The Potential of Scoring in International Mortgage Lending

by Ken Palla

INTRODUCTION

The use of scoring models in mortgage lending internationally is poised for tremendous growth. The emergence of consumer classes across Asia and Latin America and the increasing sophistication and homogenization of the European market are generating an increased demand for methods that standardize and quantify the lending process.

Additionally, the lucrative market for securitized investment products is growing internationally. A significant component of the validation and valuation of these instruments is the ability to quantify their quality on the basis of origination scoring. As these trends spread around the world, mortgage bankers are likely to come under increased pressure to adopt origination scoring methodologies that will help them more profitably keep pace with global financial demands.

While the efficacy of scoring in consumer credit lending worldwide and in the mortgage market in the United States is well tested, international mortgage lenders are just now beginning to explore the value of credit scores in mortgage lending, management and securitization. This article will explain the mechanics of scoring and explore its established roles in the international consumer lending and U.S. mortgage markets. It will then look at efforts to use scoring in the international mortgage marketplace and examine the potential such efforts hold in international asset-backed securitization.

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Lending money is risky business. Historically, lenders have sought ways to evaluate that risk in the context of the likelihood of repayment. Obviously, a lender with a better sense of the risks involved in the granting of particular loans is less likely to lose money due to default or poor performance. But the world is a tricky place and, unfortunately, appearances and intentions are not always what they seem.

Scoring is a method used by credit grantors to quantify the risks associated with granting credit to a given applicant or customer. It is a way to compare known information about a borrower with known information about other borrowers for whom outcomes have been tracked. Using databases comprised of information about borrowers and their payment performance, companies like Fair, Isaac of San Rafael, California, have devised predictive models (commonly called scorecards) that can assign scores to potential borrowers. The scores rank-order the risk of lending. Individuals with a given score pose less risk than those scoring lower and greater risk than those scoring higher.

HOW SCORING MODELS WORK

Scoring models assess risk by means of characteristics, attributes and weights. The basic goal of a scorecard is to separate the good loans from bad loans, with as few indeterminate loans (loans where we are not sure if they are "good" or "bad") as possible. (See Figure 1.)

Models typically evaluate six to 12 characteristics or categories of information about credit applicants. These are the characteristics that are most predictive of future payment and are selected based on extensive statistical research. The attributes of a characteristic are all of the possible applicant responses for that characteristic. For example, for a simple characteristic like "time with present employer," the attributes might be "less than six months," "six months to two years," "three to five years," "six to 10 years" and "11 plus years." Each response or attribute has a different weight or numeric value associated with it. These weights are determined mathematically during the research and modeling process. The sum of the weights given to an

Figure 1. Score Distributions: Numbers of Good and Bad Applicants

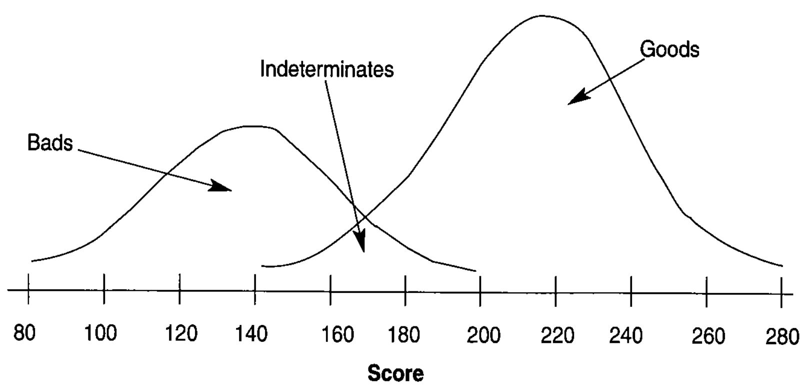
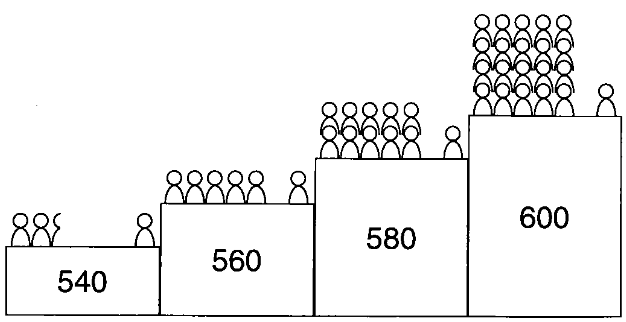


Figure 2. Scores Are Designed to Rank-Order



The actual score provides a rank-order of each loan, describing the ratio of good loans to bad loans at each score level. The single character at each level represents the bad loans.

applicant's characteristic responses constitutes the final score.

