Big Bath Accounting using Fair Value Measurement Discretion during the Financial Crisis

PETER FIECHTER and CONRAD MEYER

Graduate School of Business, University of Zurich

ABSTRACT The measurement of fair values, in particular the valuation of Level 3 positions, is complex and figures are difficult to verify. Due to the financial crisis, markets for certain financial instruments have become illiquid, and as a result, fair values are even less reliable than usual. At the same time, banks have recognized substantial losses on financial instruments at fair value. This paper therefore examines whether the discretion in fair value measurement is used for the purpose of *big bath accounting* during the financial crisis. We construct a sample of 552 U.S. bank holding companies and hand-collect data on unrealized Level 3 gains or losses for the time period from Q1 2008 to Q1 2009. Using a similar research design to Beatty et al. (2002), we find evidence that banks exhibiting poor pre-managed performance levels report significant higher discretionary Level 3 losses. Furthermore, these banks are more likely to switch in the subsequent quarter from non-managed negative earnings to reported positive earnings, which is consistent with the big bath hypothesis. The results contribute to the recent debate surrounding fair value accounting. They indicate that fair value measurement is used to manage earnings, despite extensive disclosure requirements, and confirm concerns with respect to the reliability of fair values in non-active markets.

Key Words: Fair Value Measurement, Earnings Management, Big Bath Accounting, FAS 157, Level 3

JEL Classifications: G21, M41

1. Introduction

In the absence of quoted market prices in active markets, fair value measurement can be very complex, based on subjective assumptions, and thus, may be subject to manipulation (e.g., Ryan, 2008; Dechow et al., 2009). The international standard setters acknowledge this problem. While the International Accounting Standards Board (IASB) is currently working on a new accounting standard, the Financial Accounting Standards Board (FASB) published *FAS 157 – Fair Value Measurement* which became effective for annual periods beginning on or after 15 November 2007, while earlier application was encouraged.

During the year 2008, the U.S. subprime problem became a global financial crisis, and many financial institutions were affected severely by market deterioration, which resulted in the recognition of large losses. Preparers of financial statements experienced serious problems in measuring some of their financial assets and liabilities as financial markets became illiquid (e.g., IASB Expert Advisory Panel, 2008; Basel Committee on Banking Supervision, 2008). Investors, analysts, and regulators therefore faced great uncertainty concerning the losses recognized by financial institutions in 2008. In 2009, signs of a global recovery have appeared, induced to some extent by banks reporting positive earnings rather than losses for the first time since 2007. The question arises as to whether banks intentionally overstated the losses they recognized in 2008, in order to be in a position to present positive earnings in subsequent quarters. This practice is known as *big bath accounting*.

To address this concern, we hand-collect data on unrealized Level 3 gains or losses relating to recurring and non-recurring positions measured at fair value. The data are obtained from the 10-Q and 10-K reports of U.S. banks, beginning with Q1 2008 and ending with Q1 2009. We then estimate the discretionary components of these gains or losses using a similar model to Beatty et al. (2002) and examine whether the discretionary Level 3 gains or losses are associated with big bath behavior, controlling for differences in size, leverage, Level 3 positions, and crisis exposure. We find evidence that banks with a poor pre-managed performance (i.e., the net income before discretionary Level 3 gains or losses is below the 10th percentile of the sample) report significant higher discretionary Level 3 losses than the control group. Furthermore, we demonstrate

that these banks are more likely to switch in the subsequent quarter from non-managed negative earnings to reported positive earnings.

The empirical results indicate the existence of big bath behavior during the financial crisis. They contribute to the recent debate regarding the use of fair values in financial reporting and add to the existing literature on earnings management. According to our findings, gains or losses relating to Level 3 positions and, in particular positive earnings posted for 2009 by banks that performed poorly during the crisis, should be interpreted with caution. Hence, our findings should be of interest to analysts, investors, and regulators.

The results are subject to several caveats. First, it is difficult to detect and measure earnings management (Dechow et al., 1995). However, we address this issue by running several modifications of the model and we obtain consistent results across different model specifications. Second, we acknowledge that there are other tools for earnings management in addition to Level 3 fair value *measurement* discretion, e.g., discretionary loan loss provisions (Ahmed et al., 1999), timing of investment security gains (Scholes et al., 1990), and asset securitization gains (Dechow et al., 2009). However, given the controversial and intense debate surrounding fair value measurement during the financial crisis, our focus on this particular earnings management tool to the exclusion of others is intentional.[1]

The paper is organized as follows. Section 2 provides a brief overview of existing literature in the area of fair value accounting and earnings management, followed by the development of the research hypotheses. Section 3 describes the design of the research, while section 4 describes the sample and provides descriptive statistics. The results of the empirical tests are presented in section 5, and conclusions appear in section 6.

2. Literature Review and Development of Hypotheses

2.1 Fair Value Accounting and Earnings Management

Earnings management is a major issue in accounting research and there is a substantial

[1] Fair value measurement discretion on level 2 positions is also excluded, given the lack of data resulting from the absence of disclosure requirements regarding unrealized gains or losses on level 2 positions in FAS 157.

amount of literature on this topic.[2] First, it is important to understand the incentives for engaging in earnings management. According to Kahneman and Tversky's prospect theory (1979), individuals choose among risky alternatives depending on their reference point. Since the value curve is typically convex for losses and concave for gains, different choices result from differences in reference points. Therefore, accounting strategies like earnings smoothing, target accounting, and big bath accounting may play an important role for managers (see Figure 1).

[Figure 1 here]

Second, extant literature distinguishes between real earnings management (e.g., Bartov, 1993; Black et al., 1998) and earnings management using accounting discretion (Levitt, 1998; Cohen et al., 2008). In this study, we focus on big bath accounting using accounting discretion. As per definition, the *true and fair view* required by the international standard setters FASB and IASB does not permit any earnings management strategies. However, there are certain balance sheet items for which recognition or measurement (or both) is based on significant assumptions by the management and their judgment. These items provide opportunities to engage in earnings management, since they are difficult for external auditors to verify.

