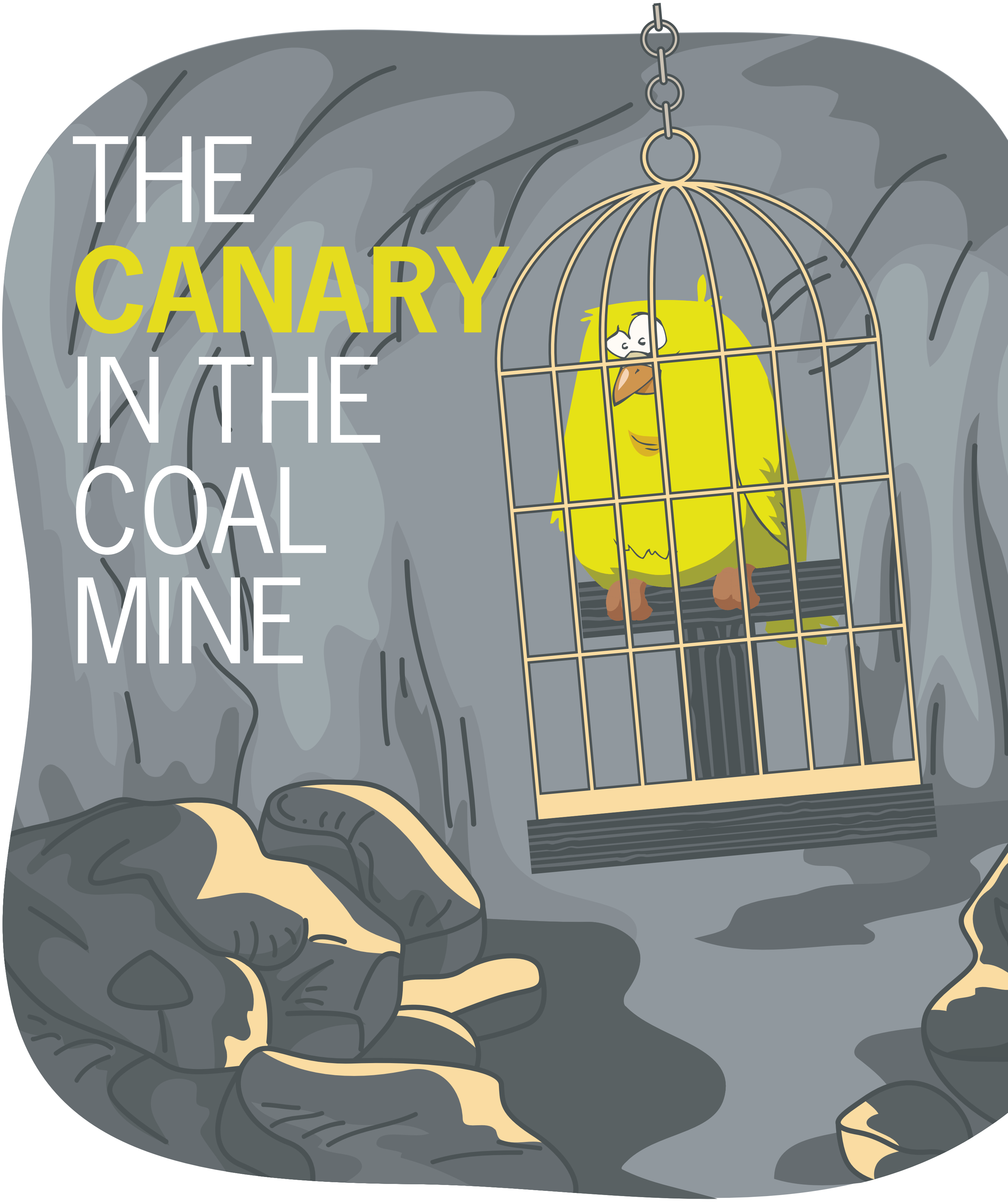
THE CANARY IN THE COAL MINE



IN YEARS PAST, IT WAS STANDARD PRACTICE TO CARRY CAGED CANARIES INTO MINES. IF DANGEROUS GASES WERE PRESENT, THE GASES WOULD KILL THE CANARY BEFORE THE MINERS, PROVIDING A WARNING FOR EVERYONE TO GET OUT IMMEDIATELY.

BY MICHAEL MARCUCCI, CRC

Most bankers have heard the saying "You make your best loans during bad times." Passed down by generations of credit officers, it is still relevant today.

