

## CREDIT OPINION

26 February 2024

Update

Send Your Feedback

### Contacts

Andrea Wehmeier +49.69.70730.782  
 VP-Senior Analyst  
 andrea.wehmeier@moodys.com

Alexander Hendricks, +49.69.70730.779  
 CFA  
 Associate Managing Director  
 alexander.hendricks@moodys.com

Carola Schuler +49.69.70730.766  
 MD-Banking  
 carola.schuler@moodys.com

# Sparkassen-Finanzgruppe

Update following rating affirmation

## Summary

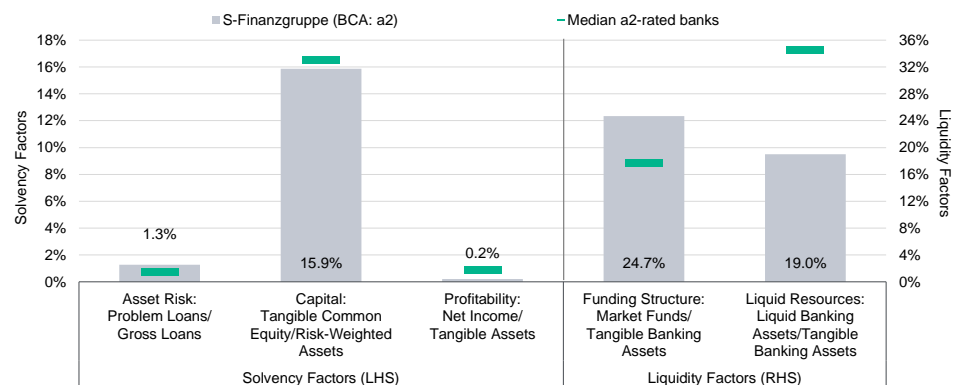
We affirmed [Sparkassen-Finanzgruppe's](#) (S-Finanzgruppe) Aa2 (stable) corporate family rating (CFR) on 02 February 2024, as well as the group's a2 Baseline Credit Assessment (BCA) and Adjusted BCA. S-Finanzgruppe, [Germany's](#) (Aaa, stable) largest banking group comprised of savings banks, Landesbanks and some specialized institutions, remains among the strongest banking groups globally.

The CFR reflects its a2 BCA and Adjusted BCA, two notches of rating uplift from our Advanced Loss Given Failure (LGF) analysis, which incorporates the relative loss severity of a liability class; and one notch of rating uplift from our assumption of moderate government support, reflecting S-Finanzgruppe's high market share and relevance for financial stability in Germany.

S-Finanzgruppe's a2 BCA is underpinned by the group's robustness given its defensive, deposit-focused funding franchise, with a leading market share in Germany. Its strong credit profile also benefits from its diversification and strong cohesion, limiting tail risks for S-Finanzgruppe. The rating further reflects a strong and stable capitalisation, benefitting from high profit retention, an improving profitability despite rising risk provisions and a good liquidity position.

Exhibit 1

### Rating Scorecard - Key financial ratios



The financial ratios for S-Finanzgruppe are as of year-end 2022.

Source: Moody's Financial Metrics™

In assigning the BCA and CFR to S-Finanzgruppe, we assess the group as if it operates as a single entity. This approach takes into consideration group member institutions' cohesion, solidarity — particularly among savings banks — and their high level of co-operation. However, the members of S-Finanzgruppe do not constitute a single entity that functions with centralised management and control at the group level. The BCA and CFR apply only to the creditworthiness of the group as a whole rather than to individual members of the group.

### Credit strengths

- » Strong capitalisation, which provides an ample buffer against unexpected shocks
- » Good asset quality, benefiting from its focus on domestic borrowers and a diversified loan book
- » Defensive funding profile, which benefits from prime access to German savings from granular retail, and small and medium-sized enterprise (SME) deposits

### Credit challenges

- » Germany's subdued economic performance pressures corporate credit quality, while tail risks with regards to commercial real exposures persist
- » Capital generation is entirely reliant on earnings retention given limited access to capital injections by public sector owners or its municipal trustees.
- » Decentralized legal structure of the group limits efficiency potential and implies higher complexity

### Outlook

The outlook on S-Finanzgruppe's CFR is stable, underpinned by its diversified banking model and the rating agency's expectation that its strong creditworthiness is unlikely to change materially. Despite a contained asset risk deterioration in coming quarters, the group's and member banks' creditworthiness will continue to benefit from a strong sector cohesion, a diversified risk profile, good capitalisation and highly defensive deposit franchise over the outlook horizon.

### Factors that could lead to an upgrade

- » While an upgrade of S-Finanzgruppe's BCA is unlikely, given its high level, a higher BCA could result from a meaningful improvement in its overall profitability and capitalisation without increasing its risk appetite.

### Factors that could lead to a downgrade

- » S-Finanzgruppe's ratings could be downgraded as a result of weaker sector cohesion amongst member banks, such as the denial of support for member banks in financially adverse situations, which appears unlikely given the recent strengthening of the IPS. Such a scenario would be accompanied by the costly loss of sector privilege, with negative repercussions for the overall credit profile for S-Finanzgruppe, but also for individual member banks' credit profiles.
- » Further, a weakening of asset quality beyond our expectations, reducing the current strong capital position, or a deterioration of profitability could lead to lower ratings.

This publication does not announce a credit rating action. For any credit ratings referenced in this publication, please see the issuer/deal page on <https://ratings.moody's.com> for the most updated credit rating action information and rating history.

