

Measuring Default Risk

The Essential Start for Commercial Loan Portfolio Management

Commercial lenders have annual targets for new business, and competition for that business can be substantial. So when they receive a loan application from a business borrower their objective is almost always to find a way to say “Yes.” Or more likely “Yes, if” because their review of the financial information and their understanding of the business will always reveal possible cause for the business to fail even with the best of intentions and the best of management. Their concern for this risk is understandable for if they are correct they get their money back and a spread of perhaps 2-3% over their cost of funds. If they are wrong the entire principal is at risk, 30-40 times the amount that they expected to gain.

Evaluating the risk of a commercial loan borrower is both an art and a science. As scientists, we attempt to assess risk by the numbers (ratios, trends, rank, etc.) separate from the subjective evaluation of the key individuals, their experience, integrity and commitment. Therein lies the art of structuring, where individuals in trying to paint within the lines, tend to look upon each loan as a separate challenge. The Science has come a long way in recent years and the latest data sources and analytics will broaden the capabilities of both the Artist and Scientist.

For most financial institutions, big and small, the risk of a loan has to be placed in the context of other loans and to that end they employ a risk rating scale. For all too many that scale is prescribed through regulation and allows for all satisfactory loans to be put within a framework of 6 performing grades or buckets. The most commonly used scale is shown in Figure 1.

Professionally, we routinely sort the hundreds, indeed thousands of different types of performing borrowers into the 5 “Pass” buckets. We also structure each loan for the borrower to fit the best possible grade creating the most “bankable deal” by using the loan agreement and credit enhancements to reduce the risk of principal loss. But this method masks the underlying diversity of risks— past, present and future – by giving us only five flavors and by not isolating the risk of the borrower from the risk of the transaction. “Granularity” is the new goal being answered by the latest data and analytics.

Flaws in the Current Approach

There are pitfalls inherent in the traditional risk rating system. Figure 1 represents the Regulatory guidelines for establishing a Risk Rating under a 6 grade system. We’ll call this the “Regulatory Scale.” It is a fair example of the methodology used by most banks today.

1. Blended Risks: Notice that the regulatory scale makes no mention of the transaction. As noted earlier, we routinely structure loans to influence the risk rating by adding credit enhancements that are perceived to mitigate the risk of the borrower. Once we've assigned the traditional risk rating, the ability to differentiate between the degree of mitigation and ultimate borrower risk is lost. To correct for this we need to separate the borrower's PD (the Risk Rating) from the transaction's LGD (the Facility Rating).

2. Term Risk: Nor does the scale mention anything about the term of the loan even though it is evident through every credit cycle that the longer the term, the greater the risk. CECL is going to require that the loan term is used to identify the risk horizon of the borrower and transaction to establish "Lifetime Loss." To prepare for this we need to have Risk and Facility Ratings that take term into account in an empirical way.

3. Sensitivity: Risk migration occurs every day for every borrower but the traditional risk rating system masks this because the majority of borrowers will remain RR-4 or RR-5 for the entire life of the relationship. In fact, the most common source of risk rating migration under the traditional system (when measured by the average rating of the performing portfolio) is usually the result of a change in credit policy that was intended to shift the average in the desired direction. To correct for this, the Risk Ratings need to be more sensitive to changes in the business cycle and distinguished through more **granularity** in the ratings.

For these reasons the use of the 6 pass grading system is mostly useless for all commercial and most risk management purposes. It does not allow adequate differentiation of risk, it is no help whatsoever in pricing transactions, it is of no use in business planning and has become a process rather than an asset in most commercial financial institutions. The coming accounting rules for loan loss accounting (FASB 825-15) will force a change in this approach and the good news is that this is a real opportunity to make a radical change that will be of enormous help to managing C & I portfolios in financial institutions big and small. Improving the Risk Rating system and adding greater granularity will be essential to address the new accounting requirements.

Risk rating or risk ranking?

Risk ratings or risk rankings need to be validated. Lenders would fully expect to find a higher historical default rate for borrowers **originally** assigned a lower grade (RR-4 to RR-6) than borrowers assigned a better grade (RR-1 to RR-3). Such a test would show whether the process

Figure 1

GRADE	DESCRIPTION
1	EXCELLENT credit SUPERIOR asset quality, EXCELLENT capacity, market leader
2	GOOD business credit, VERY GOOD asset quality, STRONG debt capacity
3	AVERAGE credit, SATISFACTORY quality & liquidity, GOOD debt capacity
4	ACCEPTABLE credit, ACCEPTABLE asset quality, LITTLE excess debt or liquidity, requires supervision
5	ACCEPTABLE but HIGH RISK business, LIMITED capacity for new debt, structure to address POTENTIAL setbacks
6	Watch list, high risk, failed transactions or conditions or
>6	Unrecoverable, set which needs work to recover principal

Note the subjective qualifiers? Art, indeed!

was successful in *ranking* the risk. When you rank successfully, your firm is confident that a RR-3 is a better credit than a RR-4 **when originated**. Clearly to be relevant the test must be on the original rating, not the rating just prior to or at the time of default. Remember Enron? They held an investment grade only weeks before the debacle. However, ranking successfully is not a cause for undue self-congratulation for the ranking remains far too imprecise to be useful in managing the portfolio **after origination**. The imprecision caused by too few grades, too many blended risks, and infrequent assessment have made it very difficult to monitor risk after origination. Post origination, the ratings are not shifted finely enough or often enough to continue to rank order risk effectively through the business cycle.

Probability of default (“PD”) is a best practice for all credit analysis. It is the numeric value of the risk of default. Determining PD is difficult, for the number in most cases lies within a very narrow range and most commercial lenders have been accustomed to ranking credit. Fortunately it is not difficult to move to a default rate grouping from a risk ranking, but in order for the new process to be acceptable for audit purposes there will have to be some testing against default experience.

