

# Are Level 3 Fair Value Remeasurements Useful? Evidence from ASC 820 Rollforward Disclosures

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# Are Level 3 Fair Value Remeasurements Useful? Evidence from ASC 820 Rollforward Disclosures

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**ABSTRACT:** Exploiting detailed disclosures mandated by Accounting Standard Codification (ASC) 820, we provide evidence for the return relevance of Level 3 fair value remeasurements for a comprehensive sample of U.S. listed banks. We find that Level 3 remeasurements recognized in earnings are more return relevant than those recognized in other comprehensive income (OCI). Our results suggest that Level 3 remeasurements in OCI partially reflect transitory illiquidity discounts that are less relevant when banks have the ability to hold the underlying assets. The regulatory capital treatment of OCI also affects the return relevance of Level 3 remeasurements in OCI. Importantly, we find no differences in the return relevance of realized versus unrealized Level 3 remeasurements in earnings, allaying concerns that investors perceive unrealized Level 3 remeasurements of lesser quality. Overall, our findings support the usefulness of the segregated disclosures of Level 3 fair value remeasurements.

**Data Availability:** Data are available from the public sources cited in the text.

**Keywords:** fair value accounting; Level 3; return relevance; ASC 820; FAS 157; other comprehensive income (OCI); fair value disclosures.

## I. INTRODUCTION

The fair value hierarchy in Accounting Standards Codification (ASC) 820 (formerly Statement of Financial Accounting Standards [SFAS] 157) prioritizes inputs used in fair value measurement into three levels ([Financial Accounting Standards Board \[FASB\] 2011](#)). The hierarchy gives highest priority to observable inputs from quoted prices in active markets (Level 1) and lowest priority to unobservable, firm-generated inputs (Level 3). Level 3 fair value estimates have been subject to criticism as they are based on “unobservable inputs, subjectively determined by the firm’s management, and subject to random errors and moral hazard” ([Ronen 2008](#), 186).

To increase transparency, ASC 820 mandates a reconciliation of period-to-period changes in recurring Level 3 assets and liabilities (hereafter, Level 3 rollforward), presenting total Level 3 fair value remeasurements separately from both cash transactions (i.e., purchases, sales, and settlements) and transfers into and out of Level 3 (see Appendix A for illustrative examples). ASC 820 also requires companies to segregate total Level 3 remeasurements into different components, namely, realized remeasurements through sales recognized in earnings, unrealized remeasurements still held at the reporting date recognized in earnings, and remeasurements recognized in other comprehensive income (OCI). These disclosure requirements,

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especially the separate disclosure of unrealized remeasurements in earnings, were highly controversial during the development of the standard and recent redeliberations by the FASB.

In this study, we examine whether disclosures related to the remeasurements of Level 3 fair values are useful to investors. In addition, we investigate whether the different components of Level 3 remeasurements are differentially return relevant. We first test whether total Level 3 remeasurements in comprehensive income, separated from cash transactions and net transfers, are return relevant. On the one hand, Level 3 remeasurements are likely return relevant when they reflect management's information about changes in shareholder wealth due to changes in economic conditions (FASB 2006, ¶C100). On the other hand, Level 3 remeasurements might be less return relevant because they are subject to managerial opportunism (Song, Thomas, and Yi 2010; Cheng 2012), noisy (Barth 1994), or already embedded in market prices (Vyas 2011).

We hand-collect quarterly data from Level 3 rollforward disclosures for a sample of 219 listed U.S. banks with non-zero recurring Level 3 assets from 2008 to 2017. We then regress four-month cumulative abnormal returns on Level 3 fair value remeasurements (Badertscher, Burks, and Easton 2014). We find that total Level 3 remeasurements recognized in comprehensive income explain abnormal stock returns incrementally to other changes recognized in comprehensive income. In contrast, cash transactions and transfers into and out of Level 3 are not return relevant. These findings suggest that the separate disclosures of Level 3 fair value remeasurements are useful to investors.

Next, we investigate whether the components of Level 3 fair value remeasurements are differentially return relevant. The FASB's focus on the disclosure of Level 3 remeasurements in earnings, separate from OCI, is driven by investors' concerns about the earnings impact of the remeasurements (FASB 2004, ¶25a; FASB 2006, ¶C97, ¶C100). Therefore, we test whether remeasurements in earnings are more return relevant than those in OCI. In addition, users indicated that the separate disclosures of realized and unrealized remeasurements in earnings would allow them "to make informed judgements and segregate the effects of fair value measurements that are inherently subjective, enhancing their ability to assess the quality of earnings" (FASB 2006, ¶C98). Opponents, however, argued that investors might incorrectly conclude that unrealized remeasurements are of a lesser quality than realized remeasurements (FASB 2006, ¶C97). If investors perceive unrealized remeasurements to be of lesser quality than realized remeasurements, then we expect a lower return relevance of the former.

We find that Level 3 remeasurements in earnings are more return relevant than Level 3 remeasurements in OCI. In fact, Level 3 remeasurements in OCI are not significantly associated with abnormal returns. In addition, as fair value remeasurements in OCI are typically unrealized, we also compare them with unrealized remeasurements in earnings and find similar results. We find no statistical difference in the return relevance of unrealized versus realized remeasurements in earnings. This result does not support concerns that investors perceive unrealized fair value remeasurements of lesser quality nor claims that realization is a necessary criterion for the usefulness of fair value remeasurements in earnings (Abdel-khalik 2008; Ronen 2008; Badertscher et al. 2014; Dong, Ryan, and Zhang 2014).

To substantiate our inference that the Level 3 rollforward disclosures are useful to investors, we perform short-window tests around the earnings announcement and 10-Q/10-K release dates. We find no significant association between short-window abnormal returns and Level 3 remeasurements at the earnings announcement dates, consistent with Level 3 rollforward disclosures not yet being available at these dates. In contrast, market reactions are significantly and positively associated with unrealized Level 3 remeasurements recognized in earnings around the 10-Q/10-K release dates, when the rollforward disclosures become available. These findings support our interpretation that Level 3 rollforward disclosures are useful.

We also conduct non-market-based tests to shed further light on the usefulness of Level 3 remeasurements. Statement of Financial Accounting Concepts (SFAC) No. 8 states that financial information is capable of influencing decisions if it has predictive value, confirmatory value, or both (FASB 2018b). Therefore, we examine the predictive ability of Level 3 fair value remeasurement components for future bank earnings (Dong et al. 2014; Evans, Hodder, and Hopkins 2014; Bratten, Causholli, and Khan 2016). We find that remeasurements in earnings predict future earnings, with no statistical difference in the predictive ability of unrealized versus realized remeasurements in earnings. In contrast, remeasurements in OCI have a lower predictive ability compared to unrealized remeasurements in earnings.

Informed by extant literature, we explore non-mutually exclusive explanations for the lower return relevance of Level 3 remeasurements in OCI. These include (1) noise in OCI associated with "recycling,"<sup>1</sup> (2) the effect of transitory illiquidity discounts recognized in OCI, and (3) the exclusion of OCI from regulatory capital. We find some evidence for (2) and (3), but not for (1). Specifically, consistent with transitory illiquidity-induced fair value changes being less relevant, we find a lower return relevance of remeasurements in OCI for banks with a higher ability to hold the underlying financial assets until fair value recovers (Ronen and Ryan 2011). In addition, we find a higher return relevance of remeasurements in OCI in a period during

<sup>1</sup> When available-for-sale (AFS) securities are sold or subject to an other-than-temporary impairment (OTTI), accumulated gains or losses are "recycled" from OCI into earnings (Jones and Smith 2011; Badertscher et al. 2014).

which U.S. regulators proposed to include OCI in the calculation of regulatory capital. This finding suggests that the regulatory treatment of fair value gains and losses in OCI matters to investors (Chircop and Novotny-Farkas 2016).

In additional analyses, we examine the extent to which Level 3 fair value remeasurements reflect changes in market observables. We find that remeasurements in OCI are more strongly associated with changes in market observables and with illiquidity-induced value changes, while unrealized remeasurements in earnings primarily reflect changes in the fundamental component of ABX returns (Bhat, Frankel, and Martin 2011). These findings suggest that the components of Level 3 fair value remeasurements reflect different sources of value changes, making segregated disclosures of these different components useful. Finally, we conduct additional analyses to mitigate concerns that our results are driven by differences in asset categories (e.g., trading versus AFS), asset types across remeasurement components, or influenced by different market conditions over time. While these analyses provide further support for our inferences, we cannot entirely rule out that the differential return relevance of remeasurement components is attributable to differences in the underlying asset types.

With this caveat in mind, our study makes several contributions. First, our findings are relevant to standard setters. In its recent redeliberations of fair value disclosures, the FASB considered whether the benefits of Level 3 rollforward disclosures would justify the costs of producing them (FASB 2015). In its final ASU 2018-13, the FASB decided to retain the Level 3 rollforward for public firms, but not for non-public firms due to said cost-benefit trade-off (FASB 2018a, ¶BC70). Our findings support the FASB's decision to retain the disclosure requirements for public firms, as the segregated disclosures provide useful information for financial statement users.

Second, our findings are relevant for the debate on whether and why the usefulness differs across items recognized in OCI and items recognized in earnings (e.g., Rees and Shane 2012). Keeping fair value measurement inputs and disclosure location constant, we find that the earnings and OCI components of Level 3 fair value remeasurements are differently return relevant and vary in their information content. Specifically, our findings suggest that investors respond differently because of (1) differences in what is reported in OCI and earnings, (2) differences in how the information in OCI and earnings is used for contracting by bank regulators, and (3) differences in the attributes of the holder of the underlying financial assets.

Third, we add to the debate whether realization should be used as a criterion for recognizing fair value remeasurements in earnings. Although it is often argued that fair value remeasurements are "holding capital gains (or losses) that have not been earned (realized)" (Abdel-khalik 2008, 7) and, therefore, should not be included in earnings, our findings show that realized and unrealized fair value remeasurements in earnings are equally return relevant. Therefore, investors do not perceive unrealized fair value remeasurements in earnings of lesser quality.

Finally, we contribute to the literature examining the value relevance and reliability of the fair value hierarchy disclosures (e.g., Song et al. 2010; Goh, Li, Ng, and Yong 2015; Lawrence, Siriviriyakul, and Sloan 2016; Kolev 2019). While providing important insights, these studies shed only limited light on the extent to which and the reasons why remeasurements of internally generated fair values are useful to investors. We extend this literature by offering explanations for why the return relevance of different components of Level 3 fair value remeasurements varies.

## II. BACKGROUND AND HYPOTHESES

### Accounting for and Disclosure of Recurring Level 3 Assets

ASC 820 requires fair value assets and liabilities to be disclosed according to a three-level hierarchy, where Level 3 fair values are based on unobservable inputs and involve subjective judgment and substantial managerial discretion (Ryan 2008). To address concerns regarding the reliability of Level 3 fair values, ASC 820 requires firms to disclose quarterly rollforwards of Level 3 fair values from the beginning to the end of the period, including (1) remeasurements recognized in earnings versus OCI, further distinguishing remeasurements recognized in earnings into realized and unrealized components, (2) purchases, sales, issuances, and settlements, and (3) transfers into and out of Level 3 (ASC 820-10-50). The FASB considers such segregated disclosures to be useful to financial statement users in assessing the impact of fair value measurements on earnings and for distinguishing changes in Level 3 assets that are due to entities' transactions versus changes in economic conditions (FASB 2006, ¶C100).

