MOODY'S INVESTORS SERVICE

CREDIT OPINION

22 December 2021

New Issue

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Landesbank Hessen-Thueringen GZ – Mortgage Covered Bonds

New Issue Report – German covered bonds

Ratings

Exhibit 1

Cover Pool (€)	Ordinary Cover Pool Assets	Covered Bonds (€)	Rating
16,792,500,000	Commercial & Residential Mortgage Loans	9,936,019,483	Aaa

All data in the report is as of 30 June 2021 unless otherwise stated
Source: Moody's Investors Service

Summary

The covered bonds issued by Landesbank Hessen-Thueringen GZ (the issuer/Helaba, Aa3(cr)) under its mortgage covered bond programme are full recourse to Helaba and are secured by a cover pool of assets consisting of commercial assets (93.0%) and residential assets (4.0%) mainly in Germany along with other supplementary assets (3.0%).

Credit strengths include the full recourse of the covered bonds to Helaba and support provided by the German legal framework for *Pfandbriefe*, which provides for the issuer's regulation and supervision.

Credit challenges include the high level of dependency on the issuer. As with most covered bonds in Europe, there are few restrictions on the future composition of the cover pool. The cover pool also has geographical and obligor concentration risks.

Our credit analysis takes into account the cover pool's credit quality, which is reflected in the collateral score of 10.4%, and the current over-collateralisation (OC) of 76.5% (on an unstressed present value basis) as of 30 June 2021.

Credit strengths

- ***Recourse to the issuer***: The covered bonds are full recourse to Landesbank Hessen-Thueringen GZ (Aa3(cr)). (See "Covered bond description")
- ***Support provided by the German legal framework***: The covered bonds are governed by the German *Pfandbrief* Act, which provides for the issuer's regulation and supervision and sets certain minimum requirements for the covered bonds and the cover pool. (See "Moody's related publications: Covered Bond Legal Frameworks")
- ***High credit quality of the cover pool***: The covered bonds are supported by a cover pool of high-quality assets. The cover pool consists of commercial assets (93.0%), residential assets (4.0%) and supplementary assets (3.0%). The collateral quality is reflected in the collateral score, which is currently 10.4%. Almost all of the residential assets and 48.6% of the commercial assets are backed by properties in Germany. (See "Cover pool analysis")
- ***Refinancing risk*:** Following what we call a covered bond (CB) anchor event, refinancing risk would be mitigated by a well-established and deep market for German *Pfandbriefe*, as well as the liquidity-matching requirements. A CB anchor event occurs when the issuer, or another entity within the issuer group that supports the issuer, ceases to service the payments on the covered bonds. The liquidity matching requirement for the next 180 days reduces refinancing risk, as well as the optional extension of covered bond maturities by 12 months after issuer default. (See "Covered bond analysis")
- ***Interest rate and currency risks***: There is some currency and little interest rate risk. While 97.4% of the liabilities are denominated in euro, only 72.6% of the asset are denominated in this currency. There is little exposure to interest rate risk because currently 80.1% of assets are fixed rate while 84.9% of covered bonds are fixed rate. Both interest rate risk and currency risk are further mitigated by the Pfandbrief Act's 2.0% present value OC requirement, which has to be maintained in stressed market conditions (that is, yield curve movements and changes in the relevant exchange rates). (See "Covered bond analysis")
- ***Provisions for a cover pool administrator***: Following an issuer default, the covered bondholders would benefit from a cover pool administrator (the *Sachwalter*) that acts independently from the issuer's insolvency administrator. Furthermore, if the German banking regulator BaFin deems it necessary, the *Sachwalter* may be appointed ahead of any issuer default. (See "Covered bond analysis")

Credit challenges

- ***High level of dependency on the issuer:*** As with most covered bonds, before the insolvency of the issuer, the issuer can materially change the nature of the programme. For example, the issuer can add new assets to the cover pool, issue new covered bonds with varying promises and enter into new hedging arrangements. Also similar to most covered bonds in Europe, this programme has few restrictions on the future composition of the cover pool. These changes could affect the credit quality of the cover pool as well as the overall refinancing and market risks. Further, if the quality of the collateral deteriorates below a certain threshold, the issuer would have the ability, but not the obligation, to increase the OC in the cover pool. (See "Covered bond analysis")
- ***Cover pool concentration****:* The cover pool has the following concentrations: (1) obligor concentration: the 10 largest borrower groups in the commercial sub-pool represent 9.8% of total commercial cover pool assets; (2) geographical concentration: the majority of the loans in the cover pool are secured on properties located in Germany with significant concentration in Hesse and North Rhine-Westphalia, (3) property type concentration of the commercial sub-pool: Offices (46.9%), multifamily (23.4%) and retail (22.3%) represent the largest property type concentrations. In an adverse scenario, these concentrations increase the probability of significant losses. However, our collateral score model takes into account, inter alia, the impact of borrower, regional and property type concentrations and these concentrations are lower than in comparable commercial real estate loan backed German *Pfandbriefe*. (See "Cover pool description")

- ***Market risks***: Following a CB anchor event, covered bondholders, to achieve timely principal payment, might need to rely on proceeds raised through the sale of, or borrowing against, the cover pool assets. The market value of these assets may be subject to high volatility after a CB anchor event. In addition, covered bondholders might have exposure to interest rate and currency risks. There are no swaps in the programme. (See "Covered bond analysis")
- ***Time subordination****:* After a CB anchor event, later-maturing covered bonds are subject to time subordination. Principal cash collections may be used on a first-come, first-served basis, paying earlier-maturing covered bonds before later-maturing covered bonds. This subordination could lead to the erosion of OC before any payments are made to later-paying covered bonds. (See "Covered bond analysis")
- ***Lack of liquidity facility*****:** The programme would not benefit from any designated source of liquidity if cash flow collections are interrupted. (See "Covered bond analysis")
- ***Economic uncertainty***: In our analysis, we have considered how the coronavirus pandemic has reshaped Germany's economic environment and the way its aftershocks will continue to reverberate and influence the performance of covered bonds. We expect the public health situation to improve as vaccinations against COVID-19 increase and societies continue to adapt to new protocols. But the virus will remain endemic, and economic prospects will vary – starkly, in some cases – by region and sector. We regard the coronavirus outbreak as a social risk under our ESG framework, given the substantial implications for public health and safety.

ESG considerations

Except with respect to the coronavirus outbreak, which we consider a social risk as described above under Economic uncertainty, in general, we consider ESG risks to be low for covered bonds. In our assessment of the programme's credit quality, we evaluate ESG risks as low. The covered bonds' dual recourse structure mitigates environmental, social and governance risks. Environmental and social risks are further mitigated by the diversified nature of the cover pool, while governance risk is largely mitigated by (i) the German legal framework for covered bonds; (ii) key programme participants' adherence to obligations; and (iii) the operational and substantive provisions of the programme documents. Please refer to General Principles for Assessing Environmental, Social and Governance Risks Methodology, 19 October 2021, which explains our general principles for assessing ESG Risks in our credit analysis globally.

- ***Environmental:*** Overall exposure to meaningful environmental risks is low in this programme as covered bondholders benefit from the issuer's liability to make payment on the covered bonds and the cover pool's geographical diversification. (See Cover pool analysis - Environmental considerations)
- ***Social****:* Overall exposure to meaningful social risks is moderate in this programme, mainly because social issues that affect lenders can also affect the cover pool. Social risks are mitigated by the covered bonds' dual recourse to both issuer and cover pool as well as the cover pool's diversification. In addition, we regard the coronavirus pandemic as a social risk under our ESG framework, given the substantial implications for public health and safety. (See Summary – Credit challenges and Cover pool analysis - Social considerations)
- ***Governance***: Overall exposure to meaningful governance risks is low in this programme due to: (i) covered bonds' dual recourse to both issuer and cover pool; (ii) the German legal framework for covered bonds; (iii) key programme participants' adherence to obligations; and (iv) the operational and substantive provisions of the programme documents. (See Additional analysis - Governance considerations)

