Does the Reliability of Fair Value Measurements Affect the Relation Between Fair Value Adjustments for Unrealized Gains and Losses and Stock Returns?

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We examine the association between stock returns and unrealized gains and losses for fair value assets. We expect investors to perceive unrealized gains and losses for firms with more subjective inputs to be less reliable and price them differently from unrealized gains and losses for firms with less subjective inputs. Additionally, we examine whether the recent global financial crisis affected investors' perceptions of fair value measurement reliability and the pricing of unrealized gains and losses. We find that investors price unrealized gains and losses differently for firms with more subjective fair value measurements and that the crisis affected this relationship.

INTRODUCTION

In September 2006, the Financial Accounting Standards Board (FASB) issued Statement of Financial Accounting Standards 157 (SFAS 157, currently Accounting Standards Codification 820). SFAS 157 provided a framework for fair value measurement and disclosure and was required for financial reporting periods after November 15, 2007. In January 2010, the FASB updated this standard with Accounting Standards Update (ASU) 2010-06. This update was a response to demand for increased disclosure quality surrounding fair value instruments following the global financial crisis that began in 2008. The update amended ASC 820 to require new disclosure related to fair value measurements, including the types of inputs and assumptions used for measuring assets at fair value. In this study, we examine investor perceptions of fair value measurements. Specifically, we examine how unrealized gains and losses on available-for-sale securities (AFS), included in other comprehensive income (OCI), are priced based on the magnitude of highly subjective (i.e., "Level 3") fair value assets, and whether this relationship changed following the global financial crisis that started in 2008.

We examine the relation between stock returns and fair value adjustments for unrealized gains and losses of AFS securities. Prior research shows that investors' discount assets measured with Level 2 and Level 3 inputs relative to Level 1 inputs. These findings are consistent with Level 1 inputs being more reliable than Level 2 and Level 3 inputs. Prior research has not examined whether unrealized gains and losses (URGL) from changes in AFS securities are priced differently based on the reliability of inputs.[1] Data regarding the magnitude of URGL measured using each level of inputs is not available. Therefore,

we examine whether URGL are priced differently using the magnitude of Level 3 fair value assets as a proxy for the likelihood that a larger portion of URGL is from assets measured using less reliable Level 3 inputs. We also examine how the 2008 global financial crisis affected this association between returns and the fair value adjustments for URGL of AFS securities.

URGL from AFS securities are classified as other comprehensive income, and several studies have examined the usefulness of OCI components. For example, Dhaliwal, Subramanyam, and Trezevant (1999) find that, prior to the requirement to report OCI (FASB Statement No. 130 Reporting Comprehensive Income (SFAS 130)), voluntarily reported OCI, as a whole does not provide incremental information content over net income. They also find that the market adjustment for URGL of AFS securities is the only component of OCI that strengthens the association between returns and net income. The lack of association between overall comprehensive income and returns in their study, however, may have been due to the fact that their sample period consists of years when the OCI reporting was not required, as Biddle and Choi (2006) find that comprehensive income is associated with equity returns more strongly than other income measures. Using a post-SFAS 130 sample, Chambers, Linsmeier, Shakespeare, and Sougiannis (2007) find that OCI as a whole, as well as foreign currency translation adjustment and market adjustment for unrealized gains and losses for AFS securities individually, are value relevant in pricing equity returns.[2] However, current research has not examined whether the quality of fair value adjustments affects investors' pricing of URGL.

Our empirical results suggest that investors believe Level 3 fair value measurements are less reliable than Level 1 and 2 fair value measurements, and consistent with prior findings, price unrealized gains as though they are overstated and unrealized losses as though they are understated for firms with greater Level 3 fair value assets. Our results also show that the recent global financial crisis had an effect on investors' perceptions of the reliability of Level 3 fair value measurements, and both the magnitude of Level 3 fair value assets and the global financial crisis affect the pricing of unrealized gains and losses on investments for AFS securities. Our study contributes to the fair value literature by showing that the quality of fair value adjustments affects the pricing of unrealized gains and losses, suggesting that the additional disclosure requirements for fair value hierarchy from SFAS 157 is useful for shareholders. This study also contributes to the fair value literature by providing evidence of the impact of quality of fair value adjustments during and after the 2008 global financial crisis. Finally, our study contributes to the OCI literature by showing the value relevance of fair value adjustments for unrealized gains and losses for AFS securities.

The rest of this study is organized as follows. Section 2 discusses prior research and background. Section 3 presents our hypotheses. Section 4 describes the sample selection and data used in this study. Section 5 presents the research design, Section 6 provides our results, and Section 7 provides additional analyses. Section 8 concludes.

PRIOR RESEARCH AND BACKGROUND

Our study is primarily related to areas of prior research on the pricing of URGL and the value relevance of fair value measurements.

Fair Value Measurement and Disclosure

Fair value accounting has long been a subject of debate. The debate centers on the trade-offs between relevance and reliability in financial reporting. Supporters of fair value accounting argue that it provides more relevant measures while opponents suggest that fair value accounting results in lower reliability because fair value measurements require greater estimation and are less verifiable by users, which creates greater information asymmetry between preparers and users. In response to the call for increased guidance regarding fair value accounting, SFAS 157 (currently ASC 820) was issued in November 2007. SFAS 157 did not introduce fair value accounting, but instead provided a uniform definition of fair value, which did not previously exist. Fair value is defined as "the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date."

Additionally, SFAS 157 provided guidance regarding fair value measurement of financial instruments by providing a fair value hierarchy.