Whether fair value remeasurements are recognized in earnings or OCI depends on the accounting categorization of Level 3 assets. Recurring Level 3 assets, for which rollforward disclosures are required, are categorized as trading, AFS, or fair value option (FVO) assets. Unrealized and realized fair value remeasurements on Level 3 assets held in the trading or FVO category are recognized in earnings. In contrast, unrealized fair value remeasurements in the AFS category are typically recognized in OCI. Unrealized fair value remeasurements on AFS securities only affect earnings, i.e., are "recycled," when the securities are sold or subject to an other-than-temporary impairment (OTTI).

An OTTI is recognized when there is significant doubt that the firm can hold the security until the fair value recovers to amortized cost. The FASB Staff Positions (FSP) FAS 115-2 and FAS 124-2 in April 2009 (FASB 2009) clarified that only the

credit loss portion of OTTI should be recorded in earnings (the “bifurcation rule”). Non-credit-related OTTIs, primarily due to illiquidity, and other fair value changes should be recognized in OCI.

Recently, as part of its disclosure framework project, the FASB reevaluated the usefulness of fair value-related disclosures (FASB 2015, 2018a) and considered whether to discard the Level 3 rollforward (FASB 2015, ¶BC25). Some commentators argued that the benefits of the Level 3 rollforward would not justify the costs of providing the information. However, most financial statement users indicated that the Level 3 rollforward is useful because it allows them to gain insight into management’s decisions, especially across different economic cycles (FASB 2018a, ¶BC30). Therefore, in the final ASU 2018-13, the FASB decided to retain the Level 3 rollforward for public, but not for non-public, entities (FASB 2018a).

## Related Research and Hypotheses

Our research question relates to the rather scarce literature examining the return relevance of fair value remeasurements (Barth 1994; Ahmed and Takeda 1995; Bhat and Ryan 2015; McInnis, Yu, and Yust 2018; Kolev 2019). A crucial difference between our study and prior literature is that most of the earlier studies construct *as-if* estimates of disclosed fair value remeasurements or fair value gains and losses, while we examine *as-reported* fair value remeasurements.<sup>2</sup> The generally lower precision in and prominence of *as-if* estimates (e.g., Aboody 1996; Ahmed, Kilic, and Lobo 2006; Schipper 2007; Müller, Riedl, and Sellhorn 2015) potentially affects previous studies’ results and might explain some of the findings indicating a lack of or weak return relevance of fair value remeasurements.

Early literature investigates the return relevance of disclosed fair value gains and losses and whether the return relevance of realized and unrealized fair value gains and losses differs. Barth (1994) uses period-to-period changes in the difference between disclosed fair values and recognized amortized costs to estimate fair value gains and losses and finds that these *as-if* estimates are generally not return relevant, except for large banks with a high proportion of liquid securities.<sup>3</sup> Ahmed and Takeda (1995) argue that Barth’s (1994) insignificant results are due to omitted correlated variables in the form of value changes of other assets and liabilities caused by interest rate movements. After controlling for banks’ interest rate exposures and changes in interest rates, Ahmed and Takeda (1995) find a significant positive relation of both unrealized and realized fair value gains and losses with stock returns.

Bhat and Ryan (2015) document that market and credit risk modeling enhances the return relevance of approximated unrealized fair value remeasurements, particularly for less liquid securities with greater valuation difficulties.<sup>4</sup> To estimate fair value income, McInnis et al. (2018) use the sum of net income, other comprehensive income, and the implied gain or loss based on the net change in disclosed fair values of financial instruments, and they show that this estimate is less return relevant than generally accepted accounting principles (GAAP) income, which is largely based on historical cost. Using data from the second and third quarter of 2008, Kolev (2019) finds that *as-reported* net gains on Level 3 assets and liabilities are positively associated with raw returns.

Taken together, the findings of prior studies indicate that fair value remeasurements on illiquid investments are, on average, less return relevant. Adding to these prior studies, we investigate not only whether *as-reported* Level 3 fair value remeasurements are return relevant, but also whether and why the return relevance varies across different Level 3 fair value remeasurement components.

Our first hypothesis relates to the return relevance of total Level 3 remeasurements recognized in comprehensive income. There are two main factors that potentially reduce the return relevance of Level 3 remeasurements. First, empirical evidence from value relevance studies suggests that Level 3 measurements are less reliable (e.g., Song et al. 2010) and associated with greater information risk (Riedl and Serafeim 2011).<sup>5</sup> Second, managers might not be able to provide information beyond what is already embedded in market prices. For example, Vyas (2011) shows that write-downs implied by credit market indices were timelier than accounting write-downs. To the extent that investors use observable, publicly available market inputs to evaluate banks’ Level 3 assets, reported Level 3 remeasurements may not be return relevant.

<sup>2</sup> We refer to *as-if* estimates of fair value remeasurements as those that are constructed using the levels of *disclosed* fair values. *As-reported* fair value remeasurements are *recognized*, as well as separately disclosed.

<sup>3</sup> More specifically, Barth (1994) estimates the fair value security gains and losses (FSGL) of investment securities as  $FSGL = RSGL - \Delta BINV + \Delta FINV$ , where RSGL are realized securities gains and losses and  $\Delta BINV$  ( $\Delta FINV$ ) are the change in the book value (disclosed fair value) of investment securities.

<sup>4</sup> Bhat and Ryan (2015) measure fair value gains and losses recognized in net income as trading revenue, which includes both (unrealized and realized) fair value gains and losses, as well as fee income. Their measure of fair value gains and losses in OCI includes OCI from pension adjustments and foreign exchange gains and losses.

<sup>5</sup> However, Lawrence et al. (2016) show that the valuation discount on Level 3 assets found in previous studies is due to omitted correlated variable bias. Using the specific setting of closed-end funds, they document that Level 3 assets are similarly value relevant as Level 1 and Level 2 assets.

However, valuations using timely information from publicly available sources might contain considerable error, particularly during turbulent times (Laux and Leuz 2009, 2010). Using Level 3 measurement, managers can deviate from recording distressed market values by relying on their own unobservable inputs and signal their expectations about the performance of the underlying assets (FASB 2008; Securities and Exchange Commission [SEC] 2008). Consequently, to the extent that Level 3 remeasurements reflect management's information about changes in shareholder wealth due to changes in economic conditions (FASB 2006, ¶C100), they are likely return relevant. Based on these arguments, we state our first hypothesis as follows:

**H1:** Level 3 fair value remeasurements recognized in comprehensive income are positively associated with abnormal returns.

Our next two hypotheses relate to the requirement of ASC 820 to segregate total Level 3 fair value remeasurements into its components. Prior literature has examined the usefulness of OCI. Experimental studies find that the reporting location of OCI affects valuation judgements (Hirst and Hopkins 1998; Maines and McDaniel 2000). While early archival studies (Dhaliwal, Subramanyam, and Trezevant 1999; O'Hanlon and Pope 1999) provide mixed evidence on the return relevance of OCI and its individual items (e.g., foreign currency translation adjustments or fair value gains and losses on AFS securities), more recent studies (Biddle and Choi 2006; Chambers, Linsmeier, Shakespeare, and Sougiannis 2007) find that OCI and its individual items are priced and that the pricing generally strengthened following the adoption of ASC 220 (formerly, FAS 130), which requires more prominent disclosure of OCI. In our setting, fair value remeasurements in earnings and OCI are based on unobservable Level 3 inputs and disclosed equally prominently (side-by-side) in the rollforward disclosure table.

Regarding Level 3 disclosures, the FASB concluded that information about fair value remeasurements recognized in earnings, separate from OCI, would allow users to assess the quality of reported earnings (FASB 2006, ¶C97). This statement suggests that the FASB perceives the earnings impact of Level 3 measurements of primary importance for investors. There are several reasons why this might be the case. First, fair value remeasurements in OCI may contain noise due to the recycling of OCI (Jones and Smith 2011). For example, if the bank recognizes an OTTI, the corresponding loss is recognized in earnings, but simultaneously recorded as a positive component of OCI.<sup>6</sup> Similarly, if an AFS security with previously accumulated OCI gains is sold, a realized gain is recognized in earnings, but also recorded as a negative component of OCI. These mechanical OCI components do not reflect economic holding gains and losses, potentially rendering them less return relevant.

Second, OCI primarily reflects interest rate risk and, especially in the case of Level 3 assets, illiquidity risk.<sup>7</sup> Ronen and Ryan (2011) and Ryan (2011) argue that illiquidity risk is different from other market risks in liquid markets. Unlike the realization of other market risks (e.g., interest rates) in liquid markets, firms cannot sell an illiquid financial instrument without sizable costs (Ronen and Ryan 2011), making a firm's intent and ability to hold a financial instrument until maturity or until recovery of market liquidity economically significant. Therefore, if firms are able to hold illiquid financial assets, then illiquidity-induced fair value changes recognized in OCI are likely transitory and potentially less relevant for investors. However, illiquidity-induced fair value remeasurements in OCI are likely relevant if investors doubt the ability of banks to hold the related investments until maturity and/or view the holding of these illiquid investments as a loss in financial flexibility.

Third, fair value remeasurements in OCI might be less return relevant because they are excluded from regulatory capital calculations (Badertscher et al. 2014). However, to the extent that investors focus on tangible common equity that includes fair value remeasurements in OCI (Shaffer 2010), the distinction in the regulatory treatment of earnings versus OCI components might not matter for return relevance.

Relative to fair value remeasurements in OCI, Level 3 fair value remeasurements in earnings likely incorporate remeasurements that are more relevant for equity investors. For example, Level 3 remeasurements in earnings include OTTI charges on Level 3 AFS securities. OTTIs reflect declines in the fair value of AFS securities due to credit losses that, based on managers' expectations, are unlikely to be recovered. This signal about underlying distress is likely useful to investors (Badertscher et al. 2014). In addition, fair value remeasurements on mortgage servicing rights (MSR) are also included in earnings and largely reflect changes in the expected revenue stream of servicing fees, i.e., changes in expected performance (Altamuro and Zhang 2013). Taking all arguments together, we formulate our second hypothesis as follows:

<sup>6</sup> Consider the following example: An AFS equity security is purchased for \$100 at the beginning of the first quarter. At the end of the first quarter, the fair value equals \$85. Therefore, a loss of \$15 is recorded in OCI, reflecting economic holding losses. In quarter two, the fair value further decreases to \$60. Assuming that this drop in fair value is considered to be "other-than-temporary," an OTTI loss of \$40 is recognized in earnings, and the \$15 OCI loss of the previous quarter is reversed, resulting in a \$15 OCI gain (positive component) in quarter two, which does not reflect economic holding gains, but simply an accounting-driven mechanical effect.

<sup>7</sup> For example, the "bifurcation rule" (FASB Staff Positions [FSP] FAS 115-2 and FAS 124-2) introduced in April 2009 clarifies that illiquidity discounts should be reflected in OCI rather than in earnings (FASB 2009). Furthermore, our additional analyses in Section VI show that Level 3 fair value remeasurements in OCI reflect both the fundamental and the illiquidity component of ABX returns (Bhat et al. 2011).

**H2:** The association with abnormal returns is stronger for Level 3 fair value remeasurements in earnings than for Level 3 fair value remeasurements in OCI.

A potential issue with H2 is that Level 3 remeasurements in earnings contain both realized and unrealized remeasurements, while remeasurements in OCI, absent any mechanical effects, contain unrealized remeasurements only. Thus, finding a higher return relevance of remeasurements in earnings might be due to investors putting greater weight on realized versus unrealized remeasurements rather than due to the reasons outlined above. To address this issue, we also compare unrealized remeasurements in earnings with unrealized remeasurements in OCI.