In the field of bank accounting, earlier literature focuses on loan loss provisions (Beaver and Engel, 1996; Ahmed et al., 1999; and Beatty et al., 2002) and the realization of gains from security transactions (Scholes et al., 1990; Beatty et al., 2002; Dong and Zhang, 2009) as instruments for earnings management. Recent bank-related studies also address the discretion afforded by fair value gains or losses from asset securitization (Dechow et al., 2009; Dechow and Shakespeare, 2009) or discretion in the classification and hence the measurement of financial instruments (Huizinga and Laeven, 2009). Finally, Song (2008) finds that the transitional provisions with respect to the application of the fair value option (in accordance with FAS 159) are used to remove accumulated losses on investment securities. In addition, Song (2008) finds that banks report earnings higher than target by managing them with the fair value option.

[2] See Healy and Wahlen (1999) for an overview of the literature on earnings management.

The objective of this paper is to provide additional evidence to the existing literature on earnings management, with the focus on an interesting and recent time period (the era of the global financial crisis), a currently controversial industry (the banking sector), and a new earnings management tool (fair value measurement of Level 3 positions).

2.2 Hypotheses

The valuation of Level 3 positions is based on models with unobservable market inputs. The resulting fair values are therefore subjective and difficult, if not impossible, for outsiders to verify (Ryan, 2008). An opportunistic management could use this leeway to engage in earnings management. In addition, the year 2008 represents a prime environment for big bath accounting. Investors and analysts already expected large deficits, as many banks had recognized losses, so the cost of managing earnings (Burgstahler and Dichev, 1997: 108) was relatively small. However, since FAS 157 requires detailed disclosure concerning Level 3 positions, and in particular requires Level 3 positions to be reconciled showing unrealized Level 3 gains or losses separately, the opportunities for manipulation ought to be reduced. In addition, investors demonstrated a particular interest in Level 3 positions during the financial crisis (e.g., Kolev, 2008; Song et al., 2008; Goh et al., 2009) We, nevertheless, hypothesize that Level 3 financial instruments represent a possible tool for big bath accounting during the financial crisis.

Previous literature shows that incentives for big bath behavior are particularly high for firms with *poor* pre-managed performance (e.g., Moehrle, 2002; Riedl, 2004; and Christensen et al., 2008). In this specific situation, a firm may recognize a larger-than-necessary loss in order to "save for a better tomorrow" (Degeorge et al., 1999), since the probability of meeting any financial goals in the current period is low. We therefore examine whether banks with poor pre-managed[3] performance recognize discretionary losses on Level 3 positions.

H1: Banks facing poor pre-managed earnings recognize discretionary unrealized losses on Level 3 positions in the quarter *t*.

[3] For the purpose of this paper, pre-managed performance is defined as the net income excluding discretionary Level 3 gains or losses (see Section 3 for the definition and calculation of the variables).

Once the discretionary loss on Level 3 positions is recognized, it becomes an effective tool to boost earnings in subsequent quarters. Management can release the established reserve to switch a negative non-managed[4] net income into a profit, for example, by estimating a higher fair value in the subsequent quarter. We state this hypothesis as follows:

H2: Banks reporting poor pre-managed earnings in quarter *t* use the discretionary unrealized losses on Level 3 positions to *switch* from non-managed negative earnings to reported positive earnings in the quarter *t+1*.

3. Research Design

FAS 157 defines *unrealized* gains or losses included in earnings as gains or losses relating to assets or liabilities still held at the reporting date (FAS 157, paragraph 32). According to this definition, *realized* gains or losses may only occur when assets are sold or liabilities settled. Realized gains or losses are expected to offer less room for manipulation than unrealized gains or losses, since an external party is involved when selling the asset or transferring the liability.[5] Positions measured at fair value on a *non-recurring* basis (e.g., impaired loans accounted for under FAS 114, other real estate owned, loans held for sale, and goodwill) are rarely marked-to-market but may be significant for the financial statements. Therefore, fair value adjustments on non-recurring items may also be used as a tool for big bath accounting. We define our dependent variable L3INC as the sum of net unrealized gains or losses on recurring Level 3 positions plus non-recurring gains or losses.[6]

We use the following regression model to estimate the nondiscretionary Level 3 gains or losses:

---

[4] In the subsequent quarter t+1, we use the term *non*-managed instead of *pre*-managed to distinguish between different time periods and calculations although both expressions represent an income measure excluding any effects of discretionary Level 3 gains or losses (see Section 3 for the definition and calculation of the variables).

[5] Gains or losses recognized in other comprehensive income (e.g., gains or losses on available-for-sale assets) are also considered to be unrealized but are to be presented in a separate line (FAS 157, paragraph A35), since they do not affect net income. Thus, gains or losses recognized in other comprehensive income are excluded from our tests.

[6] We do not distinguish between realized and unrealized gains or losses on non-recurring items at fair value, since FAS 157 does not require such disclosures (FAS 157, paragraph 33).

$$L3INC_{it} = \beta_0 + \beta_1 L3POS_{it-1} + \beta_2 MTB_{it-1} + \beta_3 SIZE_{it-1} + \beta_4 LEV_{it-1} + \beta_5 PREL3LLP_{it} + \beta_6 PREL3NII_{it} + \beta_7 QUARTER_t + \beta_8 SUBIND_i + \varepsilon_{it}$$

where:

L3INC = net unrealized gains or losses on recurring Level 3 positions plus non-recurring Level 3 gains or losses as a percentage of the beginning book value of equity;

L3POS = net Level 3 assets at the beginning of the quarter as a percentage of the beginning book value of equity;

MTB = market to book ratio at the beginning of the quarter;

SIZE = relative rank of total assets at the beginning of the quarter;

LEV = debt to assets ratio (leverage) at the beginning of the quarter;

PREL3LLP = loan loss provisions before gains or losses on Level 3 positions as a percentage of the beginning book value of equity;

PREL3NII = non-interest income before gains or losses on Level 3 positions as a percentage of the beginning book value of equity;

QUARTER = quarter index for each quarter from Q2 2008 to Q1 2009 inclusive;

SUBIND = sub-industry dummy variable; and

ε = discretionary Level 3 gains or losses (DISCL3).

