Creditreform Rating AG Rating Methodology

Bank Ratings

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Creditreform Rating

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This document (v1.4) is an updated version of a previous paper. Some wordings have been changed for greater clarity, and some details have been added, but the essential nature of the original study has been preserved. This version was completed in December 2016.

1 Introduction

Over the past 15 years, Creditreform Rating AG ("CRA“), established in 2000, has become one of Europe's leading rating agencies. In this document, CRA discloses its methodology of rating banks in order to provide the parties involved, investors and the wider public with the opportunity of developing a deeper understanding of the mechanisms behind its ratings. The rating methodology will be upgraded from time to time to reflect any changes in our methods and philosophy. The CRA rating methodology and Code of Conduct can be freely accessed on our web page (www.creditreform-rating.de).

Bank ratings are performed by assigning the bank[1] in question into a certain category (ranking) of financial strength, using a defined range of criteria. CRA compiles long-term and short-term issuer ratings and applies internationally common rating scales in order to render its results comparable and transparent. The CRA rating method is designed to provide an answer to the fundamental question of whether and to what extent the bank under review will be able to meet its future financial or contractual obligations from financial instruments fully and on time. The answer to this question is then reflected by the ranking within the rating scales. The "ability to meet financial obligations" is, for the purposes of the analysis, defined as a bank's "intrinsic financial strength“, its "stand-alone capacity“ to generate a surplus of incoming funds from its operating activities in its market environment and thereby to maintain a steadily sufficient level of liquidity. The analysis has been designed to establish whether or not the bank under review has this capacity. By taking into account other contingent credit risks, it then proceeds to examine the extent to which other potential third-party supporting factors could affect this "stand–alone“ rating. The issuer rating for the bank under review is ultimately derived from the results of this integrated analysis.

Creditreform bank ratings take into account all available information that CRA deems relevant for a balanced assessment of the banks‘ levels of financial strength and their credit or default risks. The CRA rating method analyzes bank-specific risk factors and types of risk using both quantitative and qualitative approaches.

Bank ratings represent well-informed assessments of a given bank's financial strength. They issue no recommendation of whether or not to purchase, sell or hold certain financial instruments. Neither must bank ratings be misconstrued as legal opinions or independent valuations of assets.

[1] The term "bank“ for the purposes of this rating methodology covers all credit institutions (private and public banks, savings banks and cooperative banks) in developed countries.

2 Rating Result and Rating Process

2.1 Scope of Application

The scope of application of bank ratings covers institutions whose operating activities mainly consist of typical bank transactions, that are subject to a national supervision or regulatory regime and that own a banking license. These banks should also have access to central bank money.

2.2 Rating Result and Rating Process

Ratings are the results of a rating process that takes into account quantitative as well as qualitative factors, based on data analyses and the background expertise and experience of the analysts, in order to evaluate and assess bank-specific types of risk. The rating process is designed to generate reliable assessments of a given bank's level of financial strength, using an efficient and consistent methodology. This approach reflects the objectives of guaranteeing the quality and integrity of the rating process, of avoiding conflicts of interest and of ensuring transparent and comparable decision-making mechanisms.

Stand-Alone Rating
As their first step, the analysts will try to establish the intrinsic financial strength of the bank under review, its "stand-alone capacity". This indicates the extent to which the bank can survive on the market without any type of third-party support. For this purpose, the analysts examine the business model, the strategy and the specific success factors (the unique selling propositions) of the bank under review, especially in its market environment. This section of the analysis does not take into account any country ratings, considering instead certain country-specific factors such as the GDP, macroeconomic structures and the interest rate landscape that are liable to affect the bank under review either positively or adversely. The results of this assessment will provide the context for the analysis of the audited annual financial statements (or consolidated statements) from (at least) the three most recent business years and for the subsequent derivation of financial ratios. On the basis of these financial ratios, we shall then perform peer group and competition analyses. Business reports that cover either the entire enterprise or certain divisions, risk reports and disclosures of the bank under review and other documents will also be taken into account.