This fair value hierarchy describes the inputs to be used in valuation techniques that measure fair value and provides three levels. The levels are based on the reliability of the inputs with Level 1 inputs being the most reliable. Level 1 inputs are quoted prices in active markets for identical assets and liabilities, and thus have the least amount of subjectivity in measurement. Level 2 inputs are still observable inputs, but based on "other than quoted prices" for identical assets and liabilities, which requires some level of subjectivity in determining similar, identical assets with observable prices. Level 3 inputs include "unobservable" inputs, which may include management's best estimate.

The amount of information asymmetry between financial statement preparers and users is lowest when Level 1 inputs are used and highest when Level 3 inputs are used. Because Level 1 inputs are observable, users can easily verify Level 1 fair value measurements, resulting in very low information asymmetry. Level 2 inputs are also observable, but are for similar assets and liabilities or for identical assets and liabilities in inactive markets, which can be corroborated by observable market data. Although Level 2 inputs are observable, they create more information asymmetry than Level 1 inputs because it requires identifying similar or identical assets. Finally, because Level 3 inputs cannot be observed, the use of Level 3 inputs creates the highest amount of information asymmetry.

In an attempt to reduce information asymmetry, SFAS 157 requires firms to disclose fair value measurements based on the three level hierarchy so that users can assess the reliability of fair value measurements of assets and liabilities. In further attempts to reduce information asymmetry, in January 2010 the FASB issued ASU 2010-06, which amended SFAS 157 to require new disclosures related to fair value measurements. Specifically, ASU 2010-06 required that entities disclose transfers in and out of Level 1 and Level 2, including the reasons for the transfers. ASU 2010-06 also required that entities disclose information regarding purchases, sales, and settlements of Level 3 fair value assets. A unique aspect of the adoption of both SFAS 157 and ASU 2010-06 is that shortly after adoption of SFAS 157, the U.S. economy entered a severe recession brought about by the global financial crisis in late 2008.

Consistent with higher information asymmetry associated with Level 3 fair value measurements, Riedl and Serafeim (2011) find that Level 3 fair value measurements have higher information risk than either Level 1 or Level 2 measurements, measured by examining betas and bid-ask spreads. Additionally, Benston (2008) argues that fair value estimates can be manipulated in the absence of an actively traded market, which has implications for the reliability of the Level 3 measurements. Consistent with this, Ryan (2008) finds that without quantitative disclosures, it is difficult to compare Level 3 fair value measurements across firms.

Prior research has also examined fair value measurements as a cause for the recent global financial crisis and investor perceptions of fair value measurements during and following the crisis. Laux and Leuz (2009) do not find evidence that fair value accounting caused the financial crises. Song, Thomas, and Yi (2010) examine the value relevance of fair value assets and liabilities and show that investors perceived Level 3 fair value assets to be less reliable during the global financial crisis. This is consistent with Level 3 fair value assets requiring more estimation and being subject to a greater amount of measurement error. Goh, Li, Ng, and Yong (2015) extend this study and examine the pricing of fair value estimates following the global financial crisis. They provide evidence that Level 3 fair value measurements are priced lower than Level 1 and 2 measurements following the crisis. However, the difference reduces over time. In contrast to these studies that examine the relation between fair value assets and liabilities and stock prices, we examine the relation of stock returns and comprehensive income focusing on the pricing of unrealized gains and losses for AFS securities conditional on the reliability of the fair value measurements that give rise to the unrealized gains and losses.

Value Relevance and Pricing of URGL

We extend current literature on the value relevance and pricing of OCI by examining the pricing of a specific OCI component, unrealized gains and losses, conditional on the reliability of fair value measurements. SFAS 130 defines comprehensive income as the sum of net income and other

comprehensive income. Other comprehensive income consists of gains and losses from foreign currency translation adjustments, available-for-sale securities, pension liability adjustments, and adjustments on some derivative securities. Chambers et al. (2007) provide background on the competing views regarding the use of comprehensive income. Those that oppose the use of comprehensive income argue that the OCI components are transitory and not part of core earnings. Additionally, opponents of comprehensive income argue that the unrealized gains and losses are due to market factors and not within management's control. On the other hand, Chambers et al. (2007) also offers the views of proponents of comprehensive income. Proponents argue that comprehensive income better captures economic income and is consistent with the residual income model.

There are a number of studies examining the value relevance of OCI items (Dhaliwal et al., 1999; Biddle & Choi, 2006; Chambers et al., 2007). There are also a number of studies that examine individual items among the OCI items such as foreign translation adjustments (Bartov, 1997; Soo & Soo, 1994; Louis, 2003), pension liability adjustments (Mitra & Hossain, 2009), and cash flow hedge (Campbell, 2015). Several studies have examined the URGL component of OCI. For example, Dhaliwal et al. (1999) find that, prior to the adoption of SFAS 130 which required the reporting of OCI, the market adjustment for unrealized gains and losses for AFS securities strengthens the association between returns and net income. Using a post-SFAS 130 sample, Chambers et al. (2007) find that market adjustment for unrealized gains and losses for AFS securities are value relevant in pricing equity returns. Chambers et al. (2007) uses actual rather and "as-if" reported data and shows that unrealized gains and losses on AFS securities are priced by investors. However, our study is the first to examine the effect of fair value measurement reliability on the relation between fair value adjustments for unrealized gains and losses for AFS securities and stock returns.[3]

HYPOTHESES

We examine whether the magnitude of Level 3 fair value assets affects the pricing of unrealized gains and losses. Song et al (2010) provide evidence that investors perceived Level 3 fair value assets to be less reliable during the global financial crisis. Goh et al. (2015) provide evidence in the period during and following the global financial crisis that Level 3 fair value assets are valued lower than Level 1 and Level 2 fair value assets. However, this effect is less pronounced through time. Taken together, Song et al (2010) and Goh et al. (2015) provide evidence that Level 3 fair value assets are less reliable than Level 1 and Level 2 fair value assets. This is consistent with Level 3 fair value assets requiring more estimation and being subject to a greater amount of measurement error.

