

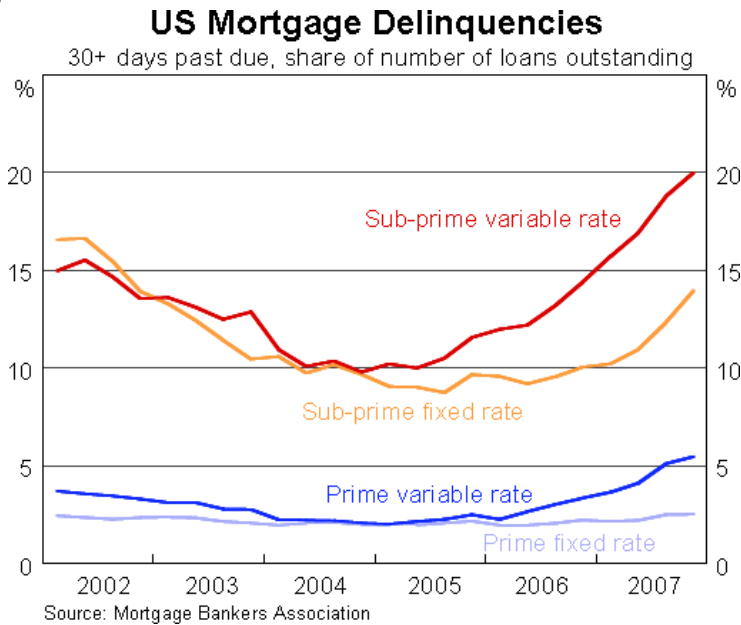
# Predicting Credit Losses in the New World

By Bernadette Kogler

*“Those who do not learn from history are doomed to repeat it”* and the lessons we can learn from our recent past are many. The last few years of mortgage origination have been characterized by the emergence of untested products and unprecedented risk layering. Underwriting standards eroded as originators frantically struggled to meet investor demand and focused primarily on market share, volume and short-term earnings. Cost-cutting and use of automation continued to increase regardless of product type and Alt-A evolved into Alt-B and even Alt-C. The view of the future remained rosy in most circles as home prices continued to escalate and homeownership as the American Dream was pushed by policy makers in Washington to maintain its historically new levels. This environment created an ease for fraud as documentation requirements were lifted and aggregators reduced quality-control and due-diligence staff.

The result was a sharp rise in delinquencies (Figure 1), particularly subprime loans with hundreds of billions of subprime ARMs re-pricing or set to re-price. A spiraling decline in real estate prices followed, exacerbated by foreclosures. An escalation in credit losses and widespread fear by investors that credit losses would only worsen led to a severe liquidity crisis which has now spread to other credit markets and the economy overall.

Figure 1



Striking the right balance between access to credit and innovation, on the one hand, and risk mitigation and controls is a daunting task. When the time is right,

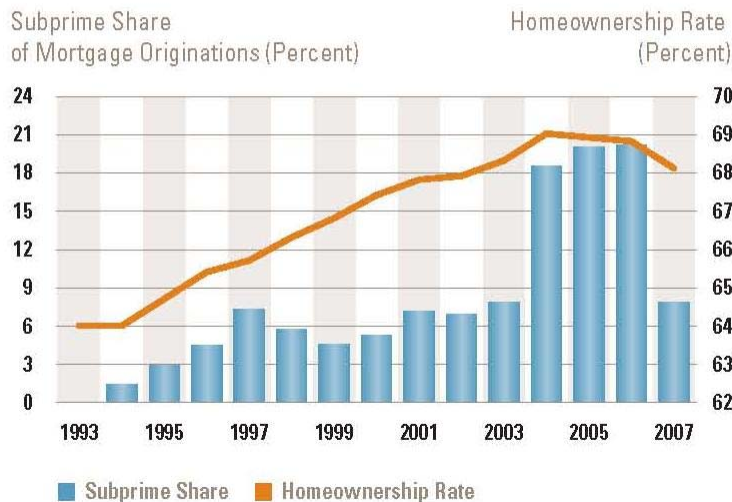
new products will emerge and in addition to better models, we must have a better process, controls and governance. We must thoughtfully assess mistakes of the past, upgrade our management tools and modify our behavior so that they are not repeated.

