MOODY'S
INVESTORS SERVICE

CREDIT OPINION
4 December 2023

Update

Send Your Feedback

RATINGS

Deutsche Bank AG

Domicile	Frankfurt am Main, Germany
Long Term CRR	A1
Type	LT Counterparty Risk Rating - Fgn Curr
Outlook	Not Assigned
Long Term Debt	A1
Type	Senior Unsecured - Fgn Curr
Outlook	Stable
Long Term Deposit	A1
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

Olivier Panis +33.1.5330.5987
Senior Vice President
olivier.panis@moodys.com

Andrea Pasceri +33.1.5330.1021
Ratings Associate
andrea.pasceri@moodys.com

Peter E. Nerby, CFA +1.212.553.3782
Senior Vice President
peter.nerby@moodys.com

Laurie Mayers +44.20.7772.5582
Associate Managing Director
laurie.mayers@moodys.com

Ana Arsov +1.212.553.3763
MD-Financial Institutions

Deutsche Bank AG

Annual Update

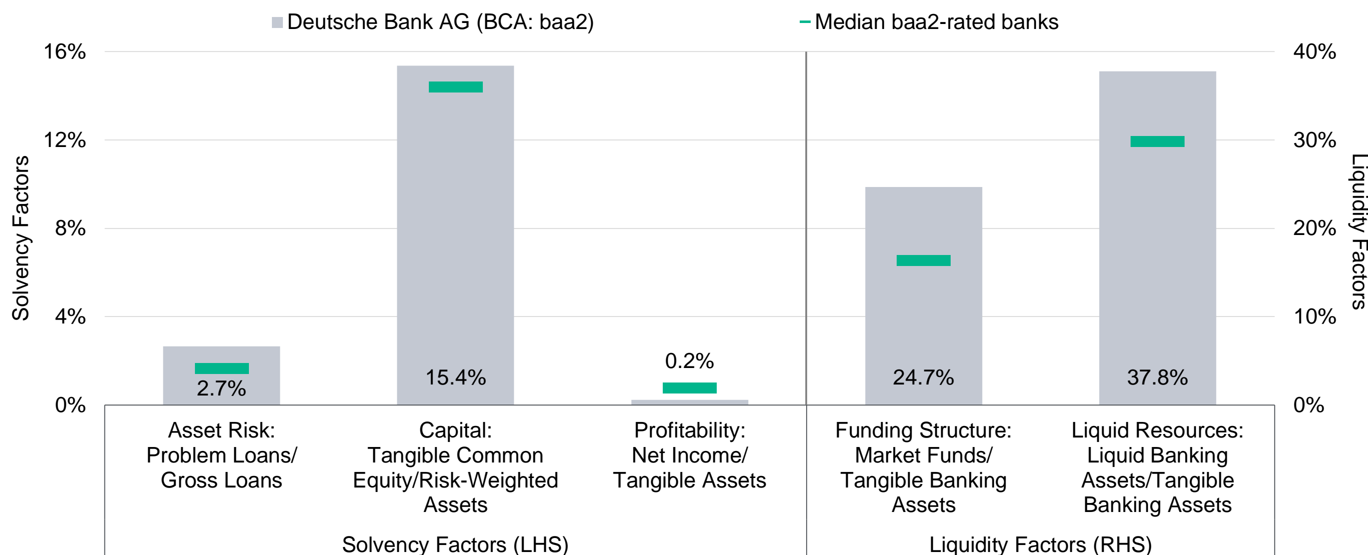
Summary

We assign A1/P-1 long- and short-term deposit ratings and A1 long-term senior unsecured debt ratings to Deutsche Bank AG (DB). The long-term ratings carry a stable outlook. We further assign Baa1 junior senior unsecured (non-preferred) debt ratings to DB. We also assign a baa2 Baseline Credit Assessment (BCA) to the bank.

The ratings reflect (1) DB's baa2 BCA and Adjusted BCA; (2) the results of our Advanced Loss-Given-Failure (LGF) analysis, providing three notches of rating uplift for deposits and senior unsecured debt, as well as one notch for its junior senior unsecured debt; and (3) a one-notch additional rating uplift for the bank's deposits and senior unsecured debt ratings, based on our assumption of a moderate level of government support for these debt classes.

The baa2 BCA takes account of DB successfully achieving its transformation plan between 2019 and 2022, allowing the bank to sustain improved, yet still relatively modest, profitability. We expect that the bank's meaningfully reduced expense base should allow DB to safeguard operating leverage in times of higher inflation and, thereby, defend its regained earnings strength during its medium-term plan to 2025. The baa2 BCA also reflects the bank's reduced reliance on market funding and high quality deposit base as well as our assessment of the bank's prudent and well controlled risk appetite that is likely to result in a sound and relatively stable asset quality through the cycle. Further, DB has improved its leverage ratio and – throughout its years of business model repositioning – maintained solid capital and liquidity metrics, additionally supporting its improved credit profile.

Exhibit 1
Rating Scorecard - Deutsche Bank AG - Key financial ratios



Source: Moody's Investors Service

Credit strengths

- The bank's continued solid capital and liquidity metrics
- Diversified loan book and strong market position in Germany mitigate the prospects of asset quality deterioration and resulting earnings strain
- Moderate reliance on confidence-sensitive wholesale market funding

Credit challenges

- To continue executing along its medium-term plan during volatile and uncertain macroeconomic conditions
- Retain and grow group-wide earnings in a context of volatile markets and slowing global economy
- Maintain robust capital markets revenues in a less favourable market environment, without increasing risk appetite
- Keep contained loan loss charges in a weaker operating environment

Outlook

- The stable outlook on the bank's long-term deposit and senior unsecured debt ratings reflects our expectation that DB will be able to maintain financial stability and, in particular, sustain its improved level of profitability as measured by our net income/tangible assets ratio, even in more uncertain operating environment. The resulting higher capital-generation capacity will allow DB to offset strain on earnings potentially resulting from cyclically lower capital market revenues or higher loan loss charges and provisioning.
- The stable outlook also reflects our assessment that the bank will maintain generally sound asset quality despite the slowdown in economic growth and the negative impact that high inflation and rising interest rates have on certain assets.

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.moodys.com for the most updated credit rating action information and rating history.

Factors that could lead to an upgrade

- We could upgrade the ratings if the bank improved its leverage ratio to 5% or above as well as increased its capital and liquidity metrics. The ratings could also be upgraded if DB meaningfully reduced its dependence on confidence-sensitive capital markets funding.
- Further, making visible progress towards exceeding its medium-term targets, in particular earning sustainably improved returns well above its 10% return on tangible equity target, while continuing to invest to strengthen its technology platform and control infrastructure, would support an upgrade. Any upgrade remains contingent on the bank maintaining a prudent and well controlled risk appetite resulting in a sound and stable asset quality and associated metrics through the cycle.

Factors that could lead to a downgrade

- We could downgrade the ratings if DB suffered a strategic setback, particularly with respect to achieving sustainable revenue generation or permanent cost savings supporting a stable operating expense base over time. In addition, the ratings could be downgraded should DB experience a material risk management failure or sustained deterioration in asset quality, liquidity or capital, or its franchise and reputation. The ratings could also be downgraded if additional litigation charges were required well in excess of existing reserves.
- A downgrade could also result from a sustained decrease in the volume of bail-in-able debt relative to the bank's tangible banking assets, leading to a higher loss severity of DB's junior senior unsecured debt or other liability classes at failure and potentially resulting in a lower rating uplift as a result of our Advanced LGF analysis.

Key indicators

Exhibit 2

Deutsche Bank AG (Consolidated Financials) [1]

	06-23[2]	12-22[2]	12-21[2]	12-20[2]	12-19[2]	CAGR/Avg.[3]
Total Assets (EUR Billion)	1,035.5	1,028.6	1,014.3	968.6	949.9	2.5[4]
Total Assets (USD Billion)	1,129.7	1,097.8	1,149.4	1,185.2	1,066.2	1.7[4]
Tangible Common Equity (EUR Billion)	55.1	54.5	51.4	47.8	47.5	4.3[4]
Tangible Common Equity (USD Billion)	60.1	58.2	58.2	58.4	53.3	3.5[4]
Problem Loans / Gross Loans (%)	2.7	2.4	2.5	2.7	2.2	2.5[5]
Tangible Common Equity / Risk Weighted Assets (%)	15.4	15.1	14.6	14.5	14.7	14.9[6]
Problem Loans / (Tangible Common Equity + Loan Loss Reserve) (%)	21.3	19.7	21.2	22.5	18.8	20.7[5]
Net Interest Margin (%)	1.4	1.4	1.1	1.2	1.5	1.3[5]
PPI / Average RWA (%)	2.0	1.6	1.1	0.9	-0.1	1.1[6]
Net Income / Tangible Assets (%)	0.3	0.2	0.2	0.1	-0.4	0.1[5]
Cost / Income Ratio (%)	74.9	77.8	85.2	88.1	101.5	85.5[5]
Market Funds / Tangible Banking Assets (%)	26.8	24.7	26.5	26.5	25.4	26.0[5]
Liquid Banking Assets / Tangible Banking Assets (%)	31.2	37.8	39.6	40.9	39.4	37.8[5]
Gross Loans / Due to Customers (%)	81.3	79.0	79.3	76.5	76.9	78.6[5]

[-] Further to the publication of our revised methodology in July 2021, only ratios from annual 2020 onwards included in this report reflect the change in analytical treatment of the "high-trigger" Additional Tier 1 instruments. [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 Investors Service and company filings

Profile

Deutsche Bank AG (DB) is the largest German-domiciled private bank, operating through a European as well as a global network servicing retail and wealthy individuals as well as corporate and institutional clients. As of September 2023, the bank reported total assets of €1.4 trillion and €860 billion of assets under management[1].

DB offers a wide range of investment, financial and related products and services to its clientele, served by 89,260 employees as of end-September 2023 in about 60 countries globally. The bank focuses on four main businesses: (1) The Corporate Bank (CB) offers cash management, trade finance and lending, as well as foreign exchange in support of corporates' needs for working capital and liquidity management, CB also serves financial institutions, SMEs and entrepreneurs; (2) the Private Bank (PB) offers retail banking and wealth management services in Germany and abroad, (3) the Investment Bank (IB) caters to the needs of corporate and institutional clients, including the trading and hedging of financial products; and (4) Asset Management (AM) has a broad range of product offerings surrounding investment funds and related products and services to both retail and institutional clients.

DB's BCA is supported by its Weighted Macro Profile of Strong (+)

DB's Strong (+) Weighted Macro Profile is mainly driven by its exposure to Germany (Aaa stable) the US (Aaa negative) or the UK (Aa3 stable), and also incorporates exposures to other EU countries, such as Spain (Baa1 stable) and Italy (Baa3 stable).

As the largest private-sector bank in Germany, DB benefits from an environment with very high economic, institutional and government financial strength and a low susceptibility to event risk. However, operating conditions for the German banking system are constrained by overly high cost bases; high fragmentation in an oversaturated market; still relatively low margins despite rising rates; modest fee income generation; and strong competition for domestic business.

Detailed credit considerations

Continued execution remains key to solidifying DB's improved credit profile and higher ratings

Since DB announced its strategic overhaul in summer 2019, it has regained earnings strength; reduced capital and leverage exposure consumption; significantly lowered operating costs; maintained strong liquidity; and reduced dependence on confidence-sensitive market funding. All these items have allowed it to self-finance its strategic overhaul without a significant impact on its key capital ratios.

The achievement of DB's strategic revamp which concluded at the end of 2022 has placed DB on firmer ground than previous, less fundamental restructurings. At the same time, and even if DB reaches its 2025 RoE targets, its performance – although materially improved – will continue to lag that of its global investment bank (GIB) peers. Therefore, to sustain its improved credit strength, DB will need to keep a steady pace in reaching its key milestones and repositioning its business model as announced through its extended 2022-25 business plan.

Under this revised three-year plan, DB aims to grow revenues by a CAGR of 3.5-4.5% between 2021 and 2025 while keeping cost broadly flat from 2022 level in order to achieve a cost-to-income ratio of below 62.5%. Together with loan loss charges retreating to around 20 basis points of gross loans by 2025 (25bps in 2022 and likely around 30 bps in 2023), DB aims to achieve a net return on tangible equity (ROTE) of 10% or higher at that point. The bank ultimately aims to achieve a 50% total payout ratio through a combination of dividends and more flexible share buybacks while maintaining its Common Equity Tier 1 (CET1) capital ratio around 13% or 200 basis points above the maximum distributable amount.

The updated medium-term targets represent a bondholder-friendly evolution of DB's strategic revamp, although success in execution increasingly relies on less predictable revenue growth rather than cost reductions. We nevertheless believe the outlined measures to be prudent and realistic assuming a gradually normalizing market environment until 2025. We would also expect DB to remain disciplined on total costs despite inflationary pressures continuing in 2023.

DB's 3.5-4.5% revenue CAGR target between 2021-2025 is expected to be generated through further volume growth in lower risk, stable businesses; additional strategic initiatives; and the bank expects the positive effect of rising interest rates on net interest income from 2022 level to amount to around €2 billion in 2023. DB's 2025 revenue guidance builds on enhancing DB's strengths in its Corporate Bank (cash management, trust and agency services, lending) and its Private Bank (retail and wealth management).

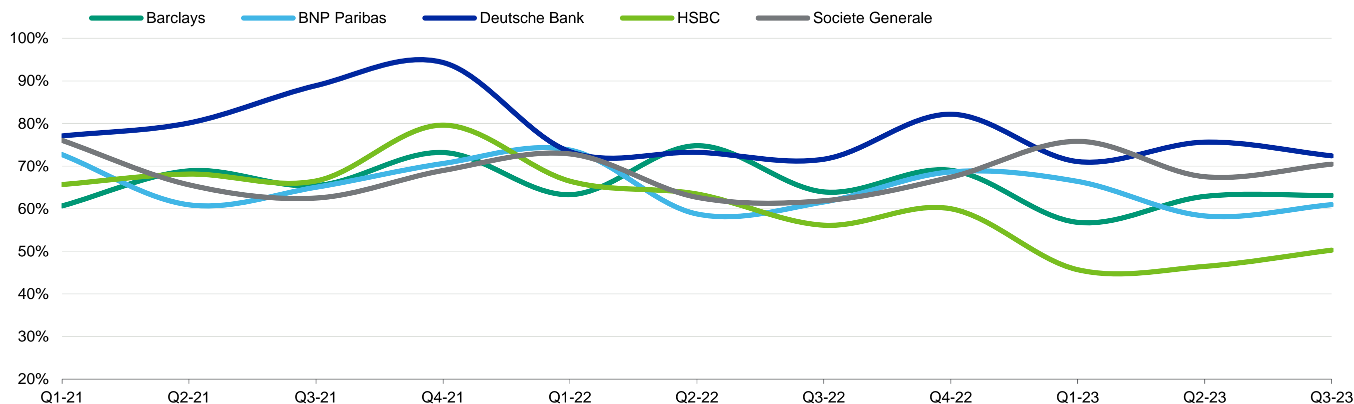
During the 2022-25 planning period, DB envisages a change in composition of underlying growth drivers, with franchise and efficiency improvements in the CB and PB segments targeted to bring in the bulk of the planned growth. Indeed, recent interest-rate hikes have improved the prospects for higher returns within the bank's core lending businesses conducted in its PB and CB segments, despite expectations of at least a normalization in the cost of risk.

DB's capital markets earnings streams in its Investment Bank (IB) and Asset Management (AM) segments remain vulnerable to market setbacks and tighter liquidity conditions, although the market volatility has supported some of DB's core IB franchises in fixed income and related client flow in recent years. But their contribution to overall revenue growth will diminish following strong outperformance of the latter against earlier projections in prior years and low origination and advisory revenues in the current context of slowing economies and high market uncertainty. The strong 37% IB contribution to group revenues in 2022 might not be sustained. However based on DB's recent market share gains and select growth investments into regions, products and technology, we believe the bank will be able to safeguard revenues and earnings and keep contained revenue or market share declines in its capital markets business, even in a less favourable market environment.

Profitability visibly improved, and DB is on track to reach its medium-term goals

We assign a ba3 Profitability score to DB, taking account of our assessment that DB is likely to make continued progress towards meeting its medium-term targets, in particular by being able to sustain adequate, yet still relatively modest, profitability. The assigned score further reflects our anticipation of a net income/tangible asset ratio (our measure of return on assets) of around 0.25% over the next 12-18 months, as uncertainties regarding the sustainability of the IB's performance and growth ambition in the PB and CB segments in a challenging operating environment, in part offset the positive net impact expected from interest rate hikes on the latter franchises' margins. Sustainably improving its profitability and efficiency metrics (see Exhibit 4) according to its revised strategic plan will support overcoming a key relative weakness for DB within its peer group.

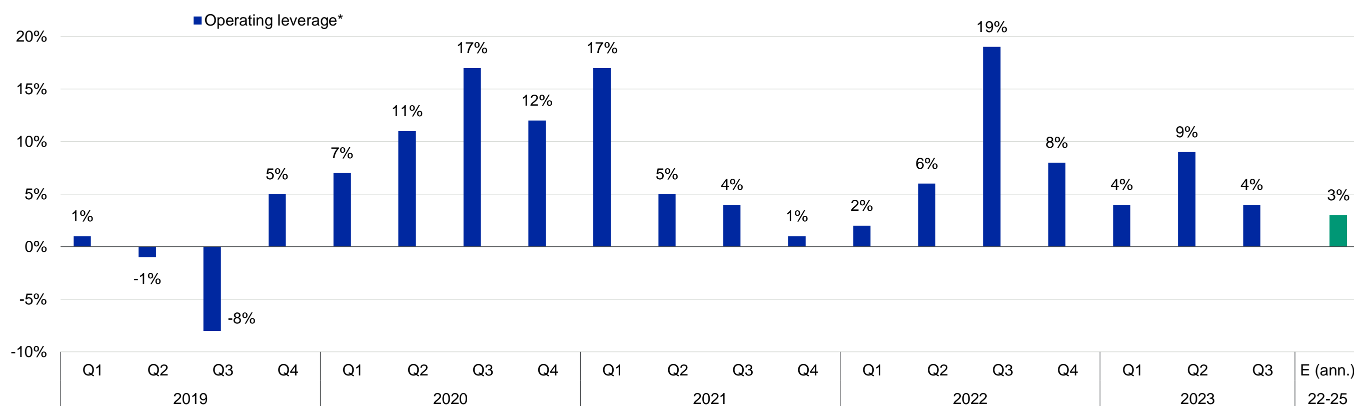
Exhibit 3
DB's restructuring success moved it close to its European GIB peers' efficiency ratios
Cost-to-income ratio (Moody's adjusted), Q1 2021 - Q3 2023



Source: Company reports, Moody's Investor

The swift rundown in the bank's operating cost base, as transformation plan generated around €3 billion of run-rate savings from year-end 2018 until the end of 2022, helped restore DB's operating leverage, making it more resilient to setbacks in its revenue performance. This was a major leap forward from DB's previous restructurings, in which it suffered greater revenue attrition and did not generate any additional operating leverage.

Exhibit 4
DB has regained operating leverage
Revenue over cost growth, year-over-year, Q1 2019 - Q3 2023 and forecast



*Revenue excluding specific items as reported by DB and annualised. ^Costs adjusted in accordance with DB definition and excluding transformation charges. Also annualised. 25F is annual according to DB guidance.
Source: Company reports, Moody's Investors Service

In 2022, the meaningfully higher cost base versus earlier projections (DB's cost target went as low as €16.7 billion for 2022 communicated at its December 2020 Investor Deep Dive) was in part driven by items outside of the bank's control, such as higher banking levies; valuation and timing differences; foreign currency moves; and Russia-related costs. However, cost inflation has also been caused by higher variable costs given the IB's strong performance as well as higher IT costs as projects were more costly or time-consuming than anticipated. DB has also invested greatly in controls, technology and processes, all of which will drive efficiencies going forward.

The new cost-to-income target of below 62.5% by 2025 would still allow for a continuation of operating leverage to build (Exhibit 5). We expect further improvement in DB's operating leverage should partly reflect continued efficiency measures, but mostly rely on

achieving the bank's revenue goals. For the first nine months of 2023, the bank reported a cost-to-income ratio of 73% broadly stable from the same period in 2022.

To support its goal of a stable underlying operating cost base, DB has identified around €2.5 billion of additional cost saving opportunities that it aims to reinvest fully into the businesses. Key items include the optimization of the Germany platform through the full integration of former Postbank's IT platform onto the DB architecture; increased usage of cloud technology reducing server cost and maintenance; better lending processes and infrastructure; and ongoing rationalisation of real-estate footprints. As of end-October 2023, the bank has already completed a material portion of those measures.

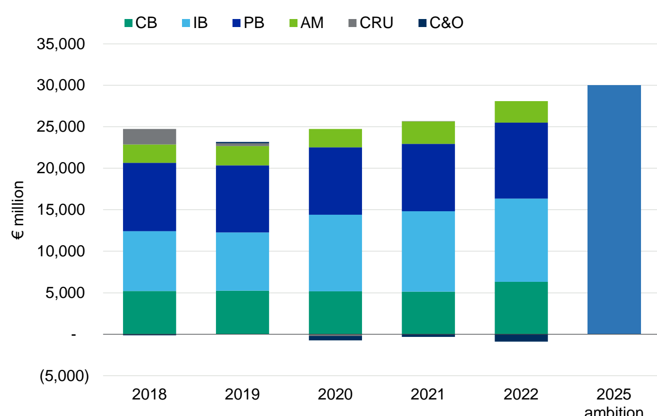
In addition, DB's 2025 costs should be freed of material business transformation-related adjustments and benefit from a reduction in the bank's contribution to the Single Resolution Fund (SRF[2]; 'banking levy').

Nevertheless, achieving the new target of maintaining operating expenses flat between 2022 and 2025 remains an ambitious target in a context of high inflation in Europe.

Exhibit 5

DB's revenue plan looks more ambitious...

Group revenue, € million

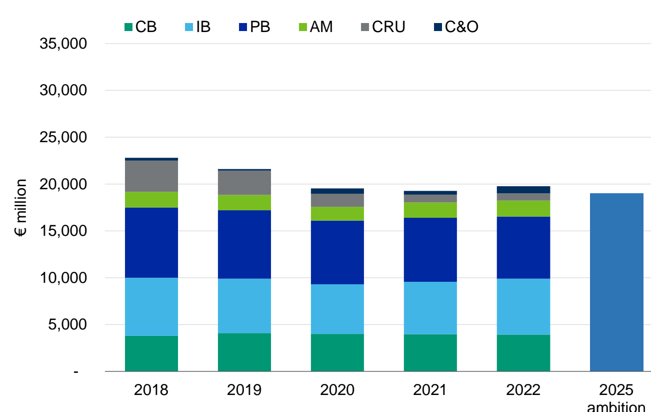


Notes: 2025 ambition reflects DB group-level target (including the CRU and the Corporate Center or 'C&O') as implied by current guidance.
Source: Company reports, Moody's Investors Service

Exhibit 6

...and the bank's cost base is expected to be broadly stable

Group adjusted costs, € million



Notes: 2025 ambition reflects DB group-level target (including the CRU and the Corporate Center or 'C&O') as implied by current guidance. By 2025, we expect the €18.5-€19 billion guidance to display reported total costs, without any further adjustments.
Source: Company reports, Moody's Investors Service

In fact, we believe DB has little room to cut further on compensation given the recently conducted staff reduction program as well as the outperformance of its capital markets unit, the latter already displaying one of the lowest compensation ratios in the industry. As a result, staying competitive and retaining or attracting key talent remains vital for achieving the projected ambitious revenue goals. If sustained and strongly executed, the announced ambitions and measures will continue putting DB on track to improve key underlying performance metrics and – according to our estimates – move closer to achieving its ambition of a 10% post-tax ROTE by 2025. This would put the bank at par with the lower-end of the return levels of several of its higher-rated peers – provided it can put through larger parts of the targeted revenue growth.

Solid revenues since 2022 support strong start for DB's achievement of 2025 target

DB reported pre-tax income of €5.6 billion in 2022, up 65% from 2021 supported by 7% of revenue growth and 5% costs reduction. This solid performance was largely driven by revenue strength in the Corporate Bank division, displaying revenue growth of 23% due to higher interest rates, fee and commission income as well as deposit growth and favorable FX movements. This was accompanied by a 3% and 6% growth of adjusted revenues in Investment Bank and Private Bank, respectively. Asset Management revenues were down 4% as higher management fees were more than offset by lower performance fees and other revenues in a challenging market environment. The strong revenue performance helped a material improvement in DB's cost-to-income ratio to 75% down from 85% in 2021. Loan loss charges stood at €1.2 billion (2021: €515 million) or 25 basis points (bps) of gross loans, reflecting more challenging

macro economic environment in 2022. At group level, DB reported a net income of €5.7 billion that included a positive impact of €1.4 billion deferred tax valuation adjustment.

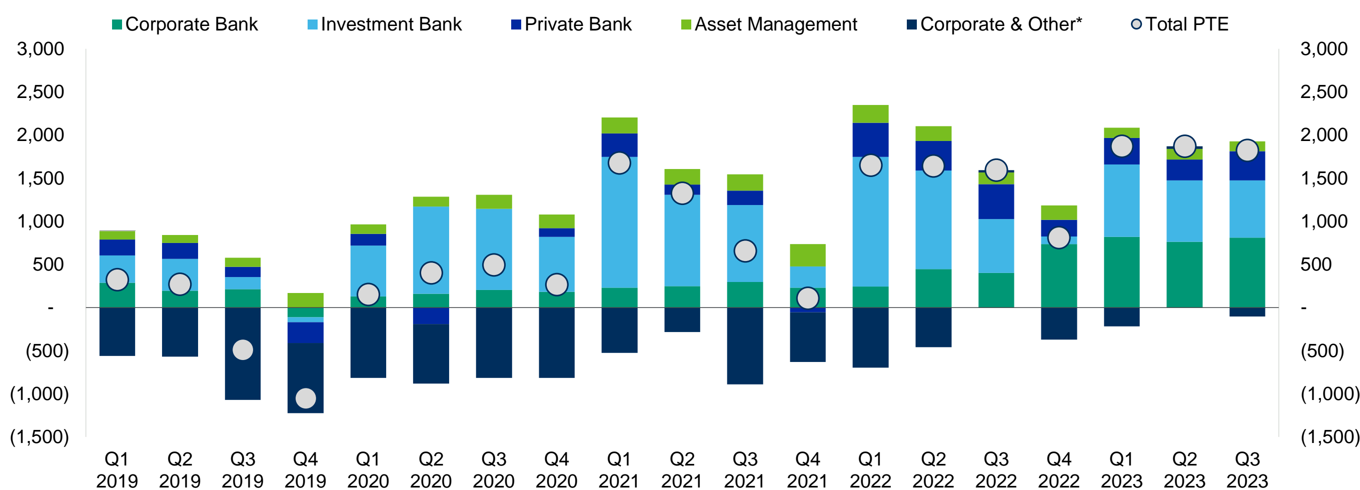
In the first nine months of 2023, DB reported total group revenues of €22.2 billion, up 6.3% year-over-year, whilst adjusted costs only increased 1.7% over the period, representing around 4.5 percentage point positive operating leverage. In Q3 only, DB reported total group revenues of €7.1 billion[3], up 6% year-over-year. The solid performance benefited from rising rates, primarily in CB (revenue up 21%) and PB (adjusted revenue up 9%). This performance more than offset the normalisation of investment banking revenue from the strong performance in 2022 (reported revenue was down 1% when excluding the debt valuation adjustments (DVA) benefit in 2022) and the lower performance of asset management activities (revenue decreased 10%). Group operating costs, excluding all extraordinary items,[4] were up 2%, below inflation rate. The bank continues to deploy its plan to achieve incremental €2.5 billion operational efficiencies by 2025, and to invest in its business growth, technologies and controls.

Considering the challenging macroeconomic environment which creates uncertainties on investment banking business flows and revenue pool, our view that net margin uptick in CB has probably reached its maximum in early 2023, and the potential for rising loan loss charges in the next 18 months, it will become more important for DB to contain costs despite continuous investments in IT & Controls and strategic hires to maintain returns near target levels and - ultimately - sustainably earn its cost of capital.

Exhibit 7

DB's profitability benefits from solid revenue performance in all core segments, despite slowdown in IB primary revenues

Adjusted quarterly pretax profits by business line (excluding litigation, impairments, DVA and one-offs), € million



* CRU discontinued from 2023 and restated in 2022 (moved to C&O). Quarterly 2019-2021 figure for C&O reflects combined CRU and C&O.

Source: Company reports, Moody's Investors Service

Diversified loan book will help mitigate undue earnings strain from loan loss charges

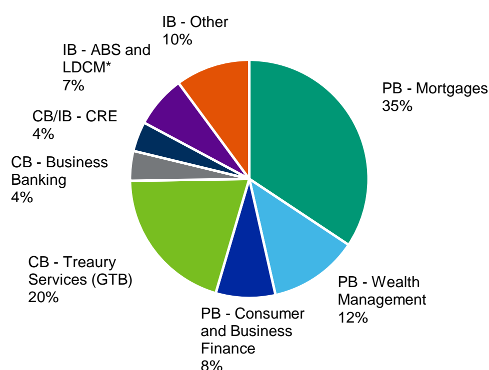
Our baa2 Asset Risk score reflects DB's well diversified loan book by asset class and segment, displaying manageable exposures to sectors most affected by effects of the economic slowdown as well as certain risk pockets, particularly sensitive to the rising interest rates environment, such as commercial real estate (CRE) and leveraged debt capital markets (LDCM). The assigned score also incorporates the market, credit and operational risks and periodic concentration risks inherent to DB's capital markets activities.

DB's €485 billion loan book remains well diversified by region, asset class and segment (Exhibits 9 and 10). The bank holds collateral of €269[5] billion against performing exposures and €5.1 billion of loan loss reserves in addition to various hedges that will help significantly reduce the bank's overall exposure to potential more major loan losses. About half of the bank's lending is directed to German corporate and retail customers, with very low exposure to unsecured consumer lending and a clear focus on highly collateralised Germany-focused residential mortgages that are typically fixed long-term, display loan-to-value (LTV) ratios of around 66% and very low delinquency ratios of less than 20 basis points, supported by strong employment levels in Germany. More than half of the loans are to retail and wealth customers, the remaining part of the loan book is exposed to corporate and investment banking: about 30% of the loan portfolio sits in the Corporate Bank (CB) – about half of which is in lower-risk transaction banking balances – and the Investment Bank (IB) holds about 20% of the bank's loan balances, mainly in asset-backed loans and CRE.

Exhibit 8

DB's loan book remains well diversified, despite some higher-risk pockets

Gross loans by segment and loan type, as of Q3 2023*



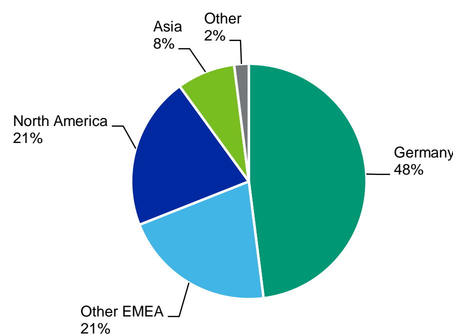
*Moody's grouping. PB = Private Bank; CB = Corporate Bank; IB = Investment Bank; ABS = Asset-backed securities; LDCM = Leveraged debt capital markets.

Sources: Company reports, Moody's Investors Service estimates

Exhibit 9

Focus on German home market will help contain loan losses

Gross loans by region, as of YE 2022



Sources: Company reports and presentations

According to our estimates, DB's concentrations in utilities, chemicals, manufacturing, automotive and transportation totaled approximately €50 billion, or about 11% of the bank's loan book, as of YE 2022. These are the sectors likely to be hit hardest by the macroeconomic slowdown, as well as those most vulnerable to commodity price hikes and potential gas supply shortages in Germany and other countries. At the same time, EU member states have been adopting national policy measures that will limit the extent of problem loan formation among corporate borrowers and households. Some borrowers may also be able to adapt their energy sources or pass higher costs on to their customers. Others have built up sufficient capital and liquidity to protect their cash flows.

In Germany, support measures extended in 2023 to mitigate the economic impact on households and businesses of high energy prices have been so far lower than initially anticipated, but they will remain in place, albeit gradually phasing out, in 2024 providing relief against any more material increase in future energy price. Together with low levels of corporate and household debt in Germany of 50% and 54% of GDP, respectively, as of June 2023[6], the bank's corporate and retail customers should be able to contend with energy market dislocations or a more severe macroeconomic slowdown without quickly becoming over-indebted.

Larger risk exposures to commercial real estate (CRE) and leveraged debt capital markets that are particularly vulnerable to interest rate hikes, market volatility as well as the impact of post-Covid trends, account together for about 8% of DB's total gross loans. Although CRE portfolio of €40 billion as of the end of September 2023 (broadly stable from YE 2022), represents large absolute

risk concentrations, they are mitigated by diversification across geographies and assets, tight lending criteria, low LTVs (64% in the investment bank and 54% in the corporate bank), exposure to strong sponsors, good underlying collateral mostly in prime locations and hedges. Around 17% of the CRE exposure was classified as stage 2 loans as of end-September 2023 (up from 14% at year-end 2022) and 6% as stage 3 (impaired, up from 4% at year-end 2022). As of September 2023, the group booked €242 million out of the €5.7 billion US CRE loans that they modified or restructured in the past 15 months and expects a more limited refinancing risk for the €3 billion exposure to be modified or restructured in the next 15 months.

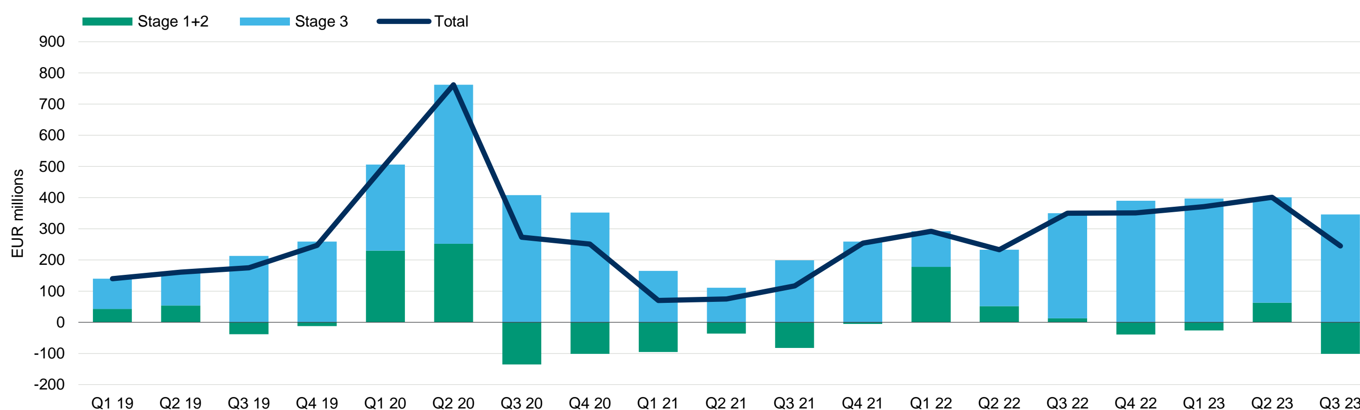
The leveraged lending portfolio of around €4 billion at year-end 2022, representing 1% of the loan book, is also well diversified across sectors, with limited borrower concentrations and around 79% of the exposure in the form of first lien secured credit facilities, mostly of revolving nature, the remaining being asset-based lending with low loss history. DB has actively de-risked its underwriting pipeline in 2022.

DB's loan-loss charges rose sharply in 2022 as the decade-long benign credit cycle began to turn. During 2022, DB's loan loss charges totaled €1.2 billion (25 bps), up significantly from €515 million (12 bps) in 2021. The increase was partly driven by significantly higher Stage 3 provisions (€1,022 million versus €734 million in 2021), reflecting a weakening macroeconomic outlook. In 9M 2023, risk provisioning continued to increase to 28 bps of gross loans (€1 billion), due to a more challenging environment that caused ratings movements in the performing loans portfolio and additional provisions booked on idiosyncratic legacy impaired loans in PB, CB and IB, unveiling no directional trend. In Q3, cost of risk even dropped to 20 bps of gross loans, as a result of model changes and improved economic projections in the US, which partly offset a slight increase in stage 3 provisions.

For full year 2023, DB expects loan loss charges to be at the upper end of a range of 25-30 basis points (bps) of gross loans. We believe these assumptions are realistic in light of the bank's diversified and highly collateralised Germany-focused loan book, and €5.1 allowances for potential loan losses which would help stave off a sudden deterioration in DB's asset quality and a sharp and unexpected rise in loan loss charges.

Exhibit 10

Loan loss charges (LLC) are likely to further gradually increase (€ million)



Source: Company reports, Moody's Investors Service

Qualitative adjustment captures remaining reliance on capital markets activities

Despite the proposed downsizing and its progress in recalibrating the bank's business model, DB will retain a significant reliance on capital markets activities for income generation: capital markets-related revenue will account for around one-third of DB's total revenue in 2023/24 (Moody's estimate). We generally consider capital markets activities to be both opaque and potentially volatile, posing significant challenges for the management of such activities, in particular because these businesses carry significant risk management and risk governance challenges; opaque risk taking; and intrinsic market, counterparty and operational risks; and display a high confidence sensitivity of the customer and funding franchises. These structural challenges continue to result in a one-notch negative qualitative adjustment to DB's BCA in respect of remaining 'Opacity and Complexity', an adjustment currently shared with all large GIBs.

Sound capital and strong liquidity continue protecting bondholders

DB's Common Equity Tier 1 (CET1) capital ratio improved to 13.9% at the end of September 2023, from 13.4% at the end of 2022 and 13.2% at the end of 2021, driven mainly by solid earnings, around 2% reduction in risk-weighted assets in the first nine months 2023 and positive effects of data and process enhancement and risk mitigation actions in Q3 2023. DB's CET1 ratio is around 280 bps above minimum regulatory requirement of around 11.2% in 2023, which includes a 0.75% countercyclical buffer in Germany and a sectoral systemic risk buffer of 2% for German residential real estate exposures.

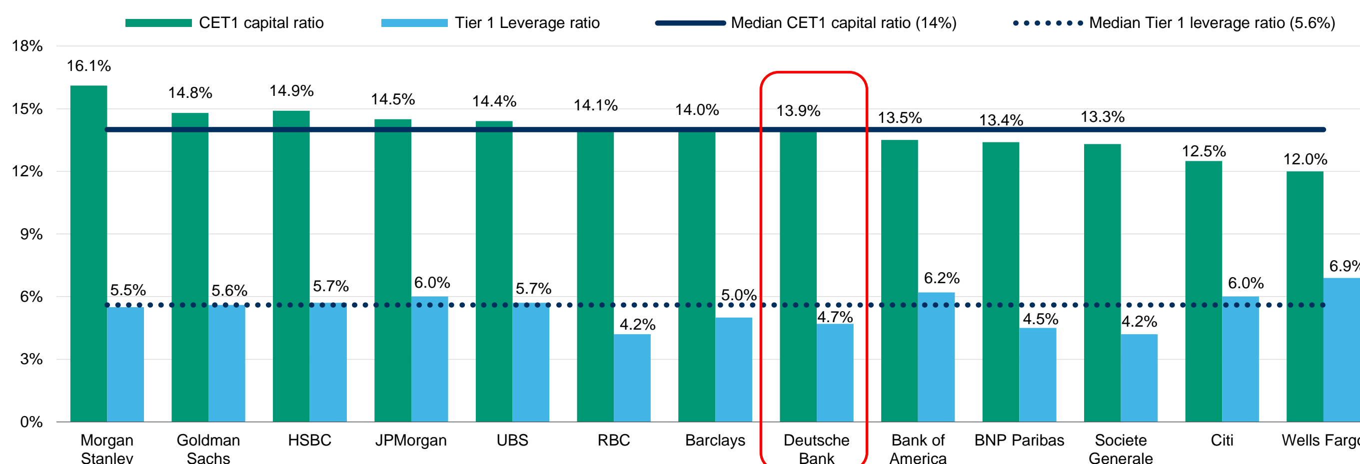
Considering the bank has already achieved around €10 billion of its €15-20 billion RWA reduction target by 2025, it has revised its ambition to a €25-30 billion range which will be mostly achieved from lower-yielding portfolios, with limited revenue impact. In addition, the bank reviewed its expected impact on RWA of the finalisation of Basel III requirements by €10-15 billion, which will provide an improved capacity (€3 billion additional capital compared to initial plan) to grow the business, distribute earnings and shield the operations against unexpected risk deterioration.

The bank announced at the beginning of the 2022-2025 strategic plan that the intended total dividend payout ratio will gradually increase to 50% by 2025 and the management board authorized in 2023 share buybacks of up to 10% of the share capital before the end of April 2028. In respect of the 2021-2025 reference period, DB announced a total capital distribution of around €8 billion[7]. During the 2021-2024 period, DB expects to grow dividends by around 50% per year, achieving a total of €3.3 billion with the remainder expected to be executed via share buybacks. The bank resumed its share buybacks in August 2023 with a maximum of €450 million until the end of December. Considering the lower RWA target for 2025 announced in Q3 2023, we expect that the payout ratio will increase faster than initially planned.

DB reported a Tier 1 leverage ratio of 4.7% at the end of September 2023, 10 bps higher than year-end 2022, mainly owing to a decline in leverage exposure to €1,235 billion (Q4 2022: €1240 billion). We expect the bank to manage towards a leverage ratio of 4.5% or higher going forward in an effort to close the gap to its peer group.

Exhibit 11

Common Equity Tier 1 (CET1) ratio and Tier 1 Leverage Ratio for Global Investment Banks, as of end-September 2023



Notes: 1) Q3 2023 for all banks 2) The Tier 1 leverage ratios of UK and European banks are calculated as per the Capital Requirement Regulations, and they exclude certain central bank balances as temporarily allowed; for US banks we show the supplemental leverage ratio (SLR). 3) The CET1 ratio for US banks is calculated under the advanced approach.
Source: Company reports, Moody's Investors Service

This capital distribution policy helps balance shareholders' and bondholders' interests and allows for sufficient flexibility by limiting the anticipated total dividends to half of the target payout, a credit positive considering the uncertain market environment. It will also help stabilising the bank's CET1 capital ratio during the 2022-2025 period. In the challenging macroeconomic context, we expect loan growth to remain subdued in 2024, but risk-weighted assets, which have been actively managed down and optimized, could be adversely impacted by negative risk migration, elevated market and counterparty risks and regulatory model reviews, which could create some volatility around the bank's CET1 ratio target of around 13%.

Strong liquidity position and sound funding profile

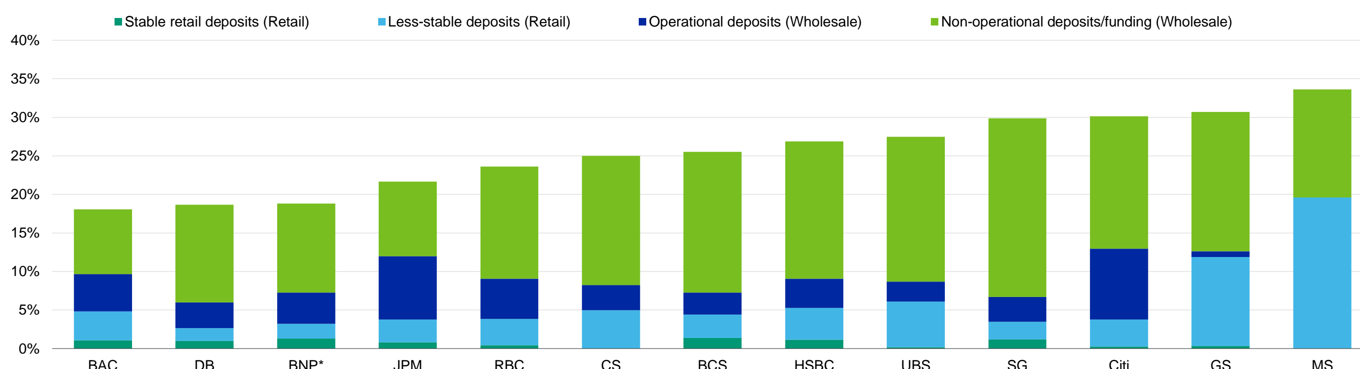
We assign an a3 Funding Structure score to DB, one notch above the bank's initial score. The positive adjustment reflects DB's extended and now more stable tenure for a larger part of its confidence-sensitive wholesale funding and further captures our expectation that DB will remain less dependent on such funding sources, adding flexibility to managing refinancing costs and executing on the announced plans over the next 12-18 months. The adjustment also takes account of the benefits provided by the bank's stable and diversified deposit base generated from its sizable domestic corporate and retail banking franchise. Deposits consitute 60% of DB's net liabilities (including equity) and are raised mostly in Germany (around 71% as of September 2023). About 51% of total deposits were sourced from retail clients and 35% of total deposits sourced from SMEs and corporates' operational or term deposits, which counterbalances the wholesale funding needs of the bank's remaining capital markets activities. As a result, DB displays one of the strongest deposit stability among global investment bank peers, based on a limited proportion of non-operational overnight deposits (14% as of Q3 2023).

Following a context of very volatile markets in Q1 2023, and the confidence crisis that followed the failure of several US regional banks and the measures taken by the Swiss National bank to ensure stability for Credit Suisse's customers, DB confirmed that the change in deposit balances experienced in the first quarter (to €592 billion at end of March from €621 billion at the end of December) reflected a normalization from very high levels posted in 2022. Indeed, deposits have bounced back since then to €611 billion at the end of September 202.

Exhibit 12

Deposits are also significantly more stable than in the past

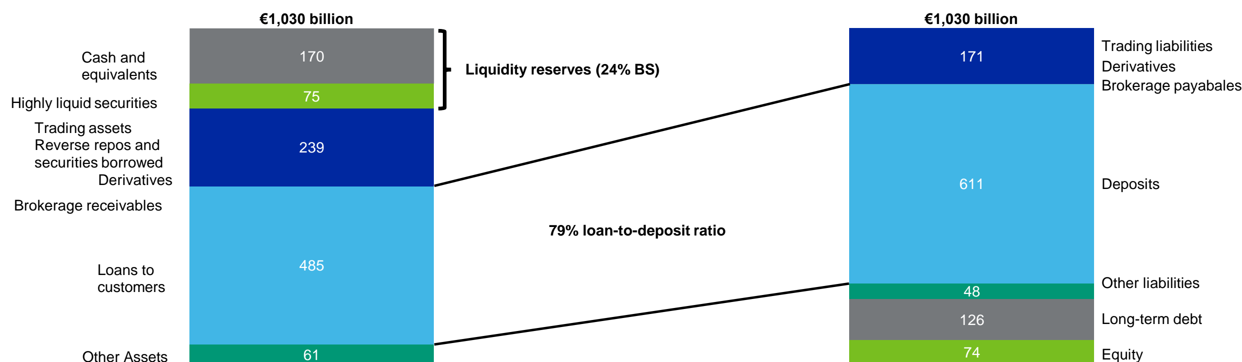
Weighted outflow of deposits as a proportion of total deposits (in %, from LCR disclosures)



*BNP outflows exclude a proportion of short-term wholesale funding the bank immediately places in central bank cash as part of its 'sterilization' strategy.
Source: Company reports, Moody's Investors Service

DB's stock of loss-absorbing debt is likely to remain above the minimum stipulated under the EU's minimum requirement for own funds and eligible liabilities (MREL; Q3 2023 fully-loaded excess was €17 billion). However, DB will continue replacing partially some maturing junior senior unsecured debt with less costly preferred senior unsecured debt. Further, the group's total loss-absorbing capacity (available TLAC) amounting to €116 billion as of the end of Q3 2023 was well in excess of DB's €83 billion requirement[8]. Long-term debt (capital market) funds outstanding totaled €126 billion, equal to around 13% of net liabilities (Exhibit 14). As of end-September 2023, the funding plan has almost been completed, with issuances amounting to €13 billion, including a €1.5 billion Tier 2 issuance replacing a Tier 2 instrument of the same size called in April. DB will focus on senior preferred debt and covered bonds issuances in Q4 2023. The bank also prepaid in Q3 the €3 billion of TLTRO maturities due in December 2023, and is left with €15 billion that will mature in 2024, of which €3 billion maturing in Q1 2024 and the remaining €10 billion in Q2 2024. This early execution of the funding plan is positive considering the market volatility experienced by banks in 2023, in particular for deeply subordinated instruments.

Exhibit 13
DB's balance sheet remains highly liquid, a credit positive (Balance sheet as of end-September 2023)



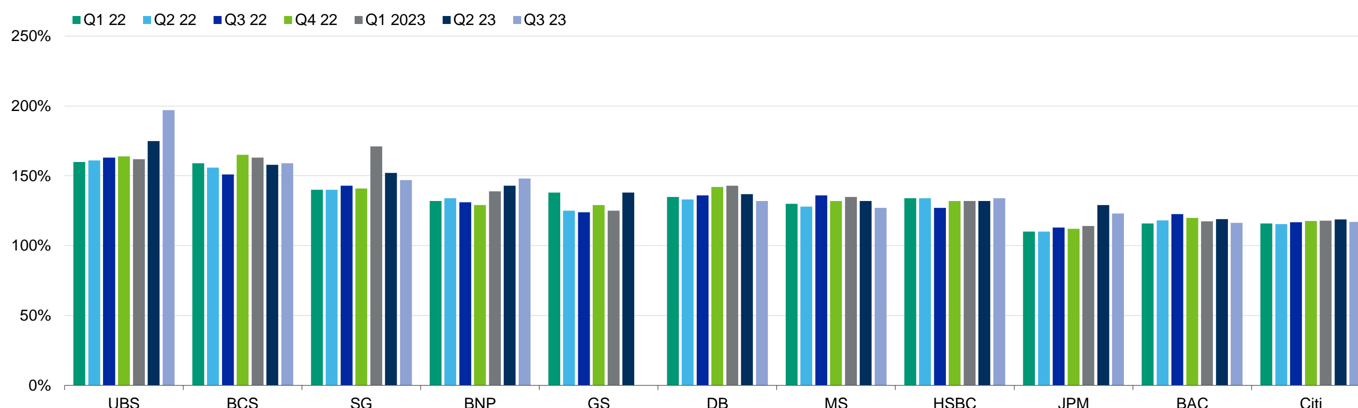
Trading and related assets along with similar liabilities, include debt and equity securities (excluding highly liquid securities); derivatives; repos; securities borrowed and lent; brokerage receivables and payables and; loans measured at fair value.
Source: DB's Fixed Income Investor Presentation Q3 2023, Moody's Investors Service

Liquidity remains a credit strength

Liquidity remains a comparative and credit-positive strength of DB and has significantly reduced the bank's refinancing risk. This is reflected in our a1 Liquid Resources score, in line with DB's initial score. The assigned score contains a one-notch downward adjustment to the initial score to reflect asset encumbrance on a sizeable portion of assets that are designated as liquid in our initial ratio and score. At the same time, we make an offsetting one-notch upward adjustment based on our consideration of the group's conservative management of liquidity across its various branches and subsidiaries, as well as its high stock of high-quality liquid assets which we expect to remain virtually unchanged from here.

The bank's reported liquidity reserves largely comprised central bank cash (71% of LCR's stock of High Quality Liquid Assets - HQLA) and other highly liquid securities (non-cash Level 1 assets represented 26% of HQLA as of Q2 2023, last data available), substantially mitigating the refinancing risks associated with its more confidence-sensitive wholesale market funding (€75 billion MREL-eligible debt outstanding as of end-September 2023[9]). The bank's strong €245 billion liquidity reserve also continued to stand well above regulatory requirements as stipulated by the Liquidity Coverage Ratio (LCR), the latter standing at 132% as of end-September 2023. Some of DB's excess liquidity is likely to be consumed by planned business growth, reducing the liquidity buffer (and LCR, see Exhibit 15). We also expect DB to gradually repay its remaining €15 billion of the TLTRO in 2024.

Exhibit 14
DB's LCR is well in-line with its peer group
GIBs' LCR, Q1 2022 - Q3 2023

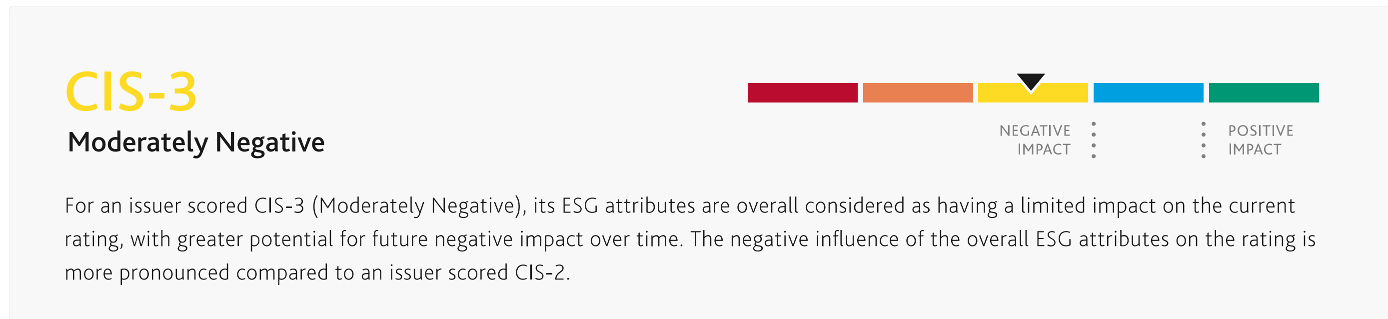


Source: Company reports, Moody's Investors Service

ESG considerations

Deutsche Bank AG's ESG Credit Impact Score is Moderately Negative CIS-3

Exhibit 15
ESG Credit Impact Score



Source: Moody's Investors Service

DB's **CIS-3** reflects the limited impact of ESG considerations on the bank's ratings to date. However, like its closest peers, DB's score reflects our industry view of the opacity, complexity and tail risks associated with running a global capital markets business, which are captured under our governance assessment. The bank's significantly improved track record in managing these risks and executing on its strategic overhaul are important mitigating factors, supported by the bank's improved financial fundamentals.

Exhibit 16
ESG Issuer Profile Scores

Source: Moody's Investors Service

Environmental

DB faces moderate exposure to environmental risks mainly because of its portfolio exposure to carbon transition risk as a diversified, universal banking group, consistent with its global peers. DB is facing mounting business risks and stakeholder pressure to meet broader carbon transition goals. In response, the bank recently set clearly articulated targets for sustainable finance for its corporate and asset management businesses and is actively engaging in further developing its comprehensive risk management and climate risk reporting frameworks.

Social

DB faces high industry-wide social risks related to regulatory risk, litigation exposure, reputational risk and high compliance standards. These risks are largely mitigated by well-developed policies and procedures. However, the design of complex, opaque or speculative financial products for institutional clients increases the bank's exposure to the potential for reputational risk and litigation. High cybersecurity and personal data risks are increasingly mitigated by the bank's improved IT framework, which includes sharing information with regulators and government cybersecurity entities.

Governance

DB has improved its management track record since the announcement of its strategic overhaul in summer 2019. It has embedded more conservative, risk-focused and risk-aware financial policies, and has much stronger overall corporate governance practices.

However, the opacity and complexity of capital market activities, which account for around 30%-40% of group revenue, exposes the group to tail 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

Loss Given Failure (LGF) analysis

DB is subject to the Bank Recovery and Resolution Directive, which we consider an operational resolution regime. Therefore, we apply our Advanced LGF analysis, where we consider the risks faced by the different debt and deposit classes across the liability structure should the bank enter resolution. In line with our standard assumptions, we assume a residual tangible common equity of 3%, as well as asset losses of 8% of tangible banking assets in a failure scenario. We also assume a 25% runoff of junior wholesale deposits and a 5% runoff of preferred deposits. Moreover, we assign a 25% probability to junior deposits being preferred to senior unsecured debt. We apply a standard assumption for European banks that 26% of deposits are junior.

The results of our Advanced LGF analysis are as follows:

- For deposits and senior unsecured debt, our LGF analysis indicates an extremely low loss given failure, leading to three notches of rating uplift from the bank's baa2 Adjusted BCA.
- For junior senior unsecured debt, our LGF analysis indicates a low loss given failure, leading to one notch of rating uplift from the bank's baa2 Adjusted BCA.
- For subordinated debt and junior securities issued by DB, our LGF analysis indicates a high loss given failure, given the small volume of debt and limited protection from more subordinated instruments and residual equity, leading to a one-notch deduction from the bank's baa2Adjusted BCA. We also incorporate additional notching from the Adjusted BCA for junior subordinated and preference share instruments, reflecting the coupon suspension risk ahead of potential failure.

Government support considerations

We assume a moderate probability of government support for both deposits and senior unsecured debt of DB, which we consider a domestic systemically important financial institution, resulting in a one-notch additional rating uplift. For junior senior unsecured debt[10], subordinated debt and hybrid instruments, we believe the potential for government support is low, and these ratings, therefore, do not benefit from any government support uplift.

A1/P-1 Counterparty Risk Ratings (CRRs)

The bank's CRRs are positioned four notches above the baa3 Adjusted BCA, reflecting the extremely low loss-given-failure provided by subordinated instruments, primarily junior senior unsecured debt, to the more senior CRR liabilities and one additional notch of government support uplift assuming a 'Moderate' level of support, in-line with our support assumptions on deposits and senior unsecured debt.

A1(cr)/P-1(cr) Counterparty Risk (CR) Assessment

The bank's CR Assessment is positioned four notches above the baa3 Adjusted BCA, based on the buffer against default provided by more subordinated instruments, primarily junior senior unsecured debt, to the senior obligations represented by the CR Assessment and one additional notch of government support uplift assuming a 'Moderate' level of support. Because the CR Assessment captures the probability of default on certain senior operational obligations, rather than expected loss, we focus purely on subordination and take no account of the volume of the instrument class.

Methodology and scorecard

Methodology

The principal methodology we use in rating Deutsche Bank AG is the Banks Methodology, published in July 2021.

