

US Banks. Causes of Bank failures in 2009 and early warning indicators*

ALESSANDRO SANTONI**, ELISA RICCI***, ARUN KELSHIKER****

130 US banks filed for bankruptcy in 2009, 45 of which in the first half of the year and the remaining 85 in the second half¹. The purpose of this paper is to review a number of indicators concerning the balance sheet and profit and loss situation of the bankrupt financial institutes, so as to focus on potential correlations between them. The aim is to identify whether it is statistically possible to define a mix of balance sheet and profit and loss conditions common to the 101² banks considered in the pre-bankrupt phase.

The study stresses that factors associated with a macroeconomic deterioration and consequent worsening of the loan portfolio are the most relevant early warning indicators. By contrast, the state of liquidity does not appear to be a determining ex-post factor, nor is it proven to be an ex-ante early warning signal. Pre-bankrupt capital levels do not appear to be a reliable confidence indicator either. A parallel with banks that have failed in the last 40 years indicates that 2009 was characterized by a more varied geographical distribution and a reduced sizing of bankrupt banks on the average, as compared to the past (83% of the total having less than 1 billion dollars in assets).

(J.E.L.: G11; G12; G14)

Introduction

In light of the research conducted, major U.S. bank failures in the 80's and 90's, but also during the *Great Depression* of the 30's, are not traceable to liquidity crises, but rather to "real" causes, mainly associated with the accumulation of impaired loans, with a consequent

"erosion" of capital to a level below the minimum required.

In a recent study³, the Bank for International Settlements (BIS) analyzed the main causes of U.S. bank failures in the 80's and 90's. It was highlighted that the extraordinary volatility of interest rates and the high level they reached in

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** University of Siena, Head of Research, Intelligence and Investor Relations of Banca Monte dei Paschi di Siena. E-mail: alessandro.santoni@banca.mps.it.

*** University of Siena.

**** E-mail: akelshiker@gmail.com.

¹ Updated as at 21/11/2009.

² As reported in the *2009 Bank Failures* document by Lacle Financial Corporation, 130 banks filed for bankruptcy. Data necessary for statistical processing in the study is available for 101 of these banks.

the wake of inflationary thrusts in the early 80's put the U.S. banking system under heavy pressure. The first to be exposed were *Savings Banks* in consideration of their business mix. By their own nature, *Savings Banks* have *long term* assets mainly exposed to residential and commercial mortgage loans. On the liabilities side, their balance sheet structure includes *short-term financing*, mainly based on short and immediate term deposits.

Most of the system's banks were adequately capitalized, with an equity/assets ratio of 9% as against 4% required as a minimum. Nevertheless, based on the BIS study, the banks that failed were those that had a significant average credit exposure, with a loans/assets ratio exceeding 60% as compared to an average ratio of 50% in the system. In addition, their percentage of exposure to residential and commercial mortgage loans was well above that of the surviving banks. Loan loss provisions had a significant impact on the banks' profit and loss statements and even got to the point of lowering the system's tangible 'equity to assets ratio' to 0.5%. The BIS study further pointed out that most of the bank failures occurred in Texas (with this State accounting for 28% of total failures and 40% of related federal costs) and California (7% of total failures and 11% of costs). These States are characterized by a weak banking supervisory framework and are more exposed to the real estate speculative bubble.

A study by Charles W. Calomiris & Joseph R. Mason⁴ on bank distress dur-

ing the Depression in the 1930s, when the number of banks operating in the U.S. dropped from 24,633 in 1929 to 15,015 in 1933, stigmatizes the fact that, in this case again, the reasons for bank failures in the U.S. were not to be found in the liquidity crises of the system, but rather in the problems of the real economy, including, first and foremost, that of Non Performing Assets (NPAs).

Similar conclusions can be drawn from our analysis of the recent U.S. bank failures. Again in the case of banks failing in 2009, the "real" component resulting from exposure to a high loans/assets ratio, combined with a heavy accumulation of NPAs, is the main factor of 'vulnerability': 90% of the banks that failed in the U.S. in 2009 had a high level of NPAs (over 4.7%).

The liquidity position is proven not to be a relevant element, considering that only in five cases out of 101 was it a decisive and unequivocal cause of default.

