Fair value accounting and the predictive ability of earnings: Evidence from the banking industry

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Abstract:

The increasing use of fair value in financial reporting has sparked an ongoing debate about the merits of a fair value accounting based reporting system. Motivated by the objectives of financial reporting stated in the conceptual framework, we investigate whether the extent to which fair values are used in financial reports is related to the ability of earnings to predict future cash flows and future earnings. For a sample of bank holding companies, we find that the use of fair values in financial reporting enhances the ability of earnings to predict future cash flows. However, we find mixed evidence with respect to fair values improving the ability of earnings to predict future earnings. Further, the ability of earnings to predict future cash flows and future earnings is improved by the use of fair value estimates only during periods of low market-wide credit risk. Overall, our findings support the view of FASB and IASB that fair value accounting helps in predicting returns on economic resources (earnings) and assessment of the amounts, timing and uncertainty of future cash flows.

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1. Introduction

Fair value accounting is a long standing major agenda item of the Financial Accounting Standards Board (FASB). Over the past two decades, the FASB has continued to incorporate more fair value accounting in financial reporting. The FASB and the International Accounting Standards Board (IASB) consider fair value as a potential measurement basis in almost every measurement decision they make (Barth 2008). The increasing use of fair value in financial reporting has sparked an ongoing debate about the merits of a fair value accounting based reporting system. For the most part, this debate has centered on the relevance versus the reliability of fair value accounting. More recently, in the wake of the subprime crisis and the tightening of credit that followed, a few studies have investigated the role of fair value accounting by banks in financial crises (Ryan 2008; Laux and Leuz 2009; Laux and Leuz 2010, Bhat et al. 2011, Bowen et al. 2011; Khan 2011). In contrast to these prior studies, we contribute to the debate about the merits of a fair value based reporting system by examining whether the extent to which fair values are used in banks’ financial reports is related to the predictability of cash flows and earnings.

Our study is motivated by the objectives of financial reporting stated in the conceptual framework. Statement of Financial Accounting Concepts (SFAC) No. 8 specifies that the objective of financial reporting is to provide decision-useful information, and this includes information which would assist in the prediction of returns on economic resources (earnings) and assessments of the amounts, timing, and uncertainty of (the prospects for) future cash flows.

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1 The FASB states that a long-term objective is to use fair value accounting to measure and report all financial instruments (see Statement of Financial Accounting Standard (SFAS) No. 159).
Fair values summarize the stream of expected future cash flows. Ideally, under a full fair value based accounting system, a fair valued balance sheet will provide complete information about the value of the firm’s assets and obligations. In this case, the income statement would simply report the changes in fair value implied by the balance sheet and earnings would be uninformative about future earnings. Earnings under a full fair value system should not predict future value changes but measure periodic shocks to value and inform financial statement users about risk (Nissim and Penman 2008). Consistent with this view, critics of fair value argue that fair values bear little relationship with contracted future cash flows. Rather than being driven by economic events such as earning revenue or incurring expenses, critics argue that the recognition of gains and losses in a full fair value system is driven by short-term market movements (Chisnall 2001).

Fair values are volatile because any change in the expectations about future cash flows results in a change in fair values. To the extent the volatility in fair values represents the underlying economic volatility, fair values are meeting the objectives of financial reporting by providing users information relating to the uncertainty and timing of future cash flows. However,

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2 SFAC 1, the predecessor of SFAC 8, indicated a similar objective for financial reporting (FASB 1978). The differences between the objectives defined across the two statements are not important for our study.

3 Generally Accepted Accounting Principles (GAAP) does not employ a full fair value based accounting system. Rather, we have a mixed-attribute model in practice under which certain items are reported at fair value and others reported on a different measurement basis (e.g., amortized cost).
Barth (2004) points out that volatility of reported fair values might be in excess of the underlying economic volatility because the volatility of fair values is enhanced by estimation-error volatility and mixed-measurement volatility.4

On the other hand, proponents of fair value claim that fair value information is the only information relevant for financial decision making. They argue that fair values provide the most current and complete estimations of the value of assets and obligations as well as information about the timing and riskiness of future cash flows (CFA Institute 2005). Barth (2008) highlights that fair values are of interest to users of financial statements because they are predictive of future cash flows. In addition, Barth et al. (1995) finds that banks violate regulatory capital requirements more frequently under a fair value based accounting system and the violations under fair value accounting help predict future regulatory capital violations. Using a different industry and setting, Aboody et al. (1999) also document the predictive ability of fair value accounting by finding that upward revaluations of fixed assets by United Kingdom firms are related to changes in future operating income and cash from operations. We contribute to this literature by investigating whether reported earnings that are more fair value based better predict future cash flows and earnings.

To address our research questions we construct a panel of United States bank holding companies (banks) from 1993 through 2008. We use two measures to capture the extent to which fair values are used in each bank’s financial reports. First, we follow Nissim and Penman (2007) and Khan (2011) and use a balance sheet approach to estimate the extent to which a bank’s financial reports are fair value oriented by using the ratio of total assets and liabilities accounted

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4 Estimation-error volatility refers to the volatility induced in reported fair values due to the lack of well-specified estimation models. Mixed-measurement volatility arises because of the different measurement objectives used to measure and report assets and liabilities. Some assets and liabilities are measured at historical cost, some at lower of cost or a current value and others at fair value.
for on a fair value basis to the total assets reported by the bank. This allows us to examine how predictability of earnings varies depending on the extent of the balance sheet’s exposure to fair value accounting rules. Second, we also use an income statement approach and proxy for the extent to which fair value is used in financial reporting by contrasting two alternative measures of reported income – net income and comprehensive income. Banks’ balance sheets consist almost entirely of investments and other financial instruments but their reported net income excludes many fair value adjustments that are included in other comprehensive income (e.g., unrealized gains and losses on available-for-sale securities, translation adjustments, etc). Therefore, with our second proxy, we examine the predictive ability of the more fair value based comprehensive income relative to net income.

To examine the ability of earnings to predict future cash flows and earnings, we follow the approach used in Altamuro and Beatty (2010) and augment their models with our proxies for the extent to which a bank uses fair values in financial reporting.

With respect to the predictability of future cash flows, we find that the use of fair values in financial reporting enhances the ability of earnings to predict future cash flows. More specifically, we find that current year earnings of banks that report a greater proportion of their assets and liabilities at fair value have a higher association with next period cash flows. Further, we find that after controlling for current period net income, the more fair value oriented comprehensive income is incrementally associated with next period cash flows.

With respect to the predictability of future earnings, we find mixed evidence. For banks that report a greater proportion of their assets and liabilities at fair value, there is no association between current period pre-tax earnings and future pre-tax earnings. However, there is a positive
association between the more fair value-oriented current period comprehensive earnings and future pre-tax earnings.

We also examine the impact of economic cycles on the predictive ability of fair value information in earnings. Critics of fair value accounting express concern that fair values may be less relevant and/or reliable during periods of economic distress, such as the recent financial crisis when asset markets were less liquid and fair values were difficult to determine. Consistent with these concerns, Evans et al. (2010) report that fair values are less value relevant during periods of high market-wide credit risk. We investigate whether more fair value based earnings are less predictive of future cash flows and earnings during periods of high market-wide credit risk. Our results suggest that the use of fair values in financial reporting enhances the predictive ability of earnings only during periods of relatively lower market-wide credit risk. We find that current pre-tax earnings are positively associated with future cash flows and future earnings only during years when credit risk is below the median level of credit risk during our sample time period. During years in which market-wide credit risk is high, we do not find any association between increased use of fair value in financial reporting and the ability of earnings to predict future cash flows. These findings are consistent with the argument that during periods of economic distress and financial crises, asset prices may reflect the amount of liquidity available in the market rather than the future earnings power of the asset (Allen and Carletti 2008).

