Lessons from the 2008-2009 US Banking Crisis

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More than 70 per cent of the largest 1,200 US banks of 2011 avoided annual losses in 2008 or 2009 largely because their operations were controlled. Bankers, faced with unexpected reverses, worked to reestablish control and profitability. Our examination of banking's record leading up to the 2008-2009 financial crisis indicates there were several abnormal changes bankers might have observed between 2005 and 2007 to put their organizations on alert. Such alerts before the crisis could have helped some banks minimize their losses or even avoid them. Looking ahead, bankers who apply the lessons identified, herein, should report more stable profitability during the volatile phases of future business cycles. Analysts and regulators alike should be able to use these same lessons to sort resilient banks from the rest.

INTRODUCTION

There are many theories explaining the 2008-2009 financial crisis. Extreme leverage and reckless investments in real estate are two frequently cited factors (Calomiris and Meltzer 2014). But we must be careful. What applies to the national economy doesn't apply exactly to every Federal Reserve Bank District or to most of the banks that survived (Bassett and King, 2008; Aubuchon and Wheelock, 2010; Robinson, 2010).

Whatever the cause, the crisis was severe and cut bank profitability. At the worst of the crisis in 2009, more than 28 per cent of the largest 1,200 US banks reported an annual loss. Even in 2011, more than 12 per cent of the survivors were still working out from losses suffered during the crisis.

Bank failures have been studied extensively by the Federal Reserve Bank. That research makes it clear that banks that did not observe the 2006 interagency guidelines with respect to Commercial Real Estate Concentrations *before the crisis* failed at a rate 46 times the failure rate of banks that followed those guidelines (Calabia, 2016). The Government Accountability Office (GAO) noted that, in general,

failed small and medium sized banks had often pursued aggressive growth strategies, relying to a large degree on expensive funding sources such as brokered deposits rather than core deposits (GAO, 2013).

Despite failures, losses, and reduced profitability through and after the crisis, what has largely been ignored is the fact that more than 70 per cent of US banks avoided an annual loss. The popular press has criticized 'bankers' as reckless, yet the evidence, carefully examined, attests that 'it ain't so.' We wondered what could be learned about surviving financial crises if we recognize that across the industry, performance varied substantially. Could some of the difference be attributed to some bankers' sustained efforts to manage profit variation – in other words, to control their operations and limit problems (Fayol 1916; Anthony 1965)?

The research question is: *How did the banks that survived the crisis do it?* With hindsight, can we marshal the facts describing the industry's record between 2000 and 2011 and identify lessons to be learned?

This paper highlights evidence that tight control was maintained through the crisis by more than 70 per cent of today's survivors. Those who did not suffered disproportionately. We will discuss profitability and control from 2000 to 2011 and the penalty associated with loose management. We will also show how profitability correlates with control and document how bankers behaved when they felt the penalty of any failure to control operations.

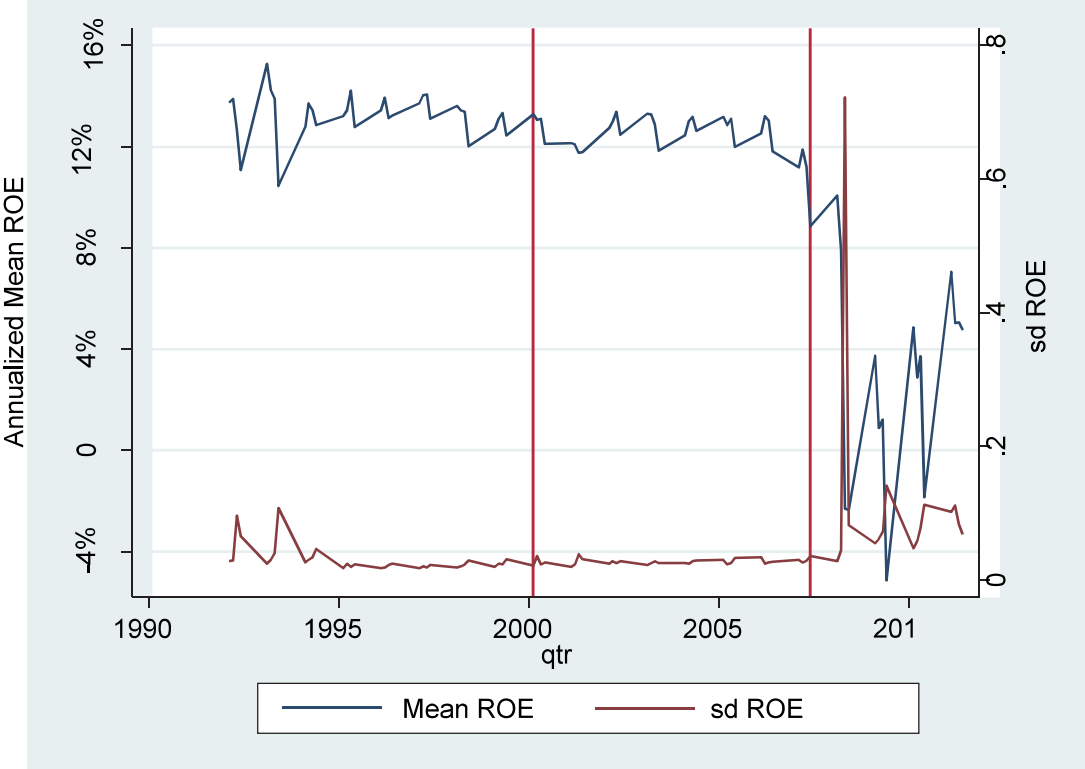
With the facts and their meaning established, we will turn to lessons for the future. In the front sections of the paper we will present evidence to establish that control matters. In the latter sections we will highlight several anomalies or signals that an alert banker could have noted between 2000 and 2007 that might have warned of an impending crisis. The particular signals we identify here may never be repeated exactly but change rarely emerges unannounced. For bankers interested in maintaining profitability through future crises, anomalies in an industry's record at any time are worth noting and evaluating.

