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Christopher N. Mitschow

John Carroll University, cmitschow15@jcu.edu

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The Effects of TARP on Fair Value Accounting

by

Christopher N. Mitschow

John Carroll University

Senior Honors Project

Spring, 2015

Abstract

In the aftermath of the financial crisis of 2008, fair value accounting in banks has come under a great deal of criticism by some who believed bank managers were intentionally reclassifying assets to prevent write-downs, or who believed that banks were taking risks with fair value assets and liabilities that caused their distressed states. We analyzed banks' use of fair value accounting by using the SEC's EDGAR database to read and analyze the financial statements of public banks which received Troubled Asset Relief Program (TARP) funds and have since repaid them. We looked to see if banks classified more assets as level 3, the most subjective measurement, to avoid write-downs and/or if they held more or fewer fair value assets or liabilities in their portfolios when distressed. In determining whether or not a bank is distressed, we view a bank as distressed in the quarter prior to receiving TARP funds, and as no longer distressed in the quarter in which the final repayment of TARP funds took place. In our research, we used data such as the ratio of fair value assets to total assets, fair value liabilities to total liabilities, and the composition of fair value assets and liabilities by level (levels 1, 2, and 3) from both when the banks were distressed and when they had become stable again. We find weak evidence for the "classification effect," or the idea that bank managers intentionally reclassified fair value assets when under distress, and strong evidence for the "portfolio effect," or the idea that banks' risk appetites significantly changed during the crisis. This suggests that while the banks' risk appetites changed when they were distressed, they were not intentionally classifying more assets as level 3.

Introduction

The 2008 financial collapse hit banks and other financial firms the hardest. In October of that year, the US Treasury established the Troubled Asset Relief Program (TARP), which authorized expenditures of \$700 billion in an attempt to spur lending and prevent a total collapse of the financial system. This amount was later reduced to \$475 billion by the Dodd-Frank Act. Some people derided TARP as the “bank bailout,” but others believe it prevented a larger collapse in the banking industry and in the economy as a whole. Some also criticized the lobbying of banks to change fair value accounting rules in their favor in the aftermath of TARP (Katz & Westbrook, 2009). Others feared the effect of campaign contributions from banks to the politicians who oversaw TARP (Isikoff, 2009).

With TARP and the financial crisis being such important topics both among academics and among the general public, research on the role of fair value accounting in the financial crisis is valuable. The purpose of this research is to determine whether there is a significant correlation between the levels of fair value assets/liabilities in banks and/or the classifications of fair value assets/liabilities to total liabilities and the distressed or stable state of banks. If such a correlation is found with the ratios that have total assets/liabilities as a denominator, it would suggest that banks are taking different levels of risk when they are distressed than when they are not. If the correlation is with the ratios that have fair value assets/liabilities as a denominator, it would mean that fair value assets/liabilities need greater scrutiny and regulation as it might provide evidence that managers intentionally classified assets as level 3, and might suggest that fair value assets and/or liabilities played a major role in the financial crisis of 2008.

In addition to finding whether the fair value assets/liabilities are correlated with the stability of the bank, it would also suggest that banks use fair value accounting in different ways when under distress. This is an important question to ask because one major piece of the debate

about the financial crisis and its resolution relates to banks' and financial institutions' much greater use of fair value accounting (also known as mark-to-market accounting). Banks classify fair value assets and liabilities as level 1, level 2, or level 3. A level 1 asset is one for which a fair value need not be estimated; it is observable in the market. For example, a T bill or stock from a publicly traded company has an observable market price established independently of the company that holds it. A level 2 asset is one whose price is determined using a model that is based on level 1 assets. For example, a stock option is not sold on the open market but there are models, such as the Black Scholes Option Pricing Model (Black & Scholes, 1973), which are commonly accepted as establishing a price. A level 3 asset is one for which the value is largely an estimate. A company can determine its own model for measuring the asset value as well as the inputs. Most financial derivatives are level 2 or 3 assets that are generally used to hedge against various types of company-specific risk. These derivatives exist to cover a wide variety of potential risks, including foreign exchange risk, interest rate risk, and even risks from changes in weather. Valuation of these derivatives and fair value assets can therefore be very difficult, and this raises some major criticisms about the way in which fair value accounting was used during the financial crisis.

