Creditreform Rating AG Rating Methodology

Corporate Ratings

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Creditreform Rating

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This document (v2.3) updates an older document while preserving its basic methodological approach. Certain ratios were more precisely worded. The update was carried out in May 2019.

1 Introduction

Over the past 15 years, Creditreform Rating AG ("CRA"), established in 2000, has become a recognized European rating agency. Creditreform Rating AG (hereinafter "CRA"), carries out credit ratings since its foundation in 2000 and is a recognized European rating agency.

In this document, CRA discloses its methodology of the corporate rating in order to provide the parties involved, investors and the public with the opportunity of developing a deeper understanding of the mechanisms behind its ratings. The rating methodology will be updated if changes in our methods occur. The rating methodology and Code of Conduct can be freely accessed on the web page (www.creditreform-rating.de) of the CRA.

A rating methodology is the system of assigning rating objects into different rating categories (classification). A CRA corporate rating refers to a specific company or issuer while taking into account their corporate group structure, assessing the overall financial strength and "creditworthiness" of (non-financial) companies in general. Corporate ratings deliver assessments that are comparable for companies with different accounting standards and legal forms, from different industries or countries and of different size.

CRA corporate ratings take into account all available information that CRA or its analysts deem relevant for a balanced assessment of the company's levels of creditworthiness and risk measures. This approach leaves some room for the information to be used and their impact on the rating result. Ratings based on this methodology make use of information that is actively or passively made available by the company or a third party, and/or information that is publicly available. Any participation of the company in the analytic activities carried out and in the finding of results is categorically excluded. A management meeting is sought after, but is an optional component of the rating process. The CRA assessments are based on a rating methodology that takes into account company-specific risk factors, using both qualitative and quantitative approaches. The focus of the analysis is not placed on the individual features or characteristics of a company's financial instruments but on a general assessment of the company's creditworthiness. In this respect it is possible that specific financial instruments receive a rating that differs from the corporate rating of their issuer.

Corporate ratings represent sound assessments of a given company's creditworthiness. They issue no recommendation of whether or not to purchase, sell or hold certain financial instruments. A corporate rating doesn't represent a legal opinion.

2 Scope of Application

CRA ratings of non-financial corporates (corporate ratings) deliver assessments of specific, going-concern companies. This rating methodology shall define the methodological framework for the preparation of such corporate ratings.

3 Rating Result and Rating Process

3.1 Rating Result

This CRA rating methodology is designed to provide an answer to the fundamental question of whether and to what extent the company under review will be able to meet its future financial obligations fully and on time. CRA corporate ratings assess qualitative and quantitative aspects of risk in the following areas of investigation:

- Structural risk
- Business risk
- Financial risk
- Financial ratio analysis

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 Supervision (for the exact wording, please see the Appendix).

Under these default criteria, a corporate default is not necessarily identical with a bankruptcy/insolvency. The default of a specific financial instrument will generally cause the company to default, but not necessarily to file for bankruptcy. Such a scenario is generally indicated by the use of the “SD“ category (for “Selective Default”).

For its corporate ratings, CRA uses a rating scale that features the internationally common rating categories from AAA to D with 19 levels of creditworthiness, two default levels and the category NR (“Not Rated”). On the CRA corporate ratings scale (see below), every ranking or category denotes a specific level of creditworthiness and corporate default risk.

Rating category	Rating	Assessment
AAA	AAA	Highest level of creditworthiness, lowest default risk
AA	AA+ AA AA-	Very high level of creditworthiness, very low default risk
A	A+ A A-	High level of creditworthiness, low default risk
BBB	BBB+ BBB BBB-	Highly satisfactory level of creditworthiness, low to medium default risk
BB	BB+ BB BB-	Satisfactory level of creditworthiness, medium default risk
B	B+ B B-	Moderate level of creditworthiness, increased default risk
C	CCC CC C	Low level of creditworthiness, high or very high default risk
SD	SD	Insufficient level of creditworthiness, selective default of a considerable proportion of the company's payment obligations
D	D	Insufficient level of creditworthiness, default, insolvency
NR	NR	Rating suspended, expired, temporarily suspended due to insufficient information, company has ceased to exist (merged, liquidated).