Scores are a quantitative determinant of the risk involved in lending to a borrower: the greater the score the better the likelihood of repayment. Figure 2 shows a sample rank-order of a set of loans. As an example, at a score of 560, there are 5:1 good loans to bad loans. At a score of 600, it is a ratio of 20:1 "goods to bads." Based on what the lender determines to be acceptable risk for their business, a "cutoff score" is selected.

The decision whether or not to grant an applicant credit is based on where their final score fell in relation to the cutoff score.

One key advantage to credit scoring is that it makes an objective analysis of a candidate's creditworthiness. Scoring is free of individual and subjective bias. Only information proven to be predictive of payment performance is taken into account. Lenders can accurately track outcomes and forecast what business improvements might result from raising or lowering score cutoffs. Figure 3 is a basic example of combining scoring and decisioning workflow to automate the decisioning process for underwriting a loan. This decisioning could be enhanced by adding such data as customer information on existing account relationships and geographic/regional differences.

Scoring often enables lenders to reduce bad accounts by 10% to 40% without reducing approval rates. Alternately, lenders can increase approval rates by 10% to 20% with no increase in bad accounts. In addition, scoring can both increase process efficiency and improve customer service. Many lenders make 80% to 90% of their lending decisions using scores alone—without the involvement of a loan officer.

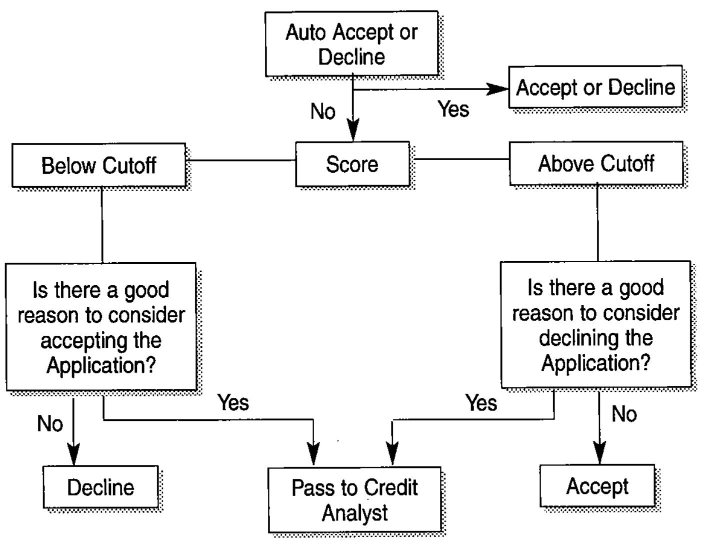
In the United States, Fair, Isaac pioneered credit scoring and modeling. Starting first in the emerging consumer credit card industry of the 1950s and 1960s, credit scoring has been adopted in the U.S. across a wide range of lending and financial marketing activities. In the U.S., 94% of bankcard issuers use credit scoring, as do 75% of the country's finance companies. Today, Fair, Isaac is considered the "gold standard" and industry leader in this field. It brings to market a wide array of tools that allow for a faster, more accurate and more consistent understanding of borrower risk.

In today's financial world, quantitative measurement of risk is an important tool in numerous business endeavors, including not only customer acquisition but also customer management, portfolio management and operational management.

CONSUMER LOAN SCORING INTERNATIONALLY

In the developing world, much the same is true. Many of the developing world's financial institutions are embracing scoring and automated decisioning technology.