If a bank's balance sheet contains relatively large net Level 3 positions, the recognition of losses rather than gains on these positions is more likely in times of serious market deterioration. Therefore, we predict L3INC to be negatively correlated with L3POS. Since we expect banks with a high risk profile and large subprime exposure to recognize

Level 3 losses rather than gains, we include the ex ante market to book ratio (MTB) as a proxy for investors' future risk perception. A low MTB in the quarter before the recognition of any Level 3 gains or losses indicates that investors already anticipated future losses from this bank. On the other hand, a high MTB is a signal that less trouble was associated with the bank. Therefore, we predict that the coefficient of MTB will be positive. We do not expect Level 3 gains or losses to be independent of *other* gains or losses. We use loan loss provisions as well as non-interest income as proxies for other gains or losses and calculate the variables PREL3LLP and PREL3NII before L3INC, since gains or losses on Level 3 positions may already be included in one of these positions in the income statement. We do not predict the sign of the coefficients of PREL3LLP and PREL3NII. On the one hand, *other* gains or losses should be aligned with Level 3 gains or losses, e.g., a troubled bank recognizes large loan loss provisions as well as substantial losses on Level 3 positions. On the other hand, a bank with loan loss provisions that are already high may have less need for allowances on its Level 3 positions. We control for differences in bank size by using the rank of total assets as a proxy for bank size, where the largest bank's value amounts to 1 and the smallest value amounts to 1 divided by the sample size.[7] We do not make any predictions about the sign of the coefficient. We control for different financing structures using the debt to asset ratio as a proxy for the bank's financial leverage, and predict a negative correlation with L3INC, since higher risk in combination with market deterioration should result in higher losses. We include several sub-industry dummies (i.e., savings and loans, regional operating, investment, and money center banks) to control for the bank's operational characteristics, which may influence the size of recognized gains or losses on Level 3 positions.[8] We do not make any predictions about the coefficients of the sub-industry dummies. To control for differences across time periods (Wooldridge, 2009), we include quarter dummies for all but the base quarter, Q1 2008.

We pool data across bank quarters to estimate the model using clustered and hete-

[7] The results do not change considerably when using the natural logarithm of total assets, which is commonly used as proxy for size in empirical research (e.g., Beatty et al. 2002).

[8] For example, Elliot et al (1991) find significant differences in size, loan loss reserves, loan loss provisions, exposure to lesser developed countries and capital adequacy ratios between money center banks and other banks. Scholes et al. (1990) and Beatty et al. (1995) also include a dummy variable for money center banks in their empirical analyses.

roskedasticity-robust standard errors as suggested by Rogers (1993). We then use the residuals of the estimated model as the proxies for discretionary Level 3 gains or losses (DISCL3). In order to obtain the *pre-managed* gains or losses, we subtract the discretionary Level 3 gains or losses from the reported net income (NI), which is also expressed as a percentage of the beginning book value of equity.

To test hypothesis H1, we define poor performers as banks whose pre-managed NI is below the 10th percentile of the sample distribution. For sensitivity reasons, we also use the 5th and 25th percentiles as thresholds for poor performance. We then compare DISCL3 between the poor performers and the control banks.

Next, we test whether these poor performers are more likely to switch from negative to positive earnings. Since banks may release their reserves (i.e., discretionary Level 3 losses) in the subsequent quarter, the non-managed income in *t+1* is calculated as the NI in *t+1 plus* DISCL3 from quarter *t*.[9] We therefore obtain the performance as if there had not been a big bath in the quarter *t*. Similar to Dechow and Shakespeare (2009), we compare this non-managed NI with the reported NI and define four threshold categories:

STAYNEG	=	non-managed and reported NI are both negative;
SWITCHNEG	=	non-managed income is positive but reported NI is negative;
SWITCHPOS	=	non-managed income is negative but reported NI is positive; and
STAYPOS	=	non-managed and reported NI are both positive.

Hypothesis H2 is then tested by comparing these four categories across different performance levels in the quarter *t*, i.e., poor performers vs. the control group, with a particular interest in SWITCHPOS.

4. Sample Description

We construct a basic sample using the database *Reuters Knowledge*. The basic sample contains 838 bank holding companies that apply FAS 157. Due to lack of data availability and since publicly held banks are expected to have more incentives for earnings

[9] The most recent observation of NI_{t+1} is the net income of the second quarter 2009.

management than privately held banks (Beatty et al. 2002), we exclude 262 non-listed banks. To mitigate noise from different regulation systems, 24 non-U.S. banks are also excluded from the sample, though they do apply FAS 157.

We gather data by hand on unrealized Level 3 gains or losses on recurring and non-recurring positions measured at fair value from the 10-Q and 10-K reports, beginning with Q1 2008 and ending with Q1 2009, which results in a sample of 2,760 bank-quarter observations (552 banks $\times$ 5 quarters). We obtain the respective data based on the disclosure requirements of FAS 157, paragraphs 32-33. We exclude: 203 quarterly observations due to missing fair value data of banks with annual reporting periods ending in March, June, and September; 107 observations where data for at least one of the explanatory regression variables is not available in Reuters Knowledge; and four observations with negative book values of equity. The final sample contains 2,446 bank-quarter observations during the time period from Q1 2008 until Q1 2009 inclusive.

[**Table 1 here**]

Table 1 provides descriptive statistics for the regression variables. Not surprisingly, the mean of L3INC is negative. Thus, on average, banks reported unrealized losses rather than gains on Level 3 positions. However, a few banks report net Level 3 gains despite the financial crisis. The median of L3INC is zero, indicating that half of the sample banks do not exhibit any Level 3 gains or losses. The mean of L3POS is 0.175 suggesting that the average sample bank contains 17.5 percent net Level 3 assets in relation to beginning of the year equity. The net Level 3 positions of some banks exceed their equity by a factor of nine (see maximum of L3POS) while other banks exhibit higher Level 3 liabilities than assets, which results in negative values of L3POS. The values of MTB also vary widely from 0.091 to 8.965 although the mean and median of MTB are close to one. Finally, the descriptive statistics document that the sample consists primarily (i.e., 73 percent) of regionally operating banks (REGIONAL).

