Joint Obligation Ratings in Consumer ABS

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Current rating agency practices for financial guarantors, or bond insurers, do not appear to consider the full range of possible outcomes for insurance provided on consumer asset-backed securities. Specifically, rating agencies do not appear to factor into the ratings of insured consumer ABS the effects of correlation between an insurer default and a transaction default. As a result, the rating agencies assign lower ratings to insured bonds from consumer ABS transactions even when the performance of the underlying assets and the performance of the insurer may have a low correlated probability of default. In addition, this may lead the rating agencies to require the bond insurer to maintain a higher level of capital than is necessary for the protection of certain consumer ABS.

Under our analysis, when the correlation between the transaction and the insurer are low, the default risk to the insured bonds is lower than either transaction or the insurer on a standalone basis. Whereas the rating agencies would typically require significantly higher levels of capital to be held by the bond insurer for the insured deal to achieve a higher rating, by our analysis, a transaction that factored in the correlation of default between the insurer and the transaction could achieve a similarly low risk of default without the additional capital, or higher rating, from the insurer.

BACKGROUND

Throughout much of the last two decades, financial guaranty insurance companies participated in segments of the structured finance market by insuring the senior bonds offered by issued transactions. Many of the largest insurers had financial strength ratings of AAA by some or all of the rating agencies. These ratings were based on rating methodologies that focused on diversified portfolios, the perception of low-risk insured obligations, strong contractual rights in insured transactions, and relatively high capital requirements. In addition, over this timeframe, certain financial guarantor insurers with lower levels of capital reserves operated with lower financial strength ratings, such as AA or A. While active in structured finance markets, these insurers were generally much smaller than their AAA counterparts.

When participating in structured finance transactions, financial guarantors typically insured bonds that would have been rated at some level below AAA (though still at an investment-grade level, that is BBB– or above) without the benefit of the insurance policy. While these bonds would have been lower rated, they were typically structured as the senior-most bond in the transaction. In the event losses on the underlying collateral of the transaction exceeded the available credit enhancement for the insured bonds, the insurers would guarantee the timely interest and ultimate principal payments owed to the bond holders. Based on the guarantee provided by the insurers, rating agencies assigned the insured bonds the rating of the insurer. In other words, if a bond with risk associated with a BBB rating was insured by a financial guarantor with a AAA financial strength rating, the bond would receive a AAA rating. Likewise, a bond with a BBB risk that was insured by an A rated insurer would receive an A rating.

For many years, the ratings of the financial guarantors were stable and investors and the rating agencies believed that because their ability to generate new business depended on their financial strength ratings, the financial guarantors would do everything in their power to preserve their ratings and maintain their stability. However, with the emergence of the financial crisis in 2007, the ratings of many of the financial guarantors began to come under pressure. Due mainly to unexpectedly high losses in mortgage-backed securities and mortgage-related collateralized debt obligations, the ratings of many of the largest AAA rated insurers were put on watch and ultimately downgraded by the rating agencies in a series of severe adjustments. Today, due to continued steep losses in their insured portfolios of mortgage-related securities, none of the previously AAA rated insurers retain AAA ratings and several are rated at non-investment-grade levels. Some insurers have exited the business and are effectively in run off, while others continue to operate or hope to restart their insurance efforts in the future. In addition, some companies, including start-up enterprises, are considering entering the financial guarantee business.

In the past, analysis of bonds insured by the financial guarantors was a relatively straightforward affair, since most of the insurers were AAA and the insured bonds received the benefit of this AAA rating. Today, investors face a variety of rating scenarios for bonds that are currently insured, or may be insured in the future, by insurers with a variety of ratings. In this article, we present a discussion of the credit risks represented by insurers and insured obligations with a variety of rating levels. Our analysis is based on the risk reflected by the ratings of both the insurer and the insured bonds rather than an analysis of the ratings themselves.

DISCUSSION OF THE ANALYSIS

According to standard practice, a fixed-income obligation insured by a monoline financial guarantor, or bond insurer, simply acquires the rating of the insurer regardless of the latter's standalone rating. Therefore, no credit is ever given to the probability that some inverse correlation may exist between instances where the transaction would be in trouble by itself, thus needing support from the insurer, and those where it would not need any support despite a bankruptcy or default of the wrap provider. In other words, thus far in the world of monoline financial guarantors, rating agencies have never measured the rating impact of the correlation structure that might inhere in this type of joint credit obligation.

For this reason, a bond insurance company normally cannot sell its only product (a surety bond) unless it is highly rated, since few senior investors would be interested in raising the standalone rating of a structured security by one notch or two, for example, from BBB+ to A. The insurer's target client base has been the AAA market. Consequently, the bond insurer will find itself in an untenable position unless it can convince the main rating agencies that credit should indeed be given to the above correlation structure. Convincing them is the subsidiary objective of the present exercise. Our main goal is to show the significant rating impact of correlation.

In what follows, we will study the impact of correlation on the rating of insured, fixed-income, consumer ABS securities for correlation coefficients in the interval $[-1, 1]$—that is, most of the correlation range. This interval is to be distinguished from the interval $[0, 1]$ that would apply to the concept of conditional default probability (CDP). Most writers on correlation seem to insist on studying CDP rather than *bona fide* correlation. As a result, with respect to joint and several obligations, one is rarely presented with studies of correlation, but always of CDP. This prevents most practitioners from seeing the impact of negative correlation, which is, by the way, the entire issue.

Method

The method is based on a two-tranche cash flow model run through Monte Carlo simulations and nonlinear iterations: pro-rata waterfall, reserve account, a classic loss curve, and a prepayment model. To this standard model, we added a wrap feature on the Class A. Only the Class A is wrapped.

This model contains a Boolean parameter able to assume values of either 1 or 0 depending on some random number being smaller or larger, respectively, than the default probability associated with the standalone monoline rating. Such probabilities can be found, for example, in the appropriate Moody's bond default study. The relevant probability is the cumulative default probability over the length of the transaction, here taken to be the weighted average maturity (WAM) of the loans in the target pool. The correlation part of the algorithm is organized as follows.

We first draw two random numbers (x_1 and x_2) for the deal and the monoline, respectively, from a standard normal distribution. Then, for each target coefficient of correlation ρ (we ran the simulation for 10 values of ρ) we define the lower-triangular, two-dimensional Cholesky decomposition V as follows:

$$V \equiv \begin{bmatrix} 1 & 0 \\ \rho & \sqrt{1-\rho^2} \end{bmatrix}$$

Please note that this Cholesky L-matrix satisfies the correlation matrix requirement:

$$M \equiv V V^T = \begin{bmatrix} 1 & \rho \\ \rho & 1 \end{bmatrix}$$

Next, we apply the usual matrix transformation, correlating the original, independent deviates x in a way that simulates the correlation matrix M:

$$\begin{Bmatrix} y_1 \\ y_2 \end{Bmatrix} = V \begin{Bmatrix} x_1 \\ x_2 \end{Bmatrix}$$

Our next step is to retrieve the financial guarantor's cumulative default probability [p_d] corresponding to the WAM of the asset pool and the rating of the insurer using the Moody's bond default study. We can now define the insurer default deviate as follows:

$$w = F_N(1-p_d)$$

F_N being the cumulative distribution function of the standard normal distribution.

The insurer will be deemed to have defaulted in the current Monte Carlo scenario if the following condition holds:

$$y_2 \geq w$$

Now, define the normal deviate z_1 as

$$z_1 \equiv y_1 \sigma_n + \mu_n$$

where σ_n represents the associated normal standard deviation and μ_n the associated normal mean of the credit loss distribution.

Thus, we can define the cumulative normal deviate q as follows:

$$q \equiv F_L\,(z_1; \mu_n, \sigma_n)$$

where F_L is the cumulative distribution function of the normal distribution $N(\mu_n, \sigma_n)$.

Finally, we define the default rate to be used in the current Monte Carlo scenario using IDFM as follows:

$$D \equiv F_{LN}^{-1}(q; \mu_{\ln}, \sigma_{\ln})$$

This is the inverse of the cumulative, log-normal distribution function.[1]

This calculation of the default rate is done for every Monte Carlo simulation in all non-linear iterations until either convergence or divergence. The Moody's Class A rating is the main output of the simulation.

Results

The Exhibits 1 and 2 show the Class A rating results (using the Moody's rating nomenclature) obtained for an A1 and Baa1 rated insurer, respectively, and a mean gross, account-space default rate of 10% with various log-normal standard deviations. The second column of each exhibit represents the rating of the A tranche when the deal is unwrapped.

Analysis of Results

As can be seen in the exhibits, when the correlation between deal losses and insurer defaults is highly negative (the left-hand side of the exhibit), the insured tranche is always Aaa regardless of the variability of credit losses. This stands to reason, since this represents a situation whereby the deal and the insurer never default at the same time. In such cases, the investors never suffer a loss because they get paid either by the deal itself or else by the insurer, which is effectively always around when the deal is in trouble. Conversely, when the correlation is highly positive, the deal behaves as though it were unwrapped. This also makes sense because we are then assuming that whenever the deal needs cash, the insurer has none to give.

However, the interesting cases are found at very low correlation levels. Effectively, this is the conjecture now implicitly assumed by the rating agencies. In the A1 rated case (Exhibit 1), the Class A and the bond insurer indeed share the same rating for Baa rated standalone ratings, although the Class A could achieve a rating higher than A1 if its standalone rating were already at that level. In other words, an A1 rated insurer insuring high investment-grade credits could raise their rating all the way up to AAA according to the assumption being used by the agencies.

Our most interesting result, however, can be observed with respect to the Baa1 rated bond insurer run at low correlation levels (Exhibit 2). In this case, due to the exponential nature of credit risk, a Baa1 rated insurer basically has the same rating impact on the Class A rating across the entire credit spectrum we sampled. This means that the sizable amount of capital potentially needed to raise the insurer's rating from Baa1 to A1 is effectively wasted.

HISTORICAL EXAMPLE OF LOW CORRELATION BETWEEN INSURER AND ASSET PERFORMANCE

The distant history of mortgage-backed securities provides an example for comparing the impact of joint obligations between a guarantor and the underlying obligation. Prior to widespread use of insurance on mortgage-backed securities, third-party enhancement was provided to mortgage transactions by mortgage insurers and bank letters of credit. Both types of third-party enhancement providers experienced downgrades in the early 1990s, and the rating agencies correspondingly downgraded deals enhanced by the related parties. However, based on our analysis of joint probability and correlation, the actual value of the enhancement varied significantly depending on the type of third-party enhancer. Because the ratings and performance of the mortgage insurers was tied to the performance of the U.S. mortgage market, the enhancement provided by the mortgage insurers was more highly correlated with the performance of the enhanced mortgage transactions. Thus, the risk of loss to the enhanced transaction was higher. In contrast, many of the banks that provided letters of credit to mortgage-backed securities were Japanese, which otherwise had limited direct exposure to the U.S. residential real estate market. As a result, the correlation between the banks that provided the letters of credit and the performance of the mortgage transactions was low. The risk of both the letter of credit provider and the mortgage transaction defaulting was very low. Therefore, the value of the enhancement to the mortgage-backed securities with these letters of credit was higher and the transactions had a lower risk of loss than the risk for which the rating agencies were giving credit.

EXHIBIT 1

Insurer Rated A1—Correlation between Insurer Default and Deal Losses

Mono-line Rating	**A1**											
Exp. Gross Credit Loss	10%											
			Correlation Coefficient between Mono-Line Default and Deal Losses									
Credit Loss Std. Dev.		**Unwrapped**	**−0.9**	**−0.7**	**−0.5**	**−0.3**	**−0.1**	**0.1**	**0.3**	**0.5**	**0.7**	**0.9**
5.00%		Aa1	Aaa	Aaa	Aaa	Aaa	Aaa	Aaa	Aaa	Aaa	Aaa	Aa1
6.50%		Aa2	Aaa	Aaa	Aaa	Aaa	Aaa	Aa1	Aa1	Aa1	Aa1	Aa2
8.00%		Aa3	Aaa	Aaa	Aaa	Aaa	Aa1	Aa1	Aa3	Aa3	Aa3	Aa3
9.50%		A1	Aaa	Aaa	Aaa	Aa1	Aa1	Aa2	Aa3	A1	A1	A1
11.00%		A2	Aaa	Aaa	Aa1	Aa1	Aa2	Aa3	A1	A2	A2	A2
12.50%		A3	Aaa	Aaa	Aaa	Aa1	Aa3	A1	A1	A2	A3	A3
14.00%		Baa1	Aaa	Aaa	Aa1	Aa1	Aa3	A1	A1	A2	A3	A3
15.50%		Baa1	Aaa	Aaa	Aaa	Aa1	Aa3	A1	A2	A2	A3	Baa1
17.00%		Baa1	Aaa	Aaa	Aaa	Aa2	Aa2	A1	A2	A3	Baa1	Baa1
18.50%		Baa2	Aaa	Aaa	Aaa	Aa2	A1	A1	A2	A3	Baa1	Baa1
20.00%		Baa2	Aaa	Aaa	Aa1	Aa2	A1	A1	A2	A3	Baa1	Baa2

EXHIBIT 2

Insurer Rated Baa1—Correlation between Insurer Default and Deal Losses

Mono-line Rating	**Baa1**
Exp. Gross Credit Loss	10%

			Correlation Coefficient between Monoline Defaults and Deal Losses									
Credit Loss Std. Dev.		**Unwrapped**	**−0.9**	**−0.7**	**−0.5**	**−0.3**	**−0.1**	**0.1**	**0.3**	**0.5**	**0.7**	**0.9**
5.00%		Aa1	Aaa	Aaa	Aaa	Aaa	Aaa	Aaa	Aaa	Aa1	Aa1	Aa1
6.50%		Aa2	Aaa	Aaa	Aaa	Aaa	Aa1	Aaa	Aa1	Aa1	Aa2	Aa2
8.00%		Aa3	Aaa	Aaa	Aaa	Aa1	Aa1	Aa2	Aa2	Aa3	Aa3	Aa3
9.50%		A1	Aaa	Aaa	Aaa	Aa1	Aa1	Aa3	Aa3	A1	A1	A1
11.00%		A2	Aaa	Aaa	Aaa	Aa1	Aa2	Aa3	A1	A1	A2	A2
12.50%		A3	Aaa	Aaa	Aaa	Aa1	Aa3	A1	A1	A2	A2	A3
14.00%		Baa1	Aaa	Aaa	Aaa	Aa1	Aa3	A1	A1	A2	A3	A3
15.50%		Baa1	Aaa	Aaa	Aa1	Aa1	Aa3	A1	A2	A3	A3	A3
17.00%		Baa1	Aaa	Aaa	Aa1	Aa1	Aa3	A1	A2	A3	A3	Baa1
18.50%		Baa2	Aaa	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa1
20.00%		Baa2	Aaa	Aaa	Aaa	Aa2	Aa3	A2	A2	A2	Baa1	Baa1

CONCLUSION

The main conclusion that can be drawn from these considerations is that a significant rating benefit could be conferred by the proper inverse correlation structure. This signals the very real possibility of optimizing a financial guarantor's balance sheet by taking advantage of this fact. Unfortunately, as things currently stand and in the foreseeable future, the lack of flexibility and engagement on the part of rating agencies vis-à-vis correlation will most likely prevent the emergence of effective capital optimization.

ENDNOTE

[1]The formulas to transform σ_n and μ_n into $\sigma_{\ln}$ and $\mu_{\ln}$ are widely available in the literature.

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