

Controlling Decisions with Statistical Portfolio Scoring

By

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During the past decade, the use of portfolio scoring (a/k/a behavior scoring) within the B2B and B2C markets has evolved at a tremendous rate. Portfolio scoring is no longer considered to be an inferior substitute for a credit and collection manager's manual back-end decision process, especially when looking at a large portfolio of customers. Portfolio scoring is now being viewed as a valuable, automated tool for credit and collection decisions for repeat transactions (release of orders), credit line management, and the development of optimal collection strategies. In today's competitive and ever-changing business marketplace, it is more important than ever to maintain a competitive advantage. The question is not, "Do I Use Portfolio Scoring?" but "What Type of Portfolio Scoring Methodology Should I Use?"

Currently for the B2B and B2C markets there are three primary types of portfolio scoring solutions being utilized – generic bureau scores, judgmental/rules based (judgmental) scoring platforms, and statistical models. Most of the early adaptors and most companies today who are utilizing portfolio scoring are primarily using generic bureau scores and/or judgmental-based scorecards. These types of scoring solutions previously have been the easiest to purchase and implement as many of the leading platforms and data, are provided by the major credit bureaus. These types of scoring solutions have shown to provide various efficiencies and have value in creating a consistent decision process. However, when compared side by side to statistical models for the purpose of portfolio analysis, both bureau and judgmental scoring have been proven to be far less predictive.

Statistical portfolio scoring technology is now readily available through hosted web based solutions and may be more cost-effective than using bureau scoring or a judgmental scoring platform that is driven by bureau data. What many companies who are either looking at or are currently using portfolio scoring do not realize is that statistical models require minimal IT support and offer the flexibility to incorporate the credit and collection manager's rules into the scoring process. The models are customized based on the user company's risk management objectives. Credit and collection managers should be in control of the decisions since they know their market best. Statistical portfolio models use a wide range of data variables, and many times the key data elements in the model is the customer's internal historical payment information. This data has proven to be the most predictive available, and it's free.

Changes in the decision strategy for the B2B and B2C markets are inevitable due to changes in customer portfolios, market and economic conditions, and as competitors become more sophisticated in their approach to decisions and risk management. Users of statistical portfolio scoring have cited better allocation of internal resources leading to greater staff effectiveness, more efficient customer segmentation for prioritization of collections, and superior long-term portfolio quality. The driving force of success, in this "automated world," is integrating the credit and collection manager's policy rules with a statistical portfolio scoring solution to manage the day to day customer management process. Those forward thinking companies that have adopted this approach have seen a dramatic reduction in days sales outstanding (DSO), write-offs and internal costs while increasing revenue.

Advances in Statistical Scoring

In the past, statistical scoring models were complicated decision tools that were only looked at by the most sophisticated organizations that usually had Ph.D. level statisticians on staff. Most were custom built and hard to interpret, implement, and very costly. This is not the case today, however many credit professionals still

believe this is true. In this age of information and technology, computing costs have fallen substantially and statistical portfolio scoring models can now be delivered at a fraction of the cost via secure FTP data transfer or through hosted web-based applications. Internal accounts receivable data drives model performance, reducing data acquisition costs and minimizes IT resources.

Yes it is true that any company can integrate the outputs of a statistical model into their current process, **but not just anybody can develop a statistically sound model.** If a company wants to build a statistical model internally it will need to have Ph.D. or masters level statisticians with years of the appropriate modeling and credit experience on staff. In addition, special costly software and hardware specifically designed to conduct advanced analytics to build the models and run them on a frequent basis is needed.

By providing commentary and straightforward reporting with performance tables, statistical portfolio scoring output is now easy to interpret and integrate into the credit and collection manager's process leaving him/her in control of the level of automation. Also, most companies that employ statistical scoring solutions use experienced external, reputable vendors that develop these types of models and provide the technical depth that would take a considerable amount of time and effort for a company to build internally. From a timing perspective, it takes far more time to build a statistical model then it would to purchase it from a qualified vendor.

Differences Between Judgmental Scoring and Statistical Scoring

Statistical scoring models should not be confused with judgmental scoring models that are often referred to as credit or collection scores. Judgmental systems are standard scorecards that are built in some type of software environment and automate the manual process that a credit and collection manager utilizes in evaluating a particular account. While judgmental systems provide greater efficiency in the credit and collection process over manual reviews, the use of statistical models takes that efficiency to the next level and by providing the additional benefit of a dramatic improvement in the accuracy of the decisions made. Statistical models accomplish this through advanced mathematical techniques to quantify risk, the results of which are then proven to be accurate through a detailed retro-validation process. This capability, more than any other, is what makes statistical scoring models such a powerful tool for the credit and collection function. Statistical scores allow credit and collection managers to prove that the models work prior to their implementation and truly make "calculated risks".

Judgmental Scoring: The judgmental scoring model is a rules-based method that relies on the credit and collection manager to determine the best data elements and weigh these data elements based on his/her judgment, and create credit policy criteria. Often these systems combine a generic credit score available from a credit bureau with other internal data to assign a risk grade. These scores are combined with policy rules based upon internal performance data, such as delinquency status, tenure as a customer and size of relationship / exposure to create a quasi-custom scoring system. A judgmental scoring model only lets you know what the potential "quality of risk" is with a customer, they do not "quantify" the risk. They are essentially ranking systems where the company with the highest score is considered the lowest risk and the company with the lowest score is considered the highest risk.

The judgmental scorecard can be developed purely based upon credit intuition, a credit or collection team or combining analytics with credit and collection management's intuition.

Approach 1 – No Validation of Rules: This method relies on intuitive business rules based upon risk and internal credit and collection experience. As a matter of fact, this would be the first step in the development of any judgmental system. However, there are significant limitations of this method. The most important is the lack of validation that the rules are appropriately being applied or weighted. Also, redundant or conflicting rules

may be used that limit the system's ability to predict future behavior. Judgmental Systems bring greater speed and efficiency to the credit evaluation process, but typically fail to bring greater accuracy and effectiveness.

Approach 2 – Validation of Rules: A retrospective analysis using a judgmental based score and testing some internal policy rules can be an important first step to better understanding the predictors of risk. However this analysis requires the ability to get historical data from your system. Typically 12 to 24 months of historical performance is required, which may be a difficult task for some creditors due to system limitations. If the data is available, the goal is to find out what data is the most predictive of future deteriorating payment performance. The basic idea is to analyze customers from several months earlier when they were in good standing, then look ahead several months to their current status and determine which customers remained in good standing and which firms deteriorated to a status of severe delinquency or loss.

Statistical Scoring: Statistical scoring models are automated business decision tools that are empirically derived and validated based on credit and collection performance of accounts from specific portfolios. The models are developed using advanced bivariate and multivariate statistical techniques to determine what information is relevant and the information's importance to solve the creditor's business objectives. Typically, multivariate logistic regression (a non-linear regression technique) is used to estimate statistical scoring models. In general, credit and portfolio scoring models are designed to predict an unacceptable risk of delinquency, write-off, or bankruptcy. Statistical models "quantify risk" by defining what the odds or probability of the delinquency occurring is, thereby giving you the ability, from an expected dollar perspective, to know the value of your risk.

Mathematics, statistics, data and technology are the driving force of the accuracy of statistical models. Human judgment is taken out of the equation. The power is provided through sophisticated analytical techniques being applied by qualified statisticians to evaluate hundreds of credit risk data elements to find the most predictive set of data elements and then optimally weighting them to maximize the model's predictiveness. Through real world applications, statistical scoring is proven to substantially improve decisions by providing a consistent, effective decision process that allows trained credit and collection managers to focus their time on more difficult receivables and develop collection strategies, including firms with limited history or unique financing needs.

Statistical scoring models can be designed for a variety of applications including proactively monitoring your portfolio for credit and collection decisions on existing accounts as well as for automating new account decisions.

Portfolio Scoring: A portfolio scoring model provides credit and collection managers with the capability to quickly and accurately evaluate the inherent risk associated with existing customers. The model is typically designed to predict if a customer will become delinquent, go to loss, bankruptcy or pay on a timely basis at some time during the six months subsequent to the time of score.

The models leverage the predictive power of internal accounts receivable data, which is proven to be the most predictive data in this type of model, and it's free and readily available. A model built exclusively for existing customers that is primarily based on actual accounts receivable performance is a much more powerful predictor of existing customer's future performance than a model based simply on external bureau data. However, the addition of bureau data to portfolio scoring models does increase predictiveness, which is often considered for larger dollar credit transactions, but is often not used for collection applications due to the additional cost. Portfolio scoring models are powerful risk management tools with multiple functions. They can be used to make new credit authorizations with existing customers, determine and monitor credit lines for both credit and marketing support, develop superior collection strategies and treatments, and to monitor the overall quality of the portfolio.

New Application Scoring: A new application scoring model provides credit managers and analysts with the capability to immediately assess the risk that a new customer will become seriously delinquent, be written-off, experience bankruptcy, or exhibit some other type of derogatory payment behavior over a specified period of time.

Different types of information drive a New Application Scoring Model including application data, and credit bureau data (commercial and/or consumer), and financial statement information, if appropriate. Statistical analysis is used to determine what set of data elements are the most predictive in evaluating credit risk that makes financial sense.

Statistical and Judgmental Scoring Working Together

Portfolio scoring is not a one-size fits all methodology. Many B2B and B2C companies are now realizing that they need to have a hybrid solution that combines both statistical and judgmental scoring in order to meet all of their needs. It has been proven that the most profitable solution is combining statistical portfolio scoring with validated policy rules to drive the credit and collections decision process. This approach yields more efficiencies by using advanced mathematics and statistics to more accurately predict credit and collection risk leading to better decisions.

The balance between growth and profitability ultimately rests with a company's risk management strategy. At the end of the day, losses, high DSO, and not collecting monies due in a timely fashion makes or breaks a company's profitability. Forward thinking credit and collection managers have begun to appreciate the value that an advanced statistical decision system adds to their bottom line. Innovative companies have integrated statistical portfolio scoring as the prime component of their risk management strategy navigating back-end decisions. A successful risk management strategy is about putting in place the necessary credit and collection controls to maintain the portfolio's quality without stifling the portfolio's growth. The market leaders are those companies that are supplementing statistical portfolio scoring with their policy rules and decision criteria to generate a more sophisticated decision system.

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