Asset quality is the best it has been in 10 years, as nonaccruals are down and some loan portfolios are showing zero charge-offs. This is good news for banks; however, it may be bad news for risk managers.

Experience shows this is exactly the time when loan officers say, "Come on, let's take some risk; we haven't had a charge-off all year," or "We aren't growing fast enough." Soon enough, straight-faced bank CEOs will ask their sales teams to find a way to underwrite investment properties in Florida for borrowers with no income and no assets.

In short, the loan workout nightmares of tomorrow are being conceived during the good times we enjoy today. As Comptroller of the Currency Thomas J. Curry said at RMA's Annual Risk Management conference in November, "Some of the loans we see banks making today are going to customers who almost certainly would not have qualified for the same loan four or five years ago…. Credit risk is showing up in two of its classic forms: relaxed credit underwriting and increased loan concentrations."[1]

In years past, it was standard practice to carry caged canaries into mines. If dangerous gases were present, the gases would kill the canary before the miners, providing a warning for everyone to get out immediately. This article leverages the experience of some seasoned industry professionals and discusses how we can build our own "canaries in the coal mine."

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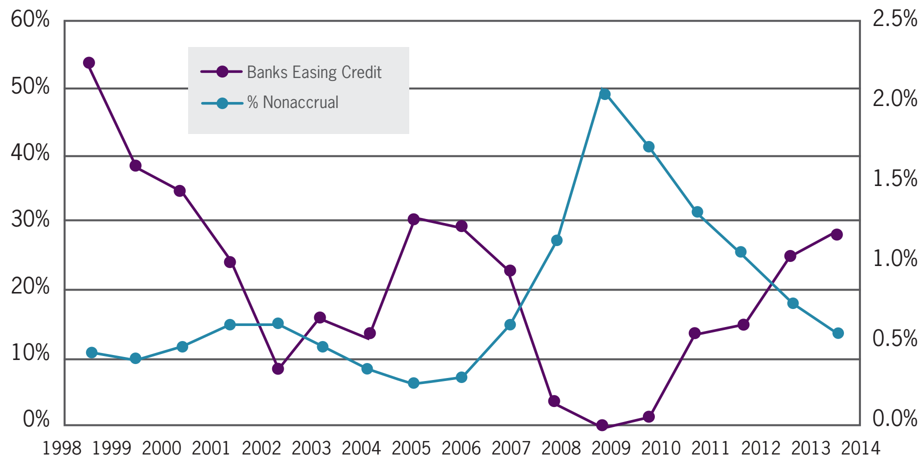
The State of the Industry

Interviews with 10 risk executives indicate a growing level of caution. Joe Hill, president of CEIS, a nationally recognized loan review firm, surveyed data from the 135 banks examined by his team. "There are a lot of new deals out there," Hill said. "Asset quality is generally pretty good. However, I am concerned about three areas: multifamily concentrations, nonrecourse deals, and covenant-lite transactions."

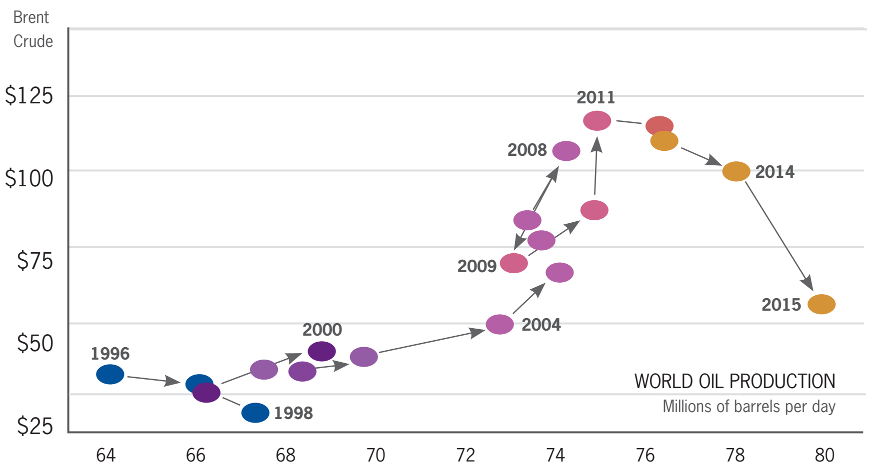
Dan Neumeyer, chief credit officer of Huntington Bancshares in Ohio, has a similar view. "We are at the point where we have had a number of good years, so we should expect that; I don't take a lot of comfort in these numbers. Within the industry, mistakes have yet to materialize. Based on history, we are in the latter stages of the recovery...probably near the eighth inning."

