2010

The Role of Fair Value Accounting in Bank Failures: 2001-2010

Jacob Edward Eugene Spring
Claremont McKenna College

CLAREMONT McKENNA COLLEGE

THE ROLE OF FAIR VALUE ACCOUNTING IN BANK FAILURES

2001-2010

SUBMITTED TO

PROFESSOR ANANDA GANGULY, Ph.D

AND

DEAN GREGORY HESS

BY

JACOB SPRING

FOR

SENIOR THESIS

FALL 2010

11/29/10

Abstract

Over the Past two and a half years banks have failed at the fastest pace since the Great Depression. These rapidly mounting bank failures have rekindled a debate surrounding the use of fair value accounting, with many arguing that fair value has exacerbated the severity of the recent financial crisis through asset devaluation and the forced sale of assets in an effort to meet capital requirements. This paper seeks to test if an entity's exposure to fair value which includes assets available-for-sale, trading assets, and loans held-for-sale as a percent of total assets increases the probability of bank failure through testing different prediction models of bank failure that use ratios generated from publicly available Call Report data. Two models are generated from these ratios, one to determine the significance of an entity's fair value exposure in predicting risk of failure, and the other to determine if a better model can be generated in the absence of the Fair Value Exposure/Total Assets ratio. The first model shows that Fair Value Exposure/Total Assets is a statistically significant ratio, and that the model employing Fair Value Exposure/Total Assets has greater bank failure predictive power than the second model that excludes this ratio. Contrary to expectations, the study determines that greater fair value exposure actually decreases a bank's risk of failure, rather than increases it. A number of possibilities as to why this may be are presented in the conclusion of the paper.

Acknowledgements

I would like to thank Professor Ananda Ganguly for being my thesis reader. His assistance in forming my topic and hypothesis, as well as his continued support throughout the writing process was invaluable to me. His comments and feedback helped me to identify and correct areas of weakness in my thesis, and helped me to generate a more directionally focused work.

I would also like to thank Professor Fan Yu for his assistance in acquiring and compiling a data set suitable to test my hypothesis in his ECON 180 course. Professor Yu was a valuable resource in sorting out econometric questions that presented themselves during the data collection and regression process.

Table of Contents

I. Introduction

The banking industry has long opposed fair value accounting, instead favoring other valuation approaches such as historical cost and amortized cost (Chisnall 2000). It is perhaps not surprising that the banking industry would favor historical and amortized cost approaches because they allows banks to recognize gains in good economic times through selling and immediately repurchasing an asset in the open the market, and defer loss recognition in a down market by leaving the depreciated asset on their balance sheet at historical or amortized cost. This scenario provides the best of both worlds to the banks by placing a floor on asset values, and indirectly allowing banks to recognize gains to immediately report profits in an up market.

The recent financial crisis has once again stoked the fair value debate. According to Moyer (2009) proponents of fair value accounting assert that it is the most relevant valuation of an entity's assets and liabilities, improves transparency for investors to make investment decisions, and serves as disincentive for institutions to hold large quantities of high volatility assets; Opponents, however, believe that fair value accounting merely exacerbates gains and losses reported by these entities, leading to higher earnings volatility. Fair value accounting rules require gains or losses to be reported even on assets that the entity may have no intention of selling at the current market price.

In recent years the Financial Accounting Standards Board introduced two new documents pertaining to fair value accounting: SFAS 157 and SFAS 159. SFAS 157

was issued for the purpose of establishing "a framework for measuring fair value in generally accepted accounting principles (GAAP), and expand[ing] disclosures about fair value measurements." (2007). SFAS 159 expanded the use of fair value, allowing entities to irrevocably elect the fair value option for certain financial instruments and assets.

Following the financial crisis in the fall of 2008 The Emergency Economic Stability Act of 2008 set forth to provide stability through injecting cash into the economy. Banks received 350 billion dollars in an effort to buffer the mounting loan losses and devaluation of a wide array of assets that they faced. In conjunction with the capital injection The Act stipulated that the SEC, Treasury Secretary, and Board of the FED undertake a study of fair value accounting to understand its effect, if any, on the bank failures as of the date of the study. The Act also gave the SEC the discretionary power to suspend the use of SFAS 157 contingent upon the finding of the Mark-to-Market accounting study. The SEC subsequently found that SFAS 157 did not play a pivotal role in the 25 bank failures of 2008 (2008).

II. Literature Review

As mandated by the Emergency Economic Recovery Act the SEC began a study to examine fair value accounting's contribution to instability in the financial markets and the subsequent bank failures occurring in 2008. To do so, the SEC gathered financial report information from banks, and segregated the data of failed banks into three groups defined by their total assets (<$1billion, $1-$10 billion, and >$10 billion) so as to not allow data of smaller failed banks to be skewed by that of the larger banks (2008). In addition to examining the role of fair value accounting on market instability and bank failures the study looked at the effect of fair value on the quality of financial information made available to investors, as well as, possible alternatives to fair value accounting and suggestions for improvement. The SEC study concluded that fair value accounting played a significant role in the reported income of financial institutions; however, the SEC found that the bank failures of 2008 were not a result of fair value accounting, but rather due to mounting credit losses and corroding investor confidence (2008).

A study undertaken by the Boston FED encompassed only large institutions, defined as having more than $100 billion in assets focused on bank regulatory capital, fair value accounting, and their link to the financial crisis. Unlike the SEC study, the Boston FED study was limited to these larger institutions because they have a greater percentage exposure to fair value assets than smaller institutions according to data gathered by the mandated SEC study of mark-to-market accounting. The Boston FED's Shaffer (2010) identified assets held on the balance sheet at fair value, and

which changes in fair value would affect the reported in a calculation of Tier 1 regulatory capital. Additionally, the net effect of changes in fair value assets was looked at to determine whether or not fair value accounting forced distressed assets sales to satisfy necessary levels of regulatory capital. In down markets an entity may be forced to sell some fair value assets to limit losses in an effort to meet regulatory capital requirements, even if the entity plans to hold the asset for the long term, it cannot risk holding the asset because of the possibility of further reducing equity capital and must sell it, further depressing prices. The study concluded that fair value accounting did not lead to forced asset sales, and that it was loan loss provisions, stock dividends, and proprietary trading that led to the destruction of capital.

An early study conducted by Daniel A. Nuxoll (2003) aimed to identify state level economic data that he believed could improve earlier bank failure models that did not include region and state specific economic data. The study used bank failures from the late ‘80s and early ‘90s to examine the impact of a state’s growth in personal income, employment, and disposable income on bank failures. Nuxoll’s study essentially builds off of prior bank failure work using essential variables in the failure of banks including net income, capital, reserves, past due loans, charge-offs, and CAMELS ratings as a control while the significance of state level economic data is tested. CAMELS ratings are a key indicator of a bank’s health, standing for Capital adequacy, Asset quality, Management, Earning, Liquidity, and Sensitivity to market risk. Nuxoll believed that the state level data would help predict bank failures because of the regional nature of the recessions faced by the United States in the late 80’s.

While economists agree that the economic conditions of a region affect the health of that region's banks, Nuxoll's study did not find state level economic data to be significant.

Further examining possibilities for the destruction of capital and potential bank failures, a University of Cambridge study by Amel-Zadeh and Meeks (2010) focused on different triggers for bank failures and whether or not they were caused by fair value accounting. The study broke the triggers into a legal trigger (balance sheet insolvency), an economic trigger, and two regulatory triggers. The study used models to assess the leverage of firms in conjunction with market conditions to test the assertion that fair value accounting leads to more aggressive pro-cyclical leveraging by firms. Also the study looked at AAA tranches of CDOs, regressed against changes in daily Credit Default Swap (CDS) spreads as a potential determinant for default expectations. After analyzing the data, the leverage of firms was not found to be pro-cyclical in nature, and that CDS spreads had no significant explanatory power in the markets assessment of bankruptcy risk.