In addition to the rating itself, we generally – if possible – qualify the outlook either as "negative", "stable" or "positive". The outlook has a time horizon of one year, forecasting the likely course of developments for the period of twelve months after the date of the rating.

Corporate ratings can also be placed under a "watch". This qualification – which replaces the outlook – indicates CRA's intention to review the rating within a relatively short period of time (generally less than six months) because we have reasons to anticipate a negative rating change.

Corporate ratings can also be qualified as "restricted".This qualification reflects that final versions of business documents or other financial information had not been submitted but can be expected shortly. It replaces all other additions.These ratings have generally been given under the proviso that the final versions of certain business documents and information shall not materially differ from their earlier versions (such as drafts) which have provided the foundation for some of the rating's assessments and assumptions. Corporate ratings that have been issued as "restricted" will be subjected to an open review if it is found that such material changes have indeed taken place.

3.2 Rating Process

3.2.1 Data Request

A team of at least two analysts is responsible for the rating. The client will be free to approach and contact this rating team throughout the rating process and the subsequent monitoring period.

The team analyses the business model of the company under review and acquires data and information about the economic and legal situation. For these purposes, the documents that have been submitted by the company and its management as well as data about the relevant markets and industries will be processed. Companies that have requested CRA to perform a rating are expected to provide their annual financial statements and information about their corporate structures, their organization and business strategy, personnel, accounting and controlling systems, products, markets, risk management function and their funding arrangements. Depending on the volume of the information that is submitted to our analysts, it is possible that only sample-based plausibility checks will be performed to verify the quality and consistency of the data. CRA will treat all these data with strict confidentiality. The preliminary analysis will also serve as a preparation for the rating interview.

3.2.2 Rating Interview

The optional rating interview is designed to provide context and additional background for the information that has been submitted. It is attended by senior managers and perhaps other stakeholders of the company under review. Qualitative as well as quantitative factors will be discussed and answers to open questions will be sought. It is possible that more than one such interview will need to be scheduled. The number of interviews and their duration will depend on the size and complexity of the company.

3.2.3 Rating Committee

The analysts will then compress the results of the qualitative and quantitative analyses into a corporate rating. This rating will be submitted as a recommendation – together with all relevant documents – to the Rating Committee, the final instance of the rating process. Only the Rating Committee is authorized to issue and amend corporate ratings. It is responsible for upholding the objectivity of the rating process and its results and guarantees the consistency of the technical and formal quality of the ratings.

4 Rating Method

CRA bases its ratings on a methodology that has been designed to analyse company-specific risk factors through qualitative and quantitative approaches. Our teams compress their analysis into a corporate rating by assessing the particular relevance of the individual factors, taking into account the specific requirements and distinguishing marks of the company under review. CRA corporate ratings focus on the following areas of risk:

CRA is using standardized analysis techniques for its corporate ratings. The strengths, weaknesses, opportunities and threats of the company under review as well as its cash flow and its key financial ratios are established through an analysis of the relevant risk domains (both in isolation and in complex networks of mutual interaction), following which, prospective consequences are derived from multiple scenarios. Under the customized scenario analysis, the resilience of a "base case scenario" is tested by subjecting this scenario to a range of stress factors.

The assessment focuses on the question whether and to what extent the operating activities of the company under review will be able to generate the level of profits and cash flows that the company requires to meet its payment obligations fully and on time. Corporate ratings also assess the balance sheet structure and the company's ability to raise external funds. This is why our analysts also examine the plausibility and the sustainability of the business model and the company's profitability. In addition, the expert knowledge of the analysts and the rating committee is used in relation to the qualitative and quantitative analyses.

4.1 Structural Risk

4.1.1 Corporate Structure & Organization

Legal and organizational structures should be designed in such a way that they help the business to reach its objectives. The assessment takes into account the size of the company under review, its legal form, ownership or shareholder structure, its position – if any – inside a corporate (group) network of interests, its affiliates, operating sites, its personnel-related and performance-related relationships, its

liability risks, financial relationships, supervisory bodies, Corporate Governance and historical development. CRA tries to verify how the internal administrative and operative responsibilities have been structured and how the coordination processes have been organized.