Figure 3. Applying Decision Strategy



Each choice is controlled by parameters you set and can change. Scoring allows institutions to determine the degree of automation appropriate for their process and culture.

Though traditionally dominated by state and semi-state ownership, Latin America is slowly converting to free enterprise. Even when taking into account recent fluctuations, the economies of the region have had their best performance in a quarter of a century.

Referring to Latin American markets, Robert Duque-Ribeiro of Fair, Isaac says, "Reduced interest-rate exposure and decreased capital requirements are highly desired everywhere, including Latin America. They can be achieved by accurately assessing credit risk at the account, customer and portfolio levels."

To this end, Fair, Isaac has partnered with Brazil's Serasa Centralizaçao de Serviçios dos Bancos, Brazil's credit bureau, to analyze existing positive and negative credit data to create the first empirically derived credit bureau scoring system offered in South America.

Customer relationship management is a major focus of this region, following the boom in consumer credit and access to new credit products. Previously, with exorbitant interest and inflation rates, credit cards were non-existent. Now credit is available to a greater population. For example, the number of Brazilian credit cardholders has nearly doubled in the past three years to 20 million, and there are estimated to be another 65 million qualified.

"The new consumer class (in Latin America) has increased almost four-fold in the last five years, and financial services institutions are eager to offer new products focused on their needs," says Duque-Ribeiro. "With economic uncertainty, rising unemployment and fluctuating interest rates, the business community now better understands that fraud and delinquency will rise too. Credit is being more carefully scrutinized."

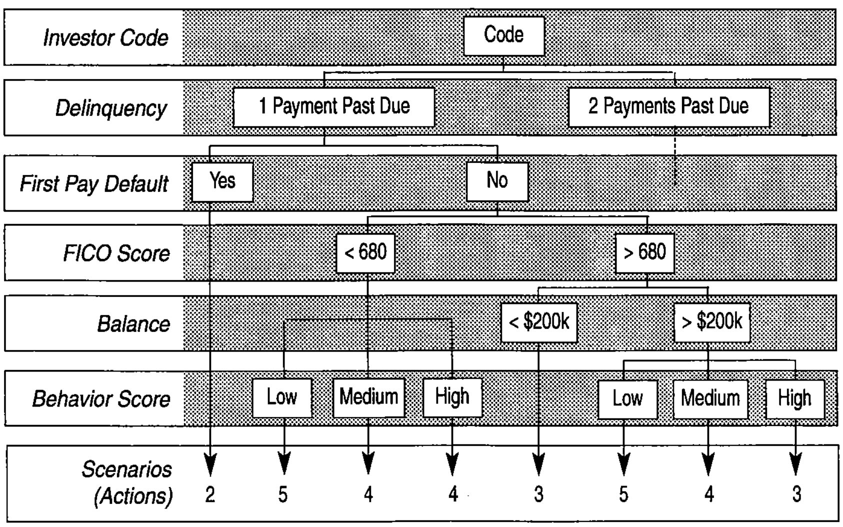
Brazilian Bank Experience

This scrutiny is well illustrated by the case of Unibanco, a 75-year-old Brazilian bank. It is installing a Fair, Isaac customer management system called TRIAD to respond to this demand. The eighth largest bank in Latin America and the third largest private bank in Brazil, Unibanco is a full-service financial institution providing retail banking, wholesale banking, insurance and asset management through its nearly 700 branches in Brazil.

Customer Management TRIAD enables individualized customer management based on the scored risk/revenue potential of each customer across multiple credit lines. Unibanco's bank is working with its finance company, Financeira Unibanco, and Cartao Unibanco, its card processor, on the development and implementation of this integrated score-based customer view. Figure 4 shows a generic TRIAD decisioning workflow for mortgage collection activities based on master file data and a behavior score. The individual "scenarios" at the bottom of the chart are instructions for the collection department. As an example, scenario 2 might direct the collections department to immediately call a "first payment default" borrower, whereas scenario 5 might not require any action at this time.