Banking Profit Variability

The fact grounding this paper is the variation of profitability in the banking industry between the peaks of the economic cycle in the first quarter of 2001 and the last quarter of 2007. Our investigation continues through the crisis of 2008 and 2009 and out to 2011. We will focus on return on equity (ROE) and profit variation as we seek an understanding of how some banks were able to sustain profitability through the crisis.

To begin, consider the record of US banking's profitability in Figure 1, which shows the mean quarterly ROE of the 1,200 largest US banks in 2011 along with its standard deviation from 1991 to 2011. ("19900" marks the beginning of the first quarter of 1990). Clearly the jagged line across the top of Figure 1 is testimony to the fact that the banking industry has experienced profit volatility across the years but, as the sharp oscillations of ROE and its standard deviation in 2008 and 2009 show, the crisis years were exceptional. The turmoil was well outside the experience of bankers and regulators.

FIGURE 1
THE HISTORIC PROFITABILITY OF THE LARGEST 1200 US BANKS OF 2011
1991-2011



To help us identify how some banks avoided loss, we tapped one of the largest data sets available, the twenty-year record of the 7,000 US banks maintained by Highline Financial (formerly owned by Thompson Reuters), restricting our investigation to the 1,200 largest banks that survived the crisis – that is, banks with assets greater than $520 million in 2011 – and their ROE. Rather than looking at simple year-to-year changes, differences from average or the variance of ROE over time, we used the absolute value of the coefficient of variation of ROE calculated over the four quarters of each year (Hatten, James and Meyer 2004). For convenience, we labelled this variable 'ACV' and it is defined by the absolute value of the standard deviation of ROE divided by its mean ($|\sigma/\mu|$). Since these are sample measures, a more precise definition is the absolute value of S_{ROE} / ROE.

ACV is easy to interpret being the standard deviation of ROE in the context of its mean. The coefficient of variation is more easily interpreted with respect to mean ROE than the variance of bank ROE. Second, ACV is very sensitive to changes in earnings, and so to changes in profitability and ROE itself. Deterioration in earnings is the earliest indicator of bank failure as Gopalan (2010) reported.

In choosing ACV we were aware that when profitability is close to zero, the coefficient of variation can take on extreme values. Thus, in interpreting our results, we took care not to be over-influenced by the most extreme cases. Third, we choose the absolute value of the coefficient of variation of ROE because the classically defined coefficient of variation of ROE will be positive if the bank is profitable and negative when a bank reports a loss. Using the absolute value of ACV avoids the computational error of interpreting any minus value of ACV as being less than zero and, so, small. Another reason for our choice is that the variance of ROE was for a time misused as a risk proxy in the strategic management literature (Bowman 1980; Bromiley, Miller and Rau 2001; Nickel and Rodriguez 2002). Bowman's methodology was criticized by Marsh and Swanson (1984) and, later, by Ruefli (1990). It is also

important to note that several years earlier, Rothschild and Stiglitz (1970, 1971) had commented specifically on errors stemming from misinterpretations of the variance of ROE as a risk measure.

In the context of US banking, we see wide variations in profitability as being indicative of limited control. Small values of ACV indicate tight control; large values point to loose control. Being sensitive to changes in ROE is an advantage because in the aggregate, shifts in ACV across the industry provide a loud signal about environmental change.

Classification of Bank ROE Variability

Before we examine the relationship between ROE and ACV, note that the correlation in any particular year is negative – higher ROE when ACV is small and low when it is large. The relationship has this form since the mean of ROE is in the denominator of ACV; the larger the mean of ROE, the smaller ACV. Of course, what is important is not whether the relationship holds at one time, but whether it holds over time and across the industry. Our working hypothesis is that tight control in prior years, represented by a small ACV, yields higher returns in later years and that loose control, indicated by a larger ACV, results in lower returns.

With this relationship in mind, we turn to the facts describing the banking industry in 2007. First, a warning: This paper is replete with tables and the tables are replete with data. The point is not the detail but the trends and relationships revealed. Our purpose is to allow the reader to appreciate trends across time, ACV class by class. An appreciation of these trends and relationships is the basis for identifying the abnormalities or signals that preceded the 2008-2009 crisis and to thereby establish the lessons learned.

Consistent with this purpose, we plotted ROE against ACV and identified five ACV classes, with upper limits in sequence of 0.2, then 0.5, 1.0, 5.0 and one where ACV was greater than 5.0. We used these class limits to partition the data from tightly controlled to loose and explore the profit and loss experience of banks fitting between these ACV's limits between 2000 and 2011. To help appreciate what these ACV limits mean, Table 2 contrasts the performance of six banks that happened to have ACV indexes very close to 0.1, 0.2 and 0.5. The banks selected had ACVs just under and just over these three cutoffs in 2007. In each pair, the bank with the lower ACV, the more tightly controlled bank, had the higher ROE. The banks' profit records between 2000 and 2007 are shown.