An exercise in Granularity...

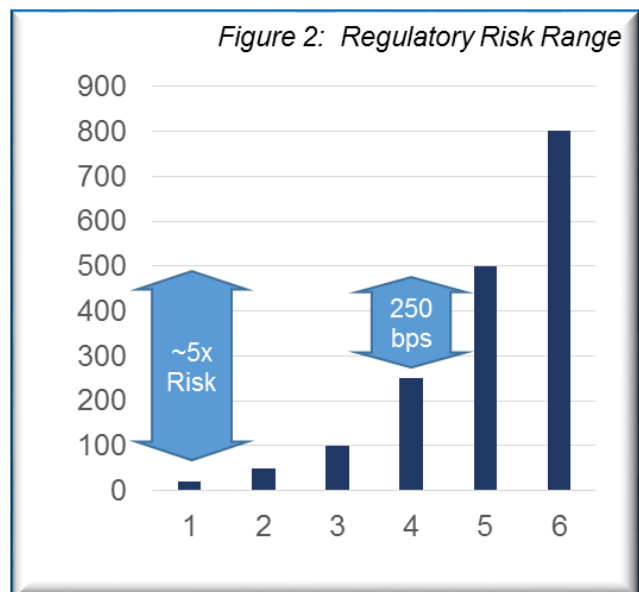
Whatever your current rating system, select 15 random credits of the same rating (e.g. 4) and pass the group to your underwriters. Ask them to evaluate only the borrowers' risk and determine the 5 Best, Worst and Average borrowers. Do not assess the facility or structure!

The results will show that you can more finely differentiate RR-4 borrowers to the Best (4a), Average (4b) and Worst (4c) sub groups. This will be very important for better pricing, avoiding adverse selection and invaluable when the new CECL rules come into place.

Moreover, if you ask the evaluators to rank each borrower from 1 to 5 in each sub-group, you will likely find a strong consensus in those rankings for the Best & Worst sub-groups.

Why is more precision important?

Referring back to Figure 1 the best risks are consistently “excellent” and the poorest “below average.” We can try to put that into numbers or in graphic form in Figure 2. The difference between an “excellent” RR-1 and the “below average” RR-5 is usually in the range of 500%. Indeed the difference between “excellent” RR-1 and “very good” RR-2 is probably more than 100%. Consider this in the context of retail banking. In that arena we can access the credit scores collected from a massive and constantly refreshed database and find out whether our borrower or prospective borrower has a score of 710 or 590. Credit scores provide great granularity in the ranking of risk but lack precision



through the business cycle. While credit scores can help you identify particular borrowers that are struggling, they cannot tell you how last quarter's economy impacts next year's risk for your performing borrowers. When it comes to precision, credit scores are much like the traditional risk rating system built only on past observations that are updated every few years. They need to be converted, often subjectively, by some process to account for changes in the business cycle.

Adverse Selection

Looking at RR-5 in Figure 2 it can be observed that the risk can be as high as 500bps, but as importantly the range above RR-4 is 250 bps. Assume (realistically) that the RR-5 population contains good and improving borrowers, "standard" borrowers that belong in RR-5 and others that are only marginally RR-5 which perhaps got there because of their longevity as a client or by loan structure. In other words we have good, average and poor. But are these risks priced to reflect that difference? If our pricing for RR-5 is (say) prime plus 2%, then the poor risks will think we are a great lender to do business with and the good risks will think about moving to a competitor to a better offer. This is adverse selection. Our lack of precision in risk rating leads to a lack of precision in risk pricing which in turn leads to us losing the risks we want to keep and attracting the risks that are dangerous and underpriced. More precision is not a risk imperative, it is a profitability imperative.

PayNet's clients have turned to PayNet AbsolutePD[®], a forward-looking analytic which solves inherent problems associated with using the traditional risk rating system and/or credit scores for portfolio risk forecasting.

Strategies for more precision

The Rating Agencies provide an example for greater precision and granularity. Over time, the difference between a AAA rated borrower and a AA+ borrower has been virtually indistinguishable. Even the most careful perusal of financial information and even the best market knowledge cannot discover a 1 in 10,000 chance of failure. There are of course very few firms that earn the best investment-grade ratings, whereas there are legions of Small & Mid-Market Enterprises (SME) representing millions of RR-4 and RR-5 borrowers. Turning to the typical SME business, the chance that financial statement review can precisely determine 325bp risk of default in the next year versus 358bp risk is probably as remote as the Rating Agencies' ability to differentiate the AAA default rate versus the AA+ default risk. The strategies noted above whereby the higher risk categories are further segmented increases the chance of a more precise range, but

How important is Granularity?

Consider the example of the major rating agencies who have 10 investment grades (AAA through BBB-) and a further 9 grades (BB through CCC-) for the largest firms in the world. Indeed the 10 investment grades differentiate firms that fall in the first 50bps of default risk. That's 10 grades to rank failure at the scale of less than five out of a thousand businesses.

Of course, if you lend in \$0.1b increments then granularity, every basis point, is extremely important. Very few SME would merit investment-grades but granularity is just as important because while we lend in \$100k increments, we often need to measure SME risk 50 or 100bps at a time.

even that is a challenge when the middle range is still sizeable and each firm has unique characteristics.

Ideally, then for SME, the answer is to calculate a Risk Rating in a model that uses as large a data sample as possible, bringing in economic and regional factors and eliminating any of the normal biases that come with human judgment. In other words, use a tried and tested model so that the human judgment and the dispassionate calculator can reach a consensus. One of the most substantial benefits of a data-rich model is the ability to compare and contrast similar businesses of similar size in order to view pricing rationally. This comparative is seldom presented to loan committees or available to lenders in the normal decision process.