FIGURE 1: CREDIT STANDARDS AND NONACCRUALS



Sources: OCC, FDIC

FIGURE 2: OIL PRICES AND WORLD OIL PRODUCTION



Source: *New York Times*

Thad Allen, chief credit officer of Zions Bancorporation, observed, "Core growth at many companies has been flat, and many have survived by cutting expenses to the bone. Many deals across the industry have qualified at lower rates, but their performance will be suspect when the yield curve begins to move."

While nonaccruals are falling, other trends of a more forward-looking nature are evident. For decades, the OCC has conducted an annual survey asking examiners whether the banks they cover are easing or tightening credit standards.[2] Comparing the OCC survey results with the industry-reported nonaccrual ratios,[3] we see an interesting pattern.

Intuitively, we know that easing credit leads to nonaccruals. In fact, the two data sets are highly negatively correlated (r = -0.78). And while each economic cycle has its own nature and character, these trends move apart for relatively short periods until convergence begins. Figure 1 suggests that nonaccrual levels have bottomed out or may do so shortly, commensurate with the tightening of standards that would appear to be the next phase of the cycle.

Specific Concerns

Each credit executive interviewed was asked, "What product or segment gives you the most concern?" Three common themes resonated.

1. Multifamily Housing

There was a near universal concern with multifamily housing, both in terms of growth and concentrations. Hill indicated that he is seeing "a consistent loosening of terms within this sector, both within the banks we examine and also with other lenders across the industry."

Bill Kametz, deputy chief credit officer at S&T Bank, echoed this comment, saying, "Multifamilies are probably a little further along the curve, and a growing number of markets appear to be overbuilt."

Allen noted, "We have been concerned about multifamily for at least a year and accordingly have raised the qualification bar and are incredibly selective about any new projects."

In a 2015 report, the OCC commented that multifamily loans are "a significant concentration and a meaningful source of loan growth for many banks with total assets of less than $10 billion. Banks are also at an elevated risk of collateral values on multifamily projects falling when interest rates increase. While this risk applies to all forms of CRE lending, multifamily lending may be of particular concern given that capitalization rates are at or near historical lows."[4]

2. Energy Industry

The second area most commonly referenced was the energy industry, for both direct and indirect exposure. The rapid decline in commodity prices has been great for the individual consumer, but painful for any business on the provider side.

The drivers of this problem boil down to simple economics: 1) a combination of lower demand as economies around the world slow down, and 2) increased supply due to fracking technology in the U.S. and other countries where production is increasing (Russia) or coming back on line after political disruptions (Iraq).

The combination of these two factors has driven prices to such low levels that over 250,000 jobs in the U.S. oil industry have been eliminated, and more than 40 companies declared bankruptcy in 2015.

Figure 2 tracks benchmark oil prices and worldwide supply. Oil prices have fallen so low and so fast that any recovery to levels observed over the last 10 years is unlikely to occur any time soon.[5]

These concerns were also noted in the most recent Shared National Credit report by the Federal Reserve, which stated, "The significant decline in oil prices over the past year has particularly adversely affected many oil and gas (O&G) exploration and production (E&P) companies leading to increased classified commitments in that subsector compared to last year."[6]

Karen Drew, chief credit review officer at CIT, noted, "Many banks have indirect exposures and should be concerned about the energy sector and how it will affect middle market companies that rely on energy business to support themselves. This would include anything that transports the energy or produces it or services it. Although many companies are hedged, when hedges roll off some losses could take shape."

With the ongoing turmoil in the energy markets, bankers should understand both their direct and indirect exposure to the energy commodities that have experienced price declines. The financial implications are as serious as collapsing oil prices. As reported by *The Economist,* they "forced JP Morgan Chase to set aside $124 million in the final quarter of last year to cover any losses in its loans to energy firms."[7]

Inevitably, there will be a ripple effect on those companies that support the energy firms but are not directly involved in the production process. This dynamic was reported recently when Wells Fargo set aside over $1 billion in reserve to cover losses tied to oil and gas. The *Wall Street Journal* reported, "…loan exposure in communities where employees work in the energy sector 'may experience some credit challenges.'"[8] Bankers should be proactive in understanding their direct and indirect exposure from this segment.

