Credit Risk Measurement: Avoiding Unintended Results

Part 3: Discount Rates and Loss Given Default

by Peter O. Davis

**Loss given default** is the measure of economic loss on a defaulted financial obligation. The discount rate selected to calculate economic loss, collections, and costs related to the defaulted asset could affect the interpretation and application of this fundamental credit metric. This article explores common discounting approaches and their potential impact on the meaning of the resulting LGD metric.

Metrics calculated for one purpose may have limitations for broader application or they may generate certain unintended theoretical interpretations when used for other purposes. This article focuses on the relatively fine point of the discount rate used to calculate loss given default (LGD). There are a number of options for choosing an “appropriate” discount rate, and each helps answer a slightly different question. The discount rate selected affects how an LGD should be interpreted and applied in other calculations.

**Modeling Loss Given Default**

As discussed in Part 1, the art/science of measuring LGD is far less mature than default risk modeling or grading methodologies. As institutions continue to collect more data on default events and the reasons for default losses, LGD models and grading frameworks will likely become increasingly sophisticated. Rather than focusing on LGD, this third article in the series looks at discounting post-default cash flows.

LGD represents the net present value of the cash flow stream related to a given exposure following the default event. Using a loan as an example, LGD would include all collections made on the loan, plus direct and indirect costs. (In practice, most institutions have not allocated indirect costs to individual loans.) Discounting each cash flow to the point of default provides the economic recovery on the defaulted loan. Expressing this recovery amount as a percent of the loan balance at default provides the recovery rate. The reciprocal of the recovery rate is the LGD. For example, if the balance at default were $100, and $80 were recov-
ered over time, representing $75 on a present-value basis, then the loss given default would be 25%. How much the economic recovery rate differs from the cash recovery rate is driven by both the amount of time it took to collect on the defaulted loan and the discount rate applied.

Understanding the length of time to recover is important to understanding the significance of the discount rate. For products where recoveries are collected relatively quickly, such as credit cards, differences in discount rates will have little impact on the resulting LGD. Where collection efforts may be protracted, such as large corporate bankruptcies, the discount rate can have a significant impact on the calculated loss given default.

**Selecting a Discount Rate**

Selecting a discount rate should be driven by the question one is looking to answer. As shown in Exhibit 1, this article outlines two common discounting approaches and the answers that they appear to offer.

While these two options are perhaps the most common approaches to calculating LGD, a number of other approaches are used as well. In some cases, institutions do not take the net present value of cash flows at all, but instead rely on net principal charge-offs as a rough proxy for LGD. In other cases, conceptually similar approaches to the current comparable market rate are employed. For example, an institution’s cost of funds is used as the discount rate in all LGD calculations.

**Borrower Interest Rate at Default**

This is the approach described in FAS No. 114, the accounting standard that governs accounting for impaired loans. Under this approach, the discount rate is based on the borrower’s interest rate at the time of default. For fixed-rate loans, neither changes in interest rates nor changes in credit pricing since loan origination affect the calculated net present value of the recoveries. In other words, this approach to LGD effectively ignores the pricing decision made at the time of loan origination and subsequent changes in interest rates.

This approach answers how well an institution does in collecting on the original contractual loan terms given a default event, but not its recovery rate when taking into consideration its opportunity cost of funds. Under this approach, recovering on a 7% loan when the institution could currently lend to a comparable borrower at 10% will have no impact on the measurement of economic loss on the 7% loan.

**Current Comparable Market Rates**

This approach looks to market rates at the time of loan default to set the appropriate discount rate. Unlike the prior approach, this approach considers the opportunity cost of funds at the time of default when measuring loss given default. This is the approach outlined in the draft Basel II supervisory guidance for U.S. banks. According to the U.S. draft interagency supervisory guidance for corporate credit published in August 2003:

*A bank must establish a discount rate that reflects the time value of money and the opportunity cost of funds to apply to recoveries and costs. The discount rate must be no less than the contract interest rate on new originations of a type similar to the transaction in question, for the lowest-quality grade in which a bank originates such transactions. Where possible, the rate should reflect the fixed rate on newly originated exposures with term corresponding to the average resolution period of defaulting assets.*

A bank must establish a discount rate that reflects the time value of money and the opportunity cost of funds to apply to recoveries and costs. The discount rate must be no less than the contract interest rate on new originations of a type similar to the transaction in question, for the lowest-quality grade in which a bank originates such transactions. Where possible, the rate should reflect the fixed rate on newly originated exposures with term corresponding to the average resolution period of defaulting assets.

This discounting approach attempts to answer how well an institution does in collecting on defaulted loans in the context of the opportunity cost of funds. This means that the same cash

---

**Exhibit 1**

<table>
<thead>
<tr>
<th>Alternative Discounting Approaches</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Discount Rate</strong></td>
</tr>
<tr>
<td>Borrower interest rate at default</td>
</tr>
<tr>
<td>Current comparable market rates</td>
</tr>
</tbody>
</table>
flow stream will likely be valued differently over time depending on comparable interest rates at the time of default. Take, for example, three scenarios where the lender fully recovered contractual principal and interest (and—for simplicity—assume no direct or indirect costs).

• In the first scenario, interest rates are unchanged at the time of default; therefore, the LGD is 0%.

• In the second scenario, comparable rates have jumped significantly. Now the lender must recognize a loss that reflects the difference between the contractual rate and the comparable rate at the time of default.

• In the third scenario, rates have dropped significantly. In this case, the lender will recognize a negative LGD, because the borrower paid at an interest rate above what the institution would have received if it had made a new comparable loan at the time of default.

This approach means that LGDs will be driven both by 1) how successful institutions are in collecting on contractual cash flows and 2) the interest rate environment at the time of default.

Interpreting LGDs Calculated with Different Discount Rates

Exhibit 2 shows an example loan to highlight the differences in the discounting approaches. In this example, after briefly being placed on nonaccrual (the triggering default event), the borrower makes timely payment over the remaining three years of the balloon loan on scheduled principal and interest. This example assumes a fixed interest rate of 7.00%.

Since the borrower continues to make full and timely payments throughout the remaining life of the loan, one would expect the recovery rate to be 100% and the LGD to be zero. This is indeed the case when the loan interest rate is used as a discount rate. The borrower pays interest and principal at 7%, and the cash flows are discounted at 7%. The net is zero—no loss, no gain.

But suppose the lender discounts the collections using the current rate on comparable loans? If the current comparable rate remains unchanged, the results are the same as those obtained using the loan interest rate. However, if interest rates rise, the lender will show a positive LGD (a loss of 7%) even as the borrower maintains a perfect post-default payment record. If interest rates fall, the borrower will show a negative LGD (a gain of 8%), even though the borrower only repaid what was owed. These changes in the LGD provide an accurate representation of the opportunity cost resulting from tying up capital at a fixed 7% rate of return as alternative investment opportunities changed.

Picking the Right Rate

While the above example has been exaggerated for effect, clearly differences in discounting methodologies can have a significant impact on calculated LGDs. Which approach is correct? That depends on what we are looking to measure. By discounting at the contractual interest rate, we obtain a consistent measure of an institution’s ability to recover on contractual cash flows over time. LGDs are not dependent on the interest rate environment in which the default occurred. Loan-pricing decisions made at the time of loan origination (i.e., originating a loan at a given fixed interest rate) do not flow through to the measurement of loss given default. In this case, economic loss is defined by the economics established at the point of loan origination, not those existing at the time of loan default.

If instead we are looking to measure the opportunity cost of recovering on default loans, the comparable interest rate at the time of default is the appropriate...
discount rate. This approach effectively moves loans that are held at book value up until default to a mark-to-market approach. The economic loss associated with fixed-rate loans that are currently below market rates will result in a higher LGD, capturing the economic loss due to a change in market rates.

While this approach effectively captures the opportunity cost associated with each defaulted loan, it does create challenges in interpreting historical LGDs to support future LGD estimates. An institution’s historical LGDs would reflect that institution’s ability to collect on contractual terms as well as the opportunity cost resulting from interest rate changes over the life of a loan (particularly for fixed-rate loans). To forecast future LGDs, it’s necessary to understand the potential for losses resulting from actual collections and expenses as well as the potential opportunity cost resulting from the differences between contractual interest rates on outstanding loans and the rates that could be charged on comparable new loans. □

Contact Davis by e-mail at peter.davis@ey.com.

Remember Your Membership

Membership renewal notices were sent out at the beginning of June. Did you receive yours? Have you responded?

Keep the benefits of RMA membership at your fingertips. If you haven’t already done so, please renew now. If you did not receive your notice or if you would like more information on the benefits of membership, contact:

RMA Membership Services
215-446-4150
1-800-677-7621