Arkansas Banks vs. Florida Banks and the Subprime Mortgage Crisis

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In the wake of the Great Recession, Arkansas banks found themselves across the negotiating table from Florida banks in transactions backed by the FDIC. The goal of this research is to identify performance characteristics that contributed to Arkansas banks having a stronger balance sheet prior to and during the crisis. The study finds that Arkansas banks are more conservative in having smaller percentage of their assets devoted to loans and a smaller percentage of their loans devoted to real estate. Arkansas banks are also more conservative in assessing the credit risk of their loan portfolios.

INTRODUCTION

> *"A financial crisis is a disruption to financial markets in which adverse selection and moral hazard problems become much worse, so that financial markets are unable to efficiently channel funds to those who have the most productive investment opportunities"* Frederic S. Mishkin

The Great Recession put a significant strain on the US economy and helped to unveil gross lack of regulation and excessive risk taking by the financial services industry. The main problem behind the credit meltdown was subprime mortgage lending. In the US, the subprime mortgage market has a rightfully earned negative perception in the US. However, the intent of its creation was positive. The market provided a path to homeownership to millions of Americans whose credit history would not allow them to qualify for a prime mortgage. The downside of such loans is a default rate that is six times higher than on prime mortgages (Chomsisengphet et. al., (2006)). Prior to 2005, subprime mortgage lending averaged about 8% of all mortgages originated in the US, by the end of 2006, the portion of subprime mortgages climbed to 20% (Krinsman (2007)). The dramatic spike was the result of insufficient regulation of the underwriting process, which in addition to lax standards pertaining to due diligence of the underwriters, allowed for stated income mortgages that did not require borrowers to prove their income. Low mortgage rates and rising real estate values, as well as the willingness of investment banks to purchase and securitize mortgages in the secondary markets created a perfect storm that swept up the nation's most regulated industry into a swift and violent collapse. Indeed, Demyanyk et. al., (2011) states that the evidence of the upcoming crisis was apparent long before the downfall began, however, rising real estate prices in 2003 through 2005, helped to obscure the evidence of the impending problems.

Credit rating agencies, compensated by the very entities they were analyzing, were willing to assign investment grade credit ratings to collateralized debt obligations (CDOs) laced with subprime mortgages, in large part because they were projecting unsustainable growth in the value of US real estate to continue in perpetuity. The deregulation, subprime lending, interest only lending and negative amortization loans

helped to further inflate real estate values, which in turn perpetuated poor lending practices (Pavlov et. al., (2010)). According to Pavlov, US regions that experienced greater degrees of subprime lending, demonstrated higher growth rates in real estate prices and subsequently experienced greater declines in real estate prices. The warning signs have been there long before the crises unfolded, Andrews (2007) stated that seven years prior to the credit crunch, a Federal Reserve Governor, Edward Gramlich, tried to sound an alarm, warning that a new generation of mortgage lenders was using unsavory practices in order to lure subprime borrowers into mortgages that they potentially could not afford.

In fact, loan originators were able to sell the mortgages in the secondary markets with absolutely no recourse, while pocketing the hefty fees, this breed of unregulated lenders used these tactics and helped to further exacerbate the eventual crisis. Piskorski et. al., (2010) and Keys et. al., (2010) find that default rates are significantly lower on loans that banks originate and hold on their books than on loans that banks originate and sell in the secondary markets. Thus, the ability to shift risk post origination process intensified moral hazard and resulted in greater lending to borrowers not capable of ever paying back the loans. The subprime crisis impacted commercial lending as well, Santos (2011) finds that firms that borrowed money from banks that incurred large losses tended to pay higher spreads and were able to borrow less per transaction, than firms who borrowed from healthier banks that avoided the subprime markets.

Indeed, the Great Recession was the greatest crisis since the Great Depression of the 1930s. Bernanke (1983) finds that in addition to the reduction of the money supply and the reduction in the wealth of bank shareholders, a credit crisis reduces the ability of financial intermediaries to bridge the information gap between market participants, lenders and borrowers. As a result, the credit tightens further and the borrowing costs increase, which further intensifies the economic downdraft. Even though there are many similarities between the Great Depression and the Great Recession, there are some obvious differences (Mishkin (2011) and Brunnermeier (2009)) instead of the 1930s style bank with people lining up at the banks, the money flowed out electronically or was simply not lent to banks on short term basis by lenders who required the use of existing mortgage bank securities on the banks' balance sheet as collateral. Short-term lenders enforced substantial haircuts to the value of the collateral, thus further exacerbating the borrowing problems for banks, causing them tremendous liquidity problems.