5. Empirical Results

5.1 Estimation of Nondiscretionary Level 3 Income

Table 2 reports the results of the OLS regression estimates of nondiscretionary Level 3 gains or losses. The model has an R^2 of 45 percent.[10] Thus, the model explains nearly half of the variation in Level 3 gains or losses, suggesting that the error term is likely to capture the *discretionary* component.

[Table 2 here]

As expected, banks with a large net Level 3 balance sheet exposure tend to report losses on these positions. The significant negative coefficients of SIZE and LEV indicate that larger banks as well as the more leveraged banks report losses rather than gains on Level 3 positions. The coefficient of MTB is positive and highly significant, suggesting that the stock market anticipates gains or losses on Level 3 positions. The significant negative coefficients of PREL3LLP and PREL3NII, respectively document a substitution effect between Level 3 and other income. The coefficient of Q408 is higher in both magnitude and significance than the coefficients of the other quarter dummies, indicating that the majority of losses were recognized in the fourth quarter of 2008. The estimated residuals from the regression serve as proxies for discretionary Level 3 gains or losses (DISCL3). To obtain the pre-managed performance, we subtract DISCL3 from NI.

5.2 Discretionary Level 3 Income and Pre-Managed Performance

Table 3 reports discretionary Level 3 gains or losses for bank-quarters with different levels of pre-managed performance (i.e., 5th, 10th, and 25th percentile).[11]

[Table 3 here]

The mean (median) DISCL3 of banks that exhibit the worst pre-managed perfor-

[10] Since the extant literature on earnings management in the field of bank accounting often uses loan loss provisions as the dependent variable (e.g., Beaver and Engel 1996; Ahmed et al. 1999; and Beatty et al. 2002), comparisons of R^2 do not appear adequate. The R^2 of our model, however, is higher than those of the aforementioned research.

[11] Note that the sample is reduced by ten bank-quarters in relation to the regression analysis in section 5.1 due to missing NI data in Reuters Knowledge.

mance (i.e., below 5th percentile) is –0.0484 (–0.0369) whereas the mean (median) of the control banks is 0.0026 (0.0056). The significant difference of –0.0510 (–0.0425) between the two groups is consistent with hypothesis H1, i.e., banks with a poor pre-managed performance increase their losses further by recognizing discretionary Level 3 losses. The use of different pre-managed performance thresholds (i.e., 10th and 25th percentiles) yields similar results, although the differences between the groups become smaller and are insignificant for the median of the 25th percentile. However, since big bath accounting is typically observed in extreme economic situations, we are confirmed rather than concerned by this result.[12]

5.3 Release of Discretionary Level 3 Income

Table 4 presents the number of bank-quarters separated by (a) the performance groups and (b) the four threshold categories in the subsequent quarter *t+1*. The majority of banks (1486) are classified as STAYPOS, i.e., both the non-managed and the reported NI are positive.

[Table 4 here]

Only 54 bank quarters that were below the 10th percentile in quarter *t*, exhibit a positive non-managed and reported NI in *t+1*. Of 141 bank quarters classified as SWITCHPOS, 27 were poor performers in the quarter t. In addition, we can see that there are more banks switching to positive earnings (156) than banks switching to negative earnings (96), which is consistent with previous literature (e.g., Burgstahler and Dichev, 1997; Degeorge et al., 1999; and Beatty et al. 2002). The chi-square tests in Table 4 indicate a significant difference between the performance group in quarter *t* and the classification in quarter *t+1*. However, to test hypothesis H2, we focus on those banks that switch from non-managed negative to reported positive earnings and, conduct a chi-square test on the relationship between SWITCHPOS and the respective performance level.

[Table 5 here]

[12] Consistent with this, we do not observe any differences in DISCL3 between banks below the 50th percentile and the control group (not reported).

Table 5 shows that 27 out of 238 (11.3 percent) poor performers switch signs in *t+1* whereas only 129 out of 2,166 control banks (5.9 percent) switch. The p-value of the chi-square test is lower than one percent indicating a significant difference in proportion between the two groups. Thus, banks that performed poorly in quarter *t* are more likely to switch in quarter *t+1* than other banks. This result is consistent with hypothesis H2. The same results appear for those banks that performed worst in the quarter *t* (i.e. below the 5th percentile). While 24 out of 121 (19.8 percent) poor performers switch signs in *t+1*, only 132 out of 2,283 (5.8 percent) control banks switch. The chi-square test results are even stronger. However, the results do not hold for those banks within the 25th percentile. Only 42 out of 595 (7.1 percent) switch signs in *t+1* whereas 114 out of 1,809 (6.3 percent) control banks switch. The difference is not significant (p-value = 0.516). Again, the big bath hypothesis is not rejected, since big bath behavior is only expected in the lowest performing percentiles.

5.4 Sensitivity Analyses

Our tests could be biased when measurement error in discretionary Level 3 income (DISCL3) is correlated with the pre-managed performance levels or threshold categories. Note that these classifications were determined using the estimated discretionary Level 3 gains or losses. However, the rather high R^2 in our model suggests the measurement error in DISCL3 to be small. Nevertheless, we address this concern by running several sensitivity checks in the next section.

5.4.1 CEO change

Previous literature finds a strong link between a change in senior management and big bath accounting (e.g., Moore, 1973; Pourciau, 1993; Geiger and North, 2006). The new management cleans the books in order to be able to present positive earnings in future periods. To control for this particular behavior, we define the binary variable CEO that takes the value of one if the CEO has been replaced in the current or previous quarter; otherwise the CEO variable takes the value of zero. We collect the relevant information

using the *ExecuComp* database and include the CEO variable in the regression model of Level 3 income.

The R^2 of 45.3 percent is similar to the R^2 of the regression model in section 5.1. The coefficient of CEO is negative (–0.027) with a p-value of six percent. Thus, a CEO change in the preceding or actual quarter leads on average to three percent lower Level 3 income scaled by equity. We then calculate the residuals of the estimated model including CEO as an explanatory variable and perform identical tests to those in section 5.2 and 5.3, respectively. The results (not reported) are consistent with the main results or even stronger, and hence, indicate that fair value measurement discretion is used for big bath accounting even after controlling for changes in senior management.