In the aftermath of the financial crisis, there was criticism as to the possibility of bank managers actively classifying fair value assets and liabilities as level 3 to take advantage of the ability to use internally developed models to value them (Webinger et al. 2013). There were also concerns as to the risk appetites of banks when they were distressed and whether or not TARP affected the willingness of banks to take risks in areas including investments and lending (Black & Hazelwood, 2013). With this in mind, we have two testable hypotheses. First the portfolio effect, banks will have a higher appetite for risk when they are not distressed, meaning that banks

under distress will have lower levels of fair value assets relative to total assets. Second the classification effect, banks under distress will have higher level 3 assets and liabilities as a percentage of fair value assets and liabilities, to reflect management opportunism in intentionally classifying assets and liabilities as level 3.

Literature Review

The 2008 financial collapse and its aftermath provide a large literature base and many potential questions to study. Some early questions regarding the collapse and TARP revolved around whether or not TARP succeeded in its goals of increasing lending from the banking industry, preventing a larger collapse of the banking industry and of the general economy (Li, 2010), and relieving businesses and homeowners that were under distress (Barofsky, 2012). Others held a more negative view of TARP, arguing that banks gained competitive advantages or that TARP increased “moral hazard” (Black & Hazelwood, 2013) (Berger & Roman, 2013). Other research questions focus on the effects of fair value accounting, whether it contributed to the crash and recession (Laux & Leuz, 2009), whether it is associated with risk (Lev & Zhou, 2009), and whether banks were opportunistic in classifying these assets to avoid excessive write downs (Webinger et al. 2013).

In terms of evaluating TARP’s success, there is good evidence that TARP likely prevented a larger collapse of the banking system and the overall economy. According to Li (2010) research, TARP did succeed in increasing lending by large banks, but there were still complaints that some banks simply held on to significant amounts of the money. Even so, the increase in lending by large banks would mean that TARP had a significant and positive economic impact.

However, this does not mean that TARP's implementation was not criticized. One important criticism of the program is that TARP as it was implemented was only directed toward banks and other financial institutions, and not toward other businesses or homeowners who were being foreclosed upon (Barofsky, 2011). This was true despite the fact that the act of Congress that created TARP authorized the Treasury to modify mortgages to maintain ownership. In other words, TARP was only successful in stabilizing the banks, and not in any broader purpose it may have had for individuals and other businesses. This might show that the overall economic impact of TARP may not have been as large as it was intended to be.

A major piece of the debate about the financial crisis and its resolution relates to banks' and financial institutions' much greater use of fair value accounting (also called mark-to-market accounting). Some people believed that much of the reason for the crash was that the fair market value of these assets (particularly levels 2 and 3) declined very rapidly (faster and more severely than their true value), thus causing banks to record massive losses and investor panic. According to Lev and Zhou (2009), however, the real issue is not fair value assets, which are mostly level 1 or 2 (though level 3 assets would create this concern), but with fair value liabilities, which are mostly level 2 or 3 and therefore concern investors much more due to the level of risk. Most existing academic research on this issue has focused on the question of whether or not the way banks have used fair value accounting was a contributing factor in the financial collapse of 2008. For example, Lev and Zhou (2009) research suggested that an investor "flight to quality" was mostly the result of excess level 2 and 3 assets and liabilities. However, other papers have concluded that there was not an excessive devaluation of these assets (i.e. a write-down larger than the actual decline in the assets' value) to cause investor panic. Laux and Leuz (2009) find that fair value accounting did not cause these write-downs of the fair value assets larger than the

actual decline in their value. In fact, they state that they found more instances of overvaluation than undervaluation. This would seem to suggest that fair value accounting is not the problem, and may actually have helped secure the banking system (Laux & Leuz, 2009).

Other academic studies have focused on the question of moral hazard or increased risk taking in banks because of TARP. The idea of moral hazard can be described as asking the question of whether banks will take these great risks again because they believe the federal government will bail them out. According to Black and Hazelwood (2013), risk-taking tended to increase at large TARP banks and decrease at small TARP banks. Part of this may be explained by the Li (2010) study, which stated that larger banks increased lending more (and thus to riskier debtors), but it could also be an argument that TARP did increase moral hazard, as the failure of large banks would be more likely to concern the federal government enough to consider a bailout, which would not be the case for failure of smaller banks. Lending some credence to this argument, another study found that banks with more exposure to risky level 3 assets tended to have better political connections (Kostovetsky, 2011). However, this research did not answer whether they took the risk because of their political connections or pursued the connections because of increased risk.