4.1.2 Management & Employees

The corporate management has a key influence on the way in which the company is controlled and is responsible for the business model incl. strategy, organization, product and pricing policies, accounting and controlling, financing, human resources and risk management as well as a wide range of other management tasks. All this requires high levels of business management skills and economic knowledge, a familiarity with the branch of industry and the various product ranges as well as leadership qualities. In order to cover this profile of different requirements, companies have to assemble a management team that includes people with different individual talents and abilities. Decision-making processes, levels of compensation, transactions with related parties and companies and other elements of Corporate Governance can affect the assessment of the management. Historical business strategies, risk tolerance levels and achievements of the management will also be taken into account for the purposes of the analysis.

The competence level of the personnel can also have a decisive impact on the success of a business. This is why CRA ratings take into account the size and the composition of the workforce as well as the investments into personnel development (training and retraining). Other potentially relevant factors include key person risks, compensation systems, levels of fluctuation, staff assessment schemes, working conditions and relevant financial ratios such as the development of the ratio of personnel costs to total costs.

4.1.3 Accounting & Controlling

Successful businesses require fully functional accounting and controlling systems with viable performance indicators. The management should have continuous access to the latest business data such as order situation, sales, overcapacities and undercapacities, liquidity, derivations from the budget and the profit contributions of individual business units. Annual financial statements should be prepared as soon as possible. Annual financial statements and any other business data that are released in the course of the year are a key source of information for all the company's stakeholders and should therefore go beyond a mere compliance with the current accounting standards and disclosure obligations, providing a comprehensive, transparent and realistic picture of the company's business and financial situation.

Controlling is a necessary administrative function and provides the management as well as the entire company with a system of information, risk management and structural leadership. It is a viable

instrument of operative and strategic control, creating a platform for further improvements and planning control. It represents a central element in a profit-oriented business management system.

Accounting and controlling systems must be integrated into a performing IT environment and should provide information contemporarily.

4.1.4 Risk Management

The CRA risk management analysis tries to establish a company's ability to systematically identify actual and contingent risks, to quantify, to monitor and to manage them. Risk management is an important element of an effective business control system. We examine how efficiently the company under review identifies and addresses its business risks and how sophisticated its risk management system is.

Risk management systems should take into account all internal and external risks (such as market risks) to which the company is exposed through its operating activities, identifying and evaluating all possible consequences for the asset, financial and profitability situations. A continuous, internal process of identifying, analysing and assessing risks allows the company to reveal new and potentially harmful trends at an early stage and to develop suitable countermeasures that reflect the severity and relevance of the individual risk factors. Risk management systems that are capable of delivering this require an adequate level of material and personnel resources.

4.2 Business Risk

4.2.1 Country Risk

Country risks are calculated on the basis of the economic conditions that are deemed relevant for the company under review. CRA analyses the risk factors "strength of the national economy" and "institutional structures", based on economic statistics and performance indicators.

Average country risks are identified for those countries in which the company under review conducts significant business activities. Positive assessments of individual countries, seen in isolation, will not have a positive impact on a corporate rating. High country risks can, conversely, adversely affect a rating.

4.2.2 Industry-Specific Risk

In order to establish the overall profitability of an entire industry and the intensity of its internal competition, CRA ratings analyse the level of business rivalry, the market entry barriers and the possibility of substituting the products by using goods from other industries. We take into account the behaviour of the competitors and the impact of government action on the situation in the industry, also the dependence of the company under review on existing customers and suppliers and the way in which such dependence may affect the company's position of negotiating related business transactions.

4.2.3 Business Model & Strategy

The business model is the basis for all operating activities. It describes the way in which the company intends to create added value. We therefore define the business model of the company under review in a preliminary step of the analysis, assessing its character on the basis of the added value of products and customer services, distribution channels, customer relations, sales and cost structures, resources, key activities and strategic partners.

