measure certain assets at fair value on a nonrecurring basis in accordance with GAAP. These adjustments to fair value usually result from application of lower-of-cost-or-market accounting or write-downs of individual assets. For assets measured at fair value on a nonrecurring basis that were still held in the balance sheet at quarter end, the following table provides the level of valuation assumptions used to determine each adjustment and the carrying value of the related individual assets or portfolios at quarter end.

(in millions)	Carrying value at quarter end				Total losses for quarter ended
	Total	Level 1	Level 2	Level 3	
March 31, 2008					
Mortgages held for sale	\$1,781	\$ —	\$1,678	\$ 103	\$ (78)
Loans held for sale	360	—	360	—	(11)
Loans <sup>(1)</sup>	546	—	546	6	(1,297)
Private equity investments	19	16	—	3	(14)
Foreclosed assets <sup>(2)</sup>	384	—	384	—	(104)
Operating lease assets	19	—	19	—	—
					<u>\$(1,504)</u>
March 31, 2007					
Mortgages held for sale	\$5,023	\$ —	\$5,023	\$ —	\$ (66)
Loans <sup>(1)</sup>	592	—	592	—	(575)
Private equity investments	3	—	—	3	(5)
Foreclosed assets <sup>(2)</sup>	225	—	225	—	(89)
					<u>\$ (735)</u>

(1) Represents carrying value and related write-downs of loans for which adjustments are predominantly based on the appraised value of the collateral. The carrying value of loans fully charged-off, which includes unsecured lines and loans, is zero.

(2) Represents the fair value and related losses of foreclosed real estate and other collateral owned that were measured at fair value subsequent to their initial classification as foreclosed assets.

**TABLE 1**  
**Sample Selection**

<b>Process</b>	<b># of Firms (1st quarter)</b>	<b># of Firms (2nd quarter)</b>	<b># of Firms (3rd quarter)</b>
Firms that report the first quarter FAS 157 information in Compustat Bank Fundamentals Quarterly after November 15, 2007.	522		
<i>Less:</i> Non-March 31 1st Quarter Ending Firms	(10)		
<i>Less:</i> Firms that do not have price information in the CRSP database	(60)		
<i>Less:</i> Outliers that have studentized residual greater than 2 in the estimation of equation (1), following Belsley, Kuh, and Welsch (1980) and Fox (1991)	(21)		
<b>Sample for the test of H1</b>	<b>431</b>	<b>419</b>	<b>410</b>
<b>Sample for the test of H2</b>	<b>431</b>		
<i>Less:</i> Firms that do not have proxy statements or have incomplete information on governance variables	(26)		
<b>Sample for the test of H3</b>	<b>405</b>	<b>398</b>	<b>392</b>

**Note:** This panel delineates the sample selection process. The sample firms were initially identified from Compustat Bank Fundamentals Quarterly Research File. To be included in the sample, firms should provide the first quarter FAS 157 fair value hierarchy disclosure after November 15, 2007 (N=522). To avoid the confounding effect of prices from different macroeconomic events, we focus on firms that end the first quarter on March 31, 2008, eliminating 10 non-March 31 quarter firms (N=512). We further require firms to have price information in the Center for Research in Security Prices (CRSP) database (N=452). To avoid the effect from extreme outliers, we follow Belsley, Kuh and Welsch (1980) and Fox (1991), eliminating 20 observations that have studentized residuals greater than 2 in the estimation of equation (1). This procedure yields an initial sample of 431 firms for H1 and H2. H3 requires the sample firms to have valid governance variables. We further eliminate 26 firms due to missing proxy statements or incomplete proxy statements to determine the value of corporate governance variables of interest in this study. H1 and H3 are tested across the first three quarters of 2008, while H2 is tested in the first quarter only due to manual data collection of Type information.