Another question that has been asked is whether TARP caused misallocation of funds and distortion of competition. Berger and Roman (2013) found that banks that received TARP funds and paid them back early gained significant competitive advantages. They also found that TARP and other banking guarantees did distort competition and cause the misallocation of funds (Berger & Roman, 2013). This suggests that it is possible that TARP itself could change the ratio of fair value assets and liabilities to total assets and liabilities. We control for this by selecting the period before the receipt of funds and of repayment of TARP funds. Since the balance sheet

reflects balances at the end of the period, the ratios for banks when they were not distressed would not be affected by the presence of the funds.

Research on whether bank managers may have been opportunistic in classifying fair value assets has also already been done, particularly in light of SEC guidance enabling managers to reclassify more fair value assets into level 3. However, even with this guidance in place, Webinger, Bloom, and Comer (2013) find that no evidence that financial firms abused the latitude inherent in FSP 157-4. They do find an increase in fair value disclosures, which was something we also noticed as we gathered data from bank statements using the SEC's EDGAR database. We similarly examine if more fair value assets or liabilities are composed of levels 2 and/or 3 during the recession using banks which received and repaid TARP funds. Webinger, Bloom, and Comer use a sample consisting of 122 Fortune 1000 financial firms in 2007 that survived in 2009. Since our research focuses on banks which received TARP funds, and not just the largest ones, we can analyze this research question from a different perspective. Furthermore, in focusing on TARP specifically, we can have a better idea of whether a bank's state of distress would make them more or less likely to abuse the SEC's guidance.

We intend for our research to be integrated with the existing literature in that we will use the actual balance sheets and financial data from the banks to answer questions that the existing literature raises. Past research suggests that we should control for bank size in our data collection, as that seems to be a determining factor for what actions banks undertake. Another important variable is the level of the fair value assets and liabilities, as this is likely to be a good measure of how risky the banks' portfolio truly is.

The Lev and Zhou (2009) study along with the Black and Hazelwood (2013) research can allow us to gather some information for the question of banks' appetites for risk in the immediate

aftermath of the housing bubble crash. The Laux and Leuz (2009) study and the Webinger, Comer, and Bloom (2013) research both provide a basis for the question of management opportunism or whether the managers used potentially problematic fair value accounting to reclassify assets to avoid write-downs of the banks' fair value assets. Other research gives us an idea of what variables to control for, such as the Berger and Roman (2013) research and Kostovetsky (2011) paper on banks with high level 3 assets. The existing literature gives us a solid basis for our research questions.

Methodology

We have obtained the financial statements of public banks which received TARP money for the quarter before receipt and for the quarter of final repayment. Using the SEC's EDGAR database, we were able to look at these financial statements for the period immediately before receiving a bailout and the period in which the bailout money is paid back. We gathered data such as total assets, liabilities, fair value assets and liabilities by level for the 153 public banks in our sample. We then used SPSS to run T-tests to measure differences in means and logit regressions to measure changes based on whether the bank is distressed. We represent this with a binary variable, with 1 representing a bank while distressed and 0 while not distressed.

In our analysis, we use ratios, such as fair value assets to total assets, fair value liabilities to total liabilities, ratios based on which level the assets and liabilities are in, as well as the balance sheet data itself. Should one or more of these prove to be significantly correlated with the "distressed" variable in these regressions, it could suggest that fair value assets and/or liabilities are treated differently when the banks are distressed versus when they are not. After this portion of data analysis is complete, the results are compiled into several tables showing data such as the number of observations, the test statistic, and the p value, among others.

In terms of analyzing the data, whichever level(s) or ratio(s) are correlated most strongly with the binary “distressed” variable are the ones which are most likely to be treated differently during a crisis. In our data collection, the majority of fair value assets banks hold appear to be level 2, so these assets are particularly likely to be a main driver behind any such correlation involving fair value assets.

One problem we ran into in conducting this research was what to do with banks’ netting adjustments on their fair value assets. Since these netting adjustments were not separated by level, we show each level “as is” but include the netting adjustment in the total fair value asset figure. This allows us to have an accurate level of risk both for expressing each level as a percentage of total fair value assets (though all percentages in this ratio will be higher), as well as for the ratio of fair value assets to total assets.

Another point to note was the much lower n for the ratios of level 1, 2, and 3 fair value liabilities to fair value liabilities. This is because many banks, particularly smaller banks, do not have fair value liabilities, so for the other ratios involving them, the result would be zero, but for the ratios just mentioned, zero appears in the denominator, so there is no valid result to give in these cases.

For our research, we ran three logit regression models. The first two models test ratios of fair value assets/liabilities to total assets/liabilities, the first one in aggregate and the second one broken down by level. This measures what we call the “portfolio effect,” or a bank’s willingness to hold these assets or liabilities. The third model tests ratios of the level 1, 2, and 3 assets/liabilities to fair value assets/liabilities. This measures the “classification effect,” or whether banks may have placed these assets into different levels before receiving TARP versus after they paid it back.

