DEUTSCHE BUNDESBANK
EUROSYSTEM

The Bundesbank's credit assessment system

Eligibility assessment

As part of Eurosystem monetary policy operations, it is possible for commercial banks to submit credit claims as collateral for refinancing operations at the Deutsche Bundesbank. For this, the borrowing enterprises must be considered **"eligible"**. This is examined in a credit assessment conducted by the Bundesbank. Enterprises can ask to be credit-assessed even if a credit claim in which they are the debtor is not submitted as collateral. In either case, the Bundesbank provides the enterprise with all the results of the credit assessment.

A description of the procedure for assessing enterprises (single entities and groups) reporting under national generally accepted accounting principles (German Commercial Code (Handelsgesetzbuch)) is given below. A separate leaflet outlines the procedure used to analyse groups reporting under the International Financial Reporting Standards (IFRS) (available at https://bundesbank.de/content/811976).

The aim of a credit assessment system is to estimate an enterprise's one-year probability of default (PD) on the basis of financial statements as precisely and reliably as possible. For that purpose, statistical methods are used to select the ratios which, when combined, are best able to predict an enterprise's PD.

Model development process: consensus approach

Financial statements prepared in accordance with the German Commercial Code (HGB) are analysed using what is known as a **consensus approach**. This approach is based on the assumption that every enterprise has a "true" credit assessment that cannot be observed directly but can instead be estimated by statistically processing multiple rating sources. The model development process comprises two phases.

– Replication of external ratings using a ratio-based model
Phase one uses a ratio-based model based on financial statements data to replicate, for every enterprise, the rating information available from banks using the internal ratings-based approach (IRB banks). The aim is to identify a combination of ratios that best explains the ratings of IRB banks for all the financial statements included in the calibration. Around 70 ratios are included in the selection process. The ratios that are ultimately selected should deliver forecasts of the highest possible quality and cover various mutually independent aspects such as capital structure, profitability, liquidity.

– Validation and recalibration
Phase two validates the ratio-based model on the basis of past observations of defaults as defined in Article 178 of the Capital Requirements Regulation (CRR) by assessing whether the model-estimated PDs match actual default rates. Significant mismatches result in the ratio-based model being adjusted to ensure that the model is both "as close to the market as possible" and delivers high-quality PD forecasts. By calibrating the model in this way, it is therefore possible to forecast an enterprise's credit quality even if current external rating information is not available for that enterprise.

Ratios

Two types of ratios are set out in the "outcome of the credit assessment":

– Model ratios
These are selected as part of the model development process. In combination, they deliver the best possible PD forecasts. The credit assessment assigns enterprises to 11 different sectors based on the industry they belong to. These include metals/transport equipment and wholesale trade, and there is a separate sector for groups. The model ratios are reselected every year for each of these sectors.

– Additional ratios
These are "classic" ratios which are generally of interest in the context of financial statement analyses, and they are also used in expert analysis to evaluate an enterprise's relative market position and trends. The four additional ratios selected are shown in the following table.

Ratio	Focus	Statement
Selected model ratios	**Included in PD calculation**	
Earnings before interest, taxes, depreciation and amortisation (EBITDA)	Operating profit or loss	Income from operating activities
Total debt ratio (adjusted)	Borrowed funds less group liabilities	Information on capital structure
Interest expense ratio	Interest expenses	Interest burden on total capital
Liquidity ratio	Means of payment	Share of cash and cash equivalents in total assets
Return on sales before extraordinary profit or loss	Result from ordinary activities	Ability to generate profit, adjusted for extraordinary influences
Short-term capital commitment (liabilities)	Current liabilities from the enterprise's direct activities	Fulfilment of short-term payment obligations from operating activities
Short-term financial liabilities ratio	Current financial liabilities	Notes on the structure of corporate finance
Cash flow return	Cash flow from operating activities	Cash and cash equivalents available for investment, repayments, etc.
Financial liabilities to equity ratio	Total financial liabilities	Indicator of financial stability
Additional ratios	**Included in expert analysis**	
Operating return	Operating profit or loss	Profit contribution from enterprise's core business activity
Debt repayment capability	Cash flow from operating activities	Possible debt reduction through cash inflows generated
Equity ratio (adjusted)	Equity	Financial stability and independence, ability to absorb losses
Accounts payable turnover in days	Trade accounts payable	Time period for settlement of trade payables from sales revenue

Source: Deutsche Bundesbank

The credit assessment process

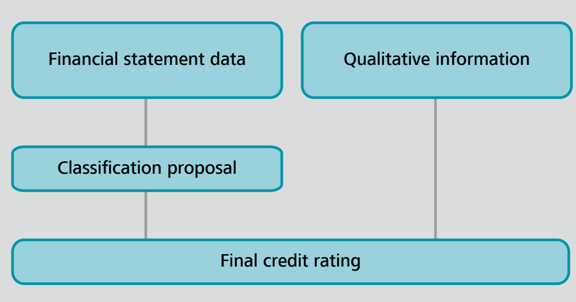
– Model proposal
In the first stage, the system initially calculates a classification proposal for the enterprise being assessed on the basis of the ratio-based model.