Finally, to test whether realization matters for the usefulness of remeasurements, we compare the return relevance of realized versus unrealized Level 3 fair value remeasurements recognized in earnings. Several academics have called for an accounting system that presents or discloses realized and unrealized fair value remeasurements separately (e.g., Abdel-khalik 2008; Ronen 2008; Laux 2012). For example, Ronen (2008) argues that the disclosure of realized amounts helps investors in assessing the reliability of prior expectations and the quality of managerial performance. Dong et al. (2014) find that realized fair value remeasurements on AFS securities are incrementally return relevant, as they help investors in predicting future bank performance.

Commentators, however, argued that “disclosures about unrealized gains and losses, alone, would not be cost beneficial and, in some cases, could be misleading. For example, users of financial statements might conclude that unrealized gains or losses are of a lesser quality than realized gains or losses, which might not be the case” (FASB 2006, ¶C97). Indeed, users commenting on the recent revision of the fair value measurement rules in ASU 2018-13 “explained that they consider unrealized gains and losses to be a lower quality (compared with realized gains and losses) because management has made a conscious decision not to lock in the gains and losses, leaving them subject to future volatility” (FASB 2018a, ¶BC25). Based on these arguments, we predict a higher return relevance of realized versus unrealized Level 3 fair value remeasurements in earnings, leading to the following hypothesis:

**H3:** The association with abnormal returns is stronger for realized Level 3 fair value remeasurements in earnings than for unrealized Level 3 fair value remeasurements in earnings.

### III. RESEARCH DESIGN

To test whether Level 3 fair value remeasurements are useful to investors, we follow Badertscher et al. (2014) and Dong et al. (2014) by regressing abnormal stock returns on the change in earnings before Level 3 remeasurements, OCI before Level 3 remeasurements, and Level 3 rollforward data. We begin with a simple model in which the main explanatory variable,  $\Delta L3FV$ , is the period-to-period change in Level 3 fair value levels:

$$CAR\_4MONTH_{it} = \alpha + \beta_1 \Delta EARNBL3_{it} + \beta_2 OCIBL3_{it} + \beta_3 \Delta L3FV_{it} + Year\text{-}Quarter\ FE + \varepsilon_{it} \quad (1)$$

To calculate the cumulative abnormal returns,  $CAR\_4MONTH$ , for bank  $i$  and quarter  $t$ , we use a four-month return interval that captures various formal and informal information flows, such as earnings announcements or 8-K and 10-Q/10-K filings (Badertscher et al. 2014). The interval starts with the last month of the current quarter and ends three months after the quarter-end, as banks announce earnings and file 10-Qs/10-Ks during this time period. We calculate abnormal returns by subtracting the monthly CRSP value-weighted market return and cumulating over the four months. The variable  $\Delta EARNBL3$  measures the change in earnings before Level 3 remeasurements in earnings over the quarter. By using the quarter-over-quarter changes in earnings, we capture the unexpected portion of earnings, assuming a random walk (Badertscher et al. 2014).<sup>8</sup> We also control for total OCI before Level 3 remeasurements in OCI ( $OCIBL3$ ).

Next, we exploit the ASC 820 disclosure requirement to separate Level 3 fair value remeasurements in comprehensive income ( $L3CI$ ) from net Level 3 transfers ( $L3TRANSFERS$ ) and net Level 3 transactions ( $L3TRANSACTIONS$ ) during a period. Consistent with H1, we predict a positive coefficient for  $L3CI$ , while we have no prediction for  $L3TRANSFERS$  and  $L3TRANSACTIONS$ :

$$CAR\_4MONTH_{it} = \alpha + \beta_1 \Delta EARNBL3_{it} + \beta_2 OCIBL3_{it} + \beta_3 L3CI_{it} + \beta_4 L3TRANSFERS_{it} + \beta_5 L3TRANSACTIONS_{it} + Year\text{-}Quarter\ FE + \varepsilon_{it} \quad (2)$$

To test H2, we split  $L3CI$  into Level 3 remeasurements in earnings ( $L3EARN$ ) and Level 3 remeasurements in OCI ( $L3OCI$ ).

<sup>8</sup> We do not use the first difference of Level 3 remeasurements and OCI, as these variables are based on fair values, which are, in principle, not predictable (Badertscher et al. 2014; Dong et al. 2014). However, when we difference all variables (including Level 3 remeasurements), our inferences are unaffected. In addition, when we do not difference any of the regression variables (including  $EARNBL3$ ), our inferences are also unaffected.

$$CAR\_4MONTH_{it} = \alpha + \beta_1 \Delta EARNBL3_{it} + \beta_2 OCIBL3_{it} + \beta_3 L3EARN_{it} + \beta_4 L3OCI_{it} + Year\text{-}Quarter\ FE + \varepsilon_{it} \quad (3)$$

Next, we further split *L3EARN* into unrealized remeasurements still held at the reporting date (*L3EARN\_UNR*) and realized remeasurements through sale (*L3EARN\_REAL*).<sup>9</sup> This last split not only allows us to test H3, but also provides an alternative test for H2, allowing us to compare unrealized remeasurements in earnings (*L3EARN\_UNR*) with *L3OCI*, which are largely unrealized.<sup>10</sup>

$$CAR\_4MONTH_{it} = \alpha + \beta_1 \Delta EARNBL3_{it} + \beta_2 OCIBL3_{it} + \beta_3 L3EARN\_UNR_{it} + \beta_4 L3EARN\_REAL_{it} + \beta_5 L3OCI_{it} + Year\text{-}Quarter\ FE + \varepsilon_{it} \quad (4)$$

All explanatory variables are scaled by beginning-of-quarter market value of equity. Following [Badertscher et al. \(2014\)](#), we winsorize all continuous variables at the 1st and 99th percentiles. We include year-quarter fixed effects and cluster standard errors by bank. We also estimate the regressions using the dependent variable, *CAR\_PLACEBO*, calculated as abnormal returns cumulated over the fourth and fifth month after the quarter-end. We do not expect to find significant associations between our explanatory variables and *CAR\_PLACEBO*, as the relevant information should already be incorporated in market prices in months four and five after the fiscal quarter-end date.

#### IV. SAMPLE SELECTION AND DESCRIPTION

We start with a sample of 467 U.S. banks from Compustat. As ASC 820 (FAS 157) became effective for annual periods on or after November 15, 2007, we collect quarterly data from 2008 through 2017. Using 10-Q and 10-K filings from EDGAR, we hand-collect data on remeasurements for Level 3 assets measured at fair value on a recurring basis from the rollforward disclosures required by ASC 820-10-50. Appendix A illustrates how we hand-collect the information and construct our key variables. We collect returns data from CRSP. The full sample consists of 8,018 bank-quarter observations for 448 unique banks. To mitigate concerns that return relevance differs systematically across banks that have exposure to Level 3 assets versus banks that do not have such exposure, e.g., because of different business models ([Laux and Leuz 2010](#)), we exclude bank-quarters without recurring Level 3 assets. The final sample consists of 5,216 bank-quarter observations for 219 unique banks from 2008 until 2017.

Table 1, Panel A presents summary statistics for the variables included in models (1) to (4). Panel A shows that the mean and median cumulative abnormal returns are positive. The mean values of the three Level 3 components differ: While the mean of  $-0.0018$  for *L3EARN\_UNR* is negative, the means of  $0.0001$  and  $0.0011$  for *L3EARN\_REAL* and *L3OCI*, respectively, are positive. Panel B shows the means of the variables by year-quarters. The signs and magnitudes of the quarter mean values differ substantially across the Level 3 remeasurement components, as well as the time periods. Panel C presents evidence on the classifications of Level 3 assets into trading, AFS, MSR, and other assets, as a percentage of recurring Level 3 assets.<sup>11</sup> The majority of the recurring Level 3 assets are classified as AFS (69 percent), followed by trading assets (13 percent) and MSR (10 percent).

Untabulated Pearson and Spearman correlations show that total Level 3 remeasurements in comprehensive income (*L3CI*) are positively correlated with cumulative abnormal returns. While remeasurements in earnings (*L3EARN\_UNR* and *L3EARN\_REAL*) are positively correlated with abnormal market returns, *L3OCI* are uncorrelated.<sup>12</sup> In addition, the three remeasurement components (*L3EARN\_UNR*, *L3EARN\_REAL*, and *L3OCI*) are negatively correlated with each other, consistent with the different nature of the three components.

#### V. EMPIRICAL RESULTS

##### Main Findings

Table 2 presents ordinary least squares (OLS) regression results of four-month cumulative abnormal returns on changes in earnings, Level 3 fair values, and OCI. In column (1), the coefficient of  $0.121$  for  $\Delta EARN$  is significantly positive (t-stat =  $2.63$ ) and its magnitude is close to the coefficient estimate of the change in earnings in [Badertscher et al. \(2014\)](#). The coefficient of  $0.088$  for *OCI* is not significantly different from zero (t-stat =  $0.48$ ). The relatively high adjusted  $R^2$  value of 26.8 percent is largely attributable to the inclusion of year-quarter fixed effects ([Bhat and Ryan 2015](#)).

<sup>9</sup> *L3EARN\_REAL* can also contain cumulative fair value remeasurements since initial recognition of AFS securities. In Section VI, we test the extent to which this affects our inferences.

<sup>10</sup> Ideally, we would have information on unrealized remeasurements in OCI that are not affected by the mechanical accounting effect, but these data are not available during our sample period. Notwithstanding this, in Section VI, we perform additional tests that attempt to isolate the unrealized component of *L3OCI*.

<sup>11</sup> Other Level 3 assets include, for example, interest-only strips, private equity investments, hedged loans, mezzanine lending loans, bank-owned life insurances, and venture capital investments.

<sup>12</sup> We note that the correlation between *L3EARN\_REAL* and *CAR\_4MONTH* is significant only for the Spearman correlations.