**TABLE 2**  
**Descriptive Statistics**

*Panel A: Relative Size of Fair Value Assets and Liabilities*

Variable	N (Firm-Quarters)	Mean	Std Dev	25th Pctl	50th Pctl	75th Pctl
<i>FVA/Total Assets</i>	1,260	14.97%	9.89%	7.93%	13.81%	19.96%
<i>FVA1/Total Assets</i>	1,260	1.15%	3.32%	0.00%	0.04%	0.57%
<i>FVA2/Total Assets</i>	1,260	13.31%	9.94%	5.93%	12.32%	18.23%
<i>FVA3/Total Assets</i>	1,260	0.51%	1.51%	0.00%	0.00%	0.33%
<i>FVL/Total Liabilities</i>	1,260	0.37%	2.57%	0.00%	0.00%	0.01%
<i>FVL1/Total Liabilities</i>	1,260	0.03%	0.24%	0.00%	0.00%	0.00%
<i>FVL2/Total Liabilities</i>	1,260	0.32%	2.36%	0.00%	0.00%	0.00%
<i>FVL3/Total Liabilities</i>	1,260	0.03%	0.20%	0.00%	0.00%	0.00%

**Note:** This panel provides descriptive statistics on the relative size of fair value assets and liabilities by Level to total assets and total liabilities.

*Panel B: Per Share Value of Price, Non-Fair Value, Fair Value Assets and Liabilities, and Income*

Variable	N (Firm-Quarters)	Mean	Std Dev	25th Pctl	50th Pctl	75th Pctl
<i>PRICE</i>	1,260	14.024	9.798	7.705	11.625	17.960
<i>NFVA</i>	1,260	133.606	73.340	85.004	121.797	163.279
<i>FVA1</i>	1,260	1.842	6.209	0.000	0.061	0.815
<i>FVA2</i>	1,260	21.150	21.321	7.630	16.352	27.250
<i>FVA3</i>	1,260	0.889	2.712	0.000	0.000	0.502
<i>NFVL</i>	1,260	142.619	77.589	89.420	131.275	171.936
<i>FVL1</i>	1,260	0.071	0.701	0.000	0.000	0.000
<i>FVL2</i>	1,260	0.783	7.552	0.000	0.000	0.002
<i>FVL12</i>	1,260	0.854	8.178	0.000	0.000	0.004
<i>FVL3</i>	1,260	0.044	0.380	0.000	0.000	0.000
<i>INC</i>	1,260	0.008	0.915	0.032	0.163	0.326

**Note:** This panel provides descriptive statistics on share price, non-fair value assets (*NFVA*), non-fair value liabilities (*NFVL*), and fair value assets and liabilities. *FVA1* (*FVL1*) indicates fair value of Level 1 assets (liabilities). Similarly, *FVA2*, *FVA3*, *FVL2*, and *FVL3* are fair values of Level 2 and Level 3 assets and liabilities. *INC* is income before extraordinary item for common shareholders.

*Panel C. Frequency of Reported Fair Value Assets/Liabilities by the Fair Value Hierarchy (N = 431 Firms from the First Quarter 2008)*

<b>Assets</b>	<b>INVSEC</b>		<b>ADEV</b>		<b>LOAN</b>		<b>AOTHER</b>	
	<b>%</b>	<b>Freq</b>	<b>%</b>	<b>Freq</b>	<b>%</b>	<b>Freq</b>	<b>%</b>	<b>Freq</b>
<b>Level 1</b>	60.32%	260	1.62%	7	2.55%	11	4.64%	20
<b>Level 2</b>	90.49%	390	15.08%	65	22.27%	96	8.12%	35
<b>Level 3</b>	28.31%	122	10.21%	44	5.57%	24	11.83%	51

  

<b>Liability</b>	<b>TRDL</b>		<b>LTDEBT</b>		<b>LDEV</b>		<b>LOTHER</b>	
	<b>%</b>	<b>Freq</b>	<b>%</b>	<b>Freq</b>	<b>%</b>	<b>Freq</b>	<b>%</b>	<b>Freq</b>
<b>Level 1</b>	1.39%	6	1.16%	5	2.32%	10	2.55%	11
<b>Level 2</b>	1.62%	7	6.26%	27	19.72%	85	3.71%	16
<b>Level 3</b>	0.23%	1	1.39%	6	3.94%	17	1.86%	8

**Note:** This panel provides the percent and the frequency of reported fair value assets and liabilities by both asset/liability types and the fair value hierarchy. We classify fair value assets and liabilities into the following categories: (1) *INVSEC* = investment securities including available for sale securities and trading securities, (2) *ADEV* = derivative assets, (3) *LOAN* = loan, and (4) *AOTHER* = all other asset items including mortgage service rights, federal funds sold, assets backed security, and other investments, (5) *TRDL* = trading liabilities, (6) *LTDEBT* = debts, and (7) *LDEV* = derivative liabilities, and (8) *LOTHER* = all other liability items.