## Key indicators

Exhibit 2

### Sparkassen-Finanzgruppe (Consolidated Financials) [1]

	12-22 <sup>2</sup>	12-21 <sup>2</sup>	12-20 <sup>2</sup>	12-19 <sup>2</sup>	12-18 <sup>2</sup>	CAGR/Avg. <sup>3</sup>
Total Assets (EUR Billion)	2,539.2	2,431.9	2,346.1	2,273.5	2,178.2	3.9 <sup>4</sup>
Total Assets (USD Billion)	2,709.9	2,755.7	2,870.6	2,552.0	2,490.0	2.1 <sup>4</sup>
Tangible Common Equity (EUR Billion)	183.7	178.3	173.7	173.0	167.8	2.3 <sup>4</sup>
Tangible Common Equity (USD Billion)	196.1	202.0	212.6	194.2	191.9	0.5 <sup>4</sup>
Tangible Common Equity / Risk Weighted Assets (%)	15.9	15.9	16.5	16.4	16.6	16.3 <sup>5</sup>
Net Interest Margin (%)	1.2	1.1	1.2	1.3	1.3	1.2 <sup>5</sup>
PPI / Average RWA (%)	1.5	1.0	1.0	1.0	1.1	1.1 <sup>5</sup>
Net Income / Tangible Assets (%)	0.2	0.2	0.2	0.3	0.2	0.2 <sup>5</sup>
Cost / Income Ratio (%)	62.5	71.0	71.6	73.5	70.8	69.9 <sup>5</sup>
Market Funds / Tangible Banking Assets (%)	24.7	26.6	26.2	25.7	26.6	26.0 <sup>5</sup>
Liquid Banking Assets / Tangible Banking Assets (%)	19.0	20.3	19.7	17.2	17.1	18.7 <sup>5</sup>
Gross Loans / Due to Customers (%)	97.2	96.1	94.3	97.4	98.0	96.6 <sup>5</sup>

[1] All figures and ratios are adjusted using Moody's standard adjustments. [2] Basel III - fully loaded or transitional phase-in; LOCAL GAAP. [3] May include rounding differences because of the scale of reported amounts. [4] Compound annual growth rate (%) based on the periods for the latest accounting regime. [5] Simple average of Basel III periods. [6] Simple average of periods for the latest accounting regime.

Sources: Moody's Investors Service and company filings

## Profile

Sparkassen-Finanzgruppe (S-Finanzgruppe) is a German financial institutions group that consists of more than 500 independent enterprises, including 353 savings banks as of October 2023; six central institutions, including five Landesbanks, the eight Landesbausparkassen (regional building societies) and eight primary insurance groups, and a number of other financial service companies.

As Germany's largest banking group, S-Finanzgruppe has a market share for lending to domestic companies and self-employed individuals of around 40%, and around 35% for mortgage lending to private households. As of 31 December 2022, S-Finanzgruppe reported total aggregated assets of €2.5 trillion (2021 and 2020: €2.4 trillion), of which almost two-thirds relate to the group of savings banks (2020: 61%; 2019: 59%).

Entities of S-Finanzgruppe are independent and managed on a decentralised basis. Most of the group's savings banks are institutions incorporated under public law and operate under municipal trusteeship. For more information, please see S-Finanzgruppe's [Issuer Profile](#), the [German Banking System Profile](#) and the [update](#) on the German banking system published on 1 March 2023, when we changed the outlook on the German banking system to stable because of its stable asset quality and better earnings prospects in view of the rising rates.

## Detailed credit considerations

### Focus on lending activities to the German economy exposes S-Finanzgruppe to the domestic economic cycle

S-Finanzgruppe's Asset Risk score of a1 one notch below the initial aa3 score reflects S-Finanzgruppe strong risk profile as visible in the non-performing loan ratio of 1.26%, that benefits from a combination of low risk retail exposures and a strong diversification across all economic sectors, but also some moderate tail risk from concentrations in highly cyclical sectors such as commercial real estate.

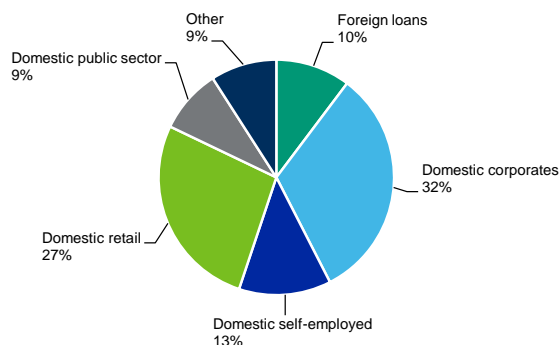
The group perspective reveals a well-diversified loan book, a focus on mortgages for retail clients and domestic corporates and limited international or non-core exposures. The strong foundation is the low risk book of retail mortgages, where we expect an ongoing healthy performance, as unemployment rates will remain stable and low. Corporate lending is more exposed to the economic lackluster recovery in Germany, however, we only expect a moderate increase in loan loss charges, though the provisioning needs will be higher for highly cyclical exposures such as commercial real estate.

Some member banks, however, need to manage risk concentrations in export-driven industries, such as automotive and cyclical commercial real estate, which are key features of Germany's economic structure.

Exhibit 3

**S-Finanzgruppe's loan book breakdown shows focus on domestic retail and domestic corporate clients**

Data as of June 2023



Aggregate Landesbank and Savings Bank data

Source: Deutsche Bundesbank

As of year-end 2022, the financially stronger savings banks accounted for around 64% of the aggregate assets of savings banks and Landesbanks, whereas a decade earlier, the financially weaker Landesbanks contributed most of the combined assets. This shift towards the more stable, primarily retail-client-focused savings banks — together with the long-term de-risking and restructuring of Landesbanks, which started after the global financial crisis — has resulted in a significant decline in the group's asset risks, which now better reflect the economic strengths and challenges of its home market.