Another Latin American success story is the Oriental Bank and Trust in Puerto Rico. "Since the installation of Fair, Isaac's origination scoring system in 1995, the bank has created a reputation for fast, professional handling of customer loan requests," says Eli Diaz, Oriental Bank and Trust senior vice president, branch administration. "By institut-

Figure 4. Decisioning Strategy for Collections



ing a tier-pricing structure based on credit score, we are able to reward good performers and distribute the cost of the credit cycle appropriately."

Oriental Bank and Trust is one of the top 10 banks in Puerto Rico in assets, with 17 branches throughout the Commonwealth. Diaz has been Oriental Bank's champion for credit scoring. As head of branch operations he reports, "We had three objectives: We wanted to maximize dollar loan volume without incremental risk, reduce branch delivery expenses, and, with confidence, obtain immediate loan approval on 95% of applications. The credit scoring system has allowed us to increase volume while reducing staff count in our centralized credit department and throughout the branch-delivery system."

As the second largest leasing operation in Puerto Rico, with about 30% of the market, Oriental Leasing adopted credit scoring with the installation of a customized credit application model for auto leasing in 1996.

"Our credit officers have now become firm advocates of the system's benefits," says Diaz. "After more than three years of using the system and with proven performance of its capabilities, we have been able to reduce substantially the high-side override of the system to allow for our maximization of the loan volume. We are also beginning to shift our collection strategy based on credit score—a faster process for low scores and a softer approach for higher scores."

The bank has also found the science of predictive technology helpful in communicating results to its board of directors. "We perform vintage delinquency analysis as well as override tracking and have familiarized our board with the results," says Diaz. "This makes our quarterly presentation to our board interesting and allows them to focus on real issues and regional performance."

SCORING FOR ORIGINATION ADOPTED BY MORTGAGE LENDERS IN THE U.S.

As the efficacy of scoring and predictive technology has become obvious for the consumer credit industry around the world, the U.S. mortgage industry has increasingly adopted it as a valuable tool. Today more than 75% of all mortgage originations in the U.S. involve a Fair, Isaac credit bureau risk score.

In July of 1995, Freddie Mac, one of the two largest housing-related government-sponsored suppliers of mortgage funds in the U.S., endorsed the use of credit bureau scores in the mortgage origination process.

While scoring was already in use by a few industry players, this endorsement sent a message that the technology of scoring was no longer considered simply an experiment in risk assessment. Instead, it was a signal from the government-sponsored enterprises that credit scoring was being perceived by some very influential players as an indispensable part of the U.S. mortgage-underwriting package. This strong signal is likely based on Freddie Mac research that shows that borrowers with "strong" credit profiles are significantly less likely to default on their mortgages.

The U.S. Federal Reserve System, in its own study using different data, came to a similar conclusion. The Federal Reserve found there to be a significant relationship between scores and mortgage performance, and also that scores were an accurate and useful tool for gauging the risk posed by prospective mortgage borrowers and those to whom there are existing loans.

In the U.S. mortgage industry, where lenders are carefully reviewing and documenting loan denials to ensure compliance with government fair lending requirements, the ability of scores to objectively rank-order applicants by risk level gives underwriters a head start in this process. Rather than simply denying applicants for loans, the use of scores allows a marshaling of underwriting resources so those higher-risk loans can be slated for special attention.

"We don't turn anyone down because of the score," says Dan Walker, vice president of United Guaranty Residential Insurance Company, a Greensboro, North Carolina-based mortgage insurer. Scoring assists United Guaranty in making better assessments within the affordable housing market by identifying applicants who are more likely to default and need special counseling or consideration. "For higher-risk applicants, as indicated by score, the solution may be a lower (loan-to-value ratio) or a smaller home," says Walker. "It might be the role of the lender to work with the borrower to bring about a win/win situation."

ADDITIONAL BENEFITS FROM SCORING

But the use of scoring in the U.S. mortgage industry is not confined simply to the evaluation of risk at origination. While lenders have explored a range of benefits from scoring, service providers have been quick to develop solutions that are useful across a range of mortgage lending business challenges. One company is using Fair, Isaac's scores to enhance its customer relationships and grow its portfolio.

