Thought experiment #1.

What if every loan was a funded term loan and was guaranteed by the US government such that upon a default you were obliged to put the loan to the government who would pay a fixed percentage of the amount outstanding.

Under these conditions, there is no LGD uncertainty as to the timing or the amount of the recovery so the economic value of defaulted assets would always be 100% minus the LGD that was contractually agreed with the government. This is as simple as it gets.

Thought experiment #2.

Imagine that every loan was guaranteed by the US government and, as in TE#1, the government promised to pay a fixed % of the loan in a single payment but, in this case, the timing of the payment is determined according to some random process. So after one default, you might recover the promised amount the day after default, but on the next one you might have to wait 6 months or a year, or 2 years before receiving the government's payment.

You could estimate the *ex ante* expected value of a defaulted asset by conducting an analysis of the *ex post* economic values realized in previous defaults. In this case, the *ex post* analysis would need to discount the payments received back to the day of default. Since there is no uncertainty as to **whether** the government was going to pay you, only uncertainty as to **when**, then it follows that you could discount the cash-flows at a "risk free" rate which only reflects the time value of money (presumably the rate at which one could have invested in US securities over the same time-frame).

You would find that the economic value of almost every defaulted assets was less than in TE#1, but the magnitude of the difference would depend on the manifestation of the random process for each asset.

Thought experiment #3.

Every loan is guaranteed by the government who will make a single payment to you after the default. In this case, both the timing and the amount of the payment are governed by random processes. So after a default, you don't know how much you will receive, or when; a reasonably realistic scenario.

Once again, you could estimate the *ex ante* expected value of a defaulted asset by looking at the *ex post* recoveries from previous defaults. And again, you would have to choose an appropriate discount rate. The question is: would you increase the discount rate applied to payments that were received because both the timing and amount were uncertain. No. The economic value of each dollar received from the government is the same, regardless of whether it is the only dollar received, or whether it is part of a larger payment, so there is no reason to adjust the discount rate due to the size of the payment, nor, as we saw in TE#2, is there reason to adjust due to differences in timing.

So, once again, the *ex post* analysis would discount all payments back to the date of default at the risk-free rate. Of course the estimated value of defaulted assets in TE#3 would be lower than in TE#2, because (on average) you would receive smaller payments, and the variance of estimated economic values would be greater because there are two random processes affecting the outcome, rather than one. However, the appropriate discount rate is the risk-free rate corresponding to the period over which discounting is being calculated.

Portfolio modeling considerations.

In all three scenarios, the best estimate of the potential recovery on a defaulted asset is the expected economic value derived from an *ex post* analysis of previous defaults. In Portfolio Manager, the average recovery could be used to set the mean of the LGD distribution. The difference between the three scenarios is that there is a higher variance in actual recoveries around the mean in TE#3 compared to TE#2, which in turn has more variance that TE#1. So the LGD distribution in PM should be parameterized accordingly.

Investment considerations.

Now, if you were to try to sell the defaulted assets on the day of default, would you expect to receive the expected value from an investor. In the special case of TE#1, the answer is yes because there is no uncertainty as to the timing or amount of payments which will be paid by the government. However, in TE#2 and #3, a rational investor would seek an additional premium to compensate for the risk that the actual realized value on the asset might be less than the expected value because this particular asset is one that experiences a long delay before payment is received or because the payment is reduced.

In other words, an investor would adjust the discount rate applied to the expected payments to include a premium for uncertainty. As portfolio managers we would adjust the LGD distribution to model that uncertainty. However it would be inappropriate to do both.

Conclusion, the rate of return required by investors to hold distressed assets includes a premium for the uncertain economic value of the asset, and as such is not an appropriate discount rate to determine the expected value of defaulted assets.

Practical considerations.

The foregoing analysis assumes that we are able to properly parameterize the LGD distribution in Portfolio Manager to account for the uncertainty of recovery. I don't think this is a valid assumption. The industry doesn't understand the drivers of recovery nearly well enough to be confident that the LGD distribution used in Portfolio Manager is accurate. Using a lower level of expected recovery is one way of compensating for the lack of understanding of the shape of the LGD distribution.

Also, since Portfolio Manager does not contain an explicit link between systematic factors and recovery levels, it is necessary to feed recovery factors into Portfolio Manager which result in lower recovery levels than observed average recoveries. One way to accomplish this is to use a higher discount rate when estimating historical recovery experience.

So for these two reasons, I continue to support the use of a discount rate considerably higher than the risk-free rate for LGD analysis.

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