**Sound capital provides an ample buffer against unexpected shocks**

Our assigned aa2 Capital score for S-Finanzgruppe, one notch above the initial score, reflects the group's strong 15.9% Tangible Common Equity (TCE) Ratio, additional capital-equivalent reserves that provide further protection, conservatively managed risk weighted assets (RWA), but also certain limitations around capital fungibility within members of the group and challenges around access to external capital sources.

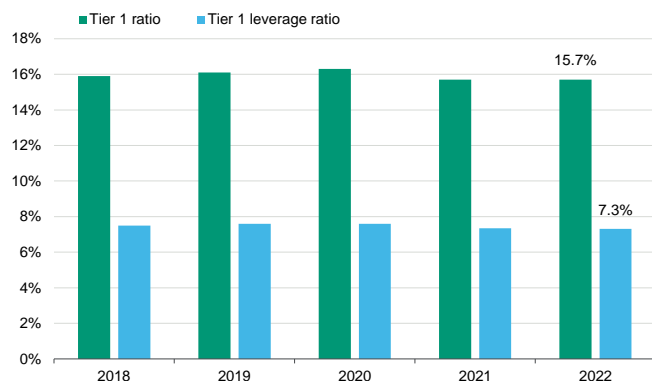
Our assessment takes into account S-Finanzgruppe's substantial buffer against severe economic downturns, that not only reflect S-Finanzgruppe's reported Tier 1 ratio of 15.7% as of year-end 2022, but additional fully taxed reserves, which are undisclosed and exist in accordance with local accounting rules (Handelgesetzbuch [HGB]), particularly at the primary bank level, hence, the savings banks.

The aa2 Capital score also reflects the solid Tier 1 leverage ratio of 7.3%, underpinning S-Finanzgruppe's conservative RWA management, with most of the savings banks applying the standard approach, with model driven RWA calculations dominating at the Landesbank level. For the group, RWA stood at 46% of total assets.

We do expect capital ratios of S-Finanzgruppe to have improved in 2023, reflecting a significant improved profitability, with most profits being retained, and then stabilise in 2024. A less dynamic earnings momentum going forward because of higher funding costs and increasing risk costs reflecting a moderate deteriorating asset quality, which leads to higher RWA despite still limited lending growth are key drivers.

Exhibit 4

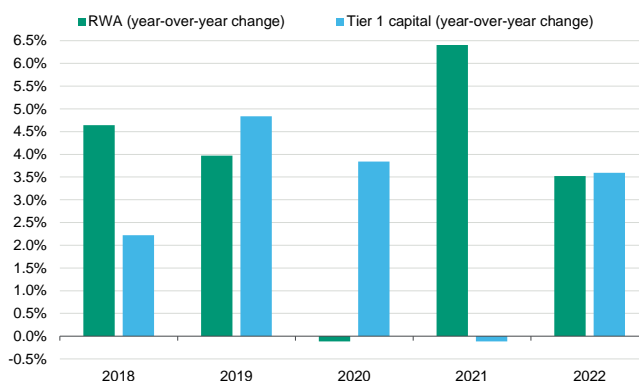
#### S-Finanzgruppe's Tier 1 and leverage ratios have been broadly stable over the last five years



Tier 1 leverage ratio: Compares average Tier 1 capital with average total assets  
Source: DSGV

Exhibit 5

#### RWA growth is usually funded by high earnings retention



Source: DSGV

Given the decentralised structure of S-Finanzgruppe, capital fungibility is somewhat more limited, though the IPS provides access to the capital reserves of members in the case of need. However, a consolidated banking group enjoys more flexibility around capital allocation than S-Finanzgruppe, which consists of legally independent entities. As S-Finanzgruppe members are either owned by public sector entities, or are under municipal trusteeship, external capital is less available than for listed, public companies, as owners need to comply with state aid rules and capital hikes are more complex.

Our capital assessment for S-Finanzgruppe further takes into consideration certain advantages, which arise from their mutual support, codified in the group's set of several IPS<sup>1</sup>. Member banks of S-Finanzgruppe benefit from the omission of large lending limits and lower regulatory capital requirements because intragroup exposures benefit from 0% risk weight. Losing these sector-specific regulations, for example, triggered by the absence of support for a troubled member bank, will have negative repercussions for their capital ratios. Although such a scenario is unlikely, the effect would be significantly negative for creditors.

#### Normalized interest rates support a sustainably improved profitability ; challenges include rising risk costs and deposit repricing

S-Finanzgruppe's assigned ba2 Profitability score, two notches above the initial b1 score reflects both our expectations around the sustainably improved profitability of S-Finanzgruppe's profitability in a normalised rates environment, and that reported profitability understates the underlying strength of the group's financial performance.

