PRIMATICS® FINANCIAL


# Case Study: Credit Risk Challenges in Loan Portfolio Acquisitions

Co-authored by: Peter Fitzsimmons and Craig Barberich

Today's bleak economic outlook has the market extremely apprehensive about the future—foreclosures are at record highs and many economists believe the worst is yet to come. Specialized ARM loans that are scheduled to reset over the next 12 to 24 months will exacerbate what is already a fragile mortgage and real estate market. Coupled with "shadow inventory", loans which are lurking in a holding pattern in view of foreclosure and REO disposition, this signals that the worst may be yet to come.

Over the past year, we have seen many financial institutions collapse due to the significant credit exposures on their balance sheets, and many banks struggle to navigate through the volatility of the markets as they continue to see further deterioration in loan performance. They are challenged to adequately identify latent credit risk exposures and estimate expected loan losses as they once thought that they could. Multiple shock waves have transformed the landscape of credit risk modelers. It's no longer feasible to look at aggregate metrics of pool-level historical performance in order to understand customer behavior and try to accurately project potential performance at an acceptable level of granularity, which is required for pro-active risk management and to support management decision making and accounting.

As origination and lending behavior became more relaxed, the reliance on a handful of borrower attributes continued as well. For example, FICO scores became an over-weighted attribute used by originators who helped qualify borrowers via new products into loan terms that they just could not afford. Current market performance information indicates that a borrower that might have what is considered to be a "good" FICO score, but may be underwater from an equity standpoint, is leading to "strategic default".

There could also be situations where a combination of good FICO score and good LTV would ordinarily be expected to have a high chance to prepay via refinancing, but due to market conditions, insufficient liquidity means that refinancing is not accessible at any price. Finally, originators sold overly-leveraged loan structures that were either cloaked in the basic credit attributes of the borrower but with little regard to the debt service capacity of the borrower, or based on limited documentation without verification, and as the market deteriorated—so did loan performance. In today's residential loan market, a more refined and more granular view is required. Risk managers need the ability to analyze a broader segment of portfolio drivers in isolation or in some combination.

It is evident that visibility into the loan-level detail, especially with respect to pools of seriously delinquent loans, is important in gaining insight into expectations of credit risk exposure and relevant risk mitigation strategies that can take advantage of timely issues. This is highlighted most vividly by the potential for loan modifications to be successful as a loss mitigation and foreclosure prevention tool. The federal government mandated moratorium on foreclosures and loan modification requirements in FDIC loss sharing agreements have ballooned the volume of loan modification transactions by banks and loan servicers. The blanket loan modification approach to solving the foreclosure crisis has yielded

unremarkable results; however, with recidivism rates for many loan portfolios approaching seventy plus percent. A broadening of loss mitigation efforts can now capitalize on specific attribution analysis based on current performance expectations by targeting loans identified as at-risk candidates for successful loan modifications, or for short-sales, or for other potential loss mitigation mechanisms, working with borrowers to achieve a less costly alternative to the traditional foreclosure/REO disposition process.

The market has confirmed that current loan performance is a complex phenomenon, which reflects external circumstances, the borrower's specific credit condition and performance options, the characteristics of the loan structure, and the supporting quality of the collateral. Whereas a small set of credit attributes had in the past served well enough in predicting loan performance, recent experience has demonstrated that this same small set of loan attributes is no longer adequate in describing the recent past performance and even less useful as a predictor of the future.

## Lessons Learned

In light of the increased levels of underperforming assets in today's market, many industry-accepted credit risk models have been recognized—post market crash—as overly optimistic, falling short in relevance to current experience, somewhat rigid in the functional abilities, drifting in their predictive power, and therefore are less reliable than once thought. Many vendor credit risk modeling products are still built upon pre-crash credit risk models and algorithms. Relying upon historical point-in-time delinquency migration assumptions, these models are disconnected from any forward-looking joint scenarios on the state of the economy, on the credit-worthiness of the borrower, and on the performance of the underlying collateral.

Compounding the lack of transparency into credit risk exposure are the lack of technologies available to risk managers.

Compounding the lack of transparency into credit risk exposure are the lack of technologies available to risk managers to adequately provide the horse power ("computer processing capacity") necessary for rigorous credit risk analysis, that leads to processing constraints and therefore too high a level of aggregation of data and results and too little predictive power within the credit risk analysis. Many risk managers are hampered by slow and outdated credit risk models, tools and manual processes that limit efficiency and increase operational risk. A credit risk process that accommodates a cohort view for risk management and financial reporting, while satisfying the special requirements for loss mitigation initiatives, executive management decision making and financial reporting, that features quick turn-around of results, while providing the granularity for detailed reporting has been nonexistent in the marketplace—until now.

