

Risk adjusted loan pricing in a commercial bank

**Challenges concerning the necessity of loan portfolio
management**

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- **RISK Adjusted Minimum Margin (RAMM) – Minimum margin model**
 - Margins have to earn expected and unexpected losses
 - Standard risk costs, Standard Equity Costs
 - Liquidity costs must be shifted to customer
 - Borrowers accept collaterals and covenants
 - Margin adjustments triggered by rating migration is possible
 - Non tradable loan is held to maturity

- **What kind of business model is behind this pricing model?**
 - Bank is ultimate investor of asset
 - Bank seeks long-term relationship with customer
 - Main account relationship and cross selling of bank products other than loans are important goals

Long-term customer relationship

- Insight knowledge of economic situation
- Internal rating "on site"
- Account relationship
- Customer buys other bank products
- Permanent contact
- Trend to help customer during crisis



CM is calculated with standard risk costs but without valuation result!

For all bank products, especially loans

Gross income

- Standard unit costs
- Standard risk costs (customer & country)
- Standard equity costs (customer & country)
- Standard liquidity costs

= Contribution margin 1 (single transaction)

- Distribution costs of branches, regions or divisions

= Contribution margin 2 or 3

- Overhead costs (allocated)

= Contribution margin 4

Contribution margin 4 = 0

+ Opportunity Costs (Market rate method)

+ Standard risk costs (Customer & Country)

+ Standard equity costs (Customer & Country)

+ Standard liquidity costs

= Price floor

+ Mark up for fixed costs

= Customer minimum margin

Minimum Margin has to cover



- insurance premiums to cover expected loss (**standard risk costs**)
- ROSC-margin on the equity consumption of the loan (**standard equity costs**)
- **Liquidity Costs** for supply of liquidity
- Product-/distribution/overhead-costs (costs allocated to products and customer group)

**When minimum margin is achieved....
contribution margin is zero**

ROSC – target = Risk free yield (gov. bonds) + Risk premium
(ROSC-margin)

ROSC = Return on Standard Capital

- Standard capital demanded by board management
- Return: CM4 + Standard equity costs + Interest on Standard Capital

Formula ROSC:

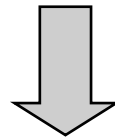
$$\frac{\text{CM4} + \text{Standard equity costs} + \text{Interest on Standard Capital}}{\text{Standard Capital}}$$

Target ROSC and minimum margin - example



Yields on equity consumption:

Risk free yield (gov. bonds).....	4%
ROSC - target.....	12%
Risk premium on equity (ROSC-margin).....	8%



Calculation standard equity costs:

Considering 7 % Standard capital of loan exposure for average rating and maturity

ROSC margin on equity consumption = $8\% * 7\% = 56\text{bp}$ of exposure

Is a ROSC of 12 % (ROSC margin = 8%) enough ?



Individual positive CM4s are required for different profit centres that have the potential of **achieving more than 8% ROSC-margin over all products or 12% ROSC** (if gov. bond yield is 4%):

- Corporate customers should achieve a **ROSC-margin of 14% to 18%**, dependent on business cycle and portfolio.
- The achievement of 18% ROE-margin with commercial corporate clients is possible even in matured markets ***focussing on the cross selling*** of service transactions (no equity consumption) together with the loan business.

Calibration of contribution margin levels



Target ROSC of 12% (ROSC margin = 8%) for loans means

a much **higher ROSC** demand for a customer profit centre

CM 4 = 0 → **target performance** achieved (ROSC-margin = 8%)

CM 4 > 0 → **overperformance** (ROSC-margin > 8%)

CM 4 < 0 → **underperformance** (ROSC-margin < 8%)

Flexible practise of RAMM calculation



If RAMM demands are too high → Instruments for the relationship officer doing business with the customer:

- Pledge of **collaterals, guarantees**
- Shortage of **maturity**
- **Cross selling** of almost all bank products to the customer allows a **ROSC- margin lower than the required 8% (e.g. 6%),** but the minimum target of 8% is upheld for the profitability of total customer relationship.

If all these instruments are not sufficient to reduce RAMM below the dumped market price:

- **do not book the loan**, or
- book the loan with negative contribution if bank wants to conquer market shares on expense of expected future profits

RAMM calculation example of a loan



Loan volume	1.000.000	Rating of customer	2,5
Value of coll.	0	Rating of guarantor	-
Net exposure	1.000.000	Volume guaranteed	0%
Maturity	5 years	st. risk costs guarantor	-
		st. equity costs guarantor	-

Risk adjusted minimum margin in % of

	Net exposure	Net exp. after guarantee	Loan volume
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Liquidity costs	0,80%	0,80%	0,80%
Standard risk costs	0,75%	0,75%	0,75%
Standard equity costs	0,56%	0,56%	0,56%
RAMM Price Floor			2,11%
Mark up for fixed costs			0,10%
Customer minimum margin (CM = 0)			2,21%

Capital usage	7,00% of net exposure	70.000
Risk free yield	4,00%	

Contribution margin loan	0
ROSC	12,00%

20% collaterals raise ROSC-margin by 39%



Loan volume	1.000.000	Rating of customer	2,5
Value of coll.	200.000	Rating of guarantor	-
Net exposure	800.000	Volume guaranteed	0%
Maturity	5 years	st. risk costs guarantor	-
		st. equity costs guarantor	-

	Risk adjusted minimum margin in % of		
	Net exposure	Net exp. after guarantee	Loan volume
Liquidity costs	0,80%	0,80%	0,80%
Standard risk costs	0,75%	0,75%	0,60%
Standard equity costs	0,56%	0,56%	0,45%
RAMM Price Floor			1,85%
Mark up for fixed costs			0,10%
Customer minimum margin (CM = 0)			1,95%
Surplus to original Customer minimum margin			0,26%
Customer margin			2,21%

Capital usage	7,00% of net exposure	56.000
Risk free yield	4,00%	

Contribution margin loan	2.620
ROSC	16,68%

20% guarantee raise ROSC-margin by 8%



Loan volume	1.000.000	Rating of customer	2,5
Value of coll.	0	Rating of guarantor	1,5
Net exposure	1.000.000	Volume guaranteed	20%
Maturity	5 years	st. risk costs guarantor	0,50%
		st. equity costs guarantor	0,48%

Risk adjusted minimum margin in % of

	Net exposure	Net exp. after guarantee	Loan volume
Liquidity costs	0,80%	0,80%	0,80%
Standard risk costs	0,75%	0,70%	0,70%
Standard equity costs	0,56%	0,54%	0,54%
RAMM Price Floor			2,04%
Mark up for fixed costs			0,10%
Customer minimum margin (CM = 0)			2,14%
Surplus to original Customer minimum margin			0,07%
Customer margin			2,21%

Capital usage	6,80% of net exposure	68.000
Risk free yield	4,00%	

Contribution margin loan	660
ROSC	12,97%

Good performance of “illiquid” loans held to maturity depends on.....



- the **right internal rating** (“know your customer“)
- the **risk adequate pricing** and the power to raise margins when customer’s rating is downgrading
- the pledge of **sufficient** collaterals and covenants
- the **successful realisation** of collaterals and restructuring of the loan in case of default (workout).

RZB's corporate customers:

- high cross selling quota (40% of gross income is generated by non-loan products)
- ROSC between 15% and more than 20%
- Good rating mix of corporate loan portfolio → risk adjusted margins prevent a bias towards high margin/low rated customers
- A B C distribution of customers improved significantly
- Relatively low loan loss experience with relationship customers