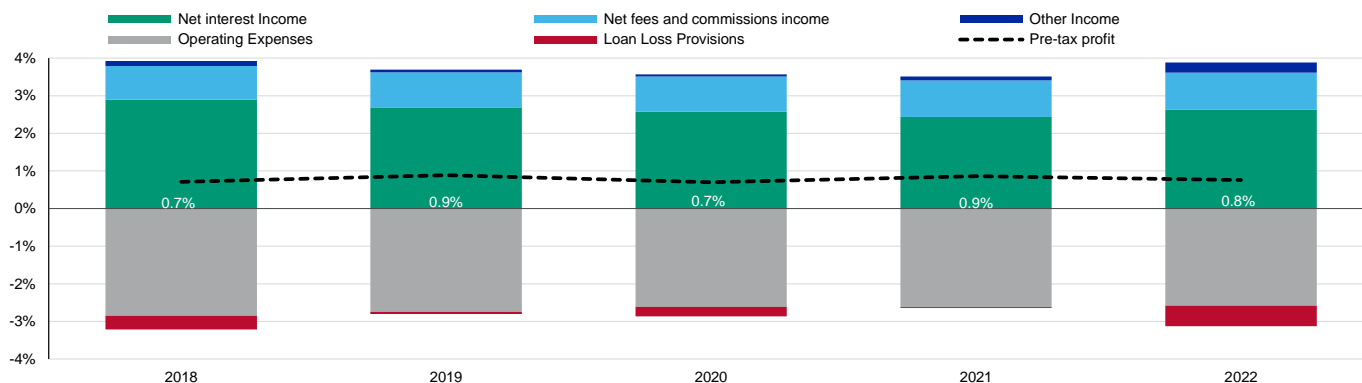
Higher rates, benefiting net interest income (NII) and improved margins because of very slow deposit repricing combined with still low risk cost will support S-Finanzgruppe's aggregate earnings. Profit retention will remain high, not only because of limited pay-outs to owners, but also because of the creation of further capital reserves via risk provisions, a well-established process under German GAAP, that leads to an understatement of reported profitability and to the accumulation of capital reserves.

Profitability will continue to benefit from normalized interest rates in 2024. However, the negative repercussions from the slowdown in the economy, which will lead to an increase in risk costs, particularly for commercial real estate and corporate exposures, deposit repricing, combined with the cost management because of inflationary pressures are among the challenges and will become more visible in 2024.

Significantly higher profits in 2023 are supported by both, savings banks and Landesbanks after the latter were the main profit contributor in 2022, signaling the completed de-risking and downsizing of Landesbanks in 2021, but also the impact of higher rates on the then largely unhedged securities portfolios of the savings banks, leading to higher loan loss provisions. We expect the evaluations to recover over time, as the high quality securities portfolios imply limited credit risks, providing tail winds to the group's profitability going forward.

Exhibit 6

S-Finanzgruppe's profitability structure has been stable over the last five years.



Profit and loss components in % of average risk-weighted assets

Source: DSGV

In 2022, Sparkassen-Finanzgruppe's cost-to-income ratio declined to 62.5% from around 70%-75% in previous years, because revenue growth outpaced a highly contained rise in costs. The achieved level is now more in line with international peers, though the revenue focused improvements are more challenging to defend in an adverse environment compared with a good cost-income ratio that is based on a more flexible cost base.

### Strong funding benefiting from prime access to German depositors

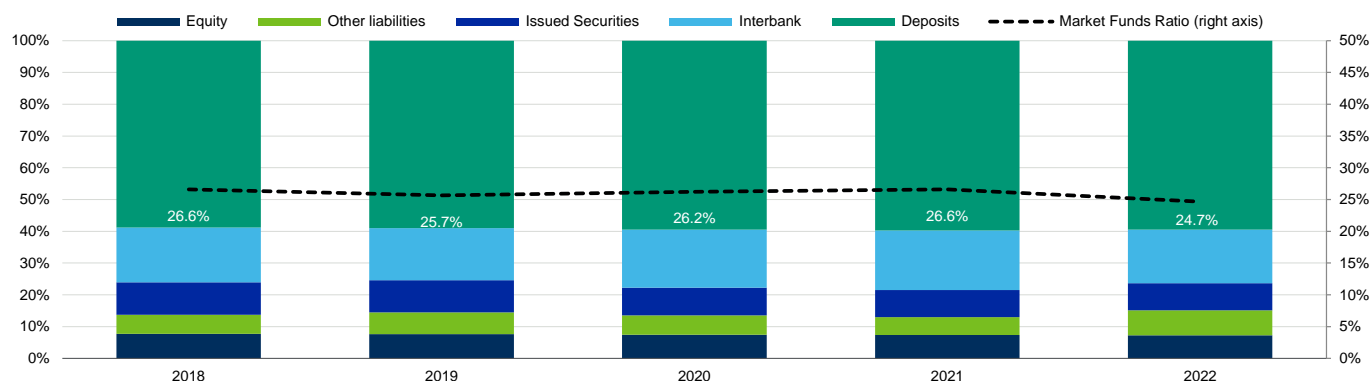
S-Finanzgruppe's credit strength is strongly supported by its funding profile. This view is reflected in our assigned a1 Funding Structure score, which is three notches above the group's baa1 initial score, based on a 24.7% market funds ratio. The positive adjustments take into account the leading market share for retail deposits and S-Finanzgruppe's role as a safe haven and the more limited market funding dependence of members than initially suggested by the numbers.

Our assessment reflects S-Finanzgruppe's strong market position, with leading market shares and the observed inflow of deposits, particularly at the savings banks level during economically adverse situation. However, also other member banks benefit from the positive effect, as the sector's institutional protection scheme limits risks for investors.

Aside of €1.5 trillion in deposits, S-Finanzgruppe's funding comprised of €455 billion of interbank exposures and €419 billion of securities as of year-end 2022, basis for the initial market funding ratio of 24.7%, that is derived from the aggregated financials.

