

**PREDICTING THE
FINANCIAL FUTURE** 

Predictive data is the clay out of which you can form the most appropriate incentives for homeowners. On a macro scale, that means more predictable borrower behavior—and that means getting a better handle on revenues and future portfolio yields.



The image shows a man in a dark suit, white shirt, and patterned tie, holding a glowing, translucent sphere with both hands. The sphere is filled with various financial data visualizations, including line graphs, bar charts, and numerical values. The background is dark and moody, with the sphere being the primary light source.

Forecasting Finances

LIKE A CRYSTAL BALL FOR THE SERVICING SPACE, PREDICTIVE ANALYTICS QUARRIES DATA TO PATENTLY REVEAL WHAT THE FUTURE HOLDS FOR HOMEOWNERS

By Adam Weinstein

In the past few years, lenders, investors, and servicers have seen it all: big, fat sales bubbles; explosions of defaults; and avalanches of paperwork filings and data. And while the broad strokes of the economy are plain enough for all to see, the billions of nitty-gritty details can—even for the most seasoned pro—be far from crystal clear.

If you're reading the *Wall Street Journal* or the latest reports from Zillow and RealtyTrac, that's a start—albeit a bare minimum nowadays for staying abreast of the economy and the pressures on your portfolio. But you can't shake the sense that somewhere out there, in that flood of data, is the info you need to predict the outcomes of your financial risks—who will default, who can benefit from

which loss mitigation measures, and what you need to do to anticipate every ebb and flow in borrower behavior. "Servicers and investors are faced with a whole lot of delinquent loans," said Mark Milner, VP of solutions consulting at LPS Applied Analytics. "Who should we focus our resources on to try to limit losses?"

The truth is out there. And it rests squarely on the number-crunching, stone-unturning supermen of predictive analytics.

Keeping an eye on the industry's numerical indicators—pricing and interest-rate trends, default rates, foreclosures, and the like—is nothing new, of course. And in volume retail businesses, predictive pricing has long kept firms ahead of the curve when it comes to optimizing their consumers' activity. Essentially, analytics in the mortgage-servicing space applies those pricing predictions to prepayment and collections risks.

"Prepayment and default models have been around for many years as part of the valuation of whole loans and mortgage-based securities," Milner said. "There are a number of providers who use predictive modeling and apply it across the lifecycle of a loan."

But what do you do with those thousands or even millions of bits of loan-level

data—especially in the dynamic servicing environment laid by the financial crisis? John Vella, COO of Equator Financial Solutions, said that the predictive analytics field has had to evolve rapidly over the past three years to anticipate loan solutions that optimize the returns for the investor and translate into sound servicer activity. "Data companies have tried to accomplish this, but due to their lack of loss mitigation experience, they have not been successful," he said. "The only successful attempts have been done with the assistance of experienced operators combined with modelers and analysts."

Advances in behavioral science, economic modeling, and computer technology have worked wonders on how that data can be crunched. Michael Sklarz, president of Collateral Analytics (and an engineering mathematician with a PhD), said that the housing and credit crunch gave the business's predictive modelers a real shot in the arm. "The subprime phenomenon added a new variable at the time, which helped drive the price bubble in a number of markets," he said.

Combine those new market pressures with psychological research and cyberpower that sounds like it's straight out of *The Matrix*—one

analyst boasts of “multiprocessor routines running hundreds of cores and CPUs,” and another said his firm regularly mines 4.5 billion documents for data—and you’ve got one heck of a gauge for portfolio health. Here’s the critical info you’ll need to harness its power.

A Proactive Portfolio Strategy

The first thing you need to know about predictive analytics is it does almost anything you need it to. Essentially, it employs historical loan-level data and leading indicators in mathematical models to predict future loan trends. That, in turn, can be used to tailor risk-management strategies to virtually any party’s need on every level of mortgage operations. “In order to utilize the limited resources that are allocated to borrowers, the ability to route loans to the right person with the desired outcome creates efficiency and consistency,” said Vella. “The models can also assist in forecasting outcomes and losses to set reserves, expectations, and create staffing models.”