**TABLE 1**  
**Descriptive Statistics**

**Panel A: Summary Statistics**

<u>Variable</u>	<u>n</u>	<u>Mean</u>	<u>p5</u>	<u>p25</u>	<u>Median</u>	<u>p75</u>	<u>p95</u>	<u>Std. Dev.</u>
<i>CAR_4MONTH</i>	5,216	0.0022	-0.4272	-0.0819	0.0296	0.1217	0.3286	0.2279
<i>ΔEARN</i>	5,216	0.0021	-0.0814	-0.0034	0.0004	0.0042	0.0837	0.1254
<i>OCI</i>	5,216	0.0010	-0.0353	-0.0056	0.0009	0.0073	0.0371	0.0261
<i>ΔEARNBL3</i>	5,216	0.0010	-0.0909	-0.0044	0.0004	0.0051	0.0913	0.1254
<i>ΔL3FV</i>	5,216	-0.0026	-0.0541	-0.0027	0.0000	0.0011	0.0405	0.0532
<i>L3TRANSFERS</i>	5,216	-0.0024	-0.0285	-0.0011	0.0000	0.0000	0.0177	0.0327
<i>L3TRANSACTIONS</i>	5,216	0.0015	-0.0044	0.0000	0.0000	0.0000	0.0056	0.0202
<i>L3CI</i>	5,216	-0.0011	-0.0210	-0.0007	0.0000	0.0010	0.0147	0.0219
<i>L3EARN</i>	5,216	-0.0019	-0.0138	-0.0003	0.0000	0.0001	0.0061	0.0134
<i>L3EARN_UNR</i>	5,216	-0.0018	-0.0112	-0.0001	0.0000	0.0000	0.0042	0.0114
<i>L3EARN_REAL</i>	5,216	0.0001	-0.0021	0.0000	0.0000	0.0000	0.0035	0.0033
<i>L3OCI</i>	5,216	0.0011	-0.0077	0.0000	0.0000	0.0003	0.0115	0.0146
<i>OCIBL3</i>	5,216	0.0000	-0.0369	-0.0058	0.0007	0.0071	0.0337	0.0263

**Panel B: Quarter Mean Values**

<u>Quarter</u>	<u>n</u>	<u>CAR_4MONTH</u>	<u>L3CI</u>	<u>L3EARN</u>	<u>L3EARN_UNR</u>	<u>L3EARN_REAL</u>	<u>L3OCI</u>
2008Q1	109	-0.2457	-0.0073	-0.0018	-0.0020	0.0001	-0.0047
2008Q2	119	0.1353	-0.0047	-0.0010	-0.0012	0.0000	-0.0027
2008Q3	140	0.1143	-0.0108	-0.0065	-0.0052	-0.0003	-0.0046
2008Q4	165	-0.2893	-0.0166	-0.0082	-0.0068	0.0001	-0.0049
2009Q1	188	-0.0715	-0.0120	-0.0074	-0.0059	-0.0006	-0.0037
2009Q2	194	-0.1525	0.0064	-0.0063	-0.0052	-0.0009	0.0103
2009Q3	188	-0.2209	-0.0031	-0.0074	-0.0063	-0.0001	0.0069
2009Q4	187	0.0807	-0.0027	-0.0045	-0.0041	-0.0003	0.0042
2010Q1	181	0.0218	0.0009	-0.0029	-0.0025	0.0002	0.0046
2010Q2	179	-0.1950	-0.0016	-0.0033	-0.0031	0.0003	0.0010
2010Q3	174	-0.0611	-0.0007	-0.0032	-0.0032	0.0002	0.0032
2010Q4	169	-0.0059	-0.0006	-0.0039	-0.0035	0.0001	0.0037
2011Q1	164	-0.0771	0.0042	0.0002	0.0002	-0.0001	0.0043
2011Q2	161	-0.0560	-0.0012	-0.0007	-0.0012	0.0005	-0.0004
2011Q3	158	-0.0027	-0.0047	-0.0018	-0.0026	0.0008	-0.0020
2011Q4	153	0.0850	0.0004	-0.0007	-0.0017	0.0004	0.0002
2012Q1	135	0.0196	0.0043	0.0002	0.0004	0.0003	0.0028
2012Q2	135	0.0814	0.0011	0.0001	-0.0006	0.0005	-0.0001
2012Q3	135	0.0293	0.0036	0.0005	0.0004	0.0002	0.0024
2012Q4	136	0.1573	0.0012	-0.0007	-0.0006	0.0003	0.0020
2013Q1	134	0.0966	0.0015	0.0002	-0.0001	0.0002	0.0012
2013Q2	132	0.0917	0.0019	0.0000	0.0007	0.0002	0.0016
2013Q3	128	0.1230	0.0018	0.0009	0.0005	0.0003	0.0006
2013Q4	122	0.0491	0.0021	-0.0005	0.0004	0.0000	0.0025
2014Q1	121	0.0330	0.0026	0.0009	0.0004	0.0004	0.0015
2014Q2	115	0.0039	-0.0005	-0.0010	-0.0004	0.0000	0.0005
2014Q3	115	0.0621	0.0005	0.0003	0.0001	0.0003	0.0002
2014Q4	113	0.0603	0.0004	0.0001	-0.0003	0.0004	0.0002
2015Q1	111	0.0794	0.0006	0.0001	0.0000	0.0001	0.0005
2015Q2	107	-0.0025	0.0009	0.0006	0.0006	0.0001	0.0003
2015Q3	104	0.0419	0.0000	-0.0002	-0.0003	0.0001	0.0002
2015Q4	101	-0.0746	-0.0014	-0.0005	-0.0002	0.0001	-0.0007
2016Q1	96	0.1010	-0.0011	-0.0005	-0.0005	0.0000	-0.0006

(continued on next page)

TABLE 1 (continued)

Quarter	n	<u>CAR_4MONTH</u>	<u>L3CI</u>	<u>L3EARN</u>	<u>L3EARN_UNR</u>	<u>L3EARN_REAL</u>	<u>L3OCI</u>
2016Q2	95	0.0728	-0.0009	-0.0010	-0.0010	0.0000	0.0001
2016Q3	96	0.2449	0.0003	0.0001	0.0000	0.0001	0.0002
2016Q4	92	0.0730	0.0015	0.0011	0.0005	0.0006	0.0000
2017Q1	88	0.0040	0.0006	0.0004	0.0003	0.0001	0.0002
2017Q2	89	0.1077	-0.0003	0.0002	0.0002	0.0000	-0.0005
2017Q3	87	0.1010	0.0002	0.0002	0.0001	0.0001	0.0000

## Panel C: Descriptive Statistics on Level 3 Asset Categories

	<u>n</u>	<u>Mean</u>	<u>p5</u>	<u>p25</u>	<u>Median</u>	<u>p75</u>	<u>p95</u>	<u>Std. Dev.</u>
<i>L3TRADING%</i>	5,216	13%	0%	0%	0%	2%	100%	29%
<i>L3AFS%</i>	5,216	69%	0%	20%	100%	100%	100%	42%
<i>L3MSR%</i>	5,216	10%	0%	0%	0%	0%	91%	25%
<i>L3OTHER%</i>	5,216	8%	0%	0%	0%	0%	83%	24%

Panel A (Panel B) reports summary statistics (quarter mean values) for observations with non-zero recurring Level 3 assets. *CAR\_4MONTH* is monthly market-adjusted returns from CRSP cumulated over the window starting the month before the fiscal quarter-end date and ending three months after the fiscal quarter-end date. The market return is the CRSP value-weighted return.  $\Delta EARN$  is the change in earnings from the previous to the current quarter. *OCI* is other comprehensive income.  $\Delta EARN_{BL3}$  is the change in earnings before Level 3 remeasurements in earnings from the previous to the current quarter.  $\Delta L3FV$  is the change in Level 3 fair values from the previous to the current quarter. *L3CI* are Level 3 fair value remeasurements recognized in comprehensive income ( $L3EARN + L3OCI$ ). *L3TRANSFERS* are net transfers into and out of Level 3. *L3TRANSACTIONS* are net Level 3 transactions (e.g., purchases, issuances, or settlements). *L3EARN* are Level 3 fair value remeasurements in earnings. *L3EARN\_UNR* (*L3EARN\_REAL*) are unrealized (realized) Level 3 fair value remeasurements in earnings. *L3OCI* are Level 3 fair value remeasurements in OCI. *OCIBL3* is other comprehensive income before Level 3 remeasurements in OCI ( $OCI - L3OCI$ ). Panel C reports summary statistics for Level 3 asset categories. *L3TRADING%*, *L3AFS%*, *L3MSR%*, and *L3OTHER%* are Level 3 trading, available-for-sale, mortgage servicing rights, and other assets, respectively, as a percentage of recurring Level 3 assets. All continuous variables are winsorized at the 1st and 99th percentiles. All variables are scaled by beginning-of-quarter market value of equity (MVE), except for *CAR\_4MONTH* and the percentage variables in Panel C.

When we include the total change in Level 3 fair values ( $\Delta L3FV$ ) in Table 2, column (2), the coefficient for  $\Delta EARN_{BL3}$  remains significantly positive with a magnitude similar to that for  $\Delta EARN$  in column (1). The coefficient for  $\Delta L3FV$  is significantly positive (coeff. = 0.157, t-stat = 1.80), although both its magnitude and statistical significance are relatively low. This result is likely attributable to the fact that  $\Delta L3FV$  mingles fair value remeasurements with changes due to transfers and transactions.

In Table 2, column (3), we disaggregate changes in Level 3 fair value levels ( $\Delta L3FV$ ) into fair value remeasurements (*L3CI*), transfers (*L3TRANSFERS*), and transactions (*L3TRANSACTIONS*). While the coefficients for Level 3 transfers and transactions are insignificant, the coefficient for *L3CI* of 0.677 is significantly different from zero (t-stat = 2.52), indicating that remeasurements recognized in comprehensive income are incrementally return relevant to other changes recognized in comprehensive income (i.e.,  $\Delta EARN_{BL3}$  and *OCIBL3*). Therefore, consistent with H1, these findings show that Level 3 fair value remeasurements are return relevant. The coefficient for *L3CI* of 0.677 in column (3) is larger in magnitude and statistically more significant than the coefficient for  $\Delta L3FV$  of 0.157 in column (2). In addition, untabulated F-tests show that the coefficient for *L3CI* is significantly different from those for *L3TRANSFERS* and *L3TRANSACTIONS* (p-value = 0.047 and 0.048, respectively). In column (4) of Table 2, we present the results using the cumulative abnormal returns calculated over the fourth and fifth month after the quarter (*CAR\_PLACEBO*). Consistent with our expectations, neither the change in earnings ( $\Delta EARN_{BL3}$ ) nor the Level 3 remeasurements (*L3CI*) are significantly associated with these returns, indicating that the market has already incorporated the relevant information. Taken together, the results from Table 2 show that the disclosures of Level 3 fair value remeasurements, separately from transfers and transactions, are useful to investors.

Table 3 presents the tests relating to H2 and H3. For illustration and comparison, in column (1), we first show that our findings do not change when excluding *L3TRANSFERS* and *L3TRANSACTIONS* from the regression equation: The coefficients for  $\Delta EARN_{BL3}$  of 0.111 (t-stat = 2.44), *OCIBL3* of 0.177 (t-stat = 0.94), and *L3CI* of 0.653 (t-stat = 2.47) in column (1) of Table 3 are very similar to those in column (3) of Table 2.<sup>13</sup>

<sup>13</sup> All our inferences, not just those in column (1), are unaffected by the inclusion or exclusion of *L3TRANSFERS* and *L3TRANSACTIONS*. We do not include these variables in the remaining regressions, as they do not reflect value changes.

**TABLE 2**  
**Regression of Abnormal Market Returns on Level 3 Fair Value Remeasurements**

Variables	Pred.	Dependent Variable			
		<i>CAR_4MONTH</i> (1)	<i>CAR_4MONTH</i> (2)	<i>CAR_4MONTH</i> (3)	<i>CAR_PLACEBO</i> (4)
<i>ΔEARN</i>	+	0.121*** (2.63)			
<i>OCI</i>	+	0.088 (0.48)			
<i>ΔEARNBL3</i>	+		0.104** (2.41)	0.111** (2.44)	0.006 (0.19)
<i>OCIBL3</i>	+		0.104 (0.56)	0.172 (0.93)	−0.079 (−0.53)
<i>ΔL3FV</i>	+		0.157* (1.80)		
<i>L3CI</i>	+			0.677** (2.52)	0.038 (0.26)
<i>L3TRANSFERS</i>	?			0.083 (0.43)	−0.305* (−1.83)
<i>L3TRANSACTIONS</i>	?			0.089 (0.66)	−0.057 (−0.63)
Intercept	?	−0.246*** (−9.78)	−0.248*** (−9.82)	−0.243*** (−9.77)	0.133*** (6.86)
Year-Quarter FE		Yes	Yes	Yes	Yes
R <sup>2</sup>		0.268	0.268	0.271	0.202
Observations		5,216	5,216	5,216	5,194

\*\*\*, \*\*, \* Indicate statistical significance at the 1 percent, 5 percent, and 10 percent levels (two-tailed), respectively.