Key characteristics

Exhibit 2
Covered bond characteristics

Moody's Programme Number:	496
Issuer:	Landesbank Hessen-Thueringen GZ
Covered Bond Type:	Commercial and residential mortgage covered bonds
Issued under Covered Bonds Law:	Yes
Applicable Covered Bonds Law:	*German Pfandbrief Act*
Entity used in Moody's TPI analysis:	Landesbank Hessen-Thueringen GZ
CR Assessment:	Aa3(cr)
CB Anchor:	CR assessment +1 notch
Senior unsecured/deposit rating:	Aa3
Total Covered Bonds Outstanding:	€9,936,019,483
Main Currency of Covered Bonds:	EUR (97.5%)
Extended Refinance Period:	Yes
Principal Payment Type:	Soft bullet
Interest Rate Type:	Fixed rate covered bonds (84.8%), Floating rate covered bonds (15.2%)
Committed Over-Collateralisation:	2.0% (on a stressed present value basis)
Current Over-Collateralisation:	76.5% (on an unstressed present value basis)
Intra-group Swap Provider:	No
Timely Payment Indicator:	High
TPI Leeway:	5 notches

Sources: Moody's Investors Service, issuer data

Exhibit 3
Cover pool characteristics

Size of Cover Pool:	€16,792,500,000
Main Collateral Type in Cover Pool:	Commercial assets (93.0%), Residential assets (4.0%) and Supplementary assets (3.0%)
Main Asset Location of Ordinary Cover Assets:	Germany
Main Currency:	Euro
Loans Count:	2,465 Commercial mortgage loans, 5,524 Residential mortgage loans
Number of Borrowers:	1,856 Commercial mortgage loans, 4,890 Residential mortgage loans
WA Unindexed eligible loan LTV	59.0% Commercial mortgage loans, 58.2% Residential mortgage loans
WA Indexed LTV:	n/d
WA Seasoning (months):	51 Commercial mortgage loans, 45 Residential mortgage loans
WA Remaining Term (months):	53 Commercial mortgage loans, 282 Residential mortgage loans
Interest Rate Type:	Fixed rate assets (80.1%), floating rate assets (19.9%)
Collateral Score:	10.4%
Cover Pool Losses:	19.9%
Further Cover Pool Details:	See Appendix 1
Pool Cut-off Date:	30 June 2021

Sources: Moody's Investors Service, issuer data

Covered bond description

The covered bonds issued under the mortgage covered bond programme of Landesbank Hessen-Thueringen GZ are full recourse to the issuer. Upon a CB anchor event, covered bondholders would have access to a cover pool of mixed loan receivables of commercial and residential loans as well as high quality substitute assets.

Structure description

The bonds

All outstanding covered bonds are non-amortising and are expected to be paid back at the bond's initial maturity date as long as Helaba is supporting the covered bonds. As of July 2021, the amendments of the *Pfandbrief* Act will, under certain conditions, allow the cover pool administrator to postpone principal payments by up to 12 months.

Issuer recourse

The covered bonds are full recourse to the issuer. Therefore, the issuer is obliged to repay principal and pay interest on the covered bonds.

Recourse to cover pool and over-collateralisation

If the issuer becomes insolvent, the covered bondholders would have priority claims over a pool of assets (cover pool). (See "Cover pool description" for the cover pool characteristics and "Cover pool analysis" for our analysis of the pool)

As of June 2021, the level of OC in the programme was 76.5% on an unstressed present value basis.

The current covered bond rating relies on an OC within the minimum legal requirements by the German *Pfandbrief* Act. The act requires that the OC exceed the principal balance of the bonds by 2% on a stressed present value basis. Based on data as of 30 June 2021, 1.5% of OC is sufficient to maintain the current covered bond rating, which is lower than the statutory minimum OC.

Although the issuer has the ability to increase the OC in the cover pool if collateral quality deteriorates below a certain threshold, the issuer does not have any obligation to do so. The failure to increase OC following a deterioration of the collateral could lead to a negative rating action.

Pooling model

Helaba has established an asset pooling framework. Sparkassen across Germany can participate in this asset pooling framework. Almost all residential assets and 3.8% of the commercial assets constitute mortgage receivables provided by Sparkassen. As of 30 June 2021, all assets provided under the pooling framework were registered in the refinancing registers of participating Sparkassen. A Bafin appointed refinancing register trustee monitors the maintenance of the refinancing register according to German banking law.

The mortgage receivables in the refinancing register of the respective Sparkassen are assigned to Helaba. Helaba can request the transfer of mortgage receivables and the registration of the land charge in favor of Helaba under certain conditions.

Legal framework

The covered bonds are governed by the *Pfandbrief* Act. There are a number of strengths in this legislation, including the regulation of the issuer by BaFin, as well as certain minimum requirements for the covered bonds and the cover pool. No specific structural features beyond the statutory requirements are implemented for Landesbank Hessen-Thueringen AG's mortgage covered bond programme. (See "Covered Bonds: Germany - Legal Framework for Covered Bonds", July 2021, for a description of the general legal framework for *Hypothekenpfandbriefe* governed by the *Pfandbrief* Act.)

Covered bond analysis

Our credit analysis of the covered bonds primarily focuses on the issuer's credit quality, refinancing risk, interest rate risk and currency risk, as well as the probability that payments on the covered bonds would be made in a timely fashion following a CB anchor event, which we measure using the Timely Payment Indicator. (See "Timely Payment Indicator")

Primary analysis

Issuer analysis - Credit quality of the issuer

The issuer's CR Assessment is Aa3(cr). (For a description of the issuer's rating drivers, see Credit Opinion, published August 2021)

The reference point for the issuer's credit strength in our analysis is the CB anchor, which for covered bond programmes under the covered bond law in Germany is the CR Assessment plus one notch.

Issuer analysis - Dependency on the issuer's credit quality

The credit quality of the covered bonds depends primarily on the credit quality of the issuer. If the issuer's credit strength were to deteriorate, there would be a greater risk that a CB anchor event would occur, leading to refinancing risk for the covered bonds. Consequently, the credit quality of the covered bonds would deteriorate unless other credit risks were to decrease.

In the event that the CB anchor deteriorates, the issuer would have the ability, but not the obligation, to increase the OC in the cover pool. Failure to increase the level of OC under these circumstances could lead to a negative rating action.

Reasons for the high level of dependency of the covered bonds with the issuer also include exposure to decisions made by the issuer in its discretion as manager of the covered bond programme. For example, before a CB anchor event, the issuer may add new assets to the cover pool and remove assets from the cover pool, issue further bonds and enter new hedging arrangements. Such actions could reduce the value of the cover pool.

As with most covered bonds in Europe, there are few contractual restrictions on the future composition of the cover pool, which creates substitution risk. Nevertheless, cover pool quality over time will be protected by, among other things, the requirements of the German *Pfandbrief* Act, which specifies what types of assets are eligible. (See “Moody's related publications: Covered Bond Legal Frameworks”)

Refinancing risk

Following a CB anchor event, the “natural” amortisation of the cover pool assets alone cannot be relied on to repay the principal. We assume that funds must be raised against the cover pool at a discount if covered bondholders are to receive timely principal payment. Where the portion of the cover pool that is potentially exposed to refinancing risk is not contractually limited, our expected loss analysis typically assumes that this amount is in excess of 50% of the cover pool.

After a CB anchor event, the market value of these assets may be subject to volatility. Examples of the stressed refinancing margins we use for different types of prime-quality assets are published in our Rating Methodology. (See “Moody's related publications - Moody’s Approach to Rating Covered Bonds”)

The refinancing-positive aspects of this covered bond programme include:

» The *Pfandbrief* Act: At the time of the declaration of the issuer's bankruptcy, or earlier if BaFin considers it necessary, a cover pool administrator (the *Sachwalter*) would take over management responsibility of the covered bond programme. The *Sachwalte*r would have the ability to sell all or part of the cover pool, with or without all or parts of the liabilities attached.

» The depth of the German market and the high level of government and financial market support expected to be available to *Pfandbriefe* in Germany, where refinancing risk is perceived as lower than in most other jurisdictions. In the modeling of this transaction, we have used refinancing margins that are lower than the refinancing margins used for most other jurisdictions.

» The issuer is required to cover potential liquidity gaps over the next 180 days between payments expected to be received under the cover pool assets and the payments due under the outstanding covered bonds.

» The programme benefits from statutory provisions to allow for an extension of a principal refinancing period; all covered bonds issued under this programme will have a soft bullet repayment with 12 months extension period after an issuer event of default.

The refinancing-negative aspects of this covered bond programme include:

» In line with other covered bond programmes, we expect that upon a CB anchor event the cover pool assets will have a higher weighted-average life, compared with the outstanding covered bonds.