WITH THE ONGOING TURMOIL IN THE ENERGY MARKETS, BANKERS SHOULD UNDERSTAND BOTH THEIR DIRECT AND INDIRECT EXPOSURE TO THE ENERGY COMMODITIES THAT HAVE EXPERIENCED PRICE DECLINES.

3. Leveraged Lending

The third area mentioned as a concern was leveraged lending. This might come as a surprise to many, given the intense focus on leveraged lending following the regulatory guidance issued in 2013.[9] But even with this guidance, the impact of prolonged and abnormally low interest rates, in addition to weakening deal structures, is a concern centered on the growing trend of nonrecourse and covenant-lite deals. According to Joe Hill at CEIS, "Within leveraged lending, nonrecourse deals have become common with more liberal standards. Conventional wisdom is that these and other covenant-lite deals are actually better quality, but that is only the theory. Time will tell."

Barb Godin, chief credit officer at Regions Bank, also expressed concerns about leveraged lending, noting that "many of the deals we see in the industry place reliance on enterprise valuations which might be pretty frothy right now. This is a very dangerous time in banking. Structures have been weakening across the industry."

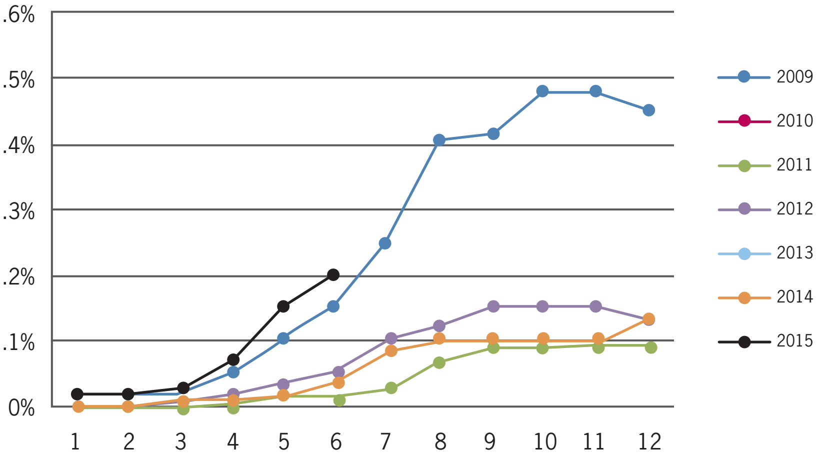
Thad Allen at Zions remarked that "in the industry and especially private equity there is way too much money chasing too few deals. This drives multiples too high and bankers may be tempted to justify deals on a short-term earnings spike. So both the private equity groups and the industry are taking higher levels of risk in the leveraged lending space."

The aforementioned Shared National Credit report also expressed concerns: "The agencies noted a significant increase in leveraged lending volumes and continued loose underwriting, as evidenced by weak capital structures and provisions that limit the lender's ability to manage risk."

Concerns are not limited to bankers, vendors, and regulators. RMA has a relationship with the Wharton School, where Gene Guill is co-director of the Advanced Risk Management Program in the Aresty Institute of Executive Education. "My concern is with the documentation and structuring. Bankers can relax standards in the face of intense competition," said Guill. "In terms of defaults and losses, we have not seen a meltdown in this market in the past but rather some renegotiating of contracts because covenants and otherwise strong documentation forced borrowers back to the table. Significant problems did not arise because loans were well structured. The risk now is that loan documentation has been relaxed and loans with fewer covenants are not likely to perform as well in a future economic downturn."

All of this supports taking a longer-term view of borrower earnings and projections, stressing deals based on a normalized interest rate, rethinking how structure mitigates risk, and being aware of portfolio concentrations.

FIGURE 3: VINTAGE DELINQUENCY



Note: Simulated portfolio

IN TODAY'S MARKETPLACE COMMERCIAL LOAN APPLICANTS WITH GOOD CREDIT PROFILES CAN GO ANYWHERE THEY WANT. THAT MEANS SPEEDY (AND SOUND) DECISIONS ARE CRITICAL.

Traditional Measures and Their Shortcomings

The problem with most measures of asset quality is that they are lagging indicators. By the time a charge-off or nonaccrual is reported, the loan/portfolio has already deteriorated. The same is true for financial statements from corporate borrowers. Quarterly statements are often 45 days in arrears and then may have to wait in line while the credit department works through a backlog of spreads.