### Modeling Changes

Modeling for credit risk and related governance are at the heart of the current mortgage debacle. Simply put, many originators and ratings agencies did not accurately estimate losses, particularly for certain mortgage products. Subprime loans and alternative products boomed through 2006 (Figure 2) and allowed access to credit that was never before available. Modeling these new products proved challenging with no historical performance data readily available and no performance data on subprime loans through a recession. With a lack of performance history, internal credit models became less effective as risk-mitigation tools and compensating processes and controls were insufficient to compete with conflicting demand for earnings and market share.

Figure 2

#### The National Homeownership Rate Peaked Before Subprime Lending Took Off



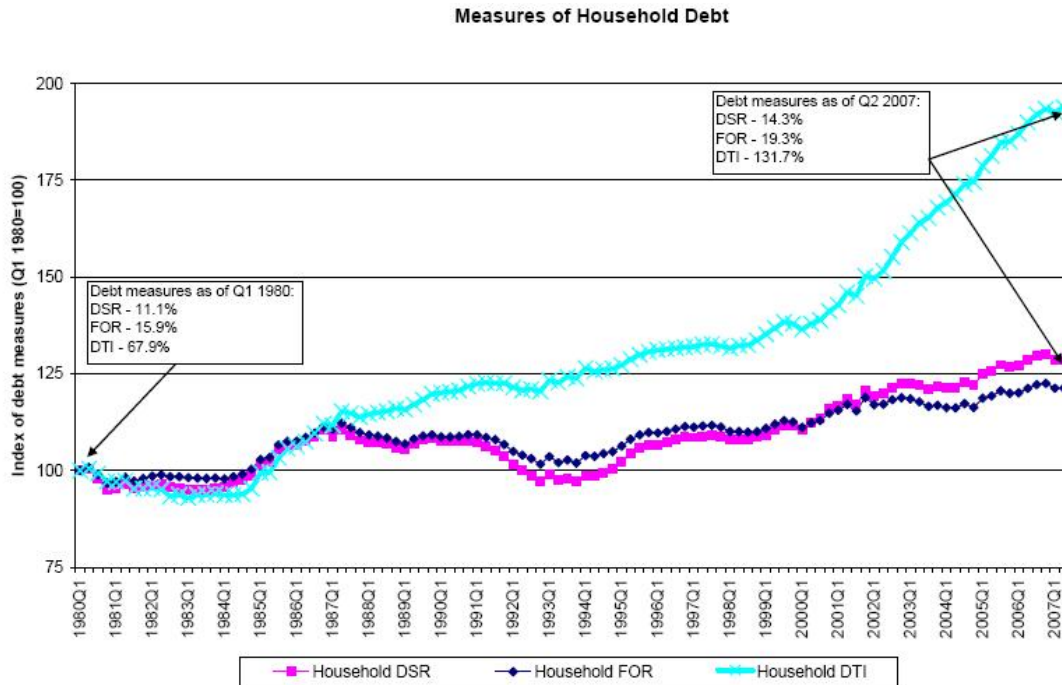
### Understanding Loan Level Characteristics

Modeling improvements are underway and we must continue to improve our models and better understand the complexity and inter-dependency of portfolio and loan level characteristics, including borrower creditworthiness, insurance coverage, historical *and current* default performance, seasoning, servicer quality, origination channel, and collateral considerations. Although the basic elements for predicting credit loss may not have changed, the correlation between assumptions and the relative weight given to each has certainly changed. Factors at the forefront of

credit analytics are reliance on FICO (over-weighted); debt-to-income (under-rated); LTV and CLTV (piggybacks); investor status (speculator loans); documentation standards; house price appreciation; delinquency transition; and re-evaluation of our “worse-case” scenarios.

