



Risk Adjusted Returns on Bank Capital

Credit risk drives capital requirements, which ultimately affects loan pricing.

by Michael T. Newsome

Two things are clear in today's credit market. First, adequacy of bank capital continues to be a prominent issue as regulators continue to look over the shoulders of bankers to confirm their assessments of credit risk and the adequacy of their capital. Second, commercial and industrial (C&I) loans are the favored asset class among banks. Demand among banks for middle-market C&I loans far exceeds the appetite of quality borrowers for additional credit. This scramble to put money to work has resulted in a conflict between banks' long term return on capital goals and the short term realities of the marketplace. Understanding how banks determine the amount of capital to be allocated to each credit and the implications for pricing will help CFOs assess the state of the market and their own credit arrangements.

Banks employ sophisticated Economic Valued Added (EVA) models that take into account credit risk in an effort to determine the return on capital earned by a business unit, (e.g. commercial banking), a product line (e.g. asset based lending), or the bank's relationship with a specific customer (e.g. XYZ Corp.). This concept was first introduced by Bankers Trust (now, Deutsche Bank) in the mid-70's and is commonly known as Risk Adjusted Return on Capital or "RAROC."

The purpose of this effort is four fold:

- Judge how much capital is needed to buffer the risk of unexpected losses in the bank's various credit exposures;
- Help quantify decisions to embrace or shed risk;
- Provide guidance for charging a rational price for the risk the bank assumes; and
- Allocate capital from under-performing activities or customers toward those that earn better risk-adjusted returns.

For a borrower, understanding a bank's RAROC machinations can offer insight as to how credit is priced.

CREDIT RISK AND CAPITAL

Making loans requires a lender to take on risk for which it expects to earn an adequate return. Greater risk requires more capital to buffer against unexpected loss. So, it makes

RISK RATING	Definition / Key Characteristics	PD	LGD 10%
TIER 4	Above Average Credit Strength	0.22%	10.50%
TIER 5	Adequate / Acceptable Credit Risk	0.94%	21.12%
TIER 6	Borderline Credit Risk	2.91%	31.91%
TIER 7	Potential Weakness Resulting in Declining Payment Prospects	8.38%	50.79%

sense that capital requirements should be predicated on actual credit exposure. Under the current Basel II capital guidelines, many larger banks are qualified to calculate their own regulatory capital requirements using a rating-based approach to account for the credit risk in their portfolios.

In significant part, the process of credit approval or review boils down to assessments made on an amalgamation of factors: his-

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torical performance, capitalization, perception of management, industry trends, credit structure and term, quality of collateral, and strength of third-party support. The result is an assignment of a specific risk rating to individual loans or exposures. The above chart summarizes the risk rating categories (tiers 4 through 7) that apply to the vast majority of middle-market companies and loans. Tiers one through three are reserved for investment grade borrowers, while tiers eight through ten reflect troubled credit situations.

Past performance of similarly rated borrowers and loans, as well as the maturity and duration of the loan, provide the basis for determining the bank's Exposure at Default

(EAD). Two key factors are used in the calculation of risk-weighted capital.

1. Probability of default (PD) This is an estimate of average (measured over a long term) one-year default rates for assets within a given risk-rating category. PD estimates reflect the expected performance of borrowers derived from historical default data.

2. Loss Given Default (LGD) The LGD factor is based on a determination by the bank of the potential principal loss if the borrower defaults, after accounting for the benefits of collateral, guaranties, and hedges. The LGD factor in the chart on page 2 assumes a 10% loss. LGD factors will be proportionally higher as the estimate of potential loss increases. For example, a tier 5 LGD with an estimated 10% loss exposure is 21.1%. A loss estimate of 50% raises the LGD factor to 105.5%.

M, PD, and LGD drive the determination of the statistical probability and magnitude of expected and unexpected losses that may occur upon default. From that comes the determination of risk-adjusted capital under Basel II, which relies on a complex mathematical formula that we'll avoid dragging the reader through.