Further, the reported aggregated numbers significantly overstate the underlying market funding dependence. Interbank funding includes - besides the temporary recourse to the European Central Bank's TLTRO - intra-sector funding, particularly excess liquidity on the primary bank level that is made available to other members, as the entity reports aggregated and not consolidated numbers, that would eliminate such intragroup exposures. Further, S-Finanzgruppe's member banks enjoy a well-developed covered bond franchise and good access to state development funding, both refinancing sources with no or lower dependence on market sentiment.

Exhibit 7

**S-Finanzgruppe benefits from a strong retail deposit base**

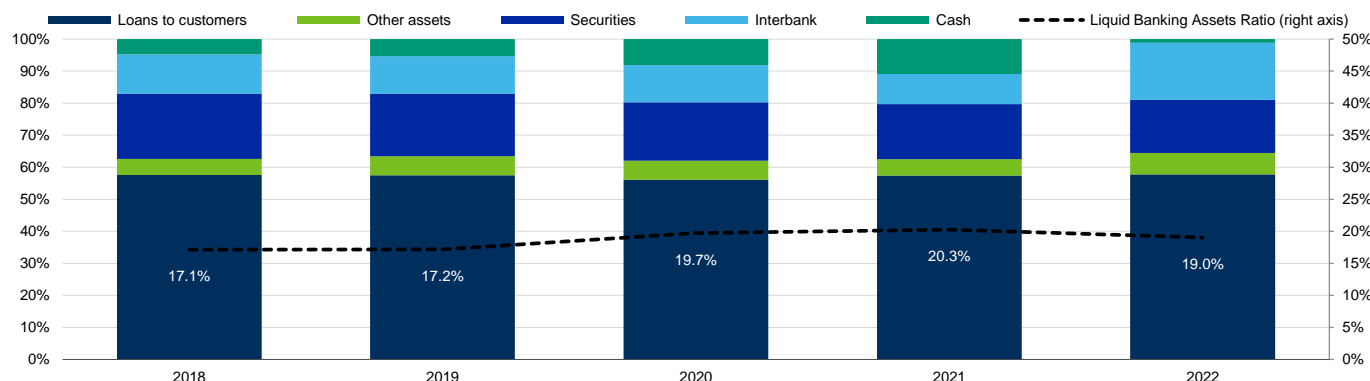
Market funds ratio = Market funds/tangible banking assets

Source: DSGV

**Sizeable liquidity supported by high-quality financial securities**

S-Finanzgruppe's assigned Liquid Resources score of baa1 is one notch above the group's initial baa2 score, derived from 19.0% of liquid assets. Our positive adjustment is based on additional available, high quality and ECB-eligible securities, that provide a further liquidity cushion, but also considers certain consolidation effects and asset encumbrance.

Exhibit 8

**S-Finanzgruppe's liquid assets have remained stable with the focus shifting to interbank**

Liquid banking assets ratio = Liquid banking assets/tangible banking assets

Source: DSGV

S-Finanzgruppe's liquidity strongly supports our assessment of the group's favourable credit profile. As of year-end 2022, aggregate liquid assets within the group consisted of €28 billion in cash and €455 billion in claims on banks. S-Finanzgruppe's €419 billion of financial securities, of which a significant part is ECB eligible and of high quality are not included in the ratio of liquid assets but provide additional resources in case of need. On the other hand, the reported ratio is somewhat overstated as it includes parts of the upstreamed excess deposits of savings banks.

The sectors sound liquidity profile is underpinned by the regulatory liquidity coverage ratios: The savings banks' liquidity coverage ratio (LCR) stood at 168% as of year-end 2022<sup>2</sup> while the reported LCRs for Landesbanks ranged between 135% and 210% in 2023.

**Strong+ macro profile**

S-Finanzgruppe's BCA is supported by its Strong+ macro profile, which is derived from the group's weighted average credit exposures, reflecting an around 80% exposure to Germany, around 15% to the European Union (EU) and around 5% worldwide. S-Finanzgruppe's

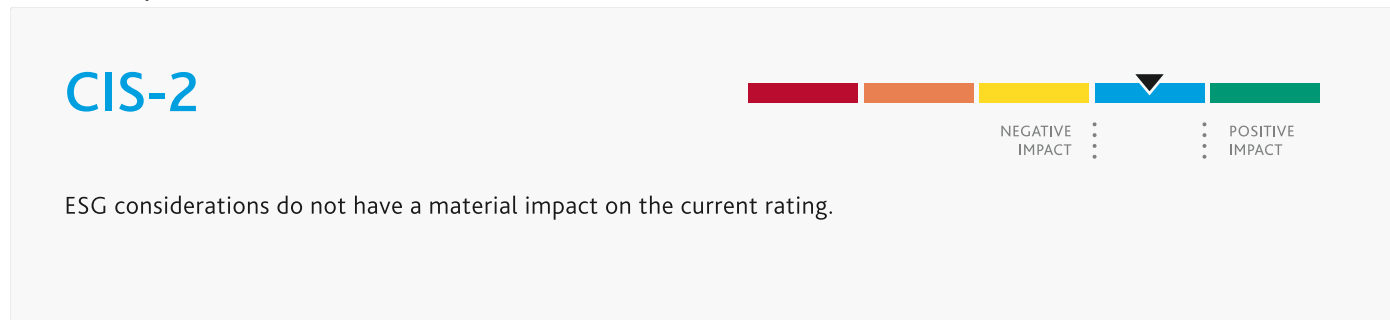
Strong+ macro profile matches the assigned German macro profile, which is largely determined by the country's very high economic, institutional and government financial strength, and very low susceptibility to event risk.