This is why it's important for management to stay focused on internal metrics such as the backlog of credit statement reviews.

The value of a leading indicator is that it provides advance warning to do something. Otherwise, a banker becomes a mere spectator to the inevitable with no power to influence events. This was the value of the canary in the coal mine. And while the assignment might seem unfair to the canary, at least its life was useful (albeit short).

Leading Indicators

Here is a list of important metrics that risk managers should always review. Think of them as the canaries in the coal mine:

CANARY #1:

An early indicator of a change in the risk profile may be applications coming through the door. Shrewd risk managers focus their resources on the risk at the margin because changes in the entire portfolio are slow to materialize and difficult to detect. But new volume trends are easier to analyze and could be indicative of the portfolio's potential forward momentum.

For a retail portfolio managed with a scorecard (generic FICO or a custom card), the population stability index (PSI)[10] is a helpful indicator that can show empirically if the risk profile of applications through the door is shifting. Since most retail portfolios are scored, the PSI is an easily constructed metric for a first line of defense.

CANARY #2:

Another important indicator is the vintage performance of discrete loan cohorts. Vintage delinquency performance measures delinquency with respect to the age of the loan in the portfolio, regardless of when the loan was originated. Therefore, a loan booked in January and a loan booked in August would measure their first month of performance in February and September, respectively.

Vintage delinquency has a strong advantage over traditional delinquency in that rapid growth does not mask portfolio deterioration. If the vintage curve departs from the norm, this can be an indicator that the risk profile has changed, either in credit standards or in the nature of the population through the door.

In Figure 3, the simulated portfolio performance of the 2015 vintage (expressed as delinquency with respect to those loans booked in the nth month of life for a given year) is departing from the norm and trending more closely to the 2009 curve, which does not portend well for future performance. As Karen Drew commented, "Bankers should look at their underwriting at vintage years. Look at vintages when underwriting was strong and watch for departures from that curve."

For larger commercial portfolios, vintage analysis can also be deployed and further adapted for line-of-credit utilization, downgrades, and nonaccruals.

CANARY #3:

For commercial portfolios, in-the-door analysis for product and segment-relevant metrics (for example, debt covered and leveraged for C&I, cash-on-cash ratio, project NOI and cap rates for CRE, and advance rates on ABL) of new vintages versus the existing portfolio can be an indicator.

As with PSI and vintage delinquency, to the extent the metrics depart from the established mean of the bank's current book indicates that the risk profile may be migrating. Any negative trends or outliers on their own do not necessarily trigger concerns, but should be a catalyst for further analysis. Trends away from the norm may also indicate that the ALLL processes might need to be challenged to ensure that the newly developing risk factors are included in the models that drive the provision and allowance buildout.

CANARY #4:

Pull-through rates[11] can be an indicator of potential problems, especially around adverse selection[12] caused by poorly trained or inadequately managed commercial loan officers. In today's marketplace, where so many online lenders and loan apps are disruptors of traditional lending practices, commercial loan applicants with good credit profiles can go anywhere they want. That means speedy (and sound) decisions are critical.

Yet, loan pipelines can become clogged by bankers who are not adept at sourcing quality applicants. In this case, poor-quality applications (either not creditworthy or with incomplete loan packages) can slow down the decision process. The unintended outcome may be that better customers are attracted to (and accept) loan decisions offered more quickly by an online lender—leaving traditional banks a lower-quality application pool driven by poorly managed credit pipelines.

CANARY #5:

Combinations of risk indicators in high-risk segments (FICO + LTV; DSC and leverage) maximize the power of data analytics. Solitary indicators are valuable, but combinations can sharpen the focus on developing problems. These combinations point to higher-risk segments of the portfolio and therefore lend themselves to inclusion in any risk appetite statement approved by the board. The following table shows some common examples:

High-risk segments can also be analyzed by comparing certain ratios to collateral

PRODUCT OR SEGMENT	METRIC 1 +	METRIC 2
C&I	DSC Ratio +	Leverage
Retail	FICO +	LTV
Retail	D/I Ratio +	LTV
CRE	Cap Rate +	LTV or LTC

types or industry segments. For instance, in commercial real estate, there may be a limit on properties with cap rates within certain types of collateral. In C&I, there may be limits imposed for DSC ratios below certain levels for a particular industry segment. These examples are not all-inclusive and should not be adopted until the board has reviewed a segmentation analysis that points to the key risks in the portfolio and articulates a strategy for measuring, managing, and monitoring those risks.