TABLE 2
PRIOR ROE PERCENTAGES FOR BANKS WITH A SPECIFIC ACV IN 2007

Bank	Total Assets 2007	ACV 2007	ROE 2000	ROE 2001	ROE 2002	ROE 2003	ROE 2004	ROE 2005	ROE 2006	ROE 2007
Dubuque Bank & Trust Company	$976MM	.0999	16.21%	17.36	20.12	18.80	16.64	15.03	16.72	14.70
South Michigan Bank & Trust	$3,315MM	.1003	15.17	10.60	4.80	11.61	12.51	12.35	12.11	13.55
Salin Bank & Trust Company	$834MM	.1996	17.86	19.20	17.68	13.25	11.92	16.49	17.81	10.13
Liberty Bank for Savings	$733MM	.2006	5.53	4.57	6.01	6.26	5.43	4.05	2.95	2.62
Apple Bank for Savings	$7.433MM	.4952	15.30	12.61	10.30	9.19	9.64	11.27	10.46	10.60
Homestreet Bank	$2,773MM	.5004	5.31	11.91	11.61	14.67	10.62	10.56	9.95	9.53

Table 3 lists the numbers of profitable banks in each ACV class year by year, the classes are rank from 1 (tight control) to 5 (very loose). Banks in class one were almost all profitable at that date. Note, too, in Table 3, the numbers of banks listed in the tightest class. The large numbers in class one indicate that most US banks operated 'tightly' in 2006 and 2007 before the crisis. Furthermore, until 2007, more than 1,000 of the almost 1,200 banks studied operated with an ACV < 0.5 (within the tightest classes, numbers 1 and 2). As the record shows, even in 2009, in the depth of the crisis, 836 of the largest US banks in our data base were profitable although the number of profitable banks in the tightest class was cut in half in 2008 and dropped further in 2009 as Table 3 shows.

TABLE 3
DISTRIBUTION OF BANK PROFITS
2007 ACV CLASS

		# of banks in each category each year					
Profitable		**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Ranked ACV Classes	***If ACV***						
1 Tight	**0.0-0.2**	753	625	290	229	340	453
2	**>0.2-≤0.5**	228	276	272	256	278	303
3 Loose	**>0.5-≤1.0**	84	112	149	147	158	145
4	**>1.0-≤5.0**	43	63	179	159	145	113
5 Very Loose	**>5.0**	8	22	51	45	31	29
	Total	1116	1098	941	836	952	1043
Not Profitable							
	If ACV						
1 Tight	**0.0-0.2**	2	1	4	4	2	0
2	**>0.2-≤0.5**	5	5	9	24	16	9
3 Loose	**>0.5-≤1.0**	9	12	20	64	33	31
4	**>1.0-≤5.0**	8	32	53	200	149	92
5 Very Loose	**>5.0**	5	10	36	37	22	11
	Total	29	60	122	329	222	143
	TOTAL	1145	1158	1063	1165	1174	1186
	% reporting losses	***2.53%***	***5.18%***	***11.48%***	***28.24%***	***18.91%***	***12.06%***

It is remarkable nonetheless that the number of banks reporting losses had actually doubled between 2006 and 2007, well ahead of the crisis. The percentage reporting losses in these years rose from 2.53 per cent to 5.18 per cent of our data set. In contrast, the recovery that began in 2009Q3 developed slowly. Even at the end of 2011, the number of banks reporting losses (133) was still more than four times the number reporting losses in 2006 (29) and more than double the number reporting losses in 2007 (60).

Furthermore, it was among the less controlled banks, those with ACV > 0.2, that the struggle to escape from loss proved to be both tough and long lasting.

Table 4 below shows how profitability varied from 2000 through 2011 for the five different ACV classes. In general, it is clear that the smaller ACV (the tighter the bank's control), the higher the ROE. For example, in 2007, the annualized average ROE of the most tightly controlled banks was 12.4 per cent; for banks in the second control class it was 9.1 per cent with the three less controlled classes of banks reporting mean ROEs of 8.1 per cent, 2.7 per cent and 0.2 per cent respectively. The trends revealed in Table 4 show that, on average and over time, tight control paid.

TABLE 4
MEAN ROE PERCENTAGE 1992-2011 FOR THE 2007 DEFINED ACV CLASSES

ACV Class	2000	01	02	03	04	05	06	07	08	09	10	11
1	13.7	13.5	14.1	13.9	13.5	13.7	13.1	12.4	11.5	10.2	10.2	10.5
2	11.2	11.0	10.9	10.8	11.1	11.5	9.8	9.1	8.9	5.6	7.3	7.7
3	9.4	9.7	9.0	9.6	10.1	10.3	7.2	8.1	5.1	-1.7	1.6	2.8
4	4.5	4.3	5.2	6.7	5.9	7.7	7.2	2.7	-3.0	-6.7	-5.8	1.2
5	0.8	0.4	0.8	1.4	1.1	0.7	1.4	0.2	0.2	0.2	0.1	-0.1
all	12.4	12.4	12.5	12.5	12.5	12.8	11.8	10.3	1.5	5.2	3.9	6.6