## ESG considerations

### Sparkassen-Finanzgruppe's ESG credit impact score is CIS-2

Exhibit 9

#### ESG credit impact score



Source: Moody's Investors Service

Sparkassen-Finanzgruppe's **CIS-2** indicates that ESG considerations have no material impact on the current ratings.

Exhibit 10

#### ESG issuer profile scores



Source: Moody's Investors Service

### Environmental

Sparkassen-Finanzgruppe faces moderate exposure to environmental risks primarily because of its member banks' portfolio exposure to carbon transition risks. In line with its peers, Sparkassen-Finanzgruppe is facing mounting business risks and stakeholder pressure to meet broader carbon transition goals. Carbon transition risks relate mostly to the member banks' corporate loan book. In response, the member banks are actively engaging in optimising their loan portfolios towards less carbon-intensive assets, though progress varies significantly amongst members.

### Social

Sparkassen-Finanzgruppe's members face high industrywide customer relations risks related to regulatory risk, litigation exposure and high compliance standards in their operations. High cyber and personal data risks are mitigated by technology solutions and organisational measures to prevent data breaches. Sparkassen-Finanzgruppe has highly negative credit exposure to customer relations risks, which is in line with the banks sector's high inherent exposure to this risk category in our social risk heat map.

### Governance

Sparkassen-Finanzgruppe faces low governance risks. The member banks' risk management and financial strategy as reflected in a recovered profitability are in line with industry practices. This also applies to policies and procedures, despite Sparkassen-Finanzgruppe's decentralized structure which entails a meaningful degree of autonomy for member banks in setting business strategy and risk appetite. The strengthened Institutional Protection Scheme (IPS) ensures better cohesion among member banks due to tighter support governance expectations and practices within the decentralized structure, despite certain limitations to central empowerment and



higher co-ordination needs around strategic decisions. With regards to the composition of board of directors, representatives of public sector owners play a prominent role. Germany's developed institutional framework mitigates associated governance risks.

ESG Issuer Profile Scores and Credit Impact Scores for the rated entity/transaction are available on Moodys.com. In order to view the latest scores, please click [here](#) to go to the landing page for the entity/transaction on MDC and view the ESG Scores section.

## Support and structural considerations

### Notching for CFR

S-Finanzgruppe is a conglomerate of diverse financial institutions in Germany. Therefore, it is not a banking group in the context of the European Capital Requirement Regulation. S-Finanzgruppe is, therefore, not a regulated group (Konzern), but all of its affiliated institutions are subject to the applicable regulation for banks or other financial institutions. As a result, the EU's Bank Recovery and Resolution Directive, which is an operational resolution regime, does not apply to S-Finanzgruppe but only to its member banking institutions individually. Thus, our CFR for S-Finanzgruppe reflects the risk characteristics of a notional single class of debt assumed to fund its aggregate balance sheet.

Our Advanced LGF analysis suggests that this notional instrument would face very low losses in resolution. This results in two notches of uplift to the CFR compared with S-Finanzgruppe's BCA of a2, and hence, a Preliminary Rating Assessment of aa3.

### Government support considerations

We expect a moderate probability of government support, resulting in a one-notch rating uplift for S-Finanzgruppe. Our government support assumption reflects S-Finanzgruppe's size and high relevance to Germany's financial stability.

## Methodology and scorecard

### Methodology

The principal methodology we use in rating S-Finanzgruppe is the [Banks Methodology](#), published in July 2021.

### About Moody's Bank Scorecard

Our scorecard is designed to capture, express and explain in summary form our Rating Committee's judgement. When read in conjunction with our research, a fulsome presentation of our judgement is expressed. As a result, the output of our scorecard may materially differ from that suggested by raw data alone (though it has been calibrated to avoid the frequent need for strong divergence). The scorecard output and the individual scores are discussed in rating committees and may be adjusted up or down to reflect conditions specific to each rated entity.

## Rating methodology and scorecard factors

Exhibit 11

### Sparkassen-Finanzgruppe

Macro Factors							
Weighted Macro Profile		Strong +	100%				
Factor	Historic Ratio	Initial Score	Expected Trend	Assigned Score	Key driver #1	Key driver #2	
Solvency							
Asset Risk							
Problem Loans / Gross Loans	-	-	-	a1	Quality of assets	Sector concentration	
Capital							
Tangible Common Equity / Risk Weighted Assets (Basel III - transitional phase-in)	15.9%	aa3	↑	aa2	Capital retention	Capital fungibility	
Profitability							
Net Income / Tangible Assets	0.2%	b1	↑	ba2	Return on assets	Expected trend	
Combined Solvency Score		a2		a2			
Liquidity							
Funding Structure							
Market Funds / Tangible Banking Assets	24.7%	baa1	↑↑	a1	Market funding quality	Deposit quality	
Liquid Resources							
Liquid Banking Assets / Tangible Banking Assets	19.0%	baa2	↑	baa1	Quality of liquid assets	Additional liquidity resources	
Combined Liquidity Score		baa1		a2			
Financial Profile							
Qualitative Adjustments				Adjustment			
Business Diversification				0			
Opacity and Complexity				0			
Corporate Behavior				0			
Total Qualitative Adjustments				0			
Sovereign or Affiliate constraint				Aaa			
BCA Scorecard-indicated Outcome - Range				a1 - a3			
Assigned BCA				a2			
Affiliate Support notching				0			
Adjusted BCA				a2			

**Balance Sheet is not applicable.**

[1] Where dashes are shown for a particular factor (or sub-factor), the score is based on non-public information.