5.4.2 Scaling of Level 3 Income

So far, we have scaled Level 3 income by lagged equity, since equity is considered to be a meaningful measure of capital (Dechow et al., 2009: 18). However, other research in the field of bank accounting scales the dependent variable by lagged total assets (e.g., Beatty et al., 2002). For sensitivity considerations, we now scale the relevant variables (i.e., L3INC, L3POS, PREL3LLP, PREL3NII, and NI) by lagged total assets instead of lagged equity.

The R^2 of the regression increases to 51.9 percent while the coefficients and significance levels of the model parameters remain constant. Again, the results (not reported) with respect to hypothesis H1 are consistent with those of the main analysis. However, the results for hypothesis H2 are weaker. While the chi-squared test indicates a significant relationship between the worst performers in quarter *t* (i.e., below the 5th percentile) and SWITCHPOS, the association between banks below the 10th percentile and SWITCHPOS is only of weak significance (Pearson chi-squared = 2.509; p-value = 0.113).

5.4.3 Capital Requirements

Since banks are subject to minimum capital requirements, i.e., four percent for the Tier 1 capital ratio and eight percent for the Tier 2 capital ratio (Basel Committee on Banking Supervision, 2006), we also control for possible effects of ex ante capital on big bath behavior.

From the descriptive statistics (not reported), we identify three banks whose Tier 2 capital ratio at the beginning of the quarter is below the minimum requirement of eight percent.[13] The mean discretionary Level 3 income of these banks (−0.095) is lower than the mean discretionary Level 3 income of the banks with an adequate capital basis (0.001). The difference is significant at the one percent level (t-statistics = 5.947). This result indicates that banks with an insufficient capital adequacy further lower their ratio by recognizing larger-than-necessary losses on Level 3 positions. However, this result should be interpreted with caution, since only three banks exhibit this kind of behavior.

If a bank is close to fall below the capital thresholds, there are less incentives for big bath accounting. We therefore test whether banks whose capital ratio is close to the minimum requirement recognize larger-than-necessary losses on Level 3 positions. We define the variable CLOSE that takes the value of one if the Tier 2 ratio at the beginning of the quarter lies between eight and eleven percent. We choose 11 percent as the upper boundary, as this is the 25th percentile of the Tier 2 ratio's distribution. For the group that is close to the threshold, the mean value of DISCL3 is −0.0006 whereas the mean of the control group excluding the three banks whose ratio is below the threshold is 0.0009. The difference between the two groups is not significant (p-value = 0.275) and suggests that larger-than-necessary losses on Level 3 positions are not associated with ex ante capital ratios.[14]

As the capital ratio at the beginning of the period may be a noisy proxy for the ex ante capital (e.g., corporate actions that influence the capital base during the quarter), we calculate a *pre-managed* Tier 2 ratio. We multiply Tier 2 ratios by the risk-weighted assets (RWA) in the quarter *t* to obtain the Tier 2 capital. We then subtract the non-scaled DISCL3 from the Tier 2 capital as well as from RWA, since discretionary Level 3 income influences both capital and risk-weighted assets. We standardize the adjusted capital with the adjusted RWA to obtain the pre-managed Tier 2 ratio. Due to lack of data availability with respect to RWA, the sample is considerably reduced to 383 bank-quarter observations. The mean (13.71 percent) as well as the median (12.62 percent) of

[13] As only one bank's Tier 1 ratio is below the threshold of four percent, we do not perform any further tests.

[14] With respect to the Tier 1 ratio, hardly no bank is *close* to the minimum requirement (5th percentile = 9.26 percent). Therefore, we do not further analyze Tier 1 ratios.

the pre-managed Tier 2 ratio are significantly lower (t-statistics = −3.953; z-statistics = −7.935) than the mean (13.97 percent) and median (12.97 percent) of the reported Tier 2 ratio. Using a t-test with paired data (Wilcoxon signed rank test), we find that the mean (median) of the pre-managed Tier 2 ratio is significantly higher than the reported Tier 2 ratio for *big bath banks*[15] whereas the pre-managed Tier 2 ratio is significantly lower than the reported Tier 2 ratio for the control group. The results indicate that the recognition of larger-than necessary losses lowers the capital ratios of banks. However, the pre-managed Tier 2 ratios of the big bath banks are not close to the minimum threshold of eight percent and none of these banks switches from an above minimum pre-managed ratio to a below minimum reported ratio. Hence, the recognition of discretionary Level 3 losses does not induce material deteriorations in regulatory capital. Taken together, the results indicate that big bath behavior is driven by the specific earnings situation rather than the ex ante capital base of a bank.

6. Conclusions

This paper investigates whether discretion in fair value measurement is used for big bath accounting during the financial crisis. We find empirical evidence that banks with a poor pre-managed performance report significant higher discretionary Level 3 losses than the control group. In addition, these banks are more likely to switch in the subsequent quarter from non-managed negative earnings to reported positive earnings, which is consistent with the big bath hypothesis. Note that big bath accounting occurs only among the worst performers (i.e., those in the 5th and 10th percentiles) while banks in the 25th percentile do not exhibit the same pattern of behavior, even though they are weak performers.

However, there are some limitations to our results. First, it is difficult to measure earnings management. Our results could be biased when measurement error in discretionary Level 3 gains or losses (DISCL3) is correlated with the pre-managed performance levels or threshold categories, although the rather high R^2 suggests the measure-

[15] We define a binary variable BATH that takes the value of one if a bank is defined as a poor performer (i.e., the net income before discretionary Level 3 gains or losses is below the 10th percentile of the sample) in the quarter t and if the bank recognizes negative discretionary Level 3 income; otherwise zero.

ment error in DISCL3 is small. We attempt to address this concern by running several sensitivity analyses and obtain consistent results across different model specifications. Second, we focus only on fair value measurement discretion on Level 3 positions. On the one hand, previous literature identifies loan loss provisions as well as the timing of gains from investment securities as common earnings management tools for banks. On the other hand, Level 2 positions are also marked-to-*model* and thus can be used for earnings. Although there is less room for manipulation with Level 2 positions, the fact that FAS 157 does not require any disclosure on Level 2 gains or losses could tempt managers to follow an earnings management strategy using these positions. Unfortunately, we were not able to conduct similar analyses to those performed on Level 3 positions, since banks do not disclose the relevant information.