About Moody's Bank Scorecard

Our bank 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 17
Deutsche Bank AG

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	2.7%	a2	↔	baa2	Operational risk	Market risk
Capital						
Tangible Common Equity / Risk Weighted Assets (Basel III - fully loaded)	15.4%	aa3	↔	a3	Nominal leverage	Expected trend
Profitability						
Net Income / Tangible Assets	0.2%	b1	↑	ba3	Return on assets	Expected trend
Combined Solvency Score		a3		baa2		
Liquidity						
Funding Structure						
Market Funds / Tangible Banking Assets	24.7%	baa1	↔	a3	Term structure	Extent of market funding reliance
Liquid Resources						
Liquid Banking Assets / Tangible Banking Assets	37.8%	a1	↔	a1	Stock of liquid assets	Expected trend
Combined Liquidity Score		a3		a2		
Financial Profile				baa1		
Qualitative Adjustments				Adjustment		
Business Diversification				0		
Opacity and Complexity				-1		
Corporate Behavior				0		
Total Qualitative Adjustments				-1		
Sovereign or Affiliate constraint				Aaa		
BCA Scorecard-indicated Outcome - Range				baa1 - baa3		
Assigned BCA				baa2		
Affiliate Support notching				0		
Adjusted BCA				baa2		

Balance Sheet	**in-scope (EUR Million)**	**% in-scope**	**at-failure (EUR Million)**	**% at-failure**
Other liabilities	261,658	26.3%	326,255	32.7%
Deposits	607,546	61.0%	545,576	54.7%
Preferred deposits	449,584	45.1%	427,105	42.9%
Junior deposits	157,962	15.8%	118,472	11.9%
Senior unsecured bank debt	24,767	2.5%	23,439	2.4%
Junior senior unsecured bank debt	52,061	5.2%	50,762	5.1%
Dated subordinated bank debt	11,700	1.2%	11,700	1.2%
Preference shares (bank)	8,981	0.9%	8,981	0.9%
Equity	29,898	3.0%	29,898	3.0%
Total Tangible Banking Assets	996,611	100.0%	996,611	100.0%

Debt Class	De Jure waterfall		De Facto waterfall		Notching		LGF Notching Guidance vs. Adjusted BCA	Assigned LGF notching	Additional Notching	Preliminary Rating Assessment
	Instrument volume + subordination	Sub-ordination	Instrument volume + subordination	Sub-ordination	De Jure	De Facto				
Counterparty Risk Rating	24.4%	24.4%	24.4%	24.4%	3	3	3	3	0	a2
Counterparty Risk Assessment	24.4%	24.4%	24.4%	24.4%	3	3	3	3	0	a2 (cr)
Deposits	24.4%	10.2%	24.4%	12.5%	3	3	3	3	0	a2
Senior unsecured bank debt	24.4%	10.2%	12.5%	10.2%	3	2	3	3	0	a2
Junior senior unsecured bank debt	10.2%	5.1%	10.2%	5.1%	1	1	1	1	0	baa1
Dated subordinated bank debt	5.1%	3.9%	5.1%	3.9%	-1	-1	-1	-1	0	baa3
Non-cumulative bank preference shares	3.9%	3.0%	3.9%	3.0%	-1	-1	-1	-1	-2	ba2

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	a2	1	A1	A1
Counterparty Risk Assessment	3	0	a2 (cr)	1	A1(cr)	
Deposits	3	0	a2	1	A1	A1
Senior unsecured bank debt	3	0	a2	1	A1	A1
Junior senior unsecured bank debt	1	0	baa1	0	Baa1	Baa1
Dated subordinated bank debt	-1	0	baa3	0	Baa3	Baa3
Non-cumulative bank preference shares	-1	-2	ba2	0	Ba2 (hyb)	Ba2 (hyb)

[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 18

Category	Moody's Rating
DEUTSCHE BANK AG	
Outlook	Stable
Counterparty Risk Rating	A1/P-1
Bank Deposits	A1/P-1
Baseline Credit Assessment	baa2
Adjusted Baseline Credit Assessment	baa2
Counterparty Risk Assessment	A1(cr)/P-1(cr)
Issuer Rating	A1
Senior Unsecured	A1
Junior Senior Unsecured	Baa1
Junior Senior Unsecured MTN	(P)Baa1
Subordinate	Baa3
Pref. Stock Non-cumulative	Ba2 (hyb)
Commercial Paper -Dom Curr	P-1
Other Short Term -Dom Curr	(P)P-1
DEUTSCHE BANK TRUST COMPANY AMERICAS	
Outlook	Stable
Counterparty Risk Rating	A1/P-1
Bank Deposits	A1/P-1
Baseline Credit Assessment	baa1
Adjusted Baseline Credit Assessment	baa1
Counterparty Risk Assessment	A1(cr)/P-1(cr)
Issuer Rating	A1

Source: Moody's Investors Service

Endnotes

1 Assets under management shown in Asset Management segment. The Private Bank further holds €547 billion of assets under management as of the same date.

2 The SRF is being built up over a period of eight years (2016-23) and will reach at least 1% of the amount of covered deposits of credit institutions in all twenty-one Banking Union countries. As of July 2023, the SRF stood at approximately €78 billion.

3 Excluding specific items as defined by DB.

4 Adjustment reflects mainly litigation, restructuring and severance charges that were €124 million higher than in Q3 2022.

5 Data as of December 2022, last available.

6 Data source is the Banque de France report on Indebtedness levels of non-financial entities - international comparisons Q2 2023.

7 including dividends paid in 2026 in respect of 2025

8 DB's TLAC requirement is equivalent to 6.75% of its leverage exposures as of the end of Q3 2023.

9 This includes senior preferred and senior non-preferred issuances, as well as AT1 and Tier 2 instruments.

10 In particular, for junior senior unsecured debt, the 2018 legal changes to Germany's bank insolvency rank order has lowered the likelihood of government support being available for these instruments, because they legally rank pari passu with most of the outstanding (statutorily subordinated) senior unsecured debt instruments issued up until 20 July 2018. This pari passu ranking of junior senior unsecured debt with legacy (statutorily subordinated) senior unsecured instruments makes it less likely that German authorities would selectively support the legacy instruments (which we reclassified into junior senior unsecured debt), following clarification that the German authorities expect these liabilities to bear losses in a resolution. As a result, our government support assumption for these instruments is 'Low'.

© 2023 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 BY MOODY'S (COLLECTIVELY, "PUBLICATIONS") 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 PUBLICATIONS ARE NOT STATEMENTS OF CURRENT OR HISTORICAL FACT. MOODY'S PUBLICATIONS 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 PUBLICATIONS DO NOT CONSTITUTE OR PROVIDE INVESTMENT OR FINANCIAL ADVICE, AND MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND PUBLICATIONS ARE NOT AND DO NOT PROVIDE RECOMMENDATIONS TO PURCHASE, SELL, OR HOLD PARTICULAR SECURITIES. MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND PUBLICATIONS 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 ITS PUBLICATIONS 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 PUBLICATIONS 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 PUBLICATIONS 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.

MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND PUBLICATIONS 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 Publications.

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 fees ranging from $1,000 to approximately $5,000,000. 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.moodys.com under the heading "Investor Relations — Corporate Governance — Charter Documents - Director and Shareholder Affiliation Policy."

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 Japan only: Moody's Japan K.K. ("MJKK") is a wholly-owned credit rating agency subsidiary of Moody's Group Japan G.K., which is wholly-owned by Moody's Overseas Holdings Inc., a wholly-owned subsidiary of MCO. Moody's SF Japan K.K. ("MSFJ") is a wholly-owned credit rating agency subsidiary of MJKK. MSFJ is not a Nationally Recognized Statistical Rating Organization ("NRSRO"). Therefore, credit ratings assigned by MSFJ are Non-NRSRO Credit Ratings. Non-NRSRO Credit Ratings are assigned by an entity that is not a NRSRO and, consequently, the rated obligation will not qualify for certain types of treatment under U.S. laws. MJKK and MSFJ are credit rating agencies registered with the Japan Financial Services Agency and their registration numbers are FSA Commissioner (Ratings) No. 2 and 3 respectively.

MJKK or MSFJ (as applicable) hereby disclose that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by MJKK or MSFJ (as applicable) have, prior to assignment of any credit rating, agreed to pay to MJKK or MSFJ (as applicable) for credit ratings opinions and services rendered by it fees ranging from JPY100,000 to approximately JPY550,000,000.

MJKK and MSFJ also maintain policies and procedures to address Japanese regulatory requirements.

REPORT NUMBER 1384847

Moody's
INVESTORS SERVICE