The purpose of this paper is to examine banks in two different regions of the US prior to the credit crisis. I look at all banks in the state of Arkansas and compare them to banks in Florida. Arkansas banks proved to be prudent leading up to the credit crisis, avoiding the temptation to join the race to increased profitability through by augmenting risk on their balance sheets. Florida banks, on the other hand, limped out of the credit crisis looking for potential acquirers to rescue them from being shut down. Indeed, Dell'Ariccia et. al., (2006) finds that regions that exhibited faster credit growth were also identified as regions with declining credit standards. As a result of this discrepancy in the appetite for risk, few of the Florida banks were acquired by the prudent banks in Arkansas. Arkansas' Centennial Bank closed seven such FDIC assisted purchases of Florida banks (Walden (2012)). I will look at the financial ratios of the Arkansas and Florida banks to establish differences in risk taking, lending, capital and the degree to which the banks in the two states rely on purchased funds versus their respective deposit bases. Gambacorta et. al., (2011) confirms that bank characteristics impact the lending decision, especially during a credit crisis. In particular, Gambacorta et. al., states that bank with less capital and a stronger reliance on purchased funds and on noninterest income were more likely to reduce credit availability. Thus, this paper will be able to identify any substantial differences in balance sheet structure of the banks in both states that impacted their lending behavior. In case of Florida banks, such actions likely further perpetuated already weakened economic conditions in the region.

DATA

The data for this study was collected from the Call Report data filed with the Federal Reserve Bank. The complete list of all commercial banks that submitted Call Reports in 2005 and 2008 was obtained from the Federal Reserve Bank of Chicago website. The year 2005 was selected because it was identified

as the last full year before the onset of the subprime mortgage crisis, and 2008 was selected because it represents the period when the crisis reached its most destructive period, culminating in the failure of Lehman Brothers. The data was collected on the unit bank level and aggregated based on the bank holding company codes. From the complete list of banks in 2005 and 2008, banks operating in Florida and Arkansas were isolated. Table 1 contains the definitions of all variables that were utilized in the study. Additionally, Table 1 serves as a key to the data abbreviations used throughout the paper, and demonstrates how the variables were calculated. The descriptive statistics are in Tables 2 and 3. Specifically, Table 2 contains descriptive statistics for the sample of Florida and Arkansas banks operating in 2005, and Table 3 presents the statistics for the sample of Florida and Arkansas banks operating in 2008.

METHODOLOGY

The goal of this research is to isolate differences in factors that differentiated the performance of Florida and Arkansas banks leading to and during the subprime credit crisis. The samples of banks and their respective performance data is obtained for all commercial banks doing business in Florida and Arkansas that filed Call Reports with the Federal Reserve in 2005 and 2008. There were 232 and 244 banks in Florida in 2005 and 2008, respectively. There were 123 and 114 banks in Arkansas in 2005 and 2008, respectively. Only those banks that furnished all of the required data were retained in the samples.

To conduct the analyses, two logit models are constructed to evaluate the bank samples. The first logit model looks at the difference between bank characteristics between Florida and Arkansas banks in 2005, and the second logit model examines the same variables in 2008. The logit model has a binomial dependent variable. In these regressions, the dependent variable is given a value of 1 for all Arkansas based banks, and is assigned a value of 0 for all Florida based banks. The following models are analyzed for both samples of banks:

STATE DUMMY = ROE + PRFMRG + ASSUTIL + LOANLOS + NINEXOP + INTMRG + OVREFF + LOANASS + COMLOAN + REALOAN + DEPDEBT

Prior to the analysis, the correlations between variables are examined to avoid problems with multicollinearity. The goal of the models is to identify bank characteristics that differentiated business practices of the Florida and Arkansas banks. This analysis will help to understand why the banking industry in Arkansas fared better during and after the crisis, fostering a string of acquisitions by Arkansas banks in Florida as the direct result of the crisis.

RESULTS

The goal of this paper is to identify structural differences between the balance sheets of Arkansas and Florida banks in 2005 and 2008. As was stated above, at the conclusion of the crisis, Arkansas banks were in an enviable position to be able to acquire Florida's failing commercial banks. This paper will reveal why these two groups of banks ended up on the opposite sides of the bargaining table coming out of the Great Recession. The year 2005 is selected because it is the last full year before the onset of the subprime mortgage crisis and 2008 represents the trough. The results of the logit regression examining banks in the 2005 sample are presented in Table 4. It is evident that Arkansas banks had smaller INTMRG (-92.69, z-statistic= -3.86). This result provides some evidence that Arkansas banks were less inclined to chase higher yielding, riskier investments, which hurt their net interest margin. Arkansas banks had a lower LOANASS and REALASS (-2.48, z-statistic=-2.17 and -11.56, z-statistic=-5.52, respectively.) This result indicates that smaller proportion of Arkansas banks' assets were invested in the loan portfolio, the riskiest and most profitable asset category on a bank's balance sheet. Furthermore, Arkansas banks had fewer real estate loans as a percent of total assets than their Florida counterparts. This result further highlights a greater aversion to risk by Arkansas banks than the Florida banks. Even though Arkansas