» Currently there are no swap arrangements available in the programme.

Interest rate and currency risk

As with the majority of European covered bonds, there is potential for interest rate and currency risks, which could arise from the different payment promises and durations made on the cover pool and the covered bonds.

In the event of issuer insolvency, we currently do not assume that the *Sachwalter* would always be able to efficiently manage any natural hedge between the cover pool and the covered bonds. Therefore, following a CB anchor event, our model would separately assess the impact of increasing and decreasing interest rates on the expected loss of the covered bonds, taking the path of interest rates that leads to the worst result. The interest rate and currency stresses used over different time horizons are published in our Rating Methodology.

Aspects of this covered bond programme that are market risk positive include:

» The requirement under the *Pfandbrief* Act that the stressed present value OC of the cover pool must exceed, by at least 2%, the total of outstanding covered bonds issued against the cover pool, and the requirement that *Pfandbrief* issuers must regularly run stress tests regarding interest rate and foreign-exchange risks. The issuer opted for the dynamic approach for determining the stress levels applied to the calculation of the stresses present value OC.

» Currently, there is very little interest rate risk, because 80.1% of the assets and 84.9% of the liabilities are fixed rate.

Aspects of this covered bond programme that are market risk negative include:

» Currently there is a mismatch in the currency profile of assets and liabilities as most of the outstanding liabilities are denominated in euros (97.5%), whereas only 72.6% of the assets are backed by loans denominated in euros.

» As of the date of this report, the issuer has not entered any swaps into the cover pool register. We understand that there are no plans to change this in the near future.

Timely Payment Indicator

Our Timely Payment Indicator (TPI) assesses the likelihood that timely payments would be made to covered bondholders following a CB anchor event, and thus determines the maximum rating a covered bond programme can achieve with its current structure while allowing for the addition of a reasonable level of OC. We have assigned a TPI of High to these covered bonds, in line with other mortgage covered bonds issued under the *Pfandbrief* Act.

Based on the current TPI of High, the TPI leeway for this programme is five notches. This five-notch leeway implies that we might downgrade the covered bonds' rating because of a TPI cap if we were to lower the CB anchor by more than five notches, all other variables being equal.

The TPI-positive aspects of this covered bond programme include:

» The high level of government and financial market support provided to *Pfandbriefe* in Germany

» The refinancing-positive factors discussed in the “Refinancing risk” section

» The strength of the German *Pfandbrief*legislation, including:

- The *Sachwalter* would take over management responsibility of the covered bond programme at the time of the declaration of the issuer's bankruptcy, or earlier.

- The *Sachwalter* would act independently from the issuer’s insolvency administrator. Having an independent cover pool administrator might reduce potential conflicts of interest between the covered bondholders and other creditors.

- The issuer is required to cover potential liquidity gaps over the next 180 days between payments expected to be received under the cover pool assets and payments due under the outstanding covered bonds.

- All covered bonds outstanding have a soft bullet repayment at maturity, with an extension period of 12 months for the repayment of the bonds.

- Set-off: We understand that the *Pfandbrief* Act excludes from set-off loans registered in the cover pool that are under German law and located in Germany.

The TPI-negative aspects of this covered bond programme include:

- The covered bond programme does not benefit from any designated source of liquidity if cash flow collections are interrupted.
- Commingling risk: Upon the appointment of the *Sachwalter*, it is our understanding that the *Sachwalter* has a priority claim on all cash flows stemming from the cover pool assets. However, these cash flows have to be separated from other cash flows to the issuer before they can be used to make payments to covered bondholders.

Additional analysis

Liquidity

The covered bond programme would not benefit from any designated source of liquidity if cash flow collections were to be interrupted. However, before an issuer default, the *Pfandbrief* Act requires the issuer to cover potential liquidity gaps for the next 180 days and to maintain a minimum OC level of 2%. After an issuer default, the *Sachwalter* would have the ability to sell a portion of the cover pool to make timely payments on the bonds. Further, all covered bonds outstanding have a soft bullet repayment at maturity, with an extension period of 12 months for the repayment of the bonds.

Time subordination

After a CB anchor event, later-maturing covered bonds would be subject to time subordination. Principal cash collections may be used on a first-come, first-served basis, paying earlier-maturing covered bonds before later-maturing covered bonds. Such payments could result in the erosion of OC before any payments are made to later-paying covered bonds.

Governance considerations

Overall exposure to meaningful governance risks is low in this programme due to covered bonds' dual recourse to both issuer and cover pool and the consideration set out below.

The principal sources of governance for this programme are (i) Germany's covered bond law; and (ii) key programme participants' adherence to obligations; and (iii) the operational and substantive provisions of the programme documents. In this programme, there are control mechanisms in place that are designed to protect covered bondholders from mistakes, misallocation of cash flows and misappropriation of assets, and that promote compliance with the covered bond legal framework and operational and reporting requirements.

In particular, we note that (i) the issuer is a regulated entity and maintains the cover pool on its balance sheet, incentivising it to maximise cover pool value as owner and servicer; (ii) the cover pool monitor and any cover pool administrator are roles prescribed by the covered bond law and both owe duties to bondholders; (iii) the covered bond law contains provisions addressing treatment of ineligible and non performing assets and contains detailed reporting requirements; and (iv) there is a high level of legal certainty over the segregation of the cover pool and the parties' respective rights to it.

Cover pool description

Pool description as of 30 June 2021

The cover pool consists of mortgage loans backed by commercial assets (93.0%) and residential mortgage loans (4.0%), and further cover assets that constitute substitute assets under the *Pfandbrief* Act (3.0%). The majority of the cover assets are loans backed by properties in Germany. The cover pool has geographical concentration in the states of Hesse and North Rhine-Westphalia. All the loans are performing.

On a nominal value basis, the cover pool assets total €16.8 billion, which back €9.9 billion of covered bonds, resulting in an OC level of 76.5% on an unstressed present value basis.

Mortgage loans with backing of commercial properties amount to €15.6 billion. Offices (46.9% of the commercial sub-pool), multi family (23.4% of the commercial sub-pool) and retail (22.3% of the commercial sub-pool) are the most important commercial asset types. The weighted average loan-to-value ratio is 59.0%. This ratio is calculated on the basis of eligible loan parts and property mortgage lending values.

Mortgage loans with backing of residential properties amount to €676.4 million. The weighted average loan-to-value ratio is 58.2%. This ratio is calculated on the basis of eligible loan parts and property mortgage lending values. The residential cover pool has a seasoning of 45 months. All of the loans are performing. (For Landesbank Hessen-Thueringen GZ 's underwriting criteria, see “Appendix: Income underwriting and valuation”)

Exhibits below show more details about the cover pool assets.

Commercial assets

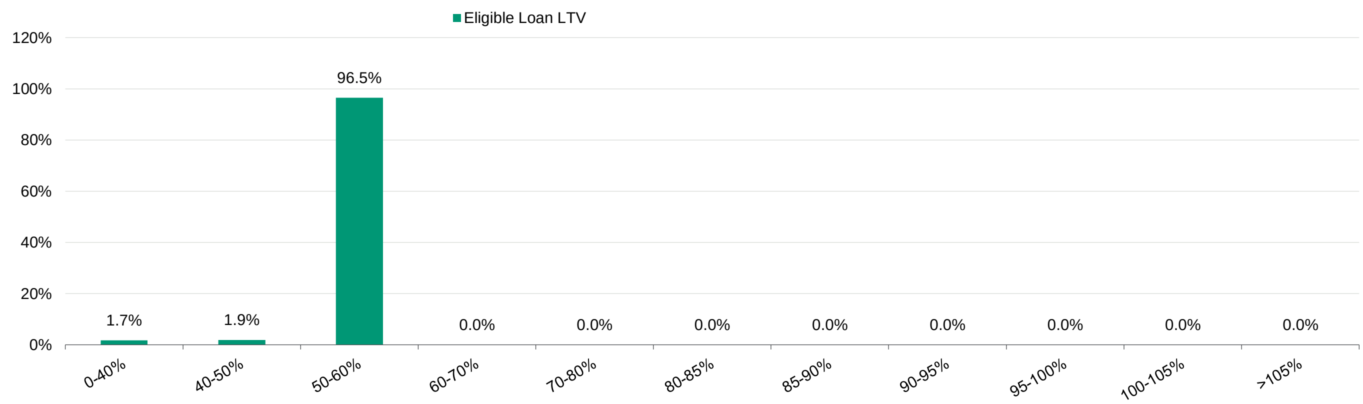
Exhibit 4
Cover pool summary - Commercial assets

Overview		Details on Loan Underwriting	
Asset type:	Commercial	WA DSCR:	n/d
Asset balance:	15,611,064,247	WA loan seasoning (in months):	51
Average loan balance:	6,333,089	WA remaining term (in months):	53
Number of loans:	2,465		
Number of borrowers:	1,856	**Details on LTV**	
Largest 10 borrowers:	9.8%	WA LTV(*):	59.0%
Number of properties:	3,818	WA Current LTV(**):	n/d
Main countries:	Germany (48.6%), USA (21.3%), Poland (6.3%)	Valuation type:	Lending Value
		LTV Threshold:	60.0%
Specific Loan and Borrower characteristics			
Bullet loans:	66.1%	**Performance**	
Main currencies:	EUR (70.5%), USD (21.3%), GBP (5.9%)	Loans in arrears ≥ 2 months:	0.0%
Fixed rate loans:	78.6%	Loans in a foreclosure procedure:	0.0%
Non-recourse to sponsor/initiator:	n/d		

(note *) Based on property value at loan origination and eligible loan parts.
(note **) Based on updated property value.
Sources: Moody's Investors Service, issuer data

Exhibit A

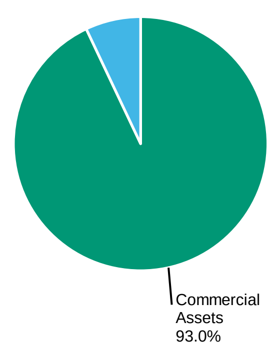
Balance per LTV band - Lending Value



Sources: Moody's Investors Service, issuer data

Exhibit B

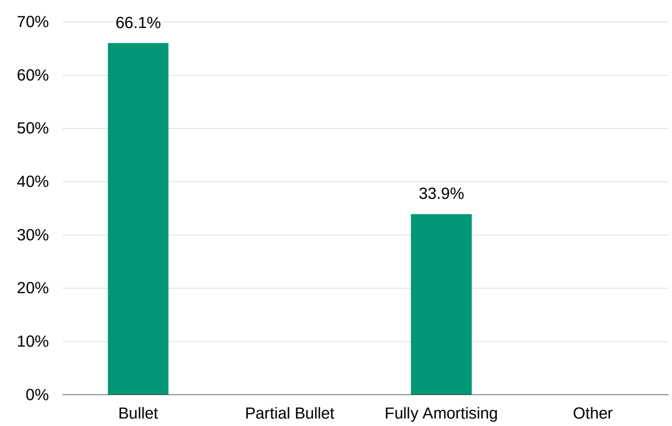
Percentage of commercial assets



Sources: Moody's Investors Service, issuer data

Exhibit C

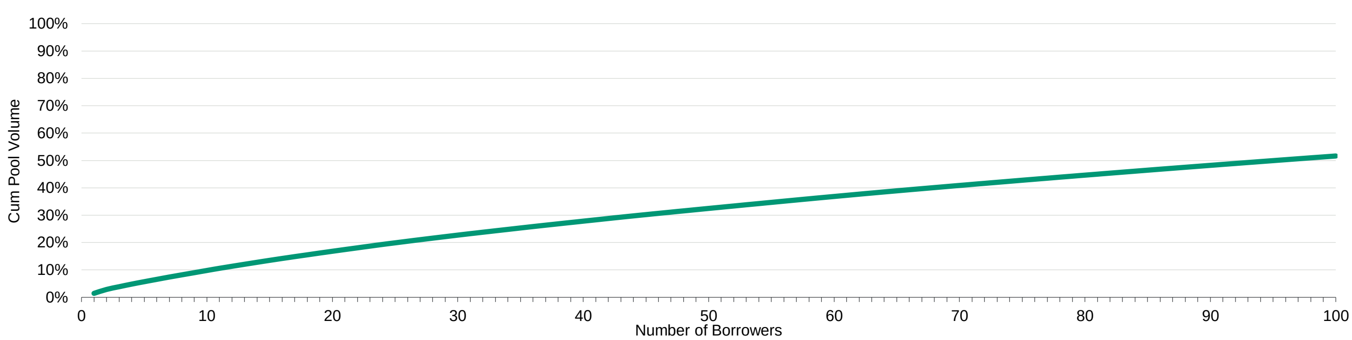
Principal repayment method



Sources: Moody's Investors Service, issuer data

Exhibit D

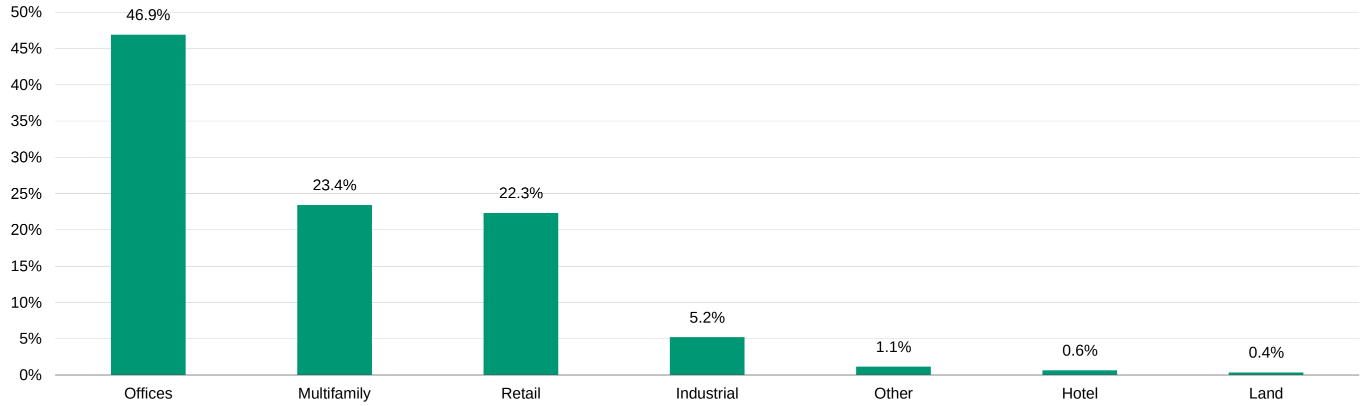
Borrower concentration



Sources: Moody's Investors Service, issuer data

Exhibit E

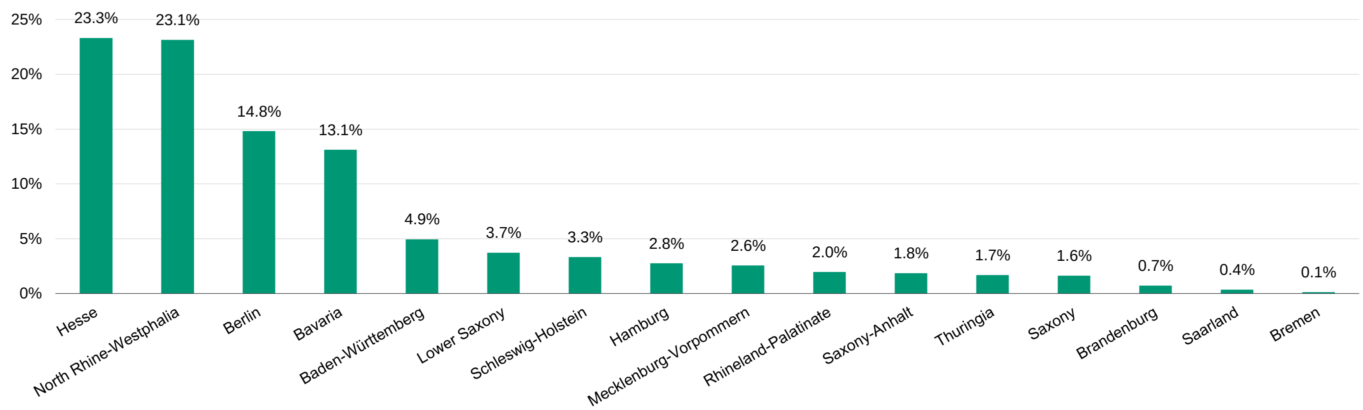
Property type



Sources: Moody's Investors Service, issuer data

Exhibit F

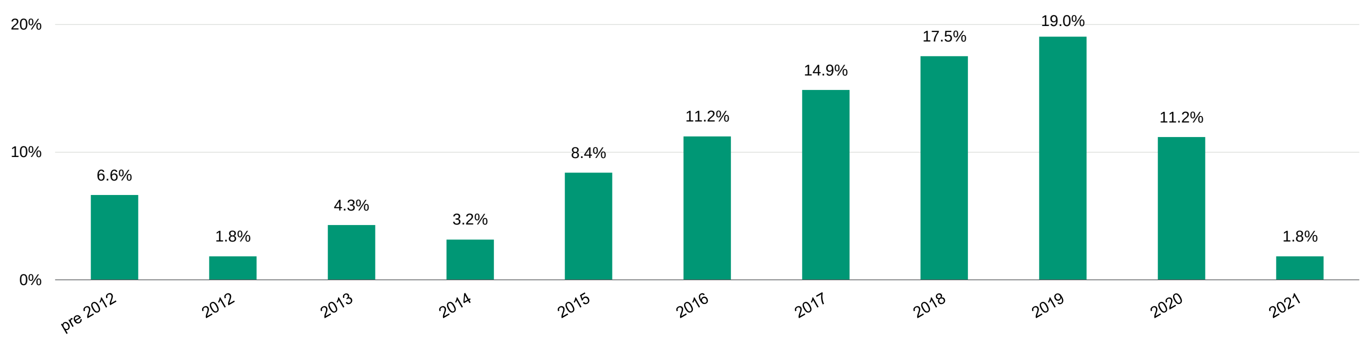
Main country regional distribution



Sources: Moody's Investors Service, issuer data

Exhibit G

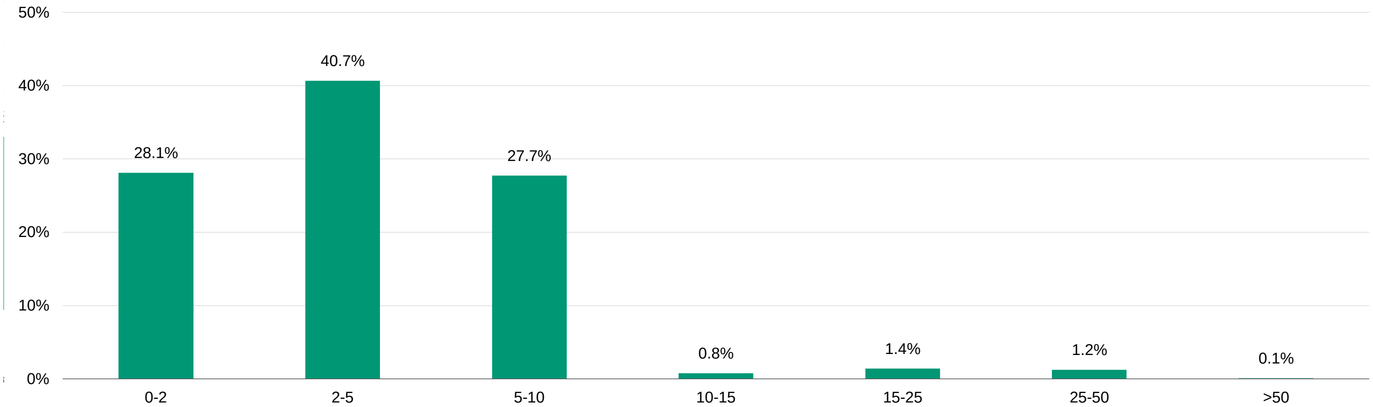
Year of loan origination



Sources: Moody's Investors Service, issuer data

Exhibit H

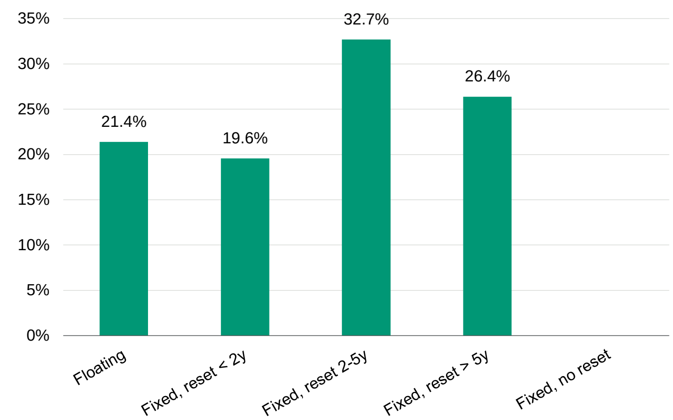
Remaining term (in years)



Sources: Moody's Investors Service, issuer data

Exhibit I

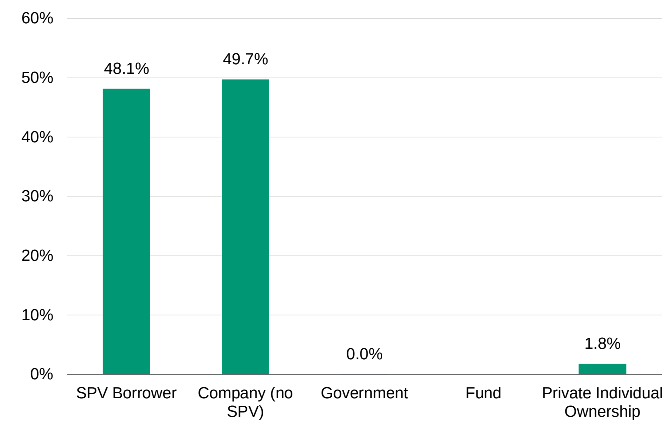
Interest rate type



Sources: Moody's Investors Service, issuer data

Exhibit J

Debtor type



Sources: Moody's Investors Service, issuer data

Residential assets

Exhibit 5

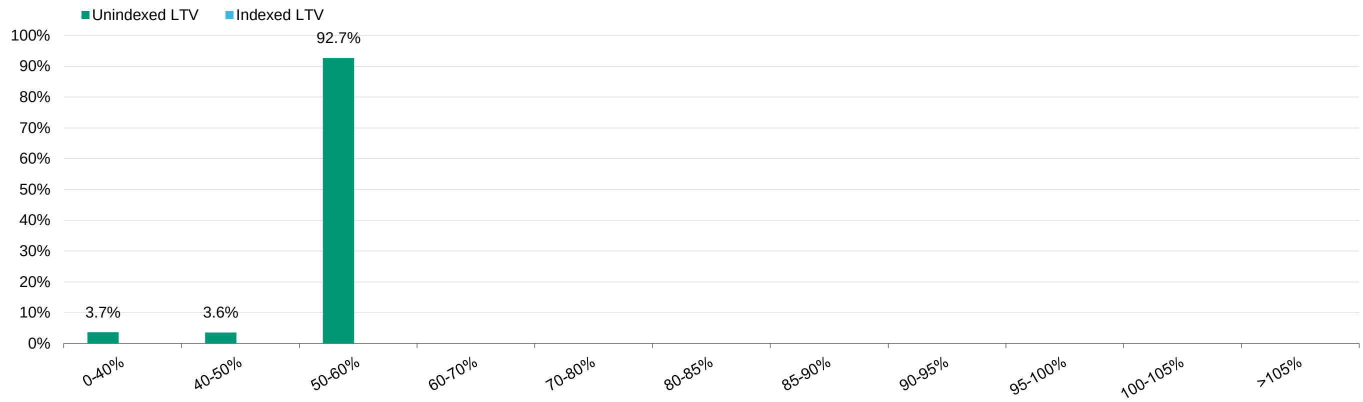
Cover pool summary - Residential assets

Overview		Specific Loan and Borrower characteristics	
Asset type:	Residential	Loans with an external guarantee in addition to a mortgage:	n/a
Asset balance:	676,435,753	Interest only Loans	0.7%
Average loan balance:	122,454	Loans for second homes / Vacation:	0.0%
Number of loans:	5,524	Buy to let loans / Non owner occupied properties:	0.0%
Number of borrowers:	4,890	Limited income verified:	0.0%
Number of properties:	4,998	Adverse credit characteristics (**)	0.0%
WA remaining term (in months):	282		
WA seasoning (in months):	45	**Performance**	
		Loans in arrears (≥ 2months - < 6months):	0.0%
Details on LTV		Loans in arrears (≥ 6months - < 12months):	0.0%
WA unindexed LTV (*)	58.2%	Loans in arrears (≥ 12months):	0.0%
WA Indexed LTV:	n/a	Loans in a foreclosure procedure:	0.0%
Valuation type:	Lending Value		
LTV threshold:	60.0%		
Junior ranks:	n/d		
Loans with Prior Ranks:	0.0%		