There are a number of risk measurement models available. Some have a clear bias toward larger corporations, especially those that use financial market data and/or quarterly audited financial statements. Some are simple ratios that can at least help by presenting a confirming or alternative view. There are some key characteristics that define the value for different sizes and types of lenders, but there should be no doubt that there can be very significant advantages from the use of a vendor model to estimate default probability.

1. The best models use huge amounts of data that a smaller lender (and even many of the larger lenders) cannot achieve. A single community bank for example may have a dozen clients with dry cleaning businesses; the database might have hundreds and perhaps thousands. More data and a bigger sample should lead to better decisions and certainly better consistency.
2. The best models have a frequency of assessment that is not driven by the lender's calendar nor by the date that the financial information is received from the borrower.
3. The best models can observe changes in risk independent of the receipt of financial information from the borrower. This is a critical advantage that can enable a significant improvement in loan monitoring and thus reduce loan losses over time. Indeed avoiding even a small number of credit losses will pay for these models if used correctly.
4. The best models have an element of forecasting built into their calculations that will prove very advantageous when the full extent of the CECL rules comes into effect. The more the provisions of the new accounting and regulatory standard for loan loss reserves are studied, the more it becomes apparent that a PD model will be a need to have rather than a nice to have.

The AbsolutePD® Model

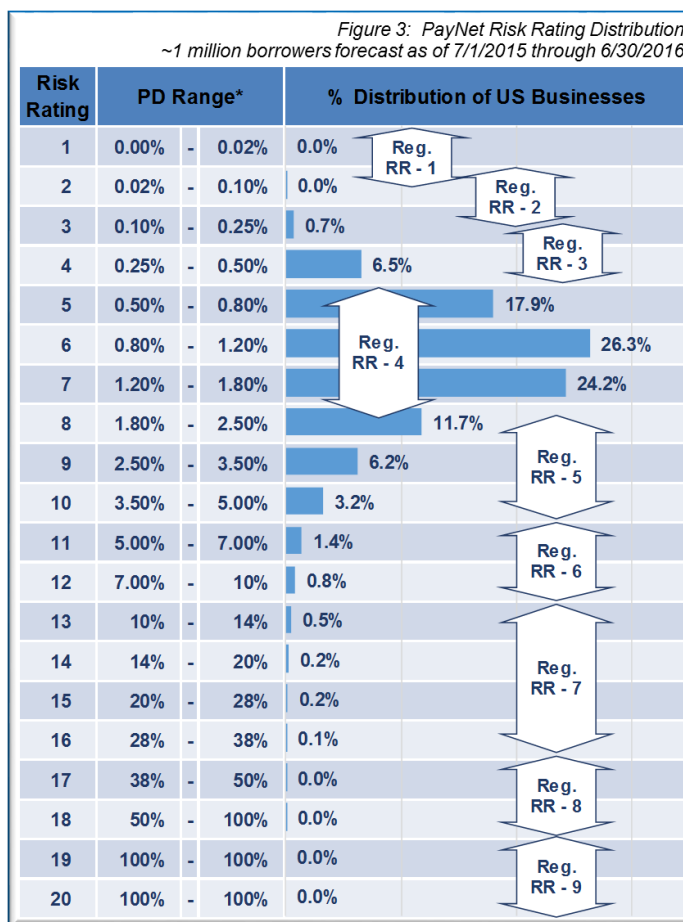
1. Millions of businesses and >400,000 SME defaults were studied
2. Quarterly recalibration of borrower, economic and lender factors
3. Does not require financial statements
4. Forecasts default rates with precision for each of the next 8 quarters

Illustrating Empirical Precision

PayNet introduced AbsolutePD®, a forward looking probability of default model, in 2009 with the primary objective of making granularity and precision achievable. PayNet developed the Risk Rating Scale shown in Figure 3 to demonstrate the power of granularity. The distribution illustrated is based on a sample of approximately 1 million businesses from the PayNet database and uses each business' individual AbsolutePD forecast for the 4 quarters ending on 6/30/2016.

For the sake, of clarity we'll notate these ratings as PN-1 through PN-20 so that we don't confuse the Regulatory Ratings (RR-1 to RR-8). There are four key observations to consider:

1. *Calibration:* In this generally linear scale, risk doubles every other grade. A PN-8 carries a midpoint PD of 2.15% versus the 1% midpoint of a PN-6.
2. *Granularity:* The scale provides the greatest granularity for the largest population of the typical US Business. Borrowers which would have been classified as RR-3, -4 and-5 are now spread over 8 PayNet Risk Ratings (between PN-3 and PN-10) giving more than twice the granularity for the bulk of commercial borrowers.
3. *Distribution:* The bar graph defines the current bell curve distribution of businesses. In 2009, as the recovery took hold, risk improved from a center point at RR-8 / 9 to center at PN-6 where it has remained since mid-2012. Unlike traditional risk rating systems, AbsolutePD responds to quarterly economic conditions, automatically.
4. *Skew:* There is a favorable bias in the current distribution. The first 120 bps of risk (PN-6 or better) contains over 50% of the population – showing the unprecedented financial strength of today's businesses. This bias will erode rapidly quarter over quarter as, inevitably, this economic cycle ends and the distribution migrates to a PN-7 or PN-8 center. Traditional risk rating systems cannot match this precision or timeliness for your business strategy.



Compounding Granular Precision with Frequency

PayNet's clients use AbsolutePD and the PayNet Risk Rating Scale to supplement their current scale. Putting a portfolio under the microscope of these analytics allows an institution to better

assess the impact of the quarterly economic activity on the next year's risk in the portfolio. In addition to the granularity of the scale allowed by more precise measurements of PD is the **frequency** of measurement.