Consumer behavior was changing, in part, while our models and correlation assumptions were not adjusted to reflect the changing consumer behavior. For example, the Federal Reserve Board data shows a demonstrable increase in household Debt-to-Income levels over the period 1980 to 2007 (Figure 3). . Some portfolio analysts are certainly focused on monitoring the debt service level going forward. After-all, it is cashflow, not a strong balance sheet that may better predict one’s re-payment ability – particularly when primary assets (equity in one’s home) may be over-stated.

Figure 3



Source: Federal Reserve Board.

While consumer behavior was changing and consumer debt was growing, our reliance on FICO score continued to increase as well. It is now widely believed that an over-weighting of FICO was among our past mistakes – mitigating layered risk with higher credit scores. Figure 4 segments 2006 subprime origination by CLTV buckets and loan purpose. The data suggests that a large percentage (33%) of borrowers were given loans with little or no down payment. More than half of such loans were further layered with stated documentation. Originators tried to mitigate

this layered risk with higher FICO scores, yet the group with the highest FICO (655) underperformed every other category in our analysis.

Figure 4

*Segmenting 2006 Subprime Originations*

| Comb. Loan-to-Value Ratio | Loan Purpose | Balance (%) | Avg. FICO | Avg. CLTV | % Stated Doc. | %60+ DQ. @ WALA 12 |
|---------------------------|--------------|-------------|-----------|-----------|---------------|--------------------|
| CLTV > 90                 | Purchase     | 33%         | 655       | 99        | 52%           | 16.6               |
| CLTV <= 90                | Purchase     | 11%         | 638       | 83        | 54%           | 13.5               |
| CLTV > 90                 | Refinance    | 11%         | 643       | 97        | 37%           | 13.2               |
| CLTV <= 90                | Refinance    | 45%         | 606       | 77        | 38%           | 9.3                |

Source: LPS

Figure 5 shows 60+ delinquencies (including Foreclosures and REO) on 2006 first-lien subprime by FICO buckets, CLTV and loan purpose. Although high FICO performs better within each category, for the same FICO bucket refinance loans with CLTV <= 90 always outperform purchase loans or loans with CLTV > 90. Further, a majority of the purchase loans with CLTV > 90, have almost always underperformed refinance loans with CLTV <= 90, irrespective of FICO.

Figure 5

*%60+ Delinquencies on 2006 First Lien Subprime by FICO, CLTV and Loan Purpose, @ WALA = 12*

|                   | 525 < FICO <550 | 550 < FICO <575 | 575 < FICO <600 | 600 < FICO <625 | 625 < FICO <650 | 650 < FICO <675 | 675 < FICO <700 |
|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| CLTV > 90, Purch  | 25.4            | 21.0            | 18.6            | 17.2            | 17.9            | 15.6            | 15.0            |
| CLTV <= 90, Purch | 18.1            | 16.0            | 14.6            | 14.4            | 14.7            | 12.1            | 11.0            |
| CLTV > 90, Refi   | 11.3            | 15.3            | 15.5            | 14.4            | 14.2            | 12.6            | 9.2             |
| CLTV <= 90, Refi  | 14.3            | 12.1            | 10.1            | 8.2             | 6.5             | 5.4             | 3.7             |