Primatics Financial has developed a web-based risk management platform that incorporates leading edge technologies and risk management tools to provide the necessary insight into residential loan credit risk exposures. Most recently, Primatics has participated in acquisition transactions that have provided direct views into current residential loan market dynamics and we've gained particular insights and "lessons learned" from these unique opportunities. Key to successfully completing these transactions and managing the most challenging segments of the acquired loan portfolios included:

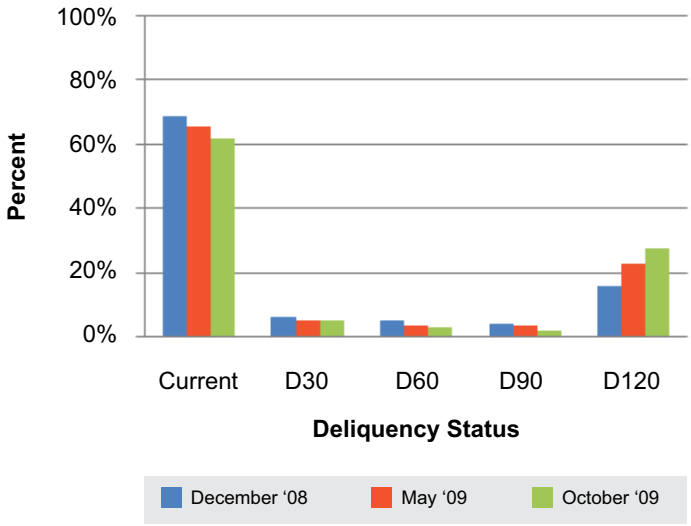
- Ability to quickly perform loan level analysis under multiple future performance scenarios with a high powered processing and reporting platform integrated with a probabilistic credit risk model.
- Aggregation of loan portfolio credit attribute data in a central repository with rigorous data quality standards and controls to ensure the best possible inputs for credit risk estimation.
- Use of results from above to quickly gain a comprehensive understanding of the drivers of loss exposure within the portfolio—effectively trapping the relevant credit and collateral attributes.
- Congregation of multiple stakeholders from business, credit, finance, and in particular accounting with the requisite knowledge that can provide necessary perspective to the financial impacts of changes in the portfolio and how they will manifest in complicated acquisition accounting requirements such as Statement of Position 03-3 and Financial Accounting Standard 141R.

Highlighted below in Exhibit 1 is a delinquency profile of an illustrative portfolio of single family residential mortgages collateralized by first lien positions. For the purposes of this illustration, the portfolio has been segmented from a larger acquired portfolio that was part of a failed bank acquisition to highlight the points of interest in this study and to maintain the confidentiality of the transaction. The loan portfolio was adversely selected as part of the acquisition and represents mostly loans with distressed characteristics such as low current FICO scores, high cumulative LTV ratios and geographic concentrations in states experiencing significant house price declines in the last 18 months. The delinquency profile for the portfolio is shown at three different time points for the same common loan population. Of specific interest is the bar-belling of loan delinquency performance that is taking place between the current and 120 day delinquent loans. A "survivalist" analysis of the underlying loans migrating through the delinquency curve over the illustrated period indicates that the primary driver of the transition is strategic default—whereby the predominant factor leading to increased delinquency was the excessive loan to value ratios or negative equity positions of the loans—with an average of 108%. This has significant implications for risk managers leveraging roll rate analyses in projecting loss estimates. Specifically, roll rate models utilizing historical transition matrices that have not incorporated the impact of strategic default into their calculations will be limited in the predictive power over short term horizons due to the delinquency persistence of loans with these characteristics through all delinquency stages. Loans will be moving at a larger volume and accelerated pace from one delinquency status to another as a result of the strategic default phenomenon. Secondly, historical roll rate methodologies absorb these point-in-time observations and estimate performance and loss expectations over longer time frames (in excess of six months) than can be reasonably assumed with this type of approach. The bar-belling observation is also a result of the backlog of mortgage loans that are trapped in a severe delinquency status of

120 days or greater due either to (a) constraints on operational systems to process foreclosures timely, (b) loan loss mitigation strategies that are holding loans back from the foreclosure process intentionally or (c) the constraints on processing foreclosure proceedings timely due to the backlog of cases in local government systems. The implications of poor quality estimates in these loss projections for business managers are significant in the formulation of their asset management strategies. Effective and integrated loss estimation tools, processes and data are fundamental in how the mortgage assets are actively assessed for risk and loss mitigation initiatives that may be deployed to prevent additional losses from taking place. Excessive loss projections will essentially result in management "over-shooting the market" and possibly exacerbating excessively distressed local real estate markets through foreclosure, short sale or other collateral disposition strategies.