Business strategies – in mutual interaction with the business model – provide the platform for the development and success of the company. This interaction has a significant impact on the company's ability to generate sustainable profits and cash flows, which is why the CRA analysts dedicate the second step of their assessment to a study of the way in which the corporate strategy interacts with the business model and with the strategically important business units that have defined targets. A key focus is placed on consistency / plausibility and a realistic assessment of existing risks, specifically on the questions in which time frame this strategy is meant to be realized or reinforced, what measures will be implemented to this end and what resources will be made available in support of the business model or with a view to achieving the corporate business targets. The assessment will also include the defined responsibilities and the existing monitoring systems that are designed to ensure the success of the strategy and compliance with the underlying business and financial plans. Risk factors from other areas of the analyses will be considered in order to establish whether the strategic objectives are realistic and whether the business model can be successfully implemented. Indicators may be provided by comparisons with historical data (has the company been able to reach its qualitative and quantitative objectives in the past?). Particular attention will be paid to implementation risks (which may for example emerge from financial requirements, the market environment or trends) that could provide stumbling blocks.

The analysis of business model and business strategy is essentially laid-out to clarify how likely it is that the company under review will reach its objectives, in the light of its past record and its current business situation.

4.3 Financial Risk

4.3.1 Liquidity

Short-term liquidity determines a company's ability to meet its payment obligations fully and on time. Liquidity plans are part of the overall financial planning system and will be assessed as such. Working capital management, the ability to generate cash flows or revenue and spending policies are also analysed. In addition to liquidity and cash flow figures, capital costs and operating costs can also be considered.

4.3.2 Balance Sheet Structure & Financing

Using asset and capital structure analyses (assets and liabilities), CRA assesses the impact of the balance sheet structure on a company's solvency and liquidity, revealing the extent to which the company under review is dependent on external funds. The ability to access financial facilities is also taken into consideration. We pay attention to the extent to which the maturities of assets and liabilities are matching and more generally to the maturities of assets and financing arrangements. Coverage ratios and other financial ratios will also inform the assessment. Our analysts want to know whether the management of the company under review has viable plans of how to source and how to use funds in the future (financing and investment plans). They will also research to what extent the financial management provides an active contribution (by ensuring an efficient access to external funds) to the success and the stability of the business. Enterprises have generally a wide range of equity and debt financing instruments at their disposal. The analysis identifies the characteristics of the individual financing instruments such as their term-to-maturity, collateral, rank, covenants (including the sanctions against their violation), interest and principal, before establishing their impact on the company's solvency and liquidity.

4.3.3 Corporate Planning

Strategic and operative business planning is one of management's (and specifically the controlling department's) key responsibilities and it includes – in addition to the planning process itself – the preparation of deviation analyses and the development of appropriate countermeasures. This requires the company in question to be in possession of the necessary know-how and infrastructure, a properly developed controlling department and adequate resources.

Corporate planning involves – in addition to an integrated planning of annual financial statements and profit-and-loss accounts – plans for the future capital requirements and liquidity situation of the company. Such a financial planning should identify balance sheet targets as well as alternative financing options and provide sufficient financial manoeuvring space.

4.3.4 Debtors & Creditors

Companies usually grant their customers short-term credit by providing them with payment terms. The department for debtor and creditor management grants and takes these short-term loans, which is why it is an essential element of the company's working capital and liquidity management system. The analysts may query the financial strength of the key debtors and creditors of the company under review in order to inform their assessment of the company's customer and supplier portfolio. The assessment of the debtor and creditor management function will be based on an analysis of the risk concentration

level (the extent to which the risk is spread among customers and suppliers), the cash conversion cycle, payment behaviours, open positions and their maturity structure as well as write-downs.

4.3.5 Current Business Development & Outlook

Since annual financial statements are only disclosed once every twelve months (and generally a considerable period after the business year in question), current business development provides important guidance for an assessment of the company's current creditworthiness. The development of the company's business in between annual financial statements is analysed on the basis of business reports such as monthly or quarterly interim statements. Particular attention will be paid to earnings, liquidity and the overall dynamics of the company under review and its economic environment. On the basis of this information, the analysts will provide an outlook for the future development of the enterprise and its impact on the company's creditworthiness.