TABLE 5
MINIMUM (WORST) ROE% 1992-2011 FOR THE 2007 DEFINED ACV CLASSES

ACV Class	2000	01	02	03	04	05	06	07	08	09	10	11
1	2.3	2.6	1.9	1.4	2.8	2.7	1.5	1.5	-24.1	-62.9	-27.9	1.0
2	-2.2	0.7	-2.5	1.2	-2.5	-2.5	0.4	-6.4	-35.8	-67.9	-54.0	-30.3
3	-5.2	1.1	-1.0	2.7	2.0	-2.2	0.8	-6.1	-26.2	-75.9	-52.9	-36.5
4	-4.8	-2.6	-3.5	0.9	0.9	-2.1	-1.2	-6.1	-38.9	-68.3	-52.3	-34.6
5	-0.1	-4.7	-3.4	1.4	0.3	-0.9	-0.7	-3.3	-4.0	-3.6	-9.9	-9.2
all	-4.8	-4.7	-3.5	0.9	0.3	-2.5	-1.2	-6.4	-38.9	-75.9	-54.0	-36.5

Note the numbers of banks in the $1.0 < ACV \leq 5.0$ and $ACV > 5.0$ classes is small, making their average behavior appear to be considerably less stable than that of the more heavily populated classes. When a bank's profitability nears zero, ACV can take on very high values. Thus, for banks with $ACV \approx 5$, year-to-year results can be affected by one or two sharp turnarounds.

In contrast, Table 5, which lists the ROE reported by the worst performing bank in each ACV class during this same time period, shows that no ACV class of bank is immune to loss. Focus first on the tightest class: clearly, as the -24.1 per cent loss on equity for 2008 and the even more damaging loss of -62.9 per cent for 2009 for the very worst performing bank in that class shows that losses can hit any bank in any control class at any time.

As ACV values increase (the lower rows of Table 4), there is a relatively orderly pattern of slightly lower ROEs and, in 2008 and 2009, either modest returns or small losses. However, as the 'minimum' results of Table 5 suggest, this once normal pattern begun to break down as early as 2004 when a bank in the second control class (first) reported a loss – again, well before the 2008-2009 crisis. The generally negative and increasingly negative minimum ROEs reported in the lower rows of Table 5 for 2005 through 2007 show that the less controlled classes of banks suffered a decline in profitability more frequently and earlier than their more tightly controlled rivals.

Returning to Table 4, although the US recovery had begun by 2009Q3, for every ACV class, ROEs were slow to return to pre-crisis levels during 2010 and 2011. The severe negative ROEs of Table 5 for the worst performing bank in each ACV class, and especially the results of the worst performing bank in the tightest control class, suggest that reestablishing the old order was difficult. Table 5 also indicates that the 'normal' order was broken 'loose to tight' with losses hitting loosely controlled banks earlier than they hit banks with tighter controls. Post-crisis, 'normal' profitability was difficult to reestablish, no matter the degree of control exercised earlier, but it is also clear that the banks managed tightly recovered earlier.

Table 6 which follows is focused on the profits and losses reported by banks in each ACV class during the crisis. For this Table, we reclassified banks by their ACV as calculated annually for each of the eight years listed, 2000 to 2007. The experience of each annual ACV class differed. What is noteworthy is the fact that the percentage of profitable banks in each annual ACV class and the percentage reporting losses in one or both crisis years was relatively stable. The best performance was reported by the most tightly controlled class.

TABLE 6
BANK PROFITABILITY & CONTROL 2008 AND 2009
% BANKS CLASSIFIED BY ACV

	1 **Tight** **ACV $\leq$ 0.2**			**2** **0.2 < ACV $\leq$ 0.5**			**3** **Loose** **0.5 < ACV $\leq$ 1.0**			**4** **1.0 < ACV $\leq$ 5.0**			**5** **Very Loose** **ACV > 5.0**		
Classified in Year	**Profit in both 2008 & 2009**	**Loss in either 2008 or 2009**	**Loss in both 2008 & 2009**	**Profit in both 2008 & 2009**	**Loss in either 2008 or 2009**	**Loss in both 2008 & 2009**	**Profit in both 2008 & 2009**	**Loss in either 2008 or 2009**	**Loss in both 2008 & 2009**	**Profit in both 2008 & 2009**	**Loss in either 2008 or 2009**	**Loss in both 2008 & 2009**	**Profit in both 2008 & 2009**	**Loss in either 2008 or 2009**	**Loss in both 2008 & 2009**
2000	70.2%	21.2%	8.6%	64.5%	21.2%	14.5%	60.0%	32.3%	7.7%	45.3%	32.1%	22.6%	54.5%	27.3%	18.2%
2001	70.3%	20.7%	9.0%	69.1%	20.6%	10.3%	53.6%	33.3%	13.1%	41.5%	38.5%	20.0%	41.7%	25%	33.3%
2002	72.8%	19.0%	8.2%	60.3%	27.6%	12.1%	43.4%	39.5%	17.1%	54.2%	25.4%	20.3%	37.5%	37.5%	25.0%
2003	70.4%	20.3%	9.3%	59.9%	28.1%	12.0%	71.1%	19.7%	9.2%	43.6%	35.4%	20.8%	14.3%	42.9%	42.9%
2004	70.2%	20.6%	9.2%	60.6%	27.7%	12.0%	50.0%	35.9%	14.1%	58.3%	16.7%	25.0%	33.3%	11.1%	55.6%
2005	69.7%	21.4%	8.8%	55.2%	29.9%	14.9%	58.7%	20.0%	21.3%	54.3%	25.7%	20.0%	41.7%	25.0%	33.3%
2006	69.9%	21.7%	8.4%	60.3%	26.5%	13.2%	44.9%	30.4%	24.6%	43.5%	23.9%	32.6%	25.0%	12.5%	62.5%
2007	76.9%	18.9%	4.2%	57.6%	31.1%	11.4%	45.8%	27.1%	27.1%	30.6%	24.7%	44.7%	37.5%	28.1%	34.4%