Laux and Leuz (2009) also address the claims by fair value opponents that mark-to-market accounting leads to excessive write-downs in down markets, outlining potential contagion problems that mark-to-market accounting may cause in a crisis, and identify which items on banks' balance sheets are held at fair value, noting in which cases management has the most discretion in determining the value of such assets. Fair Value assets fall into three Levels: Level 1 being a liquid market with quoted prices that require institutions to report these assets at the value at which

they are traded, Level 2 includes assets whose prices are readily determinable through using similar markets or data, and Level 3 includes assets that are illiquid and whose market prices are not readily determinable. Laux and Leuz (2009) intelligently note that even if banks were to be allowed to report their assets at historical cost that during the financial crisis of 2008 investors would still be concerned about banks that held significant subprime portfolios, even if the assets were being held at historical cost and not currently considered impaired. Furthermore, Laux and Leuz cite three studies: Goh (2009), Kolev (2009), and Song et al. (2009) all of which present data that investors value Level 3 assets at a 20-30% discount from that of Level 1 assets, implying that despite fair value accounting standards these securities are valued less by the market than their more liquid counterparts.

Although there is evidence that Level 3 assets are valued at a discount by investors, the question arises as to why an institution would continue to overestimate the value of these assets if the market is adjusting these inflated values downward in the market cap of the institution. An institution that is one of few players in a thinly traded market may actually force assets into Level 3 classification by discontinuing their trading of an asset that has depreciated in value since acquisition. Milbradt (2010) examines the impact that accounting regulations have on a Bank's trading activity and their ability to meet regulatory capital requirements. The study finds that banks will suspend trading in an effort to avoid price discovery when an asset's true value has fallen below the previous trading price, especially in opaque over-the-counter markets when a bank's own trading activities may negatively impact the

valuation of their assets not traded and left on their own balance sheet. The suspension of trading such assets, and forcing them into Level 3 classification, in essence relaxes regulatory capital requirements and delays losses by meeting regulatory capital requirements through use of inflated values, at the slight expense of a potential monetary penalty only once trading has resumed and price discovery has taken place. The study finds that in cases of asset appreciation the banks have clear incentive to immediately book gains. An unintended consequence of overvaluing assets to meet regulatory capital requirements through the suspension of trading depreciated assets is excessive risk that fixed holding of these devalued trading assets causes. Milbradt's study suggests that fair value assets give an institution more leeway in meeting their capital requirements, and may actually help to reduce a bank's possibility of failure.

Using only publicly available Call Report data Heinke (2010) creates financial ratios for a logit regression to examine determinants of bank failure in absence of CAMELS rating. CAMELS ratings are widely regarded as a key indicator of bank health, but are not publicly available and therefore will not be used as a determinant of bank failure in this study. Through the use of financial variables in a logit model, a binary output model, a given observation in the model will either denote bank failure, or not. The logit model is commonly used in studying bank failures, and is the technique favored by the FDIC.

III. Hypothesis

There are various reasons that a bank may fail according to Amel-Zadeh and Meeks (2010): insolvency (liabilities exceed assets), or if the bank fails to meet regulatory criterion set forth by the government in Tier 1, Tier 2, and Basel capital adequacy rules. To determine failure in each of these ways, great weight is given to the reported value of an entity's assets as a determinant of ability to meet debt and redemption demands while remaining adequately capitalized. Many of these asset values remain constant despite market fluctuations due to the use of historical cost accounting, but trading assets and assets held/available for sale are valued using fair value accounting. The use of fair value accounting as a means through which to value an entity's assets, may have dramatic effect on whether or not the entity is able to avoid failure. The changing valuation of these assets on an entity's balance sheet increases the entity's overall asset volatility, and in down markets may lead to excessive writedowns and inability to meet capital requirements. On the other hand, fair value assets may allow banks significantly greater leverage potential in up markets as fair value assets climb in value and ease the entity's difficulty in meeting regulatory capital requirements. The effect of fair value accounting on banks' balance sheets is greater in down markets than in up markets because of potential contageon problems and because in times of economic crisis the trading value of the fair value assets may deviate from their true underlying economic worth. Such deviatation from underyling value occurs as a result of market uncertaintly, and those forced to sell during these times to meet governmental capitalization criteria may experience exascerbated losses. Through the first half of 2010 86 banks have failed in

comparison to 140 in all of 2009, with only 25 failing in 2008, as seen in Graph 1. As shown by Graph 2 bank failures appear to be gaining steam, and much of the previous research conducted has focused on failures of 2008 and 2009. The increasing number of failures and continuing FDIC liquidation of these assets I believe will put downward pressure on fair value assets held by banks as the FDIC serving as the receiver for many failed banks will put assets into the marketplace as prices intended to induce quick sales, FDIC (Loss Sharing Q&A 2010). As more banks fail I hypothesize that banks that have greater exposure to fair value accounting as compared to their peers will face a higher risk of failure, particulary in down markets such as the recent financial crisis of 2008 because fair value accounting forces losses on many of these assets to be recognized.

IV. Data

Each quarter deposit institutions are required to file a Call Report with the Federal Financial Institutions Examinations Council. The FFIEC website holds Call Report information dating from 2001 to the present. During this time period hundreds of banks have failed, with the bulk of these failures occurring in 2009 and the first half of 2010. The Call Report Data for deposit institutions is available by institution or in bulk, by quarter or by year. It should be noted that since 2001 some of the call report data has changed format including Construction Loans past due and Loans Secured by Non-Farmland past due not being accounted for separately beginning in 2008, and All other 1-4 Family Loans past due not being accounted for separately beginning in 2002. Although FFEIC formatting between years differs slightly for subsections of loans past due the aggregate for each year includes all loans past due for a given bank (2010).

In addition, the FDIC website maintains a list of failed banks dating from October 1, 2000. For the purpose of this study Call Report quarterly observations from the FFEIC will denote failure/non-failure as identified by the FDIC list, and will include information from the beginning of 2001 through the second quarter of 2010, a period in which 276 thrift and deposit institutions have been taken over by the FDIC (2010). Of these 276 institutions identified as failed by the FDIC, 36 are thrift institutions, and because Call Report data only includes information from deposit institutions, thrift bank failures will be excluded from this paper's attempt to explain the 240 failures spanning the last 38 quarterly reporting periods. For the purpose of

this study “Bank Failure” will be defined as depository institutions included on the FDIC failed bank list starting in 2001. Using variables from the Call Reports the following models attempt to explain the dependent variable: a bank’s failure in the three months following a given Call Report.

V. The Logit Model

In this study multivariate logit models are used to generate predictions of bank failures in the three months following a Call Report. The logit regression is a binary dependent variable model denoting bank failure or non-failure. The logit and probit regressions are very similar in nature, but the logit regression employs the logistic distribution function rather than the cumulative standard normal distribution.

The Logit regression is defined as:

$$Pr(F=1|R_1R_2\ldots..R_k) = F(\beta_0+\beta_1R_1+\beta_2R_2+\ldots\beta_kR_k)$$

$$\text{or,} \quad = \quad \frac{1}{1+e^{-(\beta_0+\beta_1R_1+\beta_2R_2+\beta_iR_i)}}$$

Where: β_0 is the constant term of the logit regression, and $\beta_1,\beta_2,\ldots\beta_k$ are coefficients of the financial ratios generated from Call Report data $R_1,R_2,\ldots R_i$ as shown in Table 5.