HOW DOES THIS WORK?

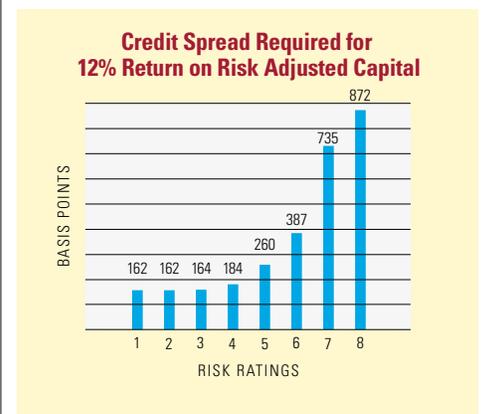
To illustrate how this works in a real situation, consider a typical middle-market borrower with a \$20 million multi-year revolving line of credit facility. The borrower is rated by the bank as a Tier 5 risk, with an expected loss of 20% on default. The tables on page 2 show a calculation of EAD, Risk Adjusted Capital, and the implied credit spread required to earn a 12% return on capital. Given regulatory required capital structures, a typical bank will expect to earn a return on capital of approxi-

CREDIT PARAMETERS		
FUNCTIONS	ASSUMPTIONS	EXPLANATION
1. Risk Rating	5	A very desirable credit profile for most banks
2. Effective Maturity (M)	2.5	Years
3. Probability of Default (PD)	0.94%	Based on parameters 1 and 2
4. Loss Given Default (LGD)	42.20%	Assumes 20% loss estimate (2 x 21.1%)
5. Exposure at Default (EAD)		
— On Balance Sheet Exposure	\$15,000	Outstanding loan balance
— Off Balance Sheet Exposure	2,500	Undrawn commitment (\$5,000 x 50% drawn at default)
Total EAD	\$17,500	

RISK ADJUSTED CAPITAL		
Basel II Unexpected Loss Factor (K)	6.772%	as % of EAD
Unexpected Loss Factor	1,185	
Expected Loss Factor (ELF)	0.397%	= PD x LGD
Expected Loss	69.42	= ELF x EAD
Risk Weighted Capital Factor	7.169%	= K + ELF
Total Risk Adjusted Capital	\$1,255	= Unexpected + Expected Losses

RETURN ON RISK ADJUSTED CAPITAL		
Target Return	12%	= NLE / RAC
Net Loan Earnings (NLE)	\$150	
+ Non Interest Expense	123	45% Efficiency Ratio
Net Margins	273	
+ Cost of Funds	165	Average 110 bps
Total Loan Revenue	438	
— Commitment Fee Revenue	(13)	25 bps
— Libor Index Revenue	(36)	1 Mo Libor (24 bps)
Credit Spread Revenue	\$389	
Credit Spread	260 bps	= 389 / 15,000

mately 12%. In this example, a spread over Libor of 260 basis points is required to generate the target return. The following graph illustrates that stronger or weaker risk rating dramatically impacts the amount of risk-adjusted capital allocated to a \$20 million loan and the pricing that justifies that capital.



Pricing in the credit markets is a function of competitive pressure, but when bankers perceive that pricing is inadequate to compensate their capital providers, internal forces will drive efforts to increase returns. The banking industry is in the midst of a transition period. In time, some combination of economic strengthening and industry restructuring will tip the balance back toward pricing that will earn the returns on bank capital that investors demand. Although timing is difficult to predict, this analysis shows that higher credit spreads and fees will be needed to generate adequate returns on bank capital. ❖



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ABOUT ZACHARY SCOTT

Zachary Scott is an investment banking and financial advisory firm founded in 1991 to serve the needs of privately held, middle-market companies. The firm offers a unique combination of in-depth knowledge of the capital markets and industry competitive dynamics, sophisticated analytical capabilities, and proven expertise in structuring and negotiating complex transactions. For more information on Zachary Scott, please go to ZacharyScott.com.

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