Overall, our results indicate that fair value measurement is a convenient earnings management tool, despite the extensive disclosure requirements. We therefore identify some room for improvement regarding the disclosure and transparency of fair value measurements. This view is consistent with the following SEC postulate:

> "While the Staff does not recommend a suspension of existing fair value standards, the Staff believes that a number of measures should be taken to improve the application and practice related to existing fair value requirements (particularly as they relate to both Level 2 and Level 3 estimates) including: […] Enhancing the existing disclosure and presentation requirements related to the effect of fair value in the financial statements […]." (SEC, 2008: 202)

The IASB's exposure draft *ED/2009/5 – Fair Value Measurement* issued in May 2009 also proposes additional disclosure in connection with the sensitivity of fair value estimates. According to this, entities are required to disclose the effect on the financial statements if changing inputs to reasonably alternative assumptions would change the fair value of Level 3 positions significantly (ED/2009/5, paragraph 57g).

While this study contributes to the recent debate surrounding fair value accounting and confirms the concerns of several stakeholders, it raises further questions. For example: whether banks that pursued a big bath strategy were rewarded by the capital markets; whether there is an interaction between institutional factors and fair value mea-

surement discretion; and finally, what are the specific drivers (e.g., management compensation) of fair value measurement discretion. Therefore, and since we consider fair value measurement to be a timely issue, we recommend future research to further investigate the effects of fair value measurement.

REFERENCES

Ahmed, A. S., Takeda, C. and Thomas, S. (1999) Bank loan loss provisions: a reexamination of capital management, earnings management and signalling effects, *Journal of Accounting and Economics*, 28(1), pp. 1–25.

Bartov, E. (1993) The timing of asset sales and earnings manipulation, *The Accounting Review*, 68(4), pp. 840–855.

Basel Committee on Banking Supervision (2006) Basel II: International convergence of capital measurement and capital standards: a revised framework, Comprehensive version, June 2006.

Basel Committee on Banking Supervision (2008) Supervisory guidance for assessing banks' financial instruments fair value practices, Consultative Document, November 2008.

Beatty, A., Chamberlain, S. and Magliolo, J. (1995) Managing Financial Reports of Commercial Banks: The Influence of Taxes, Regulatory Capital, and Earnings, *Journal of Accounting Research*, 33(2), pp. 231–261.

Beatty, A., Ke, B. and Petroni, K. (2002) Earnings Management to Avoid Earnings Declines across Publicly and Privately Held Banks, *The Accounting Review*, 77(3), pp. 547–570.

Beaver, W. and Engel, E. (1996) Discretionary behavior with respect to allowances for loan losses and the behavior of security prices, *Journal of Accounting and Economics*, 22(1-3), pp. 177–206.

Black, E. L., Sellers, K. F. and Manly, T. S. (1998) Earnings management using asset sales: An international study of countries allowing noncurrent asset revaluation, *Journal of Business Finance and Accounting*, 25(9/10), pp. 1287–1319.

Burgstahler, D. and Dichev, I. (1997) Earnings Management to Avoid Earnings Decreases and Losses, *Journal of Accounting and Economics*, (24), pp. 99–126.

Christensen, T. E., Paik, G. H., and Stice, E. K. (2008) Creating a bigger bath using the deferred tax valuation allowance, *Journal of Business Finance & Accounting*, 35(5-6), pp. 601–625.

Cohen, D., Dey, A. and Lys, T. (2008) Real and accrual-based earnings management in the pre- and post-Sarbanes-Oxley periods, *The Accounting Review*, 83(3), pp. 757–787.

Dechow, P., Sloan, R. and Sweeney, A. (1995) Detecting earnings management, *The Accounting Review*, (70), pp. 193–225.

Dechow, P. and Shakespeare, C. (2009) Do Managers Time Securitization Transactions to Obtain Accounting Benefits? *The Accounting Review*, 84(1), pp. 99–132.

Dechow, P., Myers, L. and Shakespeare, C. (2009) Fair Value Accounting and Gains from Asset Securitisations: A Convenient Earnings Management Tool with Compensation Side-Benefits, *Journal of Accounting and Economics* (forthcoming).

Degeorge, F., Patel, J. and Zeckhauser, R. (1999) Earnings Management to Exceed Thresholds, *Journal of Business*, 72(1), pp. 1–33.

Dong, M. and Zhang, X-J. (2009) Historical-Cost or Fair-Value Accounting: Analysis of the Reclassifica-

tion of Unrealized Holding Gains and Losses for Marketable Securities, Working Paper, University of Lausanne and University of California, Berkeley.

Elliott, J. A., Hanna, J. D. and Shaw, W. H. (1991) The Evaluation by the Financial Markets of Changes in Bank Loan Loss Reserve Levels, *The Accounting Review*, 66(4), pp. 847–861.

Geiger, M. A. and North, D. S. (2006) Does hiring a new CFO change things? An investigation on changes in discretionary accruals, *The Accounting Review*, 81 (4), pp. 781–809.

Goh, B. W., Ng, J. and Yong, K. O. (2009) Market pricing of banks' fair value assets reported under SFAS 157 during the 2008 economic crisis, Working Paper, Singapore Management University, Sloan School of Management, and Singapore Management University.

Healy, P. and Wahlen, J. (1999) A review of the earnings management literature and its implications for standard setting, *Accounting Horizons*, 13(4), pp. 365–383.

Huizinga, H. and Laeven, L. (2009) Accounting Discretion of Banks During a Financial Crisis, Discussion Paper, Tilburg University and International Monetary Fund.

International Accounting Standards Board (2009) Fair Value Measurements, Exposure Draft, May 2009.