(note *) based on property value at time of loan origination, further advance or borrower refinancing
(note **) Typically borrowers with a previous personal bankruptcy or borrowers with record of court claims against them at time of origination
(note ***) This “other” type refers to loans directly to Housing Cooperatives and to Landlords of Multi-Family properties (not included in Buy to Let)
Sources: Moody's Investors Service, issuer data

Exhibit A

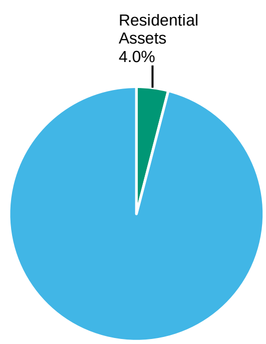
Balance per LTV band (eligible loan part only)



Sources: Moody's Investors Service, issuer data

Exhibit B

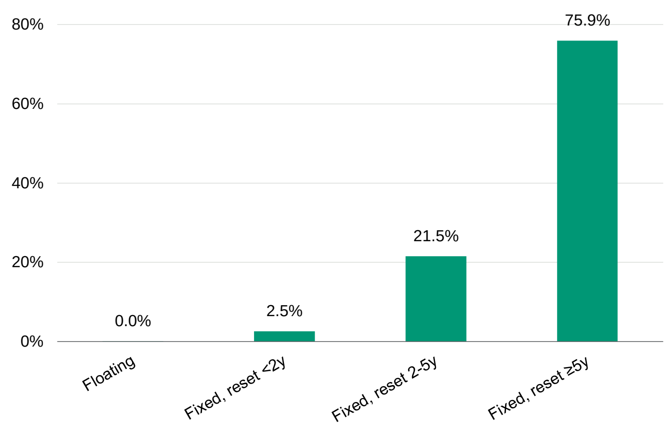
Percentage of residential assets



Sources: Moody's Investors Service, issuer data

Exhibit C

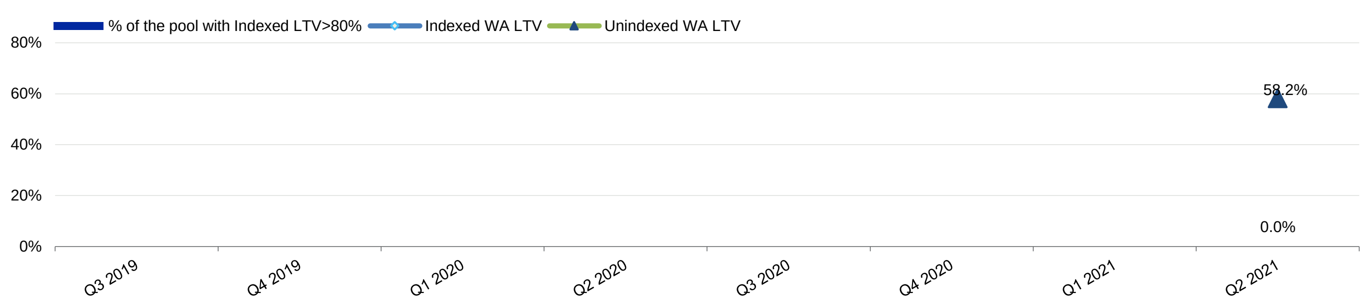
Interest rate type



Sources: Moody's Investors Service, issuer data

Exhibit D

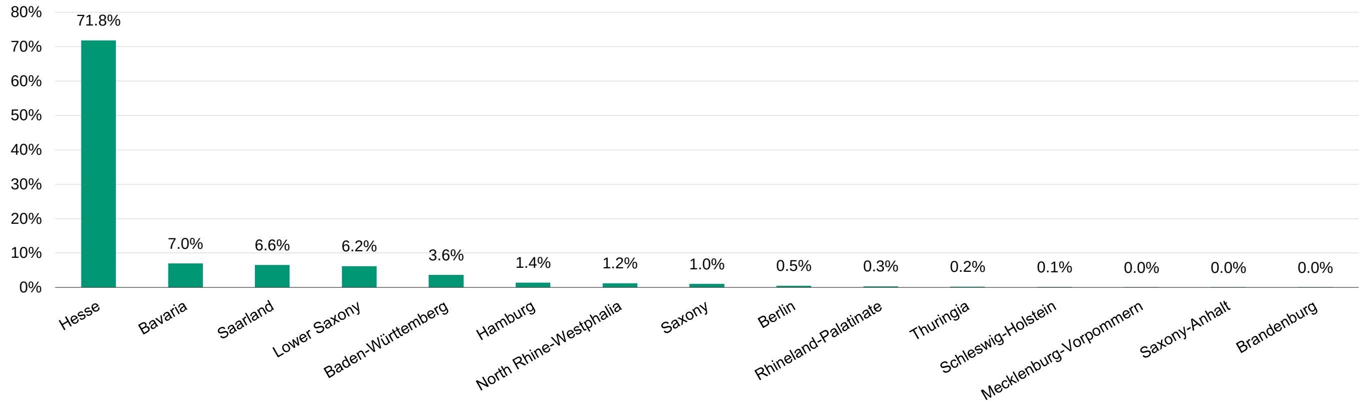
LTV



Sources: Moody's Investors Service, issuer data

Exhibit E

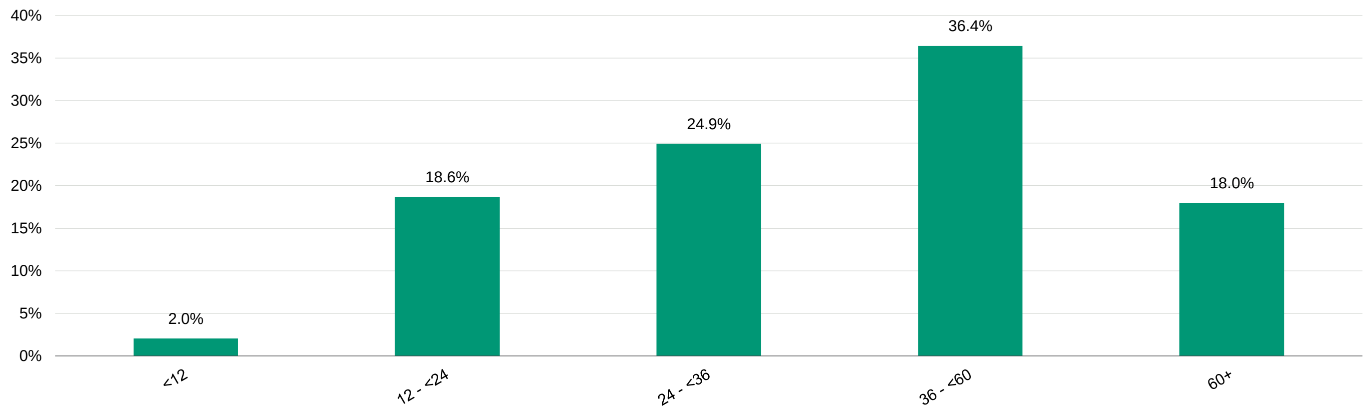
Main country regional distribution



Sources: Moody's Investors Service, issuer data

Exhibit F

Main country regional distribution



Sources: Moody's Investors Service, issuer data

Substitute assets

Of the cover assets, €505.0 million (3.0%) are substitute assets. The substitute assets currently consist of debt securities issued by German agencies.

Cover pool monitor

Pursuant to the *Pfandbrief* Act, the regulator (BaFin) has appointed a cover pool monitor (*Treuhänder*). (See "Moody's related publications: Covered Bond Legal Frameworks")

Cover pool analysis

Our credit analysis of the pool takes into account specific characteristics of the pool, as well as legal risks.

Primary cover pool analysis

We calculate the collateral score for the commercial mortgages using a multifactor model that is solved through a Monte Carlo simulation. Our analysis takes into account, among other factors, the impact of concentration on borrower, regional and country levels, as well as the credit quality of the individual borrowers.

We calculate the collateral score for the residential mortgages using a scoring model that estimates loss in severe recession scenario. Our analysis takes into account, among other factors, the LTV ratios of the mortgage loans, the seasoning and the geographical distribution.