In a traditional risk rating system where reviews are done annually (at best), or when a borrower is showing signs of trouble, the recognition of the impact of the economic cycle on the risk of the portfolio (or any particular grade) will lag current events by many months. This lag is so pervasive and embedded in ALLL under today's accounting standards that it was a primary driver behind the move to CECL wherein the entire risk of loss is assessed on day one of the loan and maintained thereafter. With granularity, frequency and empirical forecasting, the traditional lag is completely eliminated.

With AbsolutePD, the monthly loan data of a portfolio's borrowers is combined each quarter with data from the borrowers' other lenders and used within the model framework to identify characteristics and conditions of each borrower. These are then calibrated by the change in the most recent macro-economic and micro-economic conditions to project a probability of default for each of the next 8 quarters.

Furthermore, since AbsolutePD is calculated based on the data of individual borrowers, it provides a bottom-up analysis that can be segmented by various dimensions (e.g. region, industry, business unit) to help you understand which segments are leading and lagging the economic cycle's trend. As importantly, you will find early warnings to take appropriate action when individual businesses migrate significantly as the model perceives weakness in their idiosyncratic data.

Having discussed the use of PD in improving the granularity and precision of risk rating systems, we turn our attention to discussing the use of new risk ratings to monitor and respond to changes in portfolio risk (and economic returns), as well as the shortcomings of using historic data for that purpose. We'll discuss the need to improve risk forecasting implicitly and explicitly required under the imminent CECL framework.

Checkpoint:

- Risk Ratings Systems require more precision for CECL
- Precision requires both granularity and frequency of assessment
- Assessments need to empirically account for the changing business cycle

Monitoring Default Risk

Another precarious feature of the traditional rating system is that there is usually very little movement between grades and, in general, borrowers most typically migrate in one direction – into higher risk grades. Detecting increased risk is usually more heightened and the signals (e.g. loan performance) more distinct than detecting reduced risk. Indeed, many banks have found that there is more chance of a RR-3 moving to special mention or default without ever passing through RR-4 **and** RR-5.

Expanding the grades allows for more frequent rating changes that recognizes both deterioration and improvement. The advantages should be obvious. We want to identify clients that are improving for we do not want to lose them. Many commercial borrowers are net depositors and

these are very valuable clients indeed. Seeing improvement and using that to enable a closer relationship is simply good business management.

Of course we also want to observe deterioration quickly. Every loan officer knows that the earlier the detection of problems the better the outcome for both the client and the bank. Too often a loan officer will avoid downgrading his client because of the negative effects forced upon him by the 'system,' but experience shows that the financial acumen and experience within a commercial bank can be applied to help clients get past their problems and thrive again. The 'system' should encourage the loan officer who acts early, even if the outcome was not ideal.

Risk Migration

The life of loan concept embodied in CECL demands that a forecast is made for the expected loss on a loan to its *contractual* term. Lenders begin with a risk rating which for most is centered on identifying the risk for the next year (the risk horizon) and is also blended with the risk of loss embedded in the loan structure and credit enhancement. For example, a borrower having a 5 year term loan, an overdraft and a real estate loan might have three different risk ratings. In the CECL environment this borrower will gain three different risk horizons for PD, two of which will reflect the much higher PD inherent in the term loans where a borrower's risk accretes over the longer horizon.

The fact that a longer term equates with more risk is pretty obvious, but just how much more? Moreover, we need to answer the question of how much term risk change, or migration, is dependent upon the economic conditions. To assist we can look at the statistics that come from the rating agencies that provide both static pool analysis as well as transition tables on their rated credits (see Figure 4). These are helpful and readily available through their publications, however they represent the largest borrowers and are therefore not necessarily representative of small businesses.

There are four important observations that should be made:

1. Higher grade credits (AAA-BBB) are much more likely to be downgraded than upgraded, in other words they have a long term tendency to deteriorate. This should come as no surprise as there is very little room to improve and infinite room to decline.
2. The first time a material opportunity arises for an upgrade is at the BB level. Even these firms are on average much larger than the average firm in a commercial portfolio, but much more representative of such a portfolio.

Figure 4: Ratings Transition Matrix 2002-'15 as published by Fitch Investor Services

as %	AAA	AA	A	BBB	BB	B	CCC-C	D	WD
AAA	87.18	5.30	0.22					0.11	7.18
AA	0.12	85.44	8.61	0.35	0.02	0.02		0.03	5.42
A	0.01	1.84	87.55	5.02	0.41	0.06	0.03	0.07	5.00
BBB		0.13	3.09	86.56	3.13	0.47	0.13	0.17	6.31
BB	0.02	0.03	0.08	7.32	75.52	5.63	1.22	0.94	9.24
B			0.18	0.25	7.53	75.50	4.56	1.93	9.95
CCC-C				0.29	1.74	17.01	46.08	23.69	11.19

3. The significance of the WD (Withdrawn) rating is important. Around one tenth of ratings of the lower rated credits disappear as these firms are the subject of acquisition and merger as well as other causes where the rating no longer applies. Radical change would generally lead to a prepayment or renegotiation of a term loan.
4. For riskier credits the chance of them remaining at the same rating is less than the probability of change.

Taking the analysis a step further and looking at consecutive rating changes shows that the probability of upgrade or downgrade at any point in time is significantly influenced by any prior change in the rating. An upgraded credit has a much higher probability of the next change being a further upgrade and a downgraded firm has a much higher probability of the next move being a further downgrade. The trend of risk is very important.

For a lender, the fact that their loan clients can get better should be accepted as the most probable outcome. Most businesses are profitable and each year they earn enough to pay the owners and provide sufficient free cash flow to replace assets and enable growth. However, this does not change the return from the loan as the lender either has the principal repaid plus contractual interest or the firm fails. There is no capital gain or other upside in lending. This is not the problem. The problem comes from those businesses that fail to repay the loan and descend into default. So we need to focus on unfavorable migration and find better methods to predict it. Doing so will lead to a much better understanding and measurement of the borrower, transaction and term risk.