In the U.S., lenders can use data like Fair, Isaac credit bureau scores to make decisions throughout the entire loan cycle. An updated score also helps to negotiate with securitization underwriters, since it can more accurately demonstrate the current credit quality of its portfolio. In addition to using scoring in the origination process, one company found there to be significant benefits from using it in other areas.

Portfolio Defense

Another company has actively incorporated scoring in its portfolio defense strategy. In order to retain customers when market rates turn, it proactively approaches existing customers to offer a streamlined refinance process. Using a credit bureau risk score is a key factor in identifying these customers. In addition, since there is already an up-to-date picture of each customer's credit risk, they can respond better to customer-initiated inquiries about refinance options in a timely fashion.

Prioritize Collections

The ability to prioritize collection efforts has also been a key scoring benefit. One company uses credit bureau scores to prioritize collections. The most recent score determines whether the collection activity immediately begins or is delayed up to 25 days. During this waiting period, it also tempers written communication depending on bureau score.

Securitization

In the last few years, scores like Fair, Isaac's credit bureau risk scores have started to become crucial in assessing and valuing a pool of loans to sell or purchase. Investors, rating agencies and others in the secondary market have come to rely on credit bureau risk scores as a key factor in determining the credit quality of mortgage-backed and asset-backed securities.

Standard and Poor's (S&P) is one U.S. rating agency that is using scores to rate a range of asset-backed instruments. S&P uses both Fair, Isaac credit bureau risk scores and its own mortgage scores when rating prime, sub-prime and high loan-to-value mortgage transactions, and intends to increase its quantitative use of scoring in the structured rating process.

SCORING IN MORTGAGE ORIGINATION INTERNATIONALLY

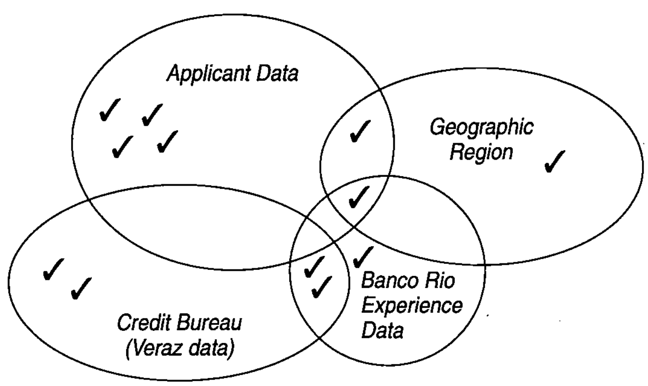
While the use of scoring inside the United States has made significant inroads in the mortgage lending realm, despite great potential it has yet to be widely adopted in mortgage markets internationally. One institution applying the use of scoring in mortgage origination outside the U.S. is Banco Rio de la Plata of Argentina. There, mortgage lending for the entire country has largely been centralized and automated through the use of Fair, Isaac scoring products. The Banco Rio mortgage scoring model uses several sources of data, including credit bureau information from Veraz, the Argentine credit bureau. See Figure 5 for the data sources used in the model.

Banco Rio achieved several benefits from this modeling, including:

- Even with the difficult global economic situation in late 1998-'99, Banco Rio maintained the number of mortgage loans.
- Bad rate of new mortgages is below 0.5%.
- Override percentage decreased from 25% to less than 10%.
- Applicants with high scores receive improved loan offers and better loan terms.
- Time to originate a loan improved (but in conjunction with new process improvements).

Building a mortgage scoring model is only part of the process. The Banco Rio project was a success because they involved key bank units in the initial planning. Some of these bank units were credit risk, technology and other affected business areas. They also assessed and improved the mortgage

Figure 5. Where Do Scorecard Characteristics Come From?



Scoring models can use information from the lender and from external data sources.

operations (i.e., they developed a new business process) in conjunction with the implementation of the new mortgage scoring.