Externals Risk Factors and Bank Regulations
Following this, the analysts will extend the scope of their assessment to further external contingent risk factors, particularly to regulatory restrictions and requirements such as the Eurozone-relevant Basel rules that are continuously amended and adjusted to the various business models for banks. The rating process therefore also needs to assess whether and to

what extent, based on all information available, the bank under review is or will be – in the foreseeable future – capable of complying with all regulatory requirements.

Third Party Support

In order to finalize the rating, our analysts will also need to establish whether any third party support will be available in order to prevent or avert an otherwise possible default and, if the answer to that question is yes, to what extent any such support may affect the financial strength of the bank (positively or adversely). The level of available support is also an important factor in peer group analyses.

Definition of a Default

All ratings must have a working definition of a default event. The definition used by CRA is essentially derived from the definition of the Basel Committee on Banking. A bank is considered "in default" when it looks highly likely that it will no longer be capable of fully meeting the contractual payment obligations of its financial instruments or when the bank is about to be wound down due to specific regulatory requirements (for example, when the financial supervisory authority imposes a moratorium). Under the CRA definition, no default is deemed to have taken place if supporting measures have been granted or announced, no matter whether this support will be provided in the form of government guarantees, guarantor liability or institutional liability or letters of comfort. An issue of voluntary or contractual waivers of receivables shall equally not be interpreted as a default. It is possible, however, that the qualitative analysis of the bank under review may under such circumstances produce a more cautious assessment of its intrinsic financial strength and stand-alone rating, causing a downgrading of the overall rating, also taking into account that external support to uphold a bank's liquidity will always have a limited time horizon.

CRA distinguishes between long-term and short-term issuer ratings and has a separate rating scale for either category. Long-term and short-term ratings are mainly differentiated with regard to the bank's liquidity and on the basis of the maturities of the financial instruments that the bank under review uses as assets or refinancing instruments when it transforms its maturities.

2.2.1 Long-Term Ratings

Long-term ratings assess the default risks for each category of a bank's financial instruments with a residual term-to-maturity of more than one year. Our analysts establish whether the bank will be able to meet its payment obligations for these financial instruments on time and whether external support may be required to service certain categories of financial instruments in order to meet the payment deadlines. The CRA scale for long-term bank ratings (see below) features the internationally common rating categories from AAA to D with 21 levels of financial strength, each of which denotes a specific level of financial strength and insolvency risk:

Rating category	Long-term rating	Assessment
AAA	AAA	Excellent level of financial strength, extremely low insolvency risk
AA	AA+ AA AA-	Very good level of financial strength, very low insolvency risk
A	A+ A A-	Good level of financial strength, low insolvency risk
BBB	BBB+ BBB BBB-	Good to satisfactory level of financial strength, low to medium insolvency risk
BB	BB+ BB BB-	Satisfactory level of financial strength, medium insolvency risk
B	B+ B B-	Adequate level of financial strength, increased insolvency risk
C	CCC CC C	Barely adequate level of financial strength, high or very high insolvency risk
SD	SD	Insufficient level of financial strength. Selective default of an essential part of the liabilities
D	D	Insufficient level of financial strength. Negative characteristics, insolvency, moratorium, default.
NR	Not Rated	Rating temporarily suspended, for example due to an ongoing liquidation

In addition to the rating itself, we qualify the outlook either as “negative“, “stable“ or “positive“. The outlook is an “early indicator”, pointing to the possibility that the rating may be modified within a period of 12 to 24 months after the date of the rating.

