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THE GERMAN PFANDBRIEF MARKET 2023 | 2024

The pfandbrief market after the end of ECB purchases

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PREFACE

Dear Ladies and Gentlemen

The economic recovery after the corona pandemic was slowed down by the sharp rise in inflation and the resulting restrictive monetary policy of the European Central Bank. The reason for this was not least the war in Ukraine, which still dominates the headlines after more than 18 months. An end to the war is not in sight. However, the economic impact on Western industrialised countries is diminishing. Inflation in the euro area is still well above the target of 2 percent. However, the inflation rate has declined in recent months. The European Central Bank has been rapidly raising its key interest rates since July 2022, most recently in September 2023. Alongside this, the European Central Bank has also stopped reinvesting under its asset purchase programme, which includes the third covered bond purchase programme.

The rapid and sharp increase in key interest rates has had a significant impact on capital market yields. The yield curve for covered bonds became inverse, i.e. bonds with shorter maturities offer a higher yield than bonds with longer maturities. This in turn caused the risk premiums for Pfandbriefe with longer maturities to rise more sharply than at the short end of the curve. The so-called credit curve thus became steeper. Even though the risk premiums for Pfandbriefe have widened less compared to the international covered bond market, these changes have not been without consequences for Pfandbrief issuers, as it has become more difficult and more expensive to issue Pfandbriefe with long maturities as a result and against the background of the increased volatility on the bond market.

Rising interest rates have also arrived in the mortgage market. New business has declined significantly in 2023 compared to the previous year, in which the volume of new loans reached a peak. Nevertheless, the Pfandbrief banks' loan portfolios have remained constant so far. For existing residential mortgage loans, which in Germany usually has long-term fixed interest rates, the risks of rising defaults due to higher interest rates seem manageable. In the case of commercial property financing, which often have variable interest rates, various European financial supervisory authorities have recently expressed concern again and again. Here, not only rising interest rates are a burden, but also the trends towards working from home and online shopping, which have been intensified by the pandemic. Higher demands on the energy efficiency of buildings could also make expensive renovations necessary for older buildings in the future. There is no shortage of challenges in the coming months. However, as a stable, long-term refinancing instrument, the Pfandbrief can make a contribution to overcoming the problems.

"The German Pfandbrief Market 2023/2024" is also available in German. All current reports are available on our website www.dzhyp.de/en/about-us/market-research.

Kind regards

DZ HYP

November 2023

THE PFANDBRIEF MARKET AFTER THE END OF ECB PURCHASES

- **The fragile economic situation, which is burdened by higher interest rates among other things, has also reached the mortgage market**
- **The steeper credit curve for pfandbriefe in 2023 slowed the inversion of the yield curve, but could not stop it**
- **In the current difficult environment, the credit quality of pfandbrief benefits from its legal framework, which creates confidence among investors**

Summary
The fragile economic situation in many European countries persists. Inflation, higher interest rates, high commodity and energy prices are weighing on the economic outlook. New lending business of German pfandbrief banks declined significantly in the first half of 2023 compared to the same period last year, when peaks were reached. However, new business seems to be stabilising at the lower level. The interest rate turnaround heralded in 2022 dampened demand for real estate, the prices of which are now also falling in Germany. Commercial real estate is particularly affected, which is why regulators are increasingly audible in their warnings of possible risks in this business segment.

The European Central Bank seems to have succeeded in ending its covered bond purchases in a market-friendly manner. The risk premiums of covered bank bonds have risen slightly in recent months. However, there can be no talk of an uncontrolled rise. Among other things, the higher yield level is probably responsible for the fact that the lack of demand from the central bank is sufficiently compensated by private investors. Mainly banks and to some extent asset managers seem to be filling the gap left by the European Central Bank at the moment. Despite all this, the yield curve of German pfandbriefe has been inverted in the first half of the year. Risk premiums at the long end of the curve, on the other hand, have increased faster than at the short end, making the credit curve steeper. The generally high volatility of yields and the comparatively low pfandbrief yields at the long end currently make it difficult for German issuers to issue pfandbriefe with long maturities (all statements reflect the data as of 30 August 2023).

The pfandbrief market continued to grow until mid-2023, with mortgage pfandbriefe still providing the growth impetus. In the current difficult economic environment, the credit quality of pfandbriefe is benefiting from the legal framework, which includes strict rules on the mortgage lending value of properties and the maximum loan-to-value ratios of 60 percent. The better than solid legal foundations create confidence, which in turn lays the foundation for a stable development of risk premiums. In this respect, the pfandbrief as a long-term refinancing instrument can be part of a solution to the existing challenges.

MARKET DEVELOPMENTS

Economic environment at the beginning of the second half of 2023

World economic situation fragile

According to DZ BANK's assessment, the global economy remains in a fragile state. In the western industrialised countries, inflation remains high at the beginning of the second half of 2023 and geopolitical uncertainties (for example, the war in Ukraine and its impact on food, energy and commodity prices) persist. In China, economic momentum has slowed recently, while in Europe the economic outlook has become gloomier. However, there are also rays of hope: the economic development in the USA turned out to be better than expected in the first half of the current year. The current economic situation in the three economic areas mentioned can be summarised as follows:

Currently better than expected economic growth in the USA

- In the United States of America, gross domestic product (GDP) grew slightly stronger in the second quarter than in the first three months of the current year. According to DZ BANK, US economic growth could reach 1.9 percent in 2023. The high unemployment rate in the corona years has given way to a good employment situation. The unemployment rate should remain below 4 percent in 2023. This in turn supports consumer spending, which is the engine of US economic growth. At the same time, inflation is declining compared to 2022, although the annual inflation rate for 2023 is likely to remain above 4 percent. The US Federal Reserve therefore countered this trend by raising its key interest rates in the first half of the year. According to DZ BANK's assessment, economic growth in the USA is likely to cool down again in 2024.

Weakened domestic and foreign demand hurts Chinese economy

- Economic growth in China was positive in the second quarter of 2023, but remained below potential growth. The weak global economic development and growing difficulties in the property market seem to be causing problems for China. In addition, there are trade barriers in the exchange of goods with the USA. This is reflected in declining exports. Due to weaker domestic demand, imports also declined. Unlike in the Western industrialised countries, Chinese inflation is currently low and even slipped slightly below zero in July. The growth target of 5 percent for this year seems only possible if the government provides for economic stimuli, for example, public investment in the country's infrastructure.

High inflation in the euro area weighs on the economic development

- An imminent trend reversal towards more growth momentum in the euro area is currently unlikely The economic developments in the member countries varied. The economies in France and Spain grew above average, while they contracted slightly in Italy and Austria. Germany was in the middle with a stagnating economy. A weakening of the economic development in industry, which seems to have emerged in the third quarter, threatens to spill over to the entire economy and thus dampens the economic outlook. The second half of 2023 could therefore see a mild recession for the euro area. The inflation rate (measured by the Harmonised Index of Consumer Prices, HICP) ranked slightly above 5 percent in mid-2023. High inflation continues to curb consumer spending. At the same time, the savings rate of private households is falling. Banks have also tightened their lending standards, so that less new lending business is being extended overall.

In relation to Germany, the outlook is anything but rosy against the global backdrop described. In the second quarter of 2023, the German economy stagnated at the level of the previous quarter. Important leading indicators signalled an economic slowdown in the middle of the year. High interest rates and only slowly declining inflation are a burden, while foreign trade impulses are lacking.

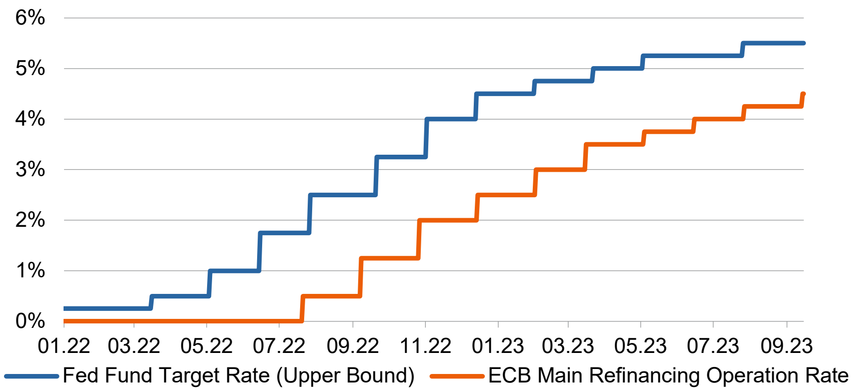
Prospects in Germany anything but rosy

Fed started to hike interest rates in March 2022

High inflation rates on both sides of the pond have prompted central banks to push up their key interest rates in recent months. The US Federal Reserve (Fed) began raising its key interest rates from the then historically low levels as early as mid-March 2022. In the meantime, the target corridor for Fed Funds is again above the 5 percent mark. The European Central Bank (ECB) ended its zero interest rate policy somewhat later and did not begin its rate hike cycle until the end of July 2022 with a large step of 50 basis points and also announced the end of its reinvestment under its asset purchase programme (APP). On 15 September 2023, the ECB raised its key interest rate to 4.5 percent, which is likely to mark the end of the rate hike cycle. The ECB's deposit rate was raised to 4 percent on the same date. Other European central banks have also raised their key interest rates sharply. The central banks' decisions have led to an increase in the general level of yields. The yield curves also became inverse. This means that the rise in interest rates on bonds with shorter maturities occurred faster and stronger than at the long end of the yield curve. Ten-year US government bonds offered a yield slightly above 4 percent in mid-August 2023. Due to the expected cooling of the US economy in 2024 and a simultaneous easing of inflationary pressure, DZ BANK's interest rate analysts expect long-term yields in the US to fall to around 3.4% by mid-2024.

Central banks raise interest rates, yield curves inverted

CYCLE OF INTEREST RATE HIKES BEGAN IN AMERICA EARLIER THAN IN THE EURO AREA



Source: Bloomberg, presentation DZ BANK

Yields on ten-year Bunds followed the trend from America. However, at a level of slightly below 3 percent at the end of September 2023, yields on German government bonds were significantly below those of their American counterparts. The interest rate analysts at DZ BANK expect ten-year Bund yields to trend towards 2.4 percent over the next twelve months. Falling inflation could fuel market expectations for interest rate cuts. At the same time, the ECB is already gradually reducing the bond holdings it has accumulated since the end of 2014 within the framework of APP by not reinvesting returns from maturing bonds. The absence of ECB bond purchases stands in the way of a stronger decline in yields. In DZ BANK's view, the current inversion of the yield curve should ease around 20 basis points over the course of the next few months.

Bund yields are clearly below the US level

Higher interest rates dampen property price development

Declining property prices as a result of rising interest rates

In America and Europe, real estate prices have come under pressure in 2023, starting from a high level. One reason for this is the rapid rise in interest rates. However, there were different price developments in the European countries, with individual regions also being affected to varying degrees. Basically, however, it can be said that residential real estate has been less affected by the price declines than commercial real estate (as of 30 June 2023). The price declines for residential property were in the single-digit percentage range in many European countries. In Sweden, house prices fell by more than 10 percent, which was above average.

Macroprudential requirements seem to pay off

Credit institutions are prepared for the current challenges. For several years, regulators in many countries inside and outside Europe have set macroprudential frameworks that regulate banks' lending standards for private home finance. These requirements seem to be paying off in the current environment because, despite the sharp rise in interest rates and declining property prices, loan default rates for private home financing have remained manageable. For commercial real estate, however, the picture is somewhat different.

Scepticism towards commercial real estate is growing

ECB sees vulnerability in the commercial real estate market

In its April 2023 issue of the Macroprudential Bulletin, the ECB stated that there are clear signs of vulnerability in the commercial property market. Among the reasons for the weakness of this market, the central bank cites the declining market liquidity of commercial buildings as well as price corrections triggered by, among other things, the current uncertain macroeconomic outlook and the ECB's tighter monetary policy stance (including interest rate hikes). Due to the increased yields, bonds have become more attractive for investors compared to commercial real estate. This slows down the demand for real estate, which in turn weighs on property prices and thus their liquidity. In addition, since the pandemic, the trends towards working from home and online shopping have intensified, dampening the demand for office and retail buildings.

Example Germany

According to DZ BANK's real estate experts, the price expectations of buyers and sellers in Germany were diverging in the first half of 2023. Real estate investments were also burdened by uncertainty about the future development of interest rates and inflation. The weak economic situation had also a dampening effect. In the retail sector, city centre rents have been declining for several years. As a result of store closures and insolvencies, considerable vacancies have built up in Germany's city centres. Larger vacant retail buildings such as department stores are therefore increasingly being converted for mixed use. At the same time, contemporary spaces are needed for new office concepts, but these are hardly available. Despite overall growing vacancies, rents for high-quality office space are therefore rising at a fast pace. In contrast, letting outdated office space is becoming increasingly difficult. However, the situation described is not limited to Germany, but also applies to other European countries. The local real estate markets have special features from country to country, so the current situation can vary from case to case. However, many risk factors, such as not least rising interest rates, are having a serious impact in many countries. Therefore, the ECB is not alone in its concerns about commercial real estate.

SUMMARY OF CURRENT STRESS FACTORS FOR COMMERCIAL REAL ESTATE AND A NUMERICAL EXAMPLE

- The pandemic reinforced the trends towards online shopping and working from home. This reduces the need for office space and retail real estate.
- Yields on real estate have not risen at the same rate as bond yields. This has reduced the attractiveness of real estate for investors, which could dampen real estate demand.
- Commercial real estate financing often has variable interest rates. In an environment of rising interest rates, the burden on borrowers also increases in this case.
- The uncertain economic situation could limit the scope for rent increases in commercial properties.
- The term of commercial loans is much shorter compared to typical residential mortgage loan in Germany or France. Banks are likely to tighten their lending criteria. If a refinancing loan does not materialise, buildings might have to be sold in a weak market environment if the investor cannot inject sufficient equity.
- Increasingly stringent requirements for commercial properties in terms of energy consumption create a need for renovation in order to ensure the marketability of old properties. The cost of renovations is also likely to rise due to high inflation, which would put a strain on the profitability of a commercial property.

A numerical example from Scope Ratings underlines the impact of the rise in interest rates (see Scope Ratings publication "A third of commercial mortgage loans in European CMBS face significant refinancing risk" dated 30 January 2023): The financing of an office building in Frankfurt am Main (Germany) with a loan-to-value (LTV) of 60% and an interest rate of 2.0% had an interest coverage ratio (ICR) of 2.0 in 2020. If the capitalisation rate for the property valuation increases by only 30 basis points, ceteris paribus the LTV increases to 68%. An increase in lending rates by 150 basis points drops the ICR to 1.14, ceteris paribus.

Source: DZ BANK

Trouble with US regional bank in March 2023 remained without consequences for the time being

Collapse of Silicon Valley Bank, the flap of a Californian butterfly's wings?

Bank share prices fell significantly in March 2023, but as a rule recovered since then (as of mid of August 2023). The falling share prices were probably triggered by the collapse of Silicon Valley Bank (SVB), which also brought second-tier American financial institutions into focus, like the flap of a butterfly's wings causing a storm. This development was reinforced by the fact that in the United States of America regional banks play an important role in the financing of commercial real estate. Across the pond, too, higher interest rates are weighing on commercial property prices, which have already fallen slightly in 2022, according to market reports. Further price declines seem possible. In the USA, too, borrowers could find it increasingly difficult to find refinancing for their commercial properties if banks tighten their underwriting criteria. This could set in motion a development as described above for Sweden. A deterioration in the commercial real estate market could in turn weigh on the asset quality of regional banks, which have already suffered from the crisis of confidence triggered by Silicon Valley Bank in March. Nervousness about the US financial sector also weighed on European beacons in spring 2023. However, the situation calmed down again in the following months, which was also reflected, for example, in falling risk premiums on unsecured bank bonds.

Covered bond spreads were also somewhat affected

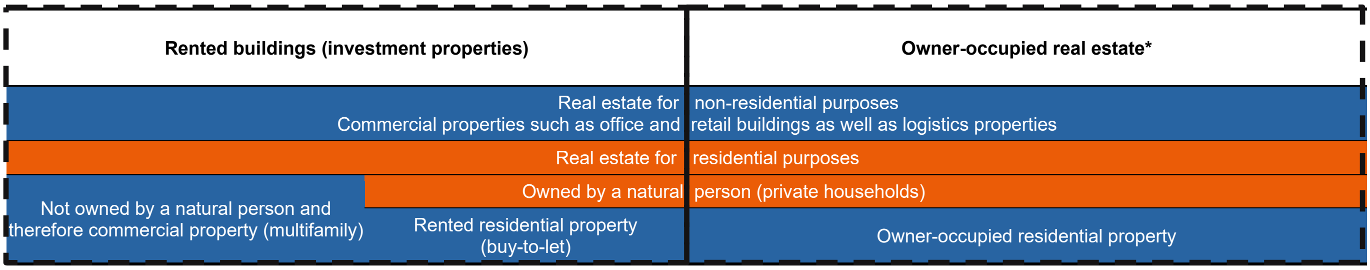
The unrest in the financial market can also be seen in the covered bond spreads in mid-March. The risk premiums bounced back and forth by several basis points on individual trading days. Overall, however, the swap spread of the iBoxx € Covered Index remained near the 20 basis point mark and thus at a typical level compared to the first quarter as a whole. The risk premiums of German mortgage pfandbriefe issued by mortgage banks specialising in real estate loans also showed somewhat higher volatility in March. In the following months, they developed largely similarly to the overall market.

Special case: multifamily buildings

As a rule, residential mortgages are used as cover assets

The share of commercial real estate financing in the business volume varies from bank to bank according to the respective business model. However, commercial property financing is the exception rather than the rule across all covered bond programmes worldwide. Mortgage covered bonds are typically backed by residential mortgage loans. These granular cover pools with collateralised claims against private individuals are considered particularly safe, even though rising interest rates and weak economic growth can have a negative impact on the credit quality of these portfolios. Within the Eurozone there are a few exceptions, especially in Germany, Austria and Spain, where commercial real estate financing can be found to varying degrees in the cover pools of mortgage covered bond programmes. But which loans are exactly considered to be commercial real estate finance?

BUNDESBANK: CLASSIFICATION OF REAL ESTATE FROM A FINANCIAL STABILITY PERSPECTIVE



Source: Deutsche Bundesbank, presentation DZ BANK, * for real estate for non-residential purposes, the exact definition is: "Real estate used by the owners for the purpose of carrying on their business, trade or activity." Social housing is also counted as commercial property, but cannot be clearly classified in this scheme. The size of the boxes says nothing about their relevance.

Classification of real estate financing

In its "Financial Stability Report 2022", the German Bundesbank has devoted a fifteen-page article to commercial real estate. Right at the beginning of the article, it introduces a classification of buildings. On the one hand, a distinction can be made between residential and commercial use of the buildings. On the other hand, it is also useful to distinguish between owner-occupied and rented properties. Especially in the case of buildings for residential purposes, there are certainly many private individuals who rent out houses and flats. There are probably also well-heeled private individuals who own and rent out commercial properties. In our estimation, real estate companies are generally active in the commercial business sector. In addition, there are companies that manage and rent out residential buildings (usually apartment buildings/ multifamily). Despite the residential purpose of these buildings and despite a granular tenant portfolio, financing of housing companies is to be classified in the commercial category. Rating agencies see it the same way.

Risks for multifamily house financing

In a recent study, Moody's pointed out risks in connection with multifamily buildings, which are – quite rightfully – viewed as among the safest property type within the commercial real estate market (see "Low debt yields and rent controls increase sensitivity of multifamily property exposures to rising interest rates" of 5 April 2023). However, the agency also finds a fly in the ointment. Rising interest rates increase the financing costs of multifamily buildings, and the high inflation rate increases the operational costs of managing and operating the buildings. Due to the restrictions on rent increases in Germany, the cost increases may not be compensated with correspondingly higher income. This is currently weighing on the credit profile of multi-family financing in Germany. On a positive note, the agency emphasises that flats to rent are currently in high demand. Due to rising interest rates and higher construction costs, fewer and fewer private households can afford new credit-financed homes, so they are turning to the rental market. Due to rising population figures, the demand for housing is also increasing, although this higher demand is currently not being compensated for by corresponding new construction activities.

Multifamily houses are in an ambiguous position, allocation not clearly possible

Based on investor reports of the covered bond issuers, it is unfortunately not possible, to the best of our knowledge, to distinguish with absolute certainty whether the financing of a multifamily house was extended to a private household or a company. In the first case, it could be argued that this loan can be assigned to the area of private residential financing if, for example, it is a loan for a three-family house and the flats within the building are not owner-occupied but rented out. This classification would be in line with the approach of the rating agencies. However, it is not only the investor reports of German issuers that do not allow a clear classification of multifamily properties. In other countries, either the information on multifamily buildings is missing or the allocation is not clearly possible, as in the case of Germany. The share of financing of multifamily buildings in the cover pools of mortgage pfandbriefe can be high in certain cases of German pfandbrief banks.

ECB COVERED BOND PURCHASE PROGRAMMES AT A GLANCE

Date	Event
July 2009	Start of purchases under CBPP1, the programme was limited to twelve months from the beginning.
July 2010	End of purchases under CBPP1; in total, covered bonds with a volume of around EUR 61bn were purchased.
November 2011	Commencement of purchases under CBPP2, with the duration of the programme also limited to twelve months from the outset.
November 2012	End of purchases under CBPP2; in total, covered bonds with a volume of around EUR 16bn were purchased.
September 2014	The ECB announces its asset purchase programme (APP), with CBPP3 as one of the first building blocks. There was no pre-set timeframe for CBPP3 purchases.
October 2014	The ECB starts its purchases under CBPP3.
March 2018	Originally, the ECB generally placed an order of 50% of the expected new issue volume for new issues eligible for purchase (ECB's primary market order). In March 2018, this percentage was reduced for the first time and gradually decreased to 5% by January 2019.
January 2019	Net new purchases under CBPP3 were reduced to zero. Only the cash inflows from maturing covered bonds were reinvested.
End October 2019	Net new purchases resumed under CBPP3. The primary market order was raised to 40% again. By the end of June 2022 - i.e. over a period of more than three years - just under EUR 51bn of covered bonds were net new purchased.
March 2020	ECB launches its Pandemic Emergency Purchase Programme (PEPP) to counter the impact of the corona pandemic on the euro area economy.
March 2022	Under the PEPP, the ECB had also purchased covered bonds with a total volume of around EUR 6bn. Net new purchases under PEPP were discontinued at the end of March 2022. The reinvestment of maturing bonds in the PEPP portfolio will continue until the end of 2024.
April 2022	The ECB reduced its primary market order for CBPP3 to 30% and gradually scaled down this percentage until the primary market order was reduced to zero at the beginning of March 2023.
July 2022	The volume of net new purchases in the APP varied over time. Since July 2022, net new purchases have been reduced to zero - for the second time in the history of the APP (see also chart below). From July 2022 to February 2023, the cash inflows from maturing bonds were fully reinvested. In July 2022, the last covered bond in the CBPP1 portfolio was redeemed. Shortly thereafter, in September 2022, the CBPP2 portfolio fell to zero.
March 2023	The ECB reduced its reinvestment from maturing bonds by EUR 15bn per month (figure refers to the APP as a whole). CBPP3 was also affected by this. CBPP3 purchases were reduced to about EUR 2bn to EUR 2.5bn per month.
July 2023	The ECB stops its CBPP3 purchases completely.
July 2050	If the covered bonds in the CBPP3 portfolio are not actively sold, there should still be a small CBPP3 stock on the ECB's balance sheet in 2050.

Source: European Central Bank, DZ BANK

The end of ECB's bond purchases under APP also relates CBPP3

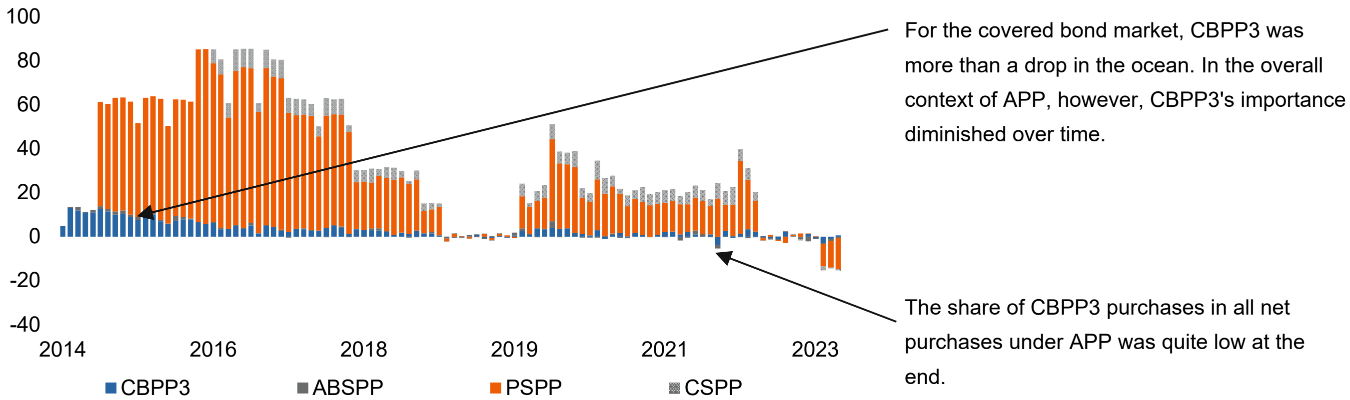
Autumn 2014: Start of QE due to low inflation expectations

The ECB's current stricter monetary policy also means that it no longer buys bonds as part of its APP. Reinvestments of maturing bonds in the APP portfolio, which also includes the third covered bond purchase programme (CBPP3), also ended since July 2023. CBPP3 has been an important (if not the most important) influencing factor on the covered bond market in recent years, which is why we would like to look back on the purchase programme within the scope of this study. At the beginning of September 2014, i.e. around nine years ago, the ECB announced not only an interest rate cut but also the creation of a the APP. The first two components of the APP were a purchase programme for asset-backed securities (ABS) and covered bonds. Later, the APP was supplemented by purchase programmes for bonds from public sector entities and corporate bonds. The background to the ECB's quantitative easing (QE), based on the American model, was that the inflation expectations of market participants were too low for the taste of the central bank.

Net new purchases under CBPP3 fluctuated strongly

The amount of net new purchases (i.e. the purchase volume after deduction of maturing covered bonds) was strongly influenced by the volume of maturing covered bonds in the CBPP3 portfolio. They fluctuated between 2014 and 2022 from almost minus EUR 4bn to plus EUR 13bn. It should also be noted that the ECB had created the Pandemic Emergency Purchase Programme (PEPP) in 2020, under which covered bonds with a total volume of around EUR 6bn were purchased from April 2020 to March 2022. The PEPP purchases had no lasting impact on the covered bond market. As things stand, the reinvestment of maturing bonds in the PEPP portfolio will take place until the end of 2024. In our opinion, the covered bond purchases within this framework should not have any significant impact in the future.

THE AMOUNT OF NET NEW PURCHASES UNDER THE FLUCTUATED STRONGLY; AT ITS PEAK, THE ECB MADE NET NEW PURCHASES OF BONDS WITH A VOLUME OF MORE THAN EUR 80BN PER MONTH
NET NEW PURCHASES PER MONTH UNDER APP IN EUR BN



Source: European Central Bank, presentation DZ BANK

ECB had experience from the first two purchase programmes

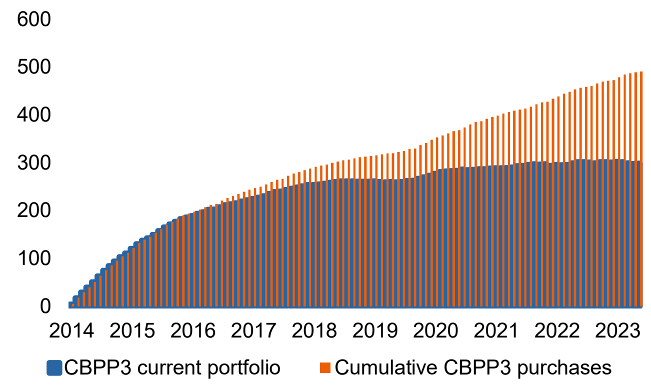
CBPP1 was very successful and was intended as support for the covered bond market

The ECB already had experience with covered bond purchases. In July 2009, the ECB launched its first covered bond purchase programme (CBPP1), under which the central bank purchased covered bank bonds with a total volume of EUR 61.1bn for twelve months. The programme was launched at the time to support the covered bond market due to the impact of the Lehman insolvency, and we believe it briefly achieved its goal. CBPP2 started in November 2011 and was supposed to reach a maximum volume of EUR 40bn. However, CBPP2 purchases never really took off, so the ECB only purchased a total volume of around EUR 16bn under CBPP2. CBPP2 was supposed to stabilise the risk premiums of covered bank bonds during the European sovereign debt crisis. We would not call CBPP2 successful, but that would perhaps be asking too much. As is well known, the sovereign debt crisis was only tamed with the words "Whatever it takes" from Mario Draghi in 2012.