Finally, we investigate whether the predictive ability of earnings under a more fair value based accounting system varies by bank size. Larger banks are expected to have available more precise fair value estimates than smaller banks because of the relative sophistication of their investment departments and because more precise quotes are obtainable for larger rather than smaller blocks of securities (Barth 1994). We find that the use of fair value enhances the
predictive ability of earnings with respect to future cash flows and future earnings for larger banks (i.e., banks with assets greater than $10 billion, approximately the top 16% of banks in our sample). However, for smaller banks, while the use of fair value makes earnings more predictable of future cash flows we do not find any evidence of fair value accounting enhancing the predictive ability of earnings with respect to future earnings.

Our study makes two contributions. First, we inform the debate about the merits of a fair value based accounting system. We find that, in certain settings, a more fair value based accounting system enhances the ability of earnings to predict cash flows and, in more limited settings, future earnings as well. These findings support the view of the boards that fair value accounting meets the objectives of financial reporting as specified in the conceptual framework. As Barth (2006) notes, “predictability of income itself is not an objective of financial reporting. Rather, income’s ability to predict future cash flows is important.” However, it is important to note that this enhancement of the predictability of earnings only occurs during periods of low credit-risk. Second, while prior studies in this literature have focused on earnings and its components in the prediction of future cash flows (Dechow et al. 1998; Barth et al. 2001; Kim and Kross 2005; Lev et al. 2010), we extend the literature on the prediction of future cash flows by documenting that use of fair values in financial reporting enhances the ability of earnings to predict future cash flows.

The remainder of the paper is organized as follows. Section 2 reviews the literature and provides some institutional background. Section 3 presents the research design and describes the sample. Section 4 discusses the results. Section 5 concludes.
2. Institutional background and literature review

Fair value is defined as “the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date” (Statement of Financial Accounting Standards No. 157). Consistent with FASB’s long term objective, the financial reporting rules in the United States have become more fair values based. Over the last few decades the FASB has issued several standards requiring recognition and disclosure of fair values. During this time, regulators, academics, and practitioners have continued to debate the merits of reporting assets and liabilities at fair value.

The debate about the merits of fair value accounting has largely focused on the relevance versus the reliability of fair value estimates. Advocates of fair value accounting claim that fair values have higher or incremental value relevance than historical costs. Many empirical studies have tested this claim with respect to fair values of financial instruments held by banks. Although results vary depending on the type and liquidity of the securities and the empirical specifications used, in general, these studies document that differences between reported fair values and book values of investment securities explain share prices (see, for example, Barth 1994, Petroni and Wahlen 1995, Barth et al. 1996, Eccher et al. 1996, Nelson 1996 and Park et. al. 1999). A related stream of research investigates the value relevance of fair value estimates of loans disclosed by banks. Barth et al. (1996) find that the fair value estimates of loans and long-term debt explain bank share prices beyond related book values. Other studies have found that fair values of loans are value relevant in limited settings (Nelson 1996, Eccher et al. 1996, Park et al. 1999, Beaver and Venkatachalam 2003 and Nissim 2003). Overall, the evidence suggests that fair value estimates of loans contain substantial measurement error and bias, and investors do not necessarily find fair value estimates of loans valuation-relevant due to the lack of reliable
estimates. Venkatachalam (1996) investigates the value relevance of fair value disclosures of banks’ derivatives and finds that fair values of derivatives are incrementally associated with bank share prices after controlling for the notional amounts of derivatives.

More recently, many commentators have criticized fair value accounting for its role in the subprime crisis and the credit crunch that followed. A few studies have investigated whether fair value accounting contributed to the crisis. Khan (2011) finds an association between bank contagion and the proportion of assets and liabilities reported at fair value, especially during periods of market illiquidity. Bhat et al. (2011) find that fair value accounting exacerbates the feedback effect between the holdings of mortgage backed securities and the underlying asset market. Bowen et al. (2011) conduct an event study around fair value accounting related pronouncements during the financial crisis and find that stock market participants appeared to welcome relaxation of fair value accounting and impairment related rules during the financial crisis of 2008-09. Badertscher et al. (2012) find that during the 2008 financial crisis fair value accounting losses had a small impact on the regulatory capital of banks but find some evidence of fair value losses triggering security sales.

We take a different approach from prior and concurrent studies and examine the merits of a fair value based accounting system by investigating whether a fair value based accounting system meets the objectives of financial reporting as specified in the conceptual framework. SFAC No. 8 specifies that one of the objectives of financial reporting is to provide information that is useful in predicting future cash flows. Fair values summarize the stream of expected future cash flows; hence, they are predictive of future cash flows (Barth 2008). The advocates of a fair value based accounting system claim that fair values provide the most current and

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5 Laux and Leuz (2009) summarize the main arguments made for and against fair value accounting playing a role in financial crises.
complete estimations of the value of assets, obligations as well as information about the timing and riskiness of future cash flows (CFA Institute 2005).

Our paper is most related to Barth et al. (1995) and Aboody et al. (1999). Using a sample comprising of banks, Barth et al. (1995) find that although fair value-based earnings are more volatile than historical cost earnings and banks violate regulatory capital requirements more frequently under a fair value based accounting system rather than historical cost accounting, the fair values-based violations are more predictive of future regulatory capital violations.6 Aboody et al. (1999) investigate whether revaluations of fixed assets by United Kingdom firms are associated with future firm performance measured as ex-post realized operating income and cash flow from operations. They find that upward revaluations are positively associated with future operating performance. Our study is also related to Petroni and Wahlen (1997) and Evans et al. (2010). Petroni and Wahlen (1997) shows that bond-investment fair values are positively associated with future reported interest income on those investments. Evans et al. (2010) finds that banks’ accumulated fair value adjustments for investment securities are positively associated with reported income from investment securities in the following period. Collectively, these papers provide some evidence of the predictive ability of a fair value based accounting system.

The critics of a fair value based accounting system claim that fair values bear little association with future cash flows because the recognition of gains and losses is driven by short-term market movements rather than when income has been earned or a loss incurred (Chisnall, 2001). Fair values tend to be more volatile than historical cost estimates because any change in the expectations relating to future cash flows results in a change in fair value estimates, even if the change in expectations might be due to short-term market fluctuations. Barth (2004) notes

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6 Barth et al. (1995) defines fair value-based (historical cost) earnings as earnings including (excluding) unrealized gains and losses on investment securities.
that fair values might represent volatility in excess of the underlying economic volatility of the firm because the volatility of fair value estimates is enhanced by estimation-error volatility and mixed-measurement volatility. The estimation-error volatility refers to the volatility that is embedded in the reported fair value estimate due to the volatility of error with which the asset or liability is measured. Mixed-measurement volatility arises due to the mixed-attribute reporting system prescribed by GAAP. Currently there is no common measurement objective for all assets and liabilities. Some assets and liabilities are measured at historical cost, some at the lower of cost or a current value and some are measured at fair value. As a result, the effects of all transactions and economic events are not fully reflected in the financial statements resulting in volatility in excess of the underlying economic volatility.

Barth et al. (1995) is one of the first papers to document that fair value-based earnings are more volatile than historical cost-based earnings. More recently, Hodder et al. (2006) also find that the volatility of full-fair value income is in excess of comprehensive income or net income.\(^7\) Graham et al. (2005) report that managers believe that more volatile earnings make it harder to predict future earnings, and the American Banking Association’s argues that fair values will create undesirable earnings volatility without increasing value relevance (ABA 2010).

Nevertheless, whether more volatile earnings under a more fair value based accounting system are more predictive of future cash flows and earnings are vital but yet unanswered empirical questions. Accordingly, we investigate whether earnings which contain more fair value based information are better predictors of future cash flows and future earnings.

We also examine the impact of economic cycles on the predictive ability of earnings. Prior literature has found that value relevance of fair value estimates is a function of the

\(^7\) Dichev and Tang (2009) point out more volatile earnings does not necessarily translate into less persistent or predictable earnings, although they show that more volatile earnings have lower persistence.
reliability with which such estimates can be measured. For example, Barth (1994) finds that unrealized gains and losses are more strongly associated with stock prices for banks with high proportions of U.S. Treasury securities. Critics of fair value accounting have often expressed the concern that fair value estimates are less relevant and/or reliable during periods of economic turmoil such as financial crises. Allen and Carletti (2008) show that during financial crises, when market are illiquid, fair values do not represent future payoffs but rather reflect the amount of cash available to buyers in the market. Evans et al. (2010) also find that value relevance parameters of fair value estimates are not stable across time. They report that the value relevance of fair value estimates decreases during periods of heightened credit risk. Accordingly, we test whether earnings which are a product of a more fair value based financial reporting system remain predictive of future cash flows and earnings during periods of heightened credit risk.

Finally, we investigate whether the size of a bank influences the relationship between the use of fair value in financial reporting and the predictive ability of earnings. Larger banks have more sophisticated investment departments and more precise fair value quotes are available for larger rather than smaller blocks of securities (Barth, 1994). Thus, it could be argued that fair value estimates included in earnings by larger banks have less estimation error compared to smaller banks. Accordingly, we examine whether more fair value based earnings are better predictors of future cash flows and earnings for larger banks.

Our study differs from the studies mentioned above investigating the predictive ability of a fair value based accounting system on multiple fronts. First, the above mentioned studies do not investigate the relationship between the predictability of future cash flows and the extent to which the accounting system is fair value based. Second, these prior studies examine the

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8 Aboody et al. (1999) examines the relationship between upward revaluations of fixed assets and future operating cash flows. Our study differs from theirs in two major ways. First, they examine only the impact of upward
impact of fair value based estimates associated with a specific asset or liability. For example, Barth et al. (1995) and Evans et al. (2010) focus on fair value accounting for investment securities. Aboody et al. (1999) investigates upward revaluations of fixed assets. In contrast, we construct more comprehensive measures to estimate the extent to which the accounting system is fair value based. Our measures takes into account all assets and liabilities reported at fair value rather than being restricted to any one type of asset or liability to proxy for the use of fair values in financial reporting.

We are aware of two prior studies that examine the predictability of fair values on future cash flows. First, Chen et al. (2006) examines the association between fair value accounting and future cash flows. They argue that if increased use of fair value accounting improves cash flow predictability then we should observe a stronger association between current accounting data and future cash flows reflected in a higher r-square. However, their results do not support this argument. In contrast to our results, they find that implementation of fair value standards over time is not associated with the increase in the predictive ability of accounting information. Hill (2009) examines how the implementation of SFAS 115 (Accounting for Certain Investments in Debt and Equity Securities) which increased the use of fair value accounting, affects the ability of earnings to predict future cash flows. Although she reports mixed findings, she shows that fair value improves the predictability of cash flows for certain banks. While Hill (2009) focuses on revaluations for fixed assets whereas we employ a more comprehensive measure to capture the impact of fair value estimates in financial reporting. Second, in contrast to Aboody et al. (1999) whose sample comprises of UK firms, our sample comprises of US banks. Banks are a more suitable setting for testing the merits of a fair value based accounting system because as an industry they have been impacted the most by the fair value rules. 9 Chen et al. (2006) also follow a different approach to measuring fair value accounting. Their first measure uses comprehensive income which should be increasing in fair value over time. Second, they also use the market capitalization of a firm as the “complete fair value accounting” book value and the change in the market capitalization plus dividends. One issue with using the trend over time to measure increased fair value is the presence of other contemporaneous events that could affect earnings and their predictive ability. While our tests may also be impacted by contemporaneous events that can impact earnings’ predictive ability, we do not rely on the time series for evidence. More importantly, we do not use market capitalization as a proxy for fair value accounting book value because it incorporates future transactions and events that the accounting rules do not explicitly include (such as growth and internally-created goodwill).
one particular fair value standard, SFAS 115, our approach does not restrict us to examining the impact of only one fair value related accounting standard and it incorporates a broader measure of fair value by including all assets or liabilities reported at fair value. Finally, neither Chen et al. (2006) nor Hill (2009) investigate whether varying macro-conditions or bank size can impact the predictive ability of earnings that are a product of a more fair value based financial reporting system.

3. Research Design and Sample

We examine whether the extent to which a firm is exposed to fair value accounting impacts the ability of reported earnings to predict future cash flows and earnings. The FASB has stated that its long-term measurement objective of accounting for financial instruments is to use fair value to measure and report financial instruments. To test our predictions we focus on the banking industry because banks have experienced the most immediate and direct effects of the move to a more fair value based financial reporting system. The balance sheets of banks are comprised almost entirely of financial instruments, some of which were the earliest assets subject to fair value recognition. Accordingly, our sample comprises of all banks that file the FR-Y9C report and have data available on the Bank Holding Companies Database maintained by the Federal Reserve Bank of Chicago.10

We use two approaches to capture the extent to which a bank is exposed to fair value accounting, a balance sheet and an income statement approach. For the balance sheet approach, our measure follows Nissim and Penman (2007) and Khan (2011). We calculate a bank’s

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10 The Bank Holding Companies (BHC) Database collects financial data included in FR-Y9C reports filed by BHCs. The FR-Y9C reports contain information from the balance sheet, income statement and risk-based capital measures as well as other additional reporting schedules. The FR-Y9C report is filed by all BHCs with total consolidated assets of $500 million or more. In addition, BHCs meeting certain criteria may be required to file this report.
exposure to fair value accounting as the sum of assets and liabilities recognized or disclosed at fair value divided by total assets. Specifically, we include in the numerator the sum of the fair values of investments, derivatives, mortgage servicing rights, other financial assets, trading liabilities, and items elected to be reported at fair value using the fair value option.\textsuperscript{11} We then examine whether cash flow predictability and earnings predictability vary across banks depending on this measure. The income statement approach follows Hodder et al. (2006) and compares the cash flow predictability and earnings predictability associated with comprehensive income relative to net income. Compared to net income, comprehensive income is more fair value-oriented as it includes unrealized fair value gains and losses on available-for-sale securities and translation adjustments.\textsuperscript{12}

We use the following model from Altamuro and Beatty (2010) to test for an association between the extent of fair value accounting and cash flow predictability.

\[ \text{Cash Flows}_t = \alpha + \beta_1 \text{Pre-tax ROA}_{t-1} + \beta_2 \log(\text{Assets}_{t-1}) + \beta_3 \text{FVA}_{t-1} + \beta_4 [\text{Pre-tax ROA}_{t-1} \times \log(\text{Assets}_{t-1})] + \beta_5 [\text{Pre-tax ROA}_{t-1} \times \text{FVA}_{t-1}] + \epsilon_t \quad (1) \]

In model (1), Cash Flows is calculated as income before taxes (BHCK4301) plus the provision for loan losses (BHCK4230), scaled by lagged total assets; Pre-tax ROA is income before taxes divided by lagged total assets. \( \log(\text{Assets}) \) is the natural log of total assets; \( \text{FVA} \) is

\textsuperscript{11} The fair values of held to maturity investments are disclosed in the BHC Database as item BHCK8551 until 2000 and BHCK1771 thereafter. The fair values of available for sale investments are disclosed as BHCK1773. Fair values of trading assets are disclosed as BHCK3545. Fair values of derivatives other than those included in trading assets are disclosed as items BHCK8733 through BHCK8748 and as items BHCK219 through BHCK222. Fair values of mortgage servicing rights are disclosed as BHCK6438. Other financial assets reported at fair value include interest-only strips receivable (BHCKA519 and BHCKA520), except in 2007 and 2008 when a specific “other financial servicing assets” at fair value was disclosed (BHCKF240). Fair values of trading liabilities are disclosed as BHCK3548. Items elected to be disclosed at fair value using the fair value option include certain non-trading securities (BHCKF240), deposits, (BHCKF252), other financial and servicing liabilities (BHCK 258), loan commitments not accounted for as derivatives (BCHK261), and loans and leases held for sale (BHCKF243). When any of these amounts are not disclosed, we set them to zero.

\textsuperscript{12} Comprehensive income is not a full fair value measure of income because it does not include fair value gains and losses on other financial instruments such as held-to-maturity securities, loans, financial liabilities and non-term deposits (Hodder et al. 2006).
a proxy for the extent to which fair value estimates are used in financial reporting, computed as the sum of assets and liabilities with fair values disclosed in the FR Y-9C reports, scaled by total assets.

We use the following model (also from Altamuro and Beatty (2010)) to test the predictive ability of a more fair value based earnings number with respect to next-period earnings.

\[
\text{Pre-tax ROA}_t = \alpha + \beta_1 \text{Pre-tax ROA}_{t-1} + \beta_2 \log(\text{Assets}_{t-1}) + \beta_3 FVA_{t-1} + \beta_4 [\text{Pre-tax ROA}_{t-1} \times \log(\text{Assets}_{t-1})] + \beta_5 [\text{Pre-tax ROA}_{t-1} \times FVA_{t-1}] + \epsilon_t
\]

(2)

Where, the variables are defined as above.

Next, we test for the association between fair value accounting and cash flow predictability and earnings predictability using an income statement approach. In this case, we replace FVA (measured using the balance sheet approach) with CINIROAdif which is based on the income statement approach (following Hodder et al. 2006).

\[
\text{Cash Flows}_t = \alpha + \beta_1 \text{Pre-tax ROA}_{t-1} + \beta_2 \log(\text{Assets}_{t-1}) + \beta_3 [\text{Pre-tax ROA}_{t-1} \times \log(\text{Assets}_{t-1})] + \beta_4 \text{CINIROAdif}_{t-1} + \epsilon_t
\]

(3)

\[
\text{Pre-tax ROA}_t = \alpha + \beta_1 \text{Pre-tax ROA}_{t-1} + \beta_2 \log(\text{Assets}_{t-1}) + \beta_3 [\text{Pre-tax ROA}_{t-1} \times \log(\text{Assets}_{t-1})] + \beta_4 \text{CINIROAdif}_{t-1} + \epsilon_t
\]

(4)

Where, CINIROAdif is the difference between pre-tax comprehensive income and pre-tax net income scaled by lagged assets. Pre-tax comprehensive income is calculated as the sum of pre-tax other comprehensive income and pre-tax earnings. We compute pre-tax other comprehensive income by dividing the reported after-tax other comprehensive income by one minus the maximum statutory corporate tax rate (35 percent for all years in our sample). Comprehensive income is a more fair value-based reported income number than net income and the coefficient
on CINIROAdif captures the incremental value of comprehensive income in predicting cash flows over and above pre-tax earnings. The remaining variables are defined as before.

We collect accounting data from the Bank Holding Companies (BHC) Database maintained by the Federal Reserve Bank of Chicago. We then merge this database with Bank Compustat and construct the final samples used in the two sets of analyses. In the first set of analyses based on the balance sheet approach to estimate the use of fair value accounting in financial reporting, our final sample consists of 4,518 bank-year observations spanning the years 1993-2008. In the second set of analyses, based on the income statement approach to measuring fair value accounting, our final sample consists of 2,090 bank-year observations spread over the years 2001-2008.13

Table 1 presents the descriptive statistics for our samples. Panel A lists the descriptive statistics for the sample based on the balance sheet approach and Panel B provides the descriptive statistics for the additional variables used in the income statement approach. The average (median) bank has assets of $13.71 ($1.41) billion. The mean (median) natural log of assets is 14.52 (14.16). The mean value of FVA is 0.23 suggesting that on average about twenty three percent of assets and liabilities are reported at fair value. Pre-tax ROA in year t and year t+1 is approximately 0.18, whereas cash flows are 2 percent of total assets on average. In panel B, the mean (median) of the pre-tax comprehensive income scaled by lagged total assets, ClptROA, is 0.017 (0.0170) whereas the mean (median) of the pre-tax other comprehensive income, CINIROAdif, is -0.0002 (-0.0004).

The correlations between our test variables are presented in Table 2. The Pearson (Spearman) correlations are presented above (below) the diagonal. Pre-tax other comprehensive

13 The comprehensive income subsample is smaller due to the unavailability of comprehensive income data from the FR Y-9C reports prior to 2001.
income (\(\text{pCINroADift}_{-1}\)) is positively correlated with Cash Flows\(_t\) and Pre-tax ROA\(_t\), suggesting that fair value estimates included in other comprehensive income are predictive of future cash flows and earnings.

4. Results

4.1. Fair value accounting and predictability of future cash flows

In this section we report the results of our multivariate analyses which test for the association between fair value accounting and future cash flows using both the balance sheet and income statement approaches. Equation (1) estimates the effect of fair value accounting on the predictability of cash flows using the balance sheet approach to measure the extent of fair value estimates used in financial reporting. The results are presented in Table 3. The model includes fixed-year effects and the p-values are two-sided based on standard errors clustered by firm. The primary coefficient of interest is on the interaction between prior-year earnings and the extent of fair value estimates used in financial reporting (Pre-tax ROA\(_{t-1}\) * FVA\(_{t-1}\)). The adjusted r-square of our model is 57 percent and it is comparable to prior research suggesting a reasonable fit (Altamuro and Beatty, 2010). Consistent with findings of prior studies, we find that prior year earnings are predictive of next year cash flows and larger banks have higher future cash flows. The coefficients on Pre-tax ROA\(_{t-1}\) and Log (Assets\(_{t-1}\)) are 0.79 (with a p-value of less than 0.001) and 0.0009 (with a p-value of less than 0.001), respectively. Of most interest to our paper, the interaction between FVA\(_{t-1}\) and pre-taxROA\(_{t-1}\), is positive and statistically significant (coefficient = 0.3272, p-value = 0.018) suggesting that prior year earnings based on a more fair value oriented accounting system are more predictive of future cash flows.

Next, table 4 reports the result of estimating equation (3) which examines the association between earnings and future cash flows using the income statement approach of measuring the
extent of fair value accounting. Specifically, this model tests the association between pre-tax other comprehensive income (ptCINIROAdif_{c,t-1}) and future cash flows. The primary coefficient of interest is on ptCINIROAdif_{c,t-1}. As before, the model includes fixed-year effects and the p-values are based on standard errors clustered by firm. The r-squares of the different specifications of the model range between 58-63 percent suggesting a reasonable fit. In the first two columns of Table 4, we use all observations in the sample to estimate equation (3) irrespective of whether pre-tax other comprehensive income is positive or negative. Similar to the results reported in Table 3, we continue to find that prior year earnings are predictive of future cash flows and larger firms have higher future cash flows. With respect to fair value estimates enhancing the predictive ability of earnings, we find that the more fair value oriented other comprehensive income is incrementally associated with future cash flows after controlling for pre-tax earnings. The coefficient on CINIROAdif_{c,t-1} is positive and statistically significant (coefficient = 0.1003, p-value = 0.049).

We also estimate equation (3) by dividing our sample based on whether pre-tax other comprehensive is positive or negative. The results are presented in the next four columns of Table 4. We find that after controlling for current year pre-tax earnings, the more fair value oriented pre-tax other comprehensive income is incrementally associated with next period cash flows only when the pre-tax other comprehensive income is negative. The coefficient on ptCINIROAdif_{c,t-1} is positive and statistically significant only for the sample where ptCINIROAdif_{c,t-1} is less than zero (coefficient = 0.4025, p-value = <0.001).

In summary, we find that the use of fair values in financial reporting enhances the predictive ability of earnings for future cash flows. More specifically, current year earnings of banks that report a greater proportion of their assets and liabilities at fair value have a higher
association with period cash flows. Further, after controlling for current period pre-tax net income, the more fair value oriented pre-tax other comprehensive income is incrementally associated with future cash flows in the case when pre-tax other comprehensive income is negative.

4.2. Fair value accounting and predictability of future earnings

In this section we investigate whether the use of fair values in financial reporting enhances the predictive ability of current earnings with respect to future earnings using both the balance sheet and the income statement approach. We first report the results of equation (2) which uses the balance sheet approach measure of fair value accounting. The model includes fixed-year effects and p-values are based on standard errors clustered by firm. The results of estimating equation (2) are presented in Table 5. In this model the coefficient of interest is the interaction of pre-tax earnings and the extent of fair values used in financial reporting (Pre-tax ROA$_{t-1}$*FVA$_{t-1}$). The r-square of the model is similar to that reported in prior studies suggesting a reasonable fit. Further, prior-year pre-tax earnings (Pre-tax ROA$_{t-1}$) is positively associated with future earnings (coefficient = 0.9380, p-value = < 0.001) and larger banks (Log Assets$_{t-1}$) have higher future earnings (coefficient = 0.0007, p-value = <0.001). The coefficient of interest, on the interaction of current year earnings and the extent of fair value estimates used in financial reporting, is positive but statistically insignificant at the 10 percent level of significance (coefficient = 0.1750, p-value = 0.18).

Next, we estimate equation (4) using the income statement approach to measure the extent of fair values used in financial reporting. The model includes fixed-year effects and p-values are based on standard errors clustered by firm. The primary coefficient of interest in this
model is of \( \text{ptCINIROAdif}_{1} \). The results are presented in Table 6. We estimate equation (4) using three-different samples – the full sample, a sample comprising of negative pre-tax other comprehensive income observations and a sample comprising of positive pre-tax other comprehensive income observations. The r-squares of the three models estimated using the different samples range between 54 percent and 62 percent suggesting a reasonable fit. We find that current year pre-tax earnings are positively associated with future pre-tax earnings in the full sample and the sample comprising of only positive pre-tax other comprehensive income observations. Larger banks earn higher next year pre-tax earnings only in the sample comprising of positive pre-tax other comprehensive income observations. With respect to fair value estimates enhancing the predictive ability of current year earnings regarding future earnings, we find that the more fair value oriented current year pre-tax other comprehensive income is incrementally associated with future pre-tax earnings in the full sample (coefficient = 0.1053, p-value = 0.037) and the sample comprising of only negative pre-tax other comprehensive income observations (coefficient = 0.2852, p-value = <0.001).

In summary, we find mixed evidence on whether the use of fair values in financial reporting enhances the predictive ability of current earnings for future earnings. For banks that report a greater proportion of their assets and liabilities at fair value, there is no association between current period pre-tax earnings and future pre-tax earnings. However, there is a positive association between the more fair value-oriented current period comprehensive earnings and future pre-tax earnings.

4.3. Economic cycles and the predictive ability of earnings
In this section we report the results of the tests that examine the impact of economic cycles on the relationship between the use of fair value estimates in financial reporting and the predictive ability of earnings. Specifically, we investigate whether more fair value based earnings are less predictive of future cash flows and earnings during periods of high market-wide credit risk versus periods low market-wide credit risk. Our proxy for market-wide credit risk is the excess of Moody’s BAA corporate bond yields over AAA corporate bond yields (Evans et al. 2010). We partition our sample-period into high credit risk years and low credit risk years based on the median of the spread between BAA corporate bond yields and AAA corporate bond yields. The years in which the spread is above (below) the median are classified as high credit risk years (low credit risk years). If fair value estimates are less relevant and/or reliable during periods of economic turmoil, we expect to find that fair value estimates enhance the predictive ability of earnings only in the low credit risk sample years.

To examine the impact of economic cycles on the predictive ability of fair value based earnings with respect to future cash flows, we estimate equation (1) in high credit risk years and low credit risk years separately. The results are presented in Panel A of Table 7. We continue to find that current year pre-tax earnings are associated with future cash flows and larger banks earn higher cash flows during high as well as low credit risk sample periods. However, the increasing use of fair value estimates in financial reporting enhances the predictive ability of earnings with respect to future cash flows only during periods of low market-wide credit risk. The coefficient on the interaction of pre-tax current year earnings and the proportion of assets and liabilities reported at fair value is positive and statistically significant (coefficient = 0.5086, p-value = 0.005) only in the years when the market-wide credit risk is below the median for the entire sample period. In the sample years when the market-wide credit risk is above its median value,
the coefficient on the interaction of Pre-tax ROA_{t-1} and FVA_{t-1} is positive but not statistically significant (coefficient = 0.1801, p-value = 0.260).

Next, we investigate the impact of market-wide credit risk on the predictive ability of fair value based earnings with respect to future earnings. We estimate equation (2) in high credit risk years and low credit risk years separately and report the results in Panel B of Table 7. Similar to findings reported in Panel A of Table 7, we find that current year pre-tax earnings of banks that report a greater proportion of their assets and liabilities at fair value are associated with future pre-tax earnings only during periods of low market-wide credit risk. During the low market-wide credit risk sample years, the coefficient on the interaction of Pre-tax ROA_{t-1} and FVA_{t-1} is positive and statistically significant (coefficient = 0.4451, p-value = 0.007) whereas during the years when the market-wide credit risk is high the coefficient is not statistically different from zero (coefficient = -.1022, p-value = 0.529).

In summary, we find that the use of fair values in financial reporting enhances the predictive ability of earnings only during periods of low market-wide credit risk. During periods of market distress asset prices may reflect the amount of liquidity available in the market rather than the future earnings power of the asset (Allen and Carletti 2008). Hence, when markets are in distress fair value based earnings are less predictive of future cash flow and future earnings because fair value estimates during such periods may be less relevant and/or less reliable.

4.4. Bank size and the predictive ability of earnings

In this section we examine whether bank size has an impact on the predictive ability of earnings to investigate whether larger banks have more precise fair value estimates available. If larger banks have more precise fair value estimates available to them because of their more sophisticated investment departments and larger blocks of securities, we expect that fair values
will enhance the predictive ability of earnings more for larger banks than for smaller banks. To
do this analysis, we partition our sample into large and small banks based on total assets.
Following Nissim and Penman (2007), banks with total assets in excess of $10 billion are
classified as large banks and rest of the sample is classified as small banks.\textsuperscript{14} Then we examine
whether the use of fair value estimates in financial reporting enhances the predictive ability of
earnings for future cash flows and future earnings for a sample of large banks as well as small
banks.

To examine the predictive ability of earnings with respect to future cash flows we
estimate equation (1) for a sample of large and small banks separately. The results are reported in
Panel A of Table 8. The r-square of the model is 54 percent for the large banks sample and 56
percent for the small banks sample, suggesting a reasonable fit across both samples. Also,
current year pre-tax earnings are predictors of future cash flows and larger banks seem to earn
greater future cash flows across both samples. Of most interest to us, the coefficient on the
interaction of current year pre-tax earnings and the extent of fair values used in financial
reporting (Pre-tax ROA\textsubscript{t-1}*FVA\textsubscript{t-1}) is positive and statistically significant in both samples. This
suggests that the use of fair value estimates enhances the predictive ability of earnings with
respect to future cash flows for large banks as well as small banks.

Next, we examine the impact of bank size on the predictive ability of earnings with
respect to future earnings. We estimate equation (2) for a sample of large and small banks
separately. The results of this analysis are reported in Panel B of Table 8. Across both samples,
the r-square of the model is 55 percent suggesting a reasonable fit. Consistent with findings in
the prior literature and findings documented in earlier tables, we find that current year earnings

\textsuperscript{14} Our dichotomous categorization combines Nissim and Penman (2007)’s “very large” and “large” bank holding
company partitions as “large”, and their “mid-sized” and “small” bank holding company partitions as “small”.

- 24 -
are predictors of future earnings. However, fair value enhancing predictability only holds in the large banks sample, not in the small banks sample. Specifically, for the sample of large banks, the coefficient on the interaction of current year pre-tax earnings and the extent of fair value estimates used in financial reporting ($\text{Pre-tax ROA}_{t-1} \times \text{FVA}_{t-1}$) is positive and statistically significant (coefficient = 0.4341, p-value = 0.026). In the sample of small banks the coefficient on the interaction is positive but statistically insignificant (coefficient = 0.1862, p-value = 0.224).

In summary, we find that the use of fair value estimates enhances the predictive ability of earnings with respect to future cash flows and future earnings for large banks. For small banks, while the use of fair value estimates enhances the predictive ability of earnings for future cash flows we do not find any evidence of fair value enhancing the predictive ability of earnings with respect to future earnings. The results provide mixed evidence regarding large banks having more precise fair value estimates that enhance the predictive ability of earnings. Even in the sample of small banks, fair values enhance the predictive ability of earnings for future cash flows.

