Managing Credit Portfolios by Maximizing Risk-Adjusted Return

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This is the first of a series of five excerpts from a forthcoming book Managing Credit Risk: Toward a Portfolio Approach to Credit Risk Management by Charles Smithson and Gregory Hayt of Rutter Associates. Future articles will appear in the March, May, July/August, and October 2001 issues.

The lending function is undergoing critical review at all financial institutions, and many institutions are in the process of changing the way in which the credit portfolio is managed. Visible evidence of the change is found in the rapid growth in secondary loan trading, credit derivatives, and loan securitization. (These loan portfolio management “tools” will be discussed in the excerpt that will appear in the May 2001 issue.)

Less obvious—but far more important—is the fact that banks are abandoning the traditional transaction-by-transaction “originate-and-hold” approach, in favor of the “efficient portfolio” approach of an investor.

Forces Leading to the Changes
Market realities are the primary reason for the changes. Banks have experienced declining margins on loans, due to disintermediation caused both by non-bank competitors and by changes in the structure of the markets. Figure 1 tracks the spreads to Libor for A-rated and BBB-rated U.S. borrowers. Notwithstanding the uptick in spreads in 1998 and 1999, the trend in spreads has been steadily downwards.

Consequently, banks have found it to be increasingly difficult to earn an economic return on, for example, high-grade corporate loans.

Bank supervisors have also been pressuring banks for changes in their loan portfolio management practices. The 1988 Capital Accord represented the first step toward risk-based capital adequacy requirements; however, the “blunt instrument” nature of the 1988 Accord gave banks an incentive to engage in “regulatory arbitrage,” that is, using credit derivatives and loan securitization to decrease the percentage of the credit extended to high-credit-quality obligors (which attract too much regulatory capital). In response, the Basel Committee on Banking Supervision (comprised of national supervisors from the U.S. and 11 other countries), opened a discussion about revising the Accord. Regardless of whether the Basel Committee...
proposes a new set of rules wherein regulatory capital is determined by the credit rating of the obligors or permits regulatory capital to be determined by the bank’s “credit portfolio model,” the impact will be more focus on credit portfolio management by the banks.

**Banks as “Investors” in Loans**

As Figure 2 illustrates, investors are increasingly displacing banks as the final holders of loans. These new investors—insurance companies, hedge funds, and mutual funds—look at bank loans as an asset class. Consequently, banks must manage their lending activity as objective investors and adopt a risk-adjusted return approach to the loan portfolio (and the loan “business”).

Moreover, the bank must be able to perform a rigorous analysis of the economics of originating, trading, and investing in loans. As investors in loans, banks must earn a sufficiently high economic return on the capital that supports the loan portfolio; if not, the bank should shift the capital to some other business.

In addition to managing quantitative aspects, banks also face major organizational challenges in moving to this more active approach. For example, the active approach will effect the traditional relationship between banks and their corporate borrowers.

**Applying Successful Equity Portfolio Techniques to Loan Portfolios**

The new market realities mean that the “credit function” must transform into a “loan portfolio management function.” Behaving like an asset manager, the bank must maximize the risk-adjusted return to the loan portfolio by actively buying and selling credit exposures where possible, and otherwise managing new business and renewals of existing facilities. This leads immediately to the realization that the princi-
ples of Modern Portfolio Theory (MPT)—which have proved so successful in the management of equity portfolios—must be applied to credit portfolios.

Modern Portfolio Theory

The central message of MPT is that, by recognizing the effects of correlation, the investor can increase the expected return for the portfolio, without increasing the riskiness of the portfolio.

To explain this, suppose that two assets are available to the investor. As is illustrated in Figure 3, Asset A has a lower expected return than Asset B; but Asset A also is less risky that Asset B. (Risk is measured by the standard deviation of the returns. An asset whose return distribution is wider—more likelihood of very high or very low returns—is more risky.)