2.2.2 Short-Term Ratings

Short-term ratings assess the default risks for each category of a bank’s financial instruments with a residual term-to-maturity of less than one year. Our analysts establish whether the bank will be able to meet its payment obligations for these short-term financial instruments on time. These financial instruments include money-market papers such as commercial papers or fixed-term and overnight deposits. Short-term ratings particularly focus on the question whether the bank under review has access to the interbank market and/or whether it has accrued a sufficient level of securities to refinance any short-term shortfall with central bank money. If no such refinancing options exist, the analysts must establish – especially in cases of decreasing financial strength – whether the bank under review can alternatively generate sufficient liquidity through its liquid assets in order to meet its payment obligations for the period of one year. Similar to long-term ratings, short-term ratings also need to assess whether third-party support

(from the government or a banking association, e.g.) may be anticipated that could guarantee an inflow of liquid funds sufficient to service short-term debt and financial instruments.

CRA uses the following rating scale for short-term ratings:

Short-term rating	Assessment
L1	Extraordinarily high level of liquidity
L2	High level of liquidity
L3	Adequate level of liquidity
NEL*)	Inadequate level of liquidity or liquidity at risk
D	Default

*)NEL = “nichterstklassige Liquidität”, liquidity of less than premier quality

CRA provides its ratings under the assumption that long-term ratings and short-term ratings are related inasmuch banks with “good“ long-term ratings are also subject to a relatively small risk of defaulting (not being able to service) their short-term debt. This is mainly due to the fact that the same factors and features that decrease the risk of a long-term default (for the purposes of a financial strength / risk analysis) also decrease the risks of a short-term default risk. Such factors include a resilient and competitive business model, a healthy financial profile, high-quality assets, a broadly diversified refinancing basis, sufficient liquidity headroom and a capital buffer which is sufficiently large to guarantee the bank’s survival through periods of low earnings. CRA therefore assumes that a high level of correlation exists between long-term and short-term ratings and believes that it is possible to represent the matching assessments in a mapping.

The standardized CRA mapping of long-term and short-term ratings looks as follows:

Rating category	Long-term rating	Short-term rating	Assessment
AAA	AAA	L1	Extraordinarily high level of liquidity
AA	AA+		
	AA		
	AA-		
A	A+	L2	High level of liquidity
	A		
	A-		
BBB	BBB+	L3	Adequate level of liquidity
	BBB		
	BBB-		
BB	BB+	NEL	Inadequate level of liquidity or liquidity at risk
	BB		
	BB-		
B	B+		
	B		
	B-		
C	CCC		
	CC		
	C		
D	D	D	Default

We believe, for example, that a bank that aspires to a high-quality short-term rating (L1 – L3) will require a long-term rating of at least BBB-. A downgrading of its long-term rating into the range below BBB-, conversely, would inevitably deny the bank in question a short-term rating in the categories L1 – L3. The mapping therefore reflects the close relationship of default risk assessments in long-term and short-term ratings. At the same time, the boundaries of the mapping for long-term and short-term ratings are not rigid and may be rather fluent in the transition zones of the short-term rating categories. Ratings and their underlying analyses must always be performed on a case-by-case basis. In order to receive the top short-term rating grade of L1, banks must – as a minimum requirement – maintain confirmed liquidity facilities that fully cover any level of short-term debt. We believe that we can plausibly assign a bank with a double-A long-term rating to the top short-term rating category of L1 only in cases where the previous year's rating outlook has been stable or positive.

3 Rating Method

CRA bases its ratings on a method that has been designed to analyze bank-specific risk factors and types of risk through qualitative and quantitative approaches. Key banking risks typically include interest rate risks, market risks, operational risks and liquidity risks. Since qualitative and quantitative factors are causally linked in a complex network of mutual interaction and since the assessment of quantitative factors is essentially based on qualitative factors (since they can often be inferred from them), the rating process links both areas and provides an integrated view. Short-term and long-term ratings apply the CRA analysis modules that will be described on the following pages, but place their emphasis on different elements of the inquiry.