Financial Accounting Standards Board (2006) *Statement of Financial Accounting Standards No. 157 – Fair Value Measurements as issued in September 2006*.

Kahneman, D. and Tversky, A. (1979) Prospect theory: An analysis of decision under risk, *Econometrica*, (47), pp. 263–291.

Kolev, K. (2008) Do investors perceive marking-to-model as marking-to-myth? Early evidence from FAS 157 disclosure, Working Paper, NYU Stern School of Business.

IASB Expert Advisory Panel (2008) Measuring and disclosing the fair value of financial instruments in markets that are no longer active, *Draft document*, September 2008.

Levitt, A. (1998) The numbers game, Unpublished, Available at http://www.sec.gov/news/speech/ speecharchive/1998/spch220.txt.

Moehrle, S. (2002) Do firms use restructuring charge reversals to meet earnings targets? *The Accounting Review*, 77(6), pp. 397–414.

Moore, M. L. (1973) Management changes and discretionary accounting decisions, *Journal of Accounting Research*, 11(1), pp. 100–107.

Pourciau, S. (1993) Earnings management and nonroutine executive changes, *Journal of Accounting and Economics*, 46(2), pp. 165–197.

Riedl, E. J. (2004) An Examination of Long-Lived Asset Impairments, *The Accounting Review*, 79(3), pp. 823–852.

Rogers, W. (1993) Regression Standard Errors in Clustered Samples. *Stata Technical Bulletin*, (13), pp. 19–23.

Ryan, S. G. (2008) Accounting in and for the Subprime Crisis, *The Accounting Review*, 83(6), pp. 1605–1638.

Scholes, M. S., Wilson, G. P. and Wolfson, M. A. (1990) Tax Planning, Regulatory Capital Planning, and

Financial Reporting Strategy for Commercial Banks, *The Review of Financial Studies*, 3(4), pp. 625–650.

Securities and Exchange Commission (2008) Report and recommendations pursuant to Section 133 of the emergency economic stabilization act of 2008: Study on mark-to-market accounting, Available at: http://www.sec.gov/news/studies/studiesarchive/2008archive.shtml.

Song, C. J. (2008) An evaluation of FAS 159 fair value option: evidence from the banking industry, Working Paper, Virginia Polytechnic Institute and State University.

Song, C. J., Thomas, W., Yi, H. (2008) Value relevance of FAS 157 fair value hierarchy information and the impact of corporate governance mechanisms, Working Paper, Virginia Polytechnic Institute and State University, University of Oklahoma, and University of Oklahoma.

Wooldridge, J. (2009) *Introductory Econometrics – A Modern Approach*, Ohio: South-Western.

Figure 1. Value function and earnings management

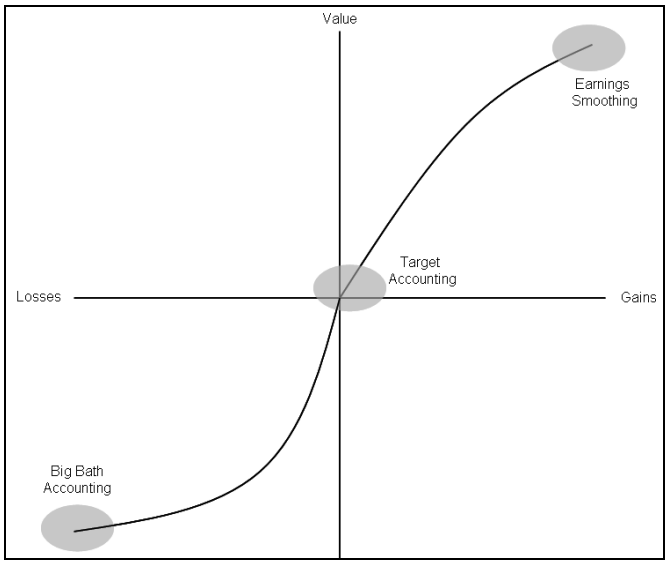

Table 1. Descriptive statistics for the regression variables

Distributional statistics				Percentiles				
Variable	*N*	*Mean*	*Min.*	*Q1*	*Median*	*Q3*	*Max.*	*Std. Dev.*
L3INC	2446	- 0.011	- 0.573	- 0.001	0.000	0.000	0.449	0.041
L3POS	2446	0.175	- 0.120	0.000	0.050	0.180	9.070	0.452
MTB	2446	1.121	0.091	0.732	1.034	1.397	8.965	0.579
SIZE	2446	0.003	0.003	0.004	0.006	0.001	0.500	0.016
LEV	2446	0.900	0.642	0.890	0.908	0.923	0.993	0.038
PREL3LLP	2446	- 0.161	- 0.569	- 0.022	- 0.008	- 0.002	0.569	0.048
PREL3NII	2446	- 0.054	- 0.874	- 0.065	- 0.047	- 0.031	0.437	0.067
Q208	2446	0.193	0.000	0.000	0.000	0.000	1.000	0.394
Q308	2446	0.203	0.000	0.000	0.000	0.000	1.000	0.402
Q408	2446	0.211	0.000	0.000	0.000	0.000	1.000	0.408
Q109	2446	0.209	0.000	0.000	0.000	0.000	1.000	0.407
S&L	2446	0.237	0.000	0.000	0.000	0.000	1.000	0.425
REGIONAL	2446	0.730	0.000	0.000	1.000	1.000	1.000	0.444
INVEST	2446	0.007	0.000	0.000	0.000	0.000	1.000	0.081
MONEYC	2446	0.010	0.000	0.000	0.000	0.000	1.000	0.101

The table reports descriptive statistics of the regression variables. L3INC is defined as the net unrealized gains or losses on recurring Level 3 positions plus non-recurring Level 3 gains or losses as a percentage of beginning book value of equity; L3POS is defined as net Level 3 assets as a percentage of beginning book value of equity; MTB is defined as market to book ratio at the beginning of the quarter; SIZE is defined as relative rank of total assets at the beginning of the quarter; LEV is defined as debt to assets ratio at the beginning of the quarter; PREL3LLP is defined as loan loss provisions before gains or losses on Level 3 positions as a percentage of beginning book value of equity; PREL3NII is defined as non-interest income before gains or losses on Level 3 positions as a percentage of beginning book value of equity; Q208 until Q109 represent quarter indices; S&L is a subindustry dummy for savings and loans banks as defined by Reuters; REGIONAL is a subindustry dummy for regional operating banks as defined by Reuters; INVEST is a subindustry dummy for investment banks as defined by Reuters; and MONEYC is a subindustry dummy for money center banks as defined by Reuters.