Consistent with the lower value relevance of Level 3 fair value assets shown in prior research, we argue that these results extend to predictions regarding the pricing of unrealized gains and losses. We expect that URGL based on less reliable measurements will be priced lower than URGL based on more reliable measurements. Based on prior literature, we expect that Level 3 measurements are less reliable than Level 1 and Level 2 measurements. However, data is not available to determine URGL based on the levels of fair value measurements. Therefore, we use the magnitude of Level 3 fair value assets as a proxy for the reliability of fair value measurements for URGL. We expect that firms with more Level 3 fair value assets are more likely to have URGL based on Level 3 measurements and argue that unrealized gains and losses will be priced differently for firms with more Level 3 fair value assets, compared to firms with fewer Level 3 fair value assets. Specifically, we expect that when investors view unrealized gains to be less reliable they will price the unrealized gains as though they are overstated. Conversely, we expect that when investors view unrealized losses to be less reliable they will price the unrealized losses as though they are underpriced. Therefore, we make hypotheses related to URGL based on the magnitude of Level 3 fair value assets:

H1a. The incremental effect of the magnitude of Level 3 fair value assets on the association between unrealized gains and stock returns is negatively related to the magnitude of Level 3 fair value assets.

H1b.   The incremental effect of the magnitude of Level 3 fair value assets on the association between unrealized losses and stock returns is positively related to the magnitude of Level 3 fair value assets.

In addition to examining the effect of the reliability of fair value measurements on pricing of unrealized gains and losses, we also examine the effect of the recent global financial crisis. The 2008 global financial crisis began shortly after the issuance of SFAS 157, and thus the subsequent recovery of the economy provides a unique opportunity to examine investor perceptions of fair value measurements. Initial studies of investor perceptions of fair value measurements had limited data and/or included only fiscal periods during the financial crisis. Our study leverages the availability of fair value hierarchy data following the issuance of SFAS 157, which allows us to examine investor perceptions of fair value measurements following the crisis and whether or not those perceptions changed as a result of the financial crisis.

Similar to Goh et al. (2015), our study focuses on the information asymmetry between preparers and users and the reliability of fair value measurements. While Goh et al. (2015) examines the value relevance of fair value asset and liability measurements during and after the global financial crisis, we extend their argument that the stability of the market has an effect on investors pricing of fair value measurements and examine whether the pricing of fair value measurements related to unrealized gains and losses for AFS securities changed following the global financial crisis. The results in Goh et al. (2015) suggest that under more stable market conditions investors perceive Level 3 fair value measurements to be more reliable. Based on these results, we expect URGL of firms will be viewed as more reliable in the post-crisis period for firms with greater Level 3 fair value assets. Therefore, we expect the negative relationship predicted in H1a will be less negative and the positive relationship predicted in H1b will be less positive in the post-crisis period. Thus, H2a and H2b are:

H2a.   The association between unrealized gains and stock returns conditional on the magnitude of Level 3 fair value assets is less pronounced in the post-crisis period relative to the crisis period.

H2b.   The association between unrealized losses and stock returns conditional on the magnitude of Level 3 fair value assets is less pronounced in the post-crisis period relative to the crisis period.

SAMPLE SELECTION AND DATA

Our sample period is 2008 to 2013. We begin in 2008 because it is the first year SFAS 157 fair value hierarchy disclosure was required. Our sample period allows us to confirm the value relevance of other comprehensive income items in the recent years, as well as to examine the effect of the financial crisis on the market pricing of AFS securities unrealized gains and losses.[4] We focus on the firms in the financial industry (SIC 6000 to 6499) because those firms hold more investment securities than firms in other industries, and thus we expect to see a more pronounced effect of the financial crisis on pricing of fair value assets in that industry. We also limit our sample to firms that hold any kind of fair value assets. We use financial data from Compustat and stock returns data from CRSP. After eliminating firm-year observations that are missing necessary data, we have 848 unique firms and 3,349 firm-year observations.

RESEARCH DESIGN

We test our hypotheses by examining the association between unrealized gains and losses for AFS securities and buy and hold raw stock returns. We start with the following model from Chambers et al. (2007) which examines the value relevance OCI components including AFS securities:

$$R_{it} = \alpha_1 + \alpha_2\,NI_{it} + \alpha_3\,D_1 + \alpha_4(NI_{it} * D_1) + \alpha_5\,FCADJ_{it} + \alpha_6\,PENADJ_{it} + \alpha_7\,MKTADJ_{it} + \varepsilon_{it} \qquad (1)$$

In Model (1), R_{it} is the twelve month buy and hold raw return beginning eight months before the fiscal year end. NI_{it} (Compustat item NI) is net income after extraordinary items and discontinued operations.

D_1 is a dummy variable equal to 1 when NI_{it} is negative, zero otherwise. $FCADJ_{it}$ (Compustat item CICURR) is the foreign currency adjustment in OCI, $PENADJ_{it}$ (Compustat item CIPEN) is the pension adjustment in OCI, and $MKTADJ_{it}$ (Compustat item CISECGL) is the unrealized gain or loss for AFS. Following Chambers et al. (2007), all comprehensive income variables are scaled by market value of equity at 8 months before the fiscal year end date.