**TABLE 3**  
**Value Relevance of Fair Values Hierarchy of FAS 157**

*Dependent Variable = Share Price*

<i>Independent Variables</i>	<b>(A)</b>				<b>(B)</b>		<b>(C)</b>	
	Coef.	Robust Std.Err.	t-stat	Coef.=0 p-value	F-stat Coef.=1	p-value	F-stat Coef.=-1	p-value
<i>Intercept</i>	1.632	0.602	2.710	0.007***				
<i>NFVA</i>	0.801	0.080	9.990	0.000***	6.120	0.014**		
<i>FVA1</i>	0.968	0.102	9.490	0.000***	0.100	0.751		
<i>FVA2</i>	0.972	0.098	9.900	0.000***	0.080	0.773		
<i>FVA3</i>	0.683	0.112	6.110	0.000***	8.040	0.005***		
<i>NFVL</i>	-0.818	0.089	-9.170	0.000***			4.170	0.041**
<i>FVL12</i>	-1.006	0.134	-7.520	0.000***			0.000	0.966
<i>FVL3</i>	-2.185	0.291	-7.500	0.000***			16.540	0.000***
<i>INC</i>	2.488	1.018	2.440	0.015**				
<i>N</i>	1260							
<i>Adj. R<sup>2</sup></i>	56.53%							
<b>Coefficient Comparisons</b>					<b>F-stat.</b>	<b>p-value</b>	<b>F-stat.</b>	<b>p-value</b>
<i>Test of FVA1=FVA2</i>					0.010	0.933		
<i>Test of FVA1=FVA3</i>					17.250	0.000***		
<i>Test of FVA2=FVA3</i>					18.630	0.000***		
<i>Test of FVL12=FVL3</i>							11.160	0.001**

**Note:** This table provides the result of OLS regression of share price on non-fair value and fair value assets and liabilities. The sample includes 1,260 firm-quarters of 431 distinct firms from the first three quarters of 2008. *NFVA* is non-fair value assets per share. *FVA1*, *FVA2*, and *FVA3* are fair value assets per share from Levels 1, 2, 3 inputs, respectively. *NFVL* is non-fair value liabilities per share. *FVL12* and *FVL3* are fair value liabilities per share from combined Levels 1 and 2 and level 3 inputs, respectively. This table provides three sets of test statistics. Column (A) provides t-statistics testing whether the coefficient estimates are different from zero. Column (B) provides F-statistics testing whether the coefficient estimates of each Level of fair value assets are different from one. Column (C) provides F-statistics testing whether the coefficient estimates of each Level of fair value liabilities are different from minus one. Standard errors are adjusted for two dimensions (both firms and quarters) following Peterson (2009) and Wooldridge (2002). \*\*\*, \*\*, and \* indicate statistical significance at the 0.01, 0.05 and 0.10 levels (two-tailed), respectively.