banks devoted a smaller percentage of their assets to the loan portfolio, they were more conservative in assessing the potential credit risk of their loans with significantly higher LOANLOS (5.25, z-statistic=1.66), thus once again demonstrating a more conservative approach to banking than the sample of Florida banks. Also, Arkansas banks were more efficient in managing their overhead. In Table 5, OVREFF is higher for Arkansas banks than Florida banks (1.98, z-statistic=1.68.)

Table 5 presents the results of a similar logit regression comparing samples of Arkansas and Florida banks in 2008, which is recognized as the year when the credit crisis reached its greatest depth. The 2008 model offers a couple of similar results, but also shows a few additional differences between the two samples of banks. The two characteristics significant in 2008 that were not significant in 2005 are ASSUTIL and NINTEXOP (46.93, z-statistic=2.29 and -7.47, z-statistic=-3.9, respectively.) Thus, Arkansas banks were producing higher levels of operating income as a percent of total assets, proving to be able to use their assets more efficiently to produce an industrial's firm equivalent to sales. Significantly higher noninterest expenses by Florida's banks may indicate the burden of dealing with the costs of foreclosures. The remaining results are similar to 2005. Arkansas banks have lower LOANASS and REALASS (-5.26, z-statistic=-3.68 and -5.57, z-statistic=-2.31, respectively.) Arkansas banks also continue to demonstrate higher levels of efficiency by producing higher levels of noninterest income per dollar of noninterest expense (OVREFF, 3.25, z-statistic=2.3.)

CONCLUSION

This paper aimed to identify differences in performance metrics between Arkansas and Florida banks prior to and during the subprime mortgage crisis. The study aimed to highlight the characteristics that may have aided Arkansas banks in assuming the role of acquirers of Florida banks in the wake of the credit meltdown. Profound differences were illuminated between the two groups of banks. Arkansas banks demonstrate a more conservative approach to doing business by devoting a smaller proportion of their assets to loans and a smaller percentage of their loans to real estate. In 2005, Arkansas banks were also more conservative in assessing the riskiness of their loan portfolios by allocating higher loan loss reserves than Florida banks. In the trough of the recession, Arkansas banks are more efficient in using their assets to produce revenues and are better able to manage their noninterest expenses. These results clearly show a difference in philosophical approach to banking by firms in the two regions. These results should be considered by state and federal bank regulators in order to reduce risk and increase efficiency of commercial banks across the country.

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TABLE 1
THIS TABLE CONTAINS DEFINITIONS AND ABBREVIATED
NAMES OF THE VARIABLES USED IN THE PAPER.

Variable Name	Variable Definition
ROE (%)	Return on equity (net income/equity)
PRFMRG (%)	Profit margin (net income/operating income)
ASSUTIL (%)	Asset utilization (operating income/assets)
LOANLOS (%)	Provision for loan losses to operating income
INTMRG (%)	Net interest margin (interest income - interest expense) / (earning assets)
OVREFF (%)	Overhead efficiency (non-interest income/non-interest expense)
LOANASS(%)	Total loans to total assets
COMLOAN (%)	C&I loans to total loans
REALASS (%)	Real estate loans to total loans
DEPDEBT (%)	Total deposits to total debt

TABLE 2
DESCRIPTIVE STATISTICS OF THE 2005 SAMPLES.
FLORIDA (N=232) ARKANSAS (N=123).

Variable	Panel A: Arkansas Banks					Panel B: Florida Banks				
	Min	Max	Mean	Std. Error	Std. Dev.	Min	Max	Mean	Std. Error	Std. Dev.
ROE	-.782	.394	.090	.009	.104	-.221	.397	.085	.006	.097
PRFMRG	-1.149	.412	.137	.017	.191	-4.425	.477	.022	.037	.565
ASSUTIL	.021	.142	.062	.001	.013	.009	.591	.058	.003	.038
LOANLOS	-.053	.917	.046	.009	.101	-.106	.515	.056	.006	.087
NINEXOP	.249	1.987	.493	.017	.184	.109	5.519	.631	.042	.643
INTMRG	.015	.066	.041	.001	.008	.010	.196	.043	.001	.017
OVREFF	.009	.834	.279	.012	.132	.000	1.395	.206	.011	.168
LOANASS	.094	.912	.605	.013	.147	.019	.951	.683	.011	.168
COMLOAN	.035	.743	.236	.013	.141	-.067	.926	.134	.008	.117
REALOAN	.219	.923	.647	.014	.156	.000	1.000	.823	.009	.141
DEPDEBT	.689	.998	.922	.006	.067	.000	.999	.916	.007	.109

TABLE 3
DESCRIPTIVE STATISTICS OF THE 2008 SAMPLES.
FLORIDA (N=244) ARKANSAS (N=114).