Under CBPP3 portfolio was built up very quickly at the beginning

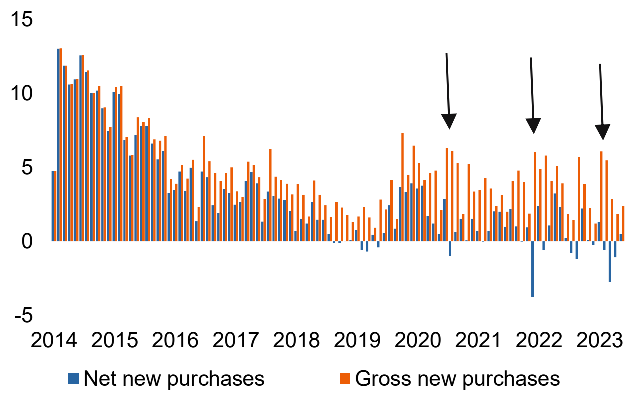
When the purchases under CBPP3 started in October 2014, the holdings of the CBPP1 and CBPP2 portfolios were still around EUR 30bn and EUR 13bn respectively. The ECB rapidly built up the CBPP3 portfolio. From October to December 2014, the CBPP3 portfolio grew to almost EUR 30bn. By the end of 2015, the portfolio had already reached almost EUR 144bn. The CBPP3 portfolio peaked at around EUR 304bn in January 2023, shortly before CBPP3 reinvestments were reduced. Since July 2023, the ECB no longer reinvests any cash-inflows from maturing bonds under APP (including CBPP3). The CBPP3 stock will therefore reduce month by month from that date. From July 2023 to June 2024 for example, the ECB expects the CBPP3 stock to reduce by a total of around EUR 30bn. The more time goes by, the smaller the monthly reduction in the CBPP3 portfolio is likely to be. In our estimation, the ECB should also have some thirty-year covered bonds in its CBPP3 holdings, so the decline of the portfolio stock will continue for a very long time. If the CBPP3 holdings are not actively reduced, as announced by the ECB, we estimate that there should still be covered bonds in the CBPP3 portfolio after 2050.

SINCE 2015 AT THE LATEST, THE ECB HAS HAD TO BUY AGAINST A GROWING REDEMPTION FLOW.
FIGURES IN BILLIONS OF EUROS



Source: ECB, calculations and presentation DZ BANK

PARTIALLY SUBSTANTIAL GROSS PURCHASES, EVEN IF THE ECB'S NET NEW PURCHASES WERE LOW
FIGURES IN € BN



Source: ECB, calculations and presentation DZ BANK

A massive market intervention

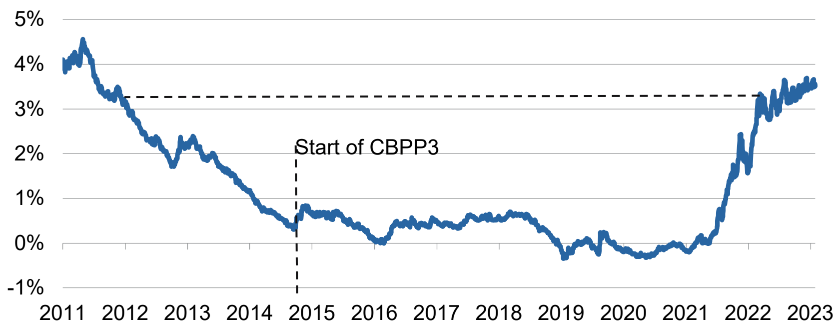
Cumulative CBPP3 purchases exceeded EUR 490bn by end-June

Since the beginning of CBPP3, the ECB has also repeatedly bought bonds with a maturity of less than one year. Therefore, since 2015, the central bank has had to buy against an ever-increasing flow of maturing covered bonds in order to build up its portfolio. The steepest increase in the CBPP3 portfolio was in the early months and then flattened out more and more. The CBPP3 portfolio remained at a level between EUR 294bn and EUR 304bn from autumn 2021 to May 2023. Cumulative CBPP3 purchases (CBPP3 stock plus the sum of all matured covered bonds within the CBPP3 portfolio) totalled to more than EUR 490bn at the end of June 2023. The CBPP3 portfolio will subsequently shrink in line with the maturities of the covered bonds. According to our estimate, the CBPP3 portfolio will shrink to less than EUR 290bn by the end of 2023.

The massive market intervention through APP in general and CBPP3 in particular did not remain without effect on yields, swap spreads and market liquidity. Draghi's "whatever it takes" had already led to the collapse of yields in 2012, well before the start of the APP. When CBPP3 began in autumn 2014, covered bond yields were already at a historically low level of around 0.8%. This did not change until the beginning of 2022, when yields began to rise sharply again in the face of highly volatile energy prices.

Impact on yields, spreads and market liquidity

IN 2022, A STEEP RISE IN YIELDS TO THE 2012 LEVEL BEGAN
YIELD OF THE IBOXX € COVERED INDEX



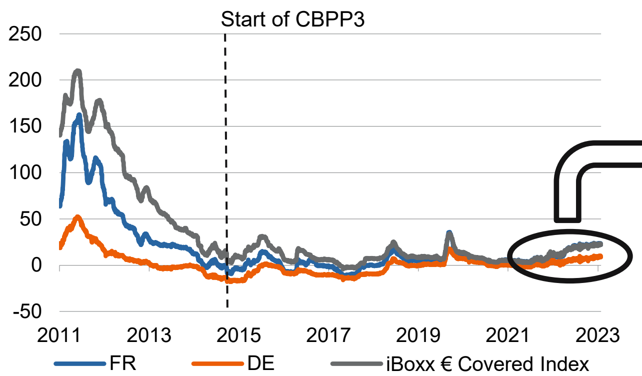
Source: Bloomberg, Markit, presentation DZ BANK; as at: 30 August 2023, 17:00h

Swap spread compression and ever-decreasing differentiation

When CBPP3 was announced in September 2014, the gap between the swap spread for the German and French subindex with the iBoxx € Covered index was just under 13 basis points. The gap between Germany and the overall index was around 31 basis points. The announcement of CBPP3 already caused risk premiums to melt away. When the purchases started in October, the spread difference between Germany and France was only a good 6 basis points and the gap between German pfandbriefe and the overall index was only about 13 basis points. However, Germany and France were not isolated cases. The risk premiums of covered bonds from the eurozone were massively compressed over a large area by CBPP3.

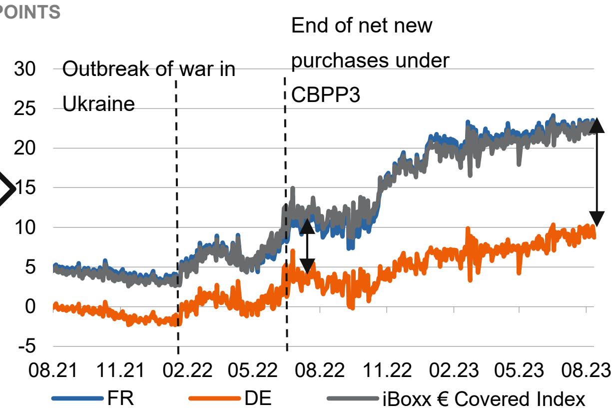
Spread compression: spreads reduced by CBPP3

MASSIVE SPREAD COMPRESSION BY CBPP3, ...
SWAP SPREADS FROM THE IBOXX € COVERED INDEX IN BASIS POINTS



Source: Bloomberg, Markit, presentation DZ BANK; data as of 30 August 2023, 17:00h

... WHICH SEEMS TO BE SLOWLY DISSOLVING SINCE 2022
SWAP SPREADS FROM THE IBOXX € COVERED INDEX IN BASIS POINTS



Source: Bloomberg, Markit, presentation DZ BANK; data as of 30 August 2023, 17:00h

Since February 2022, covered bond spreads have been rising again

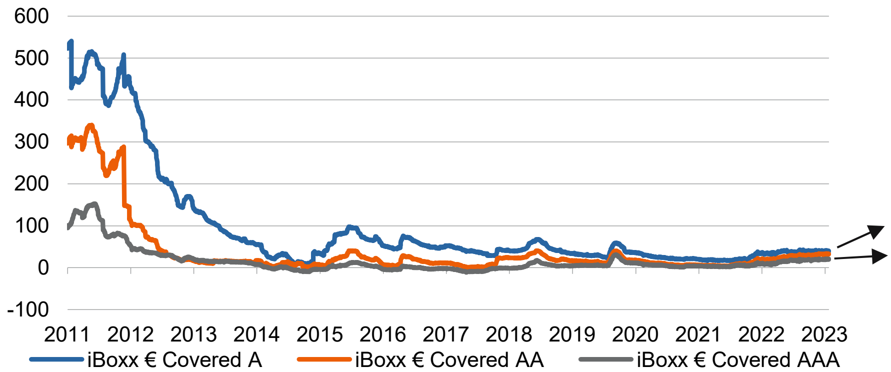
Of course, swap spreads also breathed during the phase of CBPP3 purchases and thus reacted to news and developments in the market. However, the longer CBPP3 ran and thus fewer and fewer covered bonds from eurozone issuers were available to private investors, the tighter the swap spreads became. Since September 2020, after the initial shock of the corona pandemic had subsided, the swap spread of the sub-index for France was quoted at roughly the same level as that of the overall index. At that time, the spread discount of German pfandbriefe to the overall index was only 5 basis points. The swap spread of the overall index had thus developed better than the sub-indices for Germany and France. This mainly reflected the spread rally of Southern European covered bonds at that time.

Crowding-out and spill-over

Many private investors turned their backs on the covered bond market

The ECB pursued a monetary policy objective with its bond purchases. Therefore, it bought consistently and - in economic terms - price inelastically in order to achieve its volume targets. The ECB's high demand over a longer period of time across the entire eurozone led to the swap spreads of Southern European covered bonds in particular narrowing more than the overall market. The Targeted Longer-Term Refinancing Operations (TLTRO III) decided by the ECB in March 2019 also contributed, in our view, to a reduction in the pressure for Southern European banks to refinance via the capital market. The lower supply of new issues is also likely to have contributed to the spread performance of covered bonds during this period. For investors, this situation resulted in a welcome spread performance for covered bonds in their portfolios on the one hand. On the other hand, the swap spreads compression meant that the prevailing risk premiums did not represent an adequate compensation for the credit risks for new covered bonds from the perspective of more and more investors. In combination with the low yield level, this led to many private investors turning their backs on the covered bond market in the years 2015 to 2021 (crowding out).

CREDIT RISKS ARE AGAIN MORE REFLECTED IN THE COVERED BOND SPREADS
SWAP SPREADS IN BASIS POINTS



Source: Bloomberg, Markit, presentation DZ BANK; data as of 30 August 2023, 17:00h

Investors partly switched to covered bonds from other countries

The spread performance of covered bonds from the eurozone caused by the CBPP3 purchases also spread to other regions of the world (spill-over effect). Investors who were crowded out from the eurozone, who - like banks, for example - have not completely sworn off covered bonds due to regulatory incentives, invested their money in covered bonds from Canada, Norway or Sweden, for example. The ECB purchases thus caused a global spread boom that lasted until the end of 2021. When yields started to rise again at the beginning of 2022, covered bond spreads also slowly increased. The outbreak of the war in Ukraine in February 2022 and the end of net new purchases under APP (including CBPP3) in July 2022 caused the swap spread of the iBoxx € Covered Index to increase bit by bit and it is now hovering around the mark of 25 basis points (as of end of September 2023).

Primary and secondary market: new issue volume and market liquidity

TLTRO's impact on the primary market countered CBPP3's effect

In our opinion, it is difficult to say whether CBPP3 led to more or less new issuance. There were other important influencing factors with the introduction of TLTRO II and III as well as the corona pandemic that countered the impact of CBPP3 on the primary market. In our opinion, many issuers may have looked at how strong the ECB's support had been at the time (measured by the ECB's primary market orders fluctuating over time). At times, this may have contributed to bringing forward or postponing planned new issues in individual cases.

CBPP3 reduced investment opportunities for private investors

However, CBPP3 has definitely curtailed investment opportunities for private investors. A sober look at the figures from the primary market for euro benchmark covered bonds shows that from 2015 to 2022, the private sector was deprived of investment opportunities on balance in five out of eight years due to maturities and CBPP3 purchases. The corresponding figures for the years in question are highlighted in bold in the table below. Since 2022, the volume of covered bonds available to private investors has been growing again due to the strongly above-average primary market activity.

CBPP3 PURCHASES, TLTRO III AND THE CORONA PANDEMIC: THERE HAVE BEEN MANY INFLUENCES ON THE PRIMARY MARKET SINCE 2014

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023**
(1) Covered bond new issues and taps in EUR bn*	115	146	126	112	137	138	94	96	199	136
(2) of which CBPP3-eligible new issues and taps in EUR bn	74	**104**	**80**	**77**	94	92	**69**	**59**	132	103
(3) CBPP3-eligible new issue and taps as a percentage of (1)	64%	71%	64%	69%	69%	66%	74%	61%	66%	77%
(4) Maturing CBPP3-eligible euro benchmark covered bonds in EUR bn	134	**119**	**119**	**94**	64	73	**78**	**79**	93	78
Net CBPP3 purchases in EUR bn	30	**115**	**62**	**39**	24	3	**29**	**15**	6	-15

Source: Bloomberg, calculations and presentation DZ BANK, * only euro benchmark covered bonds with an issuance volume of at least EUR 500m
** data for 2023 as at 30 June 2023 except for the volume of maturing CBPP3-eligible euro benchmark covered bonds (this figure refers to the full year)

CBPP3 has weighed on market liquidity

Michael Weigerding showed in a recent analysis that CBPP3 improved secondary market liquidity in the short term at the beginning of the purchase programme. However, after about half a year, the negative effects of CBPP3 purchases on market liquidity prevailed (see "Long-term liquidity effects of large-scale asset purchase programs: Evidence from the euro covered bond market" in the September 2023 issue of International Review of Economics & Finance). In the initial phase of CBPP3, we believe investors may have taken the opportunity to reduce parts of their covered bond positions. As a result, turnover increased and with it market liquidity. The longer the programme continued, the greater the stock effect of the CBPP3 purchases. Since the ECB holds its purchased covered bonds until maturity, each purchase by the ECB means an effective shrinking of the market. For the affected covered bonds, we believe there is little hope for an improvement in liquidity unless issuers tap their covered bonds. Most of the affected covered bonds are likely to have a very low coupon that is not in line with the current market level, so we think a broad wave of taps of these covered bonds is very unlikely. However, liquidity has probably already improved somewhat since the reduction in CBPP3 purchases since July 2022. For new issues from July 2023 at the latest, there should then no longer be any negative impact from the CBPP3 purchases.

Increasing number of investors promotes market liquidity

Market liquidity is also likely to depend on the number of active investors in the covered bond market. The more investors trading covered bonds, the better the liquidity situation in the market should be. The rise in yields since 2022 has attracted investors to the covered bond market again (crowding-in). In our view, this process is unlikely to be over yet. In this respect, there is hope that liquidity in the covered bond market will also improve step by step in this way in the coming months.

Greater spread differentiation and crowding-in

Impact of CBPP3 will disappear from June 2023 onwards

CBPP3 purchases ended on 30 June 2023. Anyone who has ever tried to give up smoking or coffee knows withdrawal symptoms. The ECB has been gentle in its transition to a post-CBPP3 period by stopping net new purchases in July 2022 and only reducing its reinvestments a few months after that. Fortunately, due to the rise in yield levels, many investors who had left the market during the CBPP3 buying phase have already returned. The effects of the massive covered bond purchases will (hopefully) gradually disappear in the coming weeks. In our view, the main effects of the end of the CBPP3 purchases include:

Better market liquidity

- The liquidity of covered bonds issued from July onwards will no longer be affected by CBPP3. However, the liquidity of covered bonds that the ECB holds in CBPP3 will not recover on its own. In our opinion, this is only possible if issuers tap the affected covered bonds, which is unlikely to happen as a general rule.

Higher spread volatility

- The lack of CBPP3 purchases are being replaced by private investors who have returned to the market for higher yields. Unlike the central bank, the buying interest of private investors fluctuates. The largely spread-independent ECB purchases will be missing as a stabiliser for spreads in the future. Therefore, swap spreads of covered bonds are likely to move more volatile than in the past years.

Stronger spread differentiation

- The risk premiums of covered bonds will be more strongly influenced by credit issues again in the future, so that spreads will differentiate more strongly. The risk premiums of covered bonds that had benefited the most from CBPP3 are also likely to have the greatest spread risks due to the end of CBPP3 purchases.

Normalisation, but what is normal?

Overall, the market situation will return to normal. But what does normal actually mean after Lehman, global financial and European sovereign debt crisis, TLTRO, CBPP3, Brexit, corona and the beginning of the Ukraine war?

ECB ready to support the covered bond market

CBPP3 was motivated by monetary policy ...

We do not wish for a fourth ECB covered bond purchase programme. We really don't! But the ECB has shown since 2009 with its CBPP1 that it is ready to support the covered bond market if necessary. CBPP3 was certainly not intended to help the market in the first place. The covered bond market was rather a means to an end to achieve the central bank's monetary policy goals. But the CBPP3 purchases probably supported the covered bond market in difficult phases. And there have been quite a few challenges since the end of 2014, for example during the corona pandemic. So if another crisis hits the market, we think there is a high probability that the ECB will again step in to support the covered bond market.

... but also acted as a support for the market

With its support, the central bank is doing justice to the high importance of covered bonds for the refinancing of European banks. Rating agencies acknowledge this with bonuses and uplifts in their rating methodologies. For example, the uplift for the starting point for the covered bond rating by Moody's & Co is regularly justified on the basis of the high importance of covered bonds for the financial system and the likelihood for public support in times of crisis.

The pfandbrief market in autumn 2023

CBPP3 impact on pfandbriefe

About a quarter of the CBPP3 purchases took place in the German pfandbrief market. This means that the CBPP3 portfolio in July 2023 contained pfandbriefe with a total volume of more than EUR 70bn. This is a considerable sum, compared to the total pfandbrief volume outstanding of around EUR 400bn at mid-2023. In the following, we look at the impact of the rising interest rates, the end of CBPP3 and other topics on the pfandbrief market.

Impact on the primary market

New vdp Issuance Climate Index is currently moderately negative with respect to new pfandbrief issues

The primary market is often the seismograph from which the reactions of market participants can be quickly read. Suitable for this the Association of German Pfandbrief Banks (vdp) presented its vdp Issuance Climate for the first time on 16 December 2022. This sentiment indicator for the primary market stood in June 2023 at -14 for pfandbriefe (after -10 in December 2022) and -29 for unsecured bank bonds (after -26). The range of possible score for the new sentiment indicator varies from -100 (very poor issuing climate) to +100 (very good issuing climate). This indicator, which is to be updated every six months, is based on a survey among the vdp member banks. The reasons for the slightly pessimistic assessment include the continuing economic burdens as a result of the Ukraine war, the increased energy costs as well as the higher inflation rate and the more restrictive ECB policy.

VDP ISSUANCE CLIMATE HAS SLIGHTLY DETERIORATED IN JUNE 2023
SCORE VALUES FROM -100 TO +100, A NEGATIVE VALUE INDICATES A GLOOMY ISSUANCE CLIMATE

	June 2023	December 2022
Score for pfandbriefe	-14	-10
Score for unsecured bank bonds	-29	-26
Total score	-21	-17

Source: Association of German Pfandbrief Banks, presentation DZ BANK

Pfandbrief market continues to grow despite gloomy issuing climate

The Pfandbrief banks' expectations at the end of 2022 had largely come true in the course of the first half of 2023. According to the association, the vdp member institutions' new mortgage business declined by 47.8 percent in the first quarter of 2023 compared to the first quarter of 2022. For the sake of fairness, it must be said that the first quarter of 2022 was a record with EUR 49bn in new real estate loans at the vdp member banks and in the second quarter the new lending business stabilised somewhat. Nevertheless, the decline in loan demand did not remain without consequences for issuing activity. From January up to and including June 2023, the vdp members issued pfandbriefe with a total volume of EUR 32.1bn. In the same period last year, the volume of new issues was a whopping EUR 41.7bn. However, we see the 23 percent decline partly as a normalisation of the exceptionally high primary market activities of the German pfandbrief banks in 2022. At the end of 2022, the vdp members expected a new issue volume of around EUR 50bn for 2023 as a whole, with EUR 41bn of this amount channelled to mortgage pfandbriefe and EUR 9bn to public sector pfandbriefe. This compares with maturities of EUUR 28bn (mortgage pfandbriefe) and EUR 15bn (public sector pfandbriefe) for 2023. Despite the decline in the volume of new issues compared to the previous year, the pfandbrief market would grow by around EUR 7bn if the expectations of the vdp members materialise.

Repayment of TLTRO III loans pending

By the end of 2023, TLTRO III loans with a volume of EUR 106bn are still due for repayment

One reason for the decline in new issuance activity may have been the weak new lending business in the first half of the year, even though the loan portfolio of German banks remained largely stable until mid-year. At the same time, banks' customer deposits increased more slowly overall, even though individual pfandbrief banks had succeeded in significantly increasing their customer deposits with loss leader offers. In addition, there were also repayments of TLTRO III loans, whereby in relation to the German banking sector the repayments could be met purely arithmetically from the abundant surplus liquidity and thus did not require any follow-up financing via new issues. By the end of 2024, the remaining repayments of TLTRO III loans with a total volume of around EUR 592bn are still due in the Eurozone, of which only just under EUR 106bn are to be repaid by the end of 2023 (as of August 2023). With the unwinding of TLTRO III, banks are likely to use less the central bank lending facilities for their refinancing in the future. For the long-term refinancing of credit institutions, greater attention is therefore likely to be paid to the capital market. Pfandbriefe are known to offer more favourable conditions from the issuer's perspective compared to unsecured bank bonds. Banks are therefore likely to remain interested in new pfandbrief issues. In our opinion, a return to the issuance volume of EUR 86bn from 2022 (data from Deutsche Bundesbank) is unlikely for either 2023 or 2024. Rather, we expect new issuance activity to normalise at the level of around EUR 55bn per year. The pfandbrief banks have sufficient cover assets available for this. Even if new mortgage business in 2023 is significantly weaker than in the previous year, the pfandbrief banks should have a sufficient stock of cover assets.

TLTRO III REPAYMENTS OF JUST UNDER EUR 106BN STILL TO COME IN 2023

Maturity	Allocated volume (in EUR bn)	Outstanding volume (in EUR bn)
27.09.2023	174.46	66.74
20.12.2023	50.41	41.17
27.03.2024	330.50	280.73
26.06.2024	109.83	69.83
25.09.2024	97.57	90.60
18.12.2024	51.97	43.08
Total	**814.74**	**592.15**

Source: ECB, presentation DZ BANK

New issue volume and growth in the pfandbrief market

New issue volume in the first half of 2023 at around EUR 34bn

The Deutsche Bundesbank figures in the table below refer to the entire German pfandbrief market. They are therefore somewhat different from the data published by the vdp because, as we understand it, in the case of new issues the vdp relies on the data of its members, whereby not all German pfandbrief banks are represented in the association. According to the Deutsche Bundesbank, the volume of new issues in the first half of 2023 was around EUR 34bn.

2023 SHOULD FALL SHORT OF THE HIGH GROSS NEW ISSUANCE VOLUME OF 2022

Figures in EUR bn	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023*
Mortgage, Ship and Aircraft Pfandbriefe	31	43	35	37	43	44	41	44	72	28
Public Pfandbriefe	15	16	10	12	7	11	19	18	14	6

Source: Deutsche Bundesbank, calculations and presentation DZ BANK, * Data for 2023 up to and including 30 June

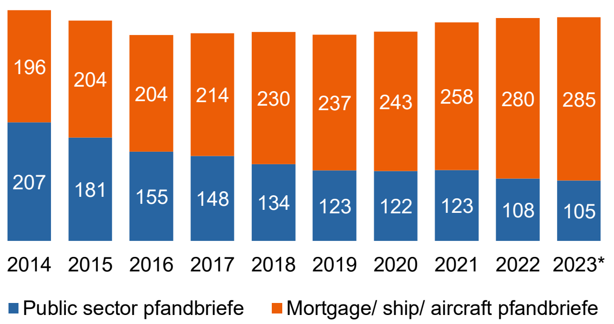
New issue volume of 2022 is an outlier

The new issue volume of EUR 86bn in 2022 is an outlier in our view. The main focus of new issuance activity is likely to remain the mortgage pfandbrief in 2023, because most pfandbrief banks are no longer expanding their lending business with the public sector and some important pfandbrief issuers are even no longer actively pursuing this business segment.

Mortgage pfandbriefe continue to provide growth impetus

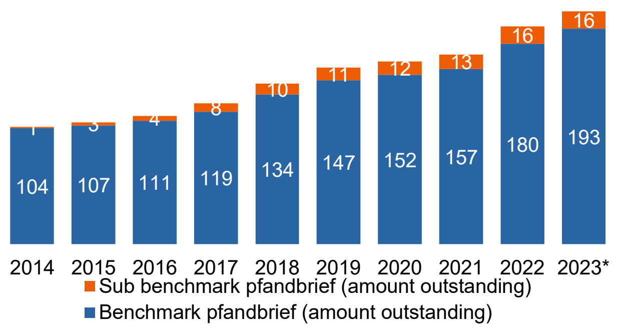
In the following we use figures from the Deutsche Bundesbank, the vdp and data we have collected from Bloomberg. The data from the various sources, as already mentioned, do not match completely. However, we try our best to derive a few general statements from it. According to the Deutsche Bundesbank, the volume outstanding rose to EUR 388bn at the end of 2022. The vdp already reported EUR 393.6bn at that time. The pfandbrief market continued to grow in the first half of 2023 and, in our opinion, should have reached a volume of around EUR 400bn by 30 June 2023. The share of public sector pfandbriefe continues to decline, while mortgage pfandbriefe continue to provide the growth impetus for the overall market. Ship pfandbriefe have been treading water since 2020 with an outstanding volume of around EUR 2bn. The last aircraft pfandbrief to date was repaid in 2019.

DESPITE DECLINING NEW BUSINESS, MORTGAGE PFANDBRIEFE REMAIN ON GROWTH TRACK
VOLUME OUTSTANDING IN EUR BN



Source: Deutsche Bundesbank, calculations and presentation DZ BANK
* Data for 2023 as at 30 June 2023

GROWTH PRIMARILY IN LIQUID PFANDBRIEFE WITH A FOCUS ON THE EURO BENCHMARK FORMAT
VOLUME OUTSTANDING IN EUR BN



Source: Bloomberg, calculations and presentation DZ BANK
* Data for 2023 as at 30 June 2023, figures relate exclusively to publicly placed (syndicated) new pfandbrief issues

Liquid benchmark pfandbriefe gain market share

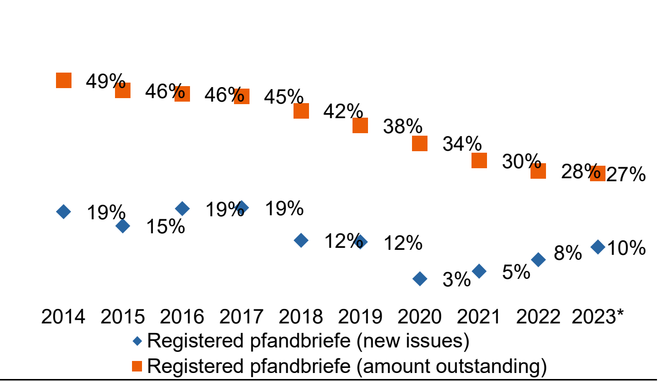
Market segment for liquid benchmark pfandbriefe grows

The share of pfandbriefe in the euro benchmark format (outstanding volume of at least EUR 500m) increased further in the first half of 2023. The total volume of this liquid market segment rose to EUR 193bn at the end of June 2023. The volume of sub-benchmark pfandbriefe (outstanding volume of at least EUR 250m but less than EUR 500m) was around EUR 16bn as at 30 June 2023 (unchanged compared to the end of 2022). This market niche is dominated by Austrian, Finnish, and German banks. With an outstanding volume of around EUR 16bn, the German segment is roughly twice as large as the Austrian segment with just under EUR 8bn, which is followed by the Finnish segment with a volume of EUR 4.8bn.

Private placement new issues during the summer break

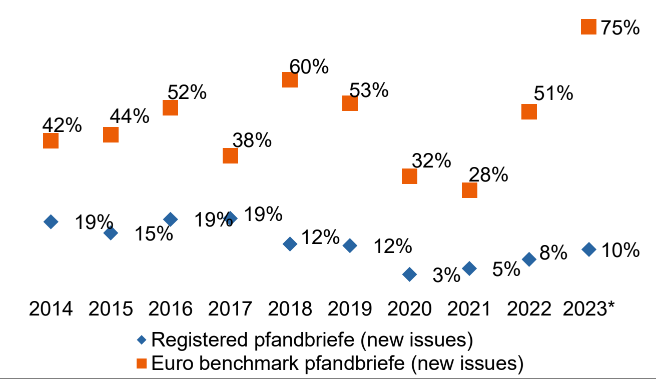
In the figures for sub-benchmark covered bonds, we have only taken into account publicly placed (syndicated) new issues. At the end of July 2023, in the middle of the summer break, three German mortgage banks each issued a one-year pfandbriefe with a volume of EUR 250m, one of which was increased by a further EUR 50m shortly after issue. The three new issues thus had a total volume of an impressive EUR 800m. To our knowledge, however, these covered bonds were not syndicated, i.e. publicly placed by a syndicate of banks. Therefore, we have not included these transactions in our new issue statistics.