For the purpose of this study a binary outcome of 1 indicates a bank failure, and 0 indicates that a bank did not fail. Call Reports are informational reports on the condition and income of reporting banks, including balance sheet and income statement information such as different categories of loans and loans past due, the equity of the reporting institution, and assets held by the bank including: held-to-maturity, available-for-sale, and trading. Because not all banks have financial information to report for each of the Call Reports categories, some variables within the call report contain mostly zeros with only a few banks holding assets or loans to report under a particular category. For example: an urban community bank may not engage in the practice of writing or holding loans to farmers, and as such would not

have any values to report for loans to farmers 30-89 days past due, 90+ days past due, and nonaccrual loans to farmers. Since there are 306,195 observations included in the study and a mere 240 bank failures, a large number of zeros contained within a ratio leads to a high correlation to another ratio, or even the dependent variable bank failure, which consists of 305,955 zeros. Highly correlated independent ratios, or high correlations between a ratio and a binary variable present difficulty in estimating the regression, and for this reason the pseudo-R^2 was used to distinguish between which of the highly correlated ratios would be used when the ratios deal with similar ratios representative of an institution's health. Correlations of the ratios are shown in Table 5. The pseudo-R^2 uses the likelihood function to measure the fit of the model, providing an accurate measure of which ratio has a higher percentage of accurate failure/non-failure prediction (Stock and Watson 2007).

Because of the cyclical nature of bank failures, and the potential for larger macro-economic issues outside of the numbers captured within the Call reports to influence the potential for bank failure, a dummy variable representing the financial crisis is included in the regression to indicate if a failure observation occurred during the recent wave of bank failures, or not. The dummy variable represents the incremental effect on a regressions output of an observation occurring within the given period. As a result, the two logit models in this study include a "MacroDummy" which interacts with the logit model if the observation occurs in

2008 or later.[1] The MacroDummy was found to be statistically significant at the 1% level when tested in a univariate logit against failure which is not surprising in light of the wave of bank failures that started in 2008. To test the hypothesis that fair value accounting holds even greater importance in times of downward market pricing, the variable FVtime was generated to see if an entity's fair value exposure had greater predictive power on bank failure during the recent financial crisis than during previous years. In order to do so the fair value exposure measurement was multiplied by the MacroDummy and tested in a univariate logit model against failure. It was found to be significant at the 1% level, with a pseudo R^2 value of 0.0278.

Table 4 shows the univariate logit of each independent ratio and binary against the dependent variable failure to see the statistical significance. Table 4 also shows the pseudo R^2 for each of the univariate logits. Following the generation of a univariate logit for each of the independent variables, a multivariate logit was constructed using ratios that were found to be significant at the 10% level when regressed independently against failure. Beginning with ratios that showed the highest pseudo R^2 values in the univariate logit regressions, additional ratios were added to the model and kept if their significance remained at or below the 10% significance level. Those ratios added to the multivariate logit not found to be significant at the 10% level were removed from the model, as were ratios that were initially significant

[1] A quarterly dummy variable was generated but deemed impractical because of collinearity between the 37 dummies. A yearly dummy was also generated, but found to be insignificant when regressed in the multivariate logits.

at the 10% level but later became insignificant with the addition of other significant ratios.

The following two models are a result of multivariate logit testing including only ratios and dummy variables found to be significant at the 10% level. The first model begins with Total Equity/Total Assets, and then uses the ratio R_8 , Fair Value Exposure/Total Assets, which includes available-for-sale assets, trading assets, and assets held for sale before adding additional ratios . The second model attempts to explain the greatest percentage of bank failure without the use of the Fair Value Exposure/Total Assets ratio, also beginning with the Total Equity/Total Assets ratio.

Model 1:

$$Pr(F=1|R_1R_2\ldots..R_k)=F(-4.626-89.49R_1+9.422R_2+20.43R_3+9.597R_4-3.174R_5-10.96R_7-1.427R_8 +0.640R_{11}+15.33R_{12}+29.61R_{13}-24.77R_{24}-13.83R_{28}+4.847R_{33}+1.973R_{34})$$

$$\frac{1}{1+e^{-(-4.626-89.49R_1+9.422R_2+20.43R_3+9.597R_4-3.174R_5-10.96R_7-1.427R_8+0.640R_{11}+15.33R_{12}+29.61R_{13}-24.77R_{24}-13.83R_{28}+4.847R_{33}+1.973R_{34})}}$$

Model 2:

$$Pr(F=1|R_1R_2\ldots..R_k)=F(-4.868+-89.32R_1+9.296R_2+20.94R_3+9.875R_4-2.827R_5+0.616R_{11} +14.45R_{12}+31.12R_{13}-23.93R_{24}-14.82R_{28}+4.649R_{30}+4.841R_{33}+2.042R_{34})$$

$$\frac{1}{1+e^{-(-4.868+-89.32R_1+9.296R_2+20.94R_3+9.875R_4-2.827R_5+0.616R_{11}+14.45R_{12}+31.12R_{13}-23.93R_{24}-14.82R_{28}+4.649R_{30}+4.841R_{33}+2.042R_{34})}}$$

Tables 1 & 2 define $R_1R_{2..}R_i$ used in model 1 and model 2.

VI. Empirical Results

Of the 34 financial ratios and variables tested in a univariate logit model, all but 9 were found to be significant at the 10% level as indicated by a non-red significance value in Table 4. The ratios not found to be significant at the 10% level include: Secured Loans Past Due 90+/Total Assets, Secured Loans Past Due Nonaccrual/Total Assets, Farmers Loans Past Due 30-89/Total Assets, Farmers Loans Past Due 90+/Total Assets, Credit Card Loans Past Due 30-89/Total Assets, Credit Card Loans Past Due 90+/Total Assets, Credit Card Loans Past Due Nonaccrual/Total Assets, Trading Liabilities/Total Assets, and Surplus/Total Assets. Trading Revenue/Total Assets was found to be significant at the 10% level. Trading Assets/Total Assets was found to be significant at the 5% level.[2]

Total Equity/Total Assets, Loans Past Due 30-89/Total Assets, Loans Past Due 90+/Total Assets, Other Real Estate/Total Assets, Available-for-Sale Securities/Total Assets, Held-to-Maturity Securities/Total Assets, Realized Gains or Losses/Total Assets, Fair Value Exposure/Total Assets, Income/Total Assets, Log(Assets), Log(Equity), Total Loans Past Due Nonaccrual/Total Assets, Secured Loans Past Due 30-89/Total Assets, Farmers Loans Past Due Nonaccrual/Total Assets, C&I Loans Past Due 30-89/Total Assets, C&I Loans Past Due 90+/Total Assets, C&I Loans Past Due Nonaccrual/Total Assets, Restructured Loans Past Due 30-89/Total Assets, Restructured Loans Past Due 90+/Total Assets, Restructured

[2] The dummy generated for observations occurring in 2008 was also found significant at the 5% level, but yearly dummies were not included in the final regressions of the study.

Loans Past Due Nonaccrual/Total Assets, Income Before Taxes/Total Assets, and Earned Surplus/Total Assets were all found to be significant at the 1% level. In addition, the MacroDummy, and FVtime were found to be significant at the 1% level.[3] The yearly dummy variables and the variable FVtime which shows the interaction between the MacroDummy and Fair Value Exposure/Total Assets were not significant when regressed in the multivariate logit models and therefore are not used in either of the two models.

In predicting the failure of a bank using a multivariate logit, ratios that are indicative that an institution may be in poor health will have positive coefficients, contributing to the probability of the model returning a failure output (1). On the other hand, ratios indicative of good health will have negative coefficients reducing the chance of predicted failure, output (0). Table 5 show my expectation of positive (+) and negative (-) ratio coefficients.