Another parameter we considered in our investigation on bank failures was the pre-failure level of capital (Tier 1). Results obtained lead us to reduce the weight of this indicator as a univocal factor. From the sample considered, it emerged that only 5% of the banks that failed were low in capital (Tier 1 negative or lower than 5%) and low in NPAs (less than 5%). Conversely, the correlation between a low level of capital and a high level of NPAs is proven to be very important, as it builds the perfect mix in the majority of failures. The combination of a high level of NPAs (higher than

³ BIS (2004), *Banks Failure in Mature Economies*.

Commercial Banks	2008	2007	2006
<i>Number</i>	7,086	7,283	7,401
<i>Net Income (\$ trl)</i>	15.5	97.6	128.2
<i>Loan loss provisions (\$ trl)</i>	152	57	25
<i>Securities Gains/Losses (\$trl)</i>	-14.3	-0.6	-1.3
Savings Banks	2008	2007	2006
<i>Number</i>	1,220	1,251	1,279
<i>Net Income (\$ trl)</i>	-10.7	2.,3	17
<i>Loan loss provisions (\$ trl)</i>	23.6	11.8	3.9
<i>Securities Gains/Losses (\$trl)</i>	-1	-0.7	3.3
Total	2008	2007	2006
<i>Number</i>	8,306	8,534	8,680
<i>Net Income (\$ trl)</i>	4.,8	99.9	145.2
<i>Loan loss provisions (\$ trl)</i>	175.6	68.8	28.9
<i>Securities Gains/Losses (\$trl)</i>	-15.3	-1.3	2

Tab. 1 - U.S. Commercial and Savings Banks (2006-2008). *Source:* FDIC.

5%) and low Tier 1 (lower than 5%) is the common factor of bank failures in 62% of cases.

In our study, we also focused on the geographical distribution of bank failures across the United States. A distinctive element of this recent wave of closings was that their concentration was at the highest in 10 U.S. States, where 78% of failures occurred as against the 53% concentration registered by BIS in the period between 1980 and 2000.

The U.S. Banking System

Our analysis starts from a ‘snapshot’ of the U.S. banking system over the last three years and in 2009, with a view to understanding and contextualizing the problems affecting the banks that failed in 2009.

At the end of 2008, the U.S. banking

system (Commercial Banks e Savings Banks) numbered 8,306 banks, 374 less than it had in 2006 and 228 less than in 2007. Bank profits went down significantly in the last three years as well, from a peak of \$145 trillion in 2006 to a minimum \$4.8 trillion in 2008. The main reason for this sharp drop in profitability lies both in the ‘explosion’ of loan loss provisions and reduced profits from trading. In particular, loan loss provisions saw a five-fold increase: from \$28 trillion in 2006 to \$175 trillion in 2008; trading, instead, went down from \$2 trillion profits in 2006 to \$15 trillion losses in 2008.

The U.S. Banking System in 2009

The process of bank number reduction and de-leveraging continued in the course of 2009. The number of banks

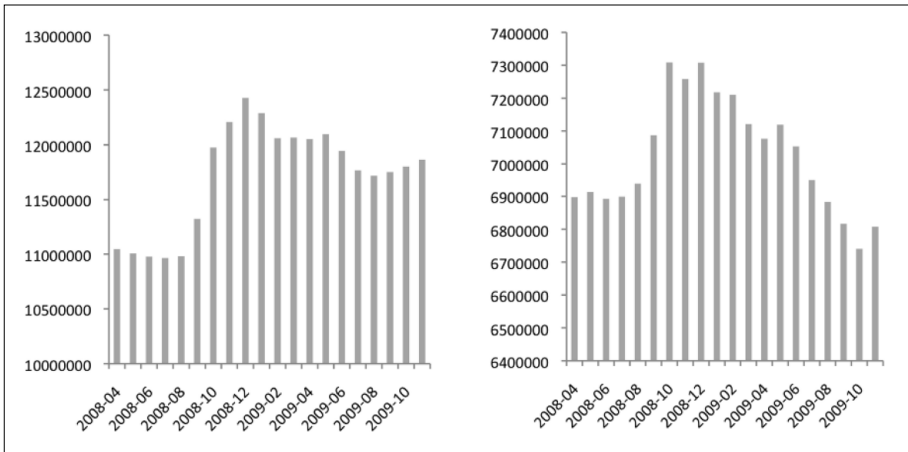


Fig. 1 - a) Total assets (\$mln), U.S. banks; b) Total lending (\$mln), U.S. banks.
Source: FDIC