Now suppose that the investor combines the two assets into a portfolio. The expected return for the portfolio is simple: The expected return for the portfolio is the weighted average of the expected returns of Asset A and Asset B. The riskiness of the portfolio is, however, more complex: The riskiness of the portfolio depends on the riskiness of Asset A and the riskiness of Asset B; but, it also depends on the correlation of the returns for Assets A and B, that is, the degree to which Assets A and B move in unison or oppositely. The dotted line in Figure 3 illustrates one extreme: If Assets A and B were perfectly positively correlated—if they moved in lockstep—there is no advantage to combining the assets into a portfolio, because the risk of the portfolio is simply the weighted risk of the two assets. The dashed line in Figure 3 illustrates the other extreme: If Assets A and B were perfectly negatively correlated—if the movement of one counteracted the movement of the other—there is a portfolio (a combination of Assets A and B) that would have no risk but would have an expected return that is higher than the risk-free return. Either of these extremes is unlikely. The normal relation between assets is that they are less than perfectly positively correlated. Such a situation is illustrated by the solid line in Figure 3: By combining the assets in the portfolio, the investor ends up with a risk that is lower than the weighted average of the risks of the two assets.

The implication of this is dramatic—by applying the tenants of MPT, an investor can increase expected return, without increasing risk. Not surprisingly, MPT-based investing has come to dominate equity investment over the past 40 years.

The Challenges in Applying MPT to Loan Portfolios

Applying MPT to portfolios of credit assets is not as simple as it might first seem. Despite its intuitive appeal, MPT is built on the critical assumption that the security returns are jointly normally distributed.

As it turns out, when they are examined empirically, equity returns do not precisely fit normal distributions. This is illustrated for IBM in Figure 4. However, equity returns are at least symmetric, so the techniques of MPT are generally employed without modifications. However, bank loan returns—particularly viewed on a hold-to-maturity basis—are neither normally distributed nor symmetric. Loans have strong option-like characteristics. As illustrated in Figure 4, the limited upside and potential 100% loss due to defaults results in highly skewed loss distribution. Consequently, we cannot directly apply the mean/variance-based techniques of MPT to portfolios of loans.
Implementation of a MPT-based approach to loan portfolio management is further complicated by data limitations. To put loan data into a portfolio system, it would be necessary to have data on default and credit migration probabilities and the percentage loss in the event of default—not to mention data on the volatilities and correlations between defaults or downgrades for individual obligors.

Moreover, loan portfolio management requires more than a mean/variance view of the world. For a loan portfolio the emphasis is on extreme outcomes—the “tail” event—to determine economic capital and credit rating. And, the loan portfolio manager must deal with complex business relationship with borrowers.

Finally, it appears that diversification “works differently” for loans. The available empirical evidence suggests some “good news” and some “bad news.” The bad news is that, in comparison to portfolios of equities, portfolios of credit assets would have to be larger to achieve the full effect of diversification. The good news is that the potential diversification effect is larger for credit portfolios than for equity portfolios.

Development of MPT-like Models for Credit Portfolios

To adapt the tenets of portfolio theory to loans, a variety of portfolio management models have come into existence. The next excerpt (which will appear in the May 2001 issue) will examine the state of the art in credit portfolio modeling, focusing on four of the most widely discussed models—KMV’s Portfolio Manager™, RiskMetrics Group’s CreditManager™, CSFB’s CreditRisk™, and McKinsey’s CreditPortfolioView™.

The Question Is Capital

In contrast to equity portfolio managers who focus on risk-adjusted return measures (for example, the Sharpe ratio), banks tend to focus on measures of risk-adjusted return to capital (RAROC measures). The problem is the determination of the amount of capital necessary to support a loan portfolio.

Since banks hold capital to provide a cushion against unexpected losses, the amount of capital a bank needs is a function of the riskiness of the bank’s portfolio. In the context of the distribution of credit losses illustrated in Figure 4, the bank’s reserves are determined by the expected loss for the portfolio. Unexpected loss is a measure of the volatility of actual losses around their expected value. For capital purposes, banks typically specify a multiple of unexpected loss such that the probability of losses exceeding capital is extremely remote, for example, 5 to 15 basis points. This point is identified as the “maximum” loss in Figure 4, where maximum is in quotes to emphasize that there is small probability of exceeding this amount.

References


Health insurers seek investment returns while managing not only the risks to their portfolios but also the constraints of insurance regulations, risk-based capital (RBC) considerations and liquidity needs. As the U.S. markets transition from a period of accommodative monetary policy to one of Fed tightening, now may be an ideal time for health insurers to assess whether their portfolios meet their risk and return objectives for the road ahead. Shifting part of the equity allocation toward a range of credit and alternatives strategies may enhance risk-adjusted returns. However, it is important to select the right strategies. Understand your portfolio so you can manage the risks.