3.1 Risk Factors in Bank Ratings

The qualitative factors largely determine the future success and the chances of a bank to survive as a business. The qualitative analysis is based on a system of indicators that takes into account factors that are relevant for a bank's financial level of strength including the business model in its market environment, the host country's economic structure, the interest rate landscape, the refinancing conditions and a host of other contingent external risk factors. In this context it also stands to establish to what extent external third-party support may affect the development of the bank under review or what (if any) measures have been taken to restructure or rescue the bank. In general, the analysis will establish whether and to what extent support may be required and whether and to what extent third parties may be ready to provide such support. A bank could, for example, receive "internal" support from a parent company or its shareholders (or a cooperative banking association) under a so-called "bail in" agreement. "External" support could be provided in the form of system-immanent interventions and regulatory measures of central banks or national governments under a so-called "bail out" agreement that may be designed to secure the survival of a bank with systemic importance. We need to point out, however, that the EU guideline for the recovery and resolution of credit institutions foresees the bail-in rather than the bail-out as the standard resolution instrument of the future, reinforcing the fundamental market principle of self-responsibility and demanding that this principle must also apply to large banks.

The qualitative parameters in turn affect the factors that have been primarily established through the quantitative analysis such as asset quality, the development of earnings over time, capital base and the refinancing foundations as well as the liquidity of the bank under review. Meaningful results can also be obtained by performing a peer group comparison or comparisons with industry-specific best-practice solutions that serve as reference procedures. The results of the qualitative analysis are then used as the foundation for a plausibility check of the business data and business plans and for a scenario-based assessment of the future business development. The qualitative factors are therefore crucial for the assessment of the quantitative factors. Financial ratios are largely established on the basis of the audited annual financial statements and management reports of the bank under review. (For further details, see 3.4.)

Bank ratings take the following into account to assess the bank-specific business risks:

- Corporate profile and business model,
- business development in the market environment,
- profitability,
- asset situation and asset quality,
- refinancing and capital quality,
- liquidity.

In the following chapters, we shall explain the individual key elements and instruments of the analysis in closer detail, identifying the opportunities and threats that are described in the Rating Report and that provide the basis for the rating itself.

3.2 Corporate Profile and Business Model

Market position and business strategy of a bank are of obvious importance. In this part of the analysis, we examine the history of the bank under review, its size (its balance sheet total or market capitalization), its affiliation (if any) to a larger group or corporation and any specific advantages or drawbacks that may result from its choice of domicile. We also study the bank's areas of business, the range of its products and services as well as its branch network in order to establish the bank's level of diversification, also determining the geographic extent of its operating range (regional, national or international).

We furthermore examine whether and to what extent other entities within the same group also operate in banking or related industries (such as leasing or factoring companies) or in the financial services industry (such as insurance companies). We assess the structures of the group, but also any contingent liability commitments that may exist between the various affiliates and the impact that affiliated companies can have on the business development, legal position and results of the group. Special attention is dedicated to the so-called "step-in risks" that are mainly generated by business relations and close ties between banks and "shadow banks" (such as "fintech" companies) or industrial corporations.

We believe that an essential – even decisive – requirement for the stable and successful development of a bank's long-term business is a competent, skilled, experienced and ethically irreproachable management. We try – as far as possible – to assess whether the current management represents these qualities and proceed to examine the strategy and risk management system of the bank under review in the light of our analysis.

In short, we analyze the business model of the bank under review, its strategies and unique selling points in the environment of its market and competitive environment.

3.3 Business Development in the Market Environment

3.3.1 Profitability

The specific market environment of the bank under review has a significant impact on its potential earnings situation.

The level of the economic growth rate – whether positive or negative – and the economic structure of a country or region can have a major impact on a bank's success structure. The level of the interest rate on the money markets and capital markets is also relevant, and assessments of the future development of the interest rate can significantly affect a bank's

business strategy. The risks connected with a change of the interest rate and any hedging deal that may consequently be deemed necessary can impact a bank's earnings situation while the same is true, under certain circumstances, for currency effects. Our rating will also reflect existing investment and refinancing structures.