IS THE LONG DESCENT OVER? SHARE OF REGISTERED PFANDBRIEFE IN VOLUME OUTSTANDING FALLS SLIGHTLY IN 2023



Source: Deutsche Bundesbank, calculations and presentation DZ BANK
* Data for 2023 as of 30 June 2023

WILL THE TREND STAY? EURO BENCHMARK PFANDBRIEFE GAIN FURTHER MARKET SHARE 2023



Source: Bloomberg, Deutsche Bundesbank, calculations and presentation DZ BANK, * Data for 2023 as of 30 June 2023

More registered pfandbriefe again

The share of euro benchmark pfandbriefe with respect to the total pfandbrief market has risen to just under 50 percent since 2022 due to the high volume of new issues. Mirroring the increase in the market share of benchmark pfandbriefe, the share of registered pfandbriefe (or Namenspfandbriefe) has declined. Compared to 2014, the ratios have reversed over the past ten years. At that time, the market share of registered pfandbriefe was 49 percent according to the Deutsche Bundesbank, which has declined during the low-interest phase to 27 percent in mid-2023. The share of registered pfandbriefe in the volume of new issues in the pfandbrief market was correspondingly low. The low point of this development was marked in 2020 with a share of registered pfandbriefe in the new issue volume of 3 percent, when pfandbriefe were generally quoted with negative yields. With the turnaround in interest rates, however, investors in registered pfandbriefe seem to be gradually returning to the market, so that the share of registered pfandbriefe in the volume of new issues has risen slightly again since 2020.

Foreign currency bonds only play a minor role

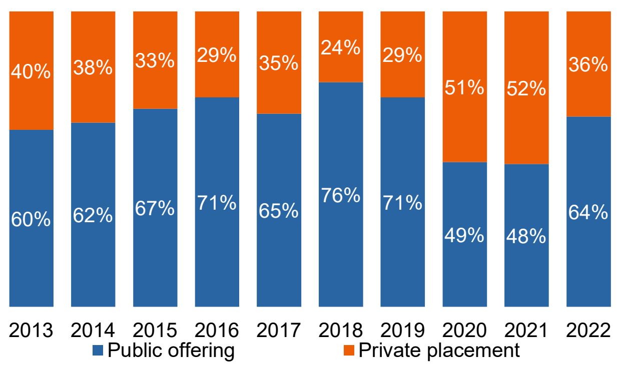
Pfandbriefe in foreign currency play only a minor role

According to the vdp, the euro remained the main issuing currency for German pfandbrief banks in 2022. The share of new pfandbrief issues in foreign currency even fell to 3 percent in 2022 (2021: 8 percent). This low number is also not unusual in the longer term. In the past ten years, the share of new pfandbrief issues in foreign currency never exceeded 12 percent. The typical pfandbrief investors - and we don't mean the ECB with CBPP3 - are based in the euro area and are therefore also likely to have a preference for the common currency.

Among the foreign currencies, the US dollar and the British pound have been the most important for German pfandbrief banks in recent years. These foreign currency pfandbriefe were mainly issued by banks that also write corresponding lending business in these currencies. The Swiss franc has become more attractive as an issuing currency since 2022 from an issuers' perspective, and not only for German pfandbrief banks. For this reason, there has been more activity on the primary market in this currency area recently, even if the volume of new issues is still quite low overall compared to the euro.

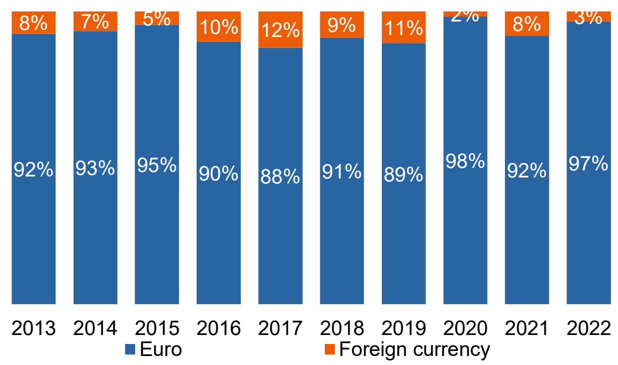
Importance of the Swiss franc increased recently

SHARE OF PUBLICLY PLACED PFANDBRIEFE NORMALISES AFTER THE TWO CORONA YEARS
DISTRIBUTION OF ALL NEW PFANDBRIEF ISSUES



Source: vdp, calculations and presentation DZ BANK

EURO IS BY FAR THE MOST IMPORTANT ISSUING CURRENCY FOR GERMAN PFANDBRIEF BANKS
DISTRIBUTION OF ALL NEW PFANDBRIEF ISSUES



Source: vdp, calculations and presentation DZ BANK

ECB demand is mainly replaced by banks

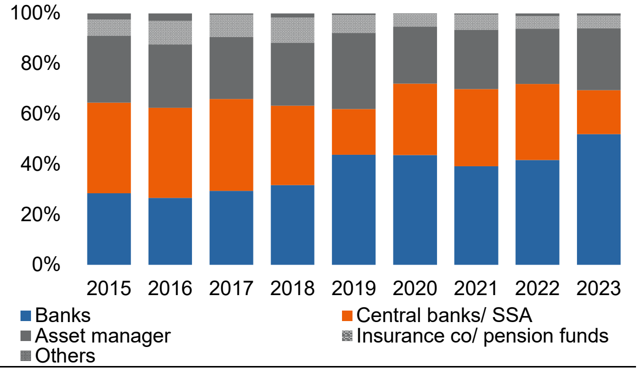
The ECB was very likely the largest investor in the pfandbrief market from the end of 2014 until mid-2023. However, the demand gap resulting from the ECB's withdrawal for all CBPP3-eligible covered bonds seems to have been closed already. At least, this is what the order book statistics of the euro benchmark new issues indicate. The charts below show the distributions by investor type, where we have distinguished between CBPP3-eligible (left) and non-CBPP3-eligible covered bonds. Only new issues of euro benchmark covered bonds have been included in the charts (from all countries worldwide, as far as the data was publicly available). The differentiation of covered bonds into CBPP3-eligible and non-CBPP3-eligible is, in our opinion, only meaningful from 2015 onwards, because CBPP3 purchases had started late in October 2014. For 2014, therefore, a small effect can already be seen in the order book statistics. However, the full effect of the ECB purchases only came into play from 2015 onwards.

Demand gap already closed again

There are a few peculiarities in the order book statistics related to the fluctuations in the ECB's purchase volume and the ECB's changing order size for new issues (primary market orders). In the first ten months of 2019, the ECB had for the first time limited its purchases to the reinvestment of maturing bonds (i.e. no more net new purchases). During this period, the primary market order had also been brought down to 5 percent of the expected volume of new issuance. In July 2022, net new purchases were reduced to zero for the second time. The reinvestment of maturing bonds was then also gradually wound down completely until the end of June 2023. The ECB lowered its primary market orders in parallel, with no more covered bonds being purchased directly on the primary market as early as March 2023. Accordingly, the charts also show that the shares of central banks and public institutions declined during these periods. It is interesting to note that this share decreased for both CBPP3-eligible and non-CBPP3-eligible covered bond new issues.

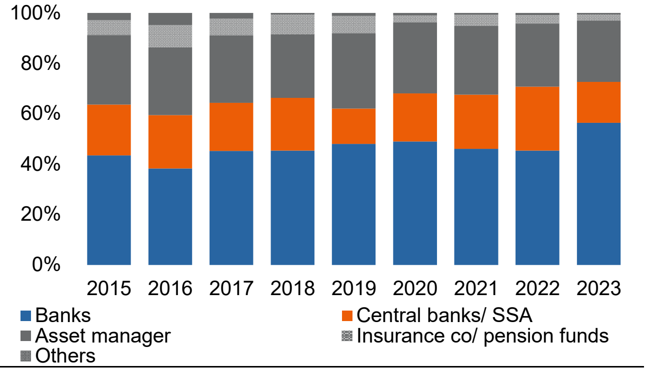
ECB purchases on the primary market have fluctuated over the years

BANKS AND ASSET MANAGERS CLOSE THE GAP
DISTRIBUTION OF ORDER BOOKS BY INVESTOR TYPE, EXCLUSIVELY CBPP3-ELIGIBLE NEW ISSUES



Source: Bloomberg, IGM, calculations and presentation DZ BANK
data for 2023 as of 30 August, SSA = sub-sovereign and agencies

DEMAND FROM PUBLIC INSTITUTIONS DECLINES AS WELL
DISTRIBUTION OF ORDER BOOKS BY INVESTOR TYPE, EXCLUDING NON-CBPP3-ELIGIBLE NEW ISSUES



Source: Bloomberg, IGM, calculations and presentation DZ BANK
data for 2023 as of 30 August, SSA = sub-sovereign and agencies

Banks have regulatory incentives to buy covered bonds

In CBPP3-eligible new issues, the lack of ECB demand was compensated by a higher share of banks and asset managers. We suspect that due to regulatory incentives, the share of banks has systematically increased anyway. For example, the minimum liquidity ratio (LCR) was introduced in 2015, requiring banks to cover net cash outflows for the next 30 days. Euro benchmark covered bonds that meet certain requirements, such as in terms of their ratings, can be used by banks as high-quality assets (HQLA) for their liquidity reserve. Therefore, a systematic increase in demand from banks for euro benchmark covered bonds would not be surprising. The numbers support this: before 2014, the share of banks in the order books was between 35 percent and 40 percent. In 2023, this share is significantly higher at 57 percent. In addition to the regulatory incentives for banks, the higher yields are also likely to have ensured that the demand gap due to the ECB's withdrawal could be closed with private investors without major spread widening.

The end of ECB purchases is also visible in the spread development

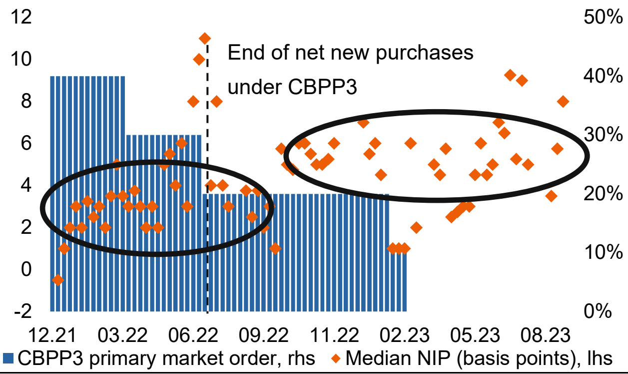
End of CBPP3 purchases led to spread widening

The impact of the ECB's withdrawal from the covered bond market with its CBPP3 purchases can nevertheless be seen in several ways in the development of risk premiums. New issue premiums have reacted to the absence of the ECB primary market since March 2023. The risk premiums of covered bonds in the secondary market have also risen slightly after the ECB announced the reduction or termination of its CBPP3 purchases. Overall, however, it can be said that the transition to the post-CBPP3 period has taken place without any major distortions in the covered bond market.

Issuers offered higher new issue premiums with the ECB's exit

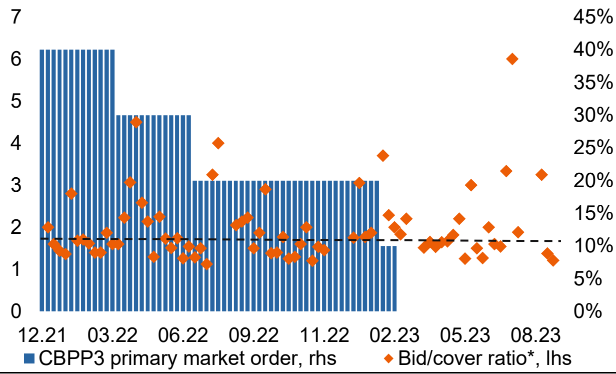
Experience shows that risk premiums react immediately after the announcement of an ECB measure. This was the case when CBPP3 was announced in September 2014 and, in our opinion, it was the same with the exit announcement. In the primary market, investor sentiment is well reflected in new issue premiums (NIP). However, the NIP depends on other factors as well. For example, the issuer can influence the level of the NIP by adjusting the volume of the new issue to the demand shortly before the order books are closed. The rule of thumb is: the larger the new issue shall be, the more NIP the issuer must offer so that the bond can be fully placed with investors. With the ECB's gradual reduction of primary market orders, the NIP for euro benchmark new issues also seems to have risen peu à peu, although - as the chart below (left) shows - some exceptions can also be found.

SINCE THE ANNOUNCEMENT OF THE END OF CBPP3 PURCHASES, NIPS HAVE INCREASED SLIGHTLY



Source: Bloomberg, IGM, DZ BANK, NIP = average new issue premium per trading week, data as of 30 August 2023

BID/COVER RATIOS HAVE REMAINED LARGELY UNCHANGED OVER TIME

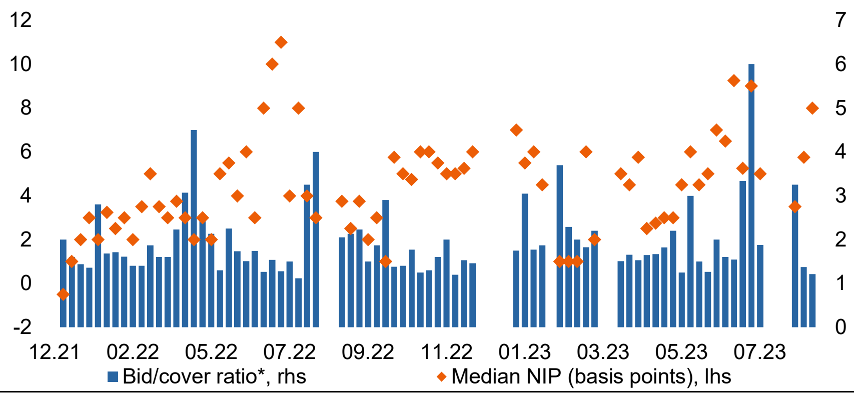


Source: Bloomberg, IGM, DZ BANK, * bid/cover ratio calculated from median order book volume divided by median new issue volume both per trading week, data as of 30 August 2023

Bid/cover ratio remained largely constant even after the ECB's withdrawal

Despite the expansion of the NIP, bid/cover ratios (ratio of order volume to new issue volume) remained largely unchanged even after the ECB's primary market orders were reduced. This could indicate that issuers, where necessary due to the decline in ECB demand, have adjusted the size of their new issue to the respective demand. In any case, bid/cover ratios have not systematically increased despite a tendency towards slightly higher NIP (see chart above, right). In our opinion, this is an indication that the lack of ECB order usually (but not always) had to be compensated by a slightly higher NIP in order to attract correspondingly more private investors (see chart below).

BID/COVER RATIOS ALSO DEPEND ON THE VOLUME OF THE NEW ISSUE, BUT WITH THE HIGHER NIPS, BID/COVER RATIOS DO NOT SEEM TO HAVE INCREASED AS WELL.



Source: Bloomberg, IGM, DZ BANK, NIP = new issue premium per trading week, * calculated from median order book volume divided by median new issue volume per trading week, data as of 30 August 2023

ECB purchases were a stabilising factor for risk premiums

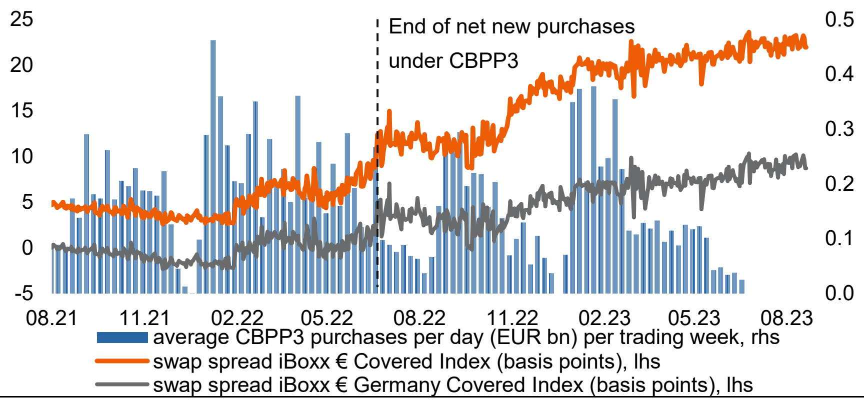
The ECB purchases were a stabilising factor for the development of risk premiums on the secondary market. They have not always been able to prevent a widening of covered bond spreads. However, according to our assessment, swap spreads could have widened considerably more, for example during the corona pandemic, if the ECB had not countered with its purchases.

Risk premiums of pfandbriefe have widened somewhat less

Spread widening and declining ECB purchases coincide

The average CBPP3 purchases per trading day per trading week in the chart below include both primary and secondary market purchases. Depending on the availability of CBPP3-eligible new issues, the distribution of purchases between the primary and secondary markets is likely to have varied significantly from week to week. Since March 2023, however, all ECB purchases have been made exclusively on the secondary market, and with the gradual reduction of primary market orders in the months before that, the share of primary market purchases is also likely to have declined successively even before then. Irrespective of the distribution of purchases, however, the outlook for the future purchase volume seems to have been a factor for the spread development. We use data from the iBoxx € Covered Index as an indicator of spread development in the secondary market. As can be seen in the chart below, the swap spread of the index widened slightly in spring 2022, which may have been a reaction to the start of the war in Ukraine. The spread widening continued when the ECB announced the end of net new purchases under CBPP3. From July 2022 (end of net new purchases, but reinvestments were still made) to July 2023 (end of CBPP3 reinvestments), the swap spread of the iBoxx € Covered Index increased by almost eleven basis points. The sub-index for German pfandbriefe was less affected by the widening. For it, there was only a widening of the swap spread by around five basis points in the same period. Since July, however, the German sub-index had to cope with a somewhat stronger pressure than the overall index, with a widening of the swap spread of around four basis points by the end of September 2023. The risk premium of the overall index only increased by around three basis points in the same period. Although the overall widening of risk premiums was still quite manageable in the secondary market at the end of September 2023, the overall market sentiment seemed to be depressed at that time. New issues in the euro benchmark format were scarce and they partly struggled to attract sufficient investor interest, despite comparatively high new issue premiums. Spread widening was not limited to the covered bond market, however. Bonds from agencies, sub-sovereigns and supranational issuers saw their risk premiums rise.

SPREAD WIDENING ALREADY STARTED IN MID-2022 AFTER THE REDUCTION OF CBPP3 PURCHASES WAS ANNOUNCED



Source: Bloomberg, ECB, Markit, presentation DZ BANK, data as of 30 August 2023, 17:00h.

Crisis of the American regional banks and rescue of Credit Suisse fell into the first half of 2023

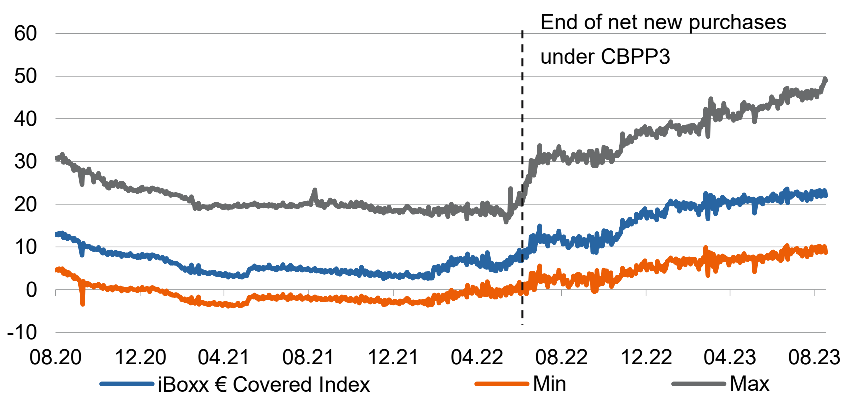
It is difficult to say - even in retrospect - whether the widening of swap spreads was caused exclusively by the cessation of ECB purchases. There were other relevant events that probably had an influence on risk premiums. In addition to the Ukraine war already mentioned, the crisis of the US regional banks and the bailout of Credit Suisse, both of which fell in the first half of 2023, probably also put risk premiums of bank bonds under pressure worldwide. Unsecured and subordinated bank bonds suffered more from these events than covered bonds. In contrast, the risk premiums of covered bonds held up much better. However, the dwindling and, from July 2023, completely missing support from CBPP3 purchases was noticeable and the covered bond spreads also widened. The risk premiums presumably benefited from the higher yield level and the still quite high Bund swap spread level at mid-year, as they attracted private investors to the covered bond market. Some private investors, however, seemed to wait with their investments in August 2023, hoping to be able to buy a pfandbrief with a yield of 4 percent soon.

Greater differentiation in spreads

Spreads of lower-rated covered bonds are under more pressure

In our opinion, the end of the ECB purchases led to a greater diversification of risk premiums because the ECB had carried out its purchases largely independently of the credit quality of the covered bonds. This strongly compressed spreads within the euro area. However, the gap between the highest and lowest swap spreads of the country sub-indices in the iBoxx € Covered Index has increased significantly again since mid-2022. This means that in an environment of generally rising spreads, the risk premiums of covered bonds from countries with an overall weaker credit profile have widened above average. The ECB purchases are no longer levelling out the spread differences as in previous years. Since July 2023 at the latest - with the complete end of the CBPP3 purchases - there is again room for greater differentiation according to the creditworthiness of the covered bonds, whereby this has already begun in the first half of 2023 and will continue going forward. For the chart below, we have evaluated the spread development of the sub-indices for the euro area countries (excluding Ireland). The highest and lowest spreads of the country sub-indices frame the swap spread of the overall index. It is noticeable that the risk premiums of the expensive covered bonds have widened less than those with lower ratings. We have removed Ireland from this analysis because the sub-index only contains one covered bond with a very short maturity and is therefore no longer representative enough in our view.

DID THE END OF CBPP3 NET NEW PURCHASES TRIGGER THE SPREAD WIDENING?
SWAP SPREADS IN BASIS POINTS



Source: Bloomberg, Markit, presentation DZ BANK, data as of 30 August 2023, 17:00h
Min (Max) = lowest (highest) swap spread for a country sub-index in the iBoxx € Covered Index (referring to the countries in the euro area without Ireland)

Sale of APP stock would accelerate developments

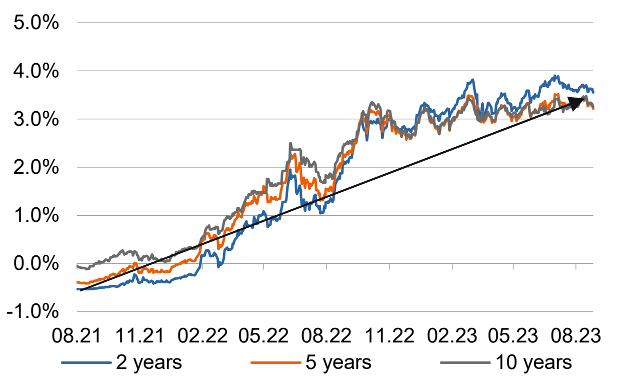
The future spread development will also continue to depend on the ECB. If the ECB decides to sell its bond holdings accumulated under APP (including covered bonds) for monetary policy reasons, this would put significant pressure on risk premiums and should lead to even greater spread differentiation between the individual country segments in the iBoxx € Covered Index. Fortunately, the ECB still has at least one alternative if it wants to tighten the monetary policy without raising its key interest rates any further. It could, for example, stop reinvesting under PEPP earlier than previously planned and announced, or scale back PEPP reinvestment. So far ECB has announced that it intends to reinvest maturing bond in its PEPP portfolio until (at least) the end of 2024. Tweaking PEPP reinvestments would avoid a situation in which the ECB would actively sell bonds under APP while still reinvesting returns from maturing bonds under PEPP. In such a scenario ECB could just as well transfer bonds from the APP portfolio to the PEPP portfolio.

Pfandbrief yields developed differently

Smiling curve for pfandbrief yields

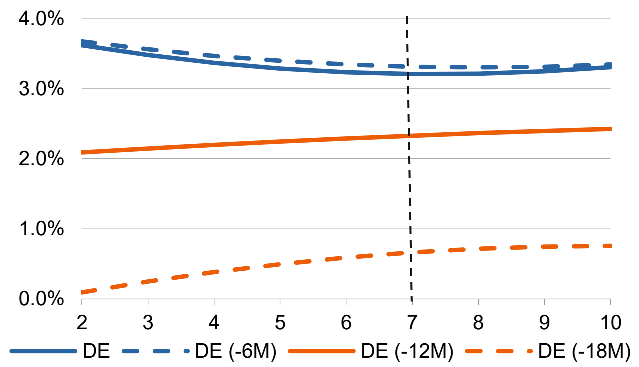
Yields at the short end of the curve have risen faster and more strongly than at the long end from the beginning of 2022 to mid-2023. This reflects the interest rate hikes by the ECB. Accordingly, the yield curve in the pfandbrief market flattened and even became inverse. In the meantime, the generic curve for pfandbrief yields calculated by DZ BANK is smiling because pfandbrief yields are rising again from a maturity of seven years (data as of mid of August 2023). Admittedly, the smile is somewhat crooked and not particularly pronounced. A complete normalisation of the yield curve is not yet in sight. This is only likely to happen with key interest rate cuts by the ECB, which are not on the monetary policy agenda at the moment. According to DZ BANK's interest rate forecast, ten-year yields are no longer likely to rise in the coming months. On the contrary, they are even trending somewhat lower over the year.

FROM -0.5 TO +3.7 PERCENT: STRONG RISE IN YIELDS AT THE SHORT END WAS ACCOMPANIED BY AN INVERSION OF THE CURVE
GENERIC PFANDBRIEF YIELDS IN PERCENT



Source: Bloomberg, DZ BANK, data as of 30 August 2023, 17:00h

YIELD CURVE NORMALLY SHAPED FROM 7 YEAR MATURITY ONWARDS
GENERIC PFANDBRIEF YIELDS (Y-AXIS), MATURITY IN YEARS (X-AXIS)

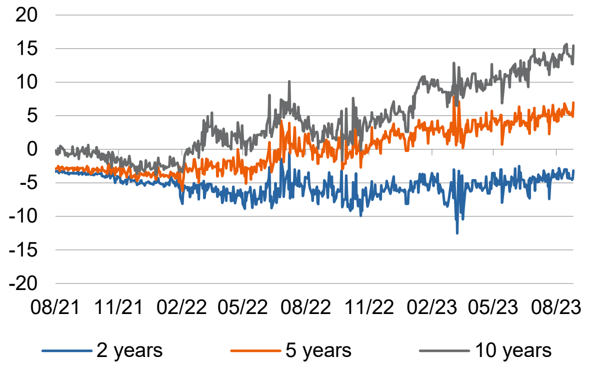


Source: Bloomberg, DZ BANK, data as of 30 August 2023, 17:00h

Pfandbrief credit curve steepened by about ten basis points

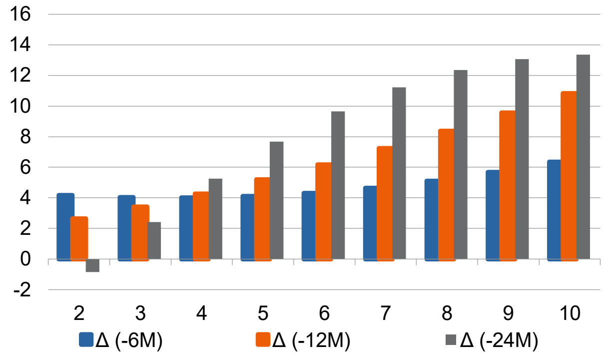
While the yield curve inverted, the pfandbrief curve of the swap spreads (credit curve) became steeper and steeper over the same period. This somewhat mitigated and slowed down the inversion of the yield curve. The generic swap spread calculated by DZ BANK for German pfandbriefe with a two-year maturity remained more or less stable between August 2021 and August 2023. In contrast, the widening for the ten-year term was more than 13 basis points. As a result, the pfandbrief credit curve has steepened by more than ten basis points in the past two years.

INCREASE IN RISK PREMIUMS, ESPECIALLY FOR MEDIUM AND LONG MATURITIES
GENERIC SWAP SPREADS OF PFANDBRIEFE IN BASIS POINTS



Source: Bloomberg, DZ BANK, data as of 30 August 2023, 17:00h

CREDIT CURVE HAS STEEPENED SIGNIFICANTLY SINCE 2022
CHANGE IN GENERIC PFANDBRIEF SWAP SPREADS IN BASIS POINTS



Source: Bloomberg, DZ BANK, Δ (-6M) = change in the generic swap spread to the current level (data as of 30 August 2023, 17:00h) in the past six months

Spreads of ten-year pfandbriefe widen not as much as the overall market

The widening in the French market segment and in the overall covered bond market has been stronger overall than in the pfandbrief market from mid-August 2021 to mid-August 2023. At the same time, the generic credit curve for French covered bonds has steepened by close to 25 basis points over the past two years (the generic credit curve for the covered bond market around 19 basis points). However, the covered bond market seems to be catching up with the development in the overall market. The risk premium of ten-year German pfandbriefe has widened by almost four basis points more than the overall market (and also compared to the French market segment) in the past six months. This means that the pfandbriefe have caught up with part of the spread development in the overall market. However, the German curve would have to steepen by another four basis points (with the overall market curve unchanged) to catch up completely. Compared to the French covered bonds, there are even nine basis points missing if the German curve is to have the same steepness.