Measuring Risk Migration

For the majority of commercial loans the banker receives financial information from the client. For the larger firms this can come as frequently as each quarter. For margined loans this information can be monthly as an extract of key financial data such as receivables or inventory levels. But for the majority, the information comes in the form of the annual financial statements usually with a preparation lag of one or even two months. Following their receipt the lender usually undertakes an 'annual review' using a prescribed process which all too often leads to no change in the rating of the borrower as the status quo is far less administratively onerous. Yet, as the transition tables show, there is a high probability that the risk has indeed changed.

If there is very little change from year to year in the majority of the Risk 4 and Risk 5 accounts, then the inevitable conclusion is that risk changes are not being measured. In part this is because the bands are so wide that the risk change is not sufficient to move the rating, but in part it is because the annual review process is often done in isolation from market conditions and looks more to the borrower than to the context within which the borrower is operating.

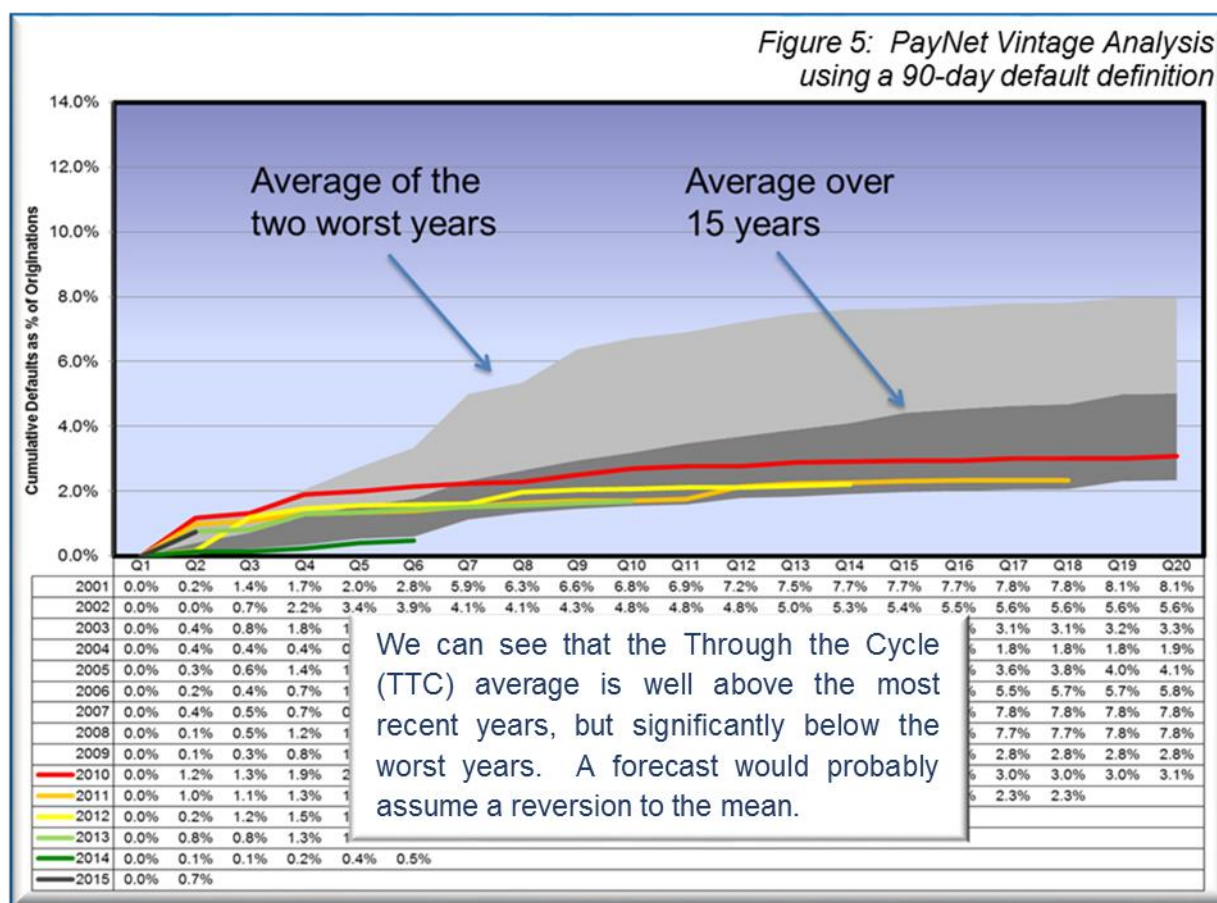
For the most part this tendency has been of little concern, but the emergence of the CECL rules makes the lack of a robust and effective migration measurement process potentially costly in terms of excess reserves. The new rules require that a forecast is made of the risk through the life of the loan and the imposition of a migration premium may be far more damaging than the adoption of defensible metrics for risk estimation.

Static Pool (Vintage) Analysis

Where there are large pools of identifiably similar assets the use of vintage or static pool analysis is common. This takes the form of holding all new loans constant with their origination date and often within their industry class. These pools are then frozen and tracked through time to observe risk migration and especially the effects of economic cycles. The process is of course data intensive especially if the pools are formed each quarter rather than annually.

It will be difficult for commercial bankers to go back and establish these pools using their own portfolio's historic data. This means that they might only become useful by 2025 assuming that there is another economic downturn before then. Asset-based lenders and leasing companies often have this data for their approach is greatly assisted by such analysis. Smaller banks (and indeed all banks) are probably better served by using the migration approach.

In addition to the difficulty of procuring the Static Pool Analysis, its fundamentally historic nature creates the same challenges in adopting for forecasting as the other methodologies. Figure 5 shows a representative sample of C&I Static Pools and will help highlight these challenges.