Our assessment of the bank's capacity to comply with regulatory requirements needs to establish whether the bank under review is subject to the control of a supervision authority and whether it has been classified as systemically important. Our analysts will forecast whether or not the bank under review will be able to comply with current and future legal and supervisory requirements and whether or not it can be supported or restructured in the event of a severe crisis or, in a worst case scenario, whether it may have to be resolved.

The assessment of the bank's earnings situation will be based on specific financial ratios and their relative development over several years, with reference to peer group values.

The analysis will specifically focus on the following financial ratios:

- Interest margins
- Commission margin
- Cost income ratios
- Trading result margin
- Operating result margin
- Net profit margin
- Return on average equity (ROAE)
- Return on average assets (ROAA)
- Return on risk-weighted assets (RoRWA)

3.3.2 Asset Situation and Asset Quality

A bank's risk profile is chiefly characterized by its balance sheet assets, which is why asset situation and asset quality are crucial factors for an assessment of its credit risks. Our analysts assess the risks that are connected with the individual assets and the standardized balance sheet assets. Risk structures are generally revealed by annual financial statements or risk reports. We examine, for example, the rating methods that were applied, the distribution of assets across the rating categories and the funds that have been accrued to cover actual and contingent risks.

Depending on the individual business model, specific attention will be paid to the "Loans and advances to customers", the risk provisions and the securities portfolio of the bank under review. Assessments of credit quality and credit risks will have priority for typical "credit banks". Our analysts will also try to establish whether any indicators for the existence of distressed loans are in evidence, and, if yes, how these loans have recently developed and what

proportion of the bank's loans must be qualified as "non-performing". The ratio of distressed or problem loans is a good indicator for the future proportion of non-performing loans. This part of the analysis is also the right place for an assessment of the bank's general risk and credit risk management systems.

Important financial ratios on whose basis the asset quality of a bank can be assessed (specifically in the context of peer group comparisons) include the following:

- Proportion of non-performing loans,
- risk-weighted asset ratios,
- risk provision ratios,
- write-off ratios.

We will furthermore examine the risks that are connected with the following assets of the bank under review:

- Bonds and other fixed-rate securities,
- shares and other variable-yield securities,
- shareholdings and interests, and
- derivatives.

3.3.3 Refinancing and Capital Quality

The capacity of a bank to assume and bear risks is determined by the structure of its capital and the strength of its equity base. Our assessment of the bank's financial base focuses on the key sources of refinancing funds and the development of its capital structure, analyzing the origin and the stability of individual refinancing products and categories of financial instruments. We accordingly analyze the bank's balance sheet equity and regulatory equity[2] and will assess how the bank under review has implemented the legal and regulatory equity requirements and how it fares under future-oriented stress scenarios.

[2] In order to render equity components of banking regulations or financial ratios of banks comparable, non-European banks must apply a "non-GAAP disclosure" or a disclosure that complies with the currently valid regulations of the Basel Committee.

The rating will pay specific attention to the following equity components (as defined in the relevant regulations) and related financial ratios:

- Common equity and Tier 1 ratio (CET 1)
- Supplementary capital and Tier 2 ratio (AT 1)
- Tier 1 capital (T 1)
- “Fully loaded” capital ratio
- Total equity and equity ratio as defined in the relevant regulations
- Leverage ratio

The calculation of the equity components and financial ratios will be based on the risk-weighted assets (RWA) disclosed by the bank under review for the business year in question. Our analysis has been designed to establish how the composition of the RWA (in terms of the different types of risk[3]) changes over the time horizon of the assessment, not to determine whether or not the volume of these RWA is adequate. A balanced assessment may require the calculation of additional financial ratios. As the systems for supervising and regulating banks evolve, these ratios may be gradually integrated into the standard analytic apparatus and become more widely available.

We analyze what impact the planned growth of the bank and measures to strengthen the equity base would have on future equity figures. We also examine what additional amount of equity the bank under review will need to maintain its ability of complying with regulatory capital requirements. The analysis will also take into account the results of the bank stress tests inasmuch as they have been published by the governments and banking supervisory authorities.

