

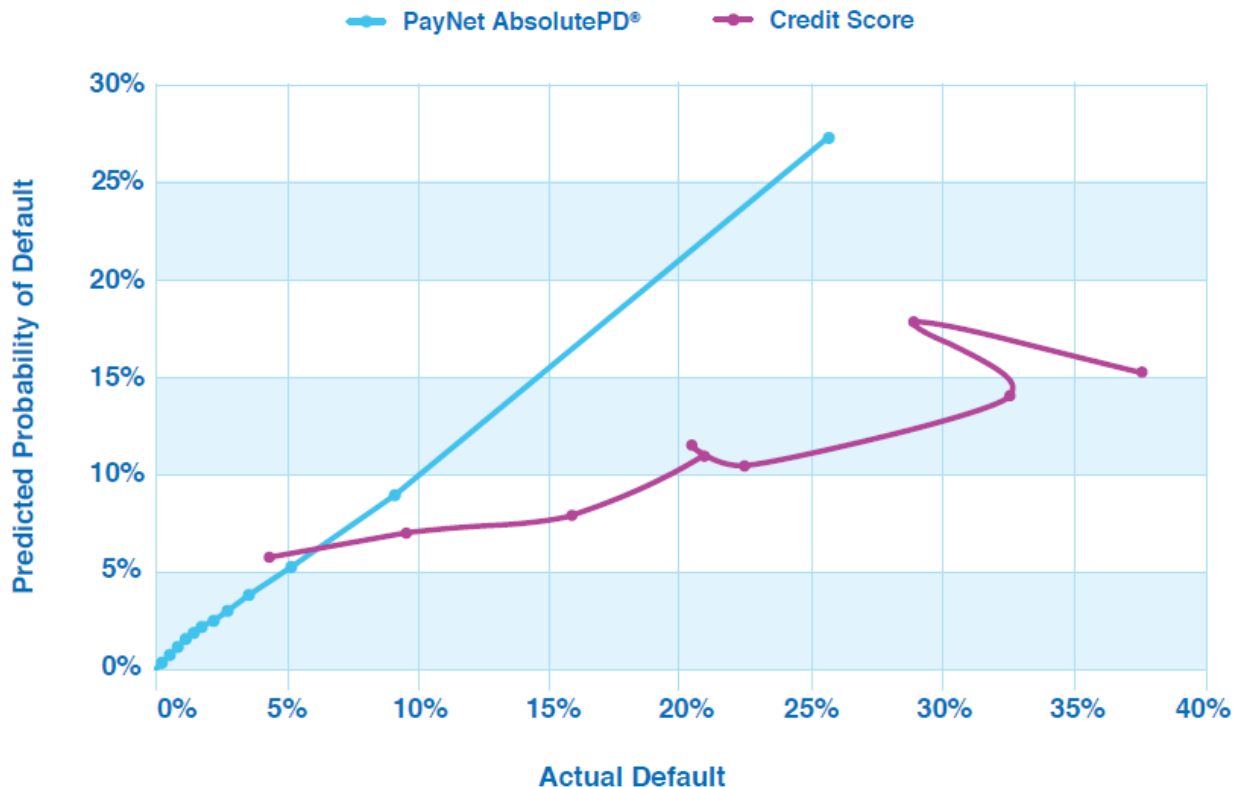
Achieving Greater Predictive Power Credit Scoring versus Probability of Default

Absolute and Ranking Measures

The economic downturn in 2009-2010 took small business lenders by surprise. Borrowers who were previously rated as credit-worthy suddenly defaulted in alarming numbers. Lenders had reasoned that Through-the-Cycle default rates would apply throughout the cycle. However, for any given level of risk, the percentage of defaults can increase dramatically in a recession.

Credit scores rank the risk of borrowers by assessing the average historical default rates of borrowers with similar characteristics. Probabilities of default, on the other hand, take into account constantly changing economic conditions when projecting the future default rate of a borrower. The following chart shows the tendency for a typical commercial credit score to underestimate actual default rates during an economic downturn. In a perfect system, predicted default rates would be the same as actual default rates. Today, technology exists to predict actual defaults with far greater accuracy than has been achieved using credit scores.

Predicted Probability of Default vs. Actual Default



Credit Scoring

Credit scores base predictions of future borrower behavior on the past. A typical credit scoring system relies on data from observing a large number of borrowers who have performed satisfactorily and unsatisfactorily on their loans. This data is statistically analyzed to calculate the historical odds of unsatisfactory performance. The historical odds are then scaled in a range, typically 450-800.

Credit scores are good for identifying the relative risk of borrowers in a population. By evaluating individual borrower traits, credit scores assess the likelihood that a borrower will exhibit the characteristics associated with unsatisfactory performance.

However, credit scores only consider borrower characteristics, rather than economic factors. They are limited by the view of unsatisfactory performance painted by the historical sample used in their construction. For this reason, credit scores are unable to adjust to new economic conditions that are outside the bounds of the original sample, and suffer from “odds shifts” during changing economic conditions.

The following chart shows the changing default rate of a credit score over successive years. Note, for example, the 660-679 scores exhibit a default range from 2.5% to 6.4% over a 4-year period. Also note the rapid shift in odds from year to year. Odds shifts may be significant enough to cause unexpected credit losses when lenders fail to adjust their loan origination policies. In addition, surprises can occur when financial institutions assume the default rate at the time of origination will remain the same for the life of the loan.

A more predictive default management system is needed to reduce uncertainty and avoid surprises.

Default Rates by Credit Quality Tier

Score	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
<600	26.9%	32.9%	27.6%	20.4%	30.8%	41.3%	43.9%	45.2%	34.2%	27.7%	34.6%
600-619	14.3%	14.5%	15.3%	12.9%	18.0%	27.6%	29.8%	29.1%	23.0%	20.9%	21.5%
620-639	10.4%	9.5%	9.2%	8.0%	13.0%	17.5%	20.6%	19.6%	14.7%	13.4%	15.2%
640-659	5.9%	5.8%	5.0%	4.7%	7.9%	10.1%	12.3%	11.8%	8.5%	7.9%	9.5%
660-679	2.9%	3.0%	2.7%	2.5%			6.4%	6.3%	4.3%	4.2%	4.5%
680-699	1.8%	1.7%	1.4%	1.5%	2.0%	2.5%	3.0%	3.2%	2.2%	2.0%	2.4%
700-719	1.3%	0.9%	1.0%	0.9%	1.0%	1.2%	1.3%	1.5%	1.1%	1.1%	1.2%
720+	0.8%	0.6%	0.5%	0.6%	0.5%	0.5%	0.5%	0.5%	0.4%	0.4%	0.4%

Probability of Default

Probability of default remains the gold standard for credit risk assessment. New techniques that go above and beyond credit scoring are needed to create a forward-looking probability of default. These techniques are able to take into account macroeconomic factors, calibrate credit risk to the economy and adjust to changing default rates.

As a result, the probability of default presents risk in terms that lenders, regulators and auditors can understand: as a percentage likelihood the borrower will fail to make payment on loans. This percentage is presented on a scale of 0% -100%. For example, a 1% probability of default means there is a 1% chance the credit obligor will default over the forecast timeframe, which is typically 1 year.

Today we have the technology to create accurate probabilities of default that are immune to the odds shifts that plague credit scoring. PayNet recommends using probability of default, such as PayNet AbsolutePD[®], as a core input for credit risk management systems.