Using Market Data

It is unlikely that most lenders will be able to use a migration factor based on their own transitions for it will be clear to most that there was very little transition. In order to comply with the CECL rules, the best option for most will be to use market data such as that demonstrated in Figure 6

which shows Regulatory Rating Transition on a 1 year horizon for a sample of ~100k California commercial borrowers based on the change in each borrower's 12 month AbsolutePD forecast as of 1/1/2009 and, the next year's forecast, at 1/1/2010.

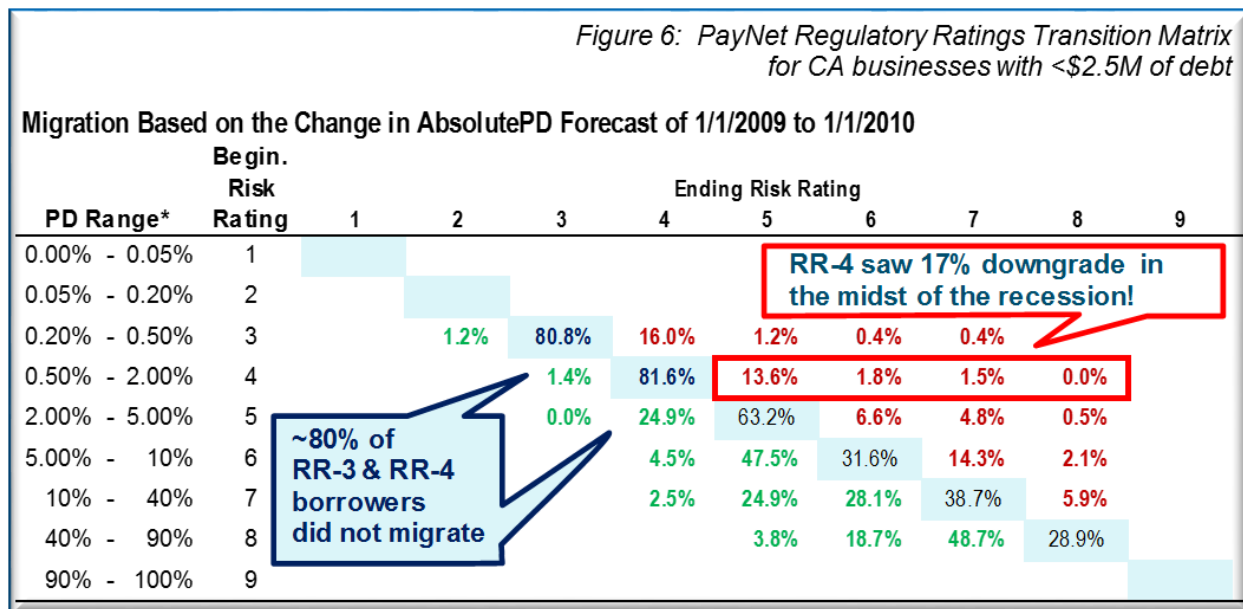
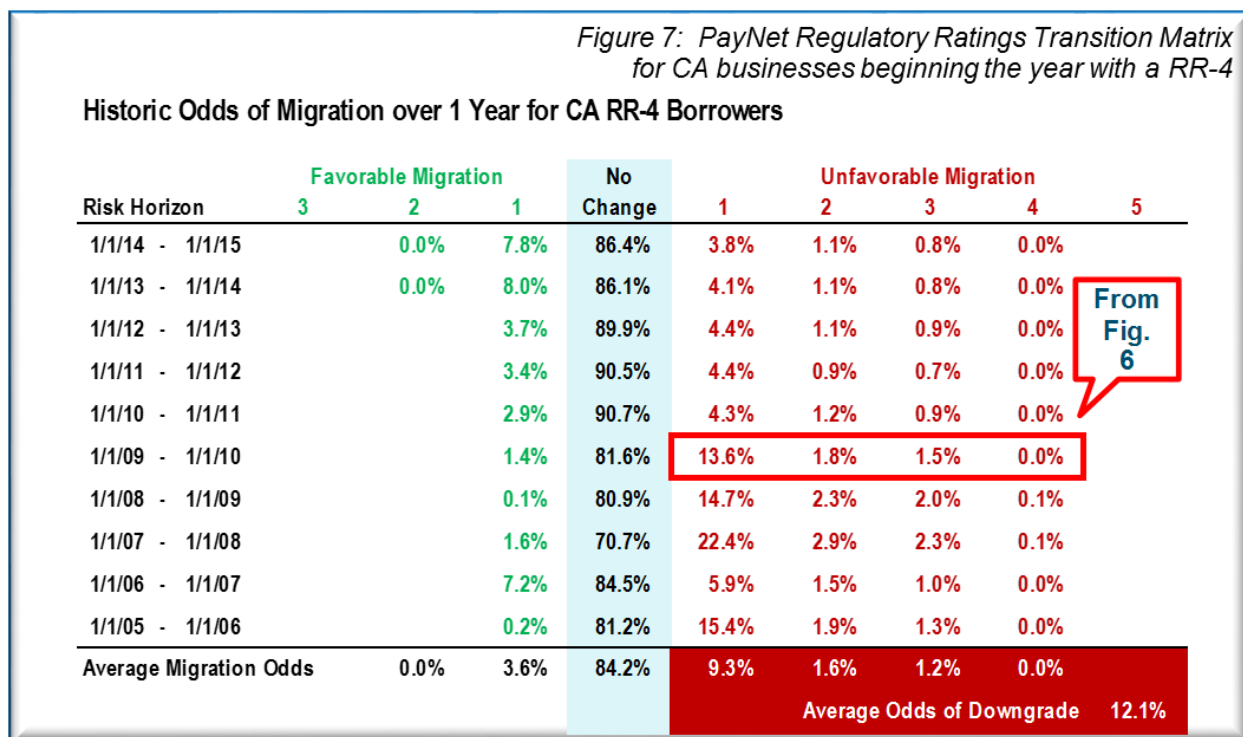


Figure 7, illustrates the through-the-cycle migration of the RR-4 borrowers by averaging the historic actual migration from 2006 to 2015. Using thousands of SME borrowers in the state of California in order to isolate regional effects, the PayNet data show the impact of the business cycle on RR-4 borrowers.