**TABLE 4**  
**Incremental Value Relevance of Fair Value Hierarchy**

<i>(i) Dependent Variable = Share Price</i>					<i>(ii) Dependent Variable = Share Price</i>				
<i>Independent Variables</i>	Coef. Estimate	Robust Std. Err.	t-stat. Coef.=0	p-value	<i>Independent Variables</i>	Coef. Estimate	Robust Std. Err.	t-stat. Coef.=0	p-value
<i>Intercept</i>	1.417	0.686	2.070	0.039	<i>INTERCEPT</i>	1.498	0.696	2.150	0.032
<i>NFVA</i>	0.839	0.087	9.600	0.000 ***	<i>NFVA</i>	0.812	0.085	9.550	0.000 ***
<i>INVSEC</i>	0.949	0.092	10.340	0.000 ***	<i>INVSEC1</i>	0.907	0.096	9.400	0.000 ***
					<i>INVSEC2</i>	0.927	0.088	10.590	0.000 ***
					<i>INVSEC3</i>	0.507	0.112	4.550	0.000 ***
<i>ADEV</i>	-0.042	0.949	-0.040	0.965	<i>ADEV1</i>	5.342	4.308	1.240	0.216
					<i>ADEV2</i>	-0.429	0.913	-0.470	0.639
					<i>ADEV3</i>	-1.220	5.603	-0.220	0.828
<i>LOAN</i>	0.828	0.124	6.690	0.000 ***	<i>LOAN1</i>	2.863	0.320	8.940	0.000 ***
					<i>LOAN2</i>	0.760	0.128	5.960	0.000 ***
					<i>LOAN3</i>	0.352	0.401	0.880	0.380
<i>AOTHER</i>	0.906	0.524	1.730	0.085 *	<i>AOTHER1</i>	2.003	0.609	3.290	0.001 ***
					<i>AOTHER2</i>	1.633	1.227	1.330	0.184
					<i>AOTHER3</i>	0.514	0.759	0.680	0.498
<i>NFVL</i>	-0.847	0.093	-9.080	0.000 ***	<i>NFVL</i>	-0.816	0.090	-9.080	0.000 ***
<i>TRDL</i>	0.165	0.272	0.610	0.545	<i>TRDL12</i>	1.033	1.174	0.880	0.380
					<i>TRDL3</i>	-342.747	368.552	-0.930	0.353
<i>LTDEBT</i>	-1.043	0.113	-9.260	0.000 ***	<i>LTDEBT12</i>	-1.016	0.099	-10.220	0.000 ***
					<i>LTDEBT3</i>	-2.550	0.452	-5.640	0.000 ***
<i>LDEV</i>	-0.062	0.988	-0.060	0.950	<i>LDEV12</i>	0.003	0.969	0.000	0.998
					<i>LDEV3</i>	15.207	11.610	1.310	0.191
<i>LOTHER</i>	-0.661	0.508	-1.300	0.194	<i>LOTHER12</i>	-1.138	0.424	-2.690	0.008 ***
					<i>LOTHER3</i>	16.129	75.303	0.210	0.831
<i>INC</i>	5.132	0.924	5.560	0.000	<i>INC</i>	5.023	0.906	5.550	0.000 ***
<i>N</i>	431				<i>N</i>	431			
<i>R</i> <sup>2</sup>	67.75%				<i>R</i> <sup>2</sup>	69.60%			
<i>Vuong's Z statistic comparing the difference in the explanatory powers across two competing models: 2.22 (p-value = 0.01, two-sided)</i>									

**Note:** This table provides the results of two OLS regressions of share price on fair value estimates. In both regressions, the dependent variable is price per share at the 10-Q filing date. The sample includes 431 banking firms that disclosed FAS 157 fair value hierarchy information in their first quarter 10Q filings in 2008. The regression (i), on the left hand side, provides the results of regression of share price on Type information (i.e., asset/liability type). *NFVA* is non-fair value assets. *INVSEC* is investment securities including available for sale securities, and trading securities. *ADEV* is derivative assets. *LOAN* is loans. *AOTHER* is all other asset items including mortgage service rights, federal funds sold, assets backed security, and other investments. *NFVL* is non-fair value liabilities. *TRDL* is trading liabilities. *LTDEBT* is debts. *LDEV* is derivative liabilities. *LOTHER* is all other liability items. The regression (ii), on the right hand side, provides the regression of share price on fair value estimates by both asset/liability types and the fair value hierarchy under FAS 157. The number after each variable represents the Level information. For example, *INVSEC1*, *INVSEC2* and *INVSEC3* are Level 1, Level 2 and Level 3 fair value estimates for *INVSEC*. The construction of other variables is similar. For liabilities, we combine Level 1 and Level 2 values into a single value. All variables are share-deflated. Standard errors are heteroskedasticity robust following Rogers (1993). \*\*\*, \*\*, and \* indicate statistical significance at the 0.01, 0.05 and 0.10 levels (two-tailed), respectively. Vuong's Z statistic compares the explanatory power of two competing (non-nested) model specifications (Vuong 1989).