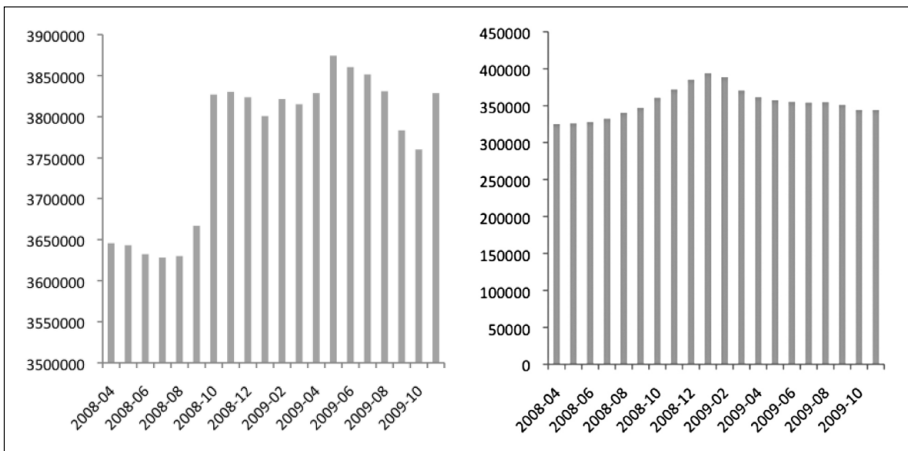


Fig. 2 - a) Total real estate mortgages (\$mln), U.S. banks; b) Total Consumer Credit (\$mln), U.S. banks. Source: FDIC

operating in the US declined further due to the failure of 130 banks in 2009, 45 of which in the first six months and the remaining 85 in the second half of the year⁵. The assets of U.S. banks have dropped by 4.54% as compared to December 2008, down \$565 billion in

absolute terms. Undoubtedly, the main reason was the contraction in lending, which was down 6.85% in the same period.

In lending, the business area suffering the most was consumer credit, with stocks down 10.64%. *Commercial Real*

⁴ Causes of US Bank Distress during the Depression, Calorimis-Mason (2009).

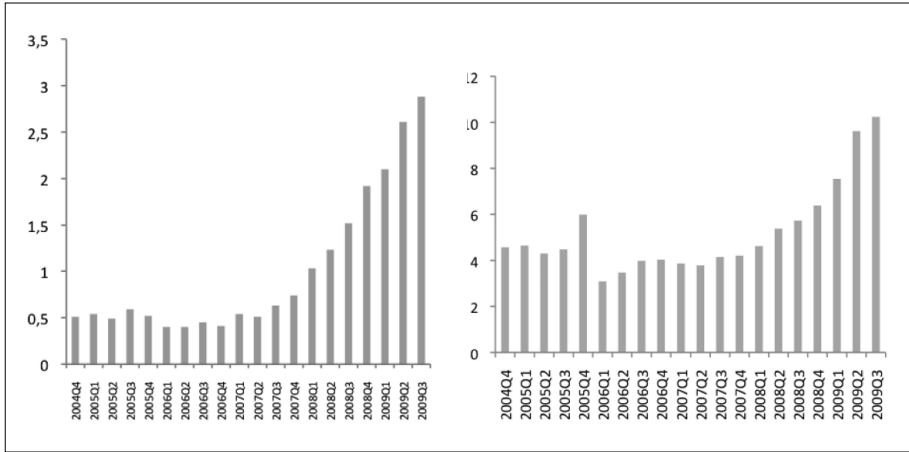


Fig. 3 - a) Total loan loss provisions (%), U.S. banks; b) Total provisions for credit cards (%), U.S. banks. *Source: FDIC.*

Estate (CRE, commercial mortgages) dropped 3.9%, whereas residential real estate mortgages remained rather stable (+0.13% as compared to 2009).

As at December 2009, the real estate mortgage component accounted for 56.2% of total lending as compared to 52.3% in the previous year. Thanks to a less pronounced drop than the average, the CRE share could remain at a level of around 24%, whereas that of consumer credit declined from 5.2% to 5%.

The macroeconomic deterioration and worsening of credit quality had a remarkable influence on U.S. banks' P&Ls. In 2009, the U.S. banking system reported 288 *basis points* in loan loss provisions as against 152 *basis points* recorded in 2008 and an all-time low of 40 *basis points* registered in the last five years. The business area most affected by the increase in loan loss provisions was consumer credit, with an increase from 412 to 586 *basis points*. The sub-component 'provisions for credit cards' grew from 638 to 1,024 *basis points*.