- **Risk of Downgrade:** In the example of Figure 6, the table shows that over the course of 2009, 13.6% of RR-4 borrowers (having PD between 0.50% and 2.0%) migrated to RR-5 (having PD between 2.0% and 5%). With a more granular risk rating system, migration is not as dramatic which helps to mitigate the impact on capital. For example, using the PayNet Rating Scale the downgrades would have been split between PN-8, -9 and -10 (see Figure 3). Mitigating the charge to capital is the main reason why the larger banks are quickly moving to adopt more granular scales but the impact for smaller institutions will be just as important in the CECL environment.
- **Speed to Cure:** The recession ended in mid-2009 and so did the migration wave – when downgrade risk improved beyond pre-recessionary levels (cleaned out all the deadwood) and has continued to improve just slightly to the 2015 prediction.
- **Reminder to Upgrade:** Note that the frequency and depth of the AbsolutePD analytic helps to identify when and where borrowers can be upgraded which will be very important in maintaining ALLL in the CECL environment.

PayNet's data on millions of businesses can provide these migration statistics by State and Industry in risk horizons to match your term risks out to seven years. Adopting data of this type will be accepted by auditors (and examiners) because of the sample size and the quality of the data.

The PayNet data differ markedly from the agency data of Figure 4 which looked at ratings transition for large corporate credits over the long run. This sample data cover your bread and butter SME borrowers over the short, mid and long-term. The PayNet data reflect characteristics of SME.

Change is normal

It occurs every day. Small, incremental changes in the business cycle cause shifts in risk only visible over the long term. The beginning and end of each recession represents a relatively short and sharp period of volatility where dramatic changes in risk need to be measured every quarter.

Improvement is more likely

As stated earlier, most small businesses are profitable. Those profits are earmarked for the owners for it is their livelihood. In a normal year they expect to have positive cash flow to pay their bills, renew or replace assets, reward the owners and reduce any borrowing they may have. Indeed a significant part of small business portfolios in banks are net depositors, not borrowers, and because of their normal profitability the businesses are likely to be better off (less risky) at the end of the year. Over the long run as businesses mature they have a higher probability of positive migration (see the RR-5 and RR-6 transitions in Figure 6 for proof of this).

They are more vulnerable

No matter how well managed or well-established, small businesses are vulnerable to changes beyond their control. The local drug store can have a major chain open within walking distance, the book store can be left behind by on-line services at lower prices - the list of threats is long.

This seldom means that they disappear overnight, but they do have a mortality rate. The lender needs to look at these trends along with a sense of what could go wrong while expecting that these will be a minority of the portfolio.

They are usually not diversified

Small businesses seldom have multiple products or lines of business that can provide resources when one element is struggling. This makes it all the more important for lenders to have data by type and location of business. This can only be achieved by having access to a sample size that provides meaningful statistics at the business and local level.

Forecasting is more difficult

Longer term forecasts are much more difficult. Small businesses normally have a business plan (albeit less formulated than large firms), but their ability to see out for several years is perhaps more limited. For larger firms, especially those with listed equity, there exists market data, analyst reports, industry studies and other resources to observe trends and assess vulnerability. The risk in most small firms is idiosyncratic.

Regional and Local effects are more important

What is the geographic risk of IBM, General Electric, Ford Motor Company? It is difficult to know for all are national and international. But for smaller firms their location can be very important. While economics are national, many events that can cause distress are local. The regional data amassed by PayNet confirms this and having migration data by state (and even county) can provide a substantial advantage in early detection of problems.

The Future of Term Lending

The key observation from the use of external risk data, whether it is from the rating agencies or the larger SME sample of PayNet, is that the cumulative risk of a five year loan is almost always likely to be in excess of the loan spread. That means that most 5-year non-amortizing term loans and revolvers will be booked at a loss in the first year. For a normal client, that first year reservation will likely be clawed back as the loan moves through time (or prepays), but it will be quite unsettling for a bank CEO to tell the shareholders that such loans are booked at a loss.

Does this mean that such loans have always been uneconomic and ill-advised? The answer to this question lies outside the realm of the PD part of the Expected Loss calculation. Bankers happen to be quite expert at making and structuring loans and a change in accounting rules does not change this fact. C & I lenders use the loan agreement to change term risk. They do so by formulating covenants that capture risk deterioration as frequently as financial information is received and are therefore able to act in the case of deterioration as a breach of covenant allows for the loan to be called before its contractual term. If term lending is to continue in similar vein to the current business process, then the impact of these structural elements should be recognized in the lending process, although it appears unlikely that this reality will be reflected in the accounting standard.

Even if they are not accepted as term risk hedges, it is a good idea to keep records of actions taken following covenant breaches. If these are frequently waived then either they are being set incorrectly (and to the annoyance of the client) or they are ineffective in mitigating losses. It is

also important that their usefulness in mitigating loss is measured so that the extent of their effectiveness is recognized. Unfortunately it seems unlikely that these facts will be of much use in the CECL calculation as FASB has chosen to make no allowance for their presence.

Banks that have adopted a RAROC (Risk Adjusted Return on Capital) model have often incorporated covenant and margin requirements as a means to allow the lender to avoid charging a term premium for migration probability, and this is still a good commercial practice.