For H1a and H1b, we modify Model 1 and decompose $MKTADJ_{it}$ into unrealized gains, URG_{it}, and unrealized losses, URL_{it}, for AFS. To test the hypotheses we interact URG_{it} and URL_{it} with the magnitude of Level 3 fair value assets.

$$R_{it} = \alpha_1 + \alpha_2 NI_{it} + \alpha_3 D_1 + \alpha_4(NI_{it} * D_1) + \alpha_5 FCADJ_{it} + \alpha_6 PENADJ + \alpha_7 URG_{it} + \alpha_8 URL_{it} + \alpha_9 LEVEL3_{it}$$
$$+ \alpha_{10} (URG_{it} * LEVEL3_{it}) + \alpha_{11} (URL_{it} * LEVEL3_{it}) + \varepsilon_{it} \qquad (2)$$

In Model (2), $LEVEL3_{it}$ is the relative magnitude of fair value Level 3 fair value assets (Compustat item AUL3) compared to total assets held by a firm. All other variables are defined the same as above. Consistent with H1a, if Level 3 fair value measurements are perceived to be less reliable, we expect α_{10} to be negative and significant, suggesting that investors believe that URG are overstated when fair value measurements are less reliable. Similarly, consistent with H1b we expect α_{11} to be positive and significant, suggesting that investors believe that URL are understated when fair value measurements are less reliable.

Next, we test H2a and H2b by including the variable $POST_{it}$, which is a dummy variable equal to 1 for the post-financial crisis period (fiscal year 2010 and later) and zero otherwise. First we estimate Model (3) to examine explore whether the global financial crisis had an impact on the pricing of unrealized gains and losses for AFS.

$$R_{it} = \alpha_1 + \alpha_2 NI_{it} + \alpha_3 D_1 + \alpha_4(NI_{it} * D_1) + \alpha_5 FCADJ_{it} + \alpha_6 PENADJ_{it} + \alpha_7 URG_{it} + \alpha_8 URL_{it} + \alpha_9 POST_{it}$$
$$+ \alpha_{10} (URG_{it} * POST_{it}) + \alpha_{11} (URL_{it} * POST_{it}) + \varepsilon_{it} \qquad (3)$$

To examine whether the global financial crisis affects the relationships in H1a and H1b we estimate Model (2) separately for the crisis sample and the post-crisis sample:

$$R_{it} = \beta_1 + \beta_2 NI_{it} + \beta_3 D_1 + \beta_4(NI_{it} * D_1) + \beta_5 FCADJ_{it} + \beta_6 PENADJ_{it} + \beta_7 URG_{it} + \beta_8 URL_{it} + \beta_9 LEVEL3_{it}$$
$$+ \beta_{10} (URG_{it} * LEVEL3_{it}) + \beta_{11} (URL_{it} * LEVEL3_{it}) + \varepsilon_{it} \qquad (2a)$$

$$R_{it} = \gamma_1 + \gamma_2 NI_{it} + \gamma_3 D_1 + \gamma_4(NI_{it} * D_1) + \gamma_5 FCADJ_{it} + \gamma_6 PENADJ_{it} + \gamma_7 URG_{it} + \gamma_8 URL_{it} + \gamma_9 LEVEL3_{it}$$
$$+ \gamma_{10} (URG_{it} * LEVEL3_{it}) + \gamma_{11} (URL_{it} * LEVEL3_{it}) + \varepsilon_{it} \qquad (2b)$$

If the global financial crisis changed investors' perception of the reliability of securities fair value measurements, we expect β_{10} and β_{11} in Model (2a) for the crisis sample to be different from γ_{10} and γ_{11} in Model (2b) for the post-crisis sample to be different. To formally test H2a and H2b we estimate Model (4) by interacting an indicator variable for the post-crisis period with our variables of interest:

$$R_{it} = \alpha_1 + \alpha_2 NI_{it} + \alpha_3 D_1 + \alpha_4(NI_{it} * D_1) + \alpha_5 FCADJ_{it} + \alpha_6 PENADJ_{it} + \alpha_7 URG_{it} + \alpha_8 URL_{it}$$
$$+ \alpha_9 LEVEL3_{it} + \alpha_{10} POST_{it} + \alpha_{11} (URG_{it} * LEVEL3_{it}) + \alpha_{12} (URL_{it} * LEVEL3_{it}) + \alpha_{13} (URG_{it} * POST_{it})$$
$$+ \alpha_{14} (URL_{it} * POST_{it}) + \alpha_{15} (LEVEL3_{it} * POST_{it}) + \alpha_{16} (URG_{it} * LEVEL3_{it} * POST_{it})$$
$$+ \alpha_{17} (URL_{it} * LEVEL3_{it} * POST_{it}) + \varepsilon_{it} \qquad (4)$$

Consistent with H2a, if the market perceived Level 3 fair value measurements to be more reliable following the global financial crisis relative to during the crisis, we expect the effect of Level 3 fair value assets on the pricing of URG in the post crisis period ($\alpha_7 + \alpha_{11} + \alpha_{13} + \alpha_{16}$) to be less pronounced than the effect of Level 3 fair value assets on the pricing of URG in the crisis period ($\alpha_7 + \alpha_{11}$). We also expect the effect of Level 3 fair value assets on the pricing of URL in the post crisis period ($\alpha_8 + \alpha_{12} + \alpha_{14} + \alpha_{17}$) to be

less pronounced than the effect of Level 3 fair value assets on the pricing of URL in the crisis period ($\alpha_8 + \alpha_{12}$), consistent with H2b. We estimate all models using OLS regression with robust standard errors clustered by firms (Petersen, 2009).

RESULTS

Table 1 presents descriptive statistics. Panel A shows that the full sample of firm-year observations have mean and median 12-month raw returns of 6.3% and 7.5%, respectively. It also shows that of the three major OCI items, unrealized gains and losses for AFS securities ($MKTADJ_{it}$) has the largest mean at 0.004 (0.4% of market value of equity). The mean URG is 0.019 and the mean URL is -0.015.