In fact, although the number of profitable banks fell, the majority of the banks maintaining tight control at some point between 2000 and 2007 – about 70% of the banks in the tight ACV ≤ 0.2 class – were profitable for the years 2008 and 2009. Moreover, fewer of these tightly controlled banks suffered quarterly or annual losses in 2008, 2009, or both, than banks in the less controlled classes. As documented in Table 3, however, there are no profit guarantees for banks in any ACV class. The record of the minimum results by ACV class in Table 5 shows that even a very tightly controlled bank can experience unpleasant surprises if its managers are not vigilant. On average, the looser a bank's controls, the more likely it will suffer losses. They also suffered longer. Finally, the loss experience of banks in the two loosest ACV classes was both severe and long lasting.

Again, consistent with every other Table, in Table 6, as ACV values rise, the percentage of banks reporting losses in the crisis years increased no matter the year for which we established the ACV classes. Note, too, that the patterns of profit and losses through 2008 and 2009 across the ACV classes are relatively stable. Table 6 points to the fact that in most years, the tightly controlled banks' real advantage includes not only higher ROE relative to their less-controlled rivals but, in addition, an apparent ability to limit losses during a crisis.

A very high 76.9 per cent of the tightest ACV class of 2007 reported profits rather than losses in both 2008 and 2009 as shown in Table 6 indicating that, when the ACV classes were defined closer to the crisis, these now tightly controlled banks fared better on average than banks that had been categorized as tightly controlled in previous years. Clearly, too, Tables 4 and 6 confirm that, just as any bank in any ACV class can suffer losses, the majority of banks in every class were profitable in 2008 and 2009 – thus our sample of almost 1,200 survivors.

Full Effect of Loosening Control

Banks which earlier in the study period had been in the tightest ACV class, class one, but had loosened control, by choice or as forced by unexpected reverses, suffered an ROE penalty. To rigorously test this observation, we identified the small number of banks operating very tightly with ACV ≤ 0.1. This test revealed that banks that had actually operated with an ACV ≤ 0.1 but then loosened control so that their ACV increased to > 0.2 suffered an average 2.2 per cent ROE penalty (drop). They had reported an ROE of 12 per cent while operating at ACV ≤ 0.1. Loosening control to ACV > 0.2 cut their ROE to 9.8 per cent. Banks operating at an ACV ≤ 0.2 loosening control to ACV > 0.2 suffered a larger average annual ROE penalty of 2.7 per cent.

To help gauge the full effect of loosening control, we re-examined the record of the banks in the very tightly controlled ACV ≤ 0.1 class. Over the long haul, the ROE for these banks declined from 13.0 per cent in 2007 to 10.7 per cent in 2011 – a 2.3 per cent downshift. This penalty paled in contrast with the penalty for any bank that loosened control to ACV > 0.2 during the same period. That penalty was an additional 3.5 per cent reduction in ROE. For the ACV≤1 banks, it seems that loosening control during the crisis had a larger negative effect on their profitability (-3.5 per cent) than the downshift of the economy itself (-2.3 per cent).

The penalty associated with loosening control is one key point but there is another. Although the average ROE penalty between 2001 and 2011 for an ACV increase from ACV ≤ 0.1 to ACV > 0.2 was 2.2 per cent, the total penalty for loosening control and slipping into a looser ACV class (operating like banks with a larger ACV) from 2001 to 2011 was only 3.5 per cent. It was not 22 per cent. This is important. It reveals what bankers do when they suffer an ROE drop: They react.

Their *reaction* – almost universal -- is to fight to reestablish control and regain profitability. Bankers tighten control when they suffer any ROE penalty no matter its cause. Their efforts between 2000 and 2007 are documented in Table 7, which tracks the movement of banks from one ACV class to another across time. Table 7 suggests bankers know that, first, control is rewarded and, second, that when profitability falls, they must recapture it and tighten control. Consider the top section of Table 7. It shows that by 2007, between 65 per cent and 70 per cent of banks that had been in the tightest ACV class in any year between 2000 and 2006 were still operating in that class, while approximately another 20 per cent were in the looser second tightest class.

