Nordic Credit Rating

12 May 2025

Covered Bond Rating Methodology

CONTENTS

INTRODUCTION

1. This methodology describes the framework within which Nordic Credit Rating AS (NCR) assigns credit ratings to covered bond pools and instruments issued by financial institutions. We define financial institutions as prudentially regulated banks and non-bank credit institutions with similar characteristics and covered bond issuers as licensed issuers of covered bonds as recognised by national or international regulators.

2. The methodology is designed to be robust, continuous and systematic, and consequently produce ratings that are relevant and comparable with other ratings assigned by NCR, as outlined in *Nordic Credit Rating: Rating Principles*, which can be found at www.nordiccreditrating.com. NCR assigns long-term credit ratings on a scale comprising several categories ranging from 'AAA', reflecting the strongest credit quality, to 'D', reflecting the weakest.

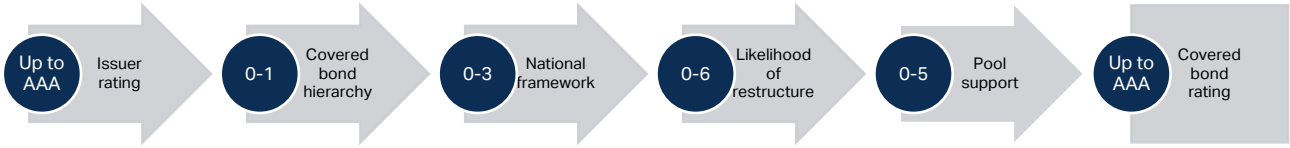
3. For a full explanation and definition of NCR ratings and the rating process, see *Nordic Credit Rating: Rating Principles*.

FRAMEWORK OVERVIEW

4. Our covered bond ratings are forward-looking assessments that consider:

   - the ongoing strength of the issuing entity to make timely payments and maintain asset quality and overcollateralisation levels in the cover pool;
   - the treatment of covered bonds in the creditor hierarchy;
   - the national regulatory framework;
   - the bank resolution regime and/or likelihood of restructuring; and,
   - the ability of the cover pool to support timely principal and interest payments in the event of an issuer default and rundown of the cover pool, if necessary.

Figure 1. NCR covered bond rating framework and notches of potential uplift from each factor

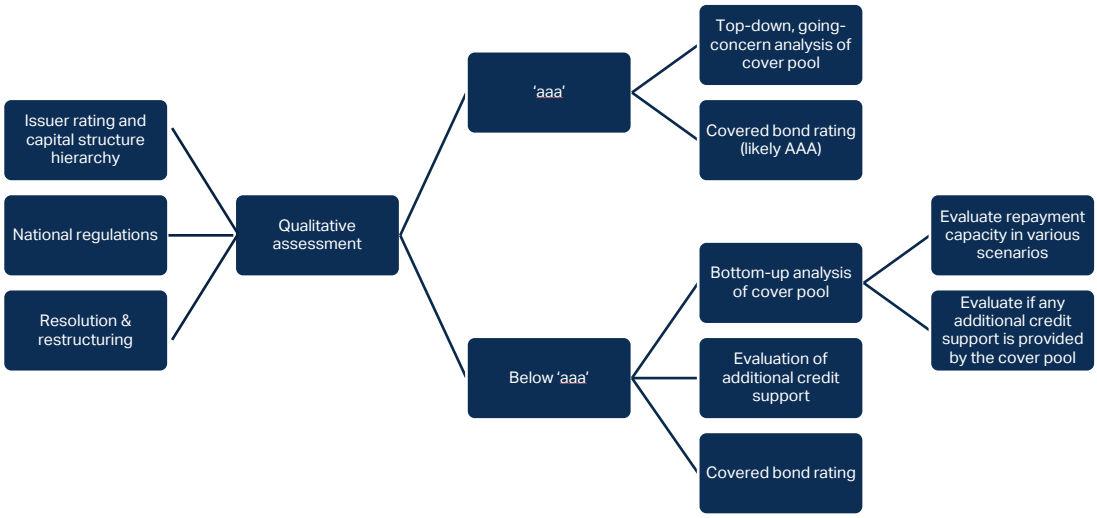


5. The complexity and depth of the cover pool analysis is dependent on the outcome of the qualitative assessment on the issuer. If the indicative assessment is 'aaa', a top-down, going-concern analysis is required and if it is below 'aaa' a more detailed, bottom-up analysis is applied.

6. When the indicative assessment is 'aaa', a top-down analysis of the cover pool is conducted given the extremely low likelihood of a cover pool relying entirely on its own assets to fulfil its commitments. It is expected that the cover pool assets would provide at least additional support to the credit quality of the pool. However, the incremental support is of marginal value to the assessment of the issue rating of the covered bond at the 'aaa' qualitative assessment level. NCR may still conduct a bottom up analysis if it is considered to provide relevant information for the market, for example, if the issuer rating has deteriorated or when a negative outlook on the issuer could result in the potential qualitative assessment falling below 'aaa'. The issuer can request a deeper analysis of the cover pool, even when the qualitative assessment is 'aaa'.

7. When the qualitative assessment results in an assessment below 'aaa', a bottom up analysis of the cover pool is undertaken to determine the ability of the underlying assets to support timely payments and full repayment over the life of the covered bond. Details of our standalone cover pool analysis can be found in Appendix 1.

Figure 2. NCR covered bond rating components

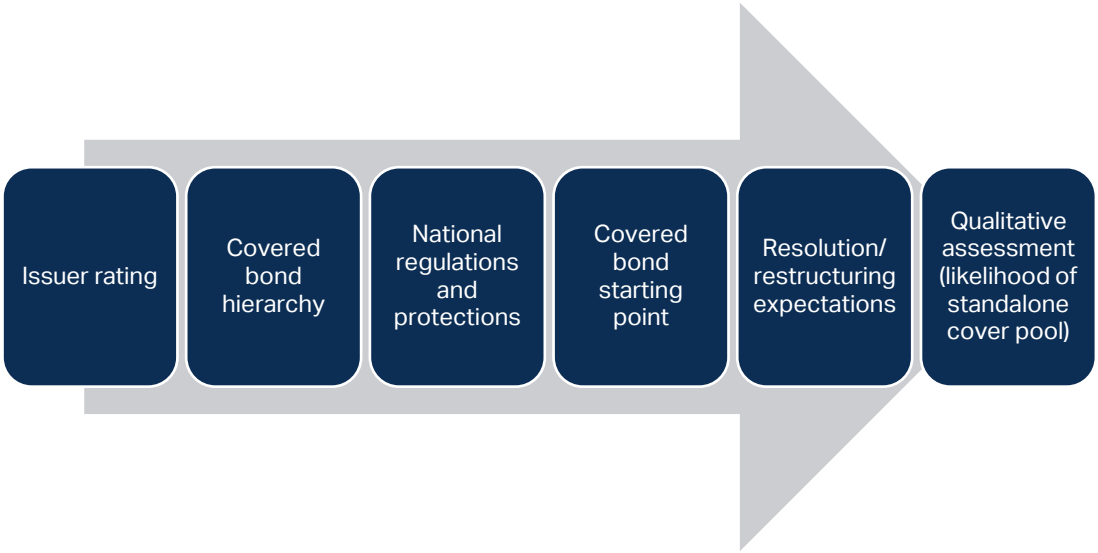


8. In scenarios where the qualitative assessment falls from 'aaa' to a lower level or when an issuer becomes decoupled from its cover pool – mostly likely resulting from falling creditworthiness of the issuer or its bank group, or reduced commitment from the issuer's collective owners – NCR increases the depth of its cover pool analysis. Conversely, when creditworthiness improves, the depth of the cover pool analysis can be recalibrated.