Source: Moody's Investors Service

## Ratings

Exhibit 12

Category	Moody's Rating
<b>SPARKASSEN-FINANZGRUPPE</b>	
Outlook	Stable
Baseline Credit Assessment	a2
Adjusted Baseline Credit Assessment	a2
Corporate Family Rating -Dom Curr	Aa2

Source: Moody's Investors Service

## Endnotes

- [1](#) This scheme includes rules for mutual support within groups of banks to ensure the liquidity and solvency of their member institutions.
- [2](#) Source: DSGVO.

© 2024 Moody's Corporation, Moody's Investors Service, Inc., Moody's Analytics, Inc. and/or their licensors and affiliates (collectively, "MOODY'S"). All rights reserved. CREDIT RATINGS ISSUED BY MOODY'S CREDIT RATINGS AFFILIATES ARE THEIR CURRENT OPINIONS OF THE RELATIVE FUTURE CREDIT RISK OF ENTITIES, CREDIT COMMITMENTS, OR DEBT OR DEBT-LIKE SECURITIES, AND MATERIALS, PRODUCTS, SERVICES AND INFORMATION PUBLISHED OR OTHERWISE MADE AVAILABLE BY MOODY'S (COLLECTIVELY, "MATERIALS") MAY INCLUDE SUCH CURRENT OPINIONS. MOODY'S DEFINES CREDIT RISK AS THE RISK THAT AN ENTITY MAY NOT MEET ITS CONTRACTUAL FINANCIAL OBLIGATIONS AS THEY COME DUE AND ANY ESTIMATED FINANCIAL LOSS IN THE EVENT OF DEFAULT OR IMPAIRMENT. SEE APPLICABLE MOODY'S RATING SYMBOLS AND DEFINITIONS PUBLICATION FOR INFORMATION ON THE TYPES OF CONTRACTUAL FINANCIAL OBLIGATIONS ADDRESSED BY MOODY'S CREDIT RATINGS. CREDIT RATINGS DO NOT ADDRESS ANY OTHER RISK, INCLUDING BUT NOT LIMITED TO: LIQUIDITY RISK, MARKET VALUE RISK, OR PRICE VOLATILITY. CREDIT RATINGS, NON-CREDIT ASSESSMENTS ("ASSESSMENTS"), AND OTHER OPINIONS INCLUDED IN MOODY'S MATERIALS ARE NOT STATEMENTS OF CURRENT OR HISTORICAL FACT. MOODY'S MATERIALS MAY ALSO INCLUDE QUANTITATIVE MODEL-BASED ESTIMATES OF CREDIT RISK AND RELATED OPINIONS OR COMMENTARY PUBLISHED BY MOODY'S ANALYTICS, INC. AND/OR ITS AFFILIATES. MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND MATERIALS DO NOT CONSTITUTE OR PROVIDE INVESTMENT OR FINANCIAL ADVICE, AND MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND MATERIALS ARE NOT AND DO NOT PROVIDE RECOMMENDATIONS TO PURCHASE, SELL, OR HOLD PARTICULAR SECURITIES. MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND MATERIALS DO NOT COMMENT ON THE SUITABILITY OF AN INVESTMENT FOR ANY PARTICULAR INVESTOR. MOODY'S ISSUES ITS CREDIT RATINGS, ASSESSMENTS AND OTHER OPINIONS AND PUBLISHES OR OTHERWISE MAKES AVAILABLE ITS MATERIALS WITH THE EXPECTATION AND UNDERSTANDING THAT EACH INVESTOR WILL, WITH DUE CARE, MAKE ITS OWN STUDY AND EVALUATION OF EACH SECURITY THAT IS UNDER CONSIDERATION FOR PURCHASE, HOLDING, OR SALE.

MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS, AND MATERIALS ARE NOT INTENDED FOR USE BY RETAIL INVESTORS AND IT WOULD BE RECKLESS AND INAPPROPRIATE FOR RETAIL INVESTORS TO USE MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS OR MATERIALS WHEN MAKING AN INVESTMENT DECISION. IF IN DOUBT YOU SHOULD CONTACT YOUR FINANCIAL OR OTHER PROFESSIONAL ADVISER.

ALL INFORMATION CONTAINED HEREIN IS PROTECTED BY LAW, INCLUDING BUT NOT LIMITED TO, COPYRIGHT LAW, AND NONE OF SUCH INFORMATION MAY BE COPIED OR OTHERWISE REPRODUCED, REPACKAGED, FURTHER TRANSMITTED, TRANSFERRED, DISSEMINATED, REDISTRIBUTED OR RESOLD, OR STORED FOR SUBSEQUENT USE FOR ANY SUCH PURPOSE, IN WHOLE OR IN PART, IN ANY FORM OR MANNER OR BY ANY MEANS WHATSOEVER, BY ANY PERSON WITHOUT MOODY'S PRIOR WRITTEN CONSENT. FOR CLARITY, NO INFORMATION CONTAINED HEREIN MAY BE USED TO DEVELOP, IMPROVE, TRAIN OR RETRAIN ANY SOFTWARE PROGRAM OR DATABASE, INCLUDING, BUT NOT LIMITED TO, FOR ANY ARTIFICIAL INTELLIGENCE, MACHINE LEARNING OR NATURAL LANGUAGE PROCESSING SOFTWARE, ALGORITHM, METHODOLOGY AND/OR MODEL.

MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND MATERIALS ARE NOT INTENDED FOR USE BY ANY PERSON AS A BENCHMARK AS THAT TERM IS DEFINED FOR REGULATORY PURPOSES AND MUST NOT BE USED IN ANY WAY THAT COULD RESULT IN THEM BEING CONSIDERED A BENCHMARK.

All information contained herein is obtained by MOODY'S from sources believed by it to be accurate and reliable. Because of the possibility of human or mechanical error as well as other factors, however, all information contained herein is provided "AS IS" without warranty of any kind. MOODY'S adopts all necessary measures so that the information it uses in assigning a credit rating is of sufficient quality and from sources MOODY'S considers to be reliable including, when appropriate, independent third-party sources. However, MOODY'S is not an auditor and cannot in every instance independently verify or validate information received in the credit rating process or in preparing its Materials.

To the extent permitted by law, MOODY'S and its directors, officers, employees, agents, representatives, licensors and suppliers disclaim liability to any person or entity for any indirect, special, consequential, or incidental losses or damages whatsoever arising from or in connection with the information contained herein or the use of or inability to use any such information, even if MOODY'S or any of its directors, officers, employees, agents, representatives, licensors or suppliers is advised in advance of the possibility of such losses or damages, including but not limited to: (a) any loss of present or prospective profits or (b) any loss or damage arising where the relevant financial instrument is not the subject of a particular credit rating assigned by MOODY'S.

To the extent permitted by law, MOODY'S and its directors, officers, employees, agents, representatives, licensors and suppliers disclaim liability for any direct or compensatory losses or damages caused to any person or entity, including but not limited to by any negligence (but excluding fraud, willful misconduct or any other type of liability that, for the avoidance of doubt, by law cannot be excluded) on the part of, or any contingency within or beyond the control of, MOODY'S or any of its directors, officers, employees, agents, representatives, licensors or suppliers, arising from or in connection with the information contained herein or the use of or inability to use any such information.

NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE ACCURACY, TIMELINESS, COMPLETENESS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF ANY CREDIT RATING, ASSESSMENT, OTHER OPINION OR INFORMATION IS GIVEN OR MADE BY MOODY'S IN ANY FORM OR MANNER WHATSOEVER.

Moody's Investors Service, Inc., a wholly-owned credit rating agency subsidiary of Moody's Corporation ("MCO"), hereby discloses that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by Moody's Investors Service, Inc. have, prior to assignment of any credit rating, agreed to pay to Moody's Investors Service, Inc. for credit ratings opinions and services rendered by it. MCO and Moody's Investors Service also maintain policies and procedures to address the independence of Moody's Investors Service credit ratings and credit rating processes. Information regarding certain affiliations that may exist between directors of MCO and rated entities, and between entities who hold credit ratings from Moody's Investors Service, Inc. and have also publicly reported to the SEC an ownership interest in MCO of more than 5%, is posted annually at [www.moody's.com](http://www.moody's.com) under the heading "Investor Relations — Corporate Governance — Charter Documents - Director and Shareholder Affiliation Policy."

Moody's SF Japan K.K., Moody's Local AR Agente de Calificación de Riesgo S.A., Moody's Local BR Agência de Classificação de Risco LTDA, Moody's Local MX S.A. de C.V., I.C.V., Moody's Local PE Clasificadora de Riesgo S.A., and Moody's Local PA Clasificadora de Riesgo S.A. (collectively, the "Moody's Non-NRSRO CRAs") are all indirectly wholly-owned credit rating agency subsidiaries of MCO. None of the Moody's Non-NRSRO CRAs is a Nationally Recognized Statistical Rating Organization.

Additional terms for Australia only: Any publication into Australia of this document is pursuant to the Australian Financial Services License of MOODY'S affiliate, Moody's Investors Service Pty Limited ABN 61 003 399 657AFSL 336969 and/or Moody's Analytics Australia Pty Ltd ABN 94 105 136 972 AFSL 383569 (as applicable). This document is intended to be provided only to "wholesale clients" within the meaning of section 761G of the Corporations Act 2001. By continuing to access this document from within Australia, you represent to MOODY'S that you are, or are accessing the document as a representative of, a "wholesale client" and that neither you nor the entity you represent will directly or indirectly disseminate this document or its contents to "retail clients" within the meaning of section 761G of the Corporations Act 2001. MOODY'S credit rating is an opinion as to the creditworthiness of a debt obligation of the issuer, not on the equity securities of the issuer or any form of security that is available to retail investors.

Additional terms for India only: Moody's credit ratings, Assessments, other opinions and Materials are not intended to be and shall not be relied upon or used by any users located in India in relation to securities listed or proposed to be listed on Indian stock exchanges.

Additional terms with respect to Second Party Opinions (as defined in Moody's Investors Service Rating Symbols and Definitions): Please note that a Second Party Opinion ("SPO") is not a "credit rating". The issuance of SPOs is not a regulated activity in many jurisdictions, including Singapore. JAPAN: In Japan, development and provision of SPOs fall under the category of "Ancillary Businesses", not "Credit Rating Business", and are not subject to the regulations applicable to "Credit Rating Business" under the Financial Instruments and Exchange Act of Japan and its relevant regulation. PRC: Any SPO: (1) does not constitute a PRC Green Bond Assessment as defined under any relevant PRC laws or regulations; (2) cannot be included in any registration statement, offering circular, prospectus or any other documents submitted to the PRC regulatory authorities or otherwise used to satisfy any PRC regulatory disclosure requirement; and (3) cannot be used within the PRC for any regulatory purpose or for any other purpose which is not permitted under relevant PRC laws or regulations. For the purposes of this disclaimer, "PRC" refers to the mainland of the People's Republic of China, excluding Hong Kong, Macau and Taiwan.

**Contacts**

Ibrahim Kara                    +49.69.86790.2103  
*Sr Ratings Associate*  
ibrahim.kara@moodys.com