Sklarz has been at it for more than 20 years—back in 1986, he was publishing peer-reviewed data on how to project pricing trends based on a small set of market variables. Since then, his firm’s work with a variety of servicers and investors—and its persistence through a variety of bull and bear markets in every clime and place—has enabled it to expand its services. A mortgage professional needs predictive analytics, he said, to anticipate block-to-block trends and “better understand the status of his loans, where there may be problems, and help with decisions on dealing with problem loans, such as whether to foreclose or work with the borrower.”

The result is a model that’s adaptable to borrowers’ circumstances and investors’ needs in any particular vintage or geographical area. It weighs the probability of a loan going into default against the magnitude of the potential loss. And that helps servicers customize their approaches. “If a loan doesn’t qualify for HAMP or other government programs, questions may arise like, ‘Well, how can we modify this loan?’” said LPS’s Milner. “This we accomplish by varying different terms and

running different scenarios to model results of various modifications—principal changes, rate changes, doing nothing.”

For example, traditional workouts, like cuts or caps in interest rates, may not be the optimum strategy for keeping a particular class of borrowers current, especially in the subprime space. Predictive modeling can give stakeholders a sense of when more drastic measures, when principal reductions, are likely to maximize loan value—and when they’re likely to fail.

In that sense, predictive data is the clay out of which you can form the most appropriate incentives for homeowners. On a macro scale, that means more predictable borrower behavior—and that means getting a better handle on revenues and future portfolio yields. “The ability to segment loans at 60 days and predict outcomes, potential losses, and timelines will help investors to staff, to forecast severity, and to reduce their cost to service,” Vella said. “The ability to segment REO properties and drive optimal marketing strategies allows for consistency amongst all asset managers as well as shortening timelines to sell while maximizing proceeds.” Besides giving servicers confidence in tailored loss mit programs and saving investors lost revenue, that entices mortgage insurers to offer better terms all around.

Predicting Title Tangles, Too

Of course, not every borrower can be saved, and predictive models will help determine your classes of likely defaultees. Once you get there, some analysis firms can help servicers make the most of their default timelines.

First American offers some novel twists on traditional predictive analytics for those very situations. Nima Nattagh, VP of research and development for First American Data Tree (who also holds a PhD), said that while predictive modeling typically focuses on the collateral and credit risks associated with mortgage lending, they’re uniquely equipped to tackle “the more title-focused risks” of a portfolio. “In the past couple of years, we’ve seen incomplete files and incomplete transaction histories have made

it difficult for servicers” in the default chain, Nattagh said. Particularly with loans being sold and resold many times over, often in securities, “determining, for example, what lien position a servicer or investor is in can prove extremely challenging.” Nevertheless, title defect “hasn’t been covered really all that well” by many portfolio consultants, he said.

The solution is “to keep track of a consumer’s transaction history as it happens,” said Nattagh’s colleague, firm President Robert Karraa. “We centralize our solutions around documents.” A lot of them: First American harnesses its brains and cyber hardware to monitor 85 percent of all mortgage transactions in the U.S.—six months ago, that meant accessing 4 billion filing documents across every major jurisdiction. Today, that load is 4.5 billion documents.

What that provides, Karraa said, is “all the changes that are occurring in a property in real time.” That’s a boon, especially in states like Florida, where foreclosure is a judicial issue and mounting backflows of cases make it hard to keep the paper trails straight. Knowing what’s missing in the filings helps servicers and investors triage the defaults that may be swelling in their portfolios.

But it doesn’t end at data acquisition. First American’s mortgage services department, led by President Patrick McLaughlin, takes their colleagues’ title research and assembles it into a comprehensive plan of attack for investors and servicers. “Getting beyond the pure title data into what’s really happening becomes very important,” McLaughlin said. First American is primarily known as a nationwide underwriter, and so its mortgage services group can bring a variety of automated and manual analyses to “add some underwriting logic” to a portfolio’s title concerns—whether you’re a hedge fund investor with 10,000 loans in a portfolio, an acquiring entity that’s looking to service new loans, or a servicer optimizing your existing workflow.