PFANDBRIEF SWAP SPREADS HAVE RECENTLY WIDENED MORE AT THE LONG END THAN THE MARKET AS A WHOLE
CHANGE IN GENERIC SWAP SPREADS PER MARKET SEGMENT AND MATURITY IN BASIS POINTS

Term in years	2	3	4	5	6	7	8	9	10
Germany Δ (-6M)	4.2	4.0	4.0	4.1	4.3	4.7	5.1	5.7	6.4
Germany Δ (-12M)	2.7	3.4	4.3	5.2	6.2	7.2	8.4	9.6	10.8
Germany Δ (-18M)	1.0	3.7	6.2	8.2	9.9	11.2	12.1	12.7	12.8
Germany Δ (-24M)	-0.8	2.4	5.3	7.7	9.7	11.2	12.4	13.1	13.4
France Δ (-6M)	4.5	4.3	4.1	3.9	3.7	3.5	3.3	3.1	2.8
France Δ (-12M)	7.9	10.7	13.1	15.0	16.5	17.6	18.3	18.5	18.3
France Δ (-18M)	7.3	12.1	16.2	19.6	22.3	24.3	25.6	26.2	26.1
France Δ (-24M)	4.8	10.7	15.7	19.9	23.4	26.0	27.7	28.7	28.9
Covered Bond Market Δ (-6M)	3.8	4.5	5.0	5.2	5.2	4.9	4.4	3.6	2.5
Covered Bond Market Δ (-12M)	6.7	10.4	13.2	15.2	16.4	16.7	16.3	15.0	12.9
Covered Bond Market Δ (-18M)	8.0	12.7	16.5	19.3	21.3	22.4	22.6	21.8	20.2
Covered Bond Market Δ (-24M)	5.2	10.9	15.6	19.3	22.2	24.0	24.9	24.9	23.9

Source: Bloomberg, DZ BANK, Δ (-6M) = change in the generic swap spread to the current level (data as of 30 August 2023, 17:00h) in the past six months

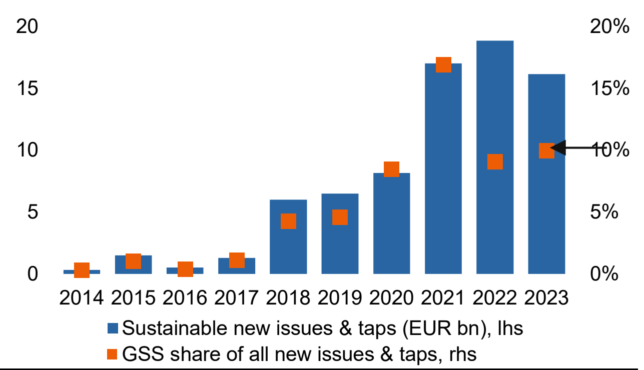
MARKET FOR SUSTAINABLE PFANDBRIEFE

Current developments

A run-up to a new record?

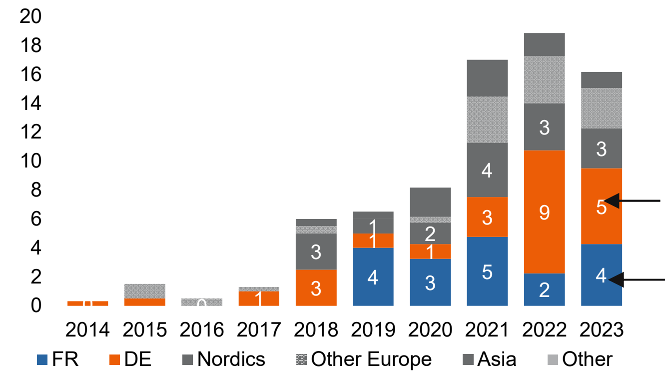
The new issue volume for sustainable covered bonds seems to be on track for a new record again in 2023. By 24 August 2023, sustainable covered bonds with a volume of EUR 16.2bn had already been issued. In 2022, EUR 18.9bn were newly brought to the market in the entire year. The figures refer to publicly placed (syndicated) covered bank bonds with a volume of at least EUR 250m. Privately placed sustainable covered bonds (including large-volume ones) are not included in the figures presented here. The share of sustainable covered bonds in all benchmark new issues is just under 10 percent and thus at a similar level as in 2022. The higher share in 2021 is an upward outlier, as the total volume of new issues in that year was very low. However, compared to the unsecured bond market, the covered bond market continues to lag behind. The share of sustainable new issuance in senior and subordinated bank bonds has stabilised slightly above the 20% mark since 2021. Banks still seem to prefer issuing their sustainable bonds in unsecured format.

SUSTAINABLE NEW ISSUE VOLUME IN 2023 ON TRACK FOR A NEW RECORD
FIGURES IN EUR BN (LHS)



Source: Bloomberg, calculations and presentation DZ BANK, figures for 2023 as of 30 August 2023, figures refer to euro-denominated covered bonds with an outstanding volume of at least EUR 250m, GSS = green, social, sustainable

MOST SUSTAINABLE NEW ISSUES SO FAR HAVE COME FROM GERMANY AND FRANCE.
FIGURES EUR BN

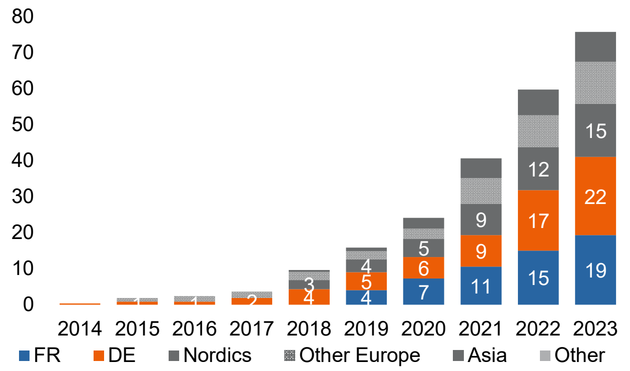


Source: Bloomberg, calculations and presentation DZ BANK, figures for 2023 as of 30 August 2023, figures refer to euro-denominated covered bonds with an outstanding volume of at least EUR 250m

Germany forms the largest country segment in the sustainable covered bond market

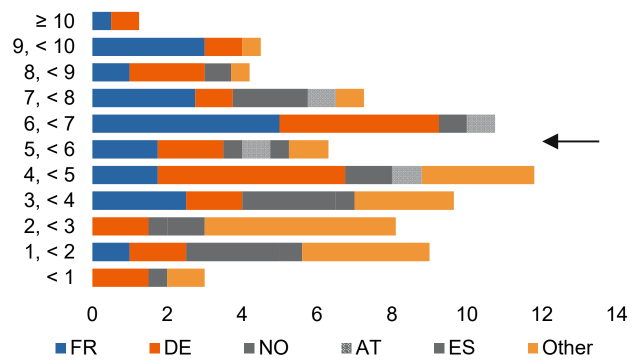
The two country segments with the highest volume remain Germany and France. Compared to the previous year, the issuing activity of German pfandbrief banks is still lagging somewhat behind. The volume of sustainable pfandbriefe outstanding from Germany nevertheless rose to around EUR 22bn (as of end of September 2023), making it the largest country segment, followed by France and issuers from the Nordic countries. However, growth in sustainable covered bonds could slow down in the coming years. In recent years, the volume of maturities has been very low. In 2018, the first sustainable covered bond matured. In 2023, the maturity volume is already at EUR 3bn (with EUR 2bn accounted for by German pfandbriefe). From 2025, the maturity volume rises to EUR 11.5bn and remains above EUR 9bn in the two years thereafter. If short-dated sustainable covered bonds are still issued, and this is not unlikely in the current market environment, these figures would increase even further. However, if the volume of new issues continues to grow as in the past years, the outstanding volume will continue to increase - albeit at a reduced rate.

OUTSTANDING VOLUME OF SUSTAINABLE PFANDBRIEFE CONTINUES TO GROW
FIGURES IN EUR BN



Source: Bloomberg, calculations and presentation DZ BANK, figures for 2023 as of 30 August 2023, figures refer to euro-denominated sustainable covered bonds with an outstanding volume of at least EUR 250m

MATURITY PROFILE OF OUTSTANDING SUSTAINABLE COVERED BONDS WITH A SMALL DIP AT MEDIUM MATURITIES
Y-AXIS: MATURITIES IN YEARS, X-AXIS IN EUR BN

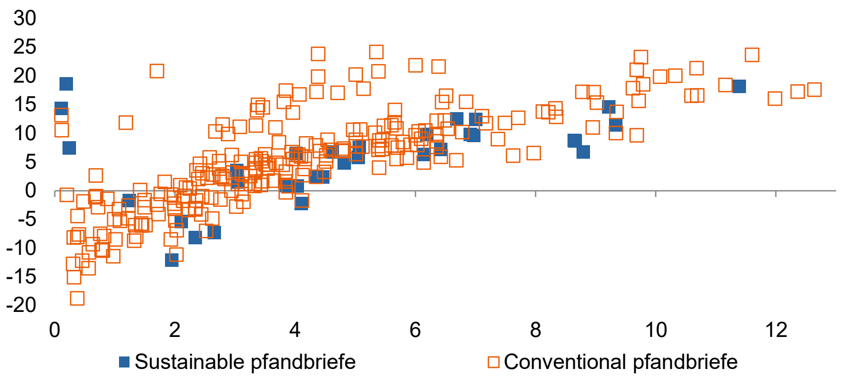


Source: Bloomberg, calculations and presentation DZ BANK, data as of 30 August 2023, figures refer to euro-denominated sustainable covered bonds with an outstanding volume of at least EUR 250m

Broader investor base for sustainable pfandbriefe

Sustainable covered bonds are still a rather scarce commodity and are popular with investors. There is a somewhat broader investor base for them compared to conventional covered bonds because they also reach investors who invested exclusively in sustainable assets. However, these advantages of sustainable covered bonds have still not translated into significant spread advantages. It is true that the order books for sustainable covered bonds fill up somewhat faster than their grey counterparts and sometimes the order books even grow to above-average volumes. But in the secondary market, a premium (or greenium) in the form of a spread discount for sustainable covered bonds is rarely discernible. The same is true for Green or Social Pfandbriefe. As can be seen in the chart below, there was no significant spread difference between sustainable and grey pfandbriefe in August 2023.

NO SIGNIFICANT SPREAD DIFFERENCE BETWEEN SUSTAINABLE AND GREY PFANDBRIEFE
INDICATIVE SWAP SPREADS IN BASIS POINTS



Source: Bloomberg, DZ BANK, data as of 30 August 2023, 17:00h

Sustainable pfandbriefe trade at no significant premium

From an investor's point of view, the fact that sustainable and conventional pfandbriefe trade at a similar spread level means that compared to other asset classes such as unsecured bank bonds, Green and Social Pfandbriefe are currently available at a bargain price. From the issuer's point of view, on the other hand, there are no savings in refinancing costs for the sometimes tedious additional work associated with sustainable cover assets in the form of additional reporting obligations, for example. However, an sustainable pfandbrief can address a larger number of investors, which is an advantage when placing a new issue.

Advantages for sustainable issuers

German banks increasingly issued unsecured bonds in sustainability format

Sustainability criteria already enjoy a high priority for many investors and some even invest their money exclusively in sustainable assets. Pfandbrief banks therefore reach a broader investor base with Green or Social Pfandbriefe compared to their conventional counterparts, which is an advantage when placing new issues. However, issuers also take on a lot of additional work with their sustainable pfandbriefe. The sustainable cover assets must not only fulfil the requirements of the Pfandbrief Act, but also certain green or social criteria. In order to identify appropriate sustainable cover assets, corresponding data must already be collected and evaluated when the loan is granted. The data is needed for additional sustainability reports on the pfandbrief programme. Perhaps the high workload and the double qualification criteria - according to the Pfandbrief Act and sustainability criteria - are reasons why still only twelve German credit institutions issue sustainable pfandbriefe (compared to a total of 83 banks with a pfandbriefe licence as of 30 June 2023). Banks seem in principle be interested to print sustainable bonds. However, in the past years many German banks have preferred to issue their new green issues in unsecured format or as subordinated bonds. These bond formats also allow them to use sustainable assets that would not be suitable as cover assets for their pfandbriefe. Another reason for the preference of unsecured or subordinated bonds is likely to be the higher potential savings in refinancing costs. Green or Social Pfandbriefe offer at best - if at all - a refinancing advantage of around one basis point compared to conventional pfandbriefe. In the case of unsecured bonds, issuers have been able to save more so far.

vdp Standard requires collateralisation of Green and Social Pfandbriefe with qualifying cover assets

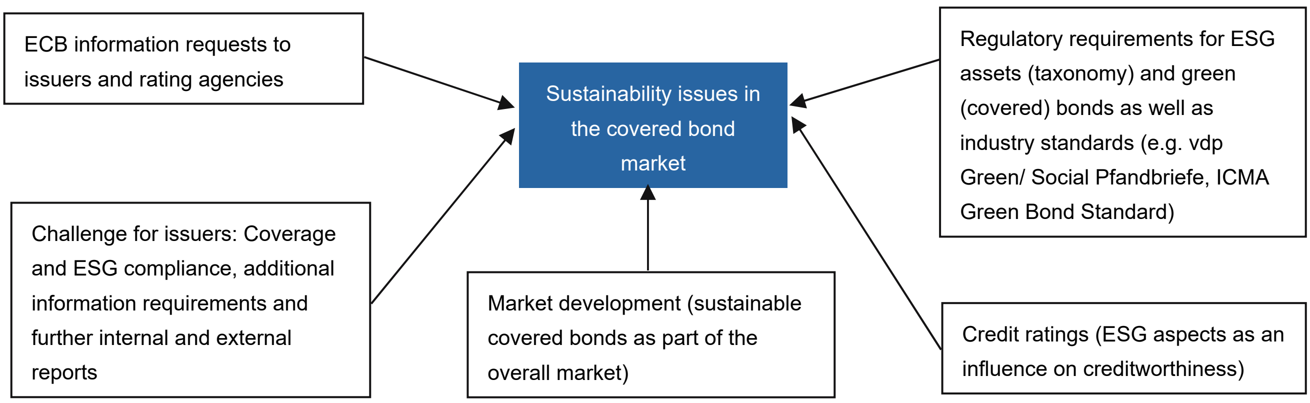
One way to overcome the challenge with the double qualification criterion for sustainable pfandbriefe would be the Sustainable-Linked-Bond format. In these sustainable bonds, the issuer promises to achieve certain targets in a specified timeframe. If these targets are not met within the promised timeframe, the issuer may have to pay a higher coupon. In principle, pfandbriefe could also be issued in the sustainable-linked format. However, so far no pfandbrief bank has done so. The vdp standards stipulate that the sustainable pfandbriefe must be collateralised with corresponding assets. This means that the loans used to finance sustainable projects must also be cover assets in the cover pool. This principle is not observed by all issuers in Europe. In Spain, for example, there are two banks that have sustainable covered bonds outstanding. However, the cover pools do not include sustainable assets at all or the sustainable cover assets do not reach the volume of the outstanding cédulas. To the best of our knowledge, the proceeds of the issue went into sustainable financing that is in the issuer's loan book.

Different perspectives on sustainability

Fundamental aspects of sustainable pfandbriefe

The market for sustainability pfandbriefe, which can be described with data on new issues, outstanding volumes, new issue premiums and the like, is one facet of the ESG topic that touches on even more areas of the banking business. In the following, we would therefore like to give a brief overview of other aspects of sustainability, such as market standards and what they mean for the lending business.

ESG AS A MULTI DIMENSIONAL ISSUE



Source: DZ BANK

Minimum standards for Social Pfandbriefe were published in 2021

Regarding market standards, in Germany the Association of German Pfandbrief Banks (vdp) has criteria for Social Pfandbriefe and Green Pfandbriefe. Both are based on the principles of the International Capital Market Association (ICMA) for sustainable bonds. In the case of Social Pfandbriefe, according to the vdp, the financed projects must offer social added value, whereby this is derived from the United Nations Sustainable Development Goals (SDGs), which include the following areas in particular:

- Financially sustainable basic infrastructure (for example, clean water, sanitation, transport and energy)
- Access to basic social services (e.g. health care, education and training)
- Affordable housing
- Job creation through the financing of small and medium-sized enterprises and microcredits
- Food security
- Socio-economic development and empowerment

Regular information and external control

The issuer of a Social Pfandbrief undertakes to provide regular (at least annual) information on its social cover assets (including an impact study). The Social Pfandbrief programme must also be assessed on an ongoing basis by an independent external third party (second party opinion, SPO) in accordance with the vdp's requirements. This task is usually performed by an ESG rating agency.

Green Mortgage Pfandbriefe dominate

Green Pfandbriefe are subject to the same additional transparency requirements as Social Pfandbriefe, which also include an SPO. In the case of Green Pfandbriefe, mortgage pfandbriefe currently dominate, and this is not likely to change any time soon. Therefore, we focus here on the criteria for the cover assets of Green Mortgage Pfandbriefe. These are summarised in the chart on the next page.

Framework for Green Public Sector Pfandbriefe established

On 20 September 2022 vdp published its minimum standards for Green Public Pfandbriefe. A bank may only use this designation if it meets the standards developed by the vdp. These include quality criteria for green public sector cover assets. In the case of financing public-sector buildings, the vdp follows the standards for Green Mortgage Pfandbriefe. In the case of public sector assets, however, financing to sovereigns or sub-sovereigns or loans guaranteed by these public sector entities in the areas of for example renewable energies, energy efficiency, pollution prevention and control, preservation of biodiversity, clean transport, sustainable water management and adaptation to climate change also qualify. The issue proceeds of a Green Public Pfandbrief may only be used for suitable assets from the areas mentioned. As with the other Green or Social Pfandbriefe, the criteria are to be reviewed and further developed on an ongoing basis.

Pfandbrief Act applies, no separate cover pools

It applies equally to Green and Social Pfandbriefe that there is no separate cover pool for them that would be separate from the cover assets of conventional Pfandbriefe. Furthermore, a bank's sustainable pfandbriefe are of course also subject to the general provisions of the Pfandbrief Act and the relevant pfandbrief ordinances. However, the cover pools of green or Social Pfandbrief issuers contain claims in at least the amount of their outstanding Green or Social Pfandbriefe respectively.

REQUIREMENTS REGARDING PROPERTIES IF THE LOANS ARE TO BE USED AS ELIGIBLE COVER ASSETS FOR GREEN PFANDBRIEFE

For new buildings, the legal energy standards of the respective country valid at the time of financing are complied with.

For existing commercial properties, at least one of the following criteria must be met:

- The relevant comparative values* published by the Federal Government are complied with.
- An established provider confirms that the commercial property falls into one of the provider's top categories (proof via sustainability certificate).
- The commercial property is in the top 15 percent of the national commercial property stock in terms of energy consumption/ demand.

For residential existing properties, at least one of the following criteria must be met:

- The residential building can be assigned at least to energy efficiency class B.
- The energy requirement of 75 kWh/m² is not exceeded.
- There is co-financing via KfW funding programmes for energy-efficient construction or refurbishment.
- The residential building is among the top 15 percent of the national residential building stock in terms of energy consumption/ demand.

The following criteria apply to renovations/refurbishments of buildings:

- The structural measures achieve a reduction in energy consumption of at least 30 percent and ...
- ... the energy refurbishment results in energy consumption/ demand reaching a level that is in line with the climate targets of the European Union.

Source: Association of German Pfandbrief Banks (vdp minimum standards), * link to comparative values, presentation DZ BANK

The foundations for sustainable pfandbriefe: ICMA guidelines

ICMA calls for transparency

As already mentioned, Green and Social Pfandbriefe are based on ICMA's general principles, which are among the most important international standards for sustainable bonds (green, social, sustainability; GSS). For the individual topics ICMA has created separate principles (Principles), which all follow the same basic idea and are revised annually. Issuers of GSS bonds voluntarily undertake to proceed in accordance with the ICMA guidelines for their sustainable bond programmes. These provide guidance on the key elements of the bond programme, centred on transparency recommendations. Investors are to be assisted by the provision of essential information to enable them to assess the social or environmental benefits of the programme. There are four core components to this, which together form the first pillar of the ICMA recommendations:

Use of proceeds

» The bond documentation shall show the use of the bond proceeds. The selected projects financed shall have a clear social or environmental benefit. The ICMA guidelines recognise a wide range of sustainable projects.

Process for project evaluation and selection

- ICMA recommends that issuers publish their own green or social bond framework. This should provide information on how the issuer selects the sustainable projects to be financed and what objectives are being pursued. Among other things, this document should clearly state the eligibility and exclusion criteria used for this purpose.

Management of proceeds

- The use of the bond proceeds should be transparent. The issuer must ensure through an internal process that the bond proceeds are used exclusively for the sustainable projects described in the bond framework. If the bond proceeds cannot flow immediately into corresponding long-term projects, the issuer should explain how the money will be used in the transition phase.

Reporting

- Until the bond proceeds are fully allocated, the issuer should report annually on the use of the bond proceeds. As far as possible, the projects should be specifically named and the expected effect (for example, the saving of CO_2 emissions) should be stated. If this is not possible (for example due to confidentiality or the high number of projects), meaningful disclosures should be made at portfolio level.

External control

The second pillar of the ICMA recommendations aims at verifying the issuer's disclosures. An external audit should cover all of the four core components of the first pillar in order to achieve the highest possible level of transparency. ICMA particularly emphasises independent verification in the selection of projects as well as the use of funds for its sustainability programme. The review can be carried out, for example, by an auditor or a rating agency specialising in sustainability issues. According to ICMA, the independent external audits can vary in scope. The association roughly divides the audits into four categories:

Second Party Opinion (SPO)

- The organisation issuing the SPO should be independent of the issuer's adviser on the sustainable bond programme and provide an independent assessment of compliance with the ICMA guidelines.

Verification

- An issuer may seek independent verification against a defined set of criteria.

Certification

- An issuer can have its sustainable bond programme certified (for example with a seal of approval or label). In turn, ICMA believes that compliance with the criteria required to obtain the label should be verified by an external third party.

Scoring/ Rating

- An issuer could also have its bonds or the sustainable bond programme reviewed by, for example, an eco-rating agency or a specialised research provider.

MIX OF GREEN AND SOCIAL BONDS AS WELL AS SUSTAINABILITY-LINKED BONDS

Sometimes a clear separation along the Green Bond Principles (GBP) and Social Bond Principles (SBP) is difficult or an issuer would like to combine financing for green and social projects in an sustainability programme. For this purpose, ICMA has created separate guidelines to be applied to sustainability bonds. The same recommendations apply to these bonds as to GBP and SBP. An important principle for all these bonds (Green Bonds, Social Bonds or Sustainability Bonds) is that the proceeds from the bond issue can only be used to finance specific, predefined projects. This is to be distinguished from sustainability-linked bonds, for which ICMA 2020 has created a framework in the form of guidelines. In the case of sustainability-linked bonds, the issuer undertakes to achieve certain predefined targets (sustainability performance targets, SPT). This is monitored using key performance indicators (KPIs). However, the issuer is not bound to specific projects when using the bond proceeds.

Source: ICMA, presentation DZ BANK

ICMA would like to see the results published

The audit by an external third party can also be limited to partial aspects. Furthermore, ICMA recommends that the auditor should disclose its general experience with the topic of sustainability as well as the results of the investigation. ICMA has developed specific forms for the publication of the results.

Uniform ESG standards through the EU taxonomy

European Green Deal as a central European project

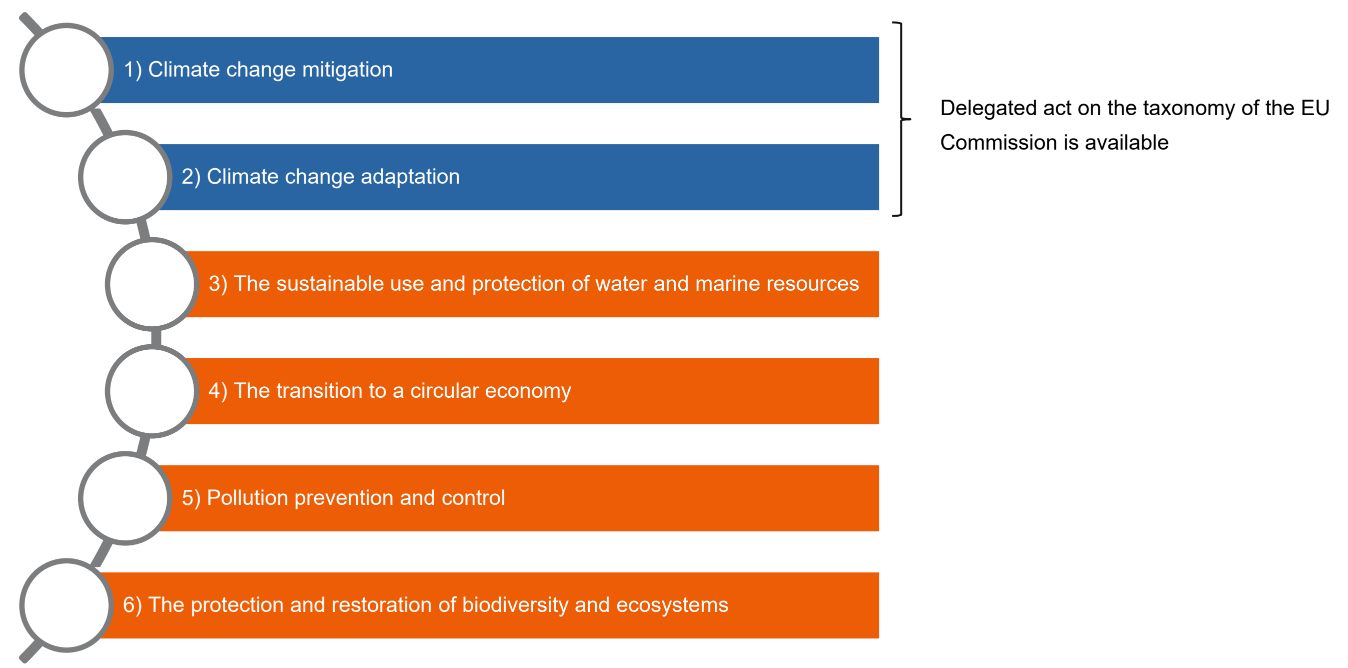
ICMA does not specify content standards for green or social projects. According to ICMA, these should be developed by institutions - such as the European Union. The EU has laid the foundations for general European ESG standards in its EU Taxonomy Regulation, which came into force on 12 July 2020. It sets criteria for economic activities which could be considered environmentally sustainable. Two essential and general criteria are:

- The activities make a significant contribution to achieving at least one of six the environmental objectives set out in the EU Taxonomy Regulation.
- The economic activities do not lead to any significant harm to any of the environmental goals (Do No Significant Harm, DNSH).

Detailed evaluation criteria

For two of the six environmental objectives mentioned within the EU taxonomy (climate protection and adaptation to climate change), the EU Commission has already published a delegated act that specifically defines the requirements and technical assessment criteria. Within the framework of the delegated act, criteria for energy-sustainable buildings were also presented. If a pfandbrief bank finances such buildings, these real estate loans would be "green mortgages" within the meaning of the taxonomy.

ENVIRONMENTAL OBJECTIVES OF THE EU TAXONOMY REGULATION



Source: DZ BANK

EU criteria for green buildings

Properties will be recognised as taxonomy-compliant if they have a class A energy performance certificate or rank among the top 15 percent in terms of primary energy demand of the building stock of a country or region. Furthermore, a maximum energy consumption of 10 percent below the requirements for a nearly zero-energy building to be defined by each EU member state is foreseen for new buildings from 2021 onwards. However, it is not enough for a building to meet the presented and quite ambitious criteria. A building will only be taxonomy-compliant if the mentioned criteria and the DNSH rule are met.

SUMMARY OF IMPORTANT RULES FOR TAXONOMY-COMPLIANT BUILDINGS FOR THE ENVIRONMENTAL GOAL OF CLIMATE PROTECTION
ASSESSMENT CRITERIA FOR THE BUILDING SECTOR

Purchase and ownership of buildings constructed before the end of 2020*	1) Either an energy certificate of class A or better … 2) … or the building is in the top 15 percent of the national or regional building stock by primary energy consumption (comparison with the stock of houses built by the end of 2020). In addition, for larger non-residential buildings (with air conditioning and heating system > 290 kW): Proof of the use of an energy management system.
Construction of new buildings (built from 2021)	Primary energy consumption of the building is 10 percent below the requirement for nearly zero-energy buildings Additionally for buildings > 5,000 square metres: 1) Airtightness test 2) Test of thermal integrity (or traceable quality control processes in this respect during the construction process). 3) Life cycle assessment via greenhouse gas emissions
Renovation	Renovation reduces primary energy demand by at least 30 percent Fulfilment of the legal requirements for comprehensive renovations (major renovation)

Source: EU Commission, vdp, DZ BANK, * for buildings constructed from 2021 onwards, the requirements to the construction of new buildings apply

DNSH criteria cause headaches

In the context of the environmental objective of climate protection, the delegated act provides for the following DNSH criteria for new buildings, the renovation of buildings and the purchase and ownership of buildings, among others:

- Integration of adaptation solutions that reduce climate risks
- Climate risk and impact analyses
- Maximum consumption for water fittings in non-residential buildings
- At least 70 percent of construction and demolition waste can be recycled
- Building design and construction technology support the circular economy and the limitation of waste generation during construction and demolition
- Measures to limit noise, dust and pollutant emissions during construction work
- Soil analysis in the case of suspected contaminated sites and limit values for hazardous substances
- The building is not erected in a protected area

Criticism of the amount of data that has to be collected

According to the vdp, the information required for green buildings goes far beyond the data currently available for real estate financing. The association also criticises excessive complexity. In addition, there is still a lack of databases at national and European level that could help banks to retrieve the necessary information in a uniform and structured manner. In addition, the vdp criticise the fact that there is no weighting of the DNSH criteria. The dripping tap thus acquires the same weight as the check for contaminated sites or the preservation of protected areas.

BENCHMARKING FOR THE TOP 15 PERCENT CRITERION IN REAL ESTATE

Together with the consultancy Drees & Sommer, the vdp has developed a benchmarking exercise with the aim of helping banks to demonstrate taxonomy compliance in real estate financing (see vdp press release of 4 April 2022). For buildings constructed by the end of 2020, the financing can be considered a contribution to achieving the environmental goal of climate protection if the building is among the best 15 percent in the national or regional market in terms of primary energy demand (TOP 15). This is where the developed benchmarking comes in, distinguishing between residential and non-residential buildings. Drees & Sommer has drawn up criteria that the TOP 15 properties must meet. In addition, the buildings must also meet the DNSH criteria if taxonomy compliance is to be achieved. According to the benchmarking, the TOP-15 criterion is achieved if a single-family house can show an energy performance certificate of energy efficiency class A+, A or B. In the case of apartment buildings, A+ or A apply. If an energy certificate is not available, the TOP-15 criterion would also be met if an energy consumption of less than 74 kWh or 70 kWh per square meter can be proven. In the case of commercial properties, proof can be provided via the Energy Saving Ordinance (EnEV) in force at the time of the building's construction. Office and retail buildings are among the top 15 percent if they meet at least the EnEV 2009 requirement. For logistics buildings, it would be EnEV 2014 or newer.