QUALITATIVE ASSESSMENT

9. NCR's qualitative assessment of covered bonds considers the likelihood that a specific cover pool will become a standalone entity, thus becoming solely responsible (without support of the issuer) for ensuring that bondholders receive timely coupon and principal payments based on interest payments, repayments, maturities and sales of cover pool assets.

Figure 3. NCR covered bond qualitative assessment process



10. Key components of the qualitative assessment are:

    - the rating on the issuer or bank group or a credit assessment of the collective owners of the issuer,
    - the rank of covered bonds in a default hierarchy,
    - national covered bond regulations and investor protections, and
    - resolution and/or restructuring expectations.

11. NCR determines the covered bond starting point, then compares the implicit default frequency of the covered bond starting point against the probability of the covered bonds being protected in a resolution scenario. For some banks, resolution is a near certainty according to current European law and explicit identification of systemically important financial institutions. However, for some covered bond issuers resolution is less likely and restructuring or acquisition of covered bond assets by other market participants is a more likely scenario. In both instances, NCR attempts to quantify the likelihood that a cover pool and its associated covered bonds will operate without the support of the issuer, collective owners or another acquiring entity and will be run down by an administrator charged with maximising the return to investors.

12. The likelihood of such a scenario occurring is converted to a qualitative assessment by comparing the indicative default frequency associated with various rating levels as outlined in *Nordic Credit Rating: Rating Principles*[1].

ISSUER RATING

13. NCR believes that repayment capacity for covered bonds is linked to the credit quality of the issuer, the issuer's banking group, or, in some instances, the collective owners of the issuer. This reflects

[1]*Nordic Credit Rating: Rating Principles* defines indicative default frequencies for AAA, AA, A, BBB, BB and C rating levels for 1, 3, 5 and 10 years. A linear extrapolation is used between rating grades and maturities to evaluate issues with ratings with plus and minus suffixes and for bonds maturing in 2, 4, 6, 7, 8 and 9 years.

ongoing ability to provide capital and liquidity and manage cover pool assets from outside the cover pool itself. This includes substituting repaid loans, replacing nonperforming loans and adding new loans to the existing pool as well as hedging market risks and providing other forms of substitute assets to maintain target overcollateralisation levels.

14. NCR's financial institution issuer ratings are forward-looking assessments that incorporate macroeconomic conditions, key risk appetite strategies and management, competitive position, and key earnings and loss performance indicators, as outlined in *Nordic Credit Rating: Financial Institutions Rating Methodology*. Together, these qualitative and quantitative analyses result in an indicative credit assessment for the issuer. We complement these analyses with peer comparisons, temporary or transitional impacts, capital structure support from bail-in-able senior unsecured debt instruments and ownership considerations to provide an issuer rating.

15. When a covered bond issuer is owned by a collective of banks which uses the entity as a funding vehicle, the evaluation of the issuer rating will incorporate the owner banks' willingness and contractual obligations to support the issuer and the means by which some of the collective owners are able to support the issuer even in the event of a default or deterioration of one or more of the owner banks. This analysis is typically included within the evaluation of potential support under our financial institutions rating methodology.

16. In the event of a material deterioration of issuer credit quality, the linkage between an issuer and the cover pool will be evaluated. As described below, the likelihood of cover pool protection via resolution or restructuring and the features of cover pool assets are the primary determinants of how closely linked the issuer rating is to the respective covered bond rating. When a cover pool has been delinked from its initial issuer, an evaluation of the creditworthiness of the standalone entity will be conducted to determine the issuer rating used in the analysis.

COVERED BOND HIERARCHY

(Up to one notch above the issuer rating)

17. Given the preference for covered bonds in Nordic bank debt hierarchies, the starting point for covered bond ratings is generally one notch higher than the long-term issuer rating.

18. This reflects the implementation of the EU's Bank Recovery and Resolution Directive (BRRD), which explicitly defines covered bonds as having priority over senior unsecured debt obligations in the default hierarchy of financial institutions. The BRRD also limits the potential for bail in of covered bonds in instances in which covered bond liabilities exceed eligible cover pool assets, which is contrary to national regulations in all Nordic countries, a factor considered in our evaluation of national covered bond regulations and protections.

19. Norway, Sweden, Denmark and Finland have incorporated the BRRD into their respective national legislation. In Denmark, mortgage credit institutions are not subject to the BRRD's bail-in tool, nor to the minimum requirement for own funds and eligible liabilities (MREL) requirements, described within the directive, but their covered bonds are assumed to have similar advantages in the credit hierarchy. However, if a covered bond is issued without BRRD protections, perhaps because of future changes to covered bond regulations or due to jurisdiction-specific legal considerations, it is possible to align the starting point with the long-term issuer rating, if appropriate.

Figure 4. Covered bond hierarchy and starting point guidelines

	0 NOTCHES	+1 NOTCH
Covered bond starting point compared to the long-term issuer rating	Covered bonds are not prioritised ahead of senior unsecured bond holders in default or liquidation.	Covered bonds are protected by the BRRD or similar legislation and are explicitly higher than other senior liabilities in the creditor hierarchy.

20. In Denmark, mortgage credit institutions have issued debt instruments secured by the cover pool known as junior covered bonds (also known as senior secured debt or Section 15 bonds). These bonds have the sole purpose of increasing supplementary collateral and raising overcollateralisation levels in the cover pool. They are also exempt from the bail-in tool described in the BRRD but have only a secondary claim on to cover pool assets. Given that the purpose of these instruments is to provide necessary liquidity, NCR expects to rate these instruments in line with their ranking in the cover pool hierarchy, without further consideration of support.

NATIONAL COVERED BOND REGULATIONS AND PROTECTIONS

(Up to three rating grades above the covered bond hierarchy)

21. In addition to protections accorded by the BRRD, national regulations play an important role in ensuring the bankruptcy remoteness of covered bonds, ringfencing cover pool assets, regulating the quality and management of cover pool assets, ensuring compliance with overcollateralisation requirements and the administration and refinancing of cover pools in the event of issuer bankruptcy.

22. EU efforts to harmonise covered bond markets across Europe are likely to promote the use of the instruments and ensure comparability across borders. They are not expected to diminish protections for investors in Nordic covered bonds.

23. Alongside regulatory considerations, the importance of covered bonds to national economies and pension savings is considered in our analysis of national protections. In addition to financing a significant portion of domestic mortgage markets in the Nordic region, many pension funds and institutional investors have large exposures to covered bonds, given the relatively low volume of long-term government debt alternatives. We believe that the importance of covered bonds will encourage national legislators and regulators in the region to take extraordinary measures to ensure that covered bond markets remain liquid, even during periods of extreme stress. Various examples of this prioritisation occurred across the Nordic region in response to the 2008 financial crisis and such measures are likely in future crises given that the region's covered bond markets have grown and are now incorporated into international liquidity standards.