Table 2 reports OLS coefficient estimates and, in parentheses, t-statistics. All models include year-quarter fixed effects. *CAR\_4MONTH* (*CAR\_PLACEBO*) are monthly market-adjusted returns from CRSP cumulated over the window starting the month before (four months after) the fiscal quarter-end date and ending three (five) months after the fiscal quarter-end date. The market return is the CRSP value-weighted return. Standards errors are clustered by bank. See Table 1 for further variable descriptions.

Distinguishing between remeasurements in earnings (*L3EARN*) and OCI (*L3OCI*) in column (2) of Table 3, we find that the coefficient of 1.101 for *L3EARN* is significantly positive at the 1 percent level (t-stat = 2.65), whereas the coefficient of 0.268 for *L3OCI* is not significant (t-stat = 0.70) and smaller in magnitude. The coefficient for *L3EARN* is significantly higher than that for *L3OCI*, as indicated by the untabulated F-statistic of 3.83 (p-value = 0.05). As both remeasurements in earnings and OCI are disclosed side-by-side in the rollforward table, the difference in return relevance cannot be explained by the different prominence of Level 3 remeasurements in earnings versus OCI. Therefore, these findings not only provide support for H2, but indicate that further disaggregation of Level 3 remeasurements into earnings and OCI provides useful information to investors.

In column (3) of Table 3, we further split *L3EARN* into unrealized (*L3EARN\_UNR*) and realized (*L3EARN\_REAL*) remeasurements in earnings. While the coefficient of 1.078 for *L3EARN\_UNR* is significantly positive (t-stat = 2.00), the coefficient for *L3OCI* of 0.229 is insignificant (t-stat = 0.60) and significantly lower (F-stat = 2.80, p-value = 0.09). This finding provides further support for H2 and suggests that Level 3 fair value remeasurements in OCI are less return relevant than unrealized Level 3 fair value remeasurements in earnings.<sup>14</sup>

The coefficient estimate for realized remeasurements in column (3) of Table 3 (*L3EARN\_REAL*) of 1.281 is similar to that for *L3EARN\_UNR* of 1.078. However, the coefficient for *L3EARN\_REAL* is not statistically significant at conventional levels (t-stat = 1.09), perhaps because of lower statistical power of realized remeasurements, e.g., due to their low frequency, as

<sup>14</sup> Although *L3OCI* can contain a “mechanical” component, which might complicate comparisons between *L3OCI* and *L3EARN\_UNR*, the combination of the findings from column (2) and column (3) of Table 3 increases confidence that H2 is valid. Below, we present additional tests that address this issue.

**TABLE 3**  
**Regression of Abnormal Returns on Components of Level 3 Fair Value Remeasurements**

Variables	Pred.	Dependent Variable			
		<i>CAR_4MONTH</i> (1)	<i>CAR_4MONTH</i> (2)	<i>CAR_4MONTH</i> (3)	<i>CAR_PLACEBO</i> (4)
<i>ΔEARNBL3</i>	+	0.111** (2.44)	0.111** (2.49)	0.108** (2.42)	0.006 (0.19)
<i>OCIBL3</i>	+	0.177 (0.94)	0.080 (0.42)	0.092 (0.48)	-0.048 (-0.31)
<i>L3CI</i>	+	0.653** (2.47)			
<i>L3EARN</i>	+		1.101*** (2.65)		
<i>L3EARN_UNR</i>	+			1.078** (2.00)	0.111 (0.36)
<i>L3EARN_REAL</i>	+			1.281 (1.09)	0.048 (0.08)
<i>L3OCI</i>	+		0.268 (0.70)	0.229 (0.60)	0.205 (0.89)
Intercept	?	-0.243*** (-9.74)	-0.244*** (-9.83)	-0.244*** (-9.84)	0.132*** (6.81)
Year-Quarter FE		Yes	Yes	Yes	Yes
R <sup>2</sup>		0.271	0.271	0.270	0.201
Observations		5,216	5,216	5,216	5,194

\*\*\*, \*\*, \* Indicate statistical significance at the 1 percent, 5 percent, and 10 percent levels (two-tailed), respectively.

Table 3 reports OLS coefficient estimates and, in parentheses, t-statistics. All models include year-quarter fixed effects. *CAR\_4MONTH* (*CAR\_PLACEBO*) are monthly market-adjusted returns from CRSP cumulated over the window starting the month before (four months after) the fiscal quarter-end date and ending three (five) months after the fiscal quarter-end date. The market return is the CRSP value-weighted return. Standard errors are clustered by bank. See Table 1 for further variable descriptions.

indicated by the distribution of *L3EARN\_REAL* in Table 1. Importantly, the coefficients for *L3EARN\_UNR* and *L3EARN\_REAL* are not significantly different from each other (F-stat = 0.03, p-value = 0.87), which does not support H3 or concerns that investors might perceive unrealized Level 3 fair value remeasurements of lesser quality than realized remeasurements. The results in column (4) show that *CAR\_PLACEBO* is not significantly associated with our components of Level 3 remeasurements, increasing confidence in our inferences.<sup>15</sup>

### Short-Window Tests

To provide further evidence that the rollforward disclosures are useful to investors, we examine short-window market reactions. Specifically, we rerun model (4) by using cumulative abnormal returns calculated over three-, five-, and seven-day windows around banks' earnings announcement dates and the release dates of the 10-Q/10-K. As the disaggregated information on Level 3 remeasurements is not yet available at the earnings announcement date, we do not expect a market reaction at that date.<sup>16</sup> In contrast, at the 10-Q/10-K release date, information about Level 3 remeasurements becomes available via the Level 3 rollforward disclosures and, thus, market prices may incorporate this information.

<sup>15</sup> In untabulated analyses, we find that our inferences are robust to the inclusion of additional control variables, namely, changes in the bad debt expense (Badertscher et al. 2014), other non-Level 3 valuation adjustments on financial instruments, and the one-year repricing gap multiplied with the five-year change in treasury rate (Ahmed and Takeda 1995).

<sup>16</sup> To bolster this assertion, we conduct a content analysis of the 8-K filings (items 2.02 and 9.01: press release) at the earnings announcement dates for a subsample of 520 bank-quarters in the bottom and top five percentiles of Level 3 fair value remeasurements in comprehensive income. We find that while almost all banks provide additional earnings guidance in their press releases, none of these 520 observations provide information about Level 3 fair value remeasurements.

**TABLE 4**  
**Regression of Short-Window Abnormal Returns on Level 3 Fair Value Remeasurements**

Variables	Pred.	Earnings Announcement			Pred.	10-Q/10-K Release Date		
		Dependent Variable				Dependent Variable		
		CAR3 (1)	CAR5 (2)	CAR7 (3)		CAR3 (4)	CAR5 (5)	CAR7 (6)
$\Delta EARNBL3$	+	0.066*** (6.90)	0.065*** (5.56)	0.060*** (4.68)	?	0.006 (0.71)	0.011 (1.04)	0.005 (0.38)
$L3EARN\_UNR$	?	0.055 (0.36)	0.266 (1.36)	0.192 (0.93)	+	0.183* (1.94)	0.348*** (2.60)	0.296** (2.16)
$L3EARN\_REAL$	?	0.011 (0.03)	0.206 (0.50)	0.074 (0.18)	+	0.027 (0.12)	-0.051 (-0.16)	-0.031 (-0.08)
$L3OCI$	?	-0.017 (-0.14)	0.132 (0.90)	0.258 (1.56)	+	0.050 (0.63)	0.083 (0.93)	0.167 (1.55)
$OCIBL3$	+	0.088 (1.35)	0.121 (1.32)	0.146 (1.49)	+	0.012 (0.33)	0.005 (0.09)	0.098 (1.49)
Intercept	?	0.002 (0.31)	0.001 (0.13)	0.005 (0.63)	?	-0.009** (-2.12)	-0.017*** (-4.13)	-0.028*** (-5.18)
Year-Quarter FE		Yes	Yes	Yes		Yes	Yes	Yes
R <sup>2</sup>		0.054	0.052	0.054		0.069	0.092	0.098
Observations		4,947	4,947	4,947		4,947	4,947	4,947

\*\*\*, \*\*, \* Indicate statistical significance at the 1 percent, 5 percent, and 10 percent levels (two-tailed), respectively.

Table 4 reports OLS coefficient estimates and, in parentheses, t-statistics. All models include year-quarter fixed effects.  $CAR3$ ,  $CAR5$ , and  $CAR7$  are cumulative abnormal returns calculated over three-, five-, and seven-day windows, respectively, around the earnings announcement and release date of the 10-Q or 10-K. Standard errors are clustered by bank.

See Table 1 for further variable descriptions.

Columns (1)–(3) of Table 4 show positive market reactions to changes in earnings before Level 3 remeasurements ( $\Delta EARNBL3$ ) around the earnings announcement date. However, as expected, the market returns do not reflect Level 3 remeasurements at the earnings announcement date. In contrast, around the 10-Q/10-K release date (columns (4)–(6)), short-window returns are significantly and positively associated with unrealized Level 3 remeasurements in earnings, consistent with disclosures about Level 3 fair value remeasurements being now available. We find no significant association between short-window returns and  $L3EARN\_REAL$  and  $L3OCI$ .<sup>17</sup> Finally, around the 10-K/10-Q release date,  $\Delta EARNBL3$  is no longer significantly associated with cumulative abnormal returns, as the market already incorporated changes in earnings at the earnings announcement date. Taken together, the findings from these short-window tests provide additional evidence that the Level 3 rollforward disclosures are useful to investors.

### Predictive Ability of Level 3 Fair Value Remeasurements

We conduct non-market-based tests to shed further light on the usefulness of Level 3 fair value remeasurements. Specifically, we investigate the ability of Level 3 remeasurements and their components to predict future bank earnings (Dong et al. 2014; Evans et al. 2014; Bratten et al. 2016). This test is also motivated by SFAC No. 8, which states that if information has predictive value, it is decision-useful (FASB 2018b). Although we do not expect fair value remeasurements to predict future fair value remeasurements, as these are inherently unpredictable, they should, in principle, predict future bank earnings (Dong et al. 2014; Evans et al. 2014; Bratten et al. 2016). For example, fair value remeasurements on MSR reflect revisions in the expected revenue stream of servicing fees (Altamuro and Zhang 2013). Furthermore, OTTI on debt instruments reflect reductions in future interest income. Following Bratten et al. (2016), we estimate the following model:

<sup>17</sup> Comparisons of the coefficients reported in Table 4, column (5) show that  $L3EARN\_UNR$  and  $L3EARN\_REAL$  are not significantly different from each other (F-stat = 1.52, p-value = 0.22). In addition, the coefficient for  $L3OCI$  is (marginally) significantly lower than  $L3EARN\_UNR$  (F-stat = 2.55, p-value = 0.11).