**EXHIBIT 1**

## Customer Balance Delinquency Migration by Balance %




***Source:*** *Primatics Financial Proprietary Loan Portfolio Data*

At the time of the acquisition no loan portfolio-specific historical information was available as the subject loans were not separately segmented from the broader population of first mortgage loans. As can be noted from the tables in Exhibit 2, the baseline credit risk model results from the bank's assessment process shows the default values were too low and the prepayment speeds (CPRs) were too fast when compared to the "calibrated" model results. The calibration exercise involved accumulating additional loan performance information as it was available over the course of time, for this specific portfolio. Prepayment expectations for the loans were difficult to define and initial model results were significantly faster than intuitively would be obvious. The prepayment algorithms were not able to capture the market circumstances associated with the lack of liquidity for refinancing opportunities and increasing loan to value requirements from lenders. Subsequent to extensive analysis of delinquency migration, strategic default and loan to value ratios and discussions with loss mitigation management regarding the loss mitigation strategies and timing, updates were made to the credit risk modeling assumptions to incorporate these inputs and results. The default probabilities increased while the loss content and timing expectations increased and extended respectively, and prepayments fell more in line with current market and future expectations. This was achieved through model calibration of default, severity, and prepayment multipliers to more precisely estimate the future performance of this portfolio.

**EXHIBIT 2**

## Default and Prepayment Rate Baseline and Calibrated Model Comparisons – Select Loans

**Baseline Model Results**

| Delinquency | Default | CPR (2yr) |
|---|---|---|
| 0 | 36.4% | 19.3% |
| 30 | 48.2% | 18.5% |
| 60 | 66.8% | 20.7% |
| 90 | 70.3% | 22.1% |
| 120 | 91.3% | 26.3% |

**Calibrated Model Results**

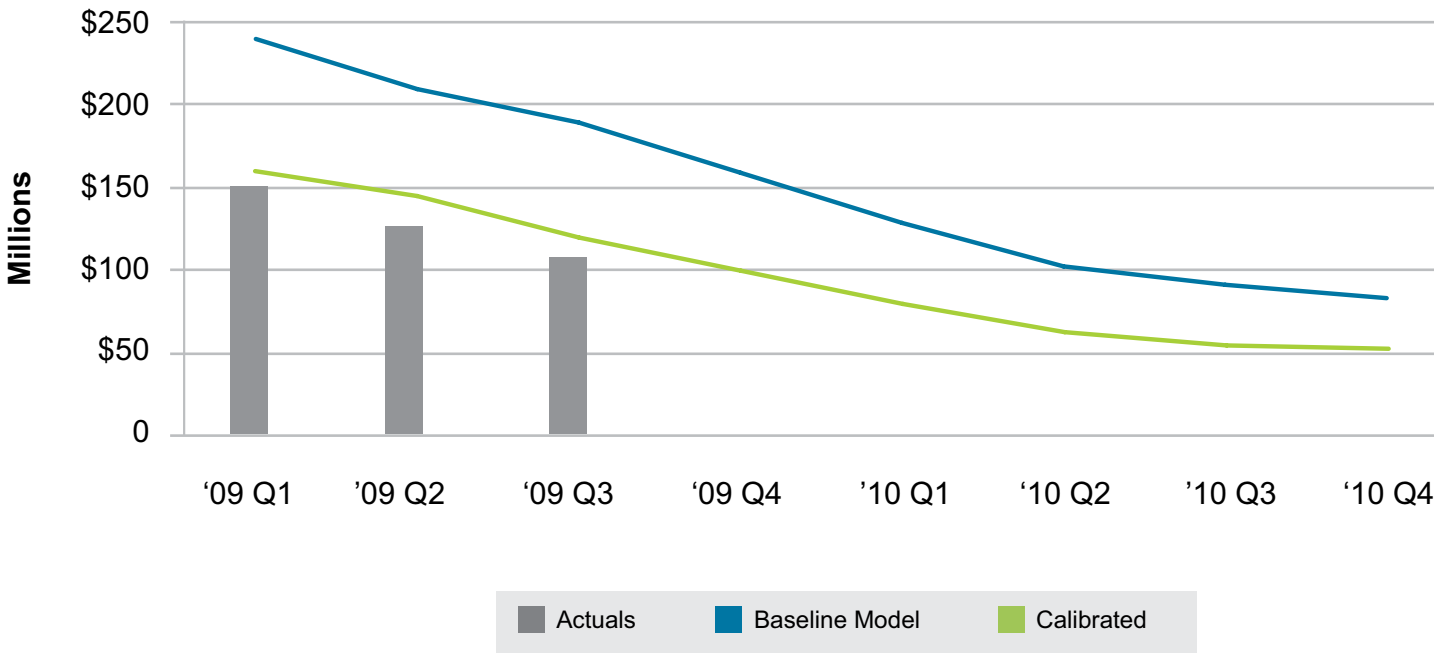
| Delinquency | Default | CPR (2yr) |
|---|---|---|
| 0 | 49.3% | 8.1% |
| 30 | 77.3% | 4.4% |
| 60 | 81.1% | 4.6% |
| 90 | 81.7% | 4.8% |
| 120 | 88.1% | 1.1% |