The New CECL Challenge

If the conclusions and recommendations to this point have been accepted, then the lender is envisioning a rating system with at least 12 pass grades. Each grade is associated with a range of default probability and that probability is of the default of the entity, not the loss that may occur should the entity default. In addition the lender will employ a vendor model backed by huge amounts of relevant and comparable data that provide a PD range that confirms (or decides) the initial risk rating and can be used to change that rating and monitor the risk through the life of the loan.

The key phrase here of course is the “life of the loan.” Credit analysis has a very strong focus on the current financial statements, trends to date and the business plans of the borrower in light of the current economy. Most vendor models provide a one year probability. But the new rules require lenders to estimate the PD for the contractual life of a C & I loan which can be 5 (or occasionally even more) years into the future.

Forecasting Risk over the Horizon

The Life of Loan concept is perhaps the most controversial aspect of the new regulations. Despite vigorous complaints and appeals from both lenders and accountants, there is no sign that the FASB will be willing to change this approach. An educated guess would be that SME lenders have a strong incentive to shorten terms. However, it is interesting to observe that in the 15 years from 1998 to 2013 the average term to maturity of SME loan portfolios in the U.S. has changed from 380 days to 610 days. Why that has happened is not clear, however the fact remains that the average maturity of a SME portfolio (without considering prepayment propensity) is still less than 2 years.

Much has been written about this new approach and it is rightly controversial, the more so because it appears that the U.S. will have a different standard than every other country. It is possible that the FASB and the International Accounting Standards Board (“IASB”) will reach the common standard that they promised and that everyone wishes for. If they do, then a 2 year forecast or a forecast for the average weighted term to maturity might be the compromise. Such a result would enhance the value of PD models that use a rolling 8 quarter forecast.

Suffice it to say at this juncture that a strict interpretation of this requirement has a very high probability of increasing loan loss reserves in the first year of its application by amounts that may well swamp profits and, as will be seen, cause 5 year loans to be booked at a loss at origination. We cannot beat the system but we can work to make the outcome sensible and perhaps even useful. For this to happen there are two vital elements to consider in the PD life of loan estimation: Migration, which we’ve just covered and Prepayments..

Prepayments

SME lenders whose main products are leases or amortizing loans have a contract with the borrower that specifies payment terms and frequency. Often the discipline and methods successfully used in retail banking can be applied to these borrowers. For commercial banks however the biggest credit risk products for SME clients are revolving lines of credit, term loans and overdraft facilities. Indeed in 2009 the FDIC reported that close to 80% of all C & I loans are done using commitment contracts and that the total value of these loans in the U.S. exceeded \$1.9 trillion.

Overdrafts are less of a problem for they are generally used for seasonal fluctuations, for cash management and other shorter-term needs. Moreover they are generally cancellable by the lender at any time or certainly within a year. Revolvers are the most important product line and the real problem. Virtually all such loans carry a prepayment right that is essentially a free option. The fact that so many borrowers take advantage of this option means that the expected life of many loans will be less than the contractual term.

The U.S. regulators and the FASB have decided that the only action that changes the expected life of a term revolver or a term loan will be prepayments. We know that there are many other possibilities such as adding a new facility, acquisitions and mergers, early renegotiation, covenant breaches and more that can end the current loan or enable the lender to call the loan or renegotiate the terms. We also know that these are not infrequent events, however only prepayments will be allowed as a reason to amend the contractual term of a loan for the purposes of calculations in CECL. This means that every lender will need to track prepayments and even better, access a database that can provide statistical evidence through time and economic conditions of the probable rate of prepayment. The effect of not doing so will be the assumption of a 60 month life for a 60 month loan and this assumption will be wrong.

Summary

Mr. William Githens of the Risk Management Association (“RMA”) commented to the FASB in 2013 that the CECL proposal has taken the concern about loan loss reserves from “too little too late” all the way to “too much too soon.” The danger for the unprepared is that it will be way too much. The only defense against that outcome will be to start from the beginning with more granularity and Probability of Default that reflects economic impact to make the risk measurement process strive for better precision. It does mean change and change is always difficult in such a complex area. Yet the change can have benefits. A better risk rating system will greatly assist in achieving consistency in structuring, risk sensitive pricing and earlier detection of risk deterioration. All of these benefits should permit higher profitability, sounder portfolios and better client relationships.

The primary purpose of financial accounting is to reflect the business results and decisions of a company, not determine them. It is important to remember that the measurement of credit risk is one of the most important skills of lenders and indeed that success in that business is highly dependent upon that skill. Getting better is a good idea and goes well beyond the dictates of financial accounting.

Next Steps

Attaining a high quality and lasting risk rating/PD measurement process is a key step, however the calculation of expected loss requires an estimate of the exposure amount at the time of default and an estimate of the likely level of principal recovery. These calculations also have significant challenges to be discussed in Part 2 of this series.

*This paper is a companion piece for PayNet's webinar series "**The Challenges of CECL**" hosted by Brian Ranson and Patrick Kuhn. Part One of the series "**Establishing and Maintaining the Probabilities of Default**" explored the importance of Probability of Default in maintaining accurate risk rating systems. A recording of that webinar is available at www.SBIinsights.com.*

PayNet AbsolutePD

For over 15 years, PayNet has collected monthly loan data from commercial lenders building a database of over 13 million US and Canadian businesses.

Each quarter, AbsolutePD calculates the commercial borrower's probability of default for each of the next eight quarters. It considers the borrower's loan performance data, the borrower's condition relative to other similar local businesses and calibrates the forecasts based on the current quarter's macro and microeconomic data.

You can learn more about PayNet's AbsolutePD at our website, or contact us directly. Since its introduction AbsolutePD has been thoroughly tested and accepted by our clients, the market and even the examiners as an accurate risk **forecasting** solution.