The overall level of capital of U.S. banks improved perceptibly in 2009. Since the end of 2007, U.S. banks have raised \$326 billion in new capital so far, which has resulted in an increase in the average Tier 1 ratio from 5.8% in December 2008 (an all time low since 1991) to 8.2%, the peak since 2001.

The capital increases approved by Citigroup and Bank of America in December 2009, amounting to \$19 billion each, embodied the two largest secondary market bids in the history of the U.S. capital market. Banks took advantage of this flow of capitals not only to repay the \$160 billion in TARP (*Troubled Assets Relief Program*) funds received, but primarily to improve the liquidity of their assets as well, with a view to reducing their exposure to the interbank market by \$505 billion.

Data and methodology

Our analysis focuses on the financial statements of the U.S. banks that failed

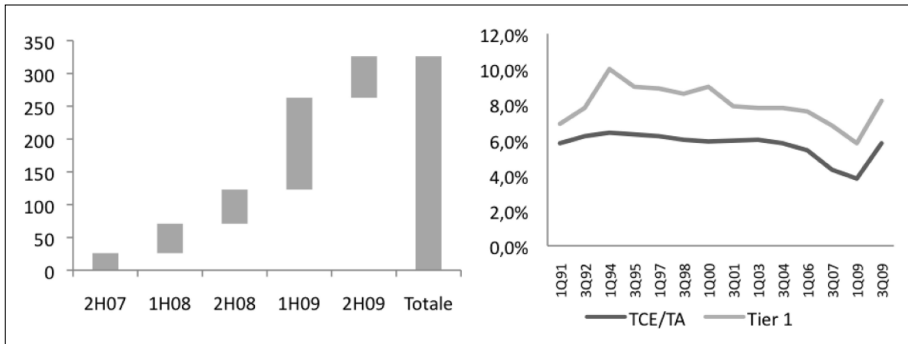


Fig. 4 - a) 2007-2009 Capital increases (\$ bln), U.S. banks; b) Capital ratios, U.S. banks.
Source: FDIC, Goldman Sachs.

in 2009. Data was obtained from the FDIC database. The indicators examined allow for an assessment of the banks' asset quality, liquidity and capital adequacy and refer to the quarter prior to failure. The analysis was conducted on

the basis of descriptive statistics for and subsequent correlation between the indicators concerned.

A proposed synopsis and brief description of the ratios⁶ is shown below.

RATIOS	DESCRIPTION
Asset quality: <i>Non Performing Assets (NPAs)/Assets</i>	Non Performing Assets including Past Due Loans (90 days or more behind schedule) and Nonaccrual loans divided by Total Assets
Capital Adequacy: <i>Leverage Capital/Assets</i>	Total capital (excluding intangible assets) divided by the bank's average assets in the current period
<i>Tier1/Rwa</i>	Tier 1 divided by Risk Weighted Assets
<i>Total Capital/Assets</i>	Total capital (Tier1 + Tier2) divided by Risk Weighted Assets
Liquidity: <i>Loans/deposits</i>	Loans to customers / customer deposits
Profitability: <i>Return on assets</i>	Net income /Total assets

⁵ Updated as at 21/11/2009.

⁶ *Asset Quality and Capital adequacy ratios* are taken from Lacle Financial Corporation; the *Loans/Deposits ratio* is calculated on the basis of data as posted in the latest pre-failure quarterly reports available on the website of the Re-capping re-caps and failures quarterly reports available on the website of the Federal Financial Institutions Examination Council.

Our analysis reveals that the 101 U.S. banks that failed in the first eleven months of 2009 had the following characteristics:

An extremely high average level of *Non Performing Assets*, amounting to 13.82% of total assets;

A level of capital (one quarter before the bankruptcy) markedly lower than the system's average, with a *Tier 1 ratio* of 3.59% and a *Total Capital/Assets* ratio of 4.74%;

A negative return on assets equal to 5.96%, mainly due to the high loan loss provisions resulting from the high level of *Non Performing Assets*;

A high *loans to assets ratio* as compared to the system, equal to 72% vs. 52% in the system;

The banks' liquidity position appears not to be "under strain", considering that *the loans/deposits ratio is 83% and the loans to customer deposits ratio is 97.8%*.

