

AEGON INSIGHTS

European ABS under the microscope – A comprehensive overview of the asset class

Asset-Backed Securities (ABS) offer an opportunity for investors to enhance return and diversify risk of their portfolio. ABS are prone to minimal interest rate risk as the yields on ABS are partly tied to short-term interest rates (3-month Euribor). Therefore, in the current interest rate environment, ABS can be a valuable source of risk-adjusted returