

CREDIT OPINION

5 March 2025

Update



Send Your Feedback

RATINGS

Hamburg Commercial Bank AG

Domicile	Hamburg, Germany
Long Term CRR	A3
Type	LT Counterparty Risk Rating - Fgn Curr
Outlook	Not Assigned
Long Term Debt	A3
Type	Senior Unsecured - Fgn Curr
Outlook	Stable
Long Term Deposit	A3
Type	LT Bank Deposits - Fgn Curr
Outlook	Stable

Please see the [ratings section](#) at the end of this report for more information. The ratings and outlook shown reflect information as of the publication date.

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 +49.69.7073.0766
MD-Banking
carola.schuler@moodys.com

» Contacts continued on last page

Hamburg Commercial Bank AG

Update to credit analysis

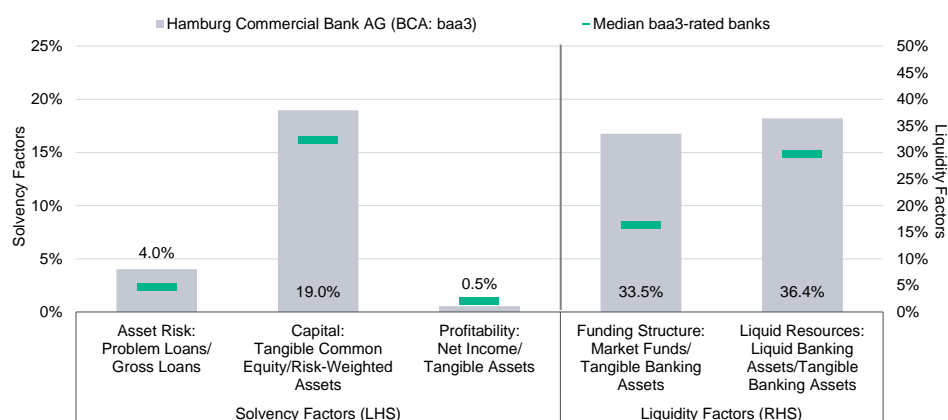
Summary

[Hamburg Commercial Bank AG's](#) (HCOB) A3 deposit and senior unsecured debt and issuer ratings reflect the bank's baa3 BCA and Adjusted BCA, and the application of our Advanced Loss Given Failure (LGF) analysis, which incorporates the relative loss severity of a liability class, resulting in three notches of rating uplift for deposits and senior unsecured debt. HCOB's ratings do not benefit from government support uplift because of its small size in the context of the German banking sector.

HCOB's baa3 BCA reflects the bank's stable solvency profile, including resilient profitability, despite digesting higher loan loss provisions from its weakening asset quality. The bank's strong capital levels provide a substantial buffer against potential losses from its still largely asset-based finance lending book, which faces rising default risk from higher interest rates. The achieved resilience in the bank's combined solvency is an important consideration in the context of its quasi-monoline business model. The BCA also incorporates the bank's stable funding and solid liquidity. HCOB's asset risk profile remains characterised by the bank's focus on higher-risk loans, predominantly asset-based lending activities, in particular commercial real estate (CRE) and shipping finance, although the bank has increased its corporate lending activities.

Exhibit 1

Rating Scorecard - Key financial ratios



Source: Moody's Ratings

Credit strengths

- » HCOB benefits from its capitalisation, which we expect to remain strong.
- » The bank has sustainably increased its profitability, providing a buffer against a potential increase in risk costs.
- » HCOB maintains solid liquidity buffers.

Credit challenges

- » The bank's asset risk concentration remains high because it is focused on high-margin asset-based lending, despite diversification into corporate lending.
- » Asset quality is weakening, particular for CRE exposures, as reflected in its rising nonperforming loans.
- » HCOB's funding profile relies on a diversified set of market funding sources.

Outlook

The stable outlook reflects our expectation that HCOB will be able to protect its achieved solvency. Furthermore, the stable outlook reflects the assumption that the outstanding volumes of junior senior unsecured and subordinated debt instruments do not significantly drop below indicated levels in relation to the bank's balance sheet.

Factors that could lead to an upgrade

- » HCOB's rating could be upgraded in case of an upgrade of its BCA, which could result from a significant risk and earnings diversification from its current asset-based finance business model.
- » The bank's junior senior unsecured debt and subordinated MTN programme ratings could be upgraded in case of significant additional volumes of capital instruments (Tier 2 and Additional Tier 1) being issued.

Factors that could lead to a downgrade

- » HCOB's ratings could be downgraded if the bank's BCA is downgraded or if its liability structure leads to a less favourable outcome under our Advanced LGF analysis, which could for example result from a significant reduction in the volume of debt instruments subordinated to senior unsecured liabilities.
- » A downgrade of HCOB's BCA could result from a weakening of the bank's combined solvency profile, in particular if this were to be caused by a deterioration of asset quality beyond our expectations, a meaningful reduction in the bank's achieved profitability or a less conservative capital management, beyond the bank's current targets.

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

Hamburg Commercial Bank AG (Consolidated Financials) [1]

	06-24 ²	12-23 ²	12-22 ²	12-21 ²	12-20 ²	CAGR/Avg. ³
Total Assets (EUR Billion)	32.3	31.5	31.5	29.9	32.6	(0.2) ⁴
Total Assets (USD Billion)	34.7	34.8	33.7	33.9	39.9	(4.0) ⁴
Tangible Common Equity (EUR Billion)	3.5	3.7	4.9	4.4	4.1	(4.0) ⁴
Tangible Common Equity (USD Billion)	3.8	4.1	5.2	5.0	5.0	(7.6) ⁴
Problem Loans / Gross Loans (%)	4.0	4.3	2.0	2.2	2.4	3.0 ⁵
Tangible Common Equity / Risk Weighted Assets (%)	19.0	22.4	31.9	31.5	26.2	26.2 ⁶
Problem Loans / (Tangible Common Equity + Loan Loss Reserve) (%)	20.6	19.4	7.3	9.1	12.1	13.7 ⁵
Net Interest Margin (%)	2.4	2.2	1.8	1.7	1.4	1.9 ⁵
PPI / Average RWA (%)	2.4	2.6	2.0	1.7	1.0	1.9 ⁶
Net Income / Tangible Assets (%)	0.5	0.6	1.2	0.8	-0.3	0.6 ⁵
Cost / Income Ratio (%)	47.3	45.6	53.7	59.6	67.4	54.7 ⁵
Market Funds / Tangible Banking Assets (%)	31.3	33.5	30.2	35.7	40.6	34.3 ⁵
Liquid Banking Assets / Tangible Banking Assets (%)	33.8	36.4	33.7	28.7	25.4	31.6 ⁵
Gross Loans / Due to Customers (%)	135.0	135.9	149.4	185.4	203.9	161.9 ⁵

[1] All figures and ratios are adjusted using Moody's standard adjustments. [2] Basel III - fully loaded or transitional phase-in; IFRS. [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 periods for the latest accounting regime. [6] Simple average of Basel III periods.

Sources: Moody's Ratings and company filings

Profile

Based in Northern Germany, Hamburg Commercial Bank AG (HCOB) is a commercial bank with a focus on asset-based lending for CRE, shipping, project finance and corporate lending, with reported total assets of €33.6 billion as of year-end 2024. HCOB is the first former Landesbank that transformed into a privately owned bank. Since November 2018, the bank has been owned by a consortium of private equity funds led by Cerberus Capital Management L.P. and J.C. Flowers & Co. As of June 2024, HCOB had 909 full-time equivalent (FTE) employees.

Weighted macro profile of Strong

Although HCOB is focused on the German market, the bank's assigned Strong weighted macro profile is set one notch below the [Strong \(+\)](#) macro profile of Germany, reflecting the issuer's international activities in countries with less benign operating environments, including its shipping exposure, which is sensitive to global trade and macroeconomic conditions.

Detailed credit considerations

Asset risk profile stabilized in 2024

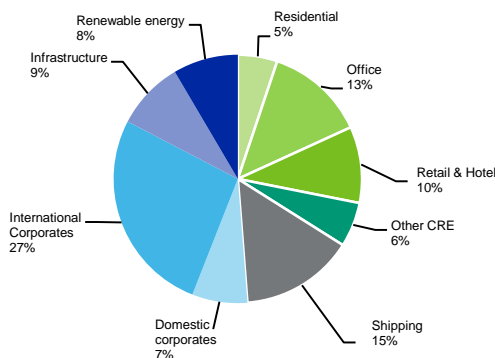
We assign a ba2 Asset Risk score to HCOB, three notches below the baa2 initial score, reflecting significant concentration risks in high-risk and volatile exposures, such as CRE and shipping, which remain at a multiple of the bank's capital. In an adverse scenario, these risks could lead to an accelerated increase in problem loans beyond the reported nonperforming loan ratio of 4% as of half-year 2024.

HCOB's loan book continues to be exposed to higher risk assets in its asset based lending portfolios, such as cyclical CRE and shipping. Though both, single name concentrations and sector concentrations for the higher risk assets, have declined over time, they still remain significant. HCOB's diversification into corporate lending is not yet sufficient to balance these risks, as evidenced by the fast rise of NPLs in 2023, followed by stabilisation in the first half-year 2024. The timely workout of its high problem loans remains key to improve the bank's asset quality, as evidenced by a reduction of problem loans to 3.3% in 2024, with particularly profitability but also capitalization providing the necessary buffers to resolve problem loans without impairing the bank's solvency profile.

In 2024, the bank's loan loss reserves including overlays decreased to €377 million (December 2023: €410 million), providing a more limited, but still-sufficient buffer against loan losses.

Exhibit 3

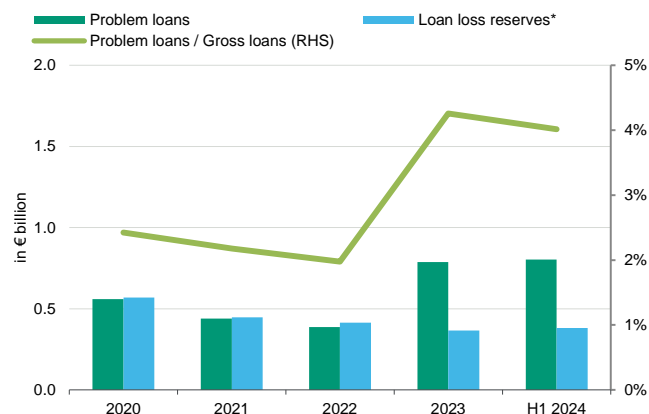
HCOB's loan book is concentrated in high-risk sectors
Total exposure of €23.7 billion (as of June 2024, breakdown by segment)



Source: Company reports

Exhibit 4

HCOB's problem loans increased rapidly, with available reserves declining
Volume in € billions



*Loan loss reserves, excluding the compensation item under the former guarantee.

Sources: Company reports and Moody's Ratings

HCOB's focus has shifted towards corporate and transport finance in 2024, that now account for an increased 20% of total assets, and 11%, respectively. However, CRE still has the highest share at 22%, though it is on a significantly declining trend. Project finance has remained almost stable at 12%.

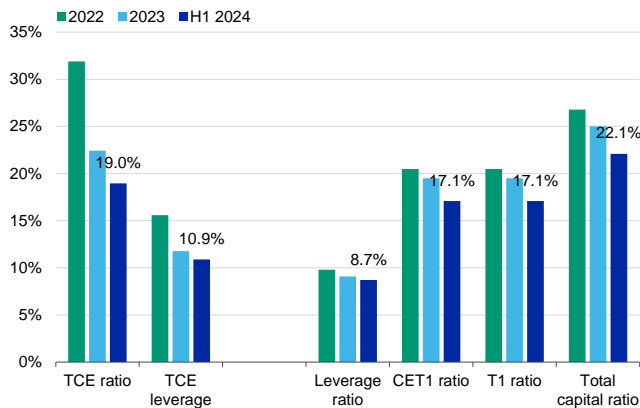
Capitalisation remains strong, providing a substantial buffer

We expect HCOB to maintain substantial core capital buffers, as reflected in the assigned aa3 Capital score, one notch below the aa2 initial score derived from the tangible common equity (TCE) ratio of 19.0%. The assigned score reflects both HCOB's strong absolute capitalisation, as reflected in its TCE leverage ratio of 10.9%, and the management's aim to maintain a Common Equity Tier 1 (CET1) capital ratio of at least 17%. This ratio is below the current capital ratios, implying a contained future decrease in capital buffers because of high dividends.

The difference between regulatory capital ratios and TCE reflects excluded planned dividends and regulatory deductions. The more contained deterioration in regulatory capital ratios during 2023 was driven by the already mentioned model change away from the advanced internal ratings-based approach, leading to higher RWA as the special dividend was already incorporated into the calculation of regulatory capital.

The [introduction of a countercyclical buffer of 0.75%](#) of domestic RWA and an additional 2.0% buffer specific to RWA from domestic loans backed by residential properties from February 2023 had a limited impact on HCOB's comfortable distance from the regulatory minimum levels. This solid distance from minimum capital requirements is further supported by the declining Pillar 2 requirement (P2R). The European Central Bank lowered the P2R from 2.75% for total capital and 1.55% for CET1 in 2021 to 1.82% and 1.02%, respectively, as of 2023. This is a departure from the trend of either stable or even rising requirements for other German banks.

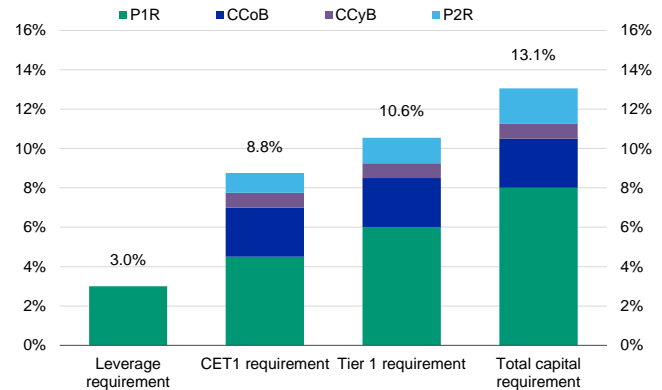
Exhibit 5

HCOB's capitalisation is strong...

TCE = Tangible common equity (our calculation); CET1 = Common Equity Tier 1; T1 = Tier 1 capital.

Source: Moody's Ratings

Exhibit 6

... and significantly exceeds its capital requirements

CCoB = Capital conservation buffer; CCyB = Countercyclical capital buffer; SIIB = Systemically important institutions buffer; P1R = Pillar 1 requirement; P2R = Pillar 2 requirement.

Requirements include the 2.5% capital conservation buffer and assumption of a partial fulfilment of the Pillar 2 requirement through Additional Tier 1 and Tier 2 instruments. Source: Company

HCOB's profitability can absorb loan losses without impairing its capital position

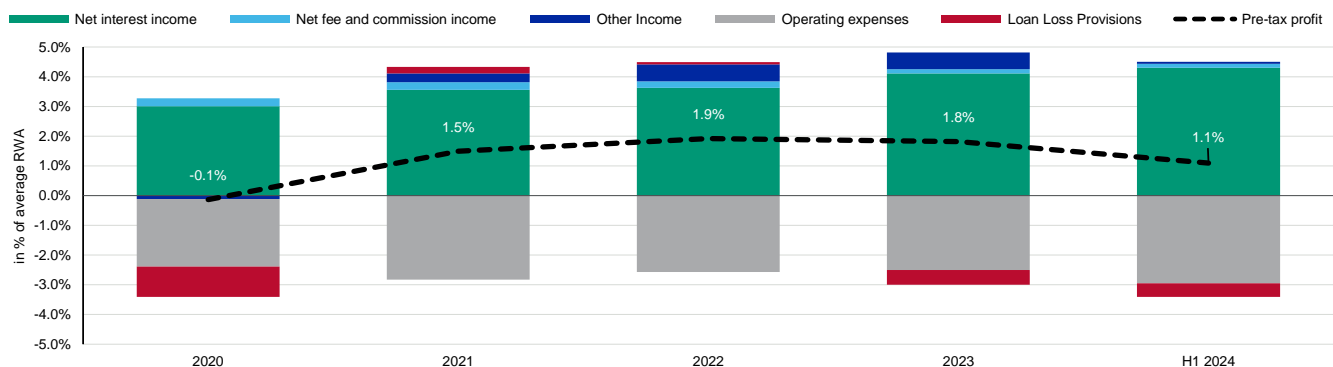
We assign a baa3 Profitability score to HCOB, in line with the initial score. This reflects our expectation that even in the current more difficult economic environment, the bank will be able to maintain its profitability.

Our view considers the bank's good cost management, as visible in the achieved cost-to-income ratio in the low-40s in percentage terms, leaving HCOB as one of the more efficient German banks, though for the full year 2024, the ratio increased to 50%. Driven by legal provisions the improved efficiency places the bank in a good position to deal with challenges, such as higher risk costs as a result of the current economic downturn, and provides a buffer against adverse developments within the more cyclical part of the asset portfolio, such as CRE. Further, the bank has been able to maintain a stable profitability vs rising RWA, underpinning the positioning at an investment grade profitability score.

Exhibit 7

Risk costs have started to pressure profitability in H1 2024

In € millions



Includes our adjustments for significant nonrecurring and unusual items. Risk provisions include provisions for non-credit risks.

Source: Moody's Ratings

For the full-year, the bank's preliminary results indicated a decrease of net income to €228 million, from €271 million in 2023. While revenues still edged up because of a higher net interest margin, a combination of higher administrative expenses, rising risk costs and particularly legal provisions, pressure the result.

HCOB's funding profile remains market reliant

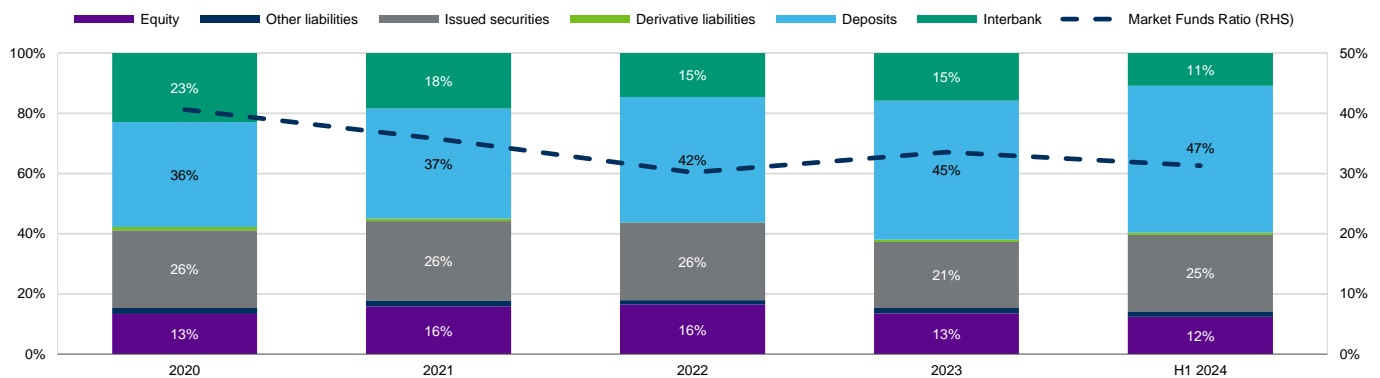
We assign a ba3 Funding Structure score to HCOB, two notches below the initial score. This takes into account our expectation of the development of the bank's funding profile; additional information on market funding instruments, such as promissory notes and registered bonds that are accounted for as deposits; and the quality of the bank's deposits with a focus on corporate clients.

HCOB has been making sound progress in the transformation of its funding structure. HCOB issued several benchmark-size unsecured and covered bonds. At the same time, the bank has been focusing on securing deposits with longer maturities, with a more granular base of lending or payment services to customers in recent years. The bank has started to reestablish a retail deposit franchise in May 2024.

As of June 2024, HCOB has fully repaid the central bank funding under the targeted longer-term refinancing operations (TLTRO III) (2023: €1.0 billion) and replaced it with other long-term funding and corporate deposits.

Exhibit 8

HCOB's marked funding reliance has stabilized



Market funds ratio = Market funds as a percentage of tangible banking assets. Interbank funding includes central bank funding.

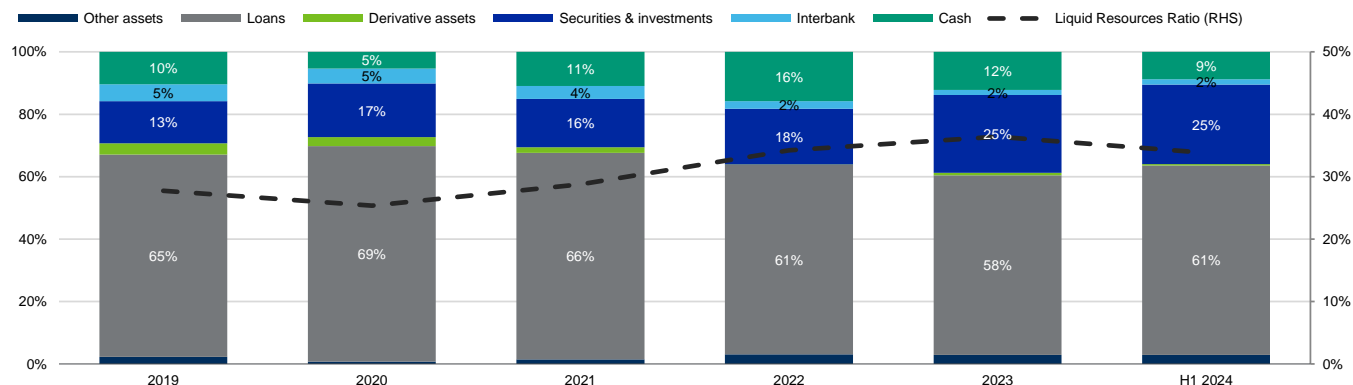
Source: Moody's Ratings

Substantial liquidity buffers to remain in place

We assign a baa2 Liquidity score to HCOB, two notches below the initial score, based on the available liquid resources after considering asset encumbrance.

HCOB maintained a €2.8 billion cash position as of June 2024, in addition to other liquid assets (including fixed-income securities) of €8.2 billion. The securities book is accounted for at fair value, with no unrealised losses. Once TLTRO funding is repaid, we expect the bank's unencumbered liquid resources to account for at least 20% of its tangible banking assets. HCOB's regulatory net stable funding ratio of 113% and liquidity coverage ratio (LCR) of 175% as of June 2024 and 116% and 216% for the year-end 2024, respectively, are well above the regulatory minimums, indicating a sound coverage of the likely liquidity outflow in the near term, including dividends.

Exhibit 9

HCOB maintains sufficient balance-sheet liquidity**Composition of assets**

Liquid resources ratio = Liquid banking assets as a percentage of tangible banking assets.

Source: Moody's Ratings

Business diversification adjustment

To reflect the risks from HCOB's focus on the asset-based lending business model, we apply a one-notch qualitative adjustment for its limited business diversification in our scorecard. The focus remains, despite the bank's diversification into corporate lending, with a strong emphasis on domestic CRE lending, renewable energy projects and shipping loans. A greater degree of specialisation may limit the bank's ability to mitigate unexpected earnings volatility from its core activities.

Business diversification is an important gauge of a bank's sensitivity to stress in a single business line. It is related to earnings stability in the sense that earnings diversification across distinct and relatively uncorrelated lines of business increases the reliability of a bank's earnings streams and its potential to absorb shocks affecting a business line.

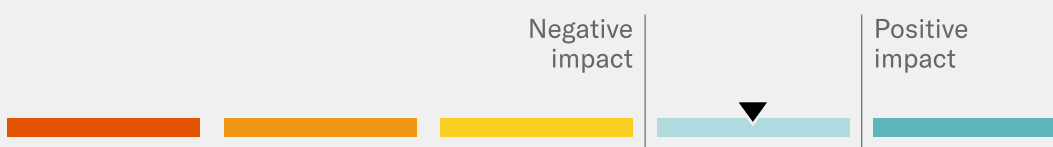
In particular, through its emphasis on CRE and ship lending, HCOB will be exposed to a rather volatile banking business through the cycle. CRE and ship lending are highly cyclical and, therefore, higher-risk sectors can cause significant losses in times of financial market stress.

ESG considerations**Hamburg Commercial Bank AG's ESG credit impact score is CIS-2**

Exhibit 10

ESG credit impact score**CIS-2**

Score



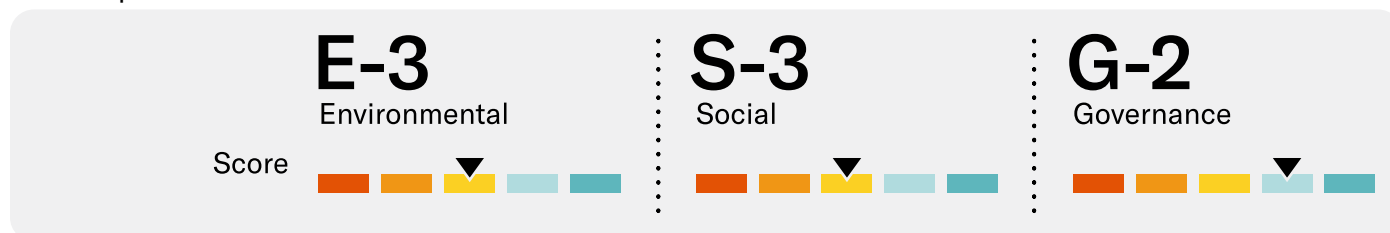
ESG considerations do not have a material impact on the current rating.

Source: Moody's Ratings

Hamburg Commercial AG's (HCOB)'s **CIS-2** indicates that ESG considerations have no material impact on the current ratings. The bank's corporate governance risks are low, with a high-risk appetite as part of its business model as an asset based finance specialist being mitigated by good controls and risk management.

Exhibit 11

ESG issuer profile scores



Source: Moody's Ratings

Environmental

HCOB faces moderate environmental risks primarily because of its exposure to carbon transition risk in its corporate loan book. In line with its peers, HCOB is facing mounting business risks and stakeholder pressure to meet broader carbon transition goals. In response, HCOB is engaging in integrating climate considerations in its credit risk assessment and supporting customers to facilitate their carbon transition.

Social

HCOB faces moderate exposure to social risks related to regulatory and litigation risks, requiring the bank to meet high compliance standards. Customer relations risks related to mis-selling and mis-representation are lower than industry average because of the bank's focus on institutional customers combined with a strong conduct track record. The bank is also proactively adapting to changing customer preferences (such as digitalisation and sustainable products).

Governance

HCOB's governance risks are low, despite its higher risk appetite and concentration risks inherent in its business model as an asset-based finance specialist. The bank's strategy, risk management function and organizational structure are in line with industry practices. HCOB's management enjoys a good track record with regards to the turnaround of the bank, including a solid earnings potential and capital generation capacity, that is able to digest increased risk costs.

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

Affiliate support

There is a low probability that HCOB's owners — primarily private equity funds, including Cerberus Capital Management, L.P., J.C. Flowers & Co. and Golden Tree Asset Management LNP — would support the bank in case of need, which results in no uplift for the baa3 Adjusted BCA from the bank's BCA.

Loss Given Failure (LGF) analysis

HCOB is subject to the EU Bank Recovery and Resolution Directive (BRRD), which we consider an operational resolution regime. We, therefore, apply our Advanced LGF analysis, using our standard assumptions. For deposits and senior unsecured debt rated A3, our LGF analysis indicates an extremely low loss given failure, leading to a three-notch uplift above the baa3 Adjusted BCA.

Government support considerations

Because of its small size relative to the German banking system and its limited degree of interconnectedness, we only assume a low probability of government support to HCOB, which does not result in any rating uplift.

Methodology and scorecard

The principal methodology we used in rating HCOB was our [Banks Methodology](#), published in November 2024.