This is not an easy task. At Union Bank, Don Stroup, chief credit officer of retail banking, has spent the last 36 months building a risk control framework that focused on certain risk band combinations. "We define certain high-risk segments and pay careful attention to them," he said. "This includes concentrations against credit exceptions, low FICO and high LTV, and other areas. When we feel these areas start to run hot, we take quick action."

CANARY #6:

Each person interviewed talked about the criticality of tracking exceptions to loan policy. Commented Joe Hill, "Exception levels are an indicator of portfolio direction. If you are not paying attention to exception rates, this can become a problem." Meanwhile, Barb Godin advises her credit officers, "Be skeptical. When you get projections, especially on exceptions, question them. Dig a bit more than normal and provide good effective challenge."

In addition to challenging exceptions at the time of underwriting, now is the time to beef up the credit metrics around loan performance for those exceptions that make it to the portfolio. Both for retail and commercial loans, commented Bill Kametz, "bankers need to be transparent with the board. The board should have full visibility to monitor loans in excess of the house limits and the loans that management made exceptions for."

Over time, the ultimate justification for any exception is the solid performance of that loan along with the economic value produced by the relationship. If the bank's metrics cannot point to these qualities as justification, the risk officer should inform the board that the basis for prior loan exception approvals may be suspect.

CANARY #7:

The Material Loss Reviews of the FDIC Inspector General[13] show that regulators cite high concentrations (especially with CRE and A&D) as common drivers of bank failure. Risk executives interviewed for this article point to the need for board members to assert themselves in this area by insisting on well-defined risk appetites, single point-of-exposure limits, and frequent reporting against these limits.

Gene Guill noted, "The first thing I would want risk managers to think about is concentration risk. What guidelines are in place to prevent a bank going too far in building concentrations before red flags come out?" And Karen Drew stated that "astute bankers are looking at their books for sector concentrations and asking tough questions. If this begins to show weakening, what would the impact be?"

CANARY #8:

All the executives interviewed agreed on the value of tracking bank growth and performance versus competitors and peer groups, with a key goal of finding outliers against peers. This is fundamental to a risk manager's job, especially where markets and products are so well defined as to lend themselves to tracking with publicly available data, such as the FDIC's bank data and statistics database.

Barb Godin said, "We stay focused on what other banks are doing…and what they are not doing. If our competitors are curtailing their risk appetite, we always

THE BOARD PLAYS A VITAL AND IRREPLACEABLE ROLE BY DEMANDING USABLE INFORMATION SO THAT TRUE EFFECTIVE CHALLENGE AND GOVERNANCE CAN OCCUR.

ask ourselves, 'What do they know that we do not?'"

James Costa, chief risk officer at TCF, takes a very similar view: "We look very carefully at what our peers are doing and what they are not doing. We formally track quite a bit of data on our peer banks and also look for anecdotes about their risk appetites. We want to be fully in tune with the tenor of the market."

Marketplace data in the form of interest rates can also be helpful. The yield curve flattened and inverted in 2006 well before unemployment, a lagging indicator, peaked in 2008-09 during the housing crisis and recession. This explains why so many risk executives have focused on the yield curve as a reliable indicator. Thad Allen remarked, "The existing yield curve suggests that we have upside in the economy, but this is hard to tell because the recovery has been so lackluster. But with a normal curve, it gives reason to believe that we have room in the current cycle."

Costa looks to "pricing, rates, and spreads as very early indicators, as the market is fairly efficient. The Federal Reserve survey of lending standards is an early indicator, but market movements around rates precede that."

CANARY #9:

Beyond this application of the yield curve, other information from the market can be gleaned for leading indicators. Gene Guill advises bankers to invest time in developing leading indicators and stress indicators, but warns that every recession is different. He advises bankers to ask this key question: Is the price of risk rising? Especially for bankers using hedges against any large exposures, the market information flowing back into the portfolio (in the form of the price of the hedge and the spreads against the given index) provides valuable insights and real-time information.

"For as the cost of hedging increases, that is the market telling you that the price of risk is increasing," Guill commented. "This information can be invaluable to the risk manager as it is market based and therefore independent."

Leading Practitioners

For those organizations viewed as true leading practitioners in the area of leveraging credit metrics, there are two common themes.