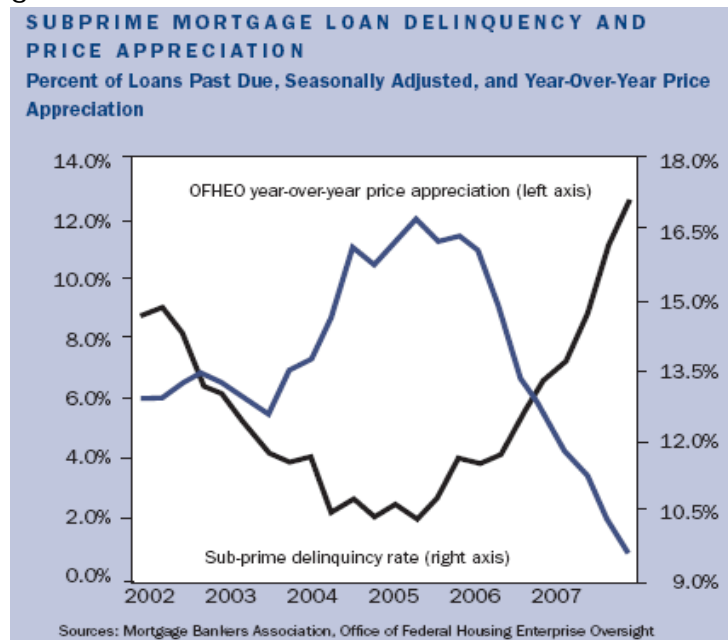
Source: LPS

Further, low documentation standards coupled with high LTVs invited a boom of housing speculators. Lending that was identified in loan tapes as traditional owner-occupied was in fact often lending to speculating investors who would flip the property for short-term profit from escalating house prices. When house prices began to decline, the financial incentive – particularly for speculators -- was to

simply walk away. The Mortgage Bankers Association reports that absentee owners accounted for almost one in five loans entering foreclosure in the third quarter of 2007.

Perhaps the biggest miss was the impact of declining house prices (Figure 6). There are two components to this. First was the underestimate of the potential magnitude of home prices declines and the underestimate of how correlated these could be across markets. Although house prices have always been known to be a driver of performance, prior to this year, modelers generally underestimated the covariance of home price trends across regions. They assumed home prices could not fall nationwide and that geographical diversity would mitigate risk. Even economists that predicted a housing burst thought the burst would be regional – not on a national level. Stress tests were not adequate where “worse case” scenarios held HPA flat and down turns were rarely modeled.

Figure 6



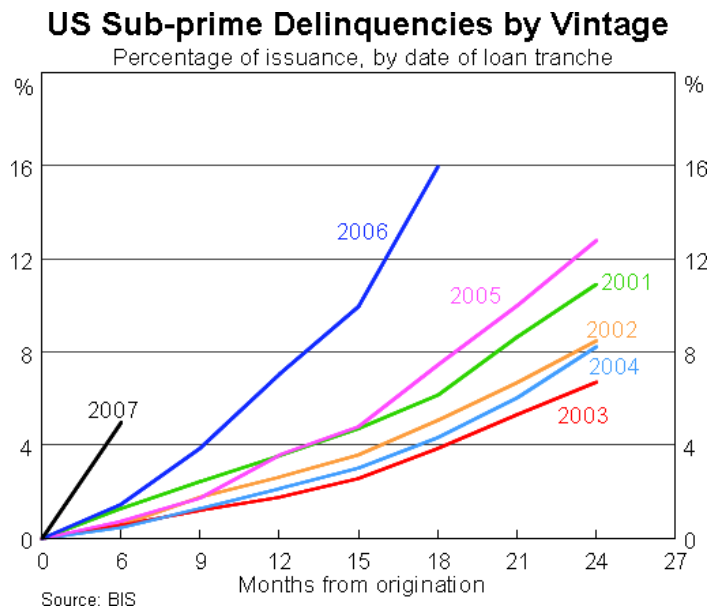
In today's market, many credit investors are evaluating house price indices and searching for new and improved methods. Some are putting more faith in Case-Shiller over the OFHEO index as Cash-Shiller, while only capturing the 20 biggest MSAs, captures a wider range of home values and product type and is updated monthly vs. quarterly updates provided by OFEO. Because of its population center bias and its inclusion of homes with non-conforming mortgages (where home price run-ups and declines have both been most pronounced), performance of CS composite has been worse than OFHEO composite in the current downturn.

The second component to the impact of housing price on credit losses is more behavioral: the relationship between home price declines and delinquency/default probability. Because previous housing downturns occurred prior to the proliferation of low-down-payment mortgages, little is known about borrowers' willingness to continue making payments on their mortgages when they are underwater on their home. Moreover, the wide-spread media coverage of people walking away from their homes (and mortgages) may be reducing the social stigma of defaulting on a mortgage, so this relationship between being underwater and defaulting is, most likely, in a constant state of flux. This uncertainty underscores the need for constant monitoring of portfolio performance, particularly in high risk segments.