**TABLE 5**  
**Predictive Ability of Level 3 Fair Value Remeasurements**

Variables	Prediction	Dependent Variable							
		<i>EARNBT</i> ( <i>t</i> +1) (1)	<i>EARNBT</i> ( <i>t</i> +2) (2)	<i>EARNBT</i> ( <i>t</i> +3) (3)	<i>EARNBT</i> ( <i>t</i> +4) (4)	<i>EARNBT</i> ( <i>t</i> +5) (5)	<i>EARNBT</i> ( <i>t</i> +6) (6)	<i>EARNBT</i> ( <i>t</i> +7) (7)	<i>EARNBT</i> ( <i>t</i> +8) (8)
<i>EARNBTL3</i>	+	0.470*** (16.68)	0.406*** (13.72)	0.376*** (13.46)	0.344*** (12.39)	0.285*** (11.39)	0.254*** (9.62)	0.225*** (8.54)	0.208*** (7.53)
<i>OCIBTL3</i>	+	0.055* (1.90)	0.028 (1.03)	0.039 (1.17)	0.001 (0.02)	0.027 (1.10)	-0.018 (-0.76)	0.038* (1.80)	0.024 (0.87)
<i>L3EARN_UNR</i>	+	0.863*** (4.06)	0.808*** (4.14)	0.751*** (4.32)	0.671*** (3.77)	0.310* (1.77)	0.280* (1.84)	0.281** (1.98)	0.095 (0.75)
<i>L3EARN_REAL</i>	+	0.647** (2.59)	0.512* (1.71)	0.346 (1.31)	0.436* (1.84)	0.168 (0.67)	0.128 (0.45)	0.278 (1.04)	0.218 (0.78)
<i>L3OCI</i>	+	0.067 (0.62)	0.120 (1.05)	0.131 (1.21)	0.122 (0.83)	0.022 (0.19)	0.103 (0.95)	0.075 (0.83)	0.068 (0.67)
<i>SIZE</i>	+	0.011*** (2.76)	0.012*** (2.73)	0.013*** (3.00)	0.015*** (3.30)	0.015*** (3.12)	0.015*** (3.17)	0.015*** (3.18)	0.016*** (3.17)
Intercept	?	-0.002*** (-3.24)	-0.005*** (-5.70)	-0.002*** (-3.31)	-0.003*** (-4.55)	-0.003*** (-4.14)	-0.004*** (-5.08)	-0.001** (-2.03)	-0.001** (-2.00)
Year-Quarter FE		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>		0.370	0.332	0.317	0.300	0.258	0.240	0.204	0.186
Observations		5.078	4.954	4.826	4.698	4.567	4.432	4.297	4.163

\*\*\*, \*\*, \* Indicate statistical significance at the 1 percent, 5 percent, and 10 percent levels (two-tailed), respectively. Table 5 reports OLS coefficient estimates and, in parentheses, t-statistics. The dependent variable *EARNBT* is earnings before taxes and is measured one to eight quarters ahead. The explanatory variables are calculated in quarter *t*. *EARNBTL3* is earnings before taxes and Level 3 gains and losses recognized in earnings. *SIZE* is the natural logarithm of total assets, divided by 100 (for ease of exposition). All variables, except *SIZE*, are scaled by lagged total assets. Standard errors are clustered by bank. See Table 1 for further variable descriptions.

$$EARNBT_{it+k} = \alpha + \beta_1 EARNBTL3_{it} + \beta_2 OCIBTL3_{it} + \beta_3 L3EARN\_UNR_{it} + \beta_4 L3EARN\_REAL_{it} + \beta_5 L3OCI_{it} + \beta_6 SIZE_{it} + Year-Quarter\ FE + \varepsilon_{it} \tag{5}$$

The dependent variable, *EARNBT*, is earnings before taxes. We measure *EARNBT* one to eight quarters ahead. *EARNBTL3* is earnings before taxes and Level 3 remeasurements in earnings. We include the Level 3 remeasurement components, *L3EARN\_UNR*, *L3EARN\_REAL*, and *L3OCI*. Furthermore, we control for other comprehensive income before taxes and Level 3 remeasurements in OCI (*OCIBTL3*), the natural logarithm of total assets (*SIZE*), and year-quarter fixed effects. All variables except for *SIZE* are scaled by lagged total assets and winsorized at the 1st and 99th percentiles. We cluster standard errors by bank.

The results in Table 5 show that unrealized remeasurements in earnings, *L3EARN\_UNR*, are significantly associated with one- to seven-quarter-ahead *EARNBT*. The coefficients range between 0.863 (t-stat = 4.06) in column (1) and 0.280 (t-stat = 1.84) in column (6). Level 3 remeasurements realized through sale, *L3EARN\_REAL*, are significantly associated with one-, two-, and four-quarter-ahead earnings (coeff. = 0.647, t-stat = 2.59; coeff. = 0.512, t-stat = 1.71; and coeff. = 0.436, t-stat = 1.84, respectively). Untabulated coefficient tests do not show statistically significant differences in the predictive ability of unrealized and realized remeasurements in earnings (p-values range from 0.19 in column (3) to 0.99 in column (7)), mitigating concerns that unrealized remeasurements are of lesser quality than realized remeasurements in earnings.

In contrast, in Table 5, *L3OCI* is not significantly associated with future *EARNBT*. The coefficients range between 0.131 (t-stat = 1.21) in column (3) and 0.022 (t-stat = 0.19) in column (5). In addition, the coefficients for *L3OCI* are significantly lower (p-values < 0.01) than those for *L3EARN\_UNR* in models (1) to (4). Therefore, Level 3 remeasurements in OCI have less predictive ability for future earnings than unrealized Level 3 remeasurements in earnings.

**Potential Explanations for Lower Level 3 OCI Relevance**

In this section, we explore several non-mutually exclusive explanations for why Level 3 remeasurements in OCI are less return relevant than those in earnings: the mechanical effect, ability to hold, and regulatory capital explanation.

### **Mechanical Effect**

We gauge the impact of the mechanical effect in OCI by interacting Level 3 remeasurements in OCI with a proxy that identifies situations in which the remeasurements in OCI might contain noise due to recycling. Specifically, we define the conditional variable *Mechanical effect* as an indicator variable that is equal to 1 for bank-quarters with non-zero realized remeasurements on AFS in earnings and non-zero beginning AFS (i.e., our proxy for recycling via sale), as well as for bank-quarters with negative unrealized remeasurements on AFS recognized in earnings (i.e., our proxy for recycling via OTTI), and 0 otherwise.<sup>18</sup> To the extent that *L3OCI* is less return relevant when containing a mechanical component, we expect a negative coefficient on the interaction term  $L3OCI \times \text{Mechanical effect}$ . As the standalone coefficient for *L3OCI* is now by construction not affected by any mechanical effects, it reflects the effect of unrealized remeasurements recognized in OCI during the reporting period.<sup>19</sup> This approach allows us to compare, at least for a sub-sample, unrealized remeasurements in OCI versus unrealized remeasurements in earnings.

Column (1) of Table 6 shows that the coefficient on the interaction term  $L3OCI \times \text{Mechanical effect}$  is not significantly different from zero (coeff. = 0.650, t-stat = 0.88). The standalone coefficient for *L3OCI* is still not significantly correlated with abnormal returns (coeff. = -0.149, t-stat = -0.28). Consistent with our main findings in Table 3, the standalone coefficient for *L3OCI* is significantly lower than that for *L3EARN\_UNR* (F-stat = 3.51, p-value = 0.06). Taken together, these findings do not support the mechanical explanation.

### **Ability to Hold**

To investigate the “ability to hold” explanation, we adapt our main analyses by interacting remeasurements in OCI with a proxy for banks’ ability to hold the underlying assets. We define the conditional variable *Ability to hold* as an indicator variable that is equal to 1 for bank-quarters with an above-median score from a principal component analysis of both cash divided by total assets and Tier 1 capital ratio, and 0 otherwise. To the extent that the market perceives illiquidity-induced value changes as less relevant for banks that have a higher ability to hold, we expect a negative coefficient on the interaction term  $L3OCI \times \text{Ability to hold}$ .

Column (2) of Table 6 shows a significantly negative coefficient on the interaction term of -1.027 (t-stat = -1.85), consistent with a lower return relevance of remeasurements in OCI for banks with a higher ability to hold. In addition, compared to the baseline estimate from Table 3, the standalone coefficient for *L3OCI* of 0.765 is higher in magnitude and significance (t-stat = 1.61) and not significantly different from that for *L3EARN\_UNR* (F-stat = 0.51, p-value = 0.48). These findings suggest that fair value changes recorded in OCI due to illiquidity discounts are less relevant if banks have the ability to hold related assets. However, we note that the findings are relatively sensitive to the variable definition of *Ability to hold* and, thus, should be interpreted with caution.

### **Regulatory Capital**

To test whether the differential regulatory capital treatment of OCI matters for its return relevance, we exploit a proposal by U.S. regulators from June 2012 that would have required all banks with total assets greater than \$500 million to include unrealized fair value remeasurements in OCI in the calculation of regulatory capital (hereafter, AOCI filter removal). Following strong opposition from the banking industry, the final implementation of this regulatory change, issued in July 2013, turned this requirement into an option for most banks, except for very large banks with asset size greater than \$250 billion.

We define a conditional variable, *AOCI proposal*, as an indicator variable that is equal to 1 for the five quarters of the proposed AOCI filter removal (i.e., from Q2 2012 until Q2 2013) for banks with total assets greater than \$500 million, and 0 otherwise. Although the AOCI filter removal was not yet effective during the proposal period, investors might perceive Level 3 fair value remeasurements in OCI to be more relevant, because they anticipate that OCI will be included in the calculation of regulatory capital. Consistent with this argument, [Chircop and Novotny-Farkas \(2016\)](#) find that investors of banks with large accumulated fair value gains and losses in OCI reacted negatively to these regulatory proposals. Therefore, to the extent that investors perceive Level 3 fair value remeasurements in OCI to be more relevant during the proposal period, we expect a positive coefficient on the interaction term  $L3OCI \times \text{AOCI proposal}$ .

<sup>18</sup> Our inferences do not change when we use alternative definitions for *Mechanical effect*. For example, when we define *Mechanical effect* as an indicator variable equal to 1 for bank-quarters in which *L3OCI* is positive, but total remeasurements on AFS securities in earnings are negative, as well as for bank-quarters in which *L3OCI* is negative, but remeasurements on AFS securities recognized in earnings are positive, and 0 otherwise.

<sup>19</sup> The intuition behind this approach can be illustrated by the rollforward disclosure examples in Appendix A. For Commerce Bankshares Inc., the remeasurement of their AFS portfolio (State and Municipal Obligations) of \$3,361 recognized in OCI during Q1 2009 is unrealized, as there is no recycling of OCI into earnings, neither via sale nor via OTTI, in this quarter. In this example, the conditional variable *Mechanical effect* is set to 0.

**TABLE 6**  
**Variation in the Return Relevance of Level 3 Fair Value Remeasurements in OCI**  
**Dependent Variable: CAR\_4MONTH**

Variables	Pred.	Coefficient Estimates (t-stats)				
		Conditional Variable				
		<i>Mechanical effect</i> (1)	<i>Ability to hold</i> (2)	<i>AOCI proposal</i> (3)	<i>Placebo proposal</i> (4)	<i>Final rule</i> (5)
<i>ΔEARNBL3</i>	+	0.112** (2.57)	0.105** (2.30)	0.109** (2.43)	0.110** (2.43)	0.108** (2.42)
<i>L3EARN_UNR</i>	+	1.211** (2.20)	1.161** (2.14)	1.053* (1.95)	1.092** (2.00)	1.077** (2.00)
<i>L3EARN_REAL</i>	+	1.370 (1.17)	1.568 (1.34)	1.363 (1.16)	1.274 (1.08)	1.277 (1.08)
<i>L3OCI</i>	+	-0.149 (-0.28)	0.765 (1.61)	0.130 (0.32)	0.292 (0.70)	0.225 (0.58)
<i>Conditional var</i>	?	0.009 (1.43)	0.016** (2.59)	-0.034 (-0.62)	0.259*** (8.41)	-0.014 (-1.08)
<i>Conditional var × L3OCI</i>	-/+	0.650 (0.88)	-1.027* (-1.85)	1.645** (2.38)	-0.617 (-0.67)	0.172 (0.33)
<i>OCIBL3</i>	+	0.089 (0.46)	0.094 (0.48)	0.103 (0.53)	0.085 (0.45)	0.091 (0.47)
Intercept	?	-0.245*** (-9.72)	-0.253*** (-10.08)	-0.244*** (-9.84)	-0.243*** (-9.84)	-0.244*** (-9.84)
Year-Quarter FE		Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>		0.271	0.276	0.270	0.270	0.270
Observations		5,216	5,021	5,216	5,216	5,216

\*\*\*, \*\*, \* Indicate statistical significance at the 1 percent, 5 percent, and 10 percent levels (two-tailed), respectively.