4.4 Financial Ratio Analysis

4.4.1 Integration into the Rating Process

Analyses of financial ratios make a key contribution to the assessments of creditworthiness in corporate ratings. They are based on the assumption that successful business activities – which are an essential requirement for a company's creditworthiness – will be reflected by the company's asset, finance and earnings situations and consequently by its financial ratios.

The results of this retrospective analysis provide indicators for a prospective forecast of the company's business development. Parameters for the assessment include the asset and capital structure and ratios that reveal the levels of profitability, financial health and liquidity by quantifying the results of the strategic and operative development of the current business model.

The CRA analyses of financial ratios are supported by statistically derived benchmark assessments. Our analysts also perform customized assessments that are based on the annual financial statements or auditing reports of the company under review.

4.4.2 Analysis and Structuring of Financial Statement Data

The analysis of financial ratios will include a critical assessment of certain important items of the financial statements. Questions concerning individual items of the financial report will be addressed in conversations with representatives from the company under review and by requesting additional documents and information. In addition to corporate data, parameters of the industry and the overall economy will also be analysed, delivering additional information about the business development of the company under review and its internal operational structures.

For the purpose of providing an unbiased view of the company's business data - as independent as possible from accounting policies and standards and which allows a comparison between these data and neutral reference values - the (tools-based) analysis of data from annual financial statements performs certain adjustments of discretionary options, allocations and specific features of individual accounting standards in compliance with precisely defined rules. This process produces standardized annual financial statements, standardized profit-and-loss accounts and standardized cash flow accounts that suit the purposes of a (comparative) financial statement analysis. The figures in these standardized accounts may differ from the original data that were disclosed in compliance with the underlying accounting standards.

Quantitative analyses and assessments can also be based on figures from preliminary annual financial statements, if this serves to provide a more up-to-date picture of the business situation and thereby a rating of higher quality.

4.4.3 Calculation and Assessment of Rating-Relevant Financial Ratios

The quantitative analysis of financial ratios in the Creditreform balance sheet ratings focuses on five areas (for a respective definition, please see the Appendix).

Asset and capital structure

The analysis of asset and capital structure includes a critical assessment of the company's capital sources and asset positions. While the capital structure reveals a company's financing sources and their composition, the list of assets displays for what purposes this capital has been spent. The calculation of financial ratios includes the maturities of assets and liabilities. The structural analyses are performed separately on either side of the balance sheet ("vertically", e.g.: equity ratio), as well as comprehensively for both assets and liabilities ("horizontally", e.g.: fixed assets ratio). The analysis can also be informed by the calculation of ratios between figures from the balance sheet and the profit-and-loss account (e.g.: capital lock-up period).

Financial strength

This area of the analysis focuses on the earnings before depreciation (EBITDA) and the cash flow, since the ratio of either figure to the volume of total debt is seen as a key indicator for a company's financial health and resilience. The cash flow analysis concentrates on the question of how many liquid funds the company under review is capable of generating from its operating activities, funds that can then be used to pay the providers of equity and loans, to make investments and to reinforce the financial basis. The cash flow calculations also include a full cash flow account that reflects incoming payments from investments and financing arrangements, representing a complete picture of financial funds, their origin

and their application. This provides the analysts with a dynamic model of the money flows that circulate within the company under review during a certain period.

Asset Structure

- ✓ Fixed asset intensity
- ✓ Asset turnover
- ✓ Asset coverage ratio
- ✓ Liquid funds to total assets

Capital Structure

- ✓ Equity ratio
- ✓ Short-term-debt ratio
- ✓ Long-term-debt ratio
- ✓ Capital lock-up period
- ✓ Gearing
- ✓ Trade-accounts-paxable ratio
- ✓ Short-term capital lock-up

Financial Stability

- ✓ Cashflow margin
- ✓ Cashflow ROI
- ✓ Total debt / EBITDA adj.
- ✓ Net total debt / EBITDA adj.
- ✓ ROCE
- ✓ Total debt repayment period