*Source: Primatics Financial Proprietary Loan Portfolio*

These updates to the default, severity and prepayment expectations lead to the overall loss expectation curves that we've highlighted in Exhibit 3 below. As can be clearly noted, the baseline loss expectations were significantly front-loaded due to the distressed condition of certain loans in the subject portfolio and the configuration of the initial assumptions applied in the credit risk modeling process as noted above relative to default, severity and prepayment. With the updates to these assumptions that were subsequently incorporated, it has significantly reduced this front-loading of loss expectations and has brought the timing and overall loss content of the estimates more into line with actual experience being observed, as can be seen in comparing the actual to expected losses noted in the third quarter of 2009.

**EXHIBIT 3**

## Comparison of Baseline and Calibrated Model Loss Expectations to Limited Actual Loss History




*Source: Primatics Financial Proprietary Loan Portfolio Data*

## New Management Tools and Business Intelligence

Market forces have placed greater urgency on risk managers to make well-informed business decisions related to their risk management assumptions, inputs and processes. Today, risk management teams are even more challenged to balance credit risk exposure while continuing to be an enabler of growth. As this paper has outlined, financial institutions need to leverage updated and more relevant risk management tools and approaches for better predictive power and the ability to execute and analyze results in a much quicker time frame. Financial institutions need the capacity to challenge assumptions through "what-if" scenarios more frequently and with the added granularity of analyzing results at the most appropriate level.

Primatics has provided such credit risk analysis through their innovative technology tools that enable such information to be generated and analyzed. By leveraging Primatics technologies such as "cloud computing," hybrid combinations of probabilistic credit models and traditional roll rate analyses and advanced data drill-down and analysis capabilities, risk management can arm themselves with the tools to succeed and can be prepared to to answer challenging or complex credit risk and loss estimate questions. Outlined below are critical considerations for financial institutions to be successful in today's challenging credit risk environment:

1. **Default/Loss/Severity/Prepayment**
   How much can you leverage historical information to forecast future values? Current prepayment models leveraging large historical data sets are forecasting prepayments at a higher rate than what is currently observed in the marketplace and should be critically assessed in their application. Additionally, the key drivers of default have changed as this market has developed and historical segmentation and loss identification criteria have shifted accordingly.

2. **Current performance of assets vs. model predicted performance**
   How well are we predicting the future performance of assets? Risk management needs to be integrated with all areas within the bank, particularly loss mitigation and line management, that are current with the dynamics of the local markets and the performance of the loan portfolios. Estimates of the remaining life of loan loss may be accurate for a given estimation, but the timing of those losses also needs to be calibrated appropriately with current information from the field.

3. **Reporting and speed of risk analysis**
   Are we able to provide answers quickly and at an appropriate level of detail to executive management, the board of directors or regulators? Leveraging a technology infrastructure that can quickly process large quantities of data through sophisticated risk models is critical. A granular level of information, analysis and speed of delivery is key to management's ability to proactively manage risks and the underlying loan assets versus being reactionary to changes in the loan portfolio or market.

4. **Data Integrity**
   "If it's not about the data, it's about the data." This is certainly not a new area but is often overlooked by senior management—dedicating time and resources to focus on the integrity of the data and ensure that the proper data validation controls/processes are in place and well-documented for downstream consumption.

## Conclusion

Today's leading credit risk methodologies have limitations in effectively addressing the potential borrower performance patterns that many loan portfolios are experiencing in the current market. Combining other credit risk tools and applying robust and innovative technologies can enable the adequate identification of hidden credit risk exposures and create a competitive advantage in the management and pricing of distressed loan portfolios. The utilization of new and innovative technologies will provide the necessary processing capacity for the quick turn-around of time-intensive credit risk calculations and provide deep and rich risk analytics. When integrated in a highly adaptable web-based platform, risk managers can harness the power of sophisticated tools for data-mining, risk segmentation and credit exposure analysis that is necessary in today's volatile market.

## The Primatics Credit Risk Team

**Pete Fitzsimmons, CA, CEO & Managing Director**
Tel: 703.342.0015
pfitzsimmons@primaticsfinancial.com

**Ken Gustin, Ph.D., Director**
Tel: 703.342.0050
kgustin@primaticsfinancial.com

**Craig Barberich, Senior Manager**
Tel: 703.342.0400
cbarberich@primaticsfinancial.com

**Dave Payne, Manager**
Tel: 703.342.0013
dpayne@primaticsfinancial.com

## Primatics Financial, LLC

8401 Greensboro Drive
Suite 550
McLean, VA 22102
703.342.0450
evolvrisk@primaticsfinancial.com
www.primaticsfinancial.com