3.3.4 Liquidity

This part of the analysis will focus on a bank’s refinancing resources and, more generally, its available financial facilities, specifically their ratio to assets, as well as their maturity transformation processes. Based on these findings, we shall assess the liquidity status of the bank under review.

We will also examine the extent of the bank’s access to short-term funds on the money markets and from the central bank as well as to so far unused refinancing facilities for an implementation of its business development plans.

[3] Credit risks, operating risks, market risks, also for the assessment of counterparty credit risks in OTC transactions (Credit Valuation Adjustment).

Key items and financial ratios of the analysis will include the following:

- Interbank ratio
- Maturities of asset-backed securities and liabilities
- Matching maturities
- Subordinated liabilities
- Loans to deposits ratio (LTD)
- Liquidity coverage ratio (LCR)
- Net stable funding ratio (NSFR)
- Total Loss-Absorbing Capacity (TLAC)

An assessment of possible liquidation scenarios for a specific bank will be based – if available – on the bank's Total Loss-Absorbing Capacity (TLAC) and its Asset Encumbrance Ratio. TLAC is a standardized minimum ratio of capital requirements in compliance with Basel III and GLAC ("Gone-Concern Loss-Absorbing Capacity"). The Asset Encumbrance Ratio establishes the proportion of a bank's assets that would go into the insolvency estate to cover uncollateralized claims. Disclosure obligations of credit institutions concerning their encumbered assets are regulated in Europe by the Capital Requirements Regulation (CRR).

The analysis of financial ratios will also take into account – if available – the sum total of customer funds under off-balance-sheet administration and irrevocable credit commitments.

3.4 Integrated Review of the Results From the Analysis

Creditreform's quantitative analysis of financial ratios mainly focuses on four areas:

- Profitability
- Asset situation and asset quality
- Refinancing and capital quality
- Liquidity

One key source of information for the analysis of historical financial data is the collection of recent audited annual financial statements (single-enterprise and consolidated statements from the last three business years), supported by up-to-date actual figures and targets. Our analysts dedicate a lot of attention to annual financial statements, specifically to conspicuous items under their qualitative analysis of financial data, assessing the historical data with a view to providing sustainable forecasts of future business developments. The annual financial statements are transformed into standardized balance sheet and P&L account formats in order to allow comparisons with annual statements from other banks and to develop highly specific, highly selective and therefore highly meaningful financial ratios that provide the foundation for further analyses.

The assessment of a bank’s risk-bearing capacity – specifically if the bank under review is considered systemically important – in the light of a possible future need for recovery or resolution measures may require the calculation of additional financial ratios for the purposes of the analysis or the rating, if these ratios gradually assume the status of a regulatory minimum standard and the high-quality data that are required for their calculation become widely available.

For the purposes of establishing a rating result or a rating grade, the results from the analysis of the financial ratios will – in Step One of the process – be ranked (as “good“ and “bad“ ratios) and weighted according to their relevance in the respective area of analysis. The same process is repeated for banks in the peer group, so that the results from the analysis can be subjected to a univariate assessment and evaluated accordingly. This technique aims – in Step Two of the process – to deliver an overall assessment on the basis of weighted and compressed financial ratios and taking into account all results of the qualitative analysis. This assessment in turn provides the foundation for the rating grade of the bank under review

4 Continuous Monitoring and Follow-Up Rating

Following the release of the (initial) rating, the team of analysts continues to observe the business development of the bank under review (this process is called “monitoring”) in order to ensure that the rating is not made obsolete by events, staying in close contact with the client and evaluating business documents such as quarterly reports. If any significant events or developments occur during the monitoring period that may adversely or positively affect the business of the bank under review, the original rating may be adjusted.

Once the monitoring period has expired, a valid rating will generally require a new rating process to be performed for a follow-up rating. Any measures taken by the bank which have changed the determining factors of its financial strength can then cause an adjustment of the rating.