Future Margin Income and the EL Charge for Credit Cards in Basel II

The RMA Capital Working Group, continuing its dialogue with U.S. and international regulators concerning Basel II, focuses here on the pricing structure of credit products with high expected loss rates. This article explores the role of stressed future margin income in covering the full range of expected loss.

Most Basel II observers have become well acquainted with the terms "expected losses" (EL) and "unexpected losses" (UL), because the final international rule issued in 2004 contains a capital charge for each. U.S. regulators are expected to retain this EL charge when they finalize their own Basel II rules sometime in 2007.

The EL portion of the capital charge is levied by reducing the amount of the allowance for loan and lease losses (ALLL) that can qualify as Tier 2 capital. Specifically, only the excess of ALLL over EL will count as capital under Basel II, whereas currently *all* of the ALLL (up to 1.25% of risk-weighted assets) qualifies. The EL charge can be especially onerous for any product, such as credit cards, that has high expected losses. For cards, EL generally exceeds the ALLL, so that, under Basel II, none of the ALLL counts as Tier 2 capital. In addition, the excess of EL over ALLL is used to *reduce further* the bank's Tier 1 and Tier 2 capital.[1] The EL charge is the main reason why, in the QIS4 exercise, the Basel II capital charge for credit cards was significantly *higher* than under the old Accord.

Risk practitioners have long argued that a regulatory capital charge for credit risk EL is inappropriate. Specifically, while regulators view the ALLL as serving the purpose of "covering" EL, practitioners disagree and say that loan *yields* must at least cover EL so that all of the ALLL is available to serve a capital purpose. Specifically, practitioners say that yields must be at least enough to cover interest expenses, all net noninterest expenses, all expected credit losses, *and* a market return to economic capital. If this is not the case, the bank has priced the loan too low and the loan is not generating any added value to the bank's shareholders.

In this continuing debate over the EL charge, regulators have said that margins on loans may not be enough to cover EL *during a tail event*, when many loans will be defaulted and not paying any yields. U.S. regulators made this concern explicit by suggesting, in 2003, that future margin income (FMI) on credit cards could be allowed to offset 75% of the EL capital charge *if* the bank could show that expected FMI was not only higher than EL but also high enough to cover two standard deviations of historical loss experience.[2] This "prove it to me" attitude of the U.S. regulators was welcomed by some of the U.S. banks that held card receivables, but, unfortunately, in the end the international Basel committee did not agree to the U.S. suggestion.

The FMI proposal. The U.S. proposal was, in a sense, too conservative and not on-point with regard to the ability of margin

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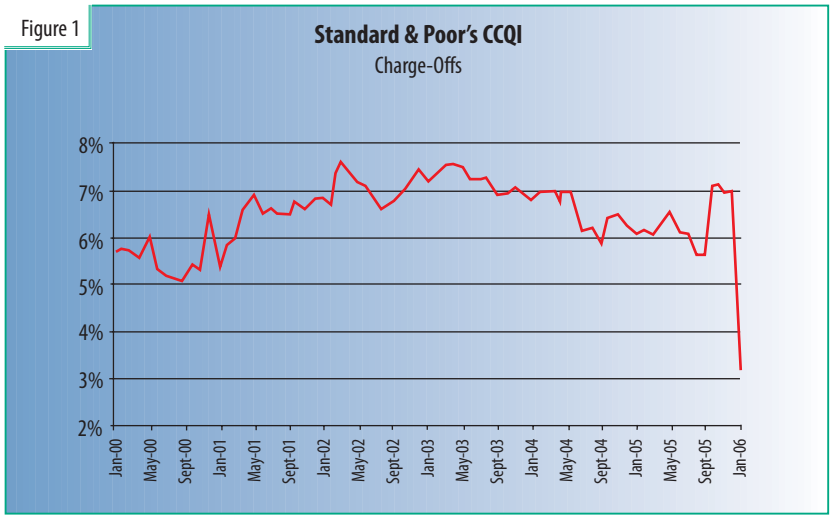
Figure 1



income *during a tail event* to shelter unconditional expected losses (while capital covered the very high realized *unexpected* losses during the tail event). Rather, the proposal asked the banker to have *expected* margins on existing balances cover about 98% of the loss distribution—that is, margins were being asked to do almost all of the job capital was intended to do.[3] Even so, under the pricing policies of modern credit card operations, margins are likely to achieve this goal. Indeed, during the recent economic cycle, while charge-offs have varied widely (with unemployment), net margins have been more than sufficient to cover these varying credit losses at all points in the cycle. See Figures 1 and 2, from Standard and Poors' Credit Card Quality Index update.[4]

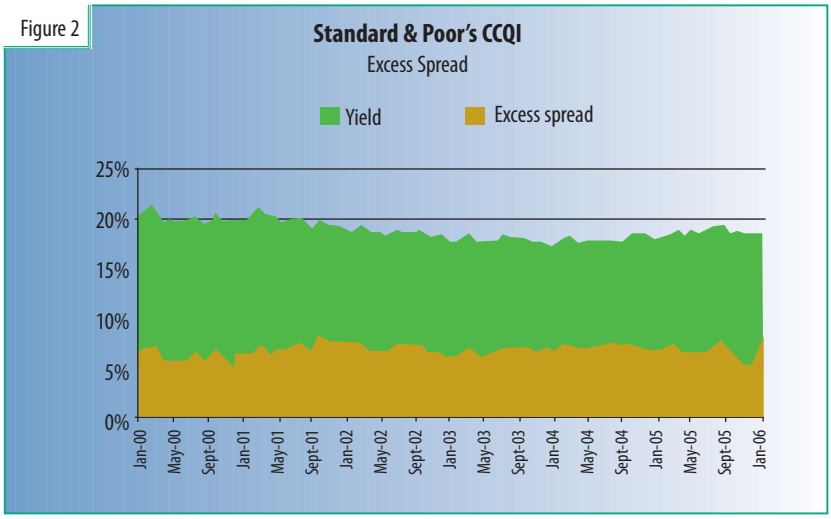
"Yield" in Figure 2 refers to all interest and noninterest revenue. "Excess spread" refers to the yields on the receivables minus the base interest costs of funds minus the 2% servicing fee charged by the originator-servicing bank, minus realized charge-offs. Figure 2 shows that excess spread (from the viewpoint of the special-purpose securitization vehicle) fluctuated from about 5% in January 2000 to about 8.7% in January 2006. The bank originator-servicer, on an all-managed-receivable basis, can calculate FMI (as defined by the U.S. proposal) as the S&P excess spread measurement, *plus* charge-offs, *plus* the 2% servicing fee, *minus* the bank's actual noninterest expenses as a percentage of managed assets. This latter, noninterest expense number is estimated by looking at expenses of specialty banking companies that are "mono-line" card companies—or card bank subsidiaries of major, diversified bank holding companies—to calculate a noninterest expense ratio for card operations only. A six-bank weighted average of these noninterest expenses to managed receivables was 5.32% in 2004.[5] Thus, for December 2005, the S&P release shows that FMI is approximately:

(1) FMI = Excess spread (5.1%), plus charge-offs (7.0%) plus 2% servicing fee, minus originator-servicer noninterest expenses (5.32%) = 8.78%

During other months in the S&P data, FMI ranges from about 8.58% to 9.88% as a percentage of balances.[6] Charge-offs during the period covered by the graphs ranged from a high of about 7.6% to a low of 3.2% (see Figure 1). In other words, expected FMI (8.58% to 9.88%) not only covers the mean plus two standard deviations of loss rates, but also covers *all* the realized loss possibilities (3.2% to 7.6%) during the six-year cycle shown in the figures.

What about the volatility of loss rates over a much longer run? Data from the Call Report for the top 100 commercial banks shows that, from 1Q1985 through 4Q2004, the mean charge-off ratio for credit cards was 4.26% and the standard deviation was 0.92%.[7] This means that the mean-plus-

Figure 2



two standard-deviation loss rate was 6.1%, which is well below the expected FMI calculated above (8.58% to 9.88%). Indeed, as shown for the past six years, expected FMI covered essentially all of the loss distribution, not just mean-plus-2 standard deviations.

Was the 2003 proposal the proper way to treat FMI? No. First, in some ways, it was too lenient in that it never really addressed the issue of how margins on non-defaulted accounts would react during an actual tail event. Second, if a bank met the test, only 75% of the EL charge would be eliminated; further, there was a major cliff effect (either 75% of the EL charge would be eliminated or nothing would be eliminated). The RMA Capital Working Group proposes a much different test—one suggested by the regulators themselves (in private discussions with risk practitioners during the formulation of Basel II in the U.S.). The question is whether interest margins net of noninterest expenses on good accounts are sufficient to cover EL, not on an expected basis but *in the actual tail event* generated by the Basel II credit risk model applied at the Basel confidence interval of 99.9%. The test consists of supposing that a tail event occurs and then calculating net spreads on *non-defaulted accounts*. If these spreads can cover EL, and if capital can cover UL, in the actual tail event, regulators should eliminate *all* of the EL charge or should impose a partial EL charge to the extent that such margins, again in the tail event, cover somewhat less than all of EL.

To show how the FMI calculation would work, let's begin with the average weighted PD for cards shown in the recently released banking agencies' summary of the QIS4 exercise (PD = 3.02%).[8] We plug this PD and an LGD of 100% into the QRE credit risk model of Basel II to arrive at the percentage of accounts that would default in a tail event (%DEF). This realized bad-tail default frequency is 9.93%.[9] The questions are as follows:

1. What are the FMI yields on the accounts that *didn't* default in the tail event?
2. Is this FMI sufficient to cover the EL expressed as a % of balances?

To answer these questions, we can use the estimated FMI (flowing from the underlying managed receivables) from the S&P data for, say, December 2005, which was calculated above as 8.78% (as a percent of balances). This is a conservative FMI rate, compared with, say, the 9.88% number in January 2004. If we assume that accounts default evenly throughout the year of the tail event, margin income is earned on the non-defaulted accounts for the full year plus, on average, for half of the year for the accounts that default. Remember, the EAD calculation for Basel II capital takes into account the fact that unpaid interest at the time of default is treated as an addition to the balance at default. Thus, we cannot "double-count" the effect of this unpaid interest by, on the one hand, failing to count it as margin income up until the time of default, while at the same time grossing up balances by EAD (the ratio of exposure-at-default to current balance) when calculating unexpected losses (the regulatory capital requirement). The absolute amount of FMI during the tail event is calculated as follows:

(2) $FMI during the tail event= 8.78%*(1-%DEF)*BAL +0.5*%DEF*BAL) =
8.78*(90.08 + 0.5*9.92)*BAL =
8.34%*BAL

That is, FMI is 8.34% of balances.

Next, let's compare this FMI *during a tail event* with unconditional EL (again, as a percent of balances). For example, we can use the S&P charge-off rate as a percent of average balances during the last three months of 2005 (5.7%) as our EL. This number is observed roughly at the trough of the six-year cycle and, therefore, is somewhat higher than true Basel II EL for purposes of the ALLL-EL test (which is through-the-cycle PD times through-the-cycle EL times EAD as a percent of balances).[10] Using the 5.7% EL, we obtain the following:

(3) FMI/EL = 8.34%/5.70% = 1.46

FMI more than covers EL, even in the midst of the tail event. These calculations partially take into consideration the ability of the credit card bank to react to the tail event by 1) increasing interest margins on accounts, and 2) receiving additional noninterest income in the form of increased late fees for the accounts that do not default (late fees for the defaulted accounts are included as a balance-at-default when computing the EAD multiplier). These tail-event cushions are reflected within the S&P data, which measure actual cash flows to the receivables in the special-purpose vehicle.

A similar analysis using internal, proprietary data bucketed by PD ranges gives very similar results—FMI within a particular bucket during a downturn generally will cover the EL portion of total losses during that downturn. This provides very strong support for the practitioner's view that, for this retail product, the ALLL is not needed to cover EL and that

UL and EL

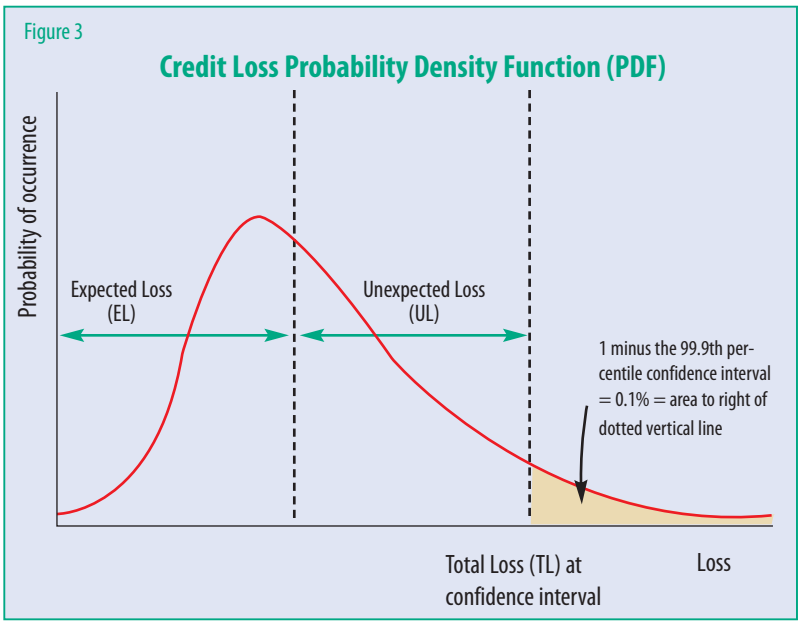
The terms "UL" and "EL" are well understood by risk practitioners, but senior management sometimes uses the terms inappropriately. For the credit portfolio (and operational loss events), UL and EL are part of the bank's estimate of a "distribution" of possible future loss rates over the next one- year horizon. Practitioners call this "distribution" a *probability density function,* or PDF. [Note: a *cumulative distribution function,* or CDF, is related to the PDF.] Each point on the "thick-tailed" PDF, measured from of the vertical axis, represents the probability that a particular loss (measured from the horizontal axis) will occur over the next year. The "thick-tailed" feature of a credit loss distribution means that the probability of an *extremely* large loss occurring, while low, is not that much lower than the probability of a very large loss occurring.

The distribution itself can be estimated from historical data, but it represents only what *might* happen, not what has actually happened or usually happens. Expected loss, or EL, is the point on the distribution's horizontal axis representing the simple mean of the distribution—the average of each loss outcome weighted by the outcome's probability of occurrence. (See the left-hand vertical dotted line in Figure 3.) EL could indeed be the same as the historical average loss rate, but only if the credit portfolio is unchanged from its historical average composition and only if today's macroeconomic conditions (and the conditions of other variables that influence portfolio loss rates) are the same as historical average conditions. That is, the loss distribution's shape, and therefore EL and UL, change daily, monthly, and quarterly, along with the composition of the bank's portfolio.

Unexpected loss, or UL, is the *total loss* (on the horizontal axis)— the loss that occurs at the chosen confidence interval — *minus* EL. By "chosen confidence interval", we mean the 99.9th percentile used by Basel II. On the graph, the right-hand vertical dotted line is *not* this 99.9th percentile, as some have mistakenly stated. Rather, where the right-hand dotted vertical line crosses the horizontal axis is the total loss (TL) that occurs with only 0.1% probability—and the *area* under the distribution to the right of TL is, in fact, 0.1%. The area under a PDF always totals exactly 1 (i.e., 100%). Therefore, if regulators were to lower the chosen confidence interval to, say, 99% instead of 99.9%, then the *area* to the right of the right-hand dotted line would have to increase from 0.1% to 1.0%, which means the right-hand dotted vertical line would have to move to the left. The TL at the new lower confidence interval would be less—but since EL would remain the same (the mean of the distribution), UL (which is TL minus EL) would have to decline. The new *Notice of Proposed Rulemaking* changes the UL calculation from the original ANPR by subtracting an EL from the Total Loss at the confidence interval that is somewhat less than the actual mean loss rate of the PDF. This mean loss rate would be PD times LGD, where the LGD is the "downturn" LGD that banks must estimate and plug into the Basel II risk model and PD is the probability of default. Rather, the U.S. regulators require that banks subtract an EL that is equal to PD times ELGD (the through-the-cycle LGD that is always less than the downturn LGD). As a result of subtracting from the total loss an EL that is lower than the true, model-based EL, the NPR results in a higher UL (regulatory capital requirement) than otherwise.

Finally, while some refer to UL as VaR, this is not literally true. Value at Risk (VaR) refers to a measurement from a distribution that shows the probability of any particular change occurring in the market value of a portfolio (usually a portfolio of marked-to-market trading positions). Since market value of a portfolio can change positively as well as negatively, a VaR distribution (density function) exists on both sides of the vertical axis, showing the probability of any particular change in value occurring. VaR is often defined as the difference between the *negative change* in market value that occurs at the chosen confidence interval and the *expected change* in portfolio value. In this sense, VaR is analogous to the UL in a credit loss distribution. However, in some applications, the practitioner may refer to VaR as simply the negative amount of value change on the left-hand side of the density function at the chosen confidence interval (still other definitions of VaR have been used in practice). Some best-practice banks measure economic capital for credit risk by estimating VaR-type portfolio-value-change distributions for the credit portfolio, but Basel II uses the "loss rate" approach discussed here.

Figure 3



tangible equity *plus all of the ALLL* serves as real equity to absorb unexpected losses.

Even if PDs are higher than the 3.02% shown in the QIS4 survey, FMI will cover EL. Indeed, even if we do not increase interest margins (to compensate for any increase in unconditional default probability), FMI is still likely to cover EL. For example, increasing PD to 4%, while leaving every other variable the same, results in the calculation shown in equation (3) being FMI/EL = 1.09.

Finally, note that the calculation of defaulted accounts in the tail event has been made using

the Basel II credit risk model with an asset value correlation (AVC) of 4%. Risk practitioners in the credit card field have generally estimated AVCs to be in the 2-3% range. At these latter AVCs, FMI in the tail event will more easily cover EL or, put another way, even smaller margins can generate sufficient returns on non-defaulted assets to allow pricing to cover EL rather than have the ALLL cover EL.

The RMA Capital Working Group is hopeful that, as the Basel II process matures, the Basel Committee will focus more narrowly on the underlying pricing structure of high-EL credit products. If banks do their job right and price these loans to cover all interest and noninterest expenses, plus expected credit losses, plus a return to economic capital, FMI will indeed cover all of EL (and, for many products, even during a bad tail event). ❐

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NOTES

1 The ALLL is less than EL for cards for two main reasons: 1) the ALLL generally does not include the expected losses associated with undrawn lines; and 2) the accounting treatment of the ALLL typically is associated with a shorter time horizon than the one-year horizon of Basel's EL.

2 See U.S. ANPR, August 2003.

3 For example, with a normal distribution, realized losses are above mean plus two standard deviations only 2.275% of the time, implying that FMI covers losses at the 97.725% confidence interval.

4 See "U.S. Credit Card Quality Index: Charge-offs Take a Nose Dive; Overall Performance Is Robust," Standard and Poor's, March 10, 2006, at www.standardandpoors.com.

5 There were six such specialty companies as of 12/31/04 for which the bank or BHC provides 1) card receivables on its balance sheet; 2) off-balance-sheet receivables managed by the bank; and 3) noninterest expenses. They were CapOne, MBNA, Providian, Citibank South Dakota, BofA USA, and BB&T Bankcard Corp. Still other companies might fit our definition of a specialty company or bank, but in other cases (e.g., Wells Fargo, JPMChase) the company providing card services does so within a diversified operation and does not break out noninterest expenses and/or managed receivables in the manner needed.

6 This range is based on the data in Table 1 of the previously referenced S&P paper, while using an assumed 5.32% noninterest expense number taken from the six-bank sample during 2004.

7 Data is from the Federal Reserve Board, charge-off ratios for the top 100 commercial banks, at www.federalreserve.gov/releases/chargeoff/. The coefficient of variation for this data (22%) is about one-half the CV one derives from using the actual Basel II credit risk model for credit cards, suggesting that the 4% asset value correlation Basel has dictated for cards is quite high.

8 See "Summary Findings of the Fourth Quantitative Impact Study," OCC, FRB, FDIC, OTS, February 24, 2006.

9 See page 70 of the June 2004 final Basel Committee Standard for Qualifying Revolving Retail Exposures: Correlation (R) = 0.04; Capital requirement (K) = LGD × N[(1 - R)^-0.5 × G(PD) + (R / (1 - R))^0.5 × G(0.999)]- PD x LGD.

10 Note that we can use this S&P charge-off rate to imply an EAD (which was not published in the agencies' QIS4 summary). That is, charge-offs, as a percent of balances (not exposures), are equal to PD*LGD*EAD, where PD is the unconditional expected default rate (percentage of accounts that default), LGD is the loss rate given the balance at default, and EAD is the dollar amount at default as a percentage of balances now. EAD is a number greater than 1 to the extent that an obligor defaulting sometime over the next year will almost certainly draw down some more of the unused line prior to default, partly through unpaid interest as well as principal. Good obligors, meanwhile, likely will continue to have outstanding balances at roughly the same level. Using the 91.7% LGD given in the agencies' QIS4 summary, we find that:

EAD = 5.7%/(PD*LGD) = 5.7/(3.02*0.917) = 2.06.

The 5.7% expected charge-off rate (as a percentage of balances, not exposures) and the resulting EAD of 2.06 (as a percentage of balances) are consistent with, but somewhat more conservative than, over-the-recent-cycle internal (proprietary) data.