Tab. 2 - Characteristics of banks that failed in the USA in 2009.

NPA's/Asset %	13,82%
Leverage Capital/Assets %	2,82%
Total Cap/Assets %	4,74%
Tier 1/Asset	3,59%
ROA %	-5,96%
Total Assets (\$mln) medio	972
TOTAL LOANS (\$mln)	641,36
TOTAL DEPOSITS (\$mln)	777,9
Customers	713,4
Others	65,7
LOANS/DEPOSITS	83,01%
LOANS/DEPOSITS customers	97,89%
LOANS/ASSETS	72,38%

Source: FDIC.

The statistical analysis

The weight of provisions

Descriptive statistics reported in Table 1 corroborate the fact that the Banks under consideration showed, on average, a high percentage of Non Performing Assets over Total Assets (13.82%) in the immediate period prior to the failure. The table also shows the distribution of NPAs/Assets. Even though values cover a rather wide spectrum ranging from a minimum level of

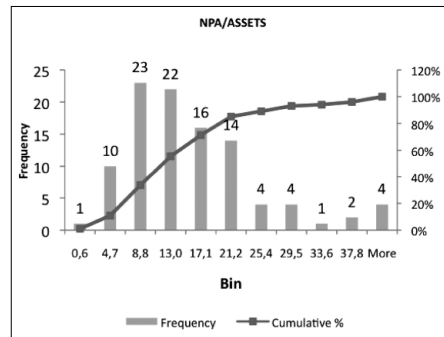


Fig. 5 - NPA/Assets.

Tab. 3 - NPA/Assets (%).

Mean	13,82
Standard Error	0,88
Median	11,81
Mode	12,52
Standard Deviation	8,86
Sample Variance	78,55
Kurtosis	1,61
Skewness	1,27
Range	41,35
Minimum	0,56
Maximum	41,91
Sum	1395,40
Count	101,00
Confidence Level (95.0%)	1,75

Source: FDIC.

0.6% to a maximum level of 41.9%, it may be inferred that approximately 23% of the banking institutions that failed had a level of NPAs ranging from 4.7% to 8.8% of total Assets. Interestingly, once the 4.7% NPA level over total assets is exceeded, the amount of failures accelerates significantly, with a 130% increase as compared to the previous range. 70% of failures are concentrated within an NPA range comprised between 4.7% and 17% (Fig. 5 and Tab. 2).

A significant piece of statistical evidence, associated to the high weight of the NPA ratio on the number of failures, lies in the loans/assets ratio of the banks that have failed as compared to the system average. On the average, banks that have closed down had a 72% loans/assets ratio as against an average of 57%. This is a recurring characteristic in the history of US bank failures in the last thirty years. The BIS report on bank failures from 1980 to 2000 confirms that failed banks had a percentage of loans higher than that of the system. In particular, the loans to assets ratio was 60% as compared to an average of 50%.

However, in table 2 it is observed that some banks filed for bankruptcy even in the presence of a clearly lower NPAs/Assets level than average (comprised between 0.6% and 4.7%): in these cases, the capital structure and non-optimal liquidity were the most relevant differentiating factors from the sample. These anomalous cases, however, only account for 10% of the total of failed banks. In particular:

60% of banks with an NPA/Assets ratio lower than the sample average had an extremely low capital level; a case in point was the National Bank of Commerce, which failed on 16 January 2009, whose Tier 1 and Leverage Capital/Assets were negative (-15.59% and -10.26% respectively).

The same considerations apply to Elizabeth State Bank, First State Bank and Waterford Village Bank. Relatively smaller in size (less than 60 million in total assets), these banks were characterized by capital inadequacy and a profit and loss account burdened with severe losses (Roa -22.27%, -27.67%, -3.24% respectively).

Tab. 4 - Failed banks with low NPAs/Assets. *Source:* FDIC.