Source: vdp, DZ BANK

European Standard: Proposal for EU Green Bond Standards

Four basic requirements

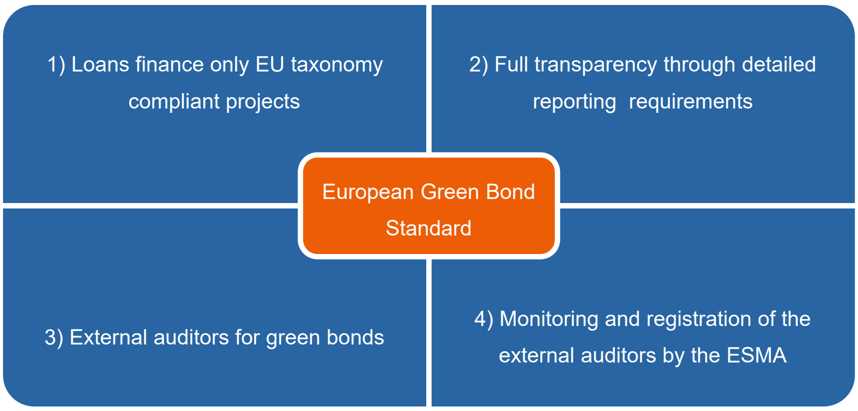
At its core, the so-called European Green Bond Standard (EUGBS) aims to create a standard for green bonds that will be linked to the requirements of the EU taxonomy. It sets four basic requirements for green bonds:

- The proceeds of the bond issue must be fully channelled into projects that are in line with the EU taxonomy. If the requirements in the delegated act on the EU taxonomy change later (are tightened), the assets originally considered to be taxonomy-compliant will be grandfathered for seven years (as of end of August 2023).
- Full transparency through detailed reporting requirements (green bond factsheet, allocation report, impact report).
- All green bonds and their taxonomy-compliant use of funds must be verified by an external auditor.
- Monitoring and registration of the external auditors by the European Securities and Markets Authority (ESMA). Potential conflict of interests shall be made public.

Gold standard for green bonds: European Green Bonds

In the second and third point, the ICMA guidelines are clearly recognisable. The reference to the EU taxonomy, in turn, clearly goes beyond the ICMA criteria in terms of content. According to the EU Commission, the EUGBS should become the international "gold standard" for green bonds, for the benefit of issuers (proof of financing of taxonomy-compliant projects) and investors (easier recognition of sustainable investments and thus reduction of the risk of "greenwashing"). All issuers of green bonds worldwide can voluntarily comply with the EUGBS, whether they are based inside or outside the EU.

THE FOUR CORNERSTONES OF THE EUROPEAN GREEN BOND STANDARD



Source: EU Commission, presentation DZ BANK

At the moment, the ICMA criteria are the market standard

In the covered bond market, according to our research 100 percent of the sustainable issuers are ICMA-compliant. Of the more than 40 issuers worldwide so far that have issued sustainable covered bonds in euros (issue volume of at least EUR 250m), all refer the corresponding ICMA guidelines. In this respect, the ICMA guidelines can justifiably be called the market standard.

Green and Social Pfandbriefe are based on the principles of ICMA

The vdp is striving for an approximation to the taxonomy criteria within the framework of the requirements for Green and Social Pfandbriefe over time. However, the vdp minimum requirements currently make no direct reference to the taxonomy criteria. Green and Social Pfandbriefe can therefore keep their name and also remain in line with the ICMA guidelines. However, Green Pfandbriefe will not be granted European Green Bond status any time soon - as it looks at the moment.

Sustainability and credit default risks

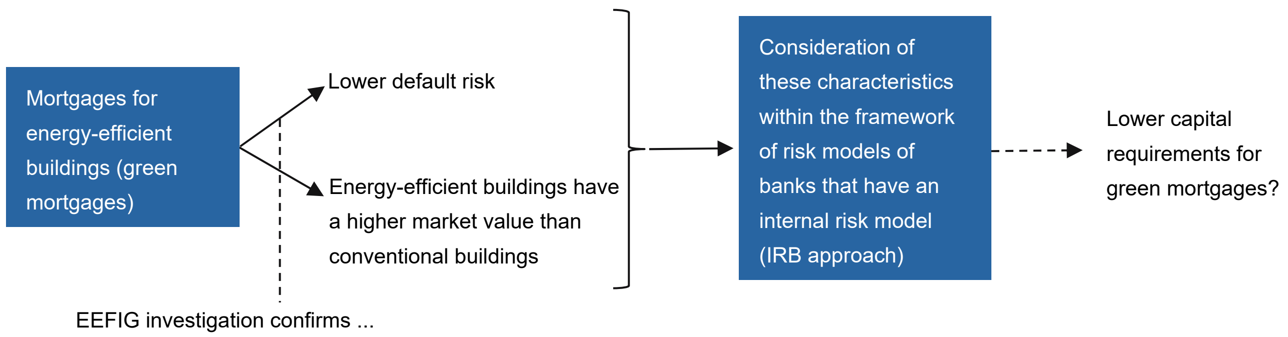
The greener the mortgage, the lower its credit risk, says a recent study by EEFIG

The ECB emphasises the importance of sustainability issues on credit default risks. In this context, the question arises whether financing of green buildings is associated with lower risks for the bank. The European Mortgage Federation's Energy Efficient Mortgage Initiative (EEMI) has already supported several studies that have investigated the relationship between the energy efficiency of buildings and the credit risk of mortgages. A fundamental study was prepared by the Energy Efficiency Financial Institutions Group (EEFIG) on behalf of the EU Commission and published in April 2022: "The quantitative relationship between energy efficiency improvements and lower probability of default of associated loans and increased value of the underlying assets". A key finding of the study presented in the EEFIG report is a negative correlation between the energy efficiency of the building and the credit risk of the mortgage. In short, the greener the mortgage, the lower the credit risk. For its analysis, EEFIG used a data pool of almost 800,000 residential mortgages, with the lion's share of 658,000 coming from the UK. The calculations confirm, according to the rules of statistical art, that customers who finance properties with high and medium energy efficiency have a 20 percent lower risk of default than customers who have properties with low energy efficiency. This result also occurred when control variables were included to account for effects of, for example, borrower income, loan maturities, loan-to-value ratios, and a number of variables related to the building. The EEFIG findings were in line with statistical research carried out by EEMI in recent years using data from Italy, Portugal and the Netherlands.

Green buildings have a higher market value

According to the study, energy-efficient buildings have a market price premium of up to 10 percent compared to conventional buildings. In addition, green buildings would command up to 5 percent higher rents when rented out. In our opinion, this reflects the energy savings in the use of the building, although against the background of the sharp rise in energy costs, the value-enhancing effect for green properties is more likely to increase in the future. EEFIG recommends that financial institutions record the energy efficiency of the buildings deposited as collateral and, as far as possible, adopt the statistical approaches of the working group for the analysis of their own portfolios. This would allow banks to better manage their credit risks and optimise the capital requirements for their mortgages. Mortgage lenders using internal risk models should therefore consider energy efficiency as a risk factor in these models. Furthermore, financial institutions should develop special credit products to (better) support customers in the energy-efficient refurbishment of buildings in the future.

GREEN MORTGAGES: DOES THE LOWER CREDIT RISK JUSTIFY CAPITAL REQUIREMENTS FOR GREEN MORTGAGES?



Source: DZ BANK

LEGAL FRAMEWORK FOR PFANDBRIEFE FROM GERMANY

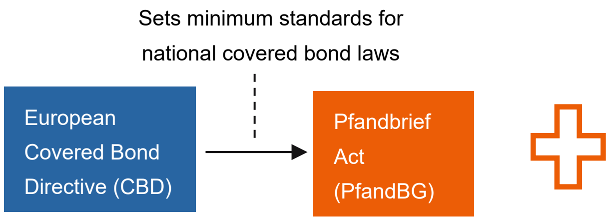
Overview of the legal bases

What are the legal bases?

PfandBG forms the legal basis

The Pfandbrief Act (PfandBG) is the central building block for the legal framework of pfandbriefe from Germany. It was amended in May 2021 to transpose the European Covered Bond Directive (CBD) into German law. The amendments entered into force in two stages. The first amendments came into force on 1 July 2021. These include the authorisation of the cover pool administrator (sachwalter) to extend the maturity of pfandbriefe by up to twelve months under certain conditions. In addition to the PfandBG, there are ordinances/ regulations issued by the BaFin. They elaborate on the partly general requirements of the PfandBG.

ELEMENTS OF THE LEGAL FRAMEWORK FOR THE GERMAN PFANDBRIEF AT A GLANCE



- Net present value regulation (Barwertverordnung)
- Regulation on the determination of the mortgage lending value (Beleihungswertermittlungsverordnung)
- Cover register statutory order (Deckungsregisterverordnung)
- Regulation on the determination of the mortgage lending values of ships and ships under construction (Schiffsbeleihungswertermittlungsverordung
- Regulation on the determination of mortgage lending values on aircraft (Flugzeugbeleihungswertermittlungsverordnung)
- German banking act (KWG) regulations on the funding register (Refinanzierungsregister) and the special representative
- Funding register statutory order (Refinanzierungsregisterverordnung)
- Reporting ordinance (Meldeverordnung)

Legal framework for German pfandbriefe

Source: DZ BANK

Who is responsible for the public supervision of the covered bond market?

BaFin supervises the pfandbrief business

The German Financial Supervisory Authority (BaFin) exercises the public supervision over a bank's pfandbrief business. Pfandbrief issuers are thus not only under the supervision of the relevant banking supervisory authority as a bank, such as the European Central Bank (ECB), but also under special public supervision by BaFin with regard to their pfandbrief business.

How is the public supervision structured?

Pool audit by BaFin usually after every three years

BaFin is authorised to issue all orders that are suitable and necessary to keep the business of the pfandbrief banks in compliance with the Pfandbrief Act and the legal ordinances issued in this connection. Of highest importance is the right of the supervisory authority to examine the cover pool assets of the pfandbriefe and thus compliance with the statutory requirements on a random basis. As a rule, these audits are carried out every three years. Furthermore, BaFin can take its own measures at any time, such as issuing instructions to the management or appointing supervisors with regard to the cover pool. BaFin also proposes an independent administrator of the cover pool (cover pool administrator or sachwalter) at the latest when the bank becomes insolvent.

Information rights and intervention options of BaFin

As the competent supervisory authority for the pfandbrief business of German banks, BaFin has the authority to set individual cover add-ons for each individual cover pool. This cover add-on can be ordered by administrative act if the minimum cover requirement laid down by the PfandBG is deemed by BaFin to be insufficient to cover the risks due to the specific composition of the cover pool. The explanatory memorandum to this part of the Pfandbrief Act lists the following examples, among others, which could justify a higher minimum cover requirement:

- The cover pool assets' market values deviate considerably from the value assumptions factored into the cover calculation.
- There are significant risk concentrations in the cover pool.
- The cover pool contains a considerable proportion of assets whose intrinsic value depends on the solvency of companies associated with the pfandbrief bank.
- Significant interest and exchange-rate mismatches exist between the cover assets and pfandbrief liabilities where these are not already adequately taken into account through the requirement to provide appropriate risk cover based on the risk-adjusted cover calculation.

The data specified in the reporting ordinance, which the pfandbrief banks must regularly transmit to BaFin, is intended to enable the supervisory authority to monitor and better assess any risks.

Requirements for issuers

Who is allowed to issue covered bonds?

Permission from BaFin required

Credit institutions based in Germany may issue pfandbriefe, if BaFin grants a permission for the pfandbrief business. The German PfandBG calls banks that issue pfandbriefe "pfandbrief banks".

Are there any special (licensing) requirements for issuers?

Requirements for obtaining a pfandbrief license

Yes. The issuance of pfandbriefe requires the permission from BaFin, whereby banks have to apply separately for a "pfandbrief license" for mortgage pfandbriefe, public sector pfandbriefe, ship pfandbriefe and aircraft pfandbriefe. The pfandbrief license is granted if the credit institution meets certain minimum requirements. The general requirements include, among others, the following points:

Regular pfandbrief issues

- The credit institution must have a license to conduct lending business. By means of a business plan, the pfandbrief issuer must prove to BaFin that the pfandbrief business is to be conducted regularly.

Minimum capital and appropriate risk management

- The bank's core capital must amount to at least EUR 25m.
- The pfandbrief bank must have a risk management system suitable for pfandbrief business. The organisational structure and the equipment of the credit institution must be set up for the pfandbrief business.

Requirements for risk management

The PfandBG places specific requirements on the risk management of a pfandbrief bank. This must ensure that all risks associated with the pfandbrief business, such as default risks, interest rate risks or currency risks as well as operational risks and liquidity risks, can be identified, assessed, managed and monitored. The risk management system must therefore meet the following requirements, among others:

Limit system and management of risks

- Limiting the concentration of risks using a limit system
- The existence of a procedure that guarantees risk reduction and early information of decision-makers in case of a strong increase of a risk

Flexibility and regular review

- Flexibility and adaptability to changing conditions alongside a review of the risk management system at least annually
- Regular, but at least quarterly, submission of a risk report to the executive board of the pfandbrief bank
- The risk management system must be documented in a detailed and comprehensible manner

License can also be withdrawn again

Once a pfandbrief license has been granted, it can also be withdrawn. However, this is only possible if the bank no longer meets the qualitative requirements of the Pfandbrief Act or has persistently violated provisions of the Pfandbrief Act or accompanying ordinances. Withdrawal is also possible if the pfandbrief bank has not issued any pfandbriefe for two years and is not expected to take up again the pfandbrief business within the next six months. In the event of license withdrawal, BaFin may order the cover pools to be liquidated by a cover pool administrator.

Is there a public register of all pfandbrief banks and pfandbrief types?

Public register of the BaFin

Yes, BaFin informs on its website, which banks have permission to conduct the pfandbrief business (including the respective pfandbrief type).

BAFIN REGULARLY PUBLISHS UPDATED LIST REGARDING THE PFANDBRIEF BANKS

Source: Bundesanstalt für Finanzdienstleistungsaufsicht (as of 26 July 2023)

Design of the transaction structure

What is the underlying transaction structure of covered bonds?

Integrated model, the cover assets remain on the issuer's balance sheet

The German pfandbrief legislation follows the integrated model. This means that the cover assets remain on the issuer's balance sheet. The entry of all cover assets in a cover register ensures that in the event of insolvency the cover pool and all cover assets can be easily and clearly identified for the benefit of the pfandbrief creditors.

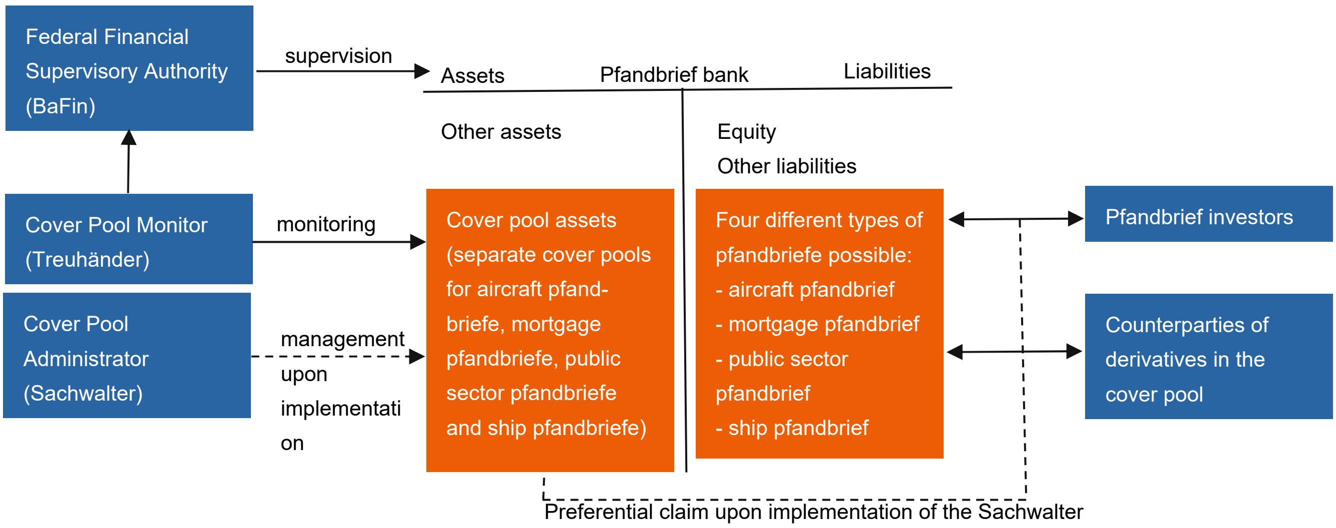
At the latest upon insolvency of the pfandbrief bank, the cover pool would be separated from the remaining assets and the cover pool would not fall under the general insolvency proceedings (insolvenzfreies Vermögen).

Is the dual recourse guaranteed?

Pfandbriefe are secured bank bonds

Yes. Pfandbriefe are secured bank bonds and therefore fulfil the principle of double recourse. The pfandbrief creditors have a direct claim against the pfandbrief bank as the issuer of the bonds. Should the pfandbrief bank be insolvent, the pfandbrief creditor would have a priority right with respect to the cover assets. Should the cover assets also turn out to be insufficient to satisfy all claims of the pfandbrief creditors, the pfandbrief creditor would still have a claim against the insolvency estate of the issuer.

GENERALISED TRANSACTION STRUCTURE OF A PFANDBRIEF



Source: DZ BANK

Has a regulatory issuance limit been set?

No issuance limit

No. The Pfandbrief Act does not provide for an issuance limit or a minimum amount outstanding for a bank's pfandbriefe.

Eligible cover assets

Which cover assets are eligible?

a) Public sector pfandbriefe

Claims and receivables from local authorities

For public sector pfandbriefe, only claims with a link to the public sector can be use as cover assets. The PfandBG specifies detailed requirements, which can be summarised as follows:

- Claims on domestic sovereign and sub-sovereign governments or public-law institutions authorised to charge fees, raise levies or impose other taxes.
- Claims on member states of the European Union (EU) or of the European Economic Area (EEA) and/ or their central banks and claims on regional and local authorities from member states of the EU and of the EEA.

- Claims against Great Britain, the United States of America, Japan, Switzerland and Canada as well as their central banks, regional governments and local authorities, as long as these can be assigned to credit quality step 1 for regulatory purposes.
- Claims against the European Central Bank (ECB) and other multilateral development banks and international organisations according to the European Banking Regulation (CRR).
- Public sector entities of a member states of the EU or the EEA
- Public entities within the meaning of the CRR domiciled in the United States of America, Japan, Switzerland and Canada, as long as they comply with credit quality step 1 of the European banking directive.
- Claims or receivables guaranteed by the above-mentioned states or local authorities. These could also be, for example, state-guaranteed claims against small and medium-sized enterprises.
- Export finance credits benefiting from a guarantee from a public sector institution or government.

Eligibility as cover for bonds with debt rescheduling clauses is given

The treaty establishing the European stability mechanism (ESM treaty) provides for the inclusion of collective action clauses (CAC) in the bond terms and conditions of ESM treaty signatory states. Similar clauses also exist in the bond conditions of other countries. They make it possible to subsequently change the bond conditions with the consent of the majority of the creditors. The PfandBG clarifies in § 4a PfandBG that the corresponding regulations in the government bonds (i.e. limited to this "narrow definition" of issuers) do not prevent the eligibility as cover asset and that these are suitable for the cover pool (be it ordinary cover as in the case of public sector pfandbriefe or as additional or substitute cover assets for all other types of pfandbriefe).

RATING-BASED VALUATION DISCOUNTS/ HAIRCUTS IN THE VDP CREDIT QUALITY DIFFERENTIATION MODEL

Rating*	Haircut used until 31 December 2018	Haircut used until 31 December 2019	Haircut used until 31 December 2020	Haircut used until 31 December 2021	Haircut used until 31 December 2022	Haircut used since 1 January 2023
AAA to BBB-	0%	0%	0%	0%	0%	0%
BB+	8%	8%	7%	7%	9%	8%
BB	11%	10%	10%	9%	11%	10%
BB-	13%	13%	12%	12%	14%	13%
B+	17%	16%	15%	15%	17%	16%
B	20%	20%	19%	18%	21%	19%
B-	24%	24%	23%	22%	25%	23%
CCC	34%	34%	33%	32%	35%	33%
CC	54%	54%	52%	52%	54%	53%
C	79%	79%	79%	78%	80%	79%
D	100%	100%	100%	100%	100%	100%

Source: vdp, presentation DZ BANK, as of July 2023, * ratings of S&P or corresponding Fitch or Moody's rating

Pfandbrief Act lacks rating rules for public sector debtors

The Pfandbrief Act allows claims on the public sector entities listed above to be fully recognised in cover calculations, irrespective of the debtor's or guarantor's credit rating. The vdp's member institutions have agreed standards for the recognition of the credit quality of public sector entities in pfandbrief cover calculation, which go beyond the requirements of the Pfandbrief Act. The vdp calls this standardised procedure the "vdp Credit Quality Differentiation Model". When including claims on member states of the EEA and their sub-sovereign entities, vdp member institutions factor rating-based discounts into their cover calculation (see table above).

b) Mortgage pfandbriefe

Receivables and loans secured by real estate liens

Only mortgages or claims secured by real estate liens that meet certain requirements are eligible as cover assets for mortgage pfandbriefe. Among other things, this means for example that only mortgages may be used as cover assets which are secured on real property, rights equivalent to real property or rights under foreign law which have the same effect as rights equivalent to real property under German law. Further requirements imposed on mortgage loans include mandatory insurance and a mortgage lending value calculation.

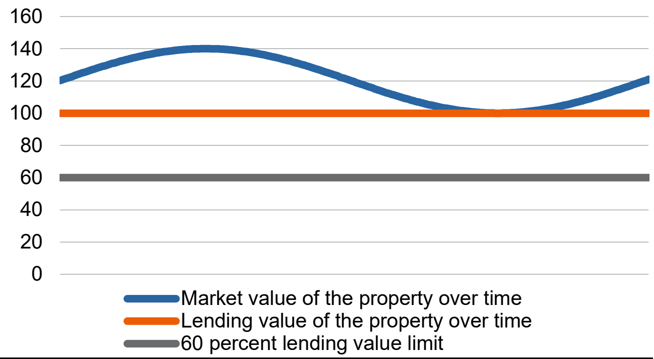
Real value versus capitalised earnings value

With regard to the calculation of the mortgage lending value, only the long-term, intrinsic or tangible value or real value (sachwert) as well as the capitalised earnings value or income value (ertragswert) of a property are taken into account. This means that it is only to be derived on the basis of the permanent characteristics of the land or building and the income to be generated from it in the long run. The income value is decisive for the mortgage lending value. This value may not be exceeded. If the real value is more than 20 percent below the income value, the assumptions on which the income value is based must be checked for their sustainability and corrected if necessary.

Mortgage lending value only takes into account the sustainable and long-term properties of a building

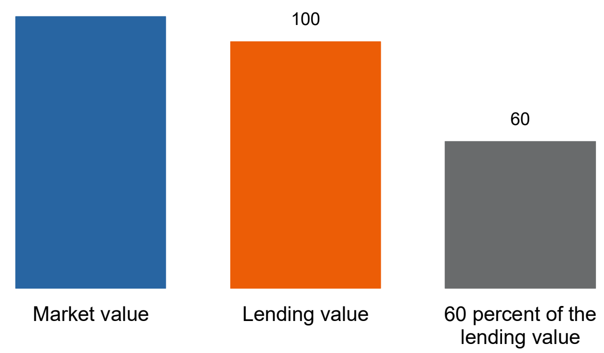
As a rule, the mortgage lending value does not exceed the market value of a property, which fluctuates over time, because speculative elements must not be taken into account when determining the mortgage lending value. The mortgage lending value must be determined by a valuer who is independent of the lending decision. He or she must have the necessary professional experience and appropriate expertise for determining the mortgage lending value. The property must be inspected, with video inspections permitted as an alternative to on-site inspections. In principle, the requirements for the determination of the mortgage lending value are the same for properties located in Germany or abroad.

LENDING VALUE ONLY REFLECTS BUILDING'S PERMANENT ATTRIBUTES



Source: vdp, presentation DZ BANK

60 PER CENT LTV LIMIT OFFERS ADDITIONAL PROTECTION



Source: DZ BANK

Dynamic minimum capitalisation factors

The rules for determining the mortgage lending value aim to achieve a prudent valuation of the property that is sustainable in the long term. The procedure for determining the mortgage lending value for real estate is defined in more detail by a regulation from BaFin, which was updated in October 2022 (regulation on the determination of the mortgage lending value, BelWertV). The changes also include a new procedure for determining more dynamic anchor values for the minimum capitalisation factors within the income approach. The basis for the new minimum capitalisation factors is the yield of thirty-year German government bonds (Bund) as of 30 November of the respective year. Three percentage points must be added to this for the valuation of residential properties and four percentage points for commercial properties. These minimum capitalisation factors can still be slightly modified by the real estate valuer within the process of the individual valuation of the property. However, the minimum capitalisation factor for residential properties must ultimately be between 3.5 percent and 5.5 percent and for commercial properties between 4.5 percent and 6.5 percent. The new minimum capitalisation factors set on the basis of the Bund yields always apply from 1 January of the following year. They are only adjusted if the new reference interest rate has changed by more than 0.5 percentage points compared to the previous value. Since October 2022, a minimum capitalisation factor of 5.1 percent will apply to residential real estate and 6.1 percent to commercial real estate.

ILLUSTRATIVE LENDABLE VALUE CALCULATION: TWO PILLARS PRINCIPLE USING THE EXAMPLE OF A NEWLY-BUILT OFFICE BUILDING

Income approach (first pillar)		**Cost approach (second pillar)**	
Land value		Land value	
600 square meter à 5,200 Euro per square meter	3,120,000 Euro	600 square meter à 5,200 Euro per square meter	3,120,000 Euro
Gross income		Value of the building	
2,000 square meters of office space à 30 Euro per square meter and month sustainable rent	720,000 Euro	Building costs: 11,500 cubic meters à 520 Euro per cubic meter	5,980,000 Euro
15 underground parking spaces à 110 Euro per parking space and month	19,800 Euro	Depreciation (0 Euro, as new building)	0 Euro
Gross annual rent	739,800 Euro	Subtotal	5,980,000 Euro
Less operating expenses (costs that are not allocable to tenants)		Plus costs of the outside area	179,400 Euro
- Management costs	22,194 Euro	Subtotal	6,159,400 Euro
- Maintenance costs	31,125 Euro	Less safety margin	615,940 Euro
- Loss of rental income risk	29,592 Euro	Subtotal	5,543,460 Euro
Total operating expenses	82,911 Euro	Plus incidental building costs	886,954 Euro
In percent of gross income	11.2 percent	Value of the building	6,430,414 Euro
Operating expenses	15.0 percent	Land value	3,120,000 Euro
Stated operating expenses	110,970 Euro	**Depreciated replacement cost value**	**9,550,414 Euro**
Net annual income	628,830 Euro	**Depreciated replacement cost value (rounded)**	**9,550,000 Euro**
Capitalisation rate: 6.00 percent			
Expected return on land	187,200 Euro	Income value / depreciated replacement cost value - 1	6.83 percent
Net income of building	441,630 Euro	The depreciated replacement cost value is only 6.83 percent below the income value (which is less than 20 percent), therefore the lending value is based on the income value (the sustainability of the income generated by the property has not to be double-checked in this case).	
Income value of the building*	7,136,741 Euro		
Land value	3,120,000 Euro		
Income value	**10,256,741 Euro**	**Mortgage lending value (income properties)**	**10,250,000 Euro**
Income value (rounded)	**10,250,000 Euro**	**Value of the cover asset (lending limit 60 percent)**	**6,150,000 Euro**

Source: vdp, presentation DZ BANK, * capitalisation rate 6 percent and remaining useful life 60 years in this theoretical example

Relief for loans falling under the small loan limit

German pfandbrief legislation allows an exception for residential buildings like owner-occupied houses (limit for small mortgage loans, Kleindarlehensgrenze), whereby the law also allows a partial commercial use of the building. If the building is partly used commercially, the share of income from the commercial use may not exceed one third of the total gross income generated from the property if this exception is to be applied. In addition, the volume of the mortgage may not exceed 600,000 euros. If the amount of the land charge (Grundschuld) - taking into account any existing prior ranking mortgage or liens - is not exceeded, then banks may use a simplified procedure to determine the mortgage lending value. The BelWertV acknowledges the use of statistical and computer-aided procedures in the valuation of detached and semi-detached houses as well as owner-occupied flats as a valuation procedure.

Uniform mortgage lending value limit of 60 percent

According to the Pfandbrief Act, only real estate loans within the first-ranking 60 percent of the determined mortgage lending value of a property can be used as cover asset for mortgage pfandbriefe (realkredit). This limit applies regardless of whether the building is residential or commercial. Loans with an LTV of more than 60 percent may be included in the cover pool, but only the first-ranking portion (taking into account any prior ranking mortgages) up to the 60 percent limit is taken into account for the cover calculation, since in the event of the pfandbrief bank's insolvency the pfandbrief creditors' preferential right is limited to these loan parts (soft LTV limit).