Culture

Some firms just get it. Others do not. Dan Neumeyer commented, "It's all about culture. Those banks that have strong risk and credit cultures that drive how they do business view training and discipline as long-term investments." Karen Drew noted, "They got there by getting the buy-in from the line. It is absolutely critical to bridge expectations from the top of the house to the bottom."

Of course, the type of culture that leads to sound risk management does not happen overnight. Thad Allen noted that he spends a great deal of his time "trying to develop the right culture." This can include developing a holistic view of people, training, compensation, investments, behaviors, and consequences for bad actors.

As James Costa of TCF observed, "Leaders in this area did not get there by accident. They got there for one of two reasons: 1) because regulators required them to make an investment in risk management, or 2) there was an environment in the leadership team that welcomed the investment in risk...probably because of a prior bad experience or near miss."

Building sound credit and risk skills takes time and is expensive, but a core set of competencies is fundamental to banking. In support of this, RMA's Credit Risk Certification program (CRC™) is a popular and effective way for credit risk managers to build and validate the skill sets of their staff.

Data

All metrics rest on solid data quality. Several credit executives discussed the impact of recent regulatory changes from CCAR and DFAST. Dan Neumeyer commented that these two regulatory dynamics "caused banks to really focus on data integrity to think about ways to reduce duplicate entries and to learn where we have data problems. Especially for the larger players, these new dynamics have driven a focus on controls and safeguards that may not have normally risen to a list of concerns."

James Costa of TCF stated that the "rigidity of compliance on CCAR has been painful, but it has forced banks to put more tools in their toolbox."

As painful and expensive as these regulatory requirements have been, the common view is that there were two primary impacts. First, the new requirements exposed data problems and led banks to focus on data integrity. Second, the improved data quality allowed for better management information.

In addition to data quality improvements, risk managers have begun to

understand the criticality of managing data through the prism of context. On this point, Barb Godin remarked, "CCAR is forcing us to understand the context of our data. The criticality of the data has also driven an evolution of organizational ownership of data, to the point where credit and risk organizations are asserting themselves to play a greater role with technology departments."

Bill Kametz of S&T Bank stated, "We started seeing the need for data and data governance in 2007-09. The data was centralized outside of credit. And there was a lack of understanding of the owners of the data. So credit asserted a greater role to provide leadership around report writing and data management. Now we have the ability to take data from the core systems...and we have confidence that the data has been validated. We take this very seriously."

Risk Managers and the Board

Every economic cycle has its own distinguishing trait. The 1980s experienced a commercial real estate bust, the 1990s saw foreign exchange contagion, the early part of this century had a tech bubble, and the latter half of the past decade suffered the mortgage crisis. In addition to building up credit metrics, how can banks prepare for the next downturn?

Joe Hill advises board members and risk managers "not to be complacent, and do not be comfortable with loan quality ratios. Board members should be more critical and demanding of their risk managers." Dan Neumeyer's advice is "to look more closely at downside scenarios and stress testing and to focus on problem-loan recognition skills. At a more fundamental level, when it comes to risk appetite and underwriting, stick to your knitting." At S&T Bank, Bill Kametz counsels risk managers to focus on fundamentals and be "fully transparent with the board and be sure that all three lines of defense [line, risk, and audit] are well defined, empowered, and fully resourced."

Karen Drew says that now is the time to get back to basics: "Board members really have to get underneath the data and get reliable information in a format they can digest; they should not become enamored of complex models but rather should understand where the bank stands, who their customers are, and how they will get repaid." James Costa suggests that "board members at all banks should be asking tough questions, ensuring transparency, and requiring that growth aspirations are reasonably balanced with the challenges of the current environment."

Metrics and analysis are vital components of modern risk management, yet disciplined underwriting, transparency, and a focus on fundamentals are critical for risk managers and board members. The board plays a vital and irreplaceable role by demanding usable information so that true effective challenge and governance can occur.

But this type of risk management discipline does not happen overnight. In credit and risk roles, there is tremendous value in managers and board members who have proven themselves through multiple economic cycles. Brian Hamilton is the chairman of Sageworks, a firm that provides financial analysis, industry data, and risk management solutions to banks nationwide. As someone who speaks with bank presidents every day, he noted, "I like bankers to have gray hair…. They should have the experience of knowing what can go wrong."

Conclusion

Banking, while increasingly commoditized, cannot yet be boiled down to an icon or a text message. The key message from these interviews is that discipline and fundamentals are the keys. The timing for this message is good for data, and experience shows that the moment of lowest nonaccruals is when bad loans creep back into the portfolio.