TABLE 1
Descriptive Statistics

Variable	N	P25	Mean	Median	P75	STDDEV
R_{it}	3,349	-0.126	0.063	0.075	0.254	0.372
NI_{it}	3,349	0.026	0.041	0.063	0.094	0.243
$FCADJ_{it}$	3,349	0.000	-0.001	0.000	0.000	0.012
$PENADJ_{it}$	3,349	0.000	0.000	0.000	0.000	0.012
$MKTADJ_{it}$	3,349	-0.008	0.004	0.000	0.012	0.086
URG_{it}	3,349	0.000	0.019	0.000	0.012	0.067
URL_{it}	3,349	-0.008	-0.015	0.000	0.000	0.048
$LEVEL3_{it}$	3,349	0.000	0.014	0.001	0.008	0.053
$POST_{it}$	3,349	0.000	0.658	1.000	1.000	0.475

R_{it}	=	12-month buy and hold raw returns beginning 8 months before the fiscal year end
NI_{it}	=	net income (Compustat item NI)
$FCADJ_{it}$	=	foreign currency adjustment (Compustat item CICURR)
$PENADJ_{it}$	=	pension liability adjustment (Compustat item CIPEN)
$MKTADJ_{it}$	=	market adjustment for available for sale securities (Compustat item CISECGL)
URG_{it}	=	unrealized gains, set to $MKTADJ$ if $MKTADJ > 0$, zero otherwise
URL_{it}	=	unrealized losses, set to $MKTADJ$ if $MKTADJ <= 0$, zero otherwise
$LEVEL3_{it}$	=	Level 3 fair value assets (Compustat item AUL3) scaled by total assets (Compustat item AT)
$POST_{it}$	=	indicator variable equal to 1 if fiscal year is after 2009, 0 otherwise

Table 2 presents the results of Model (2). As expected the coefficient on URG and URL are both positive suggesting that returns increase as unrealized gains increase and returns decrease for firms with larger losses. The coefficient on the interaction term, $URG_{it} * LEVEL3_{it}$, is negative and statistically significant at the 0.10 level. Consistent with H1a unrealized gains are viewed as less reliable for firms with more Level 3 fair value measurements. The magnitude of the coefficient suggests that for firms with the mean amount of Level 3 fair value assets the association between stock returns and unrealized gains is 0.107 lower, 1.511 vs. 1.404 for firms without Level 3 fair value assets. Additionally, the coefficient on the interaction term, $URL_{it} * LEVEL3_{it}$, is positive and statistically significant at the 0.05 level. Consistent with H1b unrealized losses are viewed as less reliable for firms with more Level 3 fair value measurements. The magnitude of the coefficient

suggests that for firms with the mean amount of Level 3 fair value assets the association between stock prices and unrealized losses is 0.074 higher, 0.353 vs. 0.427 for firms without Level 3 fair value assets.

TABLE 2

Association of Annual Raw Returns with Available-For-Sale Market Adjustments
Conditional on Level 3 Fair Value Assets

$R_{it} = \alpha_1 + \alpha_2 NI_{it} + \alpha_3 D_1 + \alpha_4(NI_{it} * D_1) + \alpha_5 FCADJ_{it} + \alpha_6 PENADJ_{it} + \alpha_7 URG_{it} + \alpha_8 URL_{it} + \alpha_9 LEVEL3_{it} + \alpha_{10} (URG_{it} * LEVEL3_{it}) + \alpha_{11} (URL_{it} * LEVEL3_{it}) + \varepsilon_{it}$

Variable	Coefficient		p-value
Intercept	0.079	***	(0.000)
NI_{it}	0.200	**	(0.033)
D_1	-0.243	***	(0.000)
$NI_{it} * D_1$	0.024		(0.807)
$FCADJ_{it}$	2.436	***	(0.001)
$PENADJ_{it}$	4.209	***	(0.000)
URG_{it}	1.511	***	(0.000)
URL_{it}	0.353	**	(0.021)
$LEVEL3_{it}$	0.166		(0.141)
$URG_{it}*LEVEL3_{it}$	-7.671	*	(0.082)
$URL_{it}*LEVEL3_{it}$	5.253	**	(0.035)
Adj R^2	3,349		
N	0.219		

Test of $URG_{it} + URG_{it}*LEVEL3_{it} = 0$	Prob > F = 0.1477
Test of $URL_{it} + URL_{it}*LEVEL3_{it} = 0$	Prob > F = 0.0188**

R_{it}	=	12-month buy and hold raw returns beginning 8 months before the fiscal year end
NI_{it}	=	net income (Compustat item NI)
$FCADJ_{it}$	=	foreign currency adjustment (Compustat item CICURR)
$PENADJ_{it}$	=	pension liability adjustment (Compustat item CIPEN)
URG_{it}	=	unrealized gains, set to *MKTADJ* if *MKTADJ* > 0, zero otherwise
URL_{it}	=	unrealized losses, set to *MKTADJ* if *MKTADJ* <= 0, zero otherwise
$LEVEL3_{it}$	=	Level 3 fair value assets (Compustat item AUL3) scaled by total assets (Compustat item AT)

All comprehensive income variables are scaled by the returns period start date market value of equity. ***,**, and * indicate two-tailed significance at 0.01, 0.05, and 0.10 levels, respectively.

Table 3 presents the results of estimating Model (3) to provide evidence of the effect of the global financial crisis on the pricing of unrealized gains and losses for AFS. The coefficient of $URG_{it}*POST_{it}$ and $URL_{it}*POST_{it}$ are both negative and significant, suggesting that in the post-crisis period unrealized gains and losses are priced closer to zero. This suggests that in the post-financial crisis period, the market discounts the reliability of unrealized gains and losses for AFS securities. Therefore, it appears that the crisis had an effect of investor perceptions of the quality of unrealized gains and losses.