Representative of good bank health I believe that the Total Equity/Total Assets and Log(Equity) ratios will have negative coefficients in the bank failure model because as equity increases so does the bank's ability to absorb losses and meet regulatory capital requirements. Also, The Surplus/Total Assets and Earned Surplus/Total Assets ratios will likely have negative coefficients as retention of earnings is a sign of good bank health and that debt and redemptions are being fully serviced. Held-to-Maturity securities/Total Assets are assets held for the long term,

[3] Yearly dummies aside from 2008 and 2005 were found significant at the 1% level. The 2005 dummy was dropped because of perfect collinearity.

and I believe are indicative of conservative bank management and will have a negative coefficient. Realized Gains or Losses/Total Assets will likely have a negative coefficient as Realized Losses/Total Assets will have a negative value, and when multiplied by the negative coefficient of the ratio lead to a higher risk of bank failure and gains which provide additional equity will reduce the risk of failure. Income is a representation of a banks health and therefore the ratios Income/Total Assets and Income Before Tax/Total Assets are expected to have negative coefficients as well.

All categories of loans past due regardless of their delinquency status 30-89,90+, or nonaccrual will likely have positive coefficients as failure to collect payments from clients will limit the ability of a bank to service its debts and meet capital requirements, as the length of delinquency increases the coefficient of the ratio is likely to increase. Other Real Estate/Total Assets I predict will have a positive coefficient because of declining real estate values and because large amounts of assets in this category may be an indication that the bank may have repossessed collateral on their non-performing loans, a representation of poor overall loan portfolio health. In addition to this, real estate has a variety of carrying costs ranging from maintenance to state and federal taxes which make holding excess real estate on the balance sheet both a logistical challenge for banks to handle and harmful to a bank's ability to generate profits. The ratio Available-for-Sale Securities/Total Assets is also predicted to have a positive coefficient because recognition of losses on these assets as they occur may prove obstacles for banks in reaching regulatory capital requirements, and

losses in down markets will outweigh the benefit of gain recognition in up markets. As mentioned earlier in the paper I believe that the Fair Value Exposure/Total assets ratio will be positively related to bank failure, as well as, the MacroDummy because of the economic crisis of the past two and a half years leading to asset depreciation and a wave of bank failures.

To test the impact of fair value accounting on bank failures, two logit models will be created. The first will attempt to achieve the greatest pseudo R^2 using the Fair Value Exposure/Total Assets ratio using only ratios in the model that are at a minimum significant at the 10% level, and the second model will attempt to achieve the greatest pseudo R^2 using as many of the financial ratios that are found to be significant at the 10% level in the multivariate logit, not including the Fair Value Exposure/Total Assets ratio. These two models will serve to show the significance, if any, of a bank's Fair Value Exposure/Total Assets ratio on failure. If an alternate model excluding this ratio generates a higher pseudo R^2 than the first model then the importance of fair value accounting in predicting bank failures can be disproved.

The first logit model uses 13 of the 32 financial ratios generated, and uses the MacroDummy variable. Of these 13 ratios, 9 were found to be significant at the 1% level, 2 at the 5% level, and 2 at the 10% level in the multivariate logit. Table 1 shows the significance levels of the ratios used in the first model, and the pseudo R^2 of the first logit model is 0.5767. Of the ratios significant at the 1% level, Total Equity/Total Assets, Available-for-Sale Securities/Total Assets, Income Before

Taxes/Total Assets, and Reconstructed Nonaccrual Loans/Total Assets all had negative coefficients signifying that increases in any of these categories decreases the probability that the model will predict failure. Fair Value Exposure/Total Assets and Realized Gains or Losses/Total Assets were negatively correlated to bank failure and significant at the 5% and 10% level, respectively.

Significant at the 1% level the MacroDummy, Loans 30-89 Days Past Due/Total Assets, Other Real Estate/Total Assets, Log(Equity), Total Nonaccrual Loans/Total Assets, and Earned Surplus/Total Assets all held positive coefficients increasing the probability of the model predicting failure. Loans 90+ Days Past Due/Total Assets and Secured Loans 30-89 Days Past Due/Total Assets were positively correlated to bank failure and found significant at the 5% and 10% level, respectively.

A second model was generated using the financial ratios generate in Table 5 excluding Fair Value Exposure/Total Assets, See table 2. Although the fair value exposure ratio was found significant at the 5% level in the first model, the possibility exists that another model drawing from the same set of ratios could generate a higher pseudo R^2, and that the addition of the fair value exposure ratio to this second model would not result in a significance level of at least 10% for the fair value exposure ratio.

The second logit model also employs the MacroDummy variable and ratios Total Equity/Total Assets, , Loans 90+ Days Past Due/Total Assets, Other Real Estate/Total Assets, Available-for-Sale Securities/Total Assets, Log(Equity), Total Loans Past Due Nonaccrual/Total Assets, Income Before Taxes/Total Assets, Earned Surplus/Total Assets, Reconstructed Nonaccrual Loans/Total Assets, Loans 30-89 Days Past Due/Total Assets, and Secured Loans 30-89 Days Past Due/Total Assets. Rather than using the Fair Value Exposure/Total Assets ratio the second model uses Trading Assets/Total Assets which is found to be significant at the 10% level in the model, and omits Realized Gains or Losses/Total Assets because it is not significant at the 10% level when added to the model. As in the first model, the predicted coefficient sign was incorrect for Log(Equity), Available-for-Sale Securities/Total Assets, Earned Surplus/Total Assets, Fair Value Exposure/Total Assets, and Reconstructed Nonaccrual Loans/Total Assets. The second model generates a psuedo-R^2 value of 0.5746, lower than the first model, which includes the Fair Value Exposure/Total Assets ratio, by 0. 0021.

In contrast to my prediction of the ratio coefficients included in the model, Fair Value Exposure/Total Assets, Available-for-Sale Securities/Total Assets, and Reconstructed Nonaccrual Loans/Total Assets all had negative coefficients. The model coefficients of these ratios suggest that banks with greater Fair Value Exposure, more Available-for-Sale securities as a percentage of total assets, and more reconstructed nonaccrual loans as a percentage of total assets face a lesser risk of failure. A possible explanation for the fair value and Available-for-Sale coefficients

being positive is that form 2001-2008 asset prices were climbing and may have skewed data from the final two and a half years in which asset prices declined. The highly negative -24.77 coefficient of reconstructed nonaccrual loans may be explainable by some banks taking remedial action against their delinquent loans, and in the process of restructuring and saving many of these delinquent loans to create overall healthier loan portfolio than previous, have experienced some of the restructured loans once again falling into nonpayment. Banks that do not take corrective action on their loans would have no delinquent or nonpaying loans in the restructured category, but may still have a much unhealthier loan portfolio than the bank that undertook the restructuring actions. The strongly negative coefficient suggests that loan restructuring is beneficial to banks, even though many of these loans may relapse into nonpayment.

The ratios Log(Equity), and Earned Surplus/Total Assets have positive coefficients which was contrary to my expectations leading into the study. These positive coefficients may be explainable by the credit freeze that sparked the recession. The credit freeze resulted in many banks not efficiently allocating their capital. If a bank hoards its cash in fears that loans that it makes will not be repaid in full, it may actually face a higher risk of failure as a result of the lost income it was accustomed to generating in normal markets through loans.[4]

[4] Vincent Fernando- "Banks Are Hoarding So Much Cash That You Could Cut It In Half, And It Would Still Be Way Too Much"

The two models are quite similar, and share Psuedo- R^2 values that are within tenths of a percent of one another, with the main difference between the models being that the second eliminates the Fair Value Exposure/Total Assets ratio. The two models have reasonable predictive power of bank failures, but the first model's higher psuedo- R^2 may be an indication that an entity's exposure to fair value accounting as a percent of total assets may be a useful element in determining bank failure.