Figure 5. National covered bond regulations and market importance guidelines

	0 NOTCHES	+1 NOTCH	+2 NOTCHES	+3 NOTCHES
National regulation impact in addition to the covered bond starting point	One of the following is a material concern: - The bankruptcy remoteness of the cover pool. - Investors' preferential claim to pool assets.	There are no concerns over the following: - The bankruptcy remoteness of the cover pool.	There are no concerns over the following: - The bankruptcy remoteness of the cover pool.	There are no concerns over the following: - The bankruptcy remoteness of the cover pool.

	- Investors' pari passu claim to additional assets with other senior creditors. - National administrator's authority to refinance the cover pool.	- Investors' preferential claim to pool assets. - Investors' pari passu claim to additional assets with other senior creditors. - National administrator's authority to refinance the cover pool.	- Investors' preferential claim to pool assets. - Investors' pari passu claim to additional assets with other senior creditors. - National administrator's authority to refinance the cover pool.	- Investors' preferential claim to pool assets. - Investors' pari passu claim to additional assets with other senior creditors. - National administrator's authority to refinance the cover pool.
Covered bond market importance	Issued covered bonds represent less than 5% of total domestic funding.	Issued covered bonds represent a material share (typically around 10%) of total domestic funding.	Issued covered bonds represent a material share (typically around 15%) of total domestic funding.	Issued covered bonds represent a material share (typically around 15%) of total domestic funding.
Balance principle (see para 24 below) and automatic refinancing of outstanding loans	No	No	No	Balance principle materially improves asset and liability matching and reduces interest rate risk. Legal framework ensures bond refinancing, even in the event of issuer default.

24. In Denmark, the so-called "balance principle" and a law ensuring refinancing of the cover pool, even in the event of default, provide even further protection from default in the cover pool by virtually eliminating risk associated with asset and liability mismatches, currency and interest rate risk and refinancing risk for most cover pools and outstanding covered bonds. NCR views this an additional strength in the Danish covered bond framework, effectively providing an additional notch of uplift for issuers operating according to the balance principle. In addition, a majority of outstanding bond covenants allow administrators to extend the maturity of covered bonds in the event of a failed covered bond auction.

25. The applicability of uplift due to national regulatory support could vary for issuers of covered bonds secured by bespoke, non-traditional or concentrated assets. NCR reserves the right to adjust the relevant support notching where concerns arise.

COVERED BOND STARTING POINT

26. The covered bond starting point combines the following factors: issuer rating, the covered bond hierarchy and an evaluation of the respective national regulation and market. The covered bond starting point is reflected in lower case letters using NCR's rating scale. The indicative default frequency associated with the covered bond starting point is reflected in the qualitative assessments in Figure 7, which also consider the likelihood of resolution or restructuring as described below.

LIKELIHOOD OF RESOLUTION OR ALTERNATIVE RESTRUCTURING

27. BRRD regulations specify not only the priority of covered bonds but outline how banks in financial stress should undergo resolution and be recapitalised by bailing in specific senior unsecured instruments as described in a given financial institution's MREL requirements. MREL requirements

provide a means to recapitalise and restructure a bank or banking group without incurring losses on covered bonds. In addition, the process of resolution is expected to maintain support for the cover pool by ensuring the continuing operations of the resolved parent or banking group.

28. While the BRRD is implemented across the Nordic countries, it is not applicable to all issuers. Denmark, for example, has excluded mortgage credit institutions from the BRRD. Furthermore, MREL requirements have not been imposed on all covered bond issuers. In view of this, NCR will consider the likelihood of alternative solutions for existing cover pools in a scenario in which the parent bank is to be liquidated and the cover pool becomes a standalone entity.

29. Potential restructuring alternatives can include situations which are not considered supportive for issuer ratings. The reason is that the structural transfer of a cover pool or a market-based solution involving the sale or acquisition of a cover pool is considered only when the underlying issuer has already defaulted on senior obligations and/or the cover pool has been taken over by national administrators. In such a situation, the priority of the authorities is to reduce systemic risk and the risk for investors by finding new and stable owners for the cover pool or to manage a controlled winding down and ensure timely payments of coupons and principal of outstanding covered bonds.

30. Figure 6 sets out the guidelines for assigning a probability of resolution or restructuring to a given cover pool. The highest probability is associated with cover pools that are expected to be protected by the resolution of the pool's owner, while the lowest probability is associated with non-traditional pools where the ability to find interested buyers is highly uncertain. The probability of resolution or restructuring could differ for issuers with multiple cover pools depending on the composition of the assets in each individual pool. For example, a diversified residential mortgage pool might have a higher likelihood of resolution or restructuring than a pool of sub-prime residential mortgages, commercial mortgages or shipping loans.

Figure 6. Resolution and restructuring probability guidelines

PROBABILITY OF RESOLUTION OR RESTRUCTURING	95%	67%	33%	0%
Systemic importance	The issuer and its banking group are explicitly named as systemically important by the national regulator or resolution authority and/or the issuer is among the largest issuers of domestic covered bonds.	The issuer and its banking group are not explicitly named as systemically important, but the issuer is a large issuer of domestic covered bonds.	The issuer and its banking group are not explicitly named as systemically important.	The issuer and its banking group are not explicitly named as systemically important.
MREL requirements	MREL requirement, or similar, is defined for the issuer or banking group. Or the issuer has been specifically excluded from MREL requirements as a mortgage institution.	MREL requirement, or similar, is defined for the issuer or banking group. Or the issuer has been specifically excluded from MREL requirements as a mortgage institution.	MREL requirement, or similar, may or may not have been defined for the issuer or banking group.	No MREL requirement is defined.

PROBABILITY OF RESOLUTION OR RESTRUCTURING	95%	67%	33%	0%
Restructuring as an alternative to formal resolution	The issuer is expected to undergo resolution, protecting the cover pool from becoming self-sufficient.	An alternative solution, such as transfer of the cover pool to another issuer, is likely given the similarity of the assets and potential alliances between similar banking groups.	An alternative solution, such as transfer of the cover pool to another issuer, is possible.	An alternative solution, such as transfer of the cover pool to another issuer, is unlikely due to the non-traditional nature of the exposures.
Issuer relevance for financial stability	The issuer is among the largest issuers of domestic covered bonds and is considered vital to national or regional financial markets. The issuer may be a vital funding source for multiple banks.	The issuer is among the largest issuers of domestic covered bonds and/or is considered important to national or regional financial markets. The issuer may be an important funding source for multiple banks.	The issuer is not among the largest issuers of domestic covered bonds and has a replaceable role in national or regional financial markets. The issuer may be a funding source for multiple banks.	The issuer is not among the largest issuers of domestic covered bonds and has a minor role in national or regional financial markets.
Default implications	The default of the covered bonds would have systemic impacts on the future of the domestic covered bond market.	The default of the covered bonds would have material implications for the domestic covered bond market.	The default of the covered bonds could be a stress for the domestic covered bond market.	The default of the covered bonds would have minor implications for the domestic covered bond market.
Type of assets	Most assets are typically residential mortgages, or agricultural or public sector assets.	Most assets are typically residential mortgages, or agricultural or public sector assets.	Most assets are typically residential mortgages, agricultural or public sector assets, or high-quality commercial mortgages.	A large share of assets are non-traditional or sub-prime residential mortgages, commercial mortgages, shipping assets or other assets.