Results

As explained in the methodology section, we ran descriptive statistics, a pairwise test of means, and a logit regression under three different models with “distressed” as a binary variable, with 1 representing a distressed bank and 0 representing a bank after it has repaid TARP funds. Overall, we find evidence to support the portfolio effect; banks have a lower appetite for risk when distressed. We find weak support for the classification effect; managers classify more fair value assets as level 3 when distressed.

The pairwise test of means establishes a significant difference in means for the ratio of fair value assets to total assets, the ratios of levels 2 and 3 assets to both total fair value assets and total assets, and level 1 liabilities to total liabilities. We give these variables further analysis with a logit regression to see if these differences in the variables have any predictive power, since the test of means establishes some evidence for both a “portfolio effect” and a “classification effect.”

(Insert Table 2)

The test of means shows very strong evidence (p value <.001) that the ratio of fair value assets to total assets is significantly lower when banks are distressed, and that this difference is driven primarily by level 2 assets. There is evidence (p value = .014) that the ratio of level 3 assets to fair value assets is higher when a bank is distressed, while the ratio of level 2 assets to fair value assets is lower (p value = .028). In fair value liabilities, there is evidence that level 1 liabilities are lower when a bank is distressed (p value = .041), and marginal evidence of higher level 3 liabilities (p value = .074).

We ran the logit regression using three models. For the first model, only the ratios of fair value assets to total assets and fair value liabilities to total liabilities are used. The second model uses the ratios of fair value assets and liabilities by level to total assets or liabilities. The third

model looked to see if the composition of fair value assets or liabilities changes (i.e. there are more or fewer assets or liabilities of a particular level within fair value assets or liabilities). The first two of these models help determine the portfolio effect; banks' appetites for risk change when they are distressed. While the last one helps explain the classification effect; whether managers are being opportunistic and, for example, moving level 2 assets into level 3 to take advantage of the increased subjectivity of the estimates.

(Insert Table 3)

Model 1 finds that both variables are significant in predicting whether or not a bank is distressed. When a bank is distressed, the ratio of fair value assets to total assets is significantly lower, while the ratio of fair value liabilities to total liabilities is significantly higher. This suggests that banks' fair value liabilities increased, so they were not willing to accept as much risk in fair value assets. Model 2 shows that this effect is mostly driven by level 2 fair value assets. This was the expected result, as a majority of fair value assets that banks hold fall in level 2. We suspect that level 2 liabilities are a driver for Model 1's findings regarding fair value liabilities but are unable to find significant results likely due to lack of power. Part of the reason for this is that not all banks have fair value liabilities, so they are not present in the data as the denominator for the ratios would be zero.

Model 3 asks the question of whether managers reclassified their fair value assets within the levels. We do not find support for this hypothesis. None of the p values are close to where they would have to be to support the hypothesis. We can only conclude that the proportion of fair value assets/liabilities for each level cannot predict the distressed or stable state of a bank.

Taken together, we find no compelling evidence from the logit regression for the classification effect or that bank managers have been opportunistic in reclassifying their fair

value assets or liabilities into higher levels to take advantage of increased subjectivity in the estimates for the values of these assets and liabilities. We do find evidence for the portfolio effect or that banks have a lower appetite for risky fair value assets when they are distressed, and that level 2 assets are the primary driver of this difference.

Conclusion

In conducting tests for our three models, we do not find strong evidence for the idea that bank managers were intentionally opportunistic in reclassifying fair value assets and liabilities in order to avoid massive write-downs in their value. However, we find significant evidence that banks' risk appetites were lower when they were distressed, and increased again after complete repayment of TARP funds. This suggests that even though banks' risk appetites had changed, there was no intentional reclassification of assets into level 3.

These results are important in that they support other studies that find that bank managers did not abuse SEC guidance to reclassify assets, supporting the Webinger, Bloom, and Comer (2013) research. We find support for the "portfolio effect" in models 1 and 2 of the logit. The recession changed banks' risk appetites, which in turn can help us understand how banks approach risk when they are under significant distress. The Laux and Leuz (2009) study suggests that we can rule out the idea that the decrease in these fair value assets has to do with excessive write-downs of these assets as the market crashed. We can also rule out the effects of volatility in options markets as the market crashed, as we would expect level 3 assets (derivatives) to undergo a similar crash, which they did not. In doing so, we can see that banks hold more level 2 assets as they are able to repay their TARP funds. This is important in seeing whether or not banks' willingness to take risks in other areas changed from the time immediately before receipt of TARP funds to the time immediately after these funds were repaid.