TABLE 3

Association of Annual Raw Returns with Available-For-Sale Market Adjustments During and Post 2008 Financial Crisis

$R_{it} = \alpha_1 + \alpha_2 NI_{it} + \alpha_3 D_1 + \alpha_4(NI_{it} * D_1) + \alpha_5 FCADJ_{it} + \alpha_6 PENADJ_{it} + \alpha_7 URG_{it} + \alpha_8 URL_{it} + \alpha_9 POST_{it} + \alpha_{10}(URG_{it} * POST_{it}) + \alpha_{11}(URL_{it} * POST_{it}) + \varepsilon_{it}$

Variable	Coefficient		p-value
Intercept	-0.012		(0.395)
NI_{it}	0.209	**	(0.029)
D_1	-0.207	***	(0.000)
$NI_{it}*D_1$	-0.023		(0.819)
$FCADJ_{it}$	1.702	**	(0.013)
$PENADJ_{it}$	2.581	***	(0.001)
URG_{it}	1.719	***	(0.000)
URL_{it}	1.186	***	(0.000)
$POST_{it}$	0.138	***	(0.000)
$URG_{it}*POST_{it}$	-1.852	***	(0.000)
$URL_{it}*POST_{it}$	-1.516	***	(0.000)
Adj R^2	3,349		
N	0.267		

R_{it}	=	12-month buy and hold raw returns beginning 8 months before the fiscal year end
NI_{it}	=	net income (Compustat item NI)
$FCADJ_{it}$	=	foreign currency adjustment (Compustat item CICURR)
$PENADJ_{it}$	=	pension liability adjustment (Compustat item CIPEN)
URG_{it}	=	unrealized gains, set to *MKTADJ* if *MKTADJ* > 0, zero otherwise
URL_{it}	=	unrealized losses, set to *MKTADJ* if *MKTADJ* <= 0, zero otherwise
$POST_{it}$	=	indicator variable equal to 1 if fiscal year is after 2009, 0 otherwise

All comprehensive income variables are scaled by the returns period start date market value of equity.
***,**, and * indicate two-tailed significance at 0.01, 0.05, and 0.10 levels, respectively.

Next, we examine H2a and H2b and test whether the global financial crisis affected the pricing of unrealized gains and losses conditional on the Level 3 fair value assets. We test this by estimating Model (2a) and (2b). Table 4 presents the results for the crisis period and post-crisis period. The results show that in the post-crisis period the coefficient on $URG_{it}*LEVEL3_{it}$ is negative and significant. Therefore, in the

post-crisis period, Level 3 fair value assets are viewed as less reliable and URG are priced lower for firms with more Level 3 fair value assets. However, $URL_{it}*LEVEL3_{it}$ is not significant in the post-crisis period, p-value 0.103. Additionally, in the crisis period our variables of interest are not significant which suggests greater Level 3 fair value assets did not affect the pricing of URGL in the crisis period. Finally, consistent with H2a the coefficient on $URG_{it}*LEVEL3_{it}$ is closer to zero in the post-crisis period. In contrast to the prediction in H2b, the coefficient on $URL_{it}*LEVEL3_{it}$ is more negative in the post-crisis period. However, Table 4 shows that in the post-crisis period the coefficient on URL_{it} is negative and significant. Therefore, because losses are negative by definition, in the post-crisis period as losses are closer to zero returns decrease. This is in contrast to the positive coefficient on URL_{it} in the crisis period. The negative coefficient in the post-crisis period suggests that investors perceive URL to be understated and price URL as though they are greater than reported.

TABLE 4
Association of Annual Raw Returns with Available-For-Sale Market Adjustments and Level 3 Fair Value Assets

$R_{it} = \alpha_1 + \alpha_2 NI_{it} + \alpha_3 D_1 + \alpha_4(NI_{it} * D_1) + \alpha_5 FCADJ_{it} + \alpha_6 PENADJ_{it} + \alpha_7 URG_{it} + \alpha_8 URL_{it} + \alpha_9 LEVEL3_{it} + \alpha_{10}(URG_{it} * LEVEL3_{it}) + \alpha_{11}(URL_{it} * LEVEL3_{it}) + \varepsilon_{it}$

Variable	Crisis Period			Post-Crisis Period		
	Coefficient		p-value	Coefficient		p-value
Intercept	-0.077	***	(0.002)	0.132	***	(0.000)
NI_{it}	1.078	***	(0.000)	0.086		(0.253)
D_1	-0.180	***	(0.000)	-0.143	***	(0.000)
$NI_{it*}D_1$	-0.997	***	(0.000)	0.419	***	(0.000)
$FCADJ_{it}$	3.931	***	(0.000)	-0.846		(0.529)
$PENADJ_{it}$	3.248	**	(0.036)	1.054	**	(0.047)
URG_{it}	1.781	***	(0.000)	0.093		(0.586)
URL_{it}	1.337	***	(0.000)	-0.467	***	(0.006)
$LEVEL3_{it}$	0.689		(0.239)	0.061		(0.520)
$URG_{it}*LEVEL3_{it}$	-10.865		(0.255)	-3.556	*	(0.063)
$URL_{it}*LEVEL3_{it}$	-2.023		(0.488)	-2.817		(0.103)
Adj R^2	1,147			2,202		
N	0.313			0.117		

Test of URG_{it} + $URG_{it}*LEVEL3_{it} = 0$	Prob > F = 0.3233	
Test of URL_{it} + $URL_{it}*LEVEL3_{it} = 0$	Prob > F = 0.8032	

Post-Crisis Period

Test of URG_{it} + $URG_{it}*LEVEL3_{it} = 0$	Prob > F = 0.0644*	
Test of URL_{it} + $URL_{it}*LEVEL3_{it} = 0$	Prob > F = 0.0473**	