Profitability

- ✓ Gross margin
- ✓ EBIT interest coverage
- ✓ EBITDA interest coverage
- ✓ Ratio of personnel costs to total costs
- ✓ Ratio of material costs to total costs
- ✓ Ratio of interest expenses to total debt
- ✓ Cost income ratio
- ✓ Return on investment
- ✓ Return on equity
- ✓ Net profit margin
- ✓ Interest burden
- ✓ Operating margin

Liquidity

- ✓ Cash ratio
- ✓ Quick ratio
- ✓ Current ratio
- ✓ Cash conversion cycle
- ✓ Inventory storage period
- ✓ Receivables collection period
- ✓ Payables settlement period

Profitability

Profitability analyses allow the analysts to put the corporate business data into a wider context of references and to qualify them through informed comparisons, always accounting for the selected influencing factors and measuring techniques. Similar to the process in the other areas of financial ratios, this creates an optimised framework for comparisons between companies of different sizes, from different industries and with other different qualities over an extended period of time. Profitability analyses perform an essential function in short-term as well as long-term assessments of financial strength.

Liquidity

Liquidity, for the purposes of analysing the creditworthiness of a company under review, is the ability of a company to meet its payment obligations at any time. This area is specifically relevant for assessments of short-term financial strength. Present-oriented liquidity analyses are largely based on coverage ratios that enable a characterization of short-term liquidity situations in terms of short-term payment obligations and their ensuing risks. Prospective liquidity analyses are mainly designed to assess financial risks and the future business development of the company under review.

This system of performing corporate ratings does not cover liquidity analyses for impending liquidations, which are designed to establish what funds can be raised to satisfy creditors in the event of a bankruptcy or insolvency.

4.4.4 Scenario analysis

In a final step, the results from all analyses in the different areas are collected to appraise the adequacy of the reviewed company´s business and financial plans. This process is mainly based on the risk factors that were identified and their likely impact on the company's future business development.

Taking into account interactions that exist between the individual areas of the analysis, individual parameters will be changed in different scenarios to test and to observe the effects that these changes have on the development of the revenues, surpluses and liquidity of the company under review.

In this way, a base case, a best case and a worst case scenario will emerge. The final assessment of the company's ability to meet its future payment obligations will be based on the scenario or set of scenarios that appears to most accurately reflect the overall picture of the company, a picture which is composed of the weighted features and characteristics from the individual areas of analysis. This choice will be duly reflected by the grade of the rating.

This method is based as much on the analysis and scenario tools that are used in the rating process as on the expert knowledge of our analysts and the members of the Rating Committee. This combination of complementary technical approaches and the use of control mechanisms during the rating process (the "four-eyes principle" and the involvement of the Rating Committee) guarantees rating results with the highest possible level of objectivity while also including prospective techniques. CRA ratings therefore represent future-oriented, objectified assessments of key risks and key factors that are relevant for the success of the companies under review.

5 Monitoring, Follow-Up Ratings and Validity

Once corporate ratings have been released, they will be monitored for a specific period of time and are valid until they are suspended or withdrawn (NR) by CRA. During this period, the team of analysts continues to monitor the company under review. The goal is to ensure that the rating is not made obsolete by events. For this purpose, the analysts continue to liaise with the management and to request additional data for further evaluations. The analysts will also conduct independent research and follow relevant articles in industry publications and business journals. If any significant events or developments occur during the monitoring period that may – in the view of CRA – adversely or positively affect the rating, the original rating may be adjusted. If the company under review fails to provide business information of acceptable quality or within acceptable time intervals (according to the judgement of CRA), the Rating Committee can decide to suspend the rating (NR).

A rating interview between the analysts and senior management representatives or responsible stakeholders of the client company will be conducted at least once a year. Events or developments that have changed the risks which are relevant for an assessment of the company's creditworthiness may result in an adjustment of the rating.

Appendix

Definition: Default Criteria

A representation of comparable default probabilities requires a clear definition of a default event. For the purposes of our integrated rating approach it is necessary to define a default event and the relevant default criteria.