Geographical restrictions

In addition to the above-mentioned requirements for the cover assets, there are also geographical restrictions. For example, the mortgages must be located in the European Economic Area, Australia, Great Britain, Japan, Canada, New Zealand, Switzerland, Singapore or the United States of America.

Building insurance is compulsory

The Pfandbrief Act requires an insurance obligation against the risks existing according to the type and location of the building if loans in the cover pool are secured with these properties. After the insolvency of the pfandbrief bank, the insurance benefits the pfandbrief creditors.

c) Ship pfandbriefe

Rights in ships and ships under construction

Loan rights backed by ship mortgages quality to serve as ordinary cover assets for ship pfandbriefe. The loans may only relate to ships or ships under construction which are recorded in a public register. The loan term may not extend beyond 20 years from launch. The regulator may permit exceptions in individual cases. Loans secured by foreign registered ships or ships under construction can only be included in the cover pool under certain conditions defined by the Pfandbrief Act. Ships and ships under construction have to be insured for at least one hundred and 10 percent of the loan's residual sum through the term of the loan.

60 percent LTV and duty to insure

The calculation of the lending value of ships and ships under construction is also subject to explicit rules, including the same 60 percent LTV ceiling for assets that applies to mortgage pfandbriefe. The lending value for ships and ships under construction must be determined by an independent and expert appraiser. The valuation must take account of the ship's permanent long-term characteristics as well as its age and possible uses. The valuation process must include an inspection of the ship. The calculation of the ship's lending value must have regard to the following four market values/prices:

Current market value

- The current market value is an estimate for the price that a ship might fetch in the normal course of business on the valuation date, when both buyer and seller are acting with the requisite prudence and without duress (i.e. no fire sale).

Average market value

- The average market value refers to the average market value fetched by comparable ships over the ten years preceding the year of valuation.

New-build price

- The new-build price is the construction price agreed with the yard plus reasonable standard add-on costs.

Purchase price

- The purchase price is the contractually agreed price for acquiring the ship being valued.

Ship's lending value based on lower of cost or market principle

The ship's lending value may not be higher than the current and/or average market value. If the average market value for the last ten years cannot be established, then additional safety discounts must be applied: either 15 percent (if the average relates to less than ten but more than three years) or 25 percent (if the average is based on three years or less). If neither the current nor the average market value can be determined, then another suitable method must be used, but in this case, the ship's lending value must not exceed 75 percent of the new-build price or purchase price. The ship's lending value should reflect its long-term value.

Aircraft pfandbriefe

Aircraft mortgages which extend to the engines

Loans secured by a right in rem in aircraft (aircraft mortgage) qualify as ordinary cover assets for aircraft pfandbriefe. Only aircraft recorded in a public register are eligible. The registered lien or foreign aircraft mortgage must also cover the engines, which account for a large proportion of the value of an aircraft. As we saw with ship mortgages, the duration of the loan on an aircraft may not exceed 20 years. The regulatory authority can allow exceptions in individual cases. Loans secured by foreign registered aircraft may also be included in the cover pool under certain conditions defined in the Pfandbrief Act. The aircraft must be insured throughout the term of the loan for at least one hundred and 10 percent of the respective loan outstanding.

Independent expert must appraise the aircraft's value

As in the case of property and ship loans, the aircraft loan may not exceed the first 60 percent of the value of the aircraft (aircraft lending value) in order to qualify as cover asset. The underlying lending value of the collateral for aircraft pfandbriefe is also subject to explicit rules defined in a regulation, and these are similar to the provisions governing ships. The aircraft lending value must be determined by an independent expert appraiser. The valuation must focus on the aircraft's long-term features. In contrast to the methodology for identifying the lending values of ships, the process for aircraft essentially focuses on the market price and the average market price in the last ten years along with the plane's value given well-balanced market conditions and in relation to the aircraft's average state (the aircraft's estimated value factoring in its maintenance condition). The lending value shall not exceed any of these three figures. If the average market price of the last ten years is not available, then the value based on the aircraft's average state is assumed to be the lending value, subject to a 10 percent markdown.

e) Other or further cover assets (for all pfandbrief types)

Other cover assets in addition to ordinary cover assets

In order to give the pfandbrief banks more flexibility in managing the cover pools, the PfandBG allows the inclusion of further cover assets in the cover register of pfandbriefe to a limited extent. The claims and receivables eligible for further cover assets are the same for all four pfandbrief types. In principle, the following receivables, among others, are suitable as further cover assets:

Due from central banks and credit institutions ...

- Claims on the ECB and other central banks from the EU or the EEA as well as claims on eligible credit institutions

... and debtors from the public sector

- For mortgage, ship and aircraft pfandbriefe: claims that would qualify as ordinary cover assets for public sector pfandbriefe

Derivatives

- Derivatives that hedge the changes in the value of the cover pool against interest rate and currency risks

Limitation for the present value of payment obligations from derivatives in cover pool

The use of derivatives in cover pool is restricted by the PfandBG. Based on a present value calculation, the share of all payment obligations from derivatives in cover pool in relation to the total amount of pfandbriefe outstanding plus the payment obligations from these derivatives may not exceed 12 percent. This 12 percent limit does not include derivatives used to hedge currency risks. For all derivatives allocated to the cover pool, special requirements apply to the underlying master agreements. Among other things, the insolvency of the pfandbrief bank must not trigger an early termination of the derivatives.

Proportion of other cover assets regulated by law

Rating agencies view it as a strength that the share of claims on other institutions from the same group as the pfandbrief bank is limited to a maximum of 2 percent. Overall, the share of claims on credit institutions as further cover assets is graded according to credit quality (see the figure below). The PfandBG allows a share of further cover assets for mortgage, ship and aircraft pfandbriefe up to a maximum of 20 percent of the outstanding volume of pfandbriefe, with the share of claims against credit institutions limited to a maximum of 15 percent. Should the pfandbrief bank enter more further cover assets into its cover register, no pfandbriefe may be issued against these assets. In the case of mortgage pfandbriefe, ship pfandbriefe and aircraft pfandbriefe, in addition to claims against credit institutions and central banks, assets that qualify as ordinary cover pool assets for public sector pfandbriefe also qualify as further cover assets. In the case of public sector pfandbriefe, the share of further cover assets is generally limited to 15 percent of the volume of public sector pfandbriefe outstanding.

OTHER COVER ASSETS ACCORDING TO THE PFANDBRIEF ACT (OVERVIEW)

1) Up to 8 percent of the relevant pfandbriefe outstanding

- Claims arising from the amounts to be paid to the pfandbrief bank in the event of an early termination of the master agreements for derivatives (with regard to the banks permitted by BaFin on the basis of a general ruling)

2) Up to 10 percent of the relevant pfandbriefe outstanding, taking into account all assets mentioned under 1)

- Claims against credit institions (credit quality step 2)
- Claims arising from the amounts to be paid to the pfandbrief bank in the event of early termination of the master agreement for derivatives (with regard to counterparties tin credit quality step 2)

3) Up to 15 percent of the relevant pfandbriefe outstanding, taking into account all assets mentioned under 2)

- Claims against the European Central Bank, central banks of the European Union or the European Economic Area and credit institution (credit quality step 1)
- Claims arising from the amounts to be paid to the pfandbrief bank in the event of early termination of the master agreement for derivatives (with regard to counterparties tin credit quality step 1)

Source: Pfandbrief Act, presentation DZ BANK

Requirements for the cover calculation

What are the requirements for the cover calculation and overcollateralisation?

Cover at nominal and cash value with a minimum surplus cover of 2 percent

The PfandBG provides for nominal overcollateralisation of the pfandbriefe in addition to the overcollateralisation based on a stressed present value calculation, which must also take into account liabilities from derivatives in cover where relevant. The cover calculation based on the present values of the pfandbriefe is subject to BaFin's supervisory requirements. According to BaFin, the pfandbrief bank must ensure that the pfandbriefe are sufficiently secured by cover assets on a net present value basis, also in stress scenarios. The issuer must ensure an overcollateralisation of at least

2 percent on a stressed risk net present values basis. The overcollateralisation based on the net present value calculation aims to cover the administration cost for the cover pool and the respective cover assets must therefore be suitable for covering the minimum liquidity ratio (LCR-eligible assets). In addition, the cover assets which are used to meet the requirements stemming from the stressed net present value calculation may not be taken into account within the cover calculation on a nominal basis. This de facto increases the nominal overcollateralisation ratio. The nominal value of the minimum overcollateralisation for mortgage pfandbriefe and public sector pfandbriefe is 2 percent. For ship and aircraft pfandbriefe, the legislator has provided for 5 percent.

INTERACTION OF PRESENT VALUE AND NOMINAL VALUE OVERCOLLATERALISATION

EXAMPLE FOR A MORTGAGE PFANDBRIEF: THE CASH FLOWS (LEFT-HAND TABLE) ARE USED TO CALCULATE THE VALUES FOR THE NET PRESENT VALUE CALCULATION, WHICH IN TURN IS USED TO CALCULATE THE MINIMUM FOR THE NOMINAL VALUE OF THE COVER POOL

	Cover pool cash flows	Pfandbrief cash flows
Year 1	2	-2
Year 2	7	-5
Year 3	8	-6
Year 4	5	-4
Year 5	68	-66
Year 6	7	-6
Year 7	8	-7
Year 8	5	-3
Present value (with 2 percent market yield)	**95.3**	**-85.7**

	In Euro	In percent
Net present value calculation		
Overcollateralisation (net present value)	9.6	11.2 percent
Minimum overcollateralisation (2 percent)	1.7	2.0 percent
	In Euro	**In percent**
Calculation of nominal overcollateralisation		
Pfandbrief, volume outstanding	80.0	--
+ minimum nominal overcollateralisation	1.6	2.0 percent*
+ minimum net present value overcollateralisation	1.7	2.0 percent
Minimum value of the cover pool on a nominal basis	**83.3**	**4.1 percent****

Source: DZ BANK, * for mortgage pfandbriefe or public sector pfandbriefe (in the case of ship or aircraft pfandbriefe, the minimum overcollateralisation on a nominal basis would be 5 percent, ** minimum nominal overcollateralisation taking into account the minimum overcollateralisation on a net present value and a nominal basis

The total overcollateralisation is available to the pfandbrief creditors

If risks arise for the recoverability of the cover pool, BaFin can impose a higher individual overcollateralisation requirement on the pfandbrief bank. With this regulation, the supervisory authority can counteract an imminent deterioration of the cover pool if necessary. The provision can have the same effect as an issue ban for a pfandbrief bank. However, in our view, compared with an actual issue ban, the BaFin's power to set a specific overcollateralisation level provides better protection for the interests of pfandbrief creditors. In addition, the Pfandbrief Act makes it clear that pfandbrief creditors shall have a preferential claims over any assets over and above the statutory overcollateralisation or overcollateralisation required by BaFin in the event of the insolvency of the pfandbrief bank.

COMPARISON OF COVERAGE REQUIREMENTS

	Minimum overcollateralisation
Germany (nominal and stressed present value)	
- Mortgage pfandbriefe, public sector pfandbriefe	2 percent
- Aircraft pfandbriefe, Ship pfandbriefe	5 percent
European covered bond directive (CBD)	0 percent*
European capital requirements regulation for banks (CRR)	5 percent**

Source: DZ BANK, * the CBD requires that the costs for the liquidation of the cover pool (after the insolvency of the issuer) are taken into account in the cover calculation, ** under certain conditions, an overcollateralisation of 2 percent is also sufficient in exceptional cases according to Article 129 CRR

Overcollateralisation in stress scenarios

BaFin has defined stress tests in its net present value regulation (Barwertverordnung) that provide for a shift in the relevant interest rate curves and, if relevant, an appreciation and depreciation of foreign currencies. The overcollateralisation of at least 2 percent must also be provided in these risk and stress scenarios.

Does the issuer have to keep a cover register?

Separate cover register for each Pfandbrief type

Yes. All assets serving as cover assets for a bank's pfandbriefe must be entered in a cover register kept separately for every pfandbrief type. This enables the unambiguous identification of the respective cover pool. Details on the form and the necessary contents of the cover register as well as the entries to be made will be precisely determined by a separate legal ordinance.

Is there an independent monitor of the cover pool?

An independent monitor continuously checks compliance with the legal requirements

Yes. A cover pool monitor (treuhänder) and at least one deputy cover pool monitor shall be appointed at each pfandbrief bank to check that the cover register is properly kept and that the pfandbriefe are sufficiently secured in accordance with the pfandbrief legislation. The appointment shall be made by BaFin after hearing the pfandbrief bank. The cover pool monitor shall independently monitor compliance with the statutory and supervisory provisions regarding the cover requirements for the pfandbriefe. The pfandbrief bank may only issue new pfandbriefe or take out assets from the cover pool with the approval of the cover pool monitor.

Extensive information rights

In order for the cover pool monitor to be able to fulfil his duties, he may at any time request to inspect the bank's pfandbrief-related documents and request information on its outstanding pfandbriefe and the values entered in the cover register. The Pfandbrief Act also stipulates that both the cover pool monitor and his deputies must have the relevant expertise and experience necessary to perform their duties.

Transparency requirements

Do issuers have to comply with certain transparency requirements?

Legal standard for mandatory reports

Yes. Every pfandbrief bank is obliged to publish the statutory minimum catalogue of information on the pfandbriefe outstanding and the cover assets in a publicly accessible form once a quarter. The PfandBG requires, for example, that for each pfandbrief type the pfandbrief bank must disclose the total amount of the pfandbriefe outstanding as well as the corresponding volume of the cover pool with respect of the nominal and present value as well as also the risk present value for stressed scenarios. In the case of the risk present value, only the result from the stress scenario leading to the lowest overcollateralisation has to be stated. In addition, the maturity structure (based on the time to the re-set of the interest rates) of the pfandbriefe as well as the cover assets must be listed and broken down according to specified maturity bands. The cover assets and pfandbriefe with a fixed-interest period of up to 24 months are shown in four sections of six months each. This is followed by three maturity bands of one year each up to the fixed-interest period of a maximum of five years. The last two maturity bands are five to ten years and more than ten years. In addition, the potential impact of a possible maturity extension by the cover pool administrator must also be taken into account when presenting the maturity profile of the pfandbriefe. In addition, in order to give investors a sense of any interest rate or currency mismatches that may exist in the bank's pfandbrief business, the transparency rules include the distribution of the cover pool and the pfandbriefe outstanding according to fixed and variable interest rates. In addition, the net present value of open currency positions between cover assets and pfandbriefe must be published (per foreign currency) and the net present value of derivatives in the cover pools must be shown.

GENERAL TRANSPARENCY REQUIREMENTS FOR ALL PFANDBRIEF TYPES

- Information on the cover calculation on a nominal, a net present value and a stressed net present value calculation including the statutory, contractual and voluntary overcollateralisation
- Maturity structure of the cover assets and the pfandbriefe outstanding as well as the conditions for a maturity extension and its effects on the maturity structure of the pfandbriefe outstanding
- Information on the liquidity risk in the form of the largest liquidity gap within the next 180 days (as a cumulative amount of daily cash flows) as well as the day on which this liquidity gap occurs
- List of pfandbriefe outstanding with their international securities identification number (ISIN)
- Information on loans in arrears in the cover pool as well as the proportion of cover assets that are in default in accordance with article 178 CRR.
- Distribution of the cover pool and the pfandbriefe outstanding by fixed and variable interest rates as well as the net present value of open currency positions (separately for each foreign currency) and the current net present value of derivatives in the cover pool.

The extended transparency requirements, which came through the implementation of the CBD into the German law, had to be met for the first time in the third quarter of 2022. The information for the previous year's values had to be published by the third quarter of 2023 for the first time.

Source: Pfandbrief Act, presentation DZ BANK

Information on non-performing loans and geographical distribution

For each pfandbrief type, the total amount of non-performing loans (more than 90 days in arrears) must be stated separately. In addition, the geographical distribution of the cover pool by country must also be published. In this context, information must be provided separately for ordinary and further cover assets.

List of ISIN and the amount of the liquidity reserve

Pfandbrief bank must publish a list of outstanding pfandbriefe with international identification numbers such as the ISIN. Furthermore, the amount of the liquidity reserve in the cover pool resulting from the 180-day liquidity calculation must also be stated.

Special information requirements on mortgage pfandbriefe

The distribution of the real estate loans in the cover pool for mortgage pfandbriefe must be made according to property type and according to the volume of the loan receivables in specified volume classes. For the loans in the cover pool, the weighted average of the term of the loans that has elapsed since the loan was granted (i.e. loan seasoning) must also be published. This figure is not broken down into owner-occupied residential mortgages and commercial property financing, but is reported for all property financing as a whole. In general the seasoning is an interesting indicator especially for owner-occupied home financing. The pfandbrief banks are also obliged to regularly report the average loan-to-value ratio for the cover pool of their mortgage pfandbriefe. Due to the calculation rules for the loan-to-value ratio, this will never exceed the statutory maximum LTV-limit of 60 percent. The PfandBG thus deviates from international standards in this respect. Nevertheless, the ratio remains an interesting piece of information for investors.

SPECIFIC TRANSPARENCY REQUIREMENTS FOR EACH PFANDBRIEF TYPE

- **Mortgage pfandbriefe:** Information on property types, geographical distribution of cover assets (by country), average loan seasoning, average loan-to-value (LTV) and on the distribution of cover assets by loan volume, as well as information on other cover assets.
- **Public sector pfandbriefe:** distribution of cover assets by borrower type (state, region, municipality, others), distribution by direct claims against and claims guaranteed by sovereigns, local governments and other public sector entities and information on export financing, distribution of cover assets by loan volume and information on other cover assets.
- **Ship pfandbriefe:** Distribution of financing by inland and seagoing vessels, geographical distribution of cover assets and information on other cover assets.
- **Aircraft pfandbriefe**: Geographical distribution of cover assets and information on other cover assets

Source: Pfandbrief Act, presentation DZ BANK

Proportion of public sector guaranteed export finance credits must be disclosed

In the case of public sector pfandbriefe, a breakdown of municipal and state loans in the cover pool by borrower type must be disclosed in line with the structure level of the regional and municipal authority. Issuers must also disclose the proportion of export finance credits with a public guarantee in the cover pool. The specific state level (i.e. sovereign, region or municipality) guaranteeing the export financing is not explicitly disclosed. All the claims within the cover pool must be split by size, although the breakdown of the groups of exposure sizes is different from what it is in the case of mortgage pfandbriefe.

Few details in the case of aircraft and ship pfandbriefe

The statutory requirements in the context of transparency rules for aircraft and ship pfandbriefe are less detailed than they are in the case of mortgage pfandbriefe. In the case of ship pfandbriefe, issuers are merely required to disclose whether the ships used as collateral for the mortgage are sea-going or inland waterway vessels. In the case of aircraft pfandbriefe, there is not even a roughly comparable breakdown of the cover assets by type of aircraft. The pfandbrief bank merely has to indicate the share of aircraft mortgages in relation to the cover assets overall. In the case of aircraft and ship pfandbriefe, claims also have to be broken down into the prescribed categories of the volume of the exposures, whereby other categories apply than in the case of mortgage and public sector pfandbriefe.

VOLUNTARY SUPPLEMENTING REPORTS ON TOP OF THE STATUTORY TRANSPARENCY REQUIREMENTS

Minimum transparency requirements according to the Pfandbrief Act

- Ensures the minimum information requirements set out in the CBD

Voluntary cover pool reports, for example in the HTT-format

- A high number of German pfandbrief issuers publish cover pool reports according to international standards on top of the minimum transparency requirements of the PfandBG

Source: DZ BANK, CBD= European covered bond directive, HTT = harmonised transparency template

For years now, the vdp has provided the compulsory disclosures of its member institutions on their pfandbrief programmes in standardised form on its website. Reports can now be found on the vdp's website which conform with an international standard of the harmonised transparency template (HTT) for over half the vdp member banks. The covered bond label initiated by the European Covered Bond Council (ECBC) requests regular reporting within the HTT-format. By far not all German pfandbrief bank carry the covered bond label. But the majority of vdp pfandbrief banks voluntary provide quarterly reports in HTT-format on top of their statutory transparency requirements, even without a covered bond label.

Information can be downloaded centrally from the websites of banking associations

FIRST REPORT UNDER NEW PFANDBRIEF REPORTING ORDINANCE ONLY DUE ONE YEAR LATER THE ORIGINALLY ANNOUNCED BY BAFIN

In addition to the publication obligations pursuant to §28 of the Pfandbrief Act, pfandbrief banks must regularly send the German Financial Supervisory Authority (BaFin) data on their cover assets. The scope of these reporting obligations is governed by the reporting ordinance published in October 2022. Originally, the first report of the pfandbrief banks in the new format was to be made on 30 June 2023. As can be seen from an article on the vdp website, BaFin informed the pfandbrief banks in June 2023 that a first report in the new format may be due one year later (with data as of 30 June 2024). Thus, the supervisory authority seems to acknowledge that the originally set time frame was probably too ambitious after all. According to the article, the reporting ordinance provides for 24 spreadsheets with several thousand data fields, of which a pfandbrief bank only has to provide the information relevant to it of course. For a programme of mortgage pfandbriefe without derivatives, but with foreign business, up to 1,767 data fields might be relevant. In addition to the sheer volume of data, the 2022 reporting ordinance has also expanded the level of detail of the information. In the case of mortgage pfandbriefe, for example, the data on mixed-use properties may not be assigned to the category of their predominant type of use, as is the case with the publication obligations under §28 of the Pfandbrief Act. Within the scope of the reports to BaFin, the information must be provided separately by type of use according to the gross income of the building. This not only involves the distinction of residential and commercial buildings, but also within the commercial category a differentiation into, for example, hotel and office, if the property is used accordingly.

Source: vdp, presentation DZ BANK

Rules for the insolvency of the issuer and existing risks

What happens in the event of the issuer's insolvency?

The cover pools of a pfandbrief bank become pfandbrief banks with limited operations after the insolvency of the issuer. The original issuer remains the legal owner of the cover pool despite its insolvency. After the pfandbrief bank's insolvency, the cover pool is no longer represented by its board of directors but by a cover pool administrator (sachwalter). The competent court appoints up to three natural persons as cover pool administrator at the request of BaFin. The cover pool administrator may also be appointed by the competent court prior to the pfandbrief bank's insolvency, if BaFin deems this necessary. The cover pool administrator shall continue the pfandbrief business independently of the pfandbrief bank's insolvency estate. The pfandbriefe shall not automatically become due and payable upon the commencement of insolvency proceedings against the pfandbrief bank.

Cover pool administrator continues the pfandbrief business

The number of pfandbrief banks with limited operations depends on the number of cover pools of the issuer. If, for example, a pfandbrief bank keeps a cover register for public sector pfandbriefe and one for mortgage pfandbriefe, one "pfandbrief bank

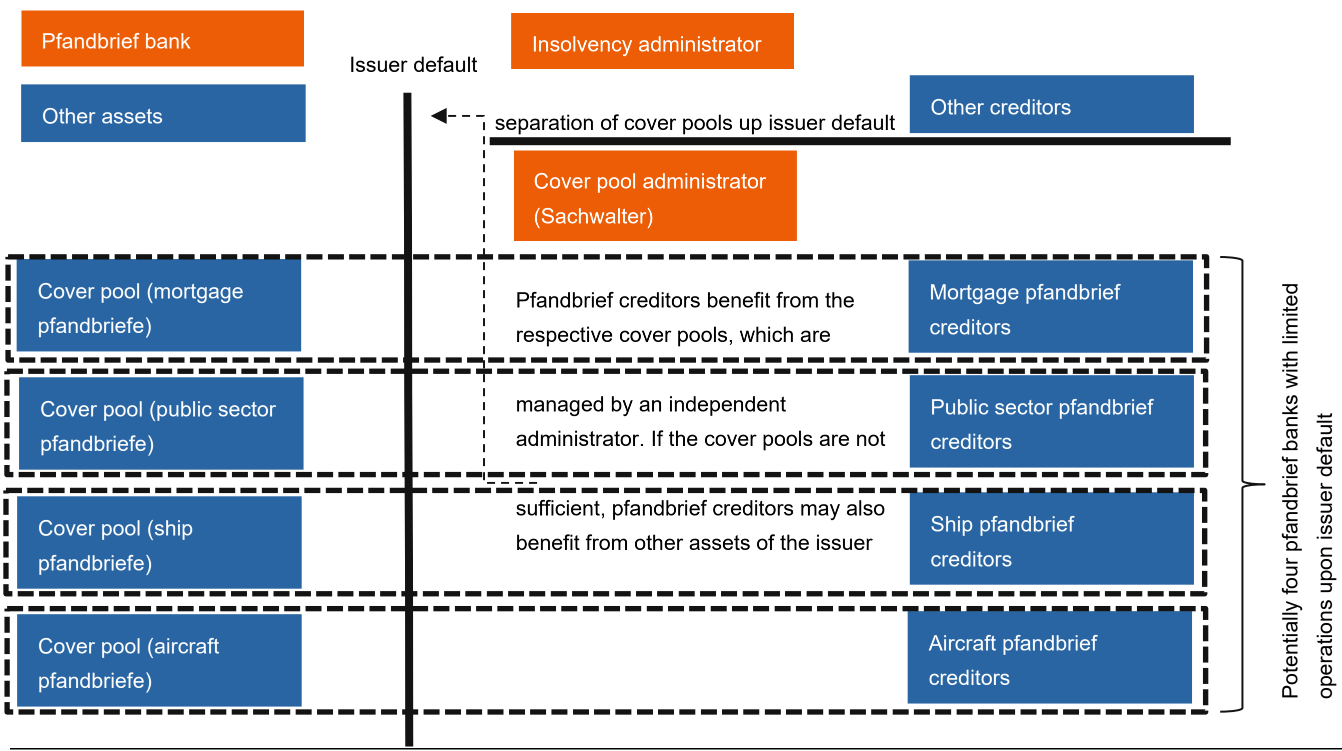
Cover pool administrator can set up advisory board

with limited operations" is created for each cover pool after the insolvency of the issuer, i.e. in the example a total of two. The cover pool administrator may appoint an advisory board (beirat) with up to five members. This body of experts is designed to help and support to the cover pool administrator by advising him on the possibly complicated issues involved in managing the cover pool. The Pfandbrief Act makes it clear that the cover pool administrator and the pfandbrief bank's insolvency administrator are considered equal partners. The pfandbrief bank's insolvency administrator may not challenge acts of the cover pool administrator that the latter performs within the scope of his activities and as port of his or her obligations and duties. The explanatory memorandum to the PfandBG states that this also applies if the insolvent pfandbrief bank's compensation claim against the cover pool is reduced as a result.

Operational risks

The cover pool administrator carries out the legal transactions necessary for the wind-down of the cover pool. A more technical question concerns the operational risks after the pfandbrief bank's insolvency. The Pfandbrief Act makes it clear that the cover pool administrator is entitled to use the pfandbrief bank's staff and operational infrastructure to fulfil all his or her duties. The costs actually incurred are born by the cover pools of the pfandbriefe. In our view the regulations on the cover pool administrator in the Pfandbrief Act are aiming at the operational risks and are attempting to make the management of the cover pools as efficient as possible after the insolvency of the pfandbrief bank.

PFANDBRIEF CREDITORS' PRIORITY IN BANKRUPTCY



Source: vdp, DZ BANK

Appointment of a special representative

If a pfandbrief bank is threatened to become insolvent, BaFin is allowed to appoint a special representative who can later assume the role of a cover pool administrator if necessary. The special representative has information rights only, which are intended to prepare him for the possible administration of the pfandbrief bank with limited operations. This gives the acting persons the necessary time to familiarise themselves with the task of running the cover pool.

Self-administration of the cover pool is a lengthy procedure

If the cover pool administrator determines that the value of the cover assets are no longer sufficient to satisfy all pfandbrief creditors' claims, a separate insolvency proceedings must be opened over the cover pool. In this case, the pfandbriefe would accelerate (i.e. become due and payable) and the cover pool would be liquidated. The proceeds from this would be distributed to the pfandbrief creditors in equal shares (pari passu). The PfandBG also creates the possibility that an illiquid or over-indebted pfandbrief bank with limited operations can be continued by the cover pool administrator within the framework of self-administration. In this case, the insolvency court may – upon BaFin's request – order the cover pool's self-administration as an alternative to opening insolvency proceedings over its assets, if this is in the interest of the creditors. Should the creditors' committee oppose this, the competent court would decide on an ordered self-administration. The liquidation of the assets of the cover pool under self-administration may be more protracted than normal insolvency proceedings, but higher recovery rates may be achievable. The flexibility created by this further option in the event that a cover pool needs to be liquidated is likely to be helpful in avoiding a distress sale due to a forced liquidation of the assets.

Are covered bonds bail-in able?

A bail-in is in theory possible, if minimum coverage requirement were not met

No, German pfandbrief creditors do not participate in any restructuring proceedings of the issuer. However, it is theoretically conceivable that a remaining (unsecured) claim of the pfandbrief creditors due to an insufficient amount of cover assets could be affected by a bail-in. However, this would mean that the pfandbrief bank had not complied with the statutory overcollateralisation (not to mention requirement to have enough cover assets for all its pfandbriefe).

What is the role of the supervisory authority?

Clear responsibilities

The responsibility for the court decisions on the appointment of the cover pool administrator is governed by the general German Insolvency Code. When appointing a cover pool administrator - if necessary even before the pfandbrief bank becomes insolvent - BaFin may propose a candidate. However, the cover pool administrator is always appointed by the competent court, regardless of whether the pfandbrief bank is already insolvent or not.