The collateral quality is reflected in the 10.4% collateral score of the pool, which is in line with the average collateral score (10.6%) of the mortgage covered bonds in Germany and below Landesbank Hessen-Thueringen GZ's peers in the commercial mortgage lending business. Our collateral scores for commercial mortgage loan cover pools are generally higher than those for residential mortgage loan cover pools because we consider commercial real estate assets more risky and more volatile than residential assets. (For details, see "Moody's related publications - Moody's Global Covered Bonds Sector Update, Q3 2021")

In addition to the eligible loan portion based LTV ratios of the commercial real estate backed mortgage loans, the issuer did provide a sample of prior, equal and junior ranking liens on the properties financed by Helaba. We used this information to derive an approximation of whole-loan loan-to-value ratios for the mortgage receivables in the cover pool.

Commercial assets (93.0% of the cover pool)
From a credit perspective, we view positively the following characteristics of the cover assets:

» All the assets are performing.

» The high share of office and multi-family properties.

From a credit perspective, we view negatively the following characteristics of the cover assets:

» The cover pool has some geographical concentration as most of the loans are backed by properties in Germany, particularly in the states of Hesse and North Rhine-Westphalia.

» There is some obligor concentration with the 10 largest obligors accounting for 9.8% of the commercial sub-pool. However, this obligor concentration is smaller than the typical obligor concentration observed in commercial real estate mortgage loan backed covered bonds in Germany.

Residential assets (4.0% of the cover pool)
From a credit perspective, we view positively the following characteristics of the cover assets:

» All of the assets are performing.

» The loans are well-seasoned (weighted average seasoning is 45 months).

From a credit perspective, we view negatively the following characteristics of the cover assets:

» The cover pool has regional concentration with the majority (71.8%) of the residential properties are located in Hesse.

Additional cover pool analysis

Environmental considerations
Overall exposure to meaningful environmental risks is low in this programme due to the issuer's liability to make payment on the covered bonds and:

» In respect of physical risks to the cover pool, the geographical diversification of the pool, the largest concentration being 71.8% of the residential assets and 23.7% of the commercial assets are located in Hesse. In addition to geographical diversification, physical environmental factors are mitigated by mandatory possession of insurance in line with market practices.

» In respect of regulatory risk, we expect that over time properties and buildings that do not meet climate-aligned standards for energy efficiency or carbon emissions will face regulatory sanctions and value impairment. However, we expect much of this risk to be gradually absorbed into the periodic updating of property valuations or ongoing capex. This will impact key credit metrics such as LTVs.

In the event of shocks in connection with regulation or physical hazards, the impact on property/building collateral will be partly mitigated by borrowers' liability to repay mortgage loans regardless of property value.

Social considerations

Overall exposure to social factors is moderate for this programme. Covered bondholders benefit from the issuer's liability to make payment on the covered bonds, meaning the bondholders will not be directly exposed to social factors affecting the cover pool unless the issuer defaults. Misconduct, poor handling of data security and customer privacy breaches by lenders are the most significant social risks that may in due course affect the credit quality of the cover pool, although lenders' financial and operational flexibility and track record of adjusting to social issues may mitigate this. In addition, the diversified nature of the cover pool is a mitigant to exposure to social factors.

In respect of the property collateralizing loans in the cover pool, externally driven demographic trends and societal preferences are the main social considerations affecting credit. These considerations generally affect the operations of building owners in respect of demand for space. For retail properties, the most notable shifts have come in mature markets, such as the shift in retail shopping toward online retailing. Especially in secondary and tertiary locations, retailers demand less physical store space, a trend accelerated in recent pandemic conditions. For office properties, the pandemic has also exacerbated existing long-term trends such as flexible/remote-working that can lead to lower tenant demand resulting eventually in lower rental levels and property values. In this programme the portion of the pool exposed to offices is 46.9%. The prime nature of those assets in this cover pool mitigates such trends as illustrated by the good historical performance of Helaba's commercial real estate mortgage loan business.

Social factors that potentially affect the cover pool have varied implications. Social risks can arise from changing demographic trends such as aging, urbanization, an increase in telecommuting and flight from cities, population declines or ways of living trends in general that impact the supply or demand for housing in particular areas, which can reduce home values. Societal and demographic trends will be relevant but typically develop over an extended timeframe that smooths out materiality for expected loss.

Social issues may be driven also by a political agenda related to housing and consumer protection, particularly in down cycles, creating pressure on recovery values. Borrower-friendly legislation as a reaction to consumer activism can affect both the underwriting and the servicing of mortgage loans in the cover pool.

In addition, the coronavirus pandemic has had a significant impact on economic activity. Although global economies have shown a remarkable degree of resilience to date and are returning to growth, the uneven effects on individual businesses, sectors and regions will continue well into 2022. While persistent virus fears remain the main risk for a recovery in demand, the economy will recover faster if vaccines and further fiscal and monetary policy responses bring forward a normalization of activity. As a result, there is a heightened degree of uncertainty around our forecasts. Our analysis has considered the effect on the performance of covered bonds from a gradual and unbalanced recovery in Germany's economic activity. We regard the coronavirus outbreak as a social risk under our ESG framework, given the substantial implications for public health and safety.

Legal risks for assets outside of Germany

In the event of the issuer's insolvency, we believe that cover pool assets outside of Germany would be less protected against claims of the issuer's other creditors than would be assets in Germany. In particular, we have identified and analysed the following scenarios:

» Claims against borrowers outside of Germany or loans not governed by German law: In the case of loans not governed by German law, the borrower might be allowed to exercise set-off, thereby reducing the amount that would be payable to the benefit of covered bondholders. Loans outside of Germany account for 52.6% of the cover pool.

» Loans to borrowers outside of the European Economic Area (EEA): 21.3% of the loans in the commercial mortgage sub-pool are granted to borrowers in the USA and 6.0% to borrowers in the UK. For these assets, in addition to the above risk, there exists the risk that the cover pool assets might not be available to the covered bondholders on a priority basis because other (unsecured) creditors of the issuer might successfully access the assets in the cover pool. These actions might result in lower recovery, owing, for example, to secondary proceedings commenced under the respective domestic law. Helaba protects the US assets for the benefit of covered bondholders via a trust structure and has confirmed to protect the UK assets in a similar way, once a trust structure has been established.

Comparables

Exhibit 6

Comparables -Landesbank Hessen-Thueringen GZ - Mortgage Covered Bonds and other selected deals

PROGRAMME NAME	Landesbank Hessen-Thueringen GZ - Mortgage Covered Bonds	DZ HYP - Mortgage Covered Bonds	Landesbank Baden-Wuerttemberg - Mortgage Covered Bonds	Berlin Hyp AG - Mortgage Covered Bonds	Aareal Bank AG - Mortgage Covered Bonds
Overview					
Programme is under the law	*Pfandbrief Act*	*Pfandbrief Act*	*Pfandbrief Act*	*Pfandbrief Act*	*Pfandbrief Act*
Main country in which collateral is based	Germany	Germany	Germany	Germany	Various
Country in which issuer is based	Germany	Germany	Germany	Germany	Germany
Total outstanding liabilities	9,936,019,483	33,630,658,293	11,796,231,941	16,368,746,182	10,603,772,268
Total assets in the Cover Pool	16,792,500,000	38,424,476,066	15,453,558,856	16,754,591,373	12,478,632,707
Issuer name	Landesbank Hessen-Thueringen GZ	DZ HYP AG	Landesbank Baden-Wuerttemberg	Berlin Hyp AG	Aareal Bank AG
Issuer CR assessment	Aa3(cr)	Aa2(cr)	Aa3(cr)	Aa2(cr)	A3(cr)
Group or parent name	n/a	DZ BANK AG	n/a	Landesbank Berlin Holding AG	n/a
Group or parent CR assessment	n/a	Aa2(cr)	n/a	n/a	n/a
Main collateral type	Commercial	Commercial	Commercial	Commercial	Commercial
Collateral types	Public Sector 0%, Residential 4% Commercial 93.0%, Other/Supplementary assets 3.0%	Commercial 72.5%, Residential 25.0%, Public Sector 0%, Other/Supplementary assets 2.4%	Commercial 75%, Residential 19%, Public Sector 0%, Other/Supplementary assets 6%	Commercial 95%, Residential 0%, Public Sector 0%, Other/Supplementary assets 5%	Commercial 92%, Residential 2%, Public Sector 0%, Other/Supplementary assets 6%
Ratings					
Covered bonds rating	Aaa	Aaa	Aaa	Aaa	Aaa
Entity used in Moody's EL & TPI analysis	Landesbank Hessen-Thueringen GZ	DZ HYP AG	Landesbank Baden-Wuerttemberg	Berlin Hyp AG	Aareal Bank AG
CB anchor	CR Assessment + 1 notch	CR Assessment + 1 notch	CR Assessment + 1 notch	CR Assessment + 1 notch	CR Assessment + 1 notch
CR Assessment	Aa3(cr)	Aa2(cr)	Aa3(cr)	Aa2(cr)	A3(cr)
SUR / LT Deposit	Aa3	Aa2	Aa3	Aa2	n/a
Unsecured claim used for Moody's EL analysis	Yes	Yes	Yes	Yes	Yes
Value of Cover Pool					
Collateral Score	10.4%	12.0%	9.1%	14.7%	15.1%
Collateral Score excl. systemic risk	n/a	11.2%	n/a	n/a	n/a
Collateral Risk (Collateral Score post-haircut)	7.0%	8.0%	6.1%	9.8%	10.1%
Market Risk	12.9%	15.3%	14.3%	11.3%	10.5%
Over-Collateralisation Levels					
Committed OC*	2.0%	2.0%	2.0%	2.0%	2.0%
Current OC	76.5%	20.0%	38.2%	4.3%	18.2%
OC consistent with current rating	1.5%	0.0%	1.0%	0.0%	18.0%
Surplus OC	75.0%	20.0%	37.2%	4.3%	0.2%
Timely Payment Indicator & TPI Leeway					
TPI	High	High	High	High	High
TPI Leeway	5	6	5	6	2
Reporting date	30 June 2021	30 June 2021	30 June 2021	30 June 2021	31 March 2021