Market disruptors are increasing and may cause adverse selection to alter through-the-door application volume. Traditional indicators of credit quality are usually lagging indicators, so by the time something is noticed it is often too late to influence events beyond reporting what is already evident.

Regulators have issued warnings about credit quality, but they have also raised the bar for data quality, improving visibility into asset-quality trends, concentrations, and risk on the margin. Boards should be demanding full transparency, especially around exceptions, high risk

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bands, and areas that are combining high growth and high concentrations. But metrics alone, while a useful way to monitor and manage a business, cannot substitute for credit risk fundamentals, a sound risk management culture, and a disciplined focus on high-risk concentrations. As Barb Godin commented, "Don't kid yourself that a high concentration can be mitigated with better metrics."

Brian Hamilton at Sageworks summed it up the best. "The collective consciousness of our country is about 20 years. We are six years into an economic expansion. The average peak-to-valley cycle is about 38 months. There will be a downturn. Maybe not next month...but not 10 years from now." Forward-thinking risk managers should be taking steps now to improve transparency, address risk concentrations, and get prepared.

The true canary in the coal mine is a risk culture that is resourced, empowered, and capable of proactively managing risks. The dynamics in today's marketplace are new, but there is really nothing new about banking. Some may say that all this investment in credit rigor, effective challenge, and MIS is unnecessary, claiming that the mistakes of the recent past were so painful that they will never be repeated. Others assert that the next economic downturn is still very far away.

Only history will determine the date and impact of the next recession. But we do not have to look too far to see the seeds of that downturn already being planted, for as reported on page one of the *Wall Street Journal* recently, "Big money managers are pushing for more Alt-A mortgages, which helped fuel the housing crisis, as investors seek higher yields."[14]

So keep feeding your canaries; we need them alive and well. Ⓡ

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Notes

1. Remarks from a speech by Thomas J. Curry delivered at RMA's Annual Risk Management Conference in Boston, November 2, 2015. Available at http://www.occ.gov/news-issuances/speeches/2015/pub-speech-2015-147.pdf.
2. See "Underwriting Standards Continue to Ease, OCC Survey Shows," December 9, 2015. Available at http://www.occ.gov/news-issuances/news-releases/2015/nr-occ-2015-157.html.
3. The FDIC's statistics on depository institutions can be found at https://www5.fdic.gov/sdi/index.asp.
4. See the OCC's "Semiannual Risk Perspective," Spring 2015, available at http://www.occ.gov/publications/publications-by-type/other-publications-reports/semiannual-risk-perspective/semiannual-risk-perspective-spring-2015.pdf.
5. "Oil Prices: What's Behind the Drop?" *New York Times*, January 22, 2016.
6. "Shared National Credits Review Notes High Credit Risk and Weaknesses Related to Leveraged Lending and Oil and Gas," November 5, 2015. Available at http://www.federalreserve.gov/newsevents/press/bcreg/20151105a.htm.
7. "American Banks: Not Out of the Woods Yet," *The Economist*, January 23, 2016.
8. "Bankers Brace for Energy Losses," *Wall Street Journal*, February 25, 2016.
9. See "Interagency Guidance on Leveraged Lending," March 21, 2013. Available at http://www.federalreserve.gov/bankinforeg/srletters/sr1303a1.pdf.
10. For more on the PSI and other retail metrics, see D. Wu and D.L. Olson, "Enterprise Risk Management: Coping with Model Risk in a Large Bank," *Journal of the Operational Research Society*, 2010. Available at http://www.palgrave-journals.com/jors/journal/v61/n2/full/jors2008144a.html.
11. Pull-through rates show the propensity of a salesperson to actually close an application; they are calculated by dividing the total number of applications into the number of applications that closed a loan. It is best calculated over time and then compared for each individual against regional and bank totals.
12. Adverse selection is the tendency of customers who accept an inferior offer to perform worse than the norm or to show an inferior risk profile. For more on this topic, see L.M. Ausubel, "Adverse Selection in the Credit Card Market," University of Maryland, 1999. Available at http://www.ausubel.com/creditcard-papers/adverse.pdf.
13. Material Loss Reviews are available on the website of the FDIC Office of Inspector General, https://www.fdicig.gov/.
14. See "What's News," *Wall Street Journal*, February 2, 2016.