Scoring Model Helps German Bank

Eurohypo, the mortgage-lending subsidiary of Deutsche Bank AG, is another significant international adopter of scoring methodologies. Eurohypo is the result of the merger of three smaller, established German mortgage banks. Frankfurter Hypothekenbank AG and Deutsche Centralboden AG merged in 1995. In 1998, Lübecker Hypothekenbank AG was incorporated into the union to establish Eurohypo. In the face of ever more demanding, price-sensitive customers and the effect on margins from increasing competition, Eurohypo set out to improve its cost-to-income ratio by re-engineering its lending processes. Objectives for this effort included:

- Establishing objective and consistent evaluation of loan applications.
- Implementing a uniform and lean decision process.
- Improving profitability as the result of reduced decisioning cost.
- Implementing risk-based control on new business.
- Enhancing Eurohypo's competitive standing.

A scoring process that would automatically reject some applications while reducing the number of reviewers for others was to be the centerpiece of this process remodel. To develop a model, Eurohypo called on Fair, Isaac.

Lacking rich independent credit bureau data for the market, Fair, Isaac utilized customer databases developed from loan applications that had been kept by each of the merging banking entities. Additional characteristics relative to the property to be mortgaged and the type of mortgage sought were also employed. The use of such data in risk modeling has been proven to be effective under a number of circumstances, both in the U.S. and internationally.

Once a model was developed, Eurohypo conducted a validation process using the model to evaluate existing loans, then examined the results relative to the original internal risk classification. Scoring proved significantly predictive.

Subsequently, an implementation test was performed to see how the model evaluated current applications. Again, the model was used in parallel to Eurohypo's existing process.

In addition to the value that scoring will bring to Eurohypo's origination process remodel, one area likely to experience positive benefits is the secondary securitization market.

Around the world, securities laws are changing to allow the creation of mortgage and asset-backed securities. Lenders are being required to increase capital, which can be easily accomplished through asset sales. Also, the international trend in the reduction of margins on mortgages has meant that lenders are looking for new ways to generate income.

For the mortgage market, this means the issuance of paper backed by the cash flow stream from mortgages. The market for these securities is expected to double in the next few years.

Generally, investors in mortgage-backed securities (MBS) qualify the securities on the basis of an institution's history or record of quality mortgage originations. The criteria used in evaluating this record include:

- The existence of sound written procedures.

- The existence of a detailed record of mortgage portfolio performance.
- Quality appraisal validation.
- Clear, consistent loan documentation to support how loans will be handled until they are paid off.
- Automated mortgage origination operations that include both a loan processing system and mortgage scoring models based on application data, credit data (if available) and property valuation.

The securities will also be qualified on the basis of servicing management, including a quality servicing operation that demonstrates the existence of a well-trained collection staff for different credit products. Additionally, investors like to see effective decisioning software tools to control delinquencies and losses. These software tools should include scoring products like behavior models that evaluate a borrower's payment performance, among other things, as well as collection workflow software.

Clearly, the use of scoring models in origination and servicing management processes is of tremendous value to the validation of mortgage-backed securities. While unique country regulations still inhibit the creation of a single securities prospectus pooling mortgages across borders, this condition is changing, fomenting an increased demand for a standardized approach to mortgage-backed securities validation. Standardized origination scoring will likely become a component of the process.

While variances in the political and legal climates in countries around the globe may initially serve as an impediment to the adoption of scoring, strong and valid arguments can be made that scoring democratizes loan qualification and pricing. Countries moving toward economic democracy will find this extremely valuable. In the U.S., endorsements by Freddie Mac and Fannie Mae underscore this point.

Likewise, the existence of weak third-party data or a lack of that data is not an immediate impediment to the adoption of scoring. Fair, Isaac has developed systems both in the U.S. and around the world (Banco Rio and Eurohypo) that use a lender's existing data to generate and implement valid effective models for origination. In many countries, banks already have internally accumulated vast customer databases that are highly valuable to organizations like Fair, Isaac, which can use them to generate strong predictive models for mortgage and other credit products.

Finally, as margins on mortgages continue to diminish, offerings of mortgage-backed securities should continue to flourish. The desire of investors for systematic qualification of those securities is likely to drive international mortgage lenders to the adoption of scoring-based origination and management procedures that will meet the global financial requirements of the 21st century.

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