TABLE 7
TRANSITIONS BETWEEN DATE CLASSIFIED AND 2007
ACV CLASS T O ACV CLASS MOVEMENT: WHERE THEY WERE IN 2007
(Percentages of the ACV classes of **2007** that had been in that **ACV class** at each prior classification)

2007 ACV Class 1	2000	2001	2002	2003	2004	2005	2006
1	65.6%	68.2	65.6	66.6	66.8	67.8	69.6
2	20.0	18.4	19.1	19.3	19.4	19.2	19.0
3	7.8	7.9	8.8	7.8	6.8	7.1	6.5
4	4.8	3.9	4.3	4.6	5.3	4.7	3.1
5	1.9	1.6	2.2	1.8	1.6	1.3	1.8

2007 ACV Class 2	2000	2001	2002	2003	2004	2005	2006
1	51.1%	50.8	54.6	51.1	48.2	40.9	38.2
2	27.5	26.3	24.2	27.6	29.5	32.5	33.2
3	10.8	11.5	9.6	9.0	12.4	12.8	14.5
4	7.2	8.0	9.2	9.3	6.0	9.9	11.4
5	3.2	3.4	2.5	3.0	4.0	3.9	2.7

2007 ACV Class 3	2000	2001	2002	2003	2004	2005	2006
1	46.2%	44.0	42.1	41.6	35.9	30.7	17.4
2	27.7	33.3	39.5	27.3	31.3	32.0	31.9
3	13.8	7.1	5.3	18.2	17.2	16.0	17.4
4	10.8	13.1	11.8	10.4	9.4	16.0	26.1
5	1.5	2.4	1.3	2.6	6.3	5.3	7.2

2007 ACV Class 4	2000	2001	2002	2003	2004	2005	2006
1	43.4%	41.5	45.8	37.5	28.9	17.1	10.9
2	24.5	29.2	23.7	25.0	21.1	25.7	26.1
3	9.4	9.2	11.9	12.5	15.8	14.3	17.4
4	18.9	13.8	15.3	18.8	34.2	28.6	30.4
5	3.8	2.4	3.4	6.3	0.0	14.3	15.2

2007 ACV Class 5	2000	2001	2002	2003	2004	2005	2006
1	45.5%	41.7	25.0	28.6	33.3	33.3	50.0
2	27.3	16.7	37.5	14.3	22.2	41.7	0.0
3	9.1	16.7	12.5	14.3	0.0	0.0	12.5
4	18.2	25.0	18.8	28.6	33.3	8.3	37.5
5	0.0	0.0	6.3	14.3	11.1	16.7	0.0

Now focus on the second ACV class in Table 7. Of banks so categorized in 2000, more than 51 per cent had tightened control to return them to the tightest ACV class by 2007. Again, focusing on the second rank class, note that the percentages of banks formerly classified in that class that were able to claw their way back into the tighter ACV ≤ 0.2 class falls as we move closer to 2008. It seems the effort to tighten control and reestablish former levels of profitability became more demanding as the 2008-2009 crisis grew closer.

Consider even more loosely controlled banks of 2000 to 2006 in Table 7, those where 1.0< ACV ≤ 5.0, the fourth of the five classes in Table 7. Closer to 2008, what was once possible for the 2000 ACV ≤ 5.0 class became very difficult. For loosely managed banks in the fourth ACV class in 2000, 43.4 per cent successfully tightened control by 2007 to reenter the tightest ACV≤ 0.2 class. In almost every subsequent year, the number successfully re-entering the tighter classes (with their higher average ROEs) falls. For example, as Table 7 shows, for the fourth ranked class of 2006, only 10.9 per cent were able to climb back into the tightest ACV ≤ 0.2 class by 2007. We can contrast these results with those of the more controlled third rank class of 2000, 46.2 per cent had reentered the tightest class by 2007. For the 2004 and 2006 third rank classes only 35.9 per cent and 17.4 per cent were as successful.

Summary of Results

Summing up, first, the evidence presented herein indicates that most US bankers are responsible and prudent fiduciaries – their banks operate 'tightly,' that is, in what we called the ACV ≤ 0.2 class. In most years, about 1,000 of the 1,200 banks studied here operated under ACV < 0.5. This makes sense in light of the fact that tight control yields higher returns than loose. The advantages of the tightest ACV ≤ 0.2 class were enhanced average profitability 2000 to 2011 and, for the few that suffered losses in the crisis, those losses were generally limited and of short duration.

Second, the percentages of any ACV class suffering losses rise as ACV increases. Loose control led to loss more frequently than tight. On average, banks maintaining control by holding their ACV ≤ 0.2 or tighter did not lose money. Far smaller numbers of the tightly controlled banks reported losses than any of the less controlled classes. The losses of banks with ACV > 1.0 in ACV classes four and five were severe and long lasting.

Third, the data indicate that bankers always strive to 're-establish" control. On average, about 70 per cent of the banks in the tightest class stayed in that class year after year. Corollarilly, about 30 per cent of that class either loosened control for some strategic reason or, being buffeted by their competitive environments, were knocked into a looser control position by loan losses (customers' problems). But, when such problems arise, the evidence is that bankers strive to recapture the advantages of tight control as quickly as possible. Bankers clearly 'value' losses highly and strive to limit them.

Signals Alerting to Potential for Future Problems

The fact that even tightly controlled banks can suffer substantial losses makes it imperative that bankers, analysts, and regulators, alike, learn the lessons of the crisis and become aware of signals that might alert them to trouble ahead. We suggest there were several alerts before the 2008-2009 crisis that might have presented opportunities to think more clearly about the industry's prospects should the economy turn down. Indeed, as we see it, the longer the positive phase of the business cycle lasts, the more alert they should be. Increased vigilance is a sensible watchword for the industry when good times persist.