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 12

Rating Factors

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	4.0%	baa2	↔	ba2	Sector concentration	Quality of assets	
Capital							
Tangible Common Equity / Risk Weighted Assets (Basel III - transitional phase-in)	19.0%	aa2	↔	aa3	Expected trend	Risk-weighted capitalisation	
Profitability							
Net Income / Tangible Assets	0.5%	baa3	↔	baa3	Expected trend	Return on assets	
Combined Solvency Score		a3		baa1			
Liquidity							
Funding Structure							
Market Funds / Tangible Banking Assets	33.5%	ba1	↔	ba3	Deposit quality	Extent of market funding reliance	
Liquid Resources							
Liquid Banking Assets / Tangible Banking Assets	36.4%	a2	↔	baa2	Stock of liquid assets	Asset encumbrance	
Combined Liquidity Score		baa2		ba1			
Financial Profile		baa1		baa2			
Qualitative Adjustments				Adjustment			
Business Diversification				-1			
Opacity and Complexity				0			
Corporate Behavior				0			
Total Qualitative Adjustments				-1			
Sovereign or Affiliate constraint				Aaa			
BCA Scorecard-indicated Outcome - Range				baa2 - ba1			
Assigned BCA				baa3			
Affiliate Support notching				0			
Adjusted BCA				baa3			

Balance Sheet is not applicable.

Debt Class	De Jure waterfall		De Facto waterfall		Notching		LGF Notching Guidance vs. Adjusted BCA	Assigned LGF notching	Additional Notching	Preliminary Rating Assessment
	Instrument	Sub- volume + subordination	Instrument	Sub- ordination + ordination	De Jure	De Facto				
Counterparty Risk Rating	-	-	-	-	-	-	-	3	0	a3
Counterparty Risk Assessment	-	-	-	-	-	-	-	3	0	a3 (cr)
Deposits	-	-	-	-	-	-	-	3	0	a3
Senior unsecured bank debt	-	-	-	-	-	-	-	3	0	a3
Junior senior unsecured bank debt	-	-	-	-	-	-	-	1	0	baa2
Dated subordinated bank debt	-	-	-	-	-	-	-	-1	0	ba1

Instrument Class	Loss Given Failure notching	Additional notching	Preliminary Rating Assessment	Government Support notching	Local Currency Rating	Foreign Currency Rating
Counterparty Risk Rating	3	0	a3	0	A3	A3
Counterparty Risk Assessment	3	0	a3 (cr)	0	A3(cr)	
Deposits	3	0	a3	0	A3	A3
Senior unsecured bank debt	3	0	a3	0	A3	A3
Junior senior unsecured bank debt	1	0	baa2	0	Baa2	
Dated subordinated bank debt	-1	0	ba1	0	(P)Ba1	

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

Source: Moody's Ratings

Ratings

Exhibit 13

Category	Moody's Rating
HAMBURG COMMERCIAL BANK AG	
Outlook	Stable
Counterparty Risk Rating	A3/P-2
Bank Deposits	A3/P-2
Baseline Credit Assessment	baa3
Adjusted Baseline Credit Assessment	baa3
Counterparty Risk Assessment	A3(cr)/P-2(cr)
Issuer Rating	A3
Senior Unsecured	A3
Junior Senior Unsecured -Dom Curr	Baa2
Junior Senior Unsecured MTN -Dom Curr	(P)Baa2
Subordinate MTN -Dom Curr	(P)Ba1
Commercial Paper -Dom Curr	P-2
Other Short Term -Dom Curr	(P)P-2

Source: Moody's Ratings

© 2025 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 Moody's Investors Service, Inc. for credit ratings opinions and services rendered by it. MCO and all MCO entities that issue ratings under the "Moody's Ratings" brand name ("Moody's Ratings"), also maintain policies and procedures to address the independence of Moody's Ratings' 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 ir.moody.com under the heading "Investor Relations — Corporate Governance — Charter and Governance 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 61 003 399 657 AFSL 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 and Net Zero Assessments (as defined in Moody's Ratings Rating Symbols and Definitions): Please note that neither a Second Party Opinion ("SPO") nor a Net Zero Assessment ("NZA") is a "credit rating". The issuance of SPOs and NZAs is not a regulated activity in many jurisdictions, including Singapore. JAPAN: In Japan, development and provision of SPOs and NZAs 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.

REPORT NUMBER 1438263

Contacts

Gerson Morgenstern +49.69.70730.796
Sr Ratings Associate
gerson.morgenstern@moodys.com