Is there a special ranking of creditors?

Pfandbrief creditors share the same rank

After the insolvency of the issuer, the pfandbrief creditors benefit from a preferential right of satisfaction with respect to the cover assets. Only the administration costs of the programme would rank ahead of the pfandbrief creditors' claims. Among themselves, the pfandbrief creditors share the same rank with the claims of the derivative counterparties.

RANKING OF CLAIMS AGAINST THE COVER POOL AFTER INSOLVENCY OF THE ISSUER

Claims of the pfandbrief creditors

Receivables of the derivative counterparties

Administration costs for managing the cover pool senior to the claims of the pfandbrief creditors and the derivative counterparties

Source: DZ BANK

What happens after the cover pool has been separated?

Transfer of the cover pool together with the pfandbriefe outstanding to a third-party pfandbrief bank

The cover pool administrator may transfer the entire cover pool or parts thereof together with the pfandbriefe outstanding to another solvent pfandbrief bank. If there is no suitable bank, the cover pools will be wind down in an orderly manner by the cover pool administrator. Only when all claims of the pfandbrief creditors have been satisfied in full can any remaining cover assets be transferred to the pfandbrief bank's insolvency estate and be used for the benefit of the other creditors of the insolvency estate of the bank. The cover pool administrator may also take out bridge loans or sell cover assets in order to meet the payment obligations arising from the pfandbriefe on time.

Further questions in connection with the pfandbrief bank’s insolvency

In the context of insolvency, there are a variety of scenarios through which the recoverability of the cover pool could be threatened. In this context, for example, the following legal issues could arise, which are, however, taken into account in the PfandBG:

Payment moratorium

- Moody's considers it unlikely that a payment moratorium will be imposed on the pfandbriefe after the insolvency proceedings against the issuer has begun. According to Moody's, operational risks could arise if, before the cover pool is separated, the pfandbrief bank is placed under a payment moratorium. In the event that insolvency proceedings are also opened over the cover pool following the insolvency of the issuer, the agency does not rule out a payment moratorium for the pfandbriefe.

Claw-back risk

- The PfandBG ensures that the pfandbrief creditors have a priority claim to the entire cover pool (including the entire overcollateralisation). The pfandbrief bank's insolvency administrator can, however, attempt to reclaim parts of the overcollateralisation. To do so, he must demonstrate to the competent court that these assets will obviously not be necessary to secure the pfandbrief creditors' claims. The hurdles for a possible transfer of cover assets to the pfandbrief bank's insolvency estate are therefore considered quite high. Assets in the cover pool that do not meet the requirements of the Pfandbrief Act are not available to the pfandbrief creditors on a priority basis. This includes, for example, the parts of mortgage loans that exceed the lending value limit of 60 percent. These claims belong to the insolvency estate of the pfandbrief bank.

Set-off risks

- Pfandbrief bank customers who have both cash on deposit at the bank and a loan from the bank could try to offset opposing (or mutual) claims against each after the issuer's insolvency. However, the Pfandbrief Act obviates this potential set-off risk to pfandbrief creditors if for example the pfandbrief bank's cover pool assets are to be netted off against for example (due) deposits held with the insolvent bank. Cover pool assets and liabilities (like pfandbriefe), which are falling due at the same time can, however, be set off.

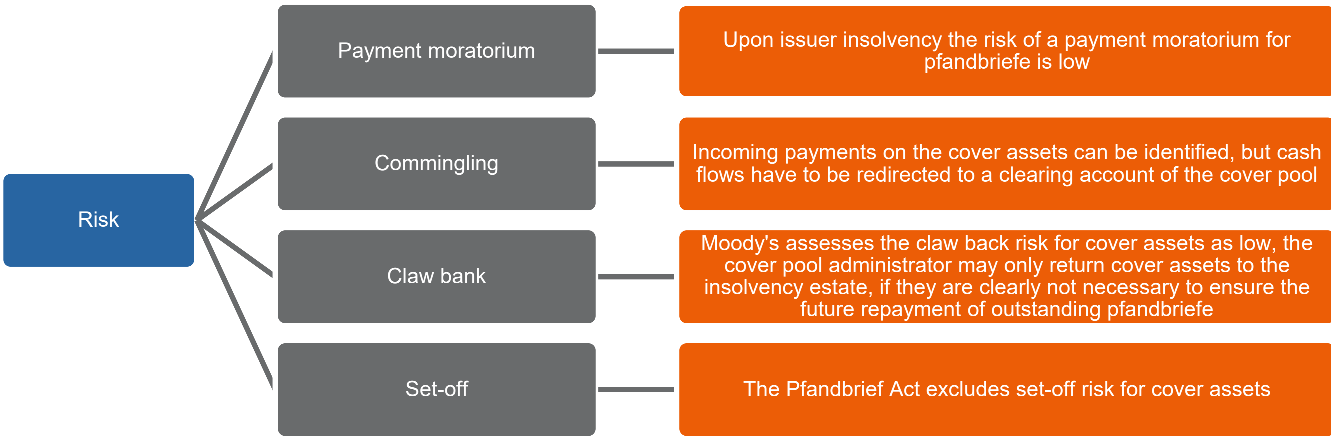
Commingling of cash flows

- It is unlikely to be the norm for pfandbrief banks that all their cover pool related cash flows will be accounted for separately and booked to a separate clearing account even before the insolvency of the issuer. For this reason, the rating agencies point out that there is a risk for the cover pools that, after the insolvency of the issuer, the cover pool administrator might not have direct access to all cash flows into the cover pool. In the worst-case scenario, it could become impossible to separate cash inflows from the bankrupt estate and they could therefore become entirely lost to the cover pool. We believe that this risk is mitigated by the fact that a cover pool administrator can be appointed even before the pfandbrief bank defaults. The administrator would then have the opportunity to initiate appropriate precautionary measures such as the prompt redirection of cash flows.

Protection against residual legal risks

Even though the residual legal risks for pfandbrief creditors in the event of the insolvency of the issuer outlined here as examples cannot be excluded with absolute certainty, there are nevertheless regulations in the Pfandbrief Act which limit these risks and contribute to avoiding them at best. In our view, these are quality features of the legal framework of German pfandbriefe.

SUMMARY OF LEGAL RISKS AND THEIR MITIGANTS FOR GERMAN PFANDBRIEFE



Source: Moody's, DZ BANK

Are covered bonds repaid in the same order as originally planned after issuer insolvency?

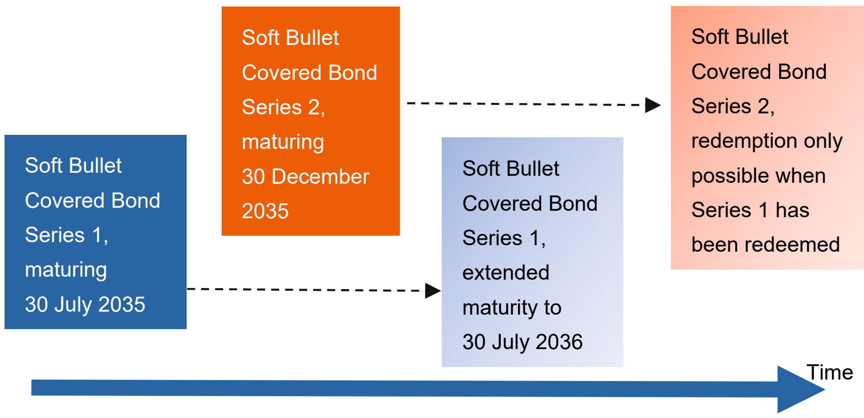
No overtaking

The pfandbriefe do not become automatically due and payable after the insolvency of the issuer. They are redeemed in the original order according to the expected maturity date. The cover pool administrator may extent the maturity of a pfandbrief by up to twelve months. However, the original redemption order must be maintained even if the term of a pfandbrief has been extended (so no overtaking, if the cover pool administrator uses the legal soft bullet). This means that, in our opinion, subsequent pfandbrief may only be repaid once the pfandbrief whose maturity has been extended has been redeemed (see figure below). Theoretically, the extension of a pfandbrief could therefore trigger a cascade of maturity extensions.

As is usual with covered bonds, there is a time subordination

In principle, German pfandbriefe face the problem of time subordination because - as is usual with covered bonds - the pfandbriefe are not automatically due and payable when the issuer becomes insolvent, but are redeemed in their original order. Later maturing pfandbriefe therefore bear the risk that the credit quality or liquidity of the cover pool deteriorate over time. The German covered bond law limits this risk by allowing the cover pool to become insolvent if the cover pool becomes over-indebtedness or illiquid. In this situation, all claims against the cover pool would be called due and the realisation proceeds from the cover assets would be distributed to the creditors (after deduction of costs that rank senior to the covered bond holders) in equal shares.

POSSIBLE MATURITY EXTENSION MUST NOT CHANGE THE ORIGINAL REDEMPTION ORDER OF THE OUTSTANDING COVERED BONDS.



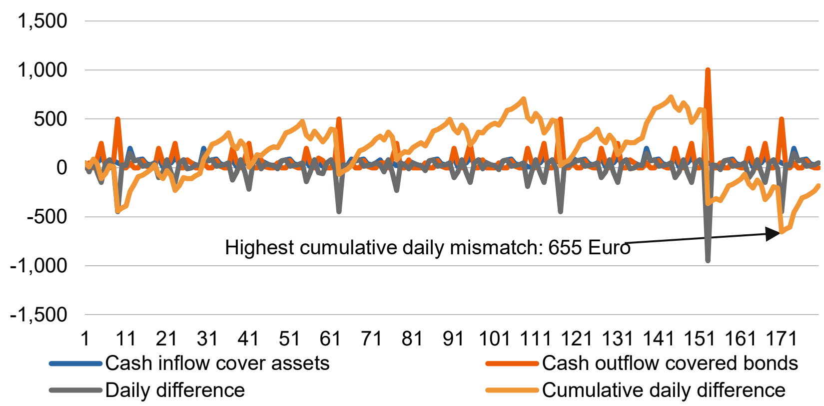
Source: DZ BANK

How is the liquidity of the cover pool ensured after the insolvency of the issuer?

Payments on pfandbriefe for the next 180 days must be ensured

In order to ensure the liquidity of the cover pool immediately after an insolvency of the pfandbrief bank, the PfandBG requires that for the next 180 days the net payment obligations are covered by a sufficient liquidity reserve with the cover pool. For each day, the difference between due payments on the pfandbriefe outstanding and cash inflows into the cover pool has is to be calculated. The largest cumulative liquidity requirement resulting from this calculation must be covered with liquid cover assets such as cash or government bonds.

EXAMPLE CALCULATION OF 180 DAYS LIQUIDITY NEEDS
VERTICAL AXIS: EURO, HORIZONTAL AXIS: TIME IN DAYS



Source: DZ BANK

Example

In the chart above you will find an example that illustrates the liquidity cover requirement of the PfandBG. In this example, the largest cumulative daily difference (the line marked with the arrow) occurs towards the end of the 180-day period and amounts to 655 euros. This amount would have to be available within the cover pool in the form of liquid assets.

Rating analysts focus on liquidity gaps

The provision to ensure liquidity for the first 180 days gives the cover pool administrator room to maneuver directly after the insolvency proceedings started for the pfandbrief bank. Liquidity risks may arise later on during the wind-down process of the cover pools if the maturities of the cover assets are longer than the maturities of the pfandbriefe outstanding. In order to strengthen the liquidity position of the cover pool, the cover pool administrator has the power to extend the maturity of the pfandbriefe outstanding by up to twelve months. The following points are particularly important in this regard:

- A solvent pfandbrief bank cannot unilaterally extend the maturity of its pfandbriefe. Only the court-appointed cover pool administrator is authorised to extend the repayment of pfandbriefe in clearly defined situations.

- The cover pool administrator may extend the redemption including interest payments of a pfandbrief by up to four weeks without giving reasons if, for example, the situation is still unclear shortly after the appointment of the cover pool administrator. However, if the maturity shall be extended by several months, this may only be done if the cover pool does not have sufficient liquid assets to cover an upcoming pfandbrief redemption and the cover pool is not over-indebted and the cover pool administrator must be convinced that the redemption will take place after the extension period. The longer-term extension of the maturity does not apply to interest payments that must continue to be made during the extension period.

- Should the term of a pfandbrief have to be extended at some point, a statutory ban on overtaking applies. This means that other pfandbriefe that mature after the original due date of the extended pfandbrief may only be repaid once the extended pfandbrief has been redeemed (see chart above).

- Interest is also paid on the pfandbriefe during the maturity extension. If the terms and conditions do not include any provisions about the coupon during the extension phase, then the original coupon payments continue to apply. However, issuers may make provisions for coupon payments during a possible extension phase in the bond terms and conditions.

Better safe than sorry: the influence of the soft bullet on the liquidity reserve

In many countries, maturity extensions may be taken into account when calculating the liquidity needs for the next 180 days. This means that no liquidity reserve needs to be built up within the cover pool for the repayment of these covered bonds because the liquidity risk within the covered bond programme is hedged by the application of the soft bullet. In the German PfandBG, however, no use was made of such provision, so that for the rolling window of 180 days a liquidity reserve has to be hold within the cover pool in addition to the soft bullet provisions. The liquidity reserve has there to cover the redemption value of all pfandbriefe within the 180 days window.

Further instruments for liquidity management

In addition to the liquidity reserve and the maturity extension of the pfandbriefe, the cover pool administrator has further instruments to manage the liquidity of the cover pool. In our opinion, these include taking out bridge loans, selling cover assets and transferring cover assets together with pfandbriefe to another pfandbrief bank. Ideally, the cover pool administrator would transfer the entire cover pool together with all associated pfandbriefe to a solvent pfandbrief bank, which would then take over the management of the cover assets and become responsible for the repayment of the pfandbriefe.

Summary of the legal bases

GERMAN PFANDBRIEF ACT COMPARED TO THE MINIMUM REQUIREMENTS OF THE CBD AND ARTICLE 129 CRR

	Germany	European Covered Bonds (Premium)
Covered Bond Type/ Designation	Hypothekenpfandbriefe (mortgage pfandbriefe), Öffentliche Pfandbriefe (public sector pfandbriefe), Schiffspfandbriefe (ship pfandbriefe), Flugzeugpfandbriefe (aircraft pfandbriefe)	Mortgage covered bonds, public sector covered bonds, ship covered bonds
Issuer	Banks holding a pfandbrief license	Credit institutions as defined in point (1) of article 4 (1) CRR
Transaction structure	Integrated model	No specifications, pooling structures possible
Special public supervision	Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin)	Appointment of national authority(ies)
Independent, regular monitoring of the cover pool	✓ (treuhänder)	option (when a monitor is appointed, the CBD sets out the monitor's powers and duties)
Main category of permitted cover assets	Depends on pfandbrief category: mortgage loans, government/municipal loans, ship finance or aircraft finance	Depending on the type of covered bond: mortgage loans, claims against public sector entities or ship financing (defined in article 129 CRR)
Other permitted cover assets	For all pfandbrief types: claims against ECB, central banks and other eligible financial institutions (up to 15 percent), derivatives; In addition for mortgage, ship and aircraft pfandbriefe: claims against public sector entities (up to 20 percent, taking into account the above-mentioned claims)	Cash receivables, HQLA cover assets (high-quality assets), loans to or guaranteed by public sector entities, derivatives
Geographical restrictions for cover assets	Public sector pfandbrief: European Economic Area (EEA), Switzerland, USA, Canada, Japan Mortgage pfandbrief: EEA, Australia, Canada, Japan, New Zealand Singapore, Switzerland, USA Aircraft pfandbrief, ship pfandbrief: no restrictions	Articles 6 and 7 CBD: basically EEA member countries, cover assets outside the EEA are eligible if they comply with the requirements of article 6 CBD
Lending limits (LTV limit)	Residential mortgages: 60 percent Commercial mortgages: 60 percent Ship mortgages: 60 percent Aircraft mortgages: 60 percent	Residential mortgages: 80 percent Commercial mortgages: 60 percent (as exception: 70 percent) Ship finance: 60 percent
Basis for the LTV calculation	Mortgage lending value of the property, ship or aircraft	Market value of the property or ship
Are loan portions above the lending limits also available to covered bond creditors on a priority basis?	✗	Possible (depends on the regulation in the respective national covered bond law)
Special cover requirements	Aggregate claims on a single credit institution may not exceed 2 percent of outstanding pfandbrief volume Present value of derivatives: maximum 12 percent Cap on pool share of non-EEA countries that do not guarantee priority of pfandbrief creditors upon issuer default: maximum 10 percent	In general, nominal value calculation, other cover calculations (e.g. at present value) could be required in addition
Statutory minimum overcollateralisation	2 percent based on a stressed present value basis and 2 percent based on a nominal value basis for public sector pfandbriefe and mortgage pfandbriefe and 5 percent for ship and aircraft pfandbriefe	5 percent (nominal), exceptional case 2 percent
Are cover assets that exceed the statutory minimum overcollateralisation also available to covered bond creditors on a priority basis?	✓	Possible (depends on the regulation in the respective national covered bond law)
Issuance limit for covered bonds	✗	✗ (but possible in principle, depends on the national covered bond legislation)
Cover calculation/ matching requirements and liquidity regulations	Present-value and nominal cover required, issuer must maintain a 180-days liquidity buffer	Nominal cover (basically), other cover principles are possible
Stress test for cover calculation	✓	✗ (not required by the CBD, but permissible)
Special statutory regulations on repayment modalities of covered bonds	✓ (the cover pool administrator (sachwalter) may extend the maturity of the pfandbriefe by up to twelve months under certain circumstances)	✓ (if soft bullets are allowed, the covered bond law must, among other things, provide uniform framework conditions for the triggers for maturity extension)
Independent administrator of the cover pool after insolvency of the issuer	✓ (Cover pool administrator (sachwalter), BaFin may appoint the sachwalter even prior to issuer's insolvency)	Option to appoint a special administrator
Impact of an issuer insolvency on covered bonds	Servicing continues as per issue T&Cs	Servicing continues as per issue T&Cs
Covered bonds are generally exempt from a bail-in?*	✓	✓

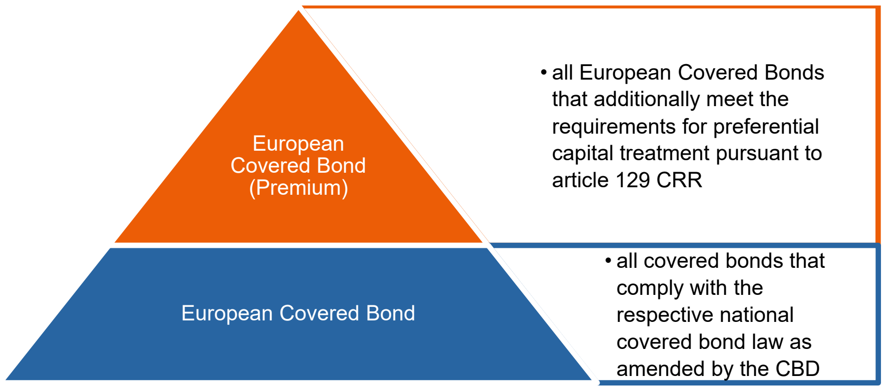
Source: European Covered Bond Council (ECBC), DZ BANK Research, CBD = European Covered Bond Directive, CRR = European Capital Requirements Regulation, ECB = European Central Bank, EEA = European Economic Area, ✓ = yes, ✗ = no,
* unsecured claims of covered bond creditors may possibly be affected by a bail-in,

REGULATORY TREATMENT IN THE EUROPEAN ECONOMIC AREA

European Covered Bonds and European Covered Bonds (Premium)

Covered bank bonds that meet the requirements of the CBD may be referred to as European Covered Bonds. This standard is also referred to in article 52(4) of the Directive on the coordination of laws, regulations and administrative provisions relating to undertakings for the collective investment in transferable securities (UCITS Directive). The famous original UCITS criteria, which can be summarised as (i) secured bank bond (ii) from an EEA country (iii) subject to special public supervision, now only apply to covered bonds issued before 8 July 2022. In the revised UCITS Directive, article 52 refers to covered bonds as defined in article 3 CBD. These are all covered bonds that fall under the national covered bond law of an EEA member state that complies with the requirements of the CBD. In addition, there are the stricter requirements for the status as European Covered Bond (Premium), for which, in addition to the requirements of the CBD, the requirements for a privilege risk weighting (article 129 CRR) must also be met. European supervisory law partly ties in with these quality criteria.

DEFINITION OF THE EUROPEAN LABEL FOR COVERED BONDS

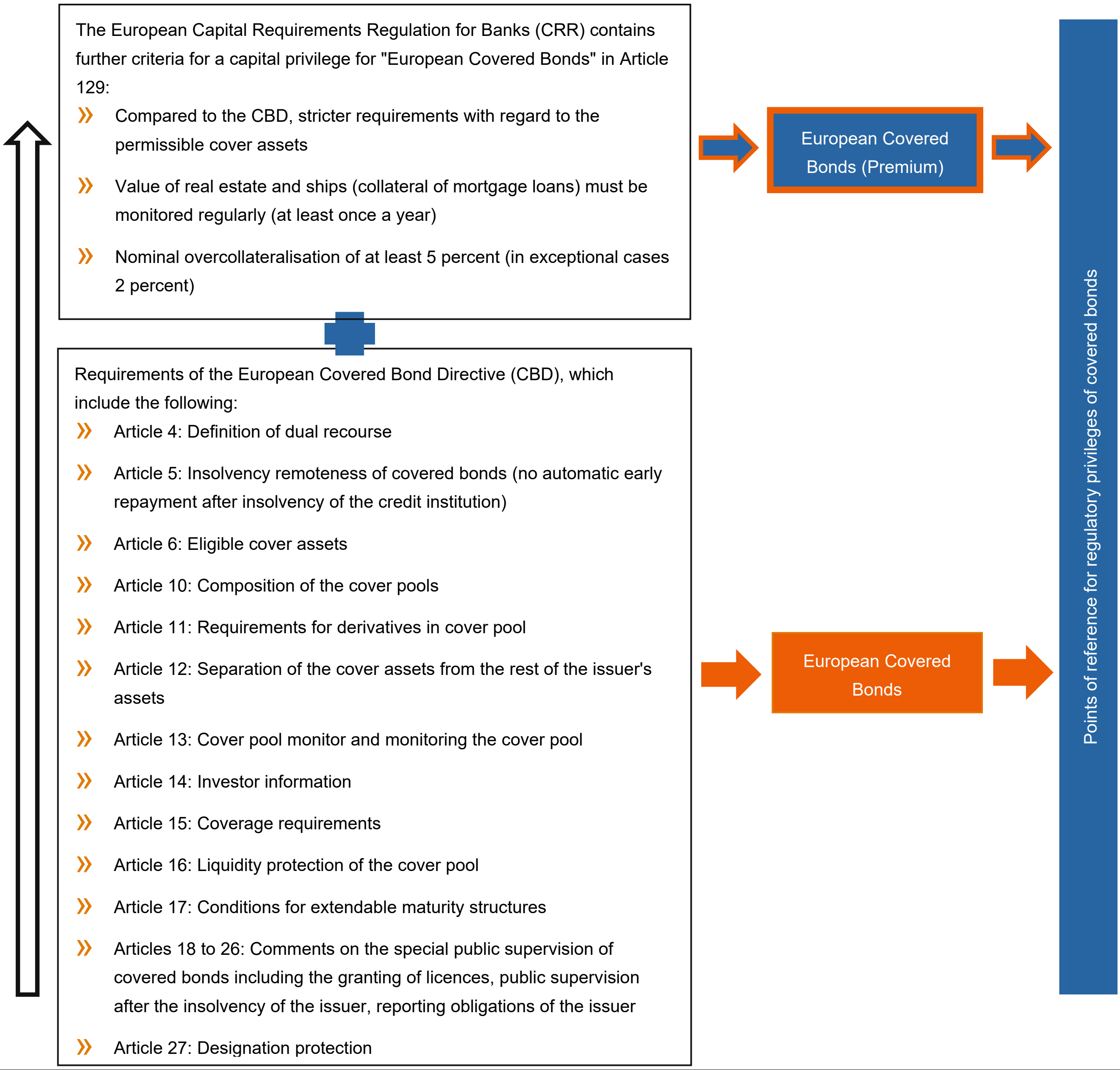


Source: European Covered Bond Directive (CBD), presentation DZ BANK

Grandfathering rules for old bonds

Since July 2022, BaFin has published a list of credit institutions that have obtained a pfandbrief licence on its website. This list shows which pfandbriefe may call themselves European Covered Bond or European Covered Bond (Premium). This designation protection applies exclusively to pfandbriefe that have been issued since 8 July 2022. All pfandbriefe issued before 8 July 2022, on the other hand, may not be designated as such. However, BaFin clarifies that all old pfandbriefe also meet the CBD criteria and that in addition all mortgage pfandbriefe, public sector pfandbriefe and ship pfandbriefe meet the stricter premium standards. This clarification is not unimportant. For covered bank bonds from the European Economic Area (EEA) issued by 8 July 2022, there are grandfathering rules. These mean that old bonds issued by banks from the EEA should retain their previous regulatory privileges. Pfandbrief investors may thus refer to BaFin's official list when it comes to proving qualification for supervisory privileges.

IMPORTANT BUILDING BLOCKS OF REGULATORY PRIVILEGES: EUROPEAN COVERED BOND STATUS AND PREMIUM STATUS



Source: DZ BANK, numerous requirements of the CBD are optional that do not have to be implemented by the EU member states, examples include article 13 (cover pool monitor for monitoring the cover pool) and article 17 (conditions for extendable maturity structures)

All investors: protection against bail-in

Covered bonds do not participate in a possible bail-in

Regulatory privileges contribute to the attractiveness of covered bonds for investors. A very important feature of covered bonds, as explained above, is that they are exempt from bail-in, which benefits all investors. Covered bonds - as collateralised claims against banks - are not reduced in nominal value or converted into equity (bail-in) in the event of a bank restructuring or resolution. Theoretically, there is a risk that covered bond creditors can participate in a bail-in with the part of their claims that is not sufficiently collateralised. However, since by definition covered bonds must always be fully collateralised - and in the case of pfandbriefe even over-collateralised - we consider this risk for pfandbrief creditors to be very low. This case would only materialise, if the statutory cover requirements were not met.

Banks are largest investor group, probably also because of regulatory privileges

In addition to the protection against a bail-in, various investor groups also benefit from special regulatory privileges, which we outline in turn below. Not least because of the regulatory privileges, banks form the largest investor group within the covered bond market.

PRIVILEGES FOR COVERED BONDS: AN OVERVIEW BY INVESTOR GROUP

All investors	Covered bonds do not participate in a bail-in
Banks	Privileged risk weighting/ capital requirements Covered bonds are LCR-eligible Exception in context of the large exposure cap (in Germany, valid until 31 December 2028 at the latest) Basic ECB eligibility of covered bonds of issuers domiciled in the EEA or a G10 country
European Central Bank	Certain covered bonds were purchased under the Asset Purchase Programme (APP) and the Pandemic Emergency Purchase Programme (PEPP)*.
Asset Manager	Undertakings for collective investment in transferable securities (UCITS) may invest up to 25 percent instead of 5 percent of their assets in covered bonds of the same issuer
Insurances	Lower factors in the calculation of spread risks and higher upper limits within the scope of concentration risks under Solvency II

Source: DZ BANK, * Since July 2023, no more covered bonds have been purchased for the CBPP3 portfolio. Covered bond reinvestments under PEPP play only a minor role.

Banks: Do German pfandbriefe meet the requirements for privileged capital backing?

Privileged risk weight, except for aircraft pfandbriefe

In order for banks to be able to consider covered bonds with a privileged risk weighting within the framework of capital adequacy (credit risk standard approach), the covered bonds must fulfil the requirements of article 129 CRR (equivalent to the status of covered bonds as European Covered Bond (Premium)). Since the requirements of article 129 CRR are already taken into account in the Pfandbrief Act, mortgage pfandbriefe, public sector pfandbriefe and ship pfandbriefe issued after 7 July 2022 always benefit from a lower (i.e. privileged) risk weighting on the basis of the German Pfandbrief Act and are also always considered to be a European Covered Bond (Premium). Aircraft pfandbriefe cannot be assigned a reduced risk weight due to their cover assets and therefore are no European Covered Bond (Premium)..

Rating also matters for the risk weight

The specific risk weight also depends on the rating of the covered bond. If no covered bond rating is available, the risk weight for the covered bond can also be derived from the risk weight for unsecured bonds of the issuer. The risk weight for the covered bond in the credit risk standardised approach would then be 10 percent, 20 percent, 50 percent or 100 percent if the corresponding risk weight for unsecured bonds of the bank is 20 percent, 50 percent, 100 percent or 150 percent, respectively.

DERIVATION OF RISK WEIGHTS IN THE CREDIT RISK STANDARD APPROACH FOR PFANDBRIEFE BASED ON EXTERNAL RATINGS

Covered Bond Rating	Credit quality step	Risk weight
AAA to AA-	1	10 percent
A+ to A-	2	20 percent
BBB+ to BBB-	3	20 percent
BB+ to BB-	4	50 percent
B+ to B-	5	50 percent
CCC+ and below	6	100 percent

Source: Article 129 (4) CRR, BaFin, presentation DZ BANK

Banks: Can German pfandbriefe be included as high-quality assets in the LCR calculation?

Basic requirements for LCR capability

Yes. The LCR Regulation provides that European Covered Bonds issued since 8 July 2022 may be used as High-Quality Liquid Assets (HQLA) in the context of the determination of the Liquidity Coverage Ratio (LCR) if, in addition, the requirements of article 129 paragraph 1 letter (c) and paragraph 1a CRR are also met. These CRR regulations deal with claims against other credit institutions that can be part of the cover pool. All German pfandbrief types fulfil these requirements. Pfandbriefe issued before 8 July 2022 are grandfathered.