LIKELIHOOD OF A STANDALONE COVER POOL

31. The likelihood of a standalone cover pool is calculated by multiplying NCR's idealized 5-year probability of default associated with the covered bond starting point by one minus the probability of a resolution or restructuring for a given cover pool based on the guidelines and probabilities set out in Figure 6. The resulting probability has been mapped to NCR's idealised 5-year probability of default table as outlined in *Nordic Credit Rating: Rating Principles*, allowing for extrapolation between rating grades and smoothing to differentiate the risk. The qualitative assessments for covered bonds are set out in Figure 7.

Figure 7. Qualitative assessments based on the covered bond starting point and the probability of resolution or restructuring

COVERED BOND STARTING POINT	95%	67%	33%	0%
aaa	aaa	aaa	aaa	aaa
aa+	aaa	aaa	aaa	aa+
aa	aaa	aaa	aa+	aa
aa-	aaa	aa+	aa	aa-
a+	aaa	aa	aa-	a+
a	aaa	aa	a+	a
a-	aa+	aa-	a	a-
bbb+	aa+	a+	a-	bbb+
bbb	aa	a	bbb+	bbb
bbb-	aa	a-	bbb	bbb-
bb+	aa-	bbb+	bbb-	bb+
bb	a+	bbb	bbb-	bb
bb-	a	bbb	bb+	bb-
b+	a	bbb-	bb	b+
b	a-	bb+	bb-	b
b-	a-	bb	b+	b-

32. NCR ratings on covered bonds issued by issuers with a high likelihood of resolution could become decoupled from their issuer due to deteriorating issuer credit quality and maintain relatively strong initial credit assessments even as the issuer is nearing resolution or default on senior obligations. This is due to the expectation that given the BRRD, such an institution is highly likely to undergo resolution, resulting in uninterrupted support for the respective cover pool.

33. If an issuer's credit quality is deteriorating, NCR will pay close attention to comments and signals from the regulator, administrator and/or resolution authority and continually monitor whether the assumed probability of restructuring and/or resolution changes over time. As the covered bond starting point declines, NCR expects to carry out a more thorough analysis of the cover pool to provide additional information about asset quality and repayment risk for investors.

COVER POOL SUPPORT

(Up to five rating grades above the qualitative assessment)

34. When the qualitative assessment results in a rating outcome lower than 'aaa', an analysis of potential rating uplift due to cover pool support is undertaken. The standalone analysis of the cover pool evaluates the ability of the pool to ensure timely coupon and principal payments, adding additional notches to the final covered bond ratings based on the ability of the pool to withstand increasingly difficult conditions. Additional cover pool support is reflected in up to five notches of uplift which can be added to the qualitative assessment, with a maximum impact of reaching a 'AAA' rating for the cover pool.

35. For issuers with a qualitative assessment of 'a-' or lower, an additional notch is added for each of the five scenarios for which the cover pool cash flows indicate full payment of principal and coupon payments for a period of up to 10 years, up to the maximum possible covered bond rating five notches above the qualitative assessment.

36. For issuers with a qualitative assessment of 'a' or higher, the potential rating is capped at the highest achieved level, with clearing level 5 aligned to a possible covered bond rating of 'aaa', level 4 to 'aa+', level 3 to 'aa', level 2 to 'aa-', and level 1 to 'a+'. In other words, for a covered bond to be eligible for a 'AAA' rating when the qualitative assessment is less than 'aaa', the pool would need to clear a level 5 stress.

37. When the fundamental analysis of the cover pool results in a qualitative assessment of 'aaa', NCR will conduct a top down going-concern analysis of the pool based primarily on publicly available data, such as Harmonised Transparency Templates or similar data typically available quarterly on issuer websites. The primary difference in the two analyses is the granularity of the input data and potential calibrations of the standard assumptions for a particular issuer.

38. For issuers with bespoke business models, such as shipping finance companies, NCR may not allow support from the cover pool to support a higher covered bond rating because of difficulty calibrating to relevant stress levels.

STANDALONE COVER POOL SUPPORT ANALYSIS

39. The cover pool support analysis assesses five increasingly difficult sets of conditions, each reflecting higher levels of stress. When cover pool assets provide enough liquidity to cover coupon and principal payments given the assumptions at each level of stress, an additional notch of support from the cover pool is added to the qualitative assessment determined in the fundamental analysis.

40. NCR's standalone analysis of a cover pool assumes that all forms of external support for the pool are exhausted and that only the underlying assets can provide enough liquidity to make coupon and principal payments. This analysis begins with the assumption that the issuer and/or banking group is being liquidated and administrators have committed to winding down the pool and selling necessary assets at a discount to ensure investors receive timely payment.

41. In these scenarios, NCR assumes that the winding down process is being managed by the relevant national authorities or an alternative third-party servicer with the intention of protecting the covered bond investors' best interests in all events. While administrators are granted the ability to refinance the respective cover pool, the cash flow analysis determines the ability of existing pool assets to support outstanding covered bonds rather than extending the liabilities to match the outstanding assets.

42. The primary objective of this analysis is to maintain three key principles in increasingly serious stress scenarios:

    - Cover pool assets must always exceed covered bond liabilities. Where applicable, this principle can be adapted to national laws with respect to discounting cash flows, indexation, market valuation and minimum overcollateralisation requirements that remain in effect during the winding down of a cover pool.
    - Covered bond coupon payments must be paid on time, according to terms and conditions.
    - Covered bonds are repaid in full at maturity, or at the contractual extended maturity date, as outlined in the terms and conditions.

43. NCR acknowledges the theoretical nature of designing default scenarios for a specific issuer (especially highly-rated issuers), as well as the unpredictable distance to a default scenario and the constant turnover of pool assets, valuations and market conditions that could occur before a default. However, we evaluate the existing cover pool as if it is representative of pool assets at the time of default, while re-evaluating and monitoring changes to the pool as part of our ongoing ratings surveillance.

Furthermore, NCR's analysis considers the contractual covered bond maturities and principal payments of existing liabilities at the time of the analysis. As a result, the standalone cover pool analysis assumes an immediate stress scenario and considers the ability of the existing cover pool assets to fulfil existing claims over the number of years necessary to include all outstanding bonds' contractual terms and conditions, up to a maximum of 10 years.

44. By its nature, a winding down analysis is reliant on important and unobserved variables such as recovery rates, asset liquidation discounts, interest rate shocks, capital markets fluctuations and customer prepayment activity in a scenario which would result in the default of a covered bond issuer. Despite the long history of covered and mortgage bonds in the Nordic countries, observable measures for these variables are unavailable due to a lack of defaults by mortgage bond issuers in modern times[2]. For this reason, NCR's assumptions are built through dialogue with Nordic market participants, an analysis of regional history which includes catastrophic bank failures in the 1920s, 1930s and early 1990s representative of a AAA scenario, and, in some cases, an extrapolation of historical events in other markets deemed relevant for the Nordic markets to create theoretical, yet realistic tail events.

45. The severity of stress is adapted to the current economic climate and housing price levels. Historically, dramatic falls in housing prices occur following dramatic increases. Such corrections usually result in a multi-year period of price declines before prices find balance at lower levels, typically after prices rebound towards a new long-term equilibrium. Markets with extreme price appreciation generally suffer larger stresses than markets at or below long-term equilibriums. Accordingly, NCR assesses the current housing and commercial real estate price climate and applies valuation stresses according to Figure 8 to the national residential housing index. When a market is fluctuating around the given thresholds or is moving quickly across thresholds a conservative and/or forward-looking approach is used to define the current housing market status and stress levels. The price trend generally applies to a given domestic market in the region but can be adapted to individual issuers based on the composition of the cover pool's regional exposure and relevant pricing situation.

Figure 8. Housing price stress scenarios applied to the national housing price index based on current housing market status

CURRENT HOUSING MARKET STATUS	>15% OVER TREND	5-15% OVER TREND	+/- 5% VS TREND	5-15% UNDER TREND	>15% UNDER TREND
Level 1	-30%	-25%	-20%	-15%	-10%
Level 2	-35%	-30%	-25%	-20%	-15%
Level 3	-40%	-35%	-30%	-25%	-20%
Level 4	-45%	-40%	-35%	-30%	-25%
Level 5	-50%	-45%	-40%	-35%	-30%

[2]According to *The Evolution of Nordic Finance*, Steffen E. Andersen, 2011, three Danish mortgage institutions have defaulted resulting in losses to creditors. Of these, two took place in 1861 and the third involved a secondary mortgage institute (only 60-75% loan-to-value [LTV]) in 1931. Due to forced mergers and acquisitions in Finland, Sweden and Norway, struggling mortgage banks became parts of larger institutions in the 1990s, potentially preventing defaults by mortgage institutions.

46. The stresses applied to the national index are adjusted for the regional and portfolio composition of the cover pool as described in Appendix 1, beginning at paragraph 63.

47. Scenario severity affects several key variables that affect the composition and underlying cashflows of a standalone cover pool:

- nonperforming loans, credit defaults and estimated credit losses;
- discounts on asset sales;
- prepayment rates;
- recovery rates;
- currency mismatches; and
- mortgage and bond rates.

48. For each scenario, if the modelled cash flows demonstrate that the existing cover pool assets can generate enough liquidity to repay outstanding covered bonds then a notch of cover pool support is added to the qualitative assessment, up to a maximum of 'aaa'. This is measured by comparing the existing overcollateralisation to the modelled interest cash flows and cover pool liquidation proceeds to make coupon and principal payments and the modelled default rates for mortgage, public sector and other cover pool assets.

49. Further details of cover pool credit risk and cash flow analysis are provided in Appendix 1.

ADJUSTMENT FACTORS

50. When necessary, NCR retains the ability to adjust covered bond ratings when the qualitative assessment and standalone cover pool assessment result in an unsatisfactory outcome, such as:

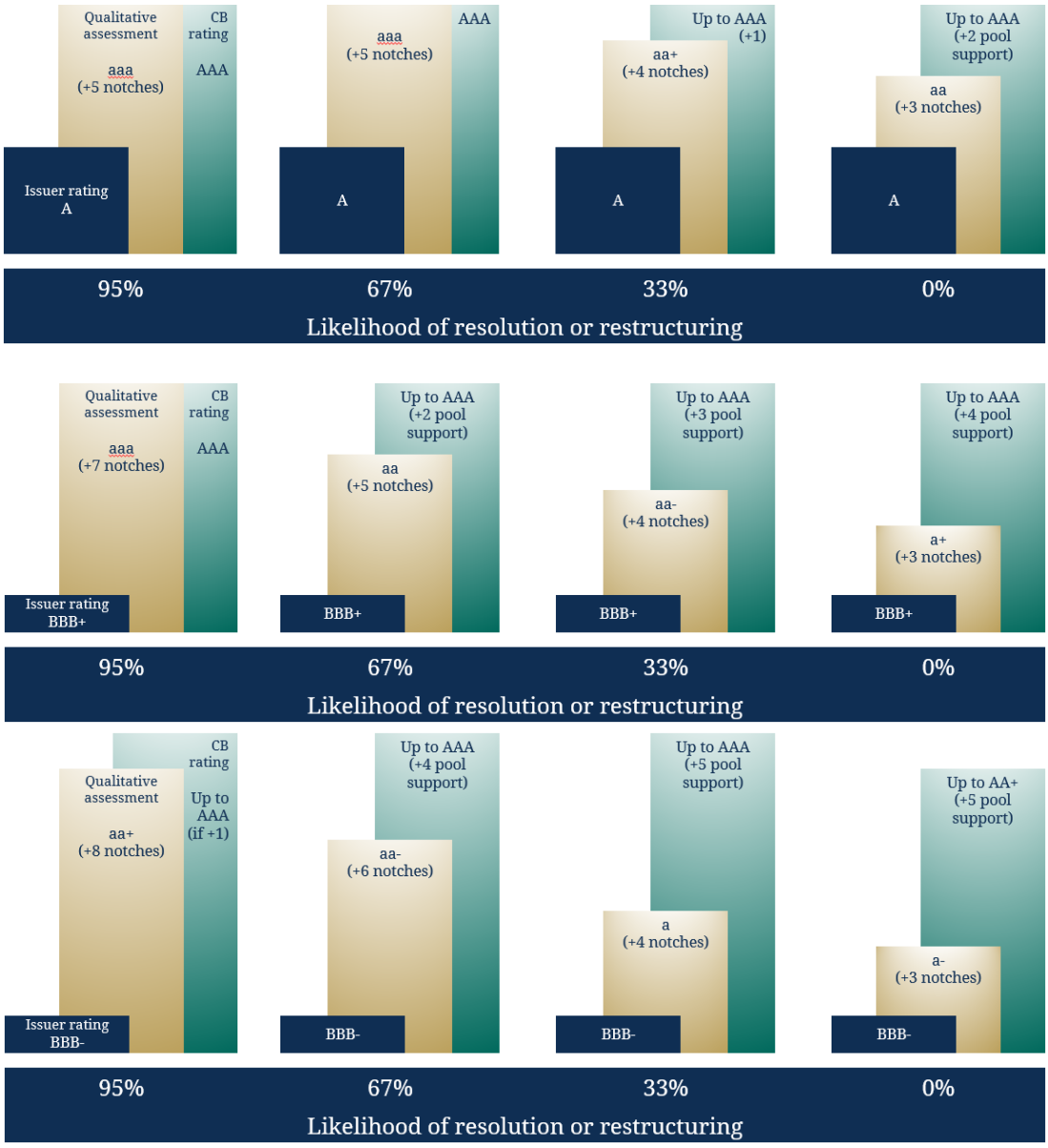
- material transitional changes to the issuer, owner or cover pool assets;
- significant deterioration of cover pool asset quality;
- concerns about risks not adequately captured, or understated, in the qualitative assessment or the standalone credit pool analysis, for example counterparty risk or the bespoke nature of the issuer which might affect the application of national regulation;
- concerns about the going concern cover pool analysis; or
- historical volatility in the management of the cover pool assets.