### Surveillance and Credit Risk Management

Improving surveillance – a process that measures performance relative to expectations – is a key focus of every credit investor in the country. There is clearly a particular focus on fostering a tighter feedback loop for untested products and risk layering and the success of this analysis may be the key to survival for some credit investors. Review of vintage analysis indicates that 2007 will perhaps be the worst performing vintage in the history of the mortgage industry (Figure 7).

Figure 7



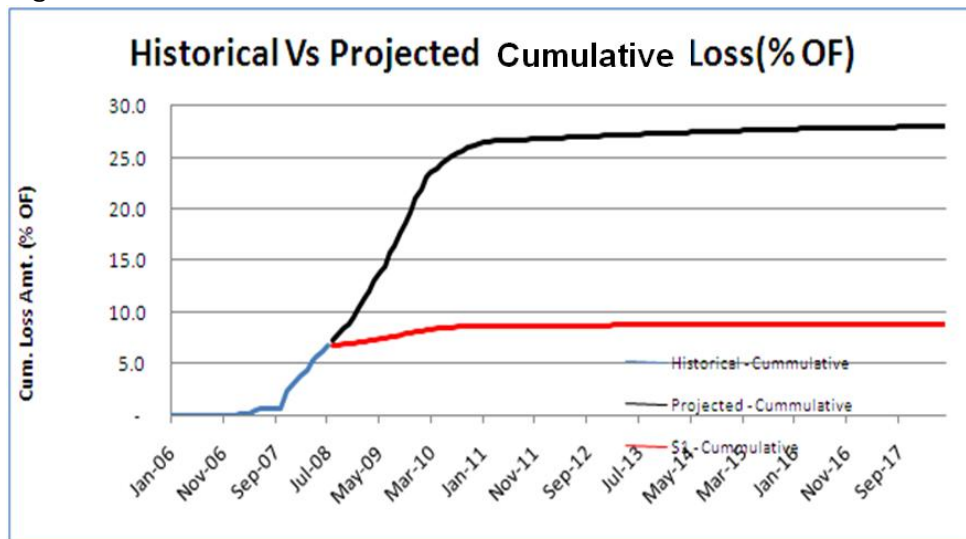
The ability to evaluate the complex and inter-related risks at the loan level is at the heart of new surveillance processes and is critical to evaluating overall credit exposure. Loan level characteristics and risk segmentation and risk reporting are more critical than ever before in the evaluation of mortgage credit risk. Credit investors must go further in evaluating individual collateral and loans where the

“drill-down” process should be creative and analytical. Among the standard risk reports that RiskSpan Inc produces for its clients are the following segmentation analyses:

- Product type segmentation
- Originator/ issuer performance
- Insurance coverage and counterparty exposure (mortgage insurers)
- Original FICO and Current FICO
- Original LTV and Current LTV and combined LTV
- Debt to Income Ratios
- Vintage analysis and year of origination
- Primary, vacation, investor and number of properties owned
- State of origination
- Home price changes by MSA – currently monthly updates
- Impact of volatility should be incorporated
- Channel of Origination
- Analysis of Appraisal (type, name of AVM company, confidence score)

These are the performance factors that will drive current delinquencies and delinquency roll rates (the percentage of loans that move from one stage of delinquency to another). Accountants rely on roll rates to estimate the percentage of performing loans that will enter delinquency and the percentage of loans in delinquency that will flow through foreclosure or charge-off (Figure 8).

Figure 8



As with other types of financial models, those designed to forecast loan losses rely on valid inputs and up-to-date coefficients in order to maximize accuracy. Rigorous

evaluation and review of the underlying model coefficients – factors applied to the model inputs in order to generate the desired outputs – must be regularly monitored and back-tested if managers are to be assured that they are not falling into the trap of applying yesterday's assumptions (or relationships that existed in yesterday's benign credit environment) to today's portfolios. In a credit environment as dynamic as the one in which we now find ourselves, loan-loss coefficients must be regularly maintained as observed loan performance continually evolves.

Although change is underway, most agree we have not yet reached the bottom and the housing recovery will be slow. In addition to better models, we must be prepared with a better process, controls and governance. We must thoughtfully assess mistakes of the past so that they are not repeated.