4.5. Robustness tests

As an alternative measure of cash flows, we use cash flows from operations (OANCF) provided in COMPUSTAT, scaled by lagged assets to further provide additional evidence on the extent to which fair value accounting affects cash flow predictability. Using this measure drastically restricts our sample to 1,366 observations because of the limited availability of cash flows from operations in Bank COMPUSTAT. With this limited sample, we re-estimate equation (1) after replacing the dependent variable with our alternative but direct measure of cash flows. The results of this test also are consistent with our primary results and show that
increase use of fair value accounting improves the ability of earnings to predict future cash flows.\textsuperscript{15}

5. Conclusion

The increasing use of fair values in financial reporting has sparked an ongoing debate about the merits of a fair value accounting based reporting system. We contribute to this debate by examining whether the extent to which fair values are used in financial reporting by banks enhances the predictive ability of earnings with respect to future cash flows and earnings. We find that current year earnings of banks that report a greater proportion of their assets and liabilities at fair value have a higher association with next period cash flows. Further, after controlling for current period earnings, the more fair value oriented comprehensive income is incrementally associated with future cash flows. However, we find mixed evidence of fair value estimates enhancing the predictive ability of earnings for future earnings. For banks that report a greater proportion of their assets and liabilities at fair value, there is no increased association between current period earnings and future earnings. However, there is a positive association between the more fair value oriented current period other comprehensive earnings and future earnings.

We also examine the impact of economic cycles and bank size on the relationship between the use of fair value estimates in financial reporting and the predictive ability of earnings. Our results suggest that fair value enhances the predictive ability of earnings only during periods of low market-wide credit risk. These findings support the view that fair values

\textsuperscript{15} Specifically, when we estimate this specification the coefficient on $Pre$-tax $ROA_{t-1} \times FVA_{t-1}$ is positive and statistically significant (coefficient = 1.3210, p-value = 0.027).
are less relevant and/or reliable during periods of economic distress and during such times asset prices reflect the amount of liquidity available in the market rather than the future earnings power of assets. With respect to bank size, fair value estimates enhance the predictive ability of earnings for both future cash flows and earnings for large banks. However, for small banks, the use of fair values enhances the predictive ability of earnings with respect to future cash flows but not for future earnings.

Our research supports the view of FASB and IASB that fair value accounting meets the objectives of financial reporting by providing decision useful information that helps in the prediction of returns on economic resources (i.e., earnings) and an assessment of the amounts, timing and uncertainty of future cash flows. Our study also has implications for the literature examining the prediction of future cash flows. The findings suggest that it is important to take into account the use of fair value estimates in financial reporting when studying the ability of earnings and its components to predict future cash flows.
References


### Table 1

**Descriptive Statistics**

#### Panel A: Descriptive Statistics—Full sample (N=4518)

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std Dev.</th>
<th>25th Pctl.</th>
<th>Median</th>
<th>75th Pctl.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assets$_t$ (Smillions)</td>
<td>13,709</td>
<td>66,706</td>
<td>602</td>
<td>1,405</td>
<td>4,941</td>
</tr>
<tr>
<td>Log(Assets$_t$)</td>
<td>14.52</td>
<td>1.62</td>
<td>13.31</td>
<td>14.16</td>
<td>15.41</td>
</tr>
<tr>
<td>FVA$_t$</td>
<td>0.229</td>
<td>0.132</td>
<td>0.148</td>
<td>0.221</td>
<td>0.297</td>
</tr>
<tr>
<td>Pre-tax ROA$_t$</td>
<td>0.0179</td>
<td>0.0079</td>
<td>0.0137</td>
<td>0.0180</td>
<td>0.0222</td>
</tr>
<tr>
<td>Pre-tax ROA$_{t-1}$</td>
<td>0.0180</td>
<td>0.0078</td>
<td>0.0139</td>
<td>0.0181</td>
<td>0.0223</td>
</tr>
<tr>
<td>Cash Flows$_t$</td>
<td>0.0207</td>
<td>0.0077</td>
<td>0.0162</td>
<td>0.0204</td>
<td>0.0248</td>
</tr>
</tbody>
</table>

#### Panel B: Descriptive Statistics—Comprehensive income sample (N=2090)

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std Dev.</th>
<th>25th Pctl.</th>
<th>Median</th>
<th>75th Pctl.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ptCIROA$_t$</td>
<td>0.0173</td>
<td>0.0090</td>
<td>0.0119</td>
<td>0.0170</td>
<td>0.0224</td>
</tr>
<tr>
<td>ptCIROAdif$_t$</td>
<td>-0.0002</td>
<td>0.0034</td>
<td>-0.0023</td>
<td>-0.0004</td>
<td>0.0015</td>
</tr>
</tbody>
</table>

**Notes.** Panel A provides descriptive statistics for our main variables of interest for our full sample, which includes bank-year ($t$) observations from 1993 to 2008, taken from bank FR Y-9C reports. *Assets* is total assets (BHCK2170). *FVA* is the extent of fair value accounting, computed as the sum of the assets and liabilities with fair values disclosed in the FR Y-9C reports, scaled by total assets. Further details relating to the calculation of *FVA* are discussed in the text. *Pre-tax ROA* is calculated as income before taxes (BHCK4301) divided by lagged assets. *Cash Flows* is calculated pre-tax net income plus the provision for loan losses (BHCK4230), scaled by total assets. Panel B provides descriptive statistics for variables of interest in our comprehensive income subsample, which includes bank year observations from 2001 to 2008 due to data limitations. In this sample, *ptCIROA* is calculated as pre-tax net income plus other pre-tax other comprehensive income, which is computed other comprehensive income (BHCB511) divided by the maximum statutory corporate tax rate (35% for all years in our sample, and *ptCIROA* is *ptCIROA* minus *Pre-tax ROA*.
Table 2
Correlations

<table>
<thead>
<tr>
<th>Variable</th>
<th>Log(Assets)</th>
<th>FVA</th>
<th>Pre-tax ROA</th>
<th>Pre-tax ROA</th>
<th>Cash Flows</th>
<th>ptCIROA</th>
<th>ptCINiroaDif</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log(Assets)</td>
<td>1</td>
<td>0.05</td>
<td>0.21</td>
<td>0.23</td>
<td>0.24</td>
<td>0.22</td>
<td>-0.06</td>
</tr>
<tr>
<td>FVA</td>
<td>0.00</td>
<td>-0.06</td>
<td>-0.01</td>
<td>-0.01</td>
<td>-0.03</td>
<td>-0.13</td>
<td>-0.08</td>
</tr>
<tr>
<td>Pre-tax ROA</td>
<td>0.87</td>
<td>1</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
<td>0.05</td>
<td>&lt;0.01</td>
<td>0.60</td>
</tr>
<tr>
<td>Pre-tax ROA</td>
<td>&lt;0.01</td>
<td>0.24</td>
<td>-0.06</td>
<td>0.72</td>
<td>0.72</td>
<td>0.65</td>
<td>0.05</td>
</tr>
<tr>
<td>Cash Flows</td>
<td>&lt;0.01</td>
<td>0.26</td>
<td>-0.03</td>
<td>0.78</td>
<td>&lt;0.01</td>
<td>0.09</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Cash Flows</td>
<td>0.26</td>
<td>0.09</td>
<td>&lt;0.01</td>
<td>1</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
<td>0.69</td>
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<tr>
<td>Cash Flows</td>
<td>&lt;0.01</td>
<td>-0.12</td>
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<td>0.93</td>
<td>&lt;0.01</td>
<td>0.76</td>
<td>0.10</td>
</tr>
<tr>
<td>Cash Flows</td>
<td>0.24</td>
<td>-0.08</td>
<td>0.73</td>
<td>0.90</td>
<td>0.74</td>
<td>0.74</td>
<td>0.39</td>
</tr>
<tr>
<td>Cash Flows</td>
<td>&lt;0.01</td>
<td>-0.01</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
<td>1</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Cash Flows</td>
<td>-0.09</td>
<td>-0.05</td>
<td>0.03</td>
<td>0.02</td>
<td>0.10</td>
<td>0.40</td>
<td></td>
</tr>
<tr>
<td>Cash Flows</td>
<td>&lt;0.01</td>
<td>0.04</td>
<td>0.12</td>
<td>0.46</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
<td>1</td>
</tr>
</tbody>
</table>