R_{it}	=	12-month buy and hold raw returns beginning 8 months before the fiscal year end

NI_{it}	=	net income (Compustat item NI)
$FCADJ_{it}$	=	foreign currency adjustment (Compustat item CICURR)
$PENADJ_{it}$	=	pension liability adjustment (Compustat item CIPEN)
URG_{it}	=	unrealized gains, set to $MKTADJ$ if $MKTADJ > 0$, zero otherwise
URL_{it}	=	unrealized losses, set to $MKTADJ$ if $MKTADJ <= 0$, zero otherwise
$LEVEL3_{it}$	=	Level 3 fair value assets (Compustat item AUL3) scaled by total assets (Compustat item AT)

All comprehensive income variables are scaled by the returns period start date market value of equity. ***,**, and * indicate two-tailed significance at 0.01, 0.05, and 0.10 levels, respectively.

The results in Table 4 provide preliminary evidence related to H2a and H2b. To formally test H2a and H2b, we examine the full sample with an indicator variable for the post-crisis period and estimate Model (4). Table 5 presents these results. These results do not provide evidence to support H2a and H2b. The results in Table 5 show that an F-test (Pre vs. Post) of the coefficients for the pricing of URG in the crisis period for firms with greater Level 3 fair value assets are not significantly different from the coefficient for the pricing of URG in the post-crisis period for firms with greater Level 3 fair value assets. Additionally, we do not find evidence that URL are priced differently conditional on the magnitude of Level 3 fair value assets in the post-crisis period vs. the crisis period. While we do not find support for H2a and H2b, the results in Table 5 are consistent with the results in Table 4 as an F-test (Post vs. Post) shows that in the post-crisis period, URG are viewed as less reliable for firms with more Level 3 fair value measurements, with a p-value of 0.014. Therefore, it seems as though the results in Table 2 for URG are driven by the post-crisis period and contrary to the predictions in H2a, Level 3 fair value assets are viewed as less reliable following the recent financial crisis. The results in Table 3 also support the notion that fair value measurements are less reliable in the post-crisis period. This suggests that the financial crisis altered investors' perceptions of the reliability of Level 3 fair value measurements in the pricing of URG, and that investors may have relied too heavily these measurements during the crisis. With respect to URL, we do not find evidence to support H2b. However, Table 4 and 5 suggest that URL are viewed as less reliable in the post-crisis period. Overall, the results in Tables 2-5 suggest that consistent with the fair value hierarchy in ASC 820, investors price URGL differently based on the reliability of the fair value measurements used to determine the URGL. Specifically, investors view Level 3 fair value measurements as less reliable when pricing URGL following the recent financial crisis.

ADDITIONAL ANALYSES

While the predictions above are related to Level 3 fair value assets, the fair value hierarchy in ASC 820 suggests that Level 2 inputs are less reliable than Level 1 inputs, but more reliable than Level 3 inputs. Therefore, we perform additional analyses to explore the effect of Level 2 fair value measurements on the pricing of URGL. We perform the analyses by adding $LEVEL2_{it}$, the relative magnitude of fair value Level 2 fair value assets (Compustat item AOL2) compared to total assets held by a firm, to Model 2 and 5. We also add all relevant interaction terms similar to tests of $LEVEL3_{it}$. If Level 2 fair value measurements are viewed as less reliable by investors, we expect the results for Level 2 to be similar to those of Level 3. Untabulated results show that when adding main effect interactions terms to Model 2, $URG_{it} * LEVEL2_{it}$ and $URL_{it} * LEVEL2_{it}$ are not significant. Therefore, investors do not seem to perceive URGL to be less reliable for firms with more Level 2 fair value measurements. We also examine whether the effect of Level 3 fair value assets on the pricing of URGL is statistically different from the effect of Level 2 fair value assets. F-tests of the difference in the coefficients on $URG_{it} * LEVEL3_{it}$ vs. $URG_{it} * LEVEL2_{it}$ and $URL_{it} * LEVEL3_{it}$ vs. $URL_{it} * LEVEL2_{it}$ show that $URG_{it} * LEVEL3_{it}$ is significantly less than $URG_{it} * LEVEL2_{it}$, and $URL_{it} * LEVEL3_{it}$ is significantly greater than $URL_{it} * LEVEL2_{it}$. These results suggest that investors perceive Level 3 fair value measurements to be less reliable than Level 2 fair value measurements and price URGL accordingly. Finally, when adding main effect and interactions

terms to Model 4 we do not find evidence that the crisis had an effect on the perceived reliability of Level 2 fair value measurements.

TABLE 5
Association of Annual Raw Returns with Available-For-Sale Market Adjustments and Level 3 Fair Value Assets

$R_{it} = \alpha_1 + \alpha_2 NI_{it} + \alpha_3 D_1 + \alpha_4 (NI_{it} * D_1) + \alpha_5 FCADJ_{it} + \alpha_6 PENADJ_{it} + \alpha_7 URG_{it} + \alpha_8 URL_{it} + \alpha_9 LEVEL_{it} + \alpha_{10} POST_{it} + \alpha_{11}(URG_{it} * LEVEL3_{it}) + \alpha_{12}(URL_{it} * LEVEL3_{it}) + \alpha_{13}(URG_{it} * POST_{it}) + \alpha_{14}(URL_{it} * POST_{it}) + \alpha_{15}(LEVEL3_{it} * POST_{it}) + \alpha_{16}(URG_{it} * LEVEL3_{it} * POST_{it}) \alpha_{17}(URL_{it} * LEVEL3_{it} * POST_{it}) + \varepsilon_{it}$