VII. Conclusion

The aim of this paper was to examine the potential effects of fair value accounting on bank failures through the creation and testing of bankruptcy prediction models. This was done by regressing a bank's exposure to fair value including trading related assets, Available for sale securities, and loans held for sale. The regressions indicate that other variables are more significant in predicting the failure of a bank as the Psuedo- R^2 of the fair value exposure univariate logit is 0.0048; whereas, Total Equity/ Total Assets and Other Real Estate/Total Assets have Psuedo- R^2 values of 0.1291 and 0.1525, respectively. As in previous research capital, loans past due, and income served as strong indicators for bank failure risk. A bank's exposure to fair value as measured by the ratio Fair Value Exposure/Total Assets is significant at the 1% level as an indicator of bank failure in the univariate logit, and significant at the 5% level in the multivariate logit model in which it is used; however, the negative coefficient signifies that greater exposure to these assets actually reduces the probability of bankruptcy.

All previous papers claim that Fair Value accounting has not been responsible for past bank failures, and cite eroding consumer confidence, loan losses, and proprietary trading losses as rational behind the failures. This study suggests that fair value accounting may actually be responsible for keeping banks from failing. Milbradt's (2010) study finds that banks exploit fair value accounting rules through the suspension of trading on some fair value assets to temporarily categorize them as illiquid Level 3 assets and inflate their values to meet regulatory capital requirements

with greater ease. The ability to exploit the characterization of fair value assets may be a reason why greater exposure to fair value lessens the risk of bank failure. The significance of the Fair Value exposure measurement in Model 1 indicates that Fair Value accounting is indeed not responsible for the recent wave of bank failures; rather it is potentially responsible for helping to keep other banks from failing.

Another possibility as to why exposure to fair value assets decrease bank failure risk is that in a time of declining values assets held at fair value will presumably be sold before assets held at historical cost or on an amortized basis when a bank needs additional liquidity because losses on fair value assets will be recognized on the balance sheet whether or not the asset is sold. Rather than recognizing losses on assets held at amortized or historical cost and incur realized losses upon their sale in addition to losses incurred on assets held at fair value, banks would likely sell fair value assets in order to raise capital necessary to meet capital requirements. Banks left with a high percentage of their assets being held at fair value may be an indication that asset sales were not needed to raise capital and signify that the healthiest banks are those with high percentages of their assets being held at fair value.

A third possibility as to the negative relation of fair value assets to failure is the nature of the size of banks failing. Following the crisis huge sums of money were given to large institutions to stay afloat and remain adequately capitalized, a benefit that many of the nation's small banks did not receive. Smaller banks have failed at a

rate far exceeding that of larger institutions. Gordon (2010) notes that regional and community banks have less flexibility over areas and sectors in which they invest than their larger counterparts, which may play a role in larger banks being able to avoid failure.

Under ideal circumstances CAMELS ratings could have been used as an independent variable in determining bank failure, but the ratings are not made public to prevent bad ratings from causing runs on particular banks. CAMELS rating include measurements as to the quality of management and the quality of assets held by the institution. The Call Report data is only able to capture a small piece of the quality of management through earnings reported by the bank and the models' only indication as to the quality of assets is seen through looking at loan losses.

VIII. Suggestions for Future Analysis

Use of non-public information would be of great use in generating a model to test the significance of fair value accounting on bank failure. Access to bank CAMELS ratings would control for the quality management of an institution being tested and give the benefit of controlling for assets quality rather than assuming all assets held under a particular category from bank to bank are in fact worth equivalent amounts. In addition, access to which bank observations fall onto the FDIC's nonpublic troubled bank list might have strong predictive power on future failures.

Future research may also want to control for entity size, limiting analysis to only institutions under a certain asset threshold. Analysis of fair values effect on failure as it pertains only to these smaller institutions would serve as a good compliment to the Boston FED study and perhaps be more relevant than the Boston FED's study of large institutions in light of the size of banks that have dominated the failed bank list over the past year.

IX. Tables, and Graphs

Table 1:
Coefficient and standard error estimates
Logit Bank Failure Model #1

VARIABLES	(1) Failure
EquityAssets (R1)	-90.32***
	(4.254)
MacroDummy (R34)	1.938***
	(0.307)
Loans90 (R3)	21.64**
	(9.052)
OtherRealEstateAssets (R4)	9.476***
	(2.219)
AFSAssets (R5)	-2.957***
	(0.990)
FVexposureAssets (R8)	-1.419**
	(0.630)
LogEquity (R11)	0.655***
	(0.148)
NonaccrualLoansTotalAssets (R12)	15.82***
	(3.835)
IncomebeforetaxTotalAssets (R28)	-14.60***
	(2.402)
EarnedSurplusAssets (R33)	4.869***
	(0.821)
ReconLoansNonacTotalAssets (R24)	-24.58***
	(9.230)
Loans3089 (R2)	9.631***
	(1.006)
Constant	-4.594***
	(0.641)
Observations	301,398

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2:
Coefficient and standard error estimates
Logit Bank Failure Model #2

VARIABLES	(1) Failure
EquityAssets (R1)	-89.32***
	(4.225)
MacroDummy (R34)	2.042***
	(0.309)
Loans3089 (R2)	9.296***
	(2.026)
Loans90 (R3)	20.94**
	(9.829)
OtherRealEstateAssets (R4)	9.875***
	(2.211)
AFSAssets (R5)	-2.827***
	(0.997)
LogEquity (R11)	0.616***
	(0.150)
NonaccrualLoansTotalAssets (R12)	14.45***
	(3.948)
IncomebeforetaxTotalAssets (R28)	-14.82***
	(2.339)
EarnedSurplusAssets (R33)	4.841***
	(0.785)
TradingAssetsTotalAssets (R30)	4.649*
	(2.419)
ReconLoansNonacTotalAssets (R24)	-23.93***
	(9.272)
SecuredLoans3089TotalAssets (R13)	31.12**
	(15.63)
Constant	-4.868***
	(0.639)
Observations	301,398

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3:
Coefficient and Standard error estimates
Model 1 & Model 2 Comparison

VARIABLES	(1) Failure	(2) Failure
EquityAssets (R1)	-89.49***	-89.32***
	(4.294)	(4.225)
MacroDummy (R34)	1.973***	2.042***
	(0.308)	(0.309)
Loans90 (R3)	20.43**	20.94**
	(9.465)	(9.829)
OtherRealEstateAssets (R4)	9.597***	9.875***
	(2.223)	(2.211)
AFSAssets (R5)	-3.174***	-2.827***
	(1.014)	(0.997)
FVexposureAssets (R8)	-1.427**	
	(0.637)	
LogEquity (R11)	0.640***	0.616***
	(0.149)	(0.150)
NonaccrualLoansTotalAssets (R12)	15.33***	14.45***
	(3.954)	(3.948)
IncomebeforetaxTotalAssets (R28)	-13.83***	-14.82***
	(2.614)	(2.339)
EarnedSurplusAssets (R33)	4.847***	4.841***
	(0.729)	(0.785)
ReconLoansNonacTotalAssets (R24)	-24.77***	-23.93***
	(9.247)	(9.272)
Loans3089 (R2)	9.422***	9.296***
	(1.513)	(2.026)
RealizedGLAssets (R7)	-10.96*	
	(6.657)	
SecuredLoans3089TotalAssets (R13)	29.61*	31.12**
	(15.50)	(15.63)
TradingAssetsTotalAssets (R30)		4.649*
		(2.419)
Constant	-4.626***	-4.868***
	(0.649)	(0.639)
Observations	301,398	301,398

