FEBRUARY 2015

The Role of Credit Scores in Consumer Loan Securitization

Contents

VantageScore®
a higher level of confidence

The Role of Credit Scores in Consumer Loan Securitization

EXECUTIVE SUMMARY

Loan securitization has become an essential source of capital for consumer lenders of all sizes, playing a significant role in expanding homeownership opportunities to millions of consumers. As the 2008 collapse of the financial securities market revealed, however, there are potential flaws in the manner in which the securitization process measures and perceives risk.

One such flaw is the way in which credit scores, filed as a component of the securitization Master Trust, are interpreted as a risk statement. This paper analyzes the specific risk exposure associated with using three-digit score values rather than their underlying probability of default and proves that using probability of default values can substantially enhance the quality of ratings assessments. The analysis is based on an example of a securitization filing and its performance for the last several years.

Keeping all other variables constant, the analysis demonstrates the improved risk insight gained from using probability of default values rather than credit score values. Specifically, using probability of default reduced incremental loss exposure from 56% to just 4% over the original ratings estimation.

The paper begins with a brief review of the securitization process, the role and interpretation of credit scores. Using a sample Master Trust filing, the impact of score values compared to probability of default is analyzed. Finally, methods and benefits of using probability of default are discussed.

USING CREDIT SCORES IN THE SECURITIZATION PROCESS

Description of the securitization process

The securitization process begins with the origination of loans using consistent underwriting criteria. Receivables are then assigned to a bankruptcy remote trust, also known as a master trust. The Master Trust may include data about the loan and borrower, including, among other things, the property location, interest rates, account balances, addresses, the borrower's age, and credit score. All of this data is used as a means to classify receivables by risk tiers.

Loans are then grouped by similar characteristics into pools and presented to rating agencies for review. Rating agencies issue an opinion about the credit risk of the pool, which includes the ability of the issuer to meet its financial obligations and the likelihood that the receivables will come under distress. Credit score information, which is included in the master trust, is a contributing factor to the rating process and the structuring of securitization tranches, in which a transaction is separated into securities according to the order and priority of receiving repayment.

In order to meet the ratings criteria of different agencies, issuers will make internal or external credit enhancements. Finally, legal documents are drafted to issue securities and issuers begin reaching out to investors to buy them. After securities are issued and sold in the market, issuers create monthly servicers statements and reports for investors to facilitate monitoring.

Newly originated loans are funded through assignment to the trust. The key assumption is that these new loans reflect the same risk and credit profile as the loans initially placed in the trust. One of the ways that investors evaluate that consistency is by looking at the credit score distribution of the trust. From a credit score perspective, this requires an implicit assumption that loans with a score of 660, for example, reflect the same probability of default over time.

What exactly is a credit score?

A credit score is a three-digit number (derived using a mathematical formula) from information contained in a consumer's credit reports. That mathematical formula is called a credit scoring model, which measures the likelihood that a consumer may default on a loan payment, of which "default" is defined as being more than 90 days past due. These models:

Figure 1: PD values for scores vary over time

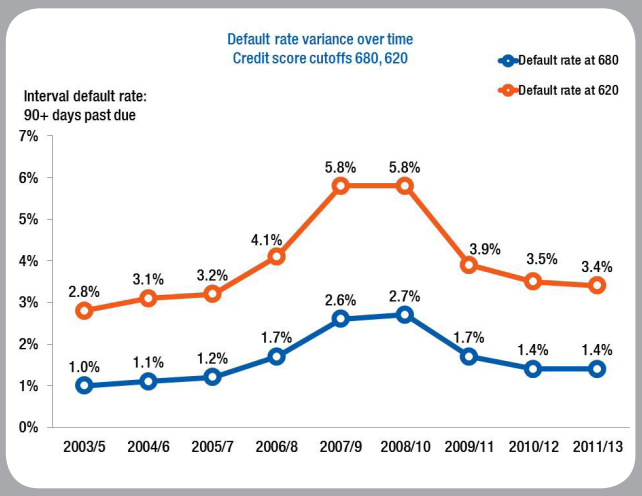
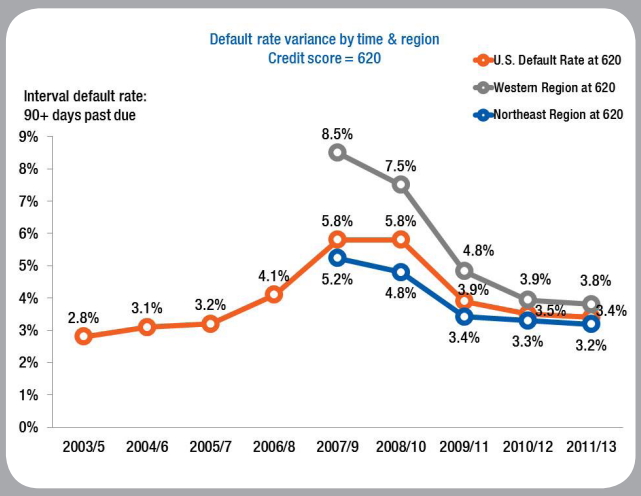