COVERED BOND RATINGS

Figure 9. The path from qualitative assessment to issue rating

51. The ratings on covered bonds reflect the qualitative assessment, the cover pool analysis and any adjustment factors. The examples below show how the issuer rating and the likelihood of resolution or restructuring affect the qualitative assessment and potential notches of uplift in the covered bond rating given a covered bond starting point that is three notches above the issuer rating.

Figure 10. Example of potential notching for issuers with 'A', 'BBB+' and 'BBB-' issuer ratings based on the probability of resolution and restructuring



COVERED BOND RATINGS AND SOVEREIGN STRESS

52. While the rule of law and sovereign structure form an important part of our analysis of both financial institutions and covered bond ratings, we do not explicitly cap covered bond ratings at the sovereign rating level or in line with NCR sovereign credit assessments (as defined in our *Sovereign Credit Assessment Methodology)*.

53. However, according to our methodology for rating financial institutions, the strength of the sovereign, as well as related global and domestic macroeconomic developments, directly affects our issuer ratings. If a sovereign's creditworthiness is falling, it would most likely be reflected in a lower NCR sovereign credit assessment, which would have follow-on effects for covered bond ratings. In the event of a significant deterioration of sovereign credit quality, the ability of a sovereign to fulfil its roles in regulating the domestic covered bond market and managing distressed banking groups through resolution would be continually evaluated, as would the role and influence of relevant European authorities' support and resolution mechanisms.

APPENDIX 1: ANALYSING THE COVER POOL

54. NCR uses scenarios to evaluate the resilience of the cover pool to increasing levels of stress. The scenario analysis serves two purposes:

- to evaluate the standalone ability of the cover pool to make coupon and principal payments on outstanding covered bonds, and
- to evaluate the resilience of the cover pool to price and asset quality fluctuations on a going-concern basis.

55. The potential notches of support from the standalone analysis of the cover pool are based on five scenarios, with the severity of the stress on asset prices dependent on the status of market prices as shown in Figure 8.

STANDALONE COVER POOL ANALYSIS

56. The standalone analysis of the cover pool considers whether current cover pool assets can support timely coupon and principal payments on outstanding covered bonds in five increasingly difficult scenarios. The analysis considers:

- credit risk associated with the revaluation of the collateral in terms of falling property prices, lower recovery rates and higher loss given default (LGD);
- deteriorating borrower credit quality and an estimate of customer and loan defaults;
- covered bond principal payments based on contractual maturity, using extended maturities for soft bullet structures;
- presumed rebates for performing asset sales necessary to repay outstanding bond principal;
- interest rate shocks and the impact on coupon and interest cash flows in the pool as well as the net present value (NPV) of liquidated assets; and
- foreign exchange shocks, when applicable.

57. The standalone analysis does not explicitly include new bonds issued by the administrator for short-term liquidity, but it is assumed that any small differences are managed by the administrator. In addition, the analysis does not consider a scenario in which the administrator issues new bonds to match the duration of outstanding assets.

58. Rather, the analysis focuses on the ability to repay outstanding covered bonds. This can be considered a conservative oversimplification in which administrators can issue new bonds to match asset maturities. However, NCR's covered bond ratings are applicable to outstanding covered bonds and for this reason we focus the analysis on whether these bonds are adequately protected by fundamental factors and the existing cover pool assets.

59. When the following criteria are fulfilled in a given scenario, an additional notch of cover pool support can be added to a qualitative assessment, thereby improving the covered bond rating:

- Cover pool assets must always exceed covered bond liabilities. Where applicable, this principle can be adapted to national laws with respect to discounting cash flows, indexation, market valuation and minimum overcollateralisation requirements that remain in effect during the winding down of a pool.
- Covered bond coupon payments must be paid on time, according to terms and conditions.
- Covered bonds are repaid in full at maturity, or at the contractually extended maturity date, as outlined in the terms and conditions.

CREDIT RISK ANALYSIS

60. NCR evaluates the impact of deteriorating asset valuations and asset quality within the cover pool, resulting in a measured impact on eligible pool assets, loans in default, recovery rates and cash flows generated by the pool.

61. Similar portfolio assets are aggregated into representative categories to simplify the analysis and balance relevant outcomes with false precision. Where there are material large exposures, specific consideration is made to stress individual exposures.

RETAIL AND COMMERCIAL MORTGAGE ASSETS

62. As described above, NCR assesses the current housing and commercial real estate price climate and applies valuation stresses to national house prices using Figure 8. When a market is fluctuating around the given thresholds or is moving quickly across thresholds a conservative and/or forward-looking approach will be used to define the current housing market status and stress levels. The price trend will generally apply to a regional domestic market but can be adapted to individual issuers based on the composition of the cover pool's regional exposure and relevant pricing situation.

63. The stresses in Figure 8 reflect national average prices and are adjusted using beta factors for regional housing markets which have historically shown higher or lower volatility. For example, the largest cities in the Nordic region have demonstrated about 20% more volatility than their respective national average, mid-sized regions are closer to their national average and rural properties somewhat below their national averages. NCR classifies domestic regions into five categories based on the historical beta of available regional price indices compared with the national index, as shown in Figure 11.

Figure 11. Standard beta factors and liquidation adjustments applied regionally

REGION CLASS	BETA VS NATIONAL AVERAGE (§63)	LIQUIDATION ADJUSTMENT (§68)	EXAMPLES
1	1.20	0.90	Capital cities and metropolitan areas
2	1.10	0.95	Large to mid-size regions
3	1.00	1.00	Small to mid-size regions
4	0.90	1.10	Largely rural areas with low transaction volume
5	0.80	1.25	Regions with low or declining populations

64. The standard stresses for commercial real estate are assumed to be 1.25 times the values in Figure 8. When a cover pool contains material commercial real estate exposures, the beta factors used for different types of commercial real estate – for example multifamily housing, subsidised housing, agricultural properties and industrial properties – can be adapted to reflect the composition of the commercial real estate portfolio and historical precedents, if available.

PORTFOLIO CONCENTRATIONS & LIQUIDITY RISK

65. The cover pool analysis considers concentration in the cover pool in three ways. When a cover pool is more concentrated than the national average:

- market-level nonperforming loan expectations are adjusted upwards,
- market-level foreclosure rebate discounts are adjusted upwards, and

- market-level asset liquidation discounts are adjusted upwards.

66. These adjustments capture the potential for concentrated portfolios to have higher stress levels for probability of default and loss severity for individual loans as well as a lower attractiveness of pool assets due to lower collateral values.

67. The analysis compares the distribution of residential and commercial mortgage assets across specified regions and compares this to the respective national averages using the following assessment:

- Concentration factor = (1+Herfindahl Index (issuer)) ÷ (1+Herfindahl Index (market)), adjusted where necessary to ensure comparability across markets.
- The maximum adjustment is +/- 25% from the respective national level.

68. In addition to the higher liquidation discounts for concentrated markets, a liquidity adjustment is applied to certain regions and affects the LGD. Generally, a country's capital city is its most liquid market with the highest volume of transactions and the largest inflow of new inhabitants, while rural markets tend to have lower turnover, low or negative population growth and long sales times. For this reason, NCR uses the regional groups in Figure 11 to apply additional asset liquidation discounts and LGD for:

- regions with relatively few housing transactions;
- large residential mortgage loans for properties exceeding market-specific thresholds; and
- large commercial real estate loans.

DETERIORATING CREDIT QUALITY

69. In addition, asset quality is stressed in line with the severity of property price declines. Default frequency and non-payment of interest are assumed to be correlated with falling asset values in the stressed scenarios. Figure 12 shows the standard stress scenario applied to prime residential and office and retail commercial mortgage loans. These standard stresses are for prime mortgage exposures and are adapted to the portfolio with consideration to regional concentrations, property types and portfolio characteristics.

Figure 12. Standard asset quality assumptions for cover pool mortgage loans in basis points

	RESIDENTIAL NON-PERFORMING LOANS	RESIDENTIAL LOANS IN DEFAULT	COMMERCIAL NON-PERFORMING LOANS	COMMERCIAL LOANS IN DEFAULT
Level 1	400	133	1200	800
Level 2	524	175	1572	1048
Level 3	687	229	2061	1374
Level 4	900	300	2700	1800
Level 5	1180	393	3540	2360

70. NCR does not assume that all nonperforming mortgage loans result in delinquencies, nor that all delinquencies result in property being foreclosed. Rather, our standard assumption is that one-third of residential mortgage loans that fall delinquent result in default, of which half of the respective properties are foreclosed via an executive auction. This assumption reflects strong social safety nets in the Nordic countries, creditors' debt recovery rights, which are material deterrents to personal bankruptcy, and a history of banks working with nonperforming loan customers to avoid foreclosure. We also note that, where necessary, foreclosures in the Danish market are typically processed within

a year by the mortgage institution itself, which could affect our view of the share of executive auctions and the related foreclosure charges for specific issuers or pools based on historical precedent.

71. NCR assumes a correlation between deteriorating credit quality of residential and commercial mortgage loans, with commercial mortgage loans having higher levels of non-performance, typically three times the level for office and retail property loans as shown in Figure 12, with default assumed to occur in two-thirds of instances of nonperforming loans, of which half of defaults are assumed to result in an executive auction at further discounted prices. When a cover pool contains material commercial real estate exposures, the expectations for nonperforming, default frequencies and foreclosures of different types of commercial real estate – for example multifamily housing, subsidised housing, agricultural properties and industrial properties – can be adapted to reflect the composition of the commercial real estate portfolio and historical precedents, if available.

LOSS SEVERITY

72. The credit loss associated with each scenario is dependent on the assumed LGD. The LGD is in turn dependent on the initial loan-to-value (LTV) profile of the cover pool, the severity of the price decline, as shown in Figure 8, and the assumed foreclosure rebate in each scenario as shown in Figure 13. In addition, the LGD is adjusted for the measured concentration and liquidity adjustments described in paragraph 67, up to a maximum of 25% above national levels.

Figure 13. Standard foreclosure rebate for residential and commercial mortgages (%)

	RESIDENTIAL MORTGAGES	COMMERCIAL MORTGAGES
Level 1	30.9	30.9
Level 2	32.7	32.7
Level 3	34.5	34.5
Level 4	36.4	36.4
Level 5	40.0	40.0

73. The resulting loss severity for a portfolio of loans is derived by comparing the portfolio default rate by the stressed LGD of the entire stock of mortgages as shown below:

- Loss severity = stressed default rate [§69-70] × stressed LGD, where
- stressed LGD = (the share of the mortgage pool with foreclosure value LTV > 100%) × LGD adjustment factor,
- foreclosure value LTV = loan ÷ foreclosure value,
- foreclosure value = initial value × (1 – market value decline [§62-63]) × [1 – (foreclosure rebate [§72] × foreclosure rate [§70-71])), and
- LGD adjustment factor = concentration factor [§67] × average liquidity adjustment [§68].

PUBLIC SECTOR ASSETS

74. As public sector exposures form a minor portion of Nordic cover pool exposures, NCR employs a portfolio approximation approach using credit risk formulas from the EU's Capital Requirements Directive for banks. All public sector assets are stressed using 5-year default frequencies associated with publicly available credit ratings or internal credit assessments for sovereign, municipal and other public exposures based on the internal-ratings based formula for credit risk and assuming a 30% correlation across the portfolio, a 50% LGD and a confidence interval equivalent to NCR's 5-year

indicative default frequency for AAA exposures. The resulting credit loss is deducted from the assets in the first stage of the cash flow assessment.

SUBSTITUTE ASSETS

75. NCR assumes that substitute assets will be quickly converted to cash to make principal payments on outstanding covered bonds, as necessary. As with public sector assets, 5-year default frequencies associated with public ratings or internal credit assessments are used to stress substitute assets, apart from cash, using a portfolio approximation. The assets are stressed using the Basel formula for credit risk and assuming a 15% correlation across the portfolio, a 50% LGD and a confidence interval equivalent to NCR's 5-year indicative default frequency for AAA exposures. The resulting credit loss is deducted from the assets in the first stage of the cash flow assessment.

COUNTERPARTY RISK & ASSOCIATED DERIVATIVES

76. Counterparty risk associated with interest rate and currency swaps is evaluated with respect to the direct counterparty or providing bank, the outstanding derivative contracts and central counterparties. This analysis is qualitative and can be considered as a rationale for an adjustment factor in the final covered bond ratings where specific concerns exist and an adjustment is warranted.

77. Principally, NCR believes that covered bond issuers will actively replace deteriorating and/or defaulted derivative counterparties to support the hedging profile of the cover pool and uphold regulatory requirements. This could be achieved by automatically replacing counterparties with specific rating triggers or issuing via central clearinghouses. However, where there is an overreliance on specific counterparties with public credit ratings of 'BBB+' or lower (or equivalent NCR credit assessments) outside of the banking or ownership group of an issuer or if key counterparties fall below 'BBB+' (or an equivalent NCR credit assessment), NCR could adjust covered bond ratings accordingly to reflect the increased likelihood of a regulatory intervention.

CASH FLOW ANALYSIS

78. The components of the cash flow analysis include:

- modelled credit losses on mortgage loans;
- contractual asset and covered bond maturities, assuming all potential maturity extensions are exercised;
- estimated prepayments;
- initial and stressed interest income from performing loans and coupon payments;
- administration fees;
- liquidated assets adjusted for changes in NPV; and
- assumed asset liquidation rebates.

79. Given that the standalone cover pool analysis assumes a cover pool in default, NCR reduces the available cover pool assets by one year of credit losses in the first step of the cash flow analysis. We assume that further credit losses affect the cover pool during the unwinding, with the length and severity increased depending on the scenario as shown in Figure 14.

Figure 14. Standard assumptions for modelled credit losses in the cash flow analysis

	INITIAL	YEAR 1	YEAR 2	YEAR 3	YEAR 4	TOTAL
Level 1	100%	100%	75%	25%	0%	300%
Level 2	100%	100%	75%	50%	0%	325%
Level 3	100%	100%	75%	50%	25%	350%
Level 4	100%	100%	75%	50%	50%	375%
Level 5	100%	100%	75%	75%	50%	400%

PRINCIPAL REPAYMENT

80. Bond principal payments are assumed to follow contractual maturity. Where bonds are issued with contractual soft bullets, the maturity is assumed to be the extended maturity date, allowing the administrator a better opportunity to preserve value in the cover pool.