A company or issuer shall be deemed to have gone into **Default (D)** for the purposes of our corporate ratings when at least one of the following criteria has been met:

1. Creditors of the company / issuer or the company / issuer itself have filed for an insolvency or a similar measure, or another regulatory / legal payment block has been imposed, or – according to the Creditreform credit information – the company / issuer has been provided with an Index of creditworthiness of 600 (= insolvency).

2. CRA assumes that the company / issuer will not meet one or several substantial payment obligations to creditors, in violation of the agreement between the company / issuer and the creditor in question (for example through a delay or refusal of payment).

3. One or several substantial payment obligations of the company / issuer are being restructured, rescheduled, renegotiated or converted (either eventuality representing a "restructuring"), provided this restructuring of debt – in the view of CRA – will adversely affect the creditors (by putting them in a disadvantaged compared to the previous agreement) and the restructuring has its roots – in the view of CRA – in financial distress of the company / issuer or in another situation equivalent to an enforcement. Restructurings of substantial payment obligations may include (but are not limited to) the following:

- Changes of the due date of payment of interest or the interest rate (for example through the deferral, suspension or reduction of interest payments).
- Changes of the due date of payment or the amount of principal payments / nominal redemption amounts (for example through maturity extensions, reductions of the nominal amount, suspension or deferral of principal redemptions).
- Conversion of debt to equity (debt-equity swap).
- Conversion of debt to subordinate debt, mezzanine capital or debt with a different interest and redemption structure to the disadvantage of the creditors (for example through an agreement that does not necessarily involve a lower final interest rate, a

conversion of fixed interest rates into optional or suspended interest components, the changes of a gradual – “amortizing” – redemption structure to an interest-only “bullet” repayment scheme).

- Satisfaction of creditor claims on the basis of repaying less than the nominal redemption amount plus interest.

Financial distress of the company under review or another situation equivalent to an enforcement may include (but are not limited to) the following:

- CRA assumes that the company / issuer will not be able to meet its original payment obligations without restructuring its debt.
- The company / issuer has, directly or indirectly, indicated that an insolvency or a similar measure would be inevitable without a restructuring of its debt, that it would be unable to meet its original payment obligations without restructuring its debt or that it would attempt to – directly or indirectly – weaken the position of the creditors in another way if the creditors failed to approve its restructuring plans.

A company or issuer shall be deemed to have gone into a **Selective Default (SD)** for the purposes of our corporate ratings (corporate rating default criteria) when the following condition has been met:

- CRA assumes that a company / issuer has failed to comply with one or more specific substantial payment obligations in accordance with the above definition of a default, but no application for insolvency has yet been filed. This typically applies when other payment obligations or other creditors continue to be paid fully and on time (for example, while restructuring a debt instrument).
- Once the grounds for diagnosing a selective default (SD) no longer apply, for example: after a restructuring of debt has been completed, the rating will be promptly reviewed and raised to a level of creditworthiness above selective default, usually in the lower non-investment grade range.

If CRA assumes that the occurrence of one of the aforementioned default criteria is imminent, for example following corporate announcements of measures that have not yet been formally implemented, the company in question will usually be assigned to the lowest category of creditworthiness, i.e. “C (watch)”.

Creditreform Rating

Definition: Financial Ratios

Asset Structure

Fixed assets intensity (%) $= \frac{\text{Fixed assets}}{\text{Balance sheet total}} \times 100$

Asset turnover $= \frac{\text{Total revenue (Aggregate operating performance)}}{\text{Ø Balance sheet total}}$

Asset coverage ratio (%) $= \frac{\text{Adjusted equity + long-term debt}}{\text{Fixed assets}} \times 100$

Liquid funds to total assets (%) $= \frac{\text{Liquid funds}}{\text{Balance sheet total}} \times 100$

Capital Structure

Equity ratio (%) $= \frac{\text{Adjusted equity}}{\text{Balance sheet total}} \times 100$

Short-term-debt ratio (%) $= \frac{\text{Short-term debt}}{\text{Balance sheet total}} \times 100$

Long-term-debt ratio (%) $= \frac{\text{Long-term debt}}{\text{Balance sheet total}} \times 100$