	National Bank of Bank	Corn Belt B&T	Sherman County Bank	Cape Fear Ban	Green Basin Bank of NV	First Bank of Beverly Hills	Citizens National Bank	Elizabeth State Bank	First State Ban	Waterford Village Bank
Failure Date	16-01-2009	13-02-2009	13-02-2009	10-04-2009	#####	24-04-2009	22-05-2009	2-07-2009	2-07-2009	24-07-2009
State	Berkley	Pittsfield	Loup City	Wilmington	Elko	Calabasas	Macomb	Elizabeth	Winchester	Williamsville
NPA's/Asset %	1,02	3,98	0,56	3,68	4,21	4,25	4,30	4,87	2,87	1,33
Leverage Capital/Assets %	-10,26	2,94	8,96	5,66	2,04	3,37	2,21	2,45	-1,39	1,10
Total Cap/Assets %	-15,59	5,30	10,74	8,01	4,45	6,45	3,41	2,91	-1,54	2,41
Tier1/Asset %	-15,59	4,00	9,51	6,74	3,16	5,17	4,55	0,02	-1,54	1,33
ROA %	-16,52	-7,02	0,22	-1,13	-4,24	-6,39	-3,93	-22,27	-27,67	-3,24
LOANS/DEPOSITS	59,36	85,28	119,35	97,26	58,84	82,87	49,95	89,20	58,77	76,69
LOANS/DEPOSITS customers	65,82	86,72	143,94	105,23	89,70	87,89	52,49	94,50	70,16	77,25
Total Assets (€ mln)	416,74	260,20	135,43	473,11	264,33	1491,15	445,66	55,03	30,07	55,71
TOTAL LOANS (€ mln)	234,99	199,37	108,19	390,51	141,95	842,31	196,21	42,93	18,10	43,06
TOTAL DEPOSITS (€ mln)	395,87	233,79	90,65	401,49	241,26	1016,46	392,80	48,13	30,80	56,15

On the other hand, Sherman County Bank and Cape Fear Bank had a high concentration of credit and an inadequate liquidity position, with a loans/deposits ratio much higher than average.

Capital level

The second layer of our analysis focuses on the capital level of the banks that have failed. The 101 banking institutions that filed for bankruptcy had an average Tier1/Assets ratio of 3.6% as compared to an average system ratio of 8.2%. In the graph it can be observed that over 70% of the banks examined had a Tier1/Assets ratio lower than 5.5% and a Total Capital/Assets of less than

6%. Nevertheless, the data highlights that 25% of the pre-failure sample had a Tier 1 ratio of more than 8.47%, namely a level that is considered to be more than adequate by the market⁹ and in line with the U.S. banking system’s average level recorded at the end of 2009.

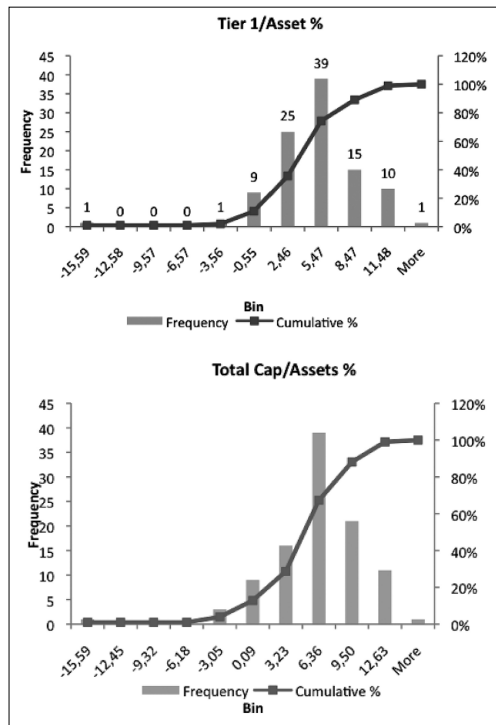
Finally, we verified whether a form of correlation exists between capital level (pre-bankruptcy) and NPA level at the time of failure. The NPAs/Assets and Tier1/Assets correlation proves to be very low and the highest number of readings is concentrated when Tier 1 values are below 8% and NPAs range from about 5 to 20%. In particular, it is interesting to note that banks with a low capital level (Tier 1 negative or lower

Tab. 5 - Average capital level of US banks that failed in 2009.

Tier 1/Asset %	
Mean	3,59
Standard Error	0,38
Median	3,75
Mode	3,13
Standard Deviation	3,85
Sample Variance	14,81
Kurtosis	5,39
Skewness	-1,03
Range	30,08
Minimum	-15,59
Maximum	14,49
Sum	362,16
Count	101,00
Confidence Level (95.0%)	0,76

Source: FDIC.

Fig. 6 - Statistical breakdown.



⁹ Re-capping re-caps and failures, Goldman Sachs, Brian Foran (2009).