Sources: Moody's Investors Service, issuer data

Methodology and monitoring

The primary methodology we use in rating the issuer's covered bonds is "Moody's Approach to Rating Covered Bonds", published in December 2021. Other methodologies and factors that may have been considered in the rating process can also be found on http://www.moodys.com. In addition, we publish a weekly summary of structured finance credit, ratings and methodologies, available to all registered users of our website, at www.moodys.com/SFQuickCheck.

We expect the issuer to deliver certain performance data to us on an ongoing basis. In the event that this data is not made available to us, our ability to monitor the ratings may be impaired. This lack of data availability could negatively affect the ratings or, in some cases, our ability to continue to rate the covered bonds.

Appendix: Income underwriting and valuation

Exhibit 7

Commercial Lending	
1. Business Focus	
1.1 What kind of CRE loans will form part of the cover pool?	Development/construction loans, investment mid and long term loans, portfolio loans (business plan)
1.2 What CRE property types do you finance?	Office, shopping centre, other retail, light-industrial, multi-family, logistic
1.3 What kind of restrictions do you have in terms of property location and quality	Main focus is on metropolitian areas location (e.g. Germany: BIG Seven) as well as other locations with solid economics
1.4 Does the cover-pool only contain self-originated loans or loan participations (e.g. syndicated loans, mezzanine loans)?	Our main focus is on direct origination of loans in access of € 30m as underwriter/arranger, club deal partner or syndicate member
2. Loan underwriting policy	
2.1 Do you accept loans with refinancing risk? If yes, do you have a maximum Exit-LTV limit at loan maturity?	Yes. See 4.3
2.2 Do you have a maximum LTV ratio that is covenanted in the loan agreement? Do max. LTV ratio vary by property type? Please specify.	Yes Yes Office and multi family: 75 %; logistic and shopping centre: 70% light indutrial: < 70%
2.3 Do you have a minimum DSCR ratio that is covenanted in the loan agreement? Do min. DSCR ratio vary by property type? Please specify.	Initial debt service: Office core 5.5%; Retail/Logistic core 6.5%; multi family 5-6 % Exit debt service: Office core 5.5%; Retail/Logistic core 6.5%; multi family 5-6 %
2.4 Do you always require full hedging in terms of interest rate and currency risk? If not, which stresses are used to calculate the DSCR ratios?	Yes (interest rate) No (currency risk) ; We calculate with an average exchange rate of the test period (for example 3/6/12 month) additional the borrower must repay parts of the loan or bring additional collateral if the exchange rate amend > 10 %
2.5 Do you require a minimum exit debt yield? Please specify	yes, see 2.3
2.6 Do you allow exceptions to and what reasons would justify exceptions?	Yes, but rarely, e.g. for premium core properties
3. Cash flow analysis	
3.1 Is a cash-flow assessment always carried out?	Yes
3.2 Do you consider in the DSCR calculation (cash-flow assessment) possible reduction in property cash flow (e.g. due to lease roll-over, changing market rents, capex requirements)?	Yes
3.3 Do you rely in the DSCR calculation (cash-flow assessment) on possible increases in property cash flow (e.g. due to expected reduction in property vacancy, rent increase, property disposal income, or sponsor support)?	No
3.4 Do you consider in the cash flow assessment the quality (tenant) and diversity of cash flows? How do you assess tenant quality?	Yes, we assess all essential tenants. The Assessment is part of the rating.
3.5 How often is the property cash flow and loan DSCR assessment updated?	The update will be done quarterly, semi-annually and yearly
4. Borrower	
4.1 Do you accept SPV as a borrower?	Yes
4.2 Do you always require direct recourse to the borrower and sponsor (natural person) holding the equity stake? If not, please provide details/limits on non-recourse business.	No
4.3 Do you have minimum requirements as for the borrower's quality? Please detail.	Initial LTV max. 65 – 75 % Exit LTV max. 60 – 70 % Initial Debt Service min. 5.5 – 8 % Exit Debt Service min. 6 – 8.75 %
4.4 How do you assess borrower's quality?	No
4.5 Do you allow exceptions to 4.3? What reasons would justify exceptions?	No

Source: Issuer

Exhibit 8

Commercial Valuation	
1 Are valuations based on market or lending values?	Market and Lending Values
2 Do you consider vacant possession values for single-tenanted properties?	Vacant possession values are mandatory for large single-tenant properties
3 Do valuations always comply with standards of the RICS Red Book?	Valuations comply with §16 German Pfandbrief Act (Pfandbriefgesetz) and Beleihungswertermittlungsverordnung (BelWertV) All valuations are based on acknowledged and standardised procedures in Germany
4 Do you always require that valuations include a review of the lease contracts, a technical report and environment report?	Yes, a review of relevant data is mandatory
5 Do you always require that valuations provide reference to comparable recent property transactions?	We always require reference to comparables of recent property transactions, if valuations are based on the “Vergleichswertfahren”
6 Could the value of a property portfolio exceed the value of the individual properties?	Lending Values: No Market Values: Possible, but only, if the market is willing to pay a premium
7 How often is the property value updated and how often is checked that the LTV covenant is not breached? (annually, ad-hoc, depending on general market movement)?	Every 3 years in general. In case of contractual LTV testing the property value update will be done annually or semin-annually In case of market change > -10 % => property value update will be conducted Ad-hoc, if the individual case requires new measurements
Other comments	

Source: Issuer

Moody's related publications

Rating Methodology

» Moody's Approach to Rating Covered Bonds, December 2021 (1307630)

Special Comments

» Covered bonds - Global: 2022 Outlook, December 2021

» Covered Bonds – Global - Sector Update - Q3 2021: Investors and issuers see improving credit environment, September 2021 (1300414)

» EU Bank Recovery and Resolution Regime Strengthens German Covered Bonds and Improves Their Ratings, July 2015 (1006468)

» Structural Protection Mechanisms for Non-EEA Assets in German Cover Pools, July 2014 (SF374519)

» Germany - Legal Framework for Covered Bonds, July 2021 (1290200)

» Proposed maturity extension and increased overcollateralization for Pfandbrief is credit positive, October 2020 (SF1249282)

Credit Opinion

» Landesbank Hessen-Thueringen GZ

Webpages

» Covered Bonds: www.moodys.com/coveredbonds

» Covered Bond Legal Frameworks: www.moodys.com/Pages/CoveredBondLegalFrameworks.aspx

To access any of these reports or webpages, click on the entry above. Note that these references are current as of the date of publication of this report and that more recent reports may be available. All research may not be available to all clients.

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