Table 4:

Univariate Logit Regressions

Independent variable Pseudo R^2 and significance

Explanatory Variable:	Pseudo R2	Significance			
				=	Significant at the 1% level
Total Equity/Total Assets	0.1291	0.000		=	Significant at the 5% level
Loans Past Due 30-89/Total Assets*	0.0015	0.000		=	Significant at the 10% level
Loans Past Due 90+/Total Assets	0.0017	0.000		=	Insignificant
Other Real Estate/Total Assets	0.1525	0.000	*	=	Iterations limited to 10
Available-for-Sale Securities/Total Assets	0.0305	0.000	**	=	Dropped perfectly predicts failure
Held-to-Maturity Securities/Total Assets	0.0137	0.000			
Realized Gains or Losses/Total Assets	0.0228	0.000			
Fair Value Exposure/Total Assets	0.0048	0.000			
Income/Total Assets	0.0007	0.006			
Log(Assets)	0.0146	0.000			
Log(Equity)	0.0198	0.000			
Total Loans Past Due Nonaccrual/Total Assets	0.0501	0.000			
Secured Loans Past Due 30-89/Total Assets	0.0023	0.000			
Secured Loans Past Due 90+/Total Assets	0.0000	0.676			
Secured Loans Past Due Nonaccrual/Total Assets	0.0001	0.333			
Farmers Loans Past Due 30-89/Total Assets	0.0000	0.908			
Farmers Loans Past Due 90+/Total Assets	0.0009	0.200			
Farmers Loans Past Due Nonaccrual/Total Assets	0.0033	0.000			
C&I Loans Past Due 30-89/Total Assets	0.0225	0.000			
C&I Loans Past Due 90+/Total Assets	0.0034	0.000			
C&I Loans Past Due Nonaccrual/Total Assets	0.0413	0.000			
Restructured Loans Past Due 30-89/Total Assets	0.0203	0.000			
Restructured Loans Past Due 90+/Total Assets	0.0038	0.000			
Restructured Loans Past Due Nonaccrual/Total Assets	0.0382	0.000			
Credit Card Loans Past Due 30-89/Total Assets	0.0000	0.630			
Credit Card Loans Past Due 90+/Total Assets	0.0000	0.791			
Credit Card Loans Past Due Nonaccrual/Total Assets	0.0000	0.909			
Income Before Taxes/Total Assets*	0.0028	0.000			
Trading Revenue/Total Assets	0.0004	0.066			
Trading Assets/Total Assets	0.0006	0.035			
Trading Liabilities/Total Assets	0.0001	0.719			
Surplus/Total Assets	0.0002	0.209			
Earned Surplus/Total Assets	0.0191	0.000			
Yr02	0.0074	0.000			
Yr03	0.0081	0.000			
Yr04	0.0117	0.001			
Yr05**					
Yr06	0.0113	0.001			
Yr07	0.0083	0.000			
Yr08	0.0015	0.011			
Yr09	0.0864	0.000			
Yr10	0.0152	0.000			
MacroDummy	0.1228	0.000			
Fvtime	0.0278	0.000			

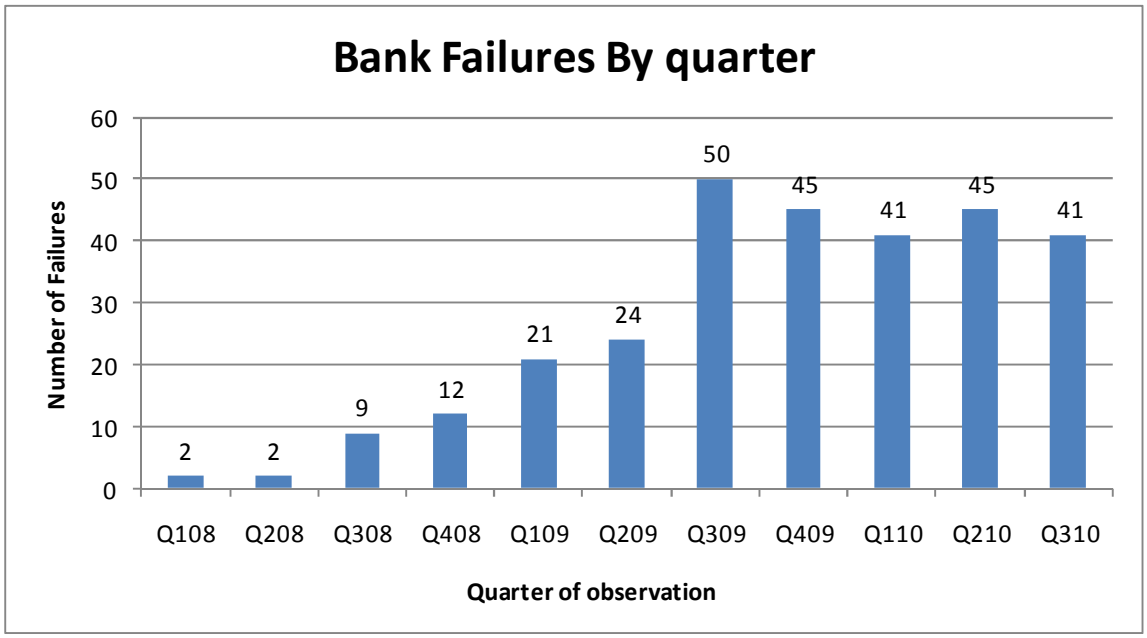
Table 5

Explanatory Variable Correlation to Failure 1 of 2:

Explanatory Variable:	Failure	R1-	R2+	R3+	R4+	R5+	R6-	R7-	R8+	R9-	R10-	R11-	R12+	R13+	R14+	R15+	R16+	R17+
Failure	1.00																	
Total Equity/Total Assets (R1)	-0.02	1.00																
Loans Past Due 30-89/Total Assets (R2)	0.01	-0.03	1.00															
Loans Past Due 90+/Total Assets (R3)	0.01	-0.03	0.17	1.00														
Other Real Estate/Total Assets (R4)	0.13	-0.08	0.02	0.01	1.00													
Available-for-Sale Securities/Total Assets (R5)	-0.02	0.06	-0.05	-0.05	-0.10	1.00												
Held-to-Maturity Securities/Total Assets (R6)	-0.01	0.06	-0.02	0.01	-0.06	-0.24	1.00											
Realized Gains or Losses/Total Assets (R7)	-0.02	0.05	-0.01	-0.01	-0.02	-0.01	-0.01	1.00										
Fair Value Exposure/Total Assets (R8)	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	1.00									
Income/Total Assets (R9)	-0.02	0.08	0.00	0.00	-0.05	0.02	0.00	0.06	0.00	1.00								
Log(Assets) (R10)	0.02	-0.31	-0.05	-0.08	0.04	-0.04	-0.10	0.02	0.00	-0.01	1.00							
Log(Equity) (R11)	-0.01	-0.01	-0.07	-0.08	0.00	-0.01	-0.08	0.04	0.00	0.01	0.94	1.00						
Total Loans Past Due Nonaccrual/Total Assets (R12)	0.05	-0.07	0.12	0.13	0.17	-0.06	-0.05	0.00	0.00	-0.03	-0.01	-0.04	1.00					
Secured Loans Past Due 30-89/Total Assets (R13)	0.01	-0.07	0.29	0.13	0.02	-0.05	-0.03	-0.01	0.00	0.00	-0.03	-0.05	0.13	1.00				
Secured Loans Past Due 90+/Total Assets (R14)	0.00	-0.03	0.08	0.43	0.02	-0.02	0.00	-0.01	0.00	0.00	-0.06	-0.07	0.09	0.17	1.00			
Secured Loans Past Due Nonaccrual/Total Assets (R15)	0.01	-0.03	0.07	0.06	0.06	-0.03	-0.03	0.01	0.00	-0.01	-0.02	-0.03	0.58	0.19	0.08	1.00		
Farmers Loans Past Due 30-89/Total Assets (R16)	0.00	-0.02	0.26	0.18	-0.20	0.00	0.01	-0.01	0.00	0.00	-0.09	-0.10	0.13	0.11	0.08	0.04	1.00	
Farmers Loans Past Due 90+/Total Assets (R17)	0.00	-0.01	0.07	0.63	-0.01	-0.01	0.01	-0.01	0.00	0.00	-0.07	-0.07	0.11	0.04	0.14	0.03	0.26	1.00
Farmers Loans Past Due Nonaccrual/Total Assets (R18)	0.00	-0.01	0.06	0.14	0.01	0.00	0.01	-0.01	0.00	0.00	-0.06	-0.07	0.57	0.03	0.07	0.11	0.22	0.21
C&I Loans Past Due 30-89/Total Assets (R19)	0.02	-0.06	0.28	0.15	0.06	-0.07	-0.04	-0.01	0.00	0.00	-0.04	-0.06	0.16	0.12	0.06	0.06	0.06	0.04
C&I Loans Past Due 90+/Total Assets (R20)	0.01	-0.03	0.10	0.52	0.03	-0.02	-0.01	0.00	0.00	0.00	-0.06	-0.07	0.09	0.07	0.13	0.03	0.06	0.08
C&I Loans Past Due Nonaccrual/Total Assets (R21)	0.05	-0.06	0.07	0.07	0.13	-0.06	-0.05	0.00	0.00	-0.03	0.01	-0.02	0.59	0.05	0.03	0.14	0.03	0.01
Restructured Loans Past Due 30-89/Total Assets (R22)	0.05	-0.02	0.05	0.03	0.10	-0.02	-0.02	0.00	0.00	-0.01	0.02	0.02	0.06	0.03	0.01	0.00	0.00	0.00
Restructured Loans Past Due 90+/Total Assets (R23)	0.01	-0.01	0.02	0.15	0.04	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.01	0.05	0.00	0.01	0.03
Restructured Loans Past Due Nonaccrual/Total Assets (R24)	0.06	-0.03	0.00	-0.01	0.21	-0.03	-0.03	-0.01	0.00	-0.03	0.06	0.04	0.37	-0.01	-0.01	0.05	-0.01	-0.01
Credit Card Loans Past Due 30-89/Total Assets (R25)	0.00	0.04	0.11	0.22	-0.01	-0.04	-0.01	0.01	0.00	0.02	0.06	0.08	0.08	-0.02	-0.01	-0.01	-0.01	0.00
Credit Card Loans Past Due 90+/Total Assets (R26)	0.00	0.07	0.08	0.31	-0.01	-0.04	0.00	0.00	0.00	0.01	0.01	0.09	-0.01	-0.02	-0.01	-0.01	0.00	0.00
Credit Card Loans Past Due Nonaccrual/Total Assets (R27)	0.00	0.01	0.07	0.01	0.00	-0.02	0.00	0.00	0.00	0.01	0.01	0.02	0.16	-0.01	0.00	0.00	0.00	0.00
Income Before Taxes/Total Assets (R28)	-0.02	0.09	0.00	0.00	-0.04	0.01	0.00	0.06	0.00	0.99	-0.01	0.01	-0.03	0.00	0.00	-0.01	0.00	0.00
Trading Revenue/Total Assets (R29)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00
Trading Assets/Total Assets (R30)	0.01	0.00	0.00	0.00	-0.01	-0.02	-0.01	0.00	0.00	0.00	0.08	0.09	-0.01	-0.01	-0.01	-0.01	0.00	0.00
Trading Liabilities/Total Assets (R31)	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.04	0.05	0.00	0.00	0.00	0.00	0.00	0.00
Surplus/Total Assets (R32)	0.01	0.67	-0.02	-0.03	0.00	-0.04	-0.01	0.05	0.00	-0.03	-0.19	0.00	-0.03	-0.05	-0.03	-0.02	-0.02	-0.01
Earned Surplus/Total Assets (R33)	-0.01	0.65	-0.02	-0.02	-0.03	-0.03	-0.01	0.07	0.00	0.41	-0.17	0.01	-0.04	-0.04	-0.03	-0.02	-0.02	-0.01
MacroDummy (R34)	0.04	-0.01	-0.06	-0.07	0.26	-0.05	-0.06	-0.02	0.00	-0.04	0.10	0.10	0.02	-0.14	-0.06	-0.12	-0.02	-0.02