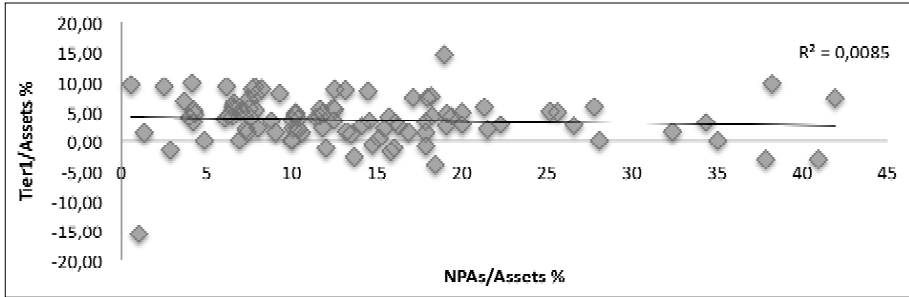


Fig. 6 - NPAs/Assets and Tier1/Assets correlation. *Source*: FDIC.

than 5%) and a low level of NPAs (below 5%) account for only 5% of the total number of banks. This suggests a more limited role for the Tier 1 capital ratio, raising questions about its being the only triggering factor of bank failures. It is rather a combination of high NPAs (over 5%) and low Tier 1 (below 5%) that emerges as the common factor in 62% of bank failures.

The liquidity position

We have analyzed the liquidity position of failed banks by considering their consolidated loans/deposits ratio and

loans to funding ratio. In funding we have only included customer deposits as this was considered by us as the “core” form of funding.

The liquidity position does not appear to have had a predominant influence on the bank failures that have occurred in the last year. Failed banks reported an average Loans to Funding ratio of 83% with a standard deviation, which in any case brings out a manageable level even on maximum values. To corroborate this, the (non-failed) US banks on average show a loans to deposits ratio of 82%. Also, an analysis

Tab. 6 - Liquidity position of U.S. failed banks. *Source*: FDIC.

Loans/Funding		Loans/Funding (Customer deposits)	
Mean	83,01	Mean	99,40
Standard Error	1,75	Standard Error	3,52
Median	82,93	Median	90,43
Standard Deviation	17,62	Standard Deviation	35,41
Sample Variance	310,45	Sample Variance	1253,58
Kurtosis	3,07	Kurtosis	6,14
Skewness	0,88	Skewness	2,20
Range	117,22	Range	205,73
Minimum	44,87	Minimum	44,87
Maximum	162,10	Maximum	250,60
Sum	8383,93	Sum	10039,63
Count	101,00	Count	101,00

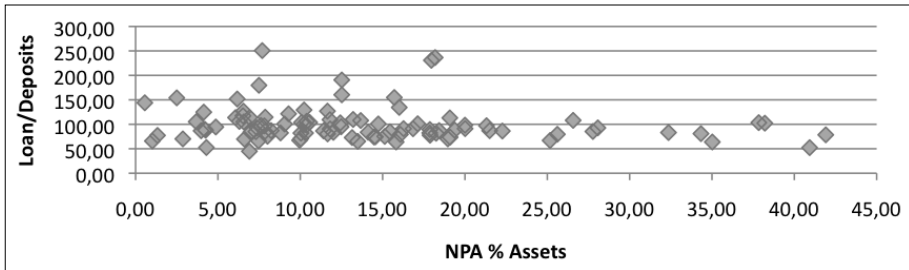


Fig. 7 - NPA's % Asset; Loan/Customer Deposits.

of the loans to customer deposits ratio, hence excluding the most volatile component of interbank and/or institutional funding, determines a 99% level that still proves to be “manageable”.

An interesting subject of study was the correlation between the NPA level and the loans to customer deposits ratio with a view to verifying how often the liquidity factor (exemplified as a loans to deposits ratio of more than 150%) was univocal and predominant over the NPA factor. Only in 5 cases out of 101 was liquidity a factor of vulnerability (loans to customer deposits exceeding 150% and an NPA level of less than 10%). This bears witness to the fact that liquidity by itself may not be considered as a triggering factor of the U.S. banks crisis in 2009.

The geographical distribution of bank failures

In the last section of our study, we focused on the geographical distribution of bank closedowns. A location comparison between failures occurring in the 1980-2000 period (BIS source) and those occurring in 2009 has highlighted a number of additional peculiarities. In particular:

1) In the 1980-2000 period, 28% of the

closures occurred in Texas, 7.2% in California, 4.4% in Illinois and 4% in Florida. 53.7% of the failures occurred in 10 States.