Notes. Pearson (Spearman) correlations are provided above (below) the diagonal. All variables are defined in Table 1.
Table 3
Cash flow predictability based on level of assets at fair value

\[
\text{Cash Flows}_t = \alpha + \beta_1 \text{Pre-tax ROA}_{t-1} + \beta_2 \log(\text{Assets}_{t-1}) + \beta_3 \text{FVA}_{t-1} + \\
\beta_4 [\text{Pre-tax ROA}_{t-1} \times \log(\text{Assets}_{t-1})] + \beta_5 [\text{Pre-tax ROA}_{t-1} \times \text{FVA}_{t-1}] + \varepsilon_t
\]  

(1)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-0.0022</td>
<td>0.489</td>
</tr>
<tr>
<td>Pre-tax ROA$_{t-1}$</td>
<td>0.7971</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Log(Assets$_{t-1}$)</td>
<td>0.0009</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>FVA$_{t-1}$</td>
<td>-0.0148</td>
<td>0.224</td>
</tr>
<tr>
<td>Pre-tax ROA$<em>{t-1}$*$\log$(Assets$</em>{t-1}$)</td>
<td>-0.0166</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Pre-tax ROA$<em>{t-1}$*$\text{FVA}</em>{t-1}$</td>
<td>0.3272</td>
<td>0.018</td>
</tr>
</tbody>
</table>

Year Fixed Effects       Included

N                          4,518

Adj. R$^2$                  57%

Notes. Variables are defined in Table 1. P-values are based on standard errors clustered by firm.
### Table 4
Cash flow predictability based on items in other comprehensive income

\[ \text{Cash Flows}_t = \alpha + \beta_1 \text{Pre-tax ROA}_{t-1} + \beta_2 \log(\text{Assets}_{t-1}) + \beta_3 [\text{Pre-tax ROA}_{t-1} \times \log(\text{Assets}_{t-1})] + \beta_4 \text{ptCINIROAdif}_{t-1} + \epsilon_t \]  

(3)

<table>
<thead>
<tr>
<th>Variable</th>
<th>All observations</th>
<th>ptCINIROAdif (_{t-1} &lt; 0)</th>
<th>ptCINIROAdif (_{t-1} \geq 0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-0.0045</td>
<td>0.192</td>
<td>0.0021</td>
</tr>
<tr>
<td>Pre-tax ROA(_{t-1})</td>
<td>0.8306</td>
<td>&lt; 0.001</td>
<td>0.5800</td>
</tr>
<tr>
<td>Log(Assets(_{t-1}))</td>
<td>0.0006</td>
<td>0.025</td>
<td>0.0001</td>
</tr>
<tr>
<td>Pre-tax ROA(<em>{t-1}) * Log(Assets(</em>{t-1}))</td>
<td>-0.0080</td>
<td>0.544</td>
<td>0.0130</td>
</tr>
<tr>
<td>ptCINIROAdif(_{t-1})</td>
<td>0.1003</td>
<td>0.049</td>
<td>0.4025</td>
</tr>
<tr>
<td>Year Fixed Effects</td>
<td>Included</td>
<td>Included</td>
<td>Included</td>
</tr>
<tr>
<td>N</td>
<td>2,090</td>
<td>1,157</td>
<td>925</td>
</tr>
<tr>
<td>Adj. R(^2)</td>
<td>60%</td>
<td>63%</td>
<td>58%</td>
</tr>
</tbody>
</table>

**Notes.** Variables are defined in Table 1. P-values are based on standard errors clustered by firm.
Table 5  
Earnings predictability based on level of assets at fair value

\[
\text{Pre-tax ROA}_t = \alpha + \beta_1 \text{Pre-tax ROA}_{t-1} + \beta_2 \log(\text{Assets }_{t-1}) + \beta_3 \text{FVA}_{t-1} + \\
\beta_4 [\text{Pre-tax ROA}_{t-1} \times \log(\text{Assets }_{t-1})] + \beta_5 [\text{Pre-tax ROA}_{t-1} \times \text{FVA}_{t-1}] + \epsilon_t
\]  

(2)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
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<td>0.280</td>
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<td>Pre-tax ROA$_{t-1}$</td>
<td>0.9380</td>
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<tr>
<td>Log(Assets$_{t-1}$)</td>
<td>0.0007</td>
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</tr>
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<td>FVA$_{t-1}$</td>
<td>-0.0184</td>
<td>0.081</td>
</tr>
<tr>
<td>Pre-tax ROA$<em>{t-1}$ \times Log(Assets$</em>{t-1}$)</td>
<td>-0.0079</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Pre-tax ROA$<em>{t-1}$ \times FVA$</em>{t-1}$</td>
<td>0.1750</td>
<td>0.181</td>
</tr>
</tbody>
</table>

Year Fixed Effects: Included

N | 4,518

Adj. R$^2$ | 56%

Notes. Variables are defined in Table 1. P-values are based on standard errors clustered by firm.
Table 6
Earnings predictability based on items in other comprehensive income

\[ Pre-tax \ ROA_t = \alpha + \beta_1 Pre-tax \ ROA_{t-1} + \beta_2 \log(\text{Assets}_{t-1}) + \beta_3 [Pre-tax \ ROA_{t-1} * \log(\text{Assets}_{t-1})] + \beta_4 ptCINIROAdif_{t-1} + \epsilon_t \]

(3)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>p-value</th>
<th>Coefficient</th>
<th>p-value</th>
<th>Coefficient</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.0005</td>
<td>0.899</td>
<td>0.0062</td>
<td>0.181</td>
<td>-0.0093</td>
<td>0.091</td>
</tr>
<tr>
<td>Pre-tax ROA_{t-1}</td>
<td>0.6669</td>
<td>0.001</td>
<td>0.4242</td>
<td>0.134</td>
<td>0.9506</td>
<td>0.001</td>
</tr>
<tr>
<td>Log(Assets_{t-1})</td>
<td>0.0002</td>
<td>0.474</td>
<td>-0.0002</td>
<td>0.461</td>
<td>0.0007</td>
<td>0.077</td>
</tr>
<tr>
<td>Pre-tax ROA_{t-1} * Log(Assets_{t-1})</td>
<td>0.0047</td>
<td>0.735</td>
<td>0.0250</td>
<td>0.175</td>
<td>-0.0185</td>
<td>0.355</td>
</tr>
<tr>
<td>ptCINIROAdif_{t-1}</td>
<td>0.1053</td>
<td>0.037</td>
<td>0.2852</td>
<td>&lt;0.001</td>
<td>0.0392</td>
<td>0.628</td>
</tr>
</tbody>
</table>

Year Fixed Effects Included

N 2,090 1,157 925

Adj. R² 58% 62% 54%

Notes. Variables are defined in Table 1. P-values are based on standard errors clustered by firm.
Table 7
Predictability in periods of high vs. low credit risk

Panel A: Cash Flows

\[ Cash Flows_{i,t} = \alpha + \beta_1 \text{Pre-tax ROA}_{i,t-1} + \beta_2 \log(\text{Assets}_{t-1}) + \beta_3 FVA_{t-1} + \beta_4 [\text{Pre-tax ROA}_{i,t-1} \times \log(\text{Assets}_{t-1})] + \beta_5 [\text{Pre-tax ROA}_{i,t-1} \times FVA_{t-1}] + \epsilon_t \]  