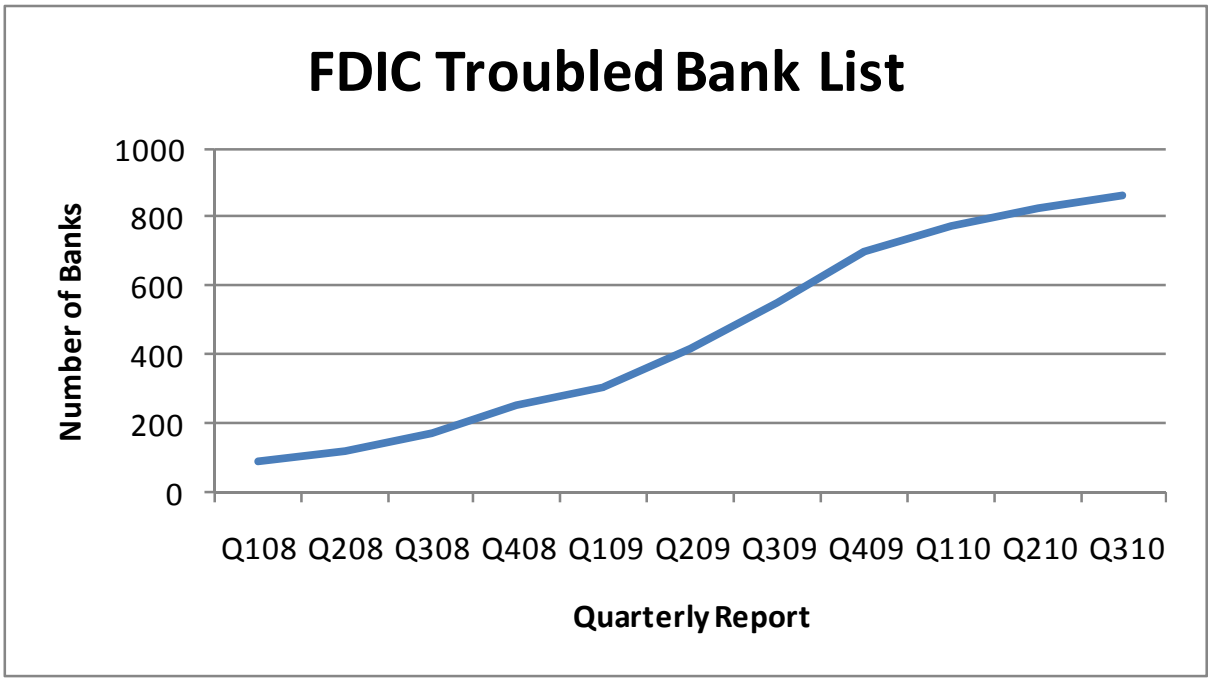
Explanatory Variable Correlation to Failure 2 of 2:																	
Explanatory Variable:	R18+	R19+	R20+	R21+	R22+	R23+	R24+	R25+	R26+	R27+	R28-	R29-	R30+	R31+	R32-	R33-	R34+
Failure																	
Total Equity/Total Assets (R1)																	
Loans Past Due 30-89/Total Assets (R2)																	
Loans Past Due 90+/Total Assets (R3)																	
Other Real Estate/Total Assets (R4)																	
Available-for-Sale Securities/Total Assets (R5)																	
Held-to-Maturity Securities/Total Assets (R6)																	
Realized Gains or Losses/Total Assets (R7)																	
Fair Value Exposure/Total Assets (R8)																	
Income/Total Assets (R9)																	
Log(Assets) (R10)																	
Log(Equity) (R11)																	
Total Loans Past Due Nonaccrual/Total Assets (R12)																	
Secured Loans Past Due 30-89/Total Assets (R13)																	
Secured Loans Past Due 90+/Total Assets (R14)																	
Secured Loans Past Due Nonaccrual/Total Assets (R15)																	
Farmers Loans Past Due 30-89/Total Assets (R16)																	
Farmers Loans Past Due 90+/Total Assets (R17)																	
Farmers Loans Past Due Nonaccrual/Total Assets (R18)	1.00																
C&I Loans Past Due 30-89/Total Assets (R19)	0.03	1.00															
C&I Loans Past Due 90+/Total Assets (R20)	0.04	0.23	1.00														
C&I Loans Past Due Nonaccrual/Total Assets (R21)	0.06	0.24	0.12	1.00													
Restructured Loans Past Due 30-89/Total Assets (R22)	0.00	0.04	0.01	0.03	1.00												
Restructured Loans Past Due 90+/Total Assets (R23)	0.01	0.01	0.05	0.02	0.11	1.00											
Restructured Loans Past Due Nonaccrual/Total Assets (R24)	0.01	0.02	0.00	0.12	0.15	0.08	1.00										
Credit Card Loans Past Due 30-89/Total Assets (R25)	0.00	-0.01	0.00	-0.01	0.04	0.05	0.00	1.00									
Credit Card Loans Past Due 90+/Total Assets (R26)	0.00	-0.01	0.00	-0.01	0.07	0.09	0.00	0.72	1.00								
Credit Card Loans Past Due Nonaccrual/Total Assets (R27)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.59	0.04	1.00							
Income Before Taxes/Total Assets (R28)	0.00	-0.01	0.00	-0.02	-0.01	0.00	-0.02	0.02	0.01	0.01	1.00						
Trading Revenue/Total Assets (R29)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00					
Trading Assets/Total Assets (R30)	0.00	-0.01	0.00	-0.01	0.00	0.00	0.00	0.02	0.02	0.01	0.00	0.05	1.00				
Trading Liabilities/Total Assets (R31)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.22	1.00			
Surplus/Total Assets (R32)	-0.02	-0.02	-0.02	-0.01	0.00	0.00	0.00	0.02	0.02	0.01	-0.01	-0.01	0.01	0.00	1.00		
Earned Surplus/Total Assets (R33)	-0.02	-0.02	-0.02	-0.02	-0.01	0.00	-0.01	0.03	0.03	0.01	0.43	0.00	0.01	0.00	0.90	1.00	
MacroDummy (R34)	-0.02	0.00	-0.01	0.07	0.06	0.02	0.14	-0.01	-0.01	0.00	-0.03	0.00	0.01	0.01	0.02	0.00	1.00

Graph 1:
Mounting Bank Failures



Source: FDIC Failed Bank List

Graph 2:
Number of Troubled Banks



Source: FDIC Quarterly Banking Profiles Q1 2008- Q3 2010

XI. References

Amel-Zadeh, Amir, and Geoff Meeks. *Bank failure, mark-to-market and the financial crisis.* Cambridge: Judge Business School, University of cambridge, 2010.

Appelbaum, Binyamin. *FDIC Packages Loans From Failed Banks: Officials Ink First Deal Under New Plan.* September 17, 2009. http://www.washingtonpost.com/wp-dyn/content/article/2009/09/16/AR2009091603055.html (accessed 10 5, 2010).

FDIC. *Failed Bank List.* 11 10, 2010. http://www.fdic.gov/bank/individual/failed/banklist.html (accessed 10 1, 2010).

—. *Loss Sharing Q&A.* September 23, 2010. http://www.fdic.gov/bank/individual/failed/lossshare/index.html (accessed 10 25, 2010).

—. *Quarterly Banking Profile.* Jan-Sept 2008-2010. http://www2.fdic.gov/QBP/qbpSelect.asp?menuItem=QBP (accessed 11 15, 2010).

Fernando, Vincent. *Banks Are Hoarding So Much Cash That You Could Cut It In Half, And It Would Still Be Way Too Much.* Feb 18, 2010. http://www.businessinsider.com/banks-cash-hoarding-could-halve-and-still-be-too-much-2010-2 (accessed October 24, 2010).

FFIEC. *Search.* 2010. https://cdr.ffiec.gov/public/ManageFacsimiles.aspx (accessed 10 1, 2010).

Financial Accounting Standards Board. *Summary of Statement No. 157.* Norwalk: Financial Accounting Standards Board, 2007.

Goh, Beng Wee. "Market Pricing of Banks' Fair Value Assets Reported Under SFAS 157 During the 2008 Economic Crisis." Working Paper, 2009.

Gordon, Marcy. *Large banks earn billions while small banks struggle: All the banks failing this year are smaller or regional.* September 1, 2010. http://www.tulsaworld.com/business/article.aspx?subjectid=51&articleid=20100901_51_E3_CUTLIN436584 (accessed November 20, 2010).

Heinke, William. "A Bank Failure Model Based on Call Report Data from 2001-2009." Thesis, Claremont, 2010.

Kolev, Kalin. "Do Invesotrs Perceive Marking-to-Model as Marking-to-Myth? Early Evidence from FAS 157 Disclosure." Working Paper, 2009.

Laux, Christian, and Christian Leuz. *Did Fair-Value Accounting Contribute to the Financial Crisis?* Frankfurt, Chicago: Goethe University Frankfurt, University of Chicago, NBER, & ECGI, 2009.

Milbradt, Konstantin. *Level 3 assets: Booking profits, concealing losses*.* Cambridge: Massachusetts Institute of Technology, 2010.

Moyer, Liz. *How Fair is Fair-Value Accounting?* June 25, 2009. http://www.forbes.com/2008/06/24/accounting-banking-sec-biz-cx_lm_0625sec.html (accessed November 10, 2010).

Nuxoll, Daniel A. *The Contribution of Economic Data to Bank-Failure Models.* Daniel a. Nuxoll, 2003.

SEC. *Report and Recommendations Pursuant to Section 133 of the emergency Economic Stabilization Act of 2008: Study on Mark-To-Market Accounting.* United States Securities and Exchange Commission, 2008.

Shaffer, Sanders. *FAIR VALUE ACCOUNTING: VILLAIN OR INNOCENT VICTIM EXPLORING THE LINKS BETWEEN FAIR VALUE ACCOUNTING, BANK REGULATORY CAPITAL AND THE RECENT FINANCIAL CRISIS.* Boston: The Federal Reserve Bank of Bostons: Quantitative Analysis Unit, 2010.
Song, Chang J., Wayne B Thomas, and Han Yi. "Value Relevance of FAS 157 Fair Value Hierarchy Information and the Impact of Corporate Governance Mechanisms." Working Paper, 2009.
Stock, James H., and Mark W. Watson. *Introduction to Econometrics.* Boston: Pearson Education, Inc. , 2007.