2) In 2009, 19.8% of the failures occurred in Georgia, 16.8% in Illinois, 11.9% in California and 7.9% in Florida. The former ten states were the location of 78% of the failures, thus showing a much higher concentration than in previous years.

The main result of the analysis is that bank failures in 2009 were mostly concentrated in 10 U.S. states, whereas the geographical distribution of failures was much more diversified in the 1980-2000 period, with the exception of Texas.

Tab. 7 - Concentration of U.S. bank failures in 2009 vs. 1980-2000. *Source: BIS, FDIC.*

U.S. States			
2009	%	1980-2000	
GA	19.8%	Texas	28.6%
IL	16.8%	California	7.2%
CA	11.9%	Illinois	4.4%
FL	7.9%	Florida	4.0%
MN	5.9%	New York	2.30%
AZ	4.0%	New Jersey	2.10%
NV	3.0%	Massa.tts	1.80%
OR	3.0%	Connecticut	1.40%
WA	3.0%	Pennsylvania	1%
TX	3.0%	Arizona	0.90%
Top ten	78.2%	Top ten	53.7%

The asset size of failed banks

Our analysis also considered the average asset size of failed banks. At the same time, the average asset size of failed banks was compared with the average size of the banks that have failed in the last 40 years, in order to break them down by classes of assets. With regard to the banks that failed in 2009, it is highlighted that 54% of them were relatively limited in size, with assets amounting to less \$300 million. In particular, 80% of failed banks had less than \$1 billion in assets. This figure should be considered against a historical average witnessing 83% of U.S. banks that have failed in the last 40 years as having less than \$300 million in assets¹⁰.

Conclusions

The financial crisis, which has its roots in the US subprime mortgage bubble that burst in 2007, has been absorbed by the US banking system thanks to the prompt rescue plan by the FED (Federal Reserve) and the huge flow of capital used to refinance banks with an impaired balance sheet (\$326 billion in capital increases were registered in the last two years). However, in 2009 alone, 1.5% of all U.S. Commercial and Savings Banks filed for bankruptcy.

In this paper we have analyzed the balance-sheet and profit and loss situation of failed banks, pointing out that an accumulation of non-performing loans

Tab. 8 - Size of banks failing in 2009 as compared to last 40 years' average. *Source:* FDIC.

U.S. Banks' Assets (\$mln)	1960-2009 Bank failures	% of total	Cumulative % per size	2009 bank failures ⁹	% of total	Cumulative % per size
below \$ 10m	333	10%	10%	0	0%	0%
from \$10m to \$50	1,212	37%	47%	5	5%	5%
\$50m - \$100m	501	15%	62%	14	14%	19%
\$100m - \$150m	290	9%	71%	13	13%	32%
\$150m - \$200m	163	5%	76%	14	14%	46%
\$200m - \$250m	125	4%	80%	9	9%	54%
\$250m - \$300m	88	3%	83%	6	6%	60%
\$300m - \$350m	57	2%	84%	3	3%	63%
\$350m - \$400m	48	1%	86%	3	3%	66%
\$400m - \$450m	45	1%	87%	5	5%	71%
\$450m - \$500m	28	1%	88%	3	3%	74%
> \$1bn	170	5%	93%	9	9%	83%
Sub total	3,060	93%	93%	84	83%	83%
\$1bn - \$3bn	152	5%	98%	11	11%	94%
\$3bn - \$5bn	34	1%	99%	3	3%	97%
\$5bn - \$10bn	22	1%	100%	1	1%	98%
\$10bn - \$20bn	10	0%	100%	1	1%	99%
\$20bn - \$40bn	4	0%	100%	1	1%	100%
> \$40bn	2	0%	100%	0	0%	100%
Total	3,284				101	

¹⁰ Clearly, the comparison has a purely descriptive value, considering that it is impossible for us to adjust the assets by the rate of inflation due to the lack of data.

combined with a business mix showing a high loans to assets ratio, generated the 'perfect storm' that it was difficult to get out of, especially for smaller banks. On the contrary, the liquidity position does not appear to have been an ex-post determining factor or an ex-ante early warn-

ing indicator. The pre-failure capital level did not turn out to be a good confidence indicator, considering that a good 25% of failed banks had a much higher Tier 1 ratio than that deemed adequate by the regulators and the market.

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