Here are the four strong signals we see:

1. ROEs were declining across the banking industry well ahead of the peak of the business cycle in 2007Q4. In contrast, ROEs were still rising at the end of the previous cycle.
2. Although, on average, loosely controlled banks suffered losses earlier than tightly controlled banks, when regulators and those managing or following banks in the tightly controlled class see an unusual number of less controlled banks unexpectedly reporting losses, they should take note.
3. A departure from the normal loss experience of any ACV class is a warning but the most ominous signal is when the average ROE of the most tightly controlled banks falls and an increased number of the former ACV ≤ 0.2 banks begin to report losses.
4. Fourth, as the US economy moved closer to crisis, it became harder to reestablish tight control. When the numbers of banks that loosened or lost control try to recover but can't, this too is a strong signal of rising competitive and environmental difficulties.

Recognition of such signals demands that bankers, regulators and analysts alike widen their scans of the banking environment well beyond peer classes. They need to tap the industrywide data that are available.

For this paper, hindsight allowed us the opportunity to scan yesterday's banking environment with the sure knowledge of what happened in 2008 and 2009. The question was: *How did the banks that survived the crisis do it?* Can we learn how to assess industry behavior during the last years of future business cycles? If we can, recognition of what the facts mean and anticipation of what might follow can help bankers and regulators maintain vigilance.

Let us elaborate on the four signals identified above to establish their precise character.

First, we noted an unexpected decline in ROE across the industry before the peak of the business cycle. During the last business cycle, but before the US economy collapsed, alert bankers and others might have also noticed an abnormal down-shift in industry profitability in 2004 or 2005 as Table 4 documents. Across the industry, ROE appears to have peaked mid-cycle, long before the 2007Q4 peak, quite unlike the US economy in the preceding cycle. Table 4 shows that in 2001, the average ROE of each ACV class was rising even as the economy peaked. But the same Table shows that despite the apparent prosperity of 2003, 2004 and 2005, the ROE of almost every ACV class had already peaked by 2006. An unusual number of banks were experiencing reduced ROE by 2007 either because opportunity was waning or competition was rising or both. By 2007, the decline in ROE across the board was quite evident although the crisis itself was a few months off.

Second, on average, loosely controlled banks suffer losses earlier than tightly controlled banks. Thus, when the management of the more tightly controlled banks see an unusual number of their less controlled rivals unexpectedly reporting losses, they should take note. Table 8 documents the rising numbers of banks reporting losses from 2001 to 2007 by ACV class as classified year by year from 2000 to 2006. Given the 2008-2009 crisis, it seems reasonable to suggest that increased numbers of banks with losses in any class *may well be precursors of later trouble across the industry* and, in particular, severe trouble for the less controlled banks.

Third, any departure from the normal experience of any ACV class is a harbinger of trouble – especially when the numbers of the most tightly controlled banks reporting losses rises unexpectedly. As control is loosened, and ACVs increase, it seems that the percentage of losers in any ACV class will rise as Table 8 shows. However, note the unusually large increases in the numbers of banks reporting losses between 2006 and 2007. In Table 8, even among the tightly controlled ACV ≤ 0.2 class, the percentage of banks reporting losses jumped by a factor of nine for ACV classes defined in the years 2000 through 2004. A substantial jump in the numbers suffering losses in any ACV class seems to be a strong signal that things are changing for the worse. For those who note the change, the issue is what to do next.

TABLE 8
PERCENTAGE OF ACV CLASSIFIED BANKS LOSING MONEY IN SPECIFIC SUBSEQUENT YEARS

2000 Class	2001	2002	2003	2004	2005	2006	2007
1	.7%	.9	.7	.7	.7	.3	2.9
2	3.6	1.4	.5	1.4	2.7	2.7	5.0
3	4.6	6.2	3.1	3.1	4.6	0.0	0.0
4	11.3	13.2	3.8	3.8	3.8	5.7	13.2
5	0.0	18.2	0.0	0.0	0.0	0.0	9.1

2001 Class	2001	2002	2003	2004	2005	2006	2007
1		.3	.3	.5	.8	.2	1.9
2		2.7	1.5	1.5	1.9	1.5	1.6
3		10.7	4.8	4.8	6.0	6.0	8.3
4		7.7	0.0	3.1	1.5	0.0	6.2
5		16.7	8.3	8.3	8.3	8.3	16.7

2002 Class	2001	2002	2003	2004	2005	2006	2007
1			.4	.6	.6	.1	2.8
2			.8	1.3	2.1	.4	3.3
3			3.9	3.9	3.9	5.3	6.6
4			6.8	8.5	8.5	8.5	13.6
5			6.3	6.3	6.3	6.3	12.5

2003 Class	2001	2002	2003	2004	2005	2006	2007
1				.1	.6	.3	2.7
2				1.9	1.1	1.5	6.0
3				2.6	3.9	0.0	2.6
4				16.7	12.5	10.4	14.6
5				14.3	28.6	14.3	28.6

2004 Class	2001	2002	2003	2004	2005	2006	2007
1					.5	.3	2.7
2					.4	.8	3.6
3					6.3	3.1	7.8
4					18.4	5.3	10.5
5					33.3	44.4	55.6

2005 Class	2001	2002	2003	2004	2005	2006	2007
1						0.0	3.0
2						2.5	3.0
3						1.3	8.0
4						20.0	17.1
5						16.7	16.7

2006 Class	2001	2002	2003	2004	2005	2006	2007
1							1.5
2							7.3
3							13.0
4							19.6
5							25.0

Table 8 shows that 0.5% of the tight 2004 Class One ACV ≤ 0.2 banks experienced losses in 2005, 0.3% of them had losses in 2006 and 2.7% in 2007 just before the crisis. In contrast, 33.3% of the 2004 defined fifth ACV class banks suffered losses in 2005. They fared worse in the next two years with 44.4% of them losing money in 2006 and 55.5% losing money in 2007, again, before the 2008/9 crisis.