Capital lock-up period (in days) $= \frac{\text{Trade accounts payable + Notes payable}}{\text{Sales revenue}} \times 365$

Trade-accounts-payable ratio (%) $= \frac{\text{Trade accounts payable}}{\text{Balance sheet total}} \times 100$

Short-term capital lock-up (%) $= \frac{\text{Short-term bank debts + other short-term debt + short-term bonds}}{\text{Sales revenue}} \times 100$

Ratio		Definition	
Gearing	=	(Total debt – liquid funds) / (Adjusted equity)	

Financial Stability

Ratio		Definition	
EBIT	=	Operating result	
EBITDA	=	Operating result + depreciations incl. amortization of goodwill – appreciation	
EBITDA adj.	=	Operating result + depreciations incl. amortization of goodwill – appreciation + non-operating expenses – non-operating income	
Liquid funds	=	Cash funds + securities (current assets)	
Cash flow margin (%)	=	(Cash flow) / (Total revenue (Aggregate operating performance))	x 100
Cash flow ROI (%)	=	(Cash flow) / (Balance sheet total)	x 100
Total debt / EBITDA adj.	=	(Total debt) / (EBITDA adj.)	
Net total debt / EBITDA adj.	=	(Total debt – liquid funds) / (EBITDA adj.)	
ROCE (%)	=	(EBIT + non-operating expenses - non-operating income) / (Adjusted equity + interest-bearing debt – liquid funds)	x 100
Total debt repayment period (years)	=	(Total debt) / (Cash flow from operating activities)	

Profitability

$$\text{Gross profit margin (\%)} = \frac{\text{Gross earnings}}{\text{Sales revenue}} \times 100$$

$$\text{EBIT interest coverage} = \frac{\text{EBIT}}{\text{Interest and similar expenses}}$$

$$\text{EBITDA interest coverage} = \frac{\text{EBITDA}}{\text{Interest and similar expenses}}$$

$$\text{Ratio of personnel costs to total costs (\%)} = \frac{\text{Personnel costs}}{\text{Total revenue (Aggregate operating performance)}} \times 100$$

$$\text{Ratio of material costs to total costs (\%)} = \frac{\text{Material costs}}{\text{Total revenue (Aggregate operating performance)}} \times 100$$

$$\text{Cost income ratio (\%)} = \frac{\text{Depreciations incl. amortization of goodwill + personnel costs+ material costs + other operating expenses}}{\text{Sales revenue + other operating income}} \times 100$$

$$\text{Ratio of interest expenses to total debt (\%)} = \frac{\text{Interest and similar expenses - discounting of pension accruals}}{\text{Total debt}} \times 100$$

$$\text{Return on investment (\%)} = \frac{\text{Annual net profit + interest result}}{\text{Balance sheet total}} \times 100$$

$$\text{Return on equity (\%)} = \frac{\text{Annual net profit}}{\text{Ø Adjusted equity}} \times 100$$

$$\text{Net profit margin (\%)} = \frac{\text{Annual net profit}}{\text{Total revenue (Aggregate operating performance)}} \times 100$$

$$\text{Interest burden (\%)} = \frac{\text{Results from ordinary business activity}}{\text{EBIT}} \times 100$$

Ratio		Formula	Factor
Operating margin (%)	=	EBIT / Total revenue (Aggregate operating performance)	x 100

Liquidity

Ratio		Formula	Factor
Cash ratio (%)	=	Cash funds / Short-term debt	x 100
Quick ratio (%)	=	Short-term current assets / Short-term debt	x 100
Current ratio (%)	=	Current assets / Short-term debt	x 100
Cash Conversion Cycle (days)	=	Inventory storage period (days) + receivables collection period (days) - payables settlement period (days)	
Inventory storage period (days)	=	Ø Inventories / Expenses for raw materials, consumables and supplies + expenses for purchased services	x 365
Receivables collection period (days)	=	Ø Trade accounts receivable / Sales revenue + inventory changes	x 365
Payables settlement period (days)	=	Ø Trade accounts payable / Expenses for raw materials, consumables and supplies + expenses for purchased services +Δ raw materials, consumables and supplies + Δ trade goods	x 365