Bond characteristics have an impact on LCR eligibility

Whether and in which HQLA category (Level 1, Level 2A or Level 2B) the covered bonds can be classified depends not only on compliance with the general requirements mentioned above but also on individual characteristics of the bond or the covered bond programme, such as the rating, the issue volume or the existing overcollateralisation. An indication of the HQLA category of a covered bond with a covered bond label can be found in the issuer directory on the website of the Covered Bond Label. There, issuers (who are members of the Covered Bond Label) have the opportunity to enter the HQLA rating they consider appropriate for each bond.

LCR eligibility also depends on bond rating

There is one more regulation to consider. Aircraft pfandbriefe, mortgage pfandbriefe and ship pfandbriefe qualify in principle as HQLA as long as they are rated at least A3/ A-. Should the credit rating for aircraft pfandbriefe and ship pfandbriefe as well as mortgage pfandbriefe collateralised (in part) with commercial real estate financing fall below this rating threshold, a classification in HQLA category 2B is not possible anymore. Financing for aircraft, commercial real estate or ships is excluded for HQLA category 2B.

POSSIBLE LCR RATINGS FOR PFANDBRIEFE

HQLA level	1	2A	2B
Haircut	7 percent	15 percent	30 percent
Maximum share of the LCR portfolio	At most 70 percent	At most 40 percent	At most 15 percent
Covered Bond Rating (second best rating)	At least AA- (credit quality step 1)	At least A- (credit quality step 2)	No specifications
Bond volume	At least EUR 500m	At least EUR 250m	At least EUR 250m
Cover	At least 2 percent	At least 7 percent	At least 10 percent
Cover assets	CBD-compliant and special requirements for claims against banks	CBD-compliant and special requirements for claims against banks	Only claims against the public sector or home financing with a risk weight of 35 percent or less (according to the Credit Risk Standard Approach)

Source: LCR Regulation, presentation DZ BANK, CBD = European covered bond directive, HQLA = High-Quality Liquid Assets, LCR = Liquidity Coverage Ratio

Banks: Are German pfandbriefe suitable as collateral for refinancing transactions with the ECB?

Law-based covered bonds are ECB-eligible

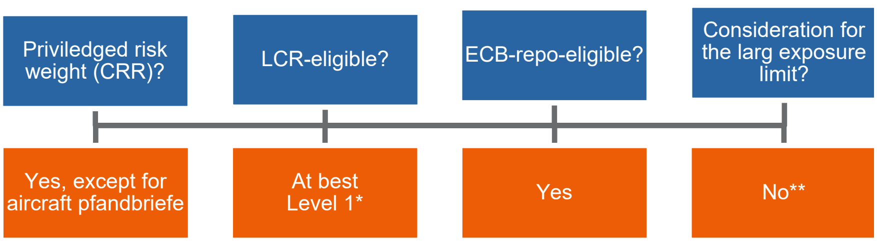
Yes, pfandbriefe or, more generally, a collateralised bank bond based on a special law (structured covered bonds are not ECB-eligible) are in principle suitable as collateral for refinancing operations with the ECB. In this context, the ECB refers to article 52(4) of the UCITS Directive, thereby requiring the standard to be a European Covered Bonds. In addition, the ECB expects a rating of at least Baa3/ BBB- and it applies varying haircuts depending on for example the rating or the maturity of the covered bond. Under certain conditions, banks can also deposit their own covered bonds with the central bank as collateral ("own-use"). In addition to the above-mentioned conditions, the criteria in article 129 (1) to (3b) and (6) and (7) CRR are also relevant. Mortgage pfandbriefe, public sector pfandbriefe and ship pfandbriefe meet these requirements.

Banks: How are covered bonds taken into account under the large exposure limits?

Pfandbriefe are excluded from large exposure limits until 2028

The CRR lists limits for the amount of exposure to individual debtors (large exposure limits). When calculating the risk positions, the CRR grants the EU member states options. In Germany, this option was used in the Regulation Supplementing the Large Exposure Rules, among other things, to exclude covered bonds within the meaning of article 129 (1), (3) and (6) CRR from the limit. According to the Association of German Pfandbrief Banks, this option will continue to exist until 31 December 2028 at the latest.

SUMMARY OF THE ADVANTAGES FOR BANKS THROUGH PRIVILEGED TREATMENT OF PFANDBRIEFE UNDER REGULATIONS



Source: DZ BANK; * Pfandbriefe collateralised with aircraft, commercial real estate or ship financing and with a rating lower than A3/A- are not LCR-eligible ** Regulation in Germany, which, as things stand at present, applies until 31 December 2028 at the longest

European Central Bank: Eligibility criteria for the third covered bond purchase programme?

Own-Use Covered Bonds (bullet format) are CBPP3-eligible

As is well known, the European Central Bank purchased covered bank bonds on a large scale as part of its third Covered Bond Purchase Programme (CBPP3). The CBPP3 portfolio reached its maximum in January 2023 at EUR 304.1bn. Only so-called "own-use covered bonds" qualified for CBPP3, i.e. covered bonds that the issuer itself could deposit with the ECB as collateral. In addition to the own-use criterion, which is linked to the fulfilment of the requirements from article 129 CRR, the covered bonds must also be in a bullet format (i.e. hard bullet or soft bullet). Covered bonds with a conditional pass-through (CPT) mechanism were not eligible for CBPP3.

Asset Manager: What are the regulatory advantages of covered bonds for asset managers?

Higher limits for investments in covered bonds

Asset managers or undertakings for collective investment in transferable securities (UCITS) are subject to many requirements, including limits on how much of the assets under management may be invested in securities of one issuer. For "European Covered Bonds", the UCITS Directive provides that EU Member States may raise in national law the limit set out in article 52 of the UCITS Directive on investments in the securities of one issuer from 5 percent to 25 percent.

ARTICLE 52 UCITS DIRECTIVE (EXTRACTS)

(1) A UCITS shall invest no more than a) 5 percent of its assets in transferable securities or money market instruments issued by the same body and ...
(4) Member States may raise the 5 percent limit referred to in the first subparagraph of paragraph 1 to 25 percent for certain bonds if the bonds were issued before 8 July 2022 and complied with the requirements of that paragraph as in force on the date of issue of the covered bond or if the bonds meet the definition of article 3(1) of Directive (EU) 2019/2162 of the European Parliament and of the Council on covered bonds.

Source: UCITS Directive

Insurance companies: Are there regulatory privileges for covered bonds under Solvency II?

Regulatory privileges under Solvency II

Insurance companies are subject to the European Directive on the taking-up and pursuit of the business of Insurance and Reinsurance (Solvency II). Among other things, it regulates the solvency capital requirements for insurance companies, which are influenced by numerous factors. European Covered Bonds - as long as they are rated at least Aa3/ AA- or better - have regulatory advantages (Solvency II refers to article 52 of the UCITS Directive). When calculating spread risks, covered bonds are subject to less stringent factors, so that covered bonds have lower capital requirements than, for example, corporate bonds. In addition, European covered bonds are subject to higher ceilings than corporate bonds within the limits of concentration risks for insurance companies. Both privileges contribute to the attractiveness of covered bank bonds for insurance companies in the context of the rather complicated calculations under Solvency II.

PFANDBRIEFE REMAIN PRIVILEGED IN THE CARETAKERSHIP LAW

The Ordinance on the Requirements for Collateral and the Investment of Certain Assets (Verordnung über die Anforderungen an Sicherheiten und die Anlage bestimmter Vermögen or Sicherheitenverordnung, SiV) came into force on 1 January 2023. The SiV is related to the new law on caretakership in Germany. Subject to compliance with the legal requirements, a guardian can therefore invest money of a person under guardianship in pfandbriefe if they fall under the Pfandbrief Act. In addition, all European Covered Bonds, i.e. covered bank bonds that meet the requirements of the European covered bond directive also qualify for this investment of money. Prior to 2023, the German Civil Code (Bürgerliches Gesetzbuch, BGB) regulated that pfandbriefe, among others, were gilt-edged (mündelsicher) investments. This status has also been retained for them under the new law on caretakership, whereby this status - and this is new as far as we know - has also been extended to European Covered Bonds from other European countries.

Source: DZ BANK

OUR ASSESSMENT

Adaptability of the German pfandbrief is a strength

The PfandBG ensures a high level of protection for pfandbrief creditor, also in an international comparison. The amendments repeatedly made to the Pfandbrief Act since its creation in 2005 underline the fact that the legislator is endeavouring to react to a changing environment and to adapt the legal regulations for German pfandbriefe in line with the times. This phenomenon is not new. The legislator is merely continuing the course taken since the introduction of the Mortgage Bank Act, even if the frequency of amendments to the Pfandbrief Act has increased compared to the times of the Mortgage Bank Act as of 1899. At the same time, we believe it is a good thing that the legislator is repeatedly putting tried and tested regulations to the test and, if necessary, adapting them to the continuously changing regulatory environment and new market standards.

PfandBG ensures premium status

The changes to the German pfandbrief legislation in 2022 ensure the status of mortgage pfandbriefe, public sector pfandbriefe and ship pfandbriefe as European Covered Bonds (Premium) in the future. This proves that due to the regular adjustments of the pfandbrief legislation, a modern framework is available which corresponds to the current international standards or can even contribute as a model for international standards.

GLOSSARY OF TERMS FROM OVER 250 YEARS OF PFANDBRIEF HISTORY

Pfandbriefe and covered bonds prior to the introduction of the Pfandbrief Act (up to 2005)

Güterpfandbriefe (pfandbriefe on a specific property), pfandbriefe issued by "Landschaften"	Güterpfandbriefe (pfandbriefe on a specific property) were issued at the end of the 18th century by Landschaften (cooperative of noble landowners such as the Silesian Landschaft). Initially, Landschaften were compulsory public-law cooperatives of noble landowners with large estates (Rittergüter) in a particular region (e.g. Silesia or Eastern Prussia). The Landschaften helped their members access credit by issuing pfandbriefe which were then handed out to borrowers and sold on by them to creditors. The Landschaft guaranteed the pfandbriefe which were issued for which in turn all the members (initially) stood as guarantors jointly and severally. The credit framework for each individual member was dependent on the respective earning power of that member's estate who could lend up to half its value.
Pfandbriefe issued by "Stadtschaften"	In the 19th century, "Stadtschaften" also emerged modelled on the Prussian Landschaften. These Stadtschaften were an association including urban house owners among others. The local Stadtschaften were regrouped in the Prussian Central Stadtschaft in order to better coordinate their pfandbrief issues. Looking back, this is a precursor of the pooling idea.
Pfandbriefe issued by "Industrieschaften"	"Industrieschaften" in turn copied the model of the Landschaften and Stadtschaften. They were associations of small and medium-sized enterprises which aimed to provide funding for their members through the issue of pfandbriefe. In the end, however, this precursor of SME covered bonds could not gain a foothold.
Rentenbriefe	Agricultural reforms in Prussia in the early 19th century were aimed at enabling farmers to buy their freedom from compulsory labour and other obligations towards the landowners. However, farmers often lacked the necessary means. A solution to this problem was offered by the Rentenbanken which date from the same time with the issue of tradable "Rentenbriefe" or annuity bonds, which were handed over to the landowners as a form of compensation. The farmers paid interest and principal to the Rentenbanken, with which the latter in turn serviced the Rentenbriefe. Rentenbriefe differ significantly from Güterpfandbriefe in so far as they did not envisage compulsory membership of all farmers in a specific region who would be jointly and severally liable for each other. Farmers were free to decide to sign an agreement with the Rentenbank and were only liable for their own debt to the Rentenbank which in turn were liable to the bondholders. This fundamental innovation was also used by the mortgage banks which sprang up at the same time and gradually also established itself with the Landschaften.
Pfandbriefe issued by mortgage banks under the Mortgage Bank Act (HBG)	In the mid-19th century, mortgage banks developed as limited companies which were allowed to issue pfandbriefe. In general, the mortgage banks lending business was strictly limited and concentrated on property financing. There were also mixed mortgage banks with a broader spectrum of activities. Any pfandbriefe issued always had to be covered to a sufficient degree by mortgage loans. The Mortgage Bank Act was passed in 1899 under the German Reich in order to standardise the legal principles for pfandbriefe; the act came into force on 1 January 1900. The HBG was only replaced by the Pfandbrief Act on 19 July 2005. The trademark "pfandbrief" was first registered in 1930. Rules were approved in 1940 making pfandbriefe gilt-edge instruments.
Public-sector bonds (Kommunalschuldverschreibungen) or pfandbriefe under the Act relating to Pfandbriefe and Similar Instruments issued by Public Credit Institutions (ÖPG)	Mortgage banks have issued municipal bonds (Kommunalschuldverschreibungen) since the end of the 19 century for the purpose of funding loans to the public sector. In this manner, the special credit institutions opened up a new business activity. There were also issuers of municipal bonds which were could be involved in a much broader spectrum of credit activities than the mortgage banks which were regulated by law (including industrial loans). These banks also issued pfandbriefe which became the object of a debate in the 1920s under the heading "Pfandbrief ohne Pfand (or pfandbrief without pledge). Ultimately, this debate led to the Act relating to Pfandbriefe and Similar Instruments issued by Public Credit Institutions (ÖPG) of 21 December 1927 which was replaced from 19 July 2005 by the Pfandbrief Act. Key provisions in the ÖPG are modelled on the HBG. The ÖPG made provisions for matching cover of loans and issued covered bonds, for a cover register to be kept and for the preferential claim of bondholders in the event of a default of the issuer.
Pfandbriefe under the Ship Banking Act (SchBG)	The Ship Banking Act was approved on 14 August 1933; the Act regulated the issue of pfandbriefe backed by ship mortgages; it was replaced by the Pfandbrief Act on 19 July 2005.
Liquidation-gold pfandbriefe (liquidation pfandbrief or Liquidationspfandbrief)	After hyperinflation in Germany had been overcome in 1923, the value of mortgages and bond claims was raised by law, in order slightly to offset the huge losses incurred by bondholders after the devaluation of the currency. The value of pfandbriefe was raised slightly more than that of other asset classes, as a result of which, pfandbrief holders suffered slightly smaller losses. However, pfandbrief issuers were unable to compensate the increase in value of the old issue immediately in cash. Holders of the old pfandbriefe received liquidation pfandbriefe in compensation, which were paid interest and repaid after a few years.

Source: "Der Pfandbrief 1769-2019 - Von der preußischen Finanzinnovation zur Covered Bond Benchmark", presentation DZ BANK

Modern pfandbriefe as per Pfandbrief Act (post 2005)

Aircraft pfandbriefe	Only claims secured by registered liens on aircraft or foreign aircraft mortgages may be used as cover for aircraft pfandbriefe. The legal basis was set out in the Pfandbrief Act in 2009.
Mortgage pfandbriefe	Only mortgages may be used as cover for mortgage pfandbriefe insofar as they meet the requirements of the Pfandbrief Act. They are the oldest type of pfandbrief.
Public sector pfandbriefe	The Pfandbrief Act defines the debtors (public-sector bodies and public institutions) whose claims may be used in the cover pool for public pfandbrief. The term "public sector pfandbrief" was first coined at the beginning of the 1990s and was aimed at making a clear distinction in relation to mortgage pfandbriefe. The terms commonly used before that were "Kommunalobligation" or "Kommunalschuldverschreibungen" (public-sector bonds or municipal bonds).
Ship pfandbriefe	Only loan claims which are secured by ship mortgages may be used as cover for ship pfandbriefe insofar as they meet the requirements set out in the Pfandbrief Act. Today's hip pfandbriefe go back to the pfandbriefe under the Ship Banking Act of 1933.

Source: "Der Pfandbrief 1769-2019 - Von der preußischen Finanzinnovation zur Covered Bond Benchmark", presentation DZ BANK

Market relevant criteria for pfandbriefe

All the pfandbriefe shown in the table below only differ in terms of the format of their issue and are subject to the same collateral requirements. As explained in detail in the section on the Pfandbrief Act, all pfandbriefe of a specific type (e.g. mortgage pfandbriefe) from a particular issuer are collateralised against the same cover pool.

Bearer pfandbriefe	Bearer pfandbriefe are freely tradable securities and can be securitised by a certificate. The transfer of a bearer pfandbrief does not require the prior approval of the issuer.
Registered pfandbriefe	Registered pfandbriefe differ from bearer pfandbriefe in so far as they are issued individually in line with the needs of investor and issued in the latter's name. Consequently, they are not fungible and any transfer to other investors is an onerous task.
Traditional pfandbriefe	Traditional pfandbriefe have an issue volume of under EUR 500m. Unlike in the case of benchmark or jumbo pfandbriefe, there is no market-making on offer involving at least three banks. Other so-called sub-benchmarks also come under this label; these have an issue volume of at least EUR 250m - a relevant issue size for the minimum liquidity ratio. As a rule, this category includes privately placed bonds, among which not least registered pfandbriefe.
Benchmark pfandbriefe	Benchmark pfandbriefe have an issue volume of at least EUR 500m and are placed publicly. The syndicate of banks which manages the placement is committed to quote bid and ask prices on demand, also for the time after the new issue has been launched. Benchmark pfandbriefe with an issue volume of EUR 1bn or over are called "jumbo" pfandbriefe. Benchmark pfandbriefe became popular in the wake of the ECB's first covered bond purchase programme (CBPP1) and were also called "Jumbolinos " at the beginning. Markit includes euro-denominated benchmark pfandbriefe (or benchmark covered bonds) in its iBoxx € Covered Index if they have a minimum maturity of over one year and an investment grade rating.
Jumbo pfandbriefe	The minimum size of jumbo pfandbriefe is EUR 1bn and they are placed publicly. The syndicate of banks involved in the placement of such pfandbriefe are committed to provide bid and ask price, also for the time after the new issue has been launched. Like benchmark pfandbriefe, jumbo pfandbriefe also qualify for inclusion in the iBoxx € Covered Index for example, if they also meet relevant criteria regarding the minimum maturity and rating.
Sub-benchmark pfandbrief	The size of sub-benchmark pfandbriefe is less than EUR 500m but at least EUR 250m. This minimum level is important in the context of rules about the minimum liquidity ratio of banks, because, under certain conditions such as rating, covered bonds with an issue volume of at least EUR 250m can qualify as Level 2A assets.
Foreign-currency pfandbriefe	Typically, pfandbriefe tend to be denominated in euro, the official currency in Germany. However, they can also be denominated in other currencies. Non-euro-denominated pfandbriefe are also called foreign currency pfandbriefe from the German point of view.
Zero-coupon pfandbriefe	Interest is paid for depositing money, and in the case of bonds such as pfandbriefe, interest is in the form of a coupon (fixed or variable rate). For pfandbriefe with a coupon of 0 percent (or a zeron coupon), attracting investors for the money handed over for the duration of the pfandbrief is the difference between the issue price at the time of purchase or issue and the repayment amount at the maturity of the pfandbrief. In view of generally very low interest rates since 2019, situations could arise in which the pfandbriefe are issued above par and repaid at par even though there was no coupon payment during the lifetime of the bond. In such cases, the pfandbrief's (issue) yield is negative. The advantage for investors is merely that other similar forms of investment lead to higher losses.

Source: vdp, DZ BANK

Special repayment agreements for pfandbriefe in last 250 years

Pfandbriefe with termination rights	If the necessary agreements are made at the time of the issue of the bond, issuers can repay their bond before it matures. This termination option has been available for a long time. In the past, it was used to help manage matching maturities between the refinancing of the mortgage bank and its lending business (back then, pfandbriefe with a 50-year maturity were not unusual). Calling partial amounts of the volume outstanding of a pfandbrief was also possible, whereby repayments to individual series were determined by random selection. In the 19th century, there were also pfandbriefe with holder termination rights (to make the pfandbrief more attractive). However, termination rights are no longer allowed in the case of modern pfandbrief holders in order to protect the issuer's liquidity and that of the cover pool.
Redemption pfandbriefe	Under an old rule in the Mortgage Bank Act, for a suitable share of newly issued pfandbriefe, repayment had to begin after one third of the term of the bonds had elapsed. A share of 40% was regarded as appropriate and it could also include pfandbriefe with an original maturity of less than 15 years. This rule was therefore of no practical relevance.
Gold pfandbriefe along with grain pfandbriefe on rye and wheat	In the case of some pfandbriefe dating back from the period of hyperinflation in Germany in the 1920s, the repayment amount of the bond was pegged to the value of a specific amount of gold or grain types such as rye and wheat in order to ensure that the pfandbrief kept its value in real terms. The pfandbriefe were securitised by mortgage loans, as usual.
Bonus pfandbriefe	Bonus pfandbriefe were repaid during their life based on a fixed repayment and bonus plan. In addition to the regular capital repayments, there were annual prize draws in which specific series of outstanding pfandbriefe were identified which then received a bonus payment. The aim of the lottery was to promote the attraction of pfandbriefe against sovereign bonds in order to increase the sale of pfandbriefe. The issue of bonus pfandbriefe was banned in 1871.
Premium pfandbriefe and index pfandbriefe	In the case of premium pfandbriefe, the bonds' redemption value exceeds their nominal or face value. Prior to the introduction of the Mortgage Bank Act, there were pfandbriefe which were repaid with a premium of 10 to 20% against the nominal value upon termination. However, premium pfandbriefe were banned with the introduction of the Mortgage Bank Act. Pfandbriefe with a step-up-coupon, however, are still allowed. In addition, according to the Mortgage Bank Act, indexed pfandbriefe are also permissible for which the redemption value is higher than the nominal value, so long as the maximum redemption value is known at the time of issue.
Existing savers' (Altsparer) pfandbriefe	After WWII, pfandbriefe as well as cash were devalued based on a ratio of 10:1 through the currency reform in 1948 in the western German occupied zone. The gains of mortgage debtors through the devaluation of the loan claims were confiscated by law and put towards the general equalisation of the war burden (Lastenausgleich). Consequently, part of the intrinsic value of the properties underlying the cover pool for the mortgage pfandbriefe as collateral was withdrawn. To offset this, existing savers (i.e. those with holdings at 1 January 1940) received compensation of 10%. Bonds which had been converted and were still denominated in Reichsmark were combined into Altsparerpfandbrief series and were moreover exempt from tax. In exchange for the compensation paid to former investors, the mortgage banks received claims on the state (central government body).

Source: "Der Pfandbrief 1769-2019 - Von der preußischen Finanzinnovation zur Covered Bond Benchmark", presentation DZ BANK

Pfandbriefe with a societal impact

Green pfandbrief	Since 2019, the Association of German Pfandbrief Banks has held the right to the word mark "Grüner Pfandbrief" or "Green Pfandbrief", for which the Association has published minimum standards. Pfandbrief banks wishing to use the "Green Pfandbrief" brand must comply with these minimum standards. So far there have only been Green Mortgage Pfandbriefe, the issue proceeds of which flow primarily into the financing of particularly energy-efficient buildings. Like all other sustainable covered bonds, Green Pfandbriefe also refer to the same cover pool as all other bonds of the same type.
Rentenbriefe	See above under "„Pfandbriefe and covered bonds prior to the introduction of the Pfandbrief Act (up to 2005)"
Social pfandbrief (Sozialer Pfandbrief)	In March 2021, the Association of German Pfandbrief Banks published minimum standards for "Soziale Pfandbriefe" or "Social Pfandbriefe", which - similar to those for Green Pfandbriefe - must be met by issuers if they wish to adorn their bonds with this name.
Social pfandbriefe (Sozialpfandbriefe(	Social pfandbriefe were pfandbriefe and public-sector bonds of which 90 percent of the proceeds were used to promote social housing construction. They were used in the post-war era to alleviate the housing shortage in Germany. Interest on social pfandbriefe was made tax-free in 1952 with the first Act to Promote the Capital Market. These tax-advantaged social pfandbriefe have all been repaid already.
Sustainable pfandbrief	Issue proceeds from Sustainable pfandbriefe are only used to finance public-sector projects or property financings which meet a fairly broad definition of sustainability criteria (environmental, social & governance, ESG). The cover used for these pfandbriefe is the same as in the case of all other bonds of this type.

Source: "Der Pfandbrief 1769-2019 - Von der preußischen Finanzinnovation zur Covered Bond Benchmark", presentation DZ BANK

BOND OVERVIEW

EURO DENOMINATED FIXED RATE COVERED BONDS WITH AN AMOUNT OUTSTANDING OF AT LEAST EUR 250M

Issuer	ISIN	Maturity	Repayment type*	Coupon (in percent)	Amount outstanding in EUR m	Indicative ASW in basis points	LCR category	ESG?
DZ HYP	DE000A161ZL4	27.10.2023	Soft bullet	0.625%	500	20	1	✗
DZ HYP	DE000A2TSD55	29.01.2024	Soft bullet	0.010%	750	-15	1	✗
DZ HYP	DE000A2BPJ45	01.03.2024	Soft bullet	0.125%	500	-7	1	✗
DZ HYP	DE000A13SWZ1	05.06.2024	Soft bullet	0.625%	500	-1	1	✗
DZ HYP	DE000A3MQU94	31.07.2024	Soft bullet	3.880%	250	-19	2A	✓
DZ HYP	DE000A12UGG2	18.09.2024	Soft bullet	1.125%	750	-5	1	✗
DZ HYP	DE000A2AAW12	06.12.2024	Soft bullet	0.050%	500	-3	1	✗
DZ HYP	DE000A14J5C9	26.02.2025	Soft bullet	0.625%	250	19	2A	✗
DZ HYP	DE000A2AASB4	06.06.2025	Soft bullet	0.375%	750	-1	1	✗
DZ HYP	DE000A289PC3	12.09.2025	Soft bullet	0.010%	1,000	-1	1	✗
DZ HYP	DE000A2G9HE4	13.11.2025	Soft bullet	0.500%	1,000	0	1	✗
DZ HYP	DE000A3MQUY1	16.01.2026	Soft bullet	3.000%	500	-5	1	✓
DZ HYP	DE000A161ZQ3	02.02.2026	Soft bullet	0.750%	875	4	1	✗
DZ HYP	DE000A14KKM9	31.03.2026	Soft bullet	0.375%	500	3	1	✗
DZ HYP	DE000A2BPJ78	16.06.2026	Soft bullet	0.500%	500	6	1	✗
DZ HYP	DE000A2AAX45	31.08.2026	Soft bullet	0.100%	500	5	1	✗
DZ HYP	DE000A2AAW53	30.09.2026	Soft bullet	0.500%	500	2	1	✗
DZ HYP	DE000A3E5UY4	26.10.2026	Soft bullet	0.010%	1,000	5	1	✗
DZ HYP	DE000A2TSDW4	15.01.2027	Soft bullet	0.010%	1,000	7	1	✗
DZ HYP	DE000A14J5J4	01.04.2027	Soft bullet	0.500%	750	6	1	✗
DZ HYP	DE000A2G9HD6	30.06.2027	Soft bullet	0.750%	500	7	1	✗
DZ HYP	DE000A2BPJ86	30.08.2027	Soft bullet	0.625%	750	7	1	✗
DZ HYP	DE000A3MQU11	29.10.2027	Soft bullet	3.000%	500	6	1	✗
DZ HYP	DE000A2TSDY0	12.11.2027	Soft bullet	0.010%	500	8	1	✗
DZ HYP	DE000A351XK8	31.01.2028	Soft bullet	3.375%	500	8	1	✓
DZ HYP	DE000A2GSP56	22.03.2028	Soft bullet	0.875%	750	8	1	✗
DZ HYP	DE000A289PA7	23.06.2028	Soft bullet	0.010%	1,000	9	1	✗
DZ HYP	DE000A289PH2	27.10.2028	Soft bullet	0.010%	1,000	10	1	✗
DZ HYP	DE000A2G9HL9	30.01.2029	Soft bullet	0.875%	750	11	1	✗
DZ HYP	DE000A3H2TQ6	20.04.2029	Soft bullet	0.010%	1,000	9	1	✗
DZ HYP	DE000A2TSDV6	29.06.2029	Soft bullet	0.050%	750	11	1	✗
DZ HYP	DE000A3MP619	21.11.2029	Soft bullet	0.750%	1,000	12	1	✓
DZ HYP	DE000A13SR38	18.01.2030	Soft bullet	0.875%	750	11	1	✗
DZ HYP	DE000A3H2TK9	29.03.2030	Soft bullet	0.010%	1,000	12	1	✗
DZ HYP	DE000A3E5UU2	15.11.2030	Soft bullet	0.010%	750	13	1	✗
DZ HYP	DE000A3MP684	30.05.2031	Soft bullet	1.625%	750	14	1	✗
DZ HYP	DE000A3MQUX3	28.11.2031	Soft bullet	2.500%	850	16	1	✗
DZ HYP	DE000A3MQUZ8	30.11.2032	Soft bullet	3.000%	500	17	1	✓
DZ HYP	DE000A3MQU45	31.05.2033	Soft bullet	3.250%	600	18	1	✗
DZ HYP	DE000A2NB841	17.04.2034	Soft bullet	0.875%	500	19	1	✗
DZ HYP	DE000A2TSDZ7	10.11.2034	Soft bullet	0.375%	500	20	1	✗
DZ HYP	DE000A2BPJ60	23.03.2037	Soft bullet	1.375%	250	28	2A	✗

Source: Bloomberg, DZ BANK, ASW = asset swap spread, CPT = conditional pass-through, ESG = pfandbriefe secured by cover assets, which comply with certain environmental, social and/ or governmental standards, LCR = Liquidity Coverage Ratio, ✓ = yes, ✗ = no, spread data as of 02.10.2023, 14:30h

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