**TABLE 5**  
**Descriptive Statistics of Corporate Governance**

*Panel A. Descriptive Statistics*

Variable	N	Mean	Std Dev	25th Pctl	50th Pctl	75th Pctl
(1) <i>BDIND</i>	405	0.78	0.12	0.71	0.80	0.88
(2) <i>ACFE</i>	405	0.32	0.21	0.20	0.25	0.33
(3) <i>ACMEET</i>	405	7.99	3.74	5.00	8.00	10.00
(4) <i>INSTHOLDPCT</i>	405	0.30	0.24	0.09	0.24	0.43
(5) <i>AUDITOFFICESIZE</i>	405	15.04	1.86	13.76	14.55	16.26
(6) <i>NOMCW</i>	405	0.82	0.38	1.00	1.00	1.00

**Note:** This table provides descriptive statistics of corporate governance variables. These variables include: (1) *BDIND* = board independence measured by the number of independent board members divided by the number of total board members, (2) *ACFE* = audit committee financial expertise measured by the number of audit committee members with financial expertise divided by the number of total audit committee members, (3) *ACMEET* = the frequency of annual audit committee meetings, (4) *INSTHOLDPCT* = percentage of shares held by institutional investors calculated from 13F filings, (5) *AUDITOFFICESIZE* = log of the audit engagement office's prior year audit fee revenue following Francis and Yu (2009), and (6) *NOMCW* = an indicator of whether the firm has not disclosed any material control weakness under SOX 302 or SOX 404 in the past.

*Panel B. Correlations*

	<b>BDIND</b>	<b>ACFE</b>	<b>ACMEET</b>	<b>INST HOLD PCT</b>	<b>AUDIT-OFFICE-SIZE</b>	<b>NOMCW</b>
<b>BDIND</b>	1	-0.048	-0.061	0.076	0.001	-0.007
		0.337	0.222	0.126	0.988	0.885
<b>ACFE</b>	-0.109	1	0.094	0.328	0.265	0.015
	0.029		0.060	<.0001	<.0001	0.756
<b>ACMEET</b>	-0.017	0.099	1	0.164	0.207	-0.184
	0.739	0.047		0.001	<.0001	0.000
<b>INSTHOLD-PCT</b>	0.031	0.246	0.174	1	0.522	-0.052
	0.538	<.0001	0.000		<.0001	0.294
<b>AUDIT-OFFICE-SIZE</b>	-0.013	0.238	0.213	0.473	1	-0.149
	0.792	<.0001	<.0001	<.0001		0.003
<b>NOMCW</b>	0.005	-0.006	-0.156	-0.068	-0.124	1
	0.922	0.907	0.002	0.169	0.012	

**Note:** This table provides correlation coefficients among corporate governance variables. The upper diagonal shows Pearson correlation coefficients. The lower diagonal presents Spearman correlation coefficients. The numbers in gray cells are p-values.

**TABLE 5 (continued)**  
**Descriptive Statistics of Corporate Governance**

*Panel C. Governance Factor Score and Sample Adequacy*

Variables	Factor loading coefficients	Kaiser-Meyer-Olkin measure of sampling adequacy
<i>BODIND</i>	0.030	0.346
<i>ACFE</i>	0.415	0.713
<i>ACMEET</i>	0.064	0.697
<i>INSTHOLDPCT</i>	0.468	0.592
<i>AUDITOFFICESIZE</i>	0.410	0.612
<i>NOMCW</i>	0.103	0.558
<b>Variation Explained</b>	39%	<b>Mean KMO = 0.6181</b>
<b>Eigenvalue</b>	1.878	

**Note:** This table provides the factor loading coefficients and Kaiser-Meyer-Olkin measure of sampling adequacy for our governance factor based on six governance variables of interest. Based on six governance variables, we run a principal component factor analysis, identifying a unique factor the eigenvalue of which is 1.878. The mean Kaiser-Myer-Oklin measure of sampling adequacy is greater than 0.5, indicating that six governance variables are appropriate for the factor analysis technique we employ (Stewart 1981).