Table 6 reports OLS coefficient estimates and, in parentheses, t-statistics. In column (1), the conditional variable *Mechanical effect* equals 1 for bank-quarters in which *L3OCI* might contain noise due to recycling, and 0 otherwise. We identify recycling as bank-quarters with non-zero realized remeasurements on AFS in earnings and non-zero beginning AFS (i.e., recycling via sale), as well as bank-quarters with negative unrealized remeasurements on AFS in earnings (i.e., recycling via OTTI). In column (2), the conditional variable *Ability to hold* equals 1 for bank-quarters with an above-median score from a principal component analysis of cash divided by total assets and the Tier 1 capital ratio, and 0 otherwise. In column (3), the conditional variable *AOCI proposal* equals 1 for the five quarters of the proposed AOCI filter removal (i.e., from Q2 2012 until Q2 2013) for banks with total assets greater than \$500 million, and 0 otherwise. In column (4), the conditional variable *Placebo proposal* equals 1 for the five quarters just before the period in which the AOCI filter removal was proposed (i.e., from Q1 2011 until Q1 2012), and 0 otherwise. In column (5), the conditional variable *Final rule* equals 1 for five quarters after the announcement of the final AOCI filter rule for banks with total assets between \$500 and \$250,000 million, and 0 otherwise. All models include year-quarter fixed effects. Standard errors are clustered by bank.

See Table 1 for further variable descriptions.

Column (3) of Table 6 shows a significantly positive coefficient on the interaction term (coeff. = 1.645, t-stat = 2.38), suggesting a higher return relevance of remeasurements in OCI during the proposal period. In addition, untabulated coefficient tests indicate that during the proposal period, the return relevance of remeasurements in OCI is not different from that for unrealized remeasurements in earnings (F-stat = 0.95, p-value = 0.33). To ensure that this finding is indeed attributable to the AOCI filter removal, we define two other conditional variables, *Placebo proposal* and *Final rule*.<sup>20</sup> The insignificant interaction terms in columns (4) and (5) suggest that remeasurements in OCI are not return relevant during the periods just before (*Placebo proposal*) and right after (*Final rule*) the AOCI proposal. Taken together, the findings in columns (3) to (5) indicate that fair value remeasurements are more relevant when they (are expected to) affect regulatory capital.

<sup>20</sup> *Placebo proposal* equals 1 for the five quarters just before the period in which the AOCI filter removal was proposed (i.e., from Q1 2011 until Q1 2012), and 0 otherwise. *Final rule* equals 1 for the five quarters after the announcement of the final AOCI filter rule for banks with total assets between \$500 and \$250,000 million, and 0 otherwise.



**TABLE 7**  
**Regression of Level 3 Fair Value Remeasurements on Changes in Market Observables**

Variables	Dependent Variable							
	L3CI		L3EARN_UNR		L3EARN_REAL		L3OCI	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>ABX_RET</i>	0.012*** (3.37)		0.002 (1.23)		0.001 (1.60)		0.009*** (4.18)	
<i>PRED_ABX_RET</i>		0.044*** (5.36)		0.016*** (4.41)		0.000 (0.28)		0.014*** (3.98)
<i>RES_ABX_RET</i>		0.001 (0.15)		-0.003 (-1.44)		0.001* (1.73)		0.007*** (2.76)
<i>EQUITY_MKT</i>	0.025*** (3.30)	0.023*** (3.04)	0.001 (0.35)	0.000 (0.08)	-0.002*** (-2.80)	-0.002*** (-2.83)	0.026*** (4.55)	0.026*** (4.46)
<i>BOND_LIQ</i>	-0.014*** (-4.03)	-0.006* (-1.90)	-0.004** (-2.31)	-0.001 (-0.33)	-0.000 (-0.42)	-0.000 (-0.52)	-0.007*** (-2.91)	-0.006** (-2.51)
Intercept	0.010*** (3.70)	0.003 (1.29)	0.001 (1.04)	-0.001 (-1.03)	0.000 (0.64)	0.000 (0.71)	0.006*** (3.28)	0.005*** (2.89)
R <sup>2</sup>	0.022	0.030	0.002	0.008	0.001	0.002	0.032	0.032
Observations	5,216	5,216	5,216	5,216	5,216	5,216	5,216	5,216

\*\*\*, \*\*, \* Indicate statistical significance at the 1 percent, 5 percent, and 10 percent levels (two-tailed), respectively.

Table 7 reports OLS coefficient estimates and, in parentheses, t-statistics. *ABX\_RET* is the quarterly return of the ABX.HE index. *RES\_ABX\_RET* is the residual from the regression of the monthly ABX index returns on Case-Shiller Home Price Index returns, returns on a REIT index, and changes in the yield of 30-year U.S. Treasury constant maturities from 2008 until 2017. *PRED\_ABX\_RET* is calculated as *ABX\_RET* - *RES\_ABX\_RET*. *EQUITY\_MKT* is the quarterly change in the S&P 500 composite index. *BOND\_LIQ* is the quarterly trading volume of the bond market scaled by the total trading volume of the bond market in Q4 2007. We collect data for the market indices from Thomson Reuters Datastream. Standard errors are clustered by bank. See Table 1 for further variable descriptions.

## VI. ADDITIONAL ANALYSES

### Association between Level 3 Fair Value Remeasurements and Market Observables

In this section, we examine the extent to which Level 3 fair value remeasurements and the components reflect market observables. The rationale for these tests is to bolster two implicit assumptions that we make in this study, namely, (1) the remeasurement components reflect different sources of value changes, and (2) illiquidity-related changes are reflected in OCI rather than in earnings.

We regress Level 3 remeasurements on different market observables that measure (1) the quarterly change in the Standard & Poor's (S&P) 500 composite index to capture changes in the equity market, (2) the quarterly return of the ABX.HE index to capture changes in the market price of (subprime) mortgage securities (Bhat et al. 2011), and (3) the quarterly trading volume of the bond market scaled by the total trading volume of the bond market in the fourth quarter of 2007 to capture changes in market liquidity (Altamuro and Zhang 2013). In addition, we follow Bhat et al. (2011) and split the quarterly return of the ABX.HE index into a predicted and residual component. This allows us to proxy for changes in fundamental values via the predicted component, while the residual measures the illiquidity component of the ABX.HE index return.

Table 7 shows the regression results and reveals three main insights. First, the relatively low R<sup>2</sup> values (between 0.1 percent and 3.2 percent) are consistent with the intent of ASC 820 to allow banks to deviate from market prices and rely more on their own unobservable inputs for the measurement of Level 3 assets (FASB 2008). Second, the different remeasurement components reflect different market changes. For example, *L3EARN\_REAL* (*L3OCI*) are negatively (positively) associated with changes in the equity market. Third, while *L3EARN\_UNR* is associated with the fundamental ABX component only (column (4)), *L3OCI* is associated with both the residual and fundamental components (column (8)). This finding is consistent with illiquidity discounts being reflected in OCI rather than in earnings. Overall, these findings indicate that the components of Level 3 fair value remeasurements reflect different sources of value changes, making segregated disclosures of the different components useful to investors.

### Level 3 Fair Value Remeasurements and Major Asset Categories/Types

We next examine the extent to which our inferences are affected by differences in asset categories across our remeasurement components. One concern is that investors value remeasurements of different asset categories differently, and that the distribution of these asset categories differs systematically across our remeasurement components.

To address this issue, we first present data on the frequencies of Level 3 remeasurements by major asset categories. We exploit the fact that ASC 820 requires separate rollforward disclosures for each major asset category. For our sample of 219 listed U.S. banks, we are able to classify Level 3 remeasurements into the following four major asset categories: TRADING, AFS, MSR, and OTHER. Panel A of Table 8 presents the frequencies of Level 3 remeasurements across asset categories. Not surprisingly, *L3OCI* stems primarily from the AFS category, with 3,142 non-zero observations. Although realized (unrealized) remeasurements in earnings stem more frequently from TRADING (AFS), with 1,013 (1,428) non-zero observations, the frequencies do not reveal a substantially different pattern across realized and unrealized remeasurements in earnings.

Next, we perform regressions with specific asset category subsamples. In column (1) of Table 8, Panel B, we use a subsample of bank-quarters in which the percentage of Level 3 AFS assets is more than 95 percent of total recurring Level 3 assets.<sup>21</sup> With this subsample, we can mitigate concerns that differences in return relevance between *L3OCI* and *L3EARN\_UNR* are driven by different asset categories. Consistent with our main findings, the return relevance of *L3OCI* is significantly lower than that for *L3EARN\_UNR* (F-stat = 3.28, p-value = 0.07).

A caveat of the previous analysis is that, even within the asset categories, there are different asset types (e.g., debt or equity securities) with possibly different asset qualities. These differences might influence the return relevance of remeasurements in OCI versus earnings. Generally, we do not have more granular data on Level 3 asset types beyond major asset categories for our comprehensive sample. Notwithstanding this, we exploit the fact that one asset type, namely, trust preferred collateralized debt obligations (hereafter, TruPS CDOs), is predominantly classified as AFS and almost exclusively measured using Level 3 inputs (source: own research). In addition, TruPS CDOs held by banks have similar features and are of largely comparable credit quality because of the concentration of the underlying collaterals in a single industry (Cordell, Hopkins, and Huang 2011). We obtain data on the fair value of TruPS CDOs held as AFS from SNL Financial and create a subsample of bank-quarters in which the percentage of TruPS CDO Level 3 AFS assets is more than 95 percent of total recurring Level 3 assets. The focus on this subsample results in a substantially reduced sample size (n = 690), but has the advantage that we can compare remeasurements in OCI versus earnings for a single asset type with a largely comparable credit quality. Results in Table 8, Panel B, column (2) show a significantly higher return relevance for *L3EARN\_UNR* than for *L3OCI* (F-stat = 4.91, p-value = 0.03), mitigating concerns that our main findings are driven by differences in asset type or quality. However, these results might not be generalizable to other Level 3 portfolios with a broader mix of asset types.

To alleviate concerns that the insignificant difference between realized and unrealized remeasurements in earnings (rejection of H3) is driven by different asset categories, we create a subsample that excludes observations for which *L3EARN\_UNR* comes from one category only (e.g., AFS), while the *L3EARN\_REAL* stems from one of the other categories (i.e., HFT, MSR, or OTHER), and *vice versa*. The results in column (3) of Table 8, Panel B show no significant difference between *L3EARN\_UNR* and *L3EARN\_REAL* (p-value = 0.887), consistent with our main findings.