Variable	Panel A: Arkansas Banks					Panel B: Florida Banks				
	Min	Max	Mean	Std. Error	Std. Dev.	Min	Max	Mean	Std. Error	Std. Dev.
ROE	-.782	.394	.090	.009	.104	-2.781	18.976	.016	.081	1.258
PRFMRG	-1.149	.412	.137	.017	.191	-7.436	.319	-.263	.045	.706
ASSUTIL	.021	.142	.062	.001	.013	.006	.162	.057	.001	.016
LOANLOS	-.053	.917	.046	.009	.101	-.010	2.416	.220	.016	.255
NINEXOP	.249	1.987	.493	.017	.184	.110	7.564	.689	.042	.663
INTMRG	.015	.066	.041	.001	.008	.006	8.244	.068	.034	.526
OVREFF	.009	.834	.279	.012	.132	-1.289	.859	.130	.011	.167
LOANASS	.094	.912	.605	.013	.147	.009	.923	.706	.009	.145
COMLOAN	.035	.743	.236	.013	.141	.000	1.000	.138	.008	.122
REALOAN	.219	.923	.647	.014	.156	.000	.995	.828	.009	.141
DEPDEBT	.689	.998	.922	.006	.067	.339	.999	.897	.006	.090

TABLE 4
RESULTS OF A LOGIT REGRESSION WHERE THE DEPENDENT VARIABLE IS EQUAL TO 1 FOR ALL BANKS BASED IN ARKANSAS IN 2005 AND EQUAL 0 FOR ALL FLORIDA BASED BANKS.

Variable	Coefficient	Std. Error	Z-Statistic	95% Conf. Interval	
ROE	3.39	2.60	1.30	-1.71	8.49
PRFMRG	1.05	2.32	0.45	-3.50	5.60
ASSUTIL	9.96	6.49	1.53	-2.77	22.69
LOANLOS	5.25	3.16	1.66*	-0.93	11.44
NINEXOP	-1.41	1.48	-0.95	-4.32	1.50
INTMRG	-92.69	24.04	-3.86***	-139.82	-45.57
OVREFF	1.98	1.18	1.68*	-0.33	4.30
LOANASS	-2.48	1.15	-2.17**	-4.73	-0.24
COMLOAN	-3.49	2.35	-1.48	-8.09	1.12
REALOAN	-11.56	2.09	-5.52***	-15.66	-7.45
DEPDEBT	0.93	1.76	0.53	-2.53	4.39
Constant	12.21	2.96	4.12***	6.40	18.02

Model chi2 =153.05***
* Indicates statistical significance at 0.10 level.
** Indicates statistical significance at 0.05 level.
***Indicates statistical significance at 0.05 level.

TABLE 5
RESULTS OF A LOGIT REGRESSION WHERE THE DEPENDENT VARIABLE IS EQUAL TO 1 FOR ALL BANKS BASED IN ARKANSAS IN 2008 AND EQUAL 0 FOR ALL FLORIDA BASED BANKS.

Variable	Coefficient	Std. Error	Z-Statistic	95% Conf. Interval	
ROE	-1.49	1.13	-1.32	-3.70	0.72
PRFMRG	0.24	2.66	0.09	-4.97	5.46
ASSUTIL	46.93	20.47	2.29**	6.81	87.04
LOANLOS	-3.54	2.44	-1.45	-8.32	1.25
NINEXOP	-7.47	1.92	-3.9***	-11.23	-3.71
INTMRG	-2.33	3.50	-0.67	-9.2	4.53
OVREFF	3.25	1.41	2.3**	0.48	6.01
LOANASS	-5.26	1.43	-3.68***	-8.07	-2.46
COMLOAN	0.03	2.74	0.01	-5.35	5.41
REALOAN	-5.57	2.41	-2.31**	-10.30	-0.84
DEPDEBT	0.54	2.00	0.27	-3.38	4.45
Constant	7.13	3.44	2.07**	0.39	13.88

Model chi2 =189.72***
* Indicates statistical significance at 0.10 level.
** Indicates statistical significance at 0.05 level.
***Indicates statistical significance at 0.05 level.