Table 2. Regression analysis of Level 3 Income

Dependent Variable: L3INC

Variable	Coefficient	(*t*-Statistic)
L3POS	- 0.0200***	(-2.921)
MTB	0.0112***	(3.932)
SIZE	- 0.0870***	(-2.768)
LEV	- 0.1507***	(-5.510)
PREL3LLP	- 0.4372***	(-5.161)
PREL3NII	- 0.1503***	(-3.376)
Q208	- 0.0038***	(-3.586)
Q308	- 0.0062***	(-4.211)
Q408	- 0.0198***	(-8.587)
Q109	- 0.0061***	(-3.390)
S&L	0.0004	(0.129)
REGIONAL	- 0.0034	(-1.241)
INVEST	0.0190***	(3.601)
MONEYC	- 0.0077	(-0.989)
F-statistics	14.13***	
N	2446	
R^2	45.04	

The table reports OLS coefficient estimates and, in parentheses, t-statistics based on heteroskedasticity-robust and clustered standard errors as suggested by Rogers (1993) where L3INC is the dependent variable. See Table 1 for the definition and calculation of the variables. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

Table 3. Discretionary Level 3 income by performance group

Discretionary Level 3 Income by Performance Group			DISCL3			
Performance		*N*	*Mean*	*Median*	*Std. Err.*	*Std. Dev.*
BELOW 5th	All	2436	0.0000	0.0052	0.0006	0.0308
	Below 5th = 1	122	- 0.0484	- 0.0369	0.0079	0.0882
	Below 5th = 0	2314	0.0026	0.0056	0.0005	0.0218
	Difference: (1) - (0)		- 0.0510***	- 0.0425***	0.0027	
	t- and z-statistics		- 19.08	- 12.06		
BELOW 10th	All	2436	0.0000	0.0052	0.0006	0.0309
	Below 10th = 1	244	- 0.0272	- 0.0137	0.0046	0.0721
	Below 10th = 0	2194	0.0030	0.0058	0.0004	0.0198
	Difference: (1) - (0)		- 0.0303***	- 0.0195***	0.0020	
	t- and z-statistics		- 15.42	- 10.46		
BELOW 25th	All	2436	0.0000	0.0052	0.0006	0.0309
	Below 25th = 1	609	- 0.0072	0.0045	0.0021	0.0521
	Below 25th = 0	1827	0.0024	0.0053	0.0004	0.0186
	Difference: (1) - (0)		- 0.0096***	- 0.0008	0.0014	
	t- and z-statistics		- 6.808	- 0.791		

The table reports mean (median) values of discretionary level 3 gains or losses (DISCL3), t-statistics (z-statistics), the number of observations, standard errors, and standard deviations. Performance is defined as the 5th, 10th, and 25th percentile of pre-managed net income, i.e., net income minus DISCL3. ***, **, and * indicate that the means (medians) are significantly different at the 1%, 5%, and 10% levels, respectively, using a two-tailed *t*-test (Mann-Whitney-Wilcoxon test).

Table 4. Threshold categories by performance group

Threshold Categories by Performance Group

			Categories			
Performance		*N*	*STAYNEG*	*SWITCHNEG*	*SWITCHPOS*	*STAYPOS*
BELOW 5th	All	2404	666	96	156	1486
	Below 5th = 1	121	79	4	24	14
	Below 5th = 0	2283	587	92	132	1472
	Pearson chi2	152.12***				
	LR chi2	148.41***				
BELOW 10th	All	2404	666	96	156	1486
	Below 10th = 1	238	145	12	27	54
	Below 10th = 0	2166	521	84	129	1432
	Pearson chi2	180.96***				
	LR chi2	174.35***				
BELOW 25th	All	2404	666	96	156	1486
	Below 25th = 1	595	315	42	42	196
	Below 25th = 0	1809	351	54	114	1290
	Pearson chi2	307.42***				
	LR chi2	296.78***				

The table reports the number of bank-quarters for different performance groups in the quarter t and classification in the quarter t+1. Banks are classified as STAYNEG when non-managed and reported income are both negative, as SWITCHNEG when non-managed income is positive but reported income is negative, as SWITCHPOS when non-managed income is negative but reported income is positive, and as STAYPOS when non-managed and reported income are both positive. Performance is defined as the 5th, 10th, and 25th percentile of pre-managed net income, i.e., net income minus DISCL3. ***, **, and * indicate that the relationship between the threshold category and the performance group is significantly different at the 1%, 5%, and 10% level, respectively, using a chi-squared test with three degree of freedom.

Table 5. Switching from negative to positive earnings

SWITCHPOS by Performance Group

			SWITCHPOS			
Performance		*N*	*Yes*	*No*	*Pearson chi2*	*LR chi2*
BELOW 5th	All	2404	156	2248		
	Below 5th = 1	121	24	97		
	Below 5th = 0	2283	132	2151	37.39***	25.71***
BELOW 10th	All	2404	156	2248		
	Below 10th = 1	238	27	211		
	Below 10th = 0	2166	129	2037	10.26***	8.71***
BELOW 25th	All	2404	156	2248		
	Below 25th = 1	595	42	553		
	Below 25th = 0	1809	114	1695	0.42	0.42

The table reports the number of bank-quarters for different performance groups in the quarter t and classification in the quarter t+1. Banks are classified as SWITCHPOS when non-managed income is negative but reported income is positive. Performance is defined as the 5th, 10th, and 25th percentile of pre-managed net income, i.e., net income minus DISCL3. ***, **, and * indicate that the relationship between SWITCHPOS and the performance group is significantly different at the 1%, 5%, and 10% level, respectively, using a chi-squared test with one degree of freedom.