– Final credit rating
In the second stage, the analyst identifies and examines additional quantitative and, in particular, qualitative information relevant for assessment. This is mainly current information and assured business factors that are not contained in the ratio-based model. This also includes reports provided by credit institutions to the German and European credit register. Moreover, special factors and non-recurring effects that might have affected the ratios are taken into account. In addition, the analyst considers other important aspects, such as information on management quality, the assessment of market position and market opportunities/risks, industry conditions, dependence on customers or suppliers and third-party opinions as well as sustainability factors.

All available information and any group structures are used for an analysis that, to ensure a holistic assessment of the enterprise, covers strategic, financial, and profitability-related aspects.

The final credit rating consists of an expected PD value ranked by a **rating class** on a scale of 1 to 8 (between 2+ and 7-, in notches). Enterprises achieving a rating class between 1 and 4- are certified as being "eligible". Rating class 8 is reserved for defaulted enterprises. The table on the back of this leaflet depicts the scale of rating classes, enabling an approximate orientation with scales used by external rating agencies that are authorised within the Eurosystem credit assessment framework.

Stages in the credit assessment process



Source: Deutsche Bundesbank

Outcome of the credit assessment – overview and explanation of results

The first page of the "Ergebnisse der Bonitätsanalyse" (outcome of the credit assessment) provides an overview of the respective enterprise's results. This shows the enterprise's position in relation to enterprises in the same sector and turnover size category on the basis of a sector-related quintile analysis of the ratios, which allows conclusions to be drawn about company-specific strengths and weaknesses.

The ratios for three consecutive years are presented in a table, which highlights changes over time. The table shows the relevant individual figures for the enterprise under review and the comparable figures for the median and the indicator. The **indicator** is the position of the enterprise-specific ratio within the value range of the associated sector and turnover size category. The median lies in the exact middle of this value range. The indicator is expressed as follows where the ratio hypothesis "the higher, the better" is used:

--	below the first quintile,
-	between the first and second quintile,
∘	between the second and third quintile,
+	between the third and fourth quintile,
++	above the fourth quintile.

Where the ratio hypothesis "the lower, the better" is used, the sequence of the indicators is reversed.

The sectoral ratios are calculated on the basis of the financial statements of around 130,000 enterprises contained in the Bundesbank's Financial Statements Data Pool. If insufficient microdata are available to calculate sector ratios when an enterprise's financial statements are assessed, it is possible, for recent reporting years, to assign the enterprise not only, as usual, to an economic activity category (four-digit economic activity number) but also to the superordinate economic activity category (three-digit economic activity number). It may be necessary to assign the enterprise to a superordinate turnover size category as well in the absence of sufficient comparative data. However, it may not be possible to calculate the sectoral figures if comparable financial statements are not available.

The overview page is supplemented by charts depicting the enterprise's capital structure, financial position and results of operations over the last three years assessed.

The overview is followed by a page of explanatory notes on the depicted ratios and indicators. The respective enterprise's ranking in the NACE classification system, including the turnover size category, is also listed here.

Detailed sector ratios and cash flow statement

Furthermore, the analysed enterprise receives more detailed data pertaining to the model ratios and additional ratios as well as the **cash flow statement** determined by the Bundesbank. For the ratios, both the median and the quintile values for the sector and turnover size category of the enterprise are depicted in tables and charts using boxplots. The enterprise-specific ratios are also displayed in the tables and charts.

The cash flow statement is the basis for analysing an enterprise's activities from a financial angle and is divided into three blocks: "Current business operations", "Investment activities" and "Financing activities".

Imprint:
Deutsche Bundesbank, Wilhelm-Epstein-Straße 14, 60431 Frankfurt am Main
Last updated: December 2023

Credit rating classifications of the Deutsche Bundesbank and external credit rating agencies authorised in the Eurosystem

Credit rating	Eligible		Not eligible		
Eurosystem credit quality steps (CQSs)	1 - 2	3	4	5	6 - 8
Probability of default (PD)	PD ≤ 0.10 %	PD ≤ 0.40 %	PD ≤ 1.00 %	PD ≤ 1.50 %	PD > 1.50 %
Deutsche Bundesbank	**1/2+/2/2-/3+/3/3-**	**4+/4/4-**	**5+/5**	**5-**	**6+/6/6-/7+/7/7-/8**
DBRS Morningstar	AAA/AAH/AA/AAL/AH/A/AL	BBBH/BBB/BBBL	BBH	BB	BBL/BH/B/BL/CCC/CC/C/D
FitchRatings	AAA/AA+/AA/AA-/A+/A/A-	BBB+/BBB/BBB-	BB+	BB	BB-/B+/B/B-/CCC/CC/C/RD/D
Moody´s	Aaa/Aa1/Aa2/Aa3/A1/A2/A3	Baa1/Baa2/Baa3	Ba1	Ba2	Ba3/B1/B2/B3/Caa1/Caa2/Caa3/Ca/C
Standard & Poor´s	AAA/AA+/AA/AA-/A+/A/A-	BBB+/BBB/BBB-	BB+	BB	BB-/B+/B/B-/CCC/CC/C/SD/D
Scope Ratings	AAA/AA+/AA/AA-/A+/A/A-	BBB+/BBB/BBB-	BB+	BB	BB-/B+/B/B-/CCC/CC/C/SD/D

Source: Deutsche Bundesbank