81. Bonds issued with automatic maturity extension triggers according to Danish law are assumed to be fully matched to assets upon default given the ability of the administrator to extend the bonds until asset maturity.

INTEREST RATE CASH FLOWS

82. Mortgage interest and coupon payments are modelled in the cash flow analysis to reflect stresses to market rates applicable to floating rate bonds and mortgage loans. The following assumptions are applied:

- Stressed market rates increase funding costs on variable rate bonds and fixed rate bonds swapped to variable rate interest payments.
- With the exception of pass-through models, such as in Denmark (§83), the initial lending margins on flexible rate mortgages are assumed to be 75% of current margins in the level 1 scenario and reduced to zero in the level 5 scenario. Fixed rate mortgage margins are adjusted to flexible rate mortgage margins on expiration of the interest rate fixing period.
- Mortgage interest from nonperforming loans is conservatively assumed to be zero throughout the cash flow analysis. Nonperforming loans are assumed to remain nominally constant during years when the cover pool is suffering credit losses (see Figure 14) and are then assumed to remain constant as a share of the cover pool for the remainder of the simulation.

83. When mortgage credit institutions take an administrative margin and otherwise pass market rates on to the customer, as is typical in Denmark, lending margins are assumed to be constant, though nonperforming loans can also affect cash flows.

ADMINISTRATION FEES

84. Administration fees payable to the regulator or administrator managing a winding down are applied annually as a percentage of remaining cover pool assets and depend on the composition of assets and the jurisdiction.

Figure 15. Standard administration fees applied to cover pool assets

	RESIDENTIAL MORTGAGE	COMMERCIAL MORTGAGE	PUBLIC SECTOR	SHIPPING/ OTHER
Admin fee (bps)	25	50	10	100

PREPAYMENTS

85. Because prepayments improve the liquid assets of the cover pool, reducing the need to sell illiquid assets, they are typically beneficial in a stressed cash flow analysis. NCR uses constant initial prepayment rates provided by the issuer in its stress scenarios, with a maximum repayment rate of 5% per annum. This is a conservative oversimplification given that performing customers are very likely to transfer their mortgages to a healthy bank in a scenario in which their own bank defaults and/or mortgage rates increase in response to higher funding costs.

86. In Denmark, proceeds from prepaid loans are used to pay down principal on the associated covered bond rather than resulting in additional liquidity in the cover pool. This is reflected in the analysis of Danish cover pools.

SALE OF ASSETS

87. When liquid assets and interest cash flows are not enough to make covered bond principal payments, performing cover pool assets are assumed to be liquidated to cover any shortfalls. Sales are modelled to match cash flow shortfalls exactly, with assets sold at a price reflecting the NPV of future cashflows at a material increase in risk premium due to market stress as well as a presumed asset discount reflecting a deterioration of the performing assets, which further reduces the attractiveness of the loans.

88. The NPV of the assets is calculated in each scenario using the stressed cover pool cash flows, discounted using the interest rates in Figure 16. Market rates are assumed to increase more than loan interest, reducing interest rate margins as the scenarios become more difficult. Accordingly, the NPV of the cash flows and the assumed sale price of pool assets decrease as the scenarios become more difficult.

Figure 16. Standard discount rate for NPV of assets, %

	DISCOUNT RATE
Level 1	4.00
Level 2	5.50
Level 3	7.00
Level 4	8.50
Level 5	10.00

89. In addition to the reduction in the NPV of performing assets, falling property values are assumed to reduce the attractiveness of pool assets by reducing collateral value. Lower collateral values would affect the eligibility of assets for an acquiring issuers' own cover pool and result in higher capital charges and higher loss severity if the sold assets went into default.

The sales price adjustment is calculated using standard liquidation discounts shown in

90. Figure 17 which increase during the stress and reflect the composition and interest rate fixings of the loans in the cover pool. The liquidation adjustments are adjusted based on the cover pool concentration factor and liquidation adjustments as described in the sections above.

Figure 17. Standard asset liquidation discounts

	FIXED RATE RESIDENTIAL MORTGAGE	FLOATING RESIDENTIAL MORTGAGE	FIXED RATE COMMERCIAL MORTGAGE	FLOATING RATE COMMERCIAL MORTGAGE
Level 1	10.0	5.0	20.0	15.0
Level 2	11.3	5.6	21.3	16.3
Level 3	12.5	6.3	22.5	17.5
Level 4	13.8	6.9	23.8	18.8
Level 5	15.0	7.5	25.0	20.0

91. The volume of assets liquidated to cover a cashflow shortfall is calculated as:

- assets to be liquidated = cash flow shortfall ÷ [(1-asset liquidation discount) × (1-NPV adjustment)], where

asset liquidation discount = standard asset liquidation discounts (

- Figure 17) × concentration factor (§67) × average liquidity adjustment (§68)

CURRENCY RISK

92. NCR evaluates whether there is a need to evaluate currency rate stress by comparing the composition of the cover pool and the funding. In most Nordic jurisdictions, currency risks are limited by national regulations. We anticipate that most cross-currency covered bond financing is swapped into local currency and evaluate outstanding currency swaps for eventual mismatches. If necessary, NCR could adjust the valuations of cross currency loans to reflect historical currency stresses or consider currency mismatches as an adjustment factor in the final covered bond ratings.

GOING CONCERN COVER POOL ANALYSIS

93. In addition to the standalone analysis of the cover pool, NCR analyses the existing covered bond assets to provide insight into the current pool's composition and ability to withstand material stresses. NCR believes that covered bond investors in a going concern cover pool are likely to be protected.

94. The going-concern analysis is an estimation of the eligible cover pool assets and overcollateralisation in given scenarios depending on declines in asset collateral and assumptions about nonperforming loans, defaults and loss severity described above. This analysis also estimates a potential credit loss within the cover pool in given scenarios. The analysis estimates the share of loans at risk of falling below regulatory LTV limits during periods of property price declines.

95. While NCR does not specify any specific requirements based on the going-concern analysis, we believe that it provides investors with a third-party evaluation of a cover pool's resilience to stress that is not obvious when evaluating portfolio level statistics. When the going-concern analysis reveals material weaknesses, NCR has the ability to adjust the ratings on covered bonds.

APPENDIX 2: DATA SOURCES

COVER POOL DATA

96. For rated entities, NCR will obtain complete data on cover pool assets, including but not limited to:

- internal rating and current standing (active, impaired) and customer types (employed, self-employed, unemployed);
- collateral valuation (current and initial) and indexation method;
- property location and type;
- lien priority;
- outstanding principal;
- interest rate information;
- amortisation profile;
- substitute asset details; and
- swap and derivative details and valuations.

97. In addition, NCR intends to obtain Harmonised Transparency Templates used as part of the European Covered Bond Council's covered bond label program, national templates and/or similarly aggregated data relevant for the analysis directly from the issuer. This information is generally available quarterly on issuers' investor relations websites.

MARKET DATA

98. Real estate indices, interest rate histories, default statistics and similar are collected from recognised national and international sources such as national statistical offices, central banks as well as multinational sources such as the Bank of International Settlements, the Organisation for Economic Co-operation and Development, EuroStat and similar services.

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