Figure 2: PD values for scores vary by time and originating region



- Are based on a wide range of criteria, including payment history, available credit, recent credit, depth or range of credit, total loan balances and credit utilization, among other factors.
- Evaluate a consumer's behavior compared to other borrowers to assess their likelihood to make timely loan repayments.
- Do not use discriminatory factors, such as gender, race, religion, natural origin or marital status. Age, employment information, interest rates and inquiries by a consumer into his or her credit profile are also not used.

The credit score value associated with a specific loan varies for a number of reasons; credit score models are built using different formulations of consumer behaviors, changes in the consumers' credit file from updates of consumer behavior, or scoring models may use different score ranges. Despite this variability, the good news is that commercial credit scores generally use probability of default (PD) values as a metric for indicating the level of risk associated with a specific score value. Consequently, different brands and versions of scores can be easily mapped to a common understanding of PD at a given point in time.

It is critical to appreciate that the PD value for a specific score value may change over time and for different populations of consumers. In other words, a score of 660 does not always reflect the same PD. For example, Figure 1 shows how PD values have changed over the last 10 years for two example score values, 620 and 680. Figure 2 shows PD values for a score of 620 varying based on the geographic region where the loans were originated.

Credit score model developers provide updated tables, performance charts, of the relationship between the score to PD annually. Note that these PD values are 'backward-looking' in that they represent default rates for the most recent historic two-year window. As with any other loss indicator, ratings analysis may consider a further adjustment to these rates to provide a future default expectation.

Why PD values can vary for a specific credit score value

The net effect of credit scores is to rank-order risk. Simplistically, the score essentially allocates the loan default risk of the U.S. system across the credit score bands. If there is more risk in the system, more risk will be assigned to each score band. This effect was clearly observed through the recession, Figure 3.

In 2009, at the peak of the recession, the ratio of consumers paying their debts on time versus those defaulting was significantly lower than the ratio in 2013. Consequently, the probability of default, defined as the number of defaulting consumers at a score band divided by the number defaulting and number of paying consumers at the same

Figure 3: Score to PD relationship varies with the overall U.S. risk level

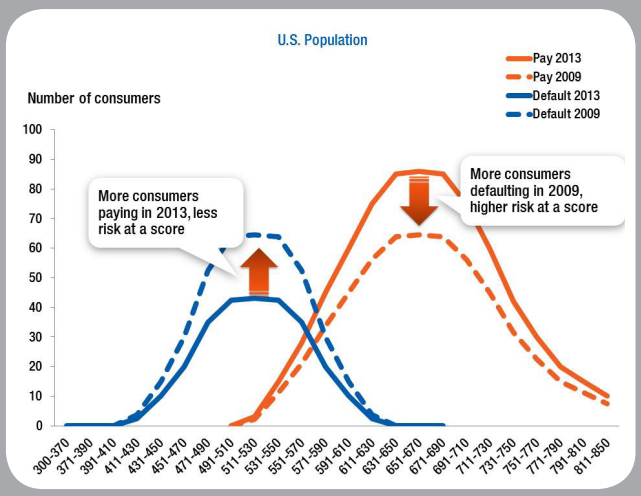


Figure 4: PD profile by score bands

Tier	Credit Score Profile	2005	2006	2007	2008	2009	2010	2011	2012	2013
A	**720+**	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.8%	0.8%
B	**661-719**	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%
C	**300-660**	25.3%	25.3%	25.3%	25.3%	25.3%	25.3%	25.3%	25.3%	25.3%