Finally, we address the concern that realized remeasurements in AFS can reflect cumulative fair value remeasurements since initial recognition, while unrealized remeasurements are the gains and losses occurring during the reporting period. Specifically, we exclude observations with non-zero realized remeasurements in AFS to compare realized versus unrealized remeasurements in earnings that occurred during the reporting period. Results in Table 8, Panel B, column (4) do not show significant differences between *L3EARN\_UNR* and *L3EARN\_REAL* (p-value = 0.944). Overall, these analyses mitigate, but cannot entirely rule out, the concern that our main inferences are driven by different asset types across our fair value remeasurement components.

### Time-Series Variation in Return Relevance of Level 3 Remeasurements

In this section, we test whether the market's perception of Level 3 remeasurements vary across different market conditions (Laux and Leuz 2009, 2010; Goh et al. 2015). We introduce different conditional variables that proxy for higher market uncertainty: (1) *ABX\_crunch* equals 1 for periods with below-median ABX returns, and 0 otherwise; (2) *Illiquidity* equals 1 for periods with an above-median Amihud (2002) illiquidity score, and 0 otherwise; and (3) *Crisis* equals 1 for financial crisis periods from Q1 2008 to Q3 2009 (Copeland, Martin, and Walker 2014; Acharya and Mora 2015), and 0 otherwise. We then interact these conditional variables with total Level 3 remeasurements in comprehensive income, as well as with the remeasurement components.

<sup>21</sup> Our inferences are unaffected when using alternative thresholds (i.e., more than 75 percent and 90 percent, as well as equal to 100 percent).

**TABLE 8**  
**Level 3 Fair Value Remeasurements and Major Asset Categories**

**Panel A: Frequencies of Non-Zero Fair Value Remeasurements by Major Asset Categories**

	<u>n</u>	<u>Percent</u>
<i>L3EARN_UNR</i>		
TRADING	1,153	22%
AFS	1,428	27%
MSR	783	15%
OTHER	698	13%
<i>L3EARN_REAL</i>		
TRADING	1,013	19%
AFS	911	17%
MSR	483	9%
OTHER	510	10%
<i>L3OCI</i>		
TRADING	57	1%
AFS	3,142	60%
MSR	0	0%
OTHER	0	0%

**Panel B: Regressions with Specific Asset Category Subsamples**

		<u>Dependent Variable: CAR_4MONTH</u>			
<u>Variables</u>	<u>Pred.</u>	AFS	TruPS CDOs	Asset	Without
		Subsample AFS > 95%	Subsample TruPS CDOs > 95%	Category Mix	Realized AFS
		(1)	(2)	(3)	(4)
<i>ΔEARNBL3</i>	?	0.080 (1.47)	0.131 (1.04)	0.109** (2.45)	0.107** (2.13)
<i>L3EARN_UNR</i>	+	1.160** (2.02)	2.774*** (3.02)	1.116** (2.03)	1.288** (2.29)
<i>L3EARN_REAL</i>	+	-0.279 (-0.12)	-1.572 (-0.25)	1.302 (1.06)	1.370 (1.30)
<i>L3OCI</i>	+	0.113 (0.25)	-0.211 (-0.21)	0.231 (0.61)	-0.016 (-0.04)
<i>OCIBL3</i>	+	0.033 (0.14)	0.385 (1.03)	0.140 (0.72)	0.106 (0.48)
Intercept	?	-0.219*** (-7.33)	-0.173** (-2.51)	-0.244*** (-9.73)	-0.226*** (-8.73)
Year-Quarter FE		Yes	Yes	Yes	Yes
R <sup>2</sup>		0.257	0.325	0.270	0.268
Observations		3,068	690	5,121	4,305

\*\*\*, \*\*, \* Indicate statistical significance at the 1 percent, 5 percent, and 10 percent levels (two-tailed), respectively.

Panel A reports frequencies (and sample percentages) of non-zero fair value remeasurements by major asset categories: TRADING, AFS, MSR, and OTHER. Panel B reports OLS coefficient estimates and, in parentheses, t-statistics. All models include year-quarter fixed effects. In column (1), we use a subsample of bank-quarters in which the percentage of Level 3 AFS assets is more than 95 percent of total recurring Level 3 assets. In column (2), we use a subsample of bank-quarters in which the percentage of trust preferred collateralized debt obligations (TruPS CDOs) Level 3 AFS assets is more than 95 percent of total recurring Level 3 assets. Column (3) excludes observations for which all the unrealized fair value remeasurements in earnings stem from one category (e.g., AFS) only, while the realized fair value remeasurements in earnings stem from one of the other categories (i.e., HFT, MSR, or OTHER), and *vice versa*. In column (4), we exclude observations with non-zero realized AFS fair value remeasurements in earnings. Standard errors are clustered by bank.

Untabulated findings show that, regardless of the conditional variable and the model specification, none of the interaction terms are significantly different from zero, suggesting that the return relevance of Level 3 remeasurements is not sensitive to market conditions. This interpretation is further supported by the estimated coefficients on the standalone variables being very similar to those reported in the main tables. Overall, these additional tests increase confidence in the generalizability of our main inferences.

## VII. CONCLUSIONS

In this study, we provide evidence that, despite their subjective nature, Level 3 fair value remeasurements recognized in comprehensive income are return relevant. We further show that Level 3 remeasurements in OCI are less return relevant than remeasurements in earnings and document the reasons for this finding. Specifically, Level 3 remeasurements in OCI (1) partially reflect illiquidity-induced value changes that are less relevant when banks have the ability to hold the underlying assets, and (2) are excluded from regulatory capital calculations. We fail to find evidence that potential noise due to recycling affects the return relevance of remeasurements in OCI. Importantly, we do not find a differential return relevance of realized versus unrealized remeasurements in earnings, allaying concerns that investors might perceive unrealized fair value remeasurements of lesser quality.

Our findings are subject to the following limitations. First, we document associations between Level 3 remeasurements and market returns and, thus, we cannot directly observe whether and how investors actually “use” the rollforward information. We conduct alternative tests aimed at shedding light on the usefulness of Level 3 remeasurements from different angles: short-window tests around 10-Q/10-K release dates, non-market-based tests on the predictive ability of Level 3 remeasurements, and tests on the extent to which Level 3 remeasurements reflect different market changes. A second caveat is related to data limitations. In particular, we do not have instrument-level reconciliation data and, thus, we cannot entirely rule out that differences in asset types or asset quality underlying the different remeasurement components affect our inferences.

These limitations aside, our findings suggest that Level 3 fair value remeasurements reflect useful information to investors. As such, our findings are relevant for standard setters. First, our evidence supports the FASB’s recent decision to retain the Level 3 rollforward disclosures (FASB 2018a) despite the critique that the benefits of such disclosures do not justify their costs. Second, our findings add to the debate about the distinction between OCI and earnings (Rees and Shane 2012). We show that in a setting where disclosure location and fair value measurement inputs are held constant, Level 3 fair value remeasurements in OCI are less return relevant than those recorded in earnings, and we provide explanations for this finding. Third, our findings suggest that realization is not a necessary condition for the usefulness of Level 3 fair value remeasurements.

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## APPENDIX A

## Examples of Rollforward Disclosures

The figure below is a disclosure example retrieved from FAS 157, ¶35A (now ASC 820):

(\$ in 000s)	Fair Value Measurements Using Significant Unobservable Inputs (Level 3)			
	Residential Mortgage- Backed Securities	Derivatives	Venture Capital Investments	Total
Beginning balance	\$ 80	\$14	\$11	\$105
Total gains or losses (realized/unrealized)				
Included in earnings (or changes in net assets)	—	11	(3)	8
Included in other comprehensive income	(5)	4	—	(1)
Purchases, issuances, and settlements	—	(7)	2	(5)
Transfers in and/or out of Level 3	—	(2)	0	(2)
Ending balance	<u>\$ 75</u>	<u>\$20</u>	<u>\$10</u>	<u>\$105</u>
The amount of total gains or losses for the period included in earnings (or changes in net assets) attributable to the change in unrealized gains or losses relating to assets still held at the reporting date	<u>\$—</u>	<u>\$ 7</u>	<u>\$ 2</u>	<u>\$ 9</u>

This disclosure example illustrates how the rollforward information translates into our (unscaled) variables. Based on this example, the values for our unscaled variables are (\$thousands):

$$L3CI = 7 [8 - 1]$$

$$L3EARN = 8$$

$$L3EARN\_UNR = 9$$

$$L3EARN\_REAL = -1 [8 - 9]$$

$$L3OCI = -1$$

The figure below is a disclosure example of Commerce Bancshares, Inc. (10-Q filing, 2009):

	Fair Value Measurements Using Significant Unobservable Inputs (Level 3)			
	State and Municipal Obligations	Private Equity Investments	Derivatives	Total
<i>(In thousands)</i>				
<b>For the three months ended March 31, 2009:</b>				
Balance at January 1, 2009	\$167,996	\$ 49,494	\$ 64	\$217,554
Total gains or losses (realized /unrealized):				
Included in earnings	—	(1,552)	99	(1,453)
Included in other comprehensive income	3,361	—	—	3,361
Purchases, issuances, and settlements, net	56	342	(105)	293
Balance at March 31, 2009	\$171,413	\$ 48,284	\$ 58	\$219,755
Total gains or losses for the three months included in earnings attributable to the change in unrealized gains or losses relating to assets still held at March 31, 2009	\$ —	\$ (1,552)	\$ 223	\$ (1,329)

This disclosure example illustrates how the rollforward information translates into our (unscaled) variables. Based on this example, the values for our unscaled variables are (in \$thousands):

$$L3CI = 1,908 [-1,453 + 3,361]$$

$$L3EARN = -1,453$$

$$L3EARN\_UNR = -1,329$$

$$L3EARN\_REAL = -124 [-1,453 - (-1,329)]$$

$$L3OCI = 3,361$$

The figure below is a disclosure example of the Capital One Financial Corporation (10-Q filing, 2009):

	Securities Available for Sale	Mortgage Servicing Rights <sup>(1)</sup>	Derivative Receivables <sup>(2)</sup>	Retained Interests in Securizations <sup>(3)</sup>
<b>Balance, January 1, 2009</b>	<b>\$2,380,261</b>	<b>\$150,544</b>	<b>\$ 59,895</b>	<b>\$ 1,470,385</b>
Total realized and unrealized gains (losses):				
Included in earnings	—	2,656	(5,870)	(101,127)
Included in other comprehensive income	(111,472)	—	—	22,898
Purchases, issuances and settlements	61,938	105,463	600,121	793,550
Transfers into Level 3 <sup>(4)</sup>	(19,867)	—	—	—
<b>Balance, March 31, 2009</b>	<b>\$2,310,860</b>	<b>\$258,663</b>	<b>\$ 654,146</b>	<b>\$ 2,185,706</b>
Change in unrealized gains (losses) included in earnings related to financial instruments held at March 31, 2009	\$ —	\$ 2,656	\$ (5,870)	\$ (25,696)

This disclosure example illustrates how this information was translated into our (unscaled) variables. Based on this example, the values for our unscaled variables are (in \$thousands):

$$L3CI = -192,915 [2,656 - 5,870 - 101,127 - 111,472 + 22,898]$$

$$L3EARN = -104,341 [2,656 - 5,870 - 101,127]$$

$$L3EARN\_UNR = -29,910 [2,656 - 5,870 - 25,696]$$

$$L3EARN\_REAL = -74,431 [-104,341 - (-29,910)]$$

$$L3OCI = -88,574 [-111,472 + 22,898]$$



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