For further evidence of this third signal, consider Table 7 again. The percentage of banks holding tight at ACV ≤ 0.2 and other ACV thresholds seems to drop as we get closer to 2008, while numbers in the looser classes rise. Between 2006 and 2007, the number of banks in the tightest ACV class fell 8.0 per cent; numbers in class two rose 20.6 per cent; while the number of banks in the third ACV class rose 55.1 per cent; and, numbers in the fourth ACV class increased 85.8 per cent. Finally, numbers in the most loosely managed class rose 400 per cent making it clear that, immediately before the crisis, many banks were being buffeted by unfamiliar profit variation. By late 2007, large numbers of the least controlled banks were already reporting losses.

The data presented throughout this paper make it clear that the 2008-2009 crisis was unusual if not abnormal – hardly news in 2016. But the key point is that in 2005, 2006 and 2007, well ahead of the crisis, the number of banks in each ACV class reporting losses jumped materially – facts that, with hindsight, now appear to be strong signals of impending trouble.

Further, in this regard, perhaps the most ominous signal is when the average ROE of the most tightly controlled banks falls and increasing numbers report losses. Then the prospects of even worse trouble appear to be significant. The minimum ROEs of Table 5 year by year tell a story – if losses start to appear among the minimum ROE statistics for a wide swathe of the industry as in 2005 and 2007, they are a strong alert for trouble ahead. Increased losses industry wide is a very loud alert.

Fourth, as the economy moved closer to crisis, it became harder to reestablish tight control and past levels of profitability. When banks that lost control just before the crisis tried to recover, they were less successful than in earlier years. The evidence supporting this conclusion is Table 7, the transition matrix tracking the movement of banks within the control hierarchy. It shows banks trying to tighten control between 2005 and 2007 but having less success each year as the crisis grew closer -- another strong signal of rising competitive and environmental pressures.

In this context, the fact that the difficulty of reestablishing control increased for the looser classes immediately after the prior peak in 2001Q4 (see the 2002 data for the ACV >5 class) is perhaps another early signal worth noting. The data in Table 7 suggest that the banking environment had begun to change as early as 2003 or 2004, warning of a building crisis far earlier than most observers believe (even today).

The number of banks in the tightest ACV class in Table 7 appears to be remarkably stable across time. The numbers show that bankers prefer to operate with tight control and without losses. Bankers vote with their feet. And, as noted already, although 30 per cent either moved out or were forced out of the tightest ACV ≤ 0.2 class for a time, they try to get back into it. The behavior of the ACV class two banks attests that over the years, most worked to get back to the ACV ≤ 0.2 level of control or tighter. But the record also shows that the closer the crisis, the harder the task. A limited ability to regain control characterized banks in the second ACV class as the economy moved towards 2008. It was 'almost evident' as early as 2004 but it is certainly clear by 2005.

As stated earlier, a sensible watchword for the industry is 'the longer the business cycle extends, the more alert to be. With banks under (capital) market pressure for profits (and to protect their autonomy from acquisition), some banks may have stretched beyond their comfort zones into unfamiliar markets where their competencies and capabilities no longer matched market needs. Perhaps these investments created an incipient weakness (albeit not quite appreciated by management or bank regulators). To the extent this is true, they were poor forecasters. The result, however, is clear – unexpected profitability variation.

CONCLUSION

Tapping industry data from 2000 through the 2008-2009 crisis to 2011, this paper focused on variation in profitability and the numbers of banks reporting profits or losses. Our research used simple measures, ROE, average ROE, and its absolute coefficient of variation (ACV), measures that can be readily calculated with commercially available software. The ACV index reveals the positive effects of tight control: Tight control is rewarded with heightened profitability; loose control is penalized with reduced profitability and exposure to a higher probability of loss. Bankers clearly recognize that these are the facts of life for, when they suffer reversals, they try to reestablish control and higher levels of profitability as soon as they can – we add, using their own methods (Calabia, 2016).

In this paper, we have shown that the success of their efforts is captured by reductions in their ACV index, an index we have labelled "Control". In addition to identifying the real influence of control, the ACV index can be used to shift bankers' and regulators' and analysts' attention from the search for potential failures and from peer classes to the behavior of the industry as a whole. In this instance, the industry record encoded by the ACV index reveals several anomalies. We have interpreted these as signals portending trouble ahead. Although we expect the next banking crisis will not have the same causes or even the same character as the last, the fact that several anomalies are quite clear in the historic record suggests that prudent bankers, regulators and analysts, might regularly scan the industry looking for deviations from 'normal' behavior. The need for such wide scope seems to become more urgent as the business cycle lengthens and growth becomes increasingly contested.

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