<table>
<thead>
<tr>
<th>Variable</th>
<th>Low Credit Risk</th>
<th>Coefficient</th>
<th>p-value</th>
<th>High Credit Risk</th>
<th>Coefficient</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.0021</td>
<td>0.620</td>
<td></td>
<td>-0.0050</td>
<td>0.214</td>
<td></td>
</tr>
<tr>
<td>Pre-tax ROA&lt;sub&gt;t-1&lt;/sub&gt;</td>
<td>0.7098</td>
<td>0.001</td>
<td></td>
<td>0.8932</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Log(Assets&lt;sub&gt;t-1&lt;/sub&gt;)</td>
<td>0.0008</td>
<td>0.001</td>
<td></td>
<td>0.0010</td>
<td>0.001</td>
<td></td>
</tr>
<tr>
<td>FVA&lt;sub&gt;t-1&lt;/sub&gt;</td>
<td>-0.0144</td>
<td>0.343</td>
<td></td>
<td>-0.0166</td>
<td>0.301</td>
<td></td>
</tr>
<tr>
<td>Pre-tax ROA&lt;sub&gt;t-1&lt;/sub&gt; * Log(Assets&lt;sub&gt;t-1&lt;/sub&gt;)</td>
<td>-0.0204</td>
<td>&lt;0.001</td>
<td></td>
<td>-0.0135</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Pre-tax ROA&lt;sub&gt;t-1&lt;/sub&gt; * FVA&lt;sub&gt;t-1&lt;/sub&gt;</td>
<td>0.5086</td>
<td>0.005</td>
<td></td>
<td>0.1801</td>
<td>0.260</td>
<td></td>
</tr>
</tbody>
</table>

Year Fixed Effects | Included | Included |
N | 2,312 | 2,206 |
Adj. R² | 56% | 58% |

Panel B: Earnings

\[ \text{Pre-tax ROA}_{i,t} = \alpha + \beta_1 \text{Pre-tax ROA}_{i,t-1} + \beta_2 \log(\text{Assets}_{t-1}) + \beta_3 FVA_{t-1} + \beta_4 [\text{Pre-tax ROA}_{i,t-1} \times \log(\text{Assets}_{t-1})] + \beta_5 [\text{Pre-tax ROA}_{i,t-1} \times FVA_{t-1}] + \epsilon_t \]  

<table>
<thead>
<tr>
<th>Variable</th>
<th>Low Credit Risk</th>
<th>Coefficient</th>
<th>p-value</th>
<th>High Credit Risk</th>
<th>Coefficient</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-0.0039</td>
<td>0.278</td>
<td></td>
<td>-0.0016</td>
<td>0.690</td>
<td></td>
</tr>
<tr>
<td>Pre-tax ROA&lt;sub&gt;t-1&lt;/sub&gt;</td>
<td>1.0366</td>
<td>&lt;0.001</td>
<td></td>
<td>0.7934</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Log(Assets&lt;sub&gt;t-1&lt;/sub&gt;)</td>
<td>0.0009</td>
<td>&lt;0.001</td>
<td></td>
<td>0.0004</td>
<td>0.190</td>
<td></td>
</tr>
<tr>
<td>FVA&lt;sub&gt;t-1&lt;/sub&gt;</td>
<td>-0.0140</td>
<td>&lt;0.001</td>
<td></td>
<td>-0.0018</td>
<td>0.564</td>
<td></td>
</tr>
<tr>
<td>Pre-tax ROA&lt;sub&gt;t-1&lt;/sub&gt; * Log(Assets&lt;sub&gt;t-1&lt;/sub&gt;)</td>
<td>-0.0324</td>
<td>0.013</td>
<td></td>
<td>-0.0017</td>
<td>0.912</td>
<td></td>
</tr>
<tr>
<td>Pre-tax ROA&lt;sub&gt;t-1&lt;/sub&gt; * FVA&lt;sub&gt;t-1&lt;/sub&gt;</td>
<td>0.4451</td>
<td>0.007</td>
<td></td>
<td>-0.1022</td>
<td>0.529</td>
<td></td>
</tr>
</tbody>
</table>

Year Fixed Effects | Included | Included |
N | 2,312 | 2,206 |
Adj. R² | 57% | 54% |

Table 8
Predictability by Bank Size

Panel A: Cash Flows

\[ \text{Cash Flows}_{it} = \alpha + \beta_1 \text{Pre-tax ROA}_{t-1} + \beta_2 \log(\text{Assets}_{t-1}) + \beta_3 FVA_{t-1} + \beta_4 \left[ \text{Pre-tax ROA}_{t-1} \times \log(\text{Assets}_{t-1}) \right] + \beta_5 \left[ \text{Pre-tax ROA}_{t-1} \times FVA_{t-1} \right] + \varepsilon_t \] (1)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Large Banks Coefficient</th>
<th>p-value</th>
<th>Small Banks Coefficient</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-0.0472</td>
<td>&lt;0.001</td>
<td>0.0006</td>
<td>0.905</td>
</tr>
<tr>
<td>Pre-tax ROA_{t-1}</td>
<td>2.6816</td>
<td>&lt;0.001</td>
<td>0.7451</td>
<td>0.008</td>
</tr>
<tr>
<td>Log(Assets_{t-1})</td>
<td>0.0034</td>
<td>&lt;0.001</td>
<td>0.0001</td>
<td>0.066</td>
</tr>
<tr>
<td>FVA_{t-1}</td>
<td>-0.0234</td>
<td>&lt;0.001</td>
<td>-0.0167</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Pre-tax ROA_{t-1} \times \log(Assets_{t-1})</td>
<td>-0.1242</td>
<td>0.001</td>
<td>-0.0116</td>
<td>0.554</td>
</tr>
<tr>
<td>Pre-tax ROA_{t-1} \times FVA_{t-1}</td>
<td>0.5184</td>
<td>0.026</td>
<td>0.3656</td>
<td>0.019</td>
</tr>
<tr>
<td>Year Fixed Effects</td>
<td>Included</td>
<td></td>
<td>Included</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>734</td>
<td></td>
<td>3,784</td>
<td></td>
</tr>
<tr>
<td>Adj. R^2</td>
<td>54%</td>
<td></td>
<td>56%</td>
<td></td>
</tr>
</tbody>
</table>

Panel B: Earnings

\[ \text{Pre-tax ROA}_{i} = \alpha + \beta_1 \text{Pre-tax ROA}_{t-1} + \beta_2 \log(\text{Assets}_{t-1}) + \beta_3 FVA_{t-1} + \beta_4 \left[ \text{Pre-tax ROA}_{t-1} \times \log(\text{Assets}_{t-1}) \right] + \beta_5 \left[ \text{Pre-tax ROA}_{t-1} \times FVA_{t-1} \right] + \varepsilon_t \] (2)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Large Banks Coefficient</th>
<th>p-value</th>
<th>Small Banks Coefficient</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-0.0490</td>
<td>&lt;0.001</td>
<td>-0.0030</td>
<td>0.543</td>
</tr>
<tr>
<td>Pre-tax ROA_{t-1}</td>
<td>3.1430</td>
<td>&lt;0.001</td>
<td>0.9059</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Log(Assets_{t-1})</td>
<td>0.0031</td>
<td>&lt;0.001</td>
<td>0.0006</td>
<td>0.057</td>
</tr>
<tr>
<td>FVA_{t-1}</td>
<td>-0.0168</td>
<td>&lt;0.001</td>
<td>-0.0071</td>
<td>0.010</td>
</tr>
<tr>
<td>Pre-tax ROA_{t-1} \times \log(Assets_{t-1})</td>
<td>-0.1465</td>
<td>&lt;0.001</td>
<td>-0.0166</td>
<td>0.362</td>
</tr>
<tr>
<td>Pre-tax ROA_{t-1} \times FVA_{t-1}</td>
<td>0.4341</td>
<td>0.046</td>
<td>0.1862</td>
<td>0.224</td>
</tr>
<tr>
<td>Year Fixed Effects</td>
<td>Included</td>
<td></td>
<td>Included</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>734</td>
<td></td>
<td>3,784</td>
<td></td>
</tr>
<tr>
<td>Adj. R^2</td>
<td>55%</td>
<td></td>
<td>55%</td>
<td></td>
</tr>
</tbody>
</table>

Notes. Variables are defined in Table 1. P-values are based on standard errors clustered by firm. The sample is partitioned based on large banks (over $10 billion in assets) and small banks (under $10 billion in assets).