*Panel D. Descriptive Statistics of Governance Factor Score and Ranking*

Variable	N	Mean	Std Dev	Min	25th Pctl	50th Pctl	75th Pctl	Max
<i>GOVSCORE</i>	405	0.00	1.00	-2.16	-0.77	-0.22	0.58	3.64
<i>GOVRANK</i>	405	0.50	0.32	0.00	0.22	0.56	0.78	1.00

**Note:** This table provides the descriptive statistics on *GOVSCORE* and *GOVRANK*. *GOVSCORE* is the standardized governance score from the factor analysis from Panel C of Table 5 with the mean of 0 and the standard deviation of 1. *GOVRANK* is the decile rank of *GOVSCORE*, ranging from zero to one.

**TABLE 6**  
**The Impact of Corporate Governance Factors on the Value Relevance of Fair Value Hierarchy Information**

**Panel A. Regressions using Factor Governance Rank**

<i>Dependent Variable = Share Price</i>			
<i>Independent Variables</i>	Coef.	t-stat. Coef.=0	p-value
<i>Intercept</i>	2.84	4.37	0.00 ***
<i>NFVA</i>	0.72	8.03	0.00 ***
<i>FVA1</i>	0.81	5.86	0.00 ***
<i>FVA2</i>	0.83	7.35	0.00 ***
<i>FVA3</i>	0.06	0.22	0.83
<i>FVA1*GOVRANK</i>	0.20	0.75	0.45
<i>FVA2*GOVRANK</i>	0.14	3.14	0.00 ***
<i>FVA3*GOVRANK</i>	0.76	2.25	0.02 **
<i>NFVL</i>	-0.74	-7.53	0.00 ***
<i>FVL12</i>	-1.03	-7.67	0.00 ***
<i>FVL3</i>	-2.22	-7.63	0.00 ***
<i>INC</i>	2.64	2.36	0.02 **
<i>GOVRANK</i>	-0.43	-0.40	0.69
<i>N</i>	1,195		
<i>R<sup>2</sup></i>	58.40%		

**Note:** This panel provides the regression results of examining the impact of governance on the value relevance of fair value assets from 431 firms' 1,195 quarterly financial reports. The dependent variable is share price. *FVA1*, *FVA2*, and *FVA3* are fair value assets per share from Levels 1, 2, 3 inputs, respectively. *NFVL* is non-fair value liabilities per share. *FVL12* and *FVL3* are fair value liabilities per share from combined Levels 1 and 2 and level 3 inputs, respectively. *INC* is net income before extraordinary items per share. *GOVRANK* is the decile rank ranging from zero (weak governance) to nine (strong governance), and then scaled by nine, based on the factor score, *GOVSCORE*, using principal-component factor analysis of six governance variables: (1) *BDIND* = board independence measured by the number of independent board members divided by the number of total board members, (2) *ACFE* = audit committee financial expertise measured by the number of audit committee members with financial expertise divided by the number of total audit committee members, (3) *ACMEET* = the frequency of annual audit committee meetings, (4) *INSTHOLDPCT* = percentage of shares held by institutional investors calculated from 13F filings, (5) *AUDITOFFICESIZE* = log of the audit engagement office's prior year audit fee revenue following Francis and Yu (2009), and (6) *NOMCW* = an indicator of whether the firm has not disclosed any material control weakness under SOX 302 or SOX 404 in the past. Standard errors are adjusted for two dimensions (both firms and quarters) following Peterson (2009) and Wooldridge (2002). \*\*\*, \*\*, and \* indicate statistical significance at the 0.01, 0.05 and 0.10 levels (two-tailed), respectively.