In seeing that risk appetites changed as a result of the financial crisis and the banks' distressed states and by finding strong evidence for a "portfolio effect," we can see the implications this might have for financial crises in the future. If banks have lower risk tolerance when they are distressed, then it is possible to advocate policy action that would rectify this and enable banks to lend money to people even during times of financial distress. Similarly, if risk taking is too high when banks are not distressed, more regulation of fair value assets and liabilities may be necessary, as these are important indicators of risk.

Future studies could build on our research by focusing on the period immediately after receipt of TARP funds, which would enable us to see if TARP funds themselves changed bank risk appetites. This would also build on the Li (2010) study by providing another way to determine whether banks did simply hold onto the TARP money rather than lending it out. Another study could also approach the question of whether banks with more fair value assets during the financial crisis repaid their TARP funds sooner than banks with fewer such assets.

In other words, this research is important in supporting other research that has already been done, but also proposes new questions about the behavior of banks and management during a financial crisis. Other research will be able to build on the conclusions reached in this study to be able to answer other questions about the crisis, TARP, and risk taking behavior in banks in the United States.

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Tables

Table 1: Descriptive Statistics

	N	Mean	St Dev	Min	Max
Distressed	310	.5	.501	0	1
TA	307	75141.85	310103.49	286	2251469
TL	307	68795.7	284994.32	252	2105626
FVA	306	25848	119962.04	0	840133
FVL	306	8493.25	48558.02	-21785	386732
L1/FVA	297	.04955	.13312	0	1
L2/FVA	305	.94075	.311441	0	4.445
L3/FVA	305	.05271	.131371	-.014	1
L1/FVL	139	.11174	.229695	0	1
L2/FVL	139	1.103343	1.157681	0	8.117
L3/FVL	139	.10946	.258333	0	1
L1/TA	306	.00887	.025088	0	.169
L2/TA	306	.17364	.120488	0	.913
L3/TA	306	.00796	.016174	-.003	.096
L1/TL	304	.002109	.0108936	-.013	.0993
L2/TL	304	.018279	.0918469	-.0815	.8232
L3/TL	304	.001125	.0047668	-.0074	.0399

Table 2 Test of Means¹

Variable	Mean difference	t statistic	p value
FVA ²	-1938.862	-1.160	.248
FVL ³	1055.9697	.684	.495
FVA/TA ⁴	-.044390121	-8.235	.000***
FVL/TL ⁵	-.000439305	-.500	.618
L1A ⁶ /TA	.00010	.062	.950
L2A/TA	-.05327	-8.756	.000***
L3A/TA	.00213	.00420	.043**
L1L ⁷ /TL	-.00056	-2.061	.041**
L2L/TL	-.00479	-1.597	.112
L3L/TL	.00048	1.799	.074*
L1A/FVA	-.006693678	-.493	.623
L2A/FVA	-.064390934	-2.214	.028**
L3A/FVA	.0267767181	2.492	.014**
L1L/FVL	.0180321747	.603	.549
L2L/FVL	-.125627962	-1.120	.268
L3L/FVL	-.001245804	-.081	.936

¹ The mean difference of a firm's level of a particular variable immediately preceding the acceptance of TARP funds and immediately following the repayment of TARP funds.

² Fair Value Assets

³ Fair Value Liabilities

⁴ Scaled by Total Assets

⁵ Scaled by Total Liabilities

⁶ Level one Fair Value Assets

⁷ Level one Fair Value Liabilities

Table 3: Binary Logistic Regression

	Model 1 (FVA/TA(L))	Model 2 (Levels/TA(L))	Model 3 (Levels/FVA(L))
FVA/TA	-.6.733 (.000***)		
FVL/TL	8.149 (.017**)		
L1A/TA		-.141 (.987)	
L2A/TA		-7.723 (.000***)	
L3A/TA		10.673 (.270)	
L1L/TL		-6.908 (.700)	
L2L/TL		4.531 (.104)	
L3L/TL		49.577 (.279)	
L1A/FVA			-1.579 (.524)
L2A/FVA			-.812 (.325)
L3A/FVA			2.780 (.273)
L1L/FVL			1.141 (.181)
L2L/FVL			.089 (.663)
L3L/FVL			.011 (.988)
N	306	304	139
Cox & Snell R Square	.071	.100	.044
Nagelkerke R Square	.094	.133	.058