Interestingly in an economic climate driven by high default volumes and mountains of filings, First American emphasizes its strength in manual analysis by live bodies. “Going down the long road of a loan mod or a short sale when there’s title issues” can



be a costly error if the due diligence isn't done, and McLaughlin said that means "going deeper when a title issue is uncovered to figure out whether it can be solved by underwriting." The upshot: "We work very closely with our lenders to provide them with a proactive stance, every time," Karraa said.

Highlighting Human Behavior

Whether you're talking about title risk or the better-known credit-lending risks, predictive analysis needs more than just numbers to crunch: It's highly dependent on a number of assumptions about human behavior in certain circumstances. To make such models as accurate as possible, analytical firms use cutting-edge psychological and economic research.

"We use behavioral indicators such as sold market times and sold-to-list price indicators in our predictions and have been doing so for many years," said Collateral's Sklarz, along

with "local market data, with information on not only what is selling but what is not selling and the corresponding market-based indicators." Milner said LPS Applied Analytics' "very sophisticated but intuitive behavioral modeling" takes a similar approach.

However, people do funny things in stressful situations, and the current housing crisis has spurred everyone in the predictive analytics field to fine-tune their assumptions about human behavior. Subprime and bubble pricing, which may have raised incentives for strategic defaults, particularly caused some recalibration. "We did not have this factor in our original home price models, which were driven primarily by employment and affordability," said Sklarz.

Vella of Equator agrees that it has become more difficult to predict borrower behavior in the current market environment. "Borrowers are now more strategic and knowledgeable,

which impacts what they will actually do today versus a year or two ago," he said. "This creates uncertainty for the servicer, which is why they need practical business expertise and not just raw data to develop the models. Historical data on outcomes based on data points is helpful, but access to real-time data is essential."

Equator's solution to that problem is to augment stats and actuarials with borrower interaction. "The borrower's interview is a major component in determining the outcome of a loan," Vella said. "The borrower's attachment to the home, job status, occupation, schooling, family size and structure, and other characteristics are predictive in nature and represent a large portion of the variables that drive the decision-making model."

LPS Applied's modeling looks not only at borrower behavior but at servicer behavior as



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well. "Parts of the model that are dependent on servicer timelines" needed adjusting, Milner said. "That has gotten stretched over the last few years as servicers try to make more and better modifications."

Another variable that the unprecedented economic downturn presented modelers with was a new regulatory regime. "We're not in a position to predict future policies of the government or those put in place by the GSEs and regulators," Milner said, but even so, "we can model how borrowers are going to behave as their economic situation changes." A dynamic economy encourages dynamic solutions.

The Best, Brightest, and Fastest

But how does one really generate those dynamic solutions with science and math rather than crystal balls and tea leaves? The brain power and technology involved in predictive analytics is truly mind-boggling. "There's a pretty big infrastructure, as you

can imagine," said First American Data Tree's Nattagh. Imagine the sheer size of a production-automation system that's needed to review those 4.5 billion documents, or the "significant computing power" LPS Applied Analytics uses to screen 53 million loans in models for every ZIP code in the U.S. "We've got to do it every day, and it's an ever-expanding operation," Nattagh said.

The human capital involved is even more impressive. LPS Applied's main offices are in San Francisco, nestled between Silicon Valley and the Lawrence Livermore National Laboratory. Milner said he leans on a number of PhDs, "on a staff of roughly 25 in the modeling aspects, another 25 on loan collection efforts, and a similar number on the property data side." And he has a team of model builders who hold doctorates in physics from the nearby University of California-Berkeley. In other words, it actually does take a rocket scientist to predict mortgage defaults.

No wonder, then, that predictive analytics is largely a third-party service provider's game: The resources required make it difficult even for big banks to field an in-house team. "For mortgage professionals to do this on their own requires significant investments," Milner said. "It's truly more cost effective for them to outsource to a firm that will generate the outputs quickly."

Which means that whatever your role in the mortgage chain and whatever measures you've taken to weather the current storm, predictive modeling is worth investigating further. If you don't use it, now's the time to dive in. If you do, now's the time to get more analytical firepower and to fine-tune your questions for the predictive experts. "In the end, lenders want to limit their losses," Milner said. "We can build a segmentation approach that meets servicers' needs." **CS**

Adam Weinstein is a reporter and consultant specializing in financial services, macroeconomics, security, and international developments.

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