**TABLE 6 (continued)**  
**The Impact of Corporate Governance Factors on the Value Relevance of Fair Value Hierarchy Information**

**Panel B. Regressions using Specific Governance Measures**

<i>Dependent Variable = Share Price</i>	Specific Governance Variable of Interest											
	Board Independence		Audit Committee Financial Expertise		Audit Committee Meeting Frequency		% of Equity Held by Institutional Investors		Auditor Size based on Engagement Office		Strong Internal Control (No History of Material Control Weakness)	
<i>Independent Variables</i>	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.
<i>Intercept</i>	2.18	2.45**	1.92	2.43 **	3.23	4.03 **	3.94	6.04 **	0.79	0.84 **	2.66	3.49**
<i>NFVA</i>	0.79	9.17***	0.80	9.66 ***	0.74	7.64 ***	0.71	7.74 ***	0.76	8.53 ***	0.78	9.27 ***
<i>FVA1</i>	0.97	6.92***	0.88	8.47 ***	0.72	5.97 ***	0.76	3.87 ***	0.94	7.84 ***	0.72	6.40***
<i>FVA2</i>	0.96	8.60***	0.96	9.85 ***	0.88	7.10 ***	0.79	7.00 ***	0.94	7.51 ***	0.86	7.67 ***
<i>FVA3</i>	0.48	3.78***	0.93	3.59 ***	0.29	0.69 ***	0.42	2.08 ***	0.15	0.85 ***	0.46	3.47***
<i>FVA1*RANK</i>	-0.02	-0.18	0.29	0.97	0.37	3.11 ***	0.24	0.75	-0.06	-0.22	0.25	2.33***
<i>FVA2*RANK</i>	0.00	0.00	0.05	0.77	0.08	1.67 *	0.23	5.08 ***	-0.02	-0.37	0.11	3.15*
<i>FVA3*RANK</i>	0.65	1.71*	-0.43	-1.16	0.69	0.99	0.29	1.19	0.84	3.03 ***	0.29	1.69*
<i>NFVL</i>	-0.81	-8.50***	-0.82	-8.96 ***	-0.76	-6.99 ***	-0.73	-7.32 ***	-0.77	-7.94 ***	-0.80	-8.58***
<i>FVL12</i>	-1.01	-7.67***	-1.04	-6.96 ***	-0.92	-5.74 ***	-1.07	-8.13 ***	-0.96	-7.55 ***	-0.83	-5.51 ***
<i>FVL3</i>	-2.08	-6.39***	-2.18	-7.99 ***	-2.27	-8.15 ***	-2.21	-6.56 ***	-2.25	-10.01 ***	-1.79	-4.38***
<i>INC</i>	2.55	2.31**	2.55	2.25 **	2.48	2.35 **	2.54	2.33 **	2.67	2.42 **	2.42	2.23**
<i>RANK</i>	-0.90	-0.79	-0.47	-0.36	-2.48	-2.11 **	-2.18	-2.02 **	2.48	1.86 *	-0.98	-1.20**
<i>N</i>	1,195		1,195		1,195		1,195		1,195		1,195	
<i>R<sup>2</sup></i>	56.31%		56.53%		57.11%		58.81%		57.15%		57.46%	

**Note:** This table provides the results of six regressions similar to Panel A of Table 6. Instead of using a factor score, six regressions in this panel report the impact of each governance measure on the value relevance fair value assets. Corporate governance variables include: (1) *BDIND* = board independence measured by the number of independent board members divided by the number of total board members, (2) *ACFE* = audit committee financial expertise measured by the number of audit committee members with financial expertise divided by the number of total audit committee members, (3) *ACMEET* = the frequency of annual audit committee meetings, (4) *INSTHOLDPCT* = percentage of shares held by institutional investors calculated from 13F filings, (5) *AUDITOFFICESIZE* = log

of the audit engagement office's prior year audit fee revenue following Francis and Yu (2009), and (6) *NOMCW* = an indicator of whether the firm has not disclosed any material control weakness under SOX 302 or SOX 404 in the past. All variables except *NOMCW* are scaled to deciles values, ranging from zero (weak governance) to nine (strong governance), and then scaled by nine. Standard errors are adjusted for two dimensions (both firms and quarters) following Peterson (2009) and Wooldridge (2002). \*\*\*, \*\*, and \* indicate statistical significance at the 0.01, 0.05 and 0.10 levels (two-tailed), respectively.