Variable	Coefficient		p-value
Intercept	-0.021		(0.196)
NI_{it}	0.221	**	(0.035)
D_1	-0.204	***	(0.000)
$NI_{it} * D_1$	-0.011		(0.917)
$FCADJ_{it}$	1.679	**	(0.023)
$PENADJ_{it}$	2.489	***	(0.001)
URG_{it}	2.064	***	(0.000)
URL_{it}	1.515	***	(0.000)
$LEVEL3_{it}$	0.820		(0.168)
$POST_{it}$	0.145	***	(0.000)
$URG_{it}*LEVEL3_{it}$	-11.738		(0.155)
$URL_{it}*LEVEL3_{it}$	-4.827		(0.115)
$URG_{it}*POST_{it}$	-2.013	***	(0.000)
$URL_{it}*POST_{it}$	-1.843	***	(0.000)
$LEVEL3_{it}*POST_{it}$	-0.769		(0.185)
$URG_{it}*LEVEL3_{it}*POST_{it}$	5.520		(0.470)
$URL_{it}*LEVEL3_{it}*POST_{it}$	3.796		(0.271)
Adj R^2	3349		
N	0.270		

Pre vs. Pre
Test of *Pre Zero Level3 URG = Pre Level3 URG*
URG = URG+URG*LEVEL3
which is: URG*LEVEL3 = 0

Prob > F = 0.1552

Test of *Pre Zero Level3 URL = Pre Level3 URL*
URL = URL+URL*LEVEL3
which is: URL*LEVEL3 = 0

Prob > F = 0.1154

Pre vs. Post
H2a: Test of *Pre Level3 URG = Post Level3 URG*

URG+URG*POST =
URG+URG*POST+URG+LEVEL3+URG*LEVEL3*POST
which is: URG*POST+URG*LEVEL3*POST=0

Prob > F = 0.6320

H2b: Test of *Pre Level3 URL = Post Level3 URL*

URL+URL*POST =
URL+URL*POST+URL+LEVEL3+URL*LEVEL3*POST
which is: URL*POST+URL*LEVEL3*POST=0

Prob > F = 0.5511

Post vs. Post
Test of *Post Zero Level3 URG = Post Level3 URG*
URG+URG*LEVEL3 = URG+URG*LEVEL3+URG*POST+URG*LEVEL3*POST
which is: URG*LEVEL3+URG*LEVEL3*POST = 0

Prob > F = 0.0141**

Test of *Post Zero Level3 URL = Post Level3 URL*
URL+URL*LEVEL3 =
URL+URL*LEVEL3+URL*POST+URL*LEVEL3*POST
which is: URL*LEVEL3+URL*LEVEL3*POST = 0

Prob > F = 0.5924

R_{it}	=	12-month buy and hold raw returns beginning 8 months before the fiscal year end
NI_{it}	=	net income (Compustat item NI)
$FCADJ_{it}$	=	foreign currency adjustment (Compustat item CICURR)
$PENADJ_{it}$	=	pension liability adjustment (Compustat item CIPEN)
URG_{it}	=	unrealized gains, set to *MKTADJ* if *MKTADJ* > 0, zero otherwise
URL_{it}	=	unrealized losses, set to *MKTADJ* if *MKTADJ* <= 0, zero otherwise
$LEVEL3_{it}$	=	Level 3 fair value assets (Compustat item AUL3) scaled by total assets (Compustat item AT)
$POST_{it}$	=	indicator variable equal to 1 if fiscal year is after 2009, 0 otherwise

All comprehensive income variables are scaled by the returns period start date market value of equity.
***,**, and * indicate two-tailed significance at 0.01, 0.05, and 0.10 levels, respectively.

CONCLUSION

Our paper examines whether the reliability of fair value measurements affects the pricing of unrealized gains and losses for AFS. Specifically, we examine whether unrealized gains and losses on investments for AFS securities are priced differently for firms with greater Level 3 fair value assets. We also examine whether this relation was affected by the recent global financial crisis. Our empirical results suggest that investors believe Level 3 fair value measurements are less reliable than Level 1 and 2 fair value measurements, and price unrealized gains as though they overstated and unrealized losses as though they are understated for firms with greater Level 3 fair value assets. Our results also show that the recent global financial crisis had an effect on investors' perceptions of the reliability of Level 3 fair value measurements. In the post-crisis, URG are priced lower when firms have more Level 3 fair value assets. Therefore, both the magnitude of Level 3 fair value assets and the global financial crisis affect the pricing of unrealized gains and losses on investments for AFS. Our study contributes to the fair value literature

by showing the value relevance the market adjustments for unrealized gains and losses for AFS securities, in the recent years, and how the 2008 global financial crisis affects this value relevance. We also shed light on what effect the presence of Level 3 fair value assets has on the pricing of unrealized gains and losses.

ENDNOTES

1. We focus on URGL for changes in AFS securities because while these figures are readily available, URGL in net income for trading securities are not available separately from realized gains and losses from trading securities and AFS.
2. Dhaliwal et al. (1999) and Biddle and Choi (2006) construct their OCI measures. Chambers et al. (2007) compare the constructed OCI measures to their hand-collected reported OCI measures. We use reported OCI measures, which are now available in Compustat.
3. In 2016 the FASB Accounting Standards Update 2016-01 which eliminated the available-for-sale classification for fiscal years beginning after December 15, 2017. While this eliminates the reporting of unrealized gains and losses in OCI and requires all unrealized gains and losses be reported in earnings, the uncertainty arising from fair value estimates still exists and this study is still relevant.
4. Dhaliwal et al. (1999) use the sample period of 1994 and 1995; Biddle and Choi (2006) from 1994 to 1998; and Chambers et al. (2007) from 1994 to 2003.

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