Figure 6: Historical PD values by score bands

Tier	Credit Score Profile	2005	2006	2007	2008	2009	2010	2011	2012	2013
A	**720+**	0.4%	0.5%	0.5%	0.6%	1.0%	1.4%	1.1%	0.8%	0.8%
B	**661-719**	2.3%	2.3%	2.3%	2.8%	4.2%	5.3%	4.2%	3.4%	3.4%
C	**300-660**	25.3%	25.5%	25.2%	25.5%	28.1%	29.9%	26.9%	28.0%	28.1%

Figure 5: Loss profile

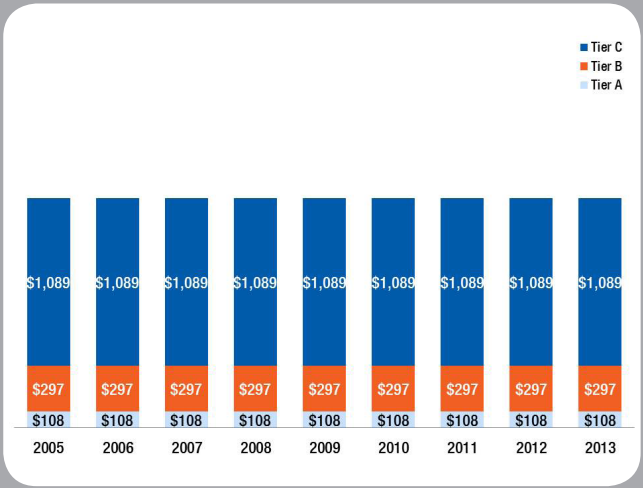
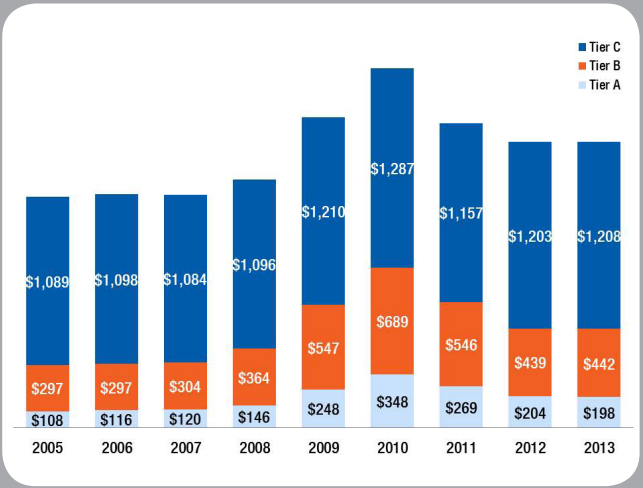


Figure 7: Actual loss profile



score band, in 2009 was substantially higher. For example, a credit score of 620 represents a default rate of 5.8% compared with a default rate of 3.4% at 620 in 2013 (See Figure 1).

Similarly, geographic regions that experienced greater impacts from the recession, i.e. greater losses, translated to higher PDs for the same score value (See Figure 2).

THE CREDIT SCORE: SECURITIZATION RISK DISCONNECT

The assumption that a score has fixed PD values over time and geography can result in a substantial misrepresentation of the risk level associated with issuer. If scores had been the sole metric used to estimate the loan risk, then certainly the credit rating estimate would have substantially underestimated expected risk performance. The reason for this is that even though loans are placed in the trust according to the same score profile, the PDs changed substantially during the recession. The following simplified example demonstrates this disconnect.

A Master Trust is established with a pool of consumer credit card receivables. For simplicity, we'll group those receivables in three tiers of risk – A, B and C – where each tier represents a range of credit scores. Receivables are assigned annually. Assuming receivables are assigned to the trust with a credit score profile that reflects identical PD values at each assignment (Figure 4), then expected losses are consistent year over year (Figure 5).

However, given PD values increased in each score band during the recession (Figure 6), the losses associated with a given credit score range were substantially higher (Figure 7).

Obviously the ratings process considers a broad range of risk indicators that would have ideally captured the increased risk for new assignments. Nevertheless, using credit score values instead of updated PD values at a minimum diminished the confidence in expected risk levels.

RESOLVING THE DISCONNECT: REPLACING SCORE VALUES WITH PROBABILITY OF DEFAULT VALUES

In order to preserve the original probability of default profile of the trust, the credit score distribution of new receivables should change over time as risk changes. Continuing with our three hypothetical risk tiers, the

relative size of each tier should be held constant and new loans should be assigned based on following score bands each year (Figure 8).

NET IMPACT

To illustrate our point, imagine two hypothetical methods of adding (and determining the eligibility of) new receivables. In the first, the securitization deal has concentration limits to ensure that new additions to the master trust preserve the original credit score distribution of the trust. This assignment method results in a consistent credit score distribution but as the risk at a given score increased during the 2008 to 2011 timeframe, the overall loss rates in the trust increased substantially. In the second, assignments are made, as described above, in order to preserve the distribution of loans at each probability of default band. Under this assignment method, loss rates remain relatively consistent year over year, however the credit score distribution varies. Comparing the loss profiles between the two assignment methods shows a reduction in losses from 56% over expectations to just 4% over expectations (Figure 9).

[Note: Losses under PD values do not fully align with expectations as average loan outstandings for the PD-based bands differ from score-based bands.]

CONCLUSION

Enhanced Master Trust documentation can deliver greater risk insight

Summarizing a pool according to a credit score distribution is not very informative: different scoring models have different underlying PD curves, and those curves change over time.

Disclosing the PD associated with each score range, as demonstrated in Figure 10, yields a higher level of insight. Alternatively, disclosing the credit score composition of the trust according to probability of default, Figure 11, can achieve a similar level of transparency.

The overall conclusion of this analysis is that using the three-digit credit score value as a reference for risk in the master trust can seriously misrepresent risk leading to incremental losses and exposure. Simply converting the score value to the underlying probability of default rate and managing assignments to the trust based on these rates ensures a substantially more accurate analysis and expectation for losses.

Moreover, probability of default is a measurement that can be consistently used across credit scoring models.

Figure 8: Score bands are adjusted to retain the same overall tier risk level

Tier	Master Trust PD Profile 2005	2006 Additions	2007 Additions	2008 Additions	2009 Additions	2010 Additions	2011 Additions
A	**0.4%**	720-850	720-850	760-850	800-850	800-850	800-850
B	**2.3%**	661-719	661-719	681-759	701-799	721-799	681-799
C	**25.3%**	300-660	300-660	300-680	300-700	300-720	300-680

Figure 9: Loss profile using PD assignment is substantially improved compared with score – based assignments

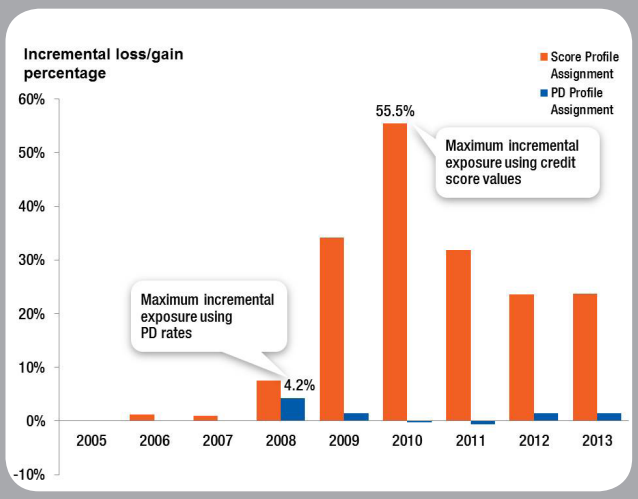


Figure 10: Assignment by PD value

	Probability of default	# of accts (mm)	$OS (mm)
721-850	**0.60%**	5.0	10.0
661-720	**4.10%**	1.0	5.0
300-660	**28.20%**	0.5	1.0
No Score	–	3.0	0.5

Figure 11: Assignment by adjusted score bands

	Probability of default	# of accts (mm)	$OS (mm)
761-850	0.40%	4.0	8.0
700-760	2.30%	2.0	6.0
300-699	25.30%	1.0	2.0
No Score	–	3.0	0.5

The VantageScore credit score models are sold and marketed only through individual licensing arrangements with the three major credit reporting companies (CRCs): Equifax, Experian and TransUnion. Lenders and other commercial entities interested in learning more about the VantageScore credit score models, including the VantageScore 3.0 credit score model, may contact one of the following CRCs listed for additional assistance:

EQUIFAX®

Call 1-888-202-4025

www.equifax.com/vantagescore

Experian

Call 1-888-414-4025

www.experian.com/consumer-information/vantagescorelenders.html

TransUnion

Call 1-866-922-2100

www.transunion.com/corporatebusiness/solutions/financialservices/bank_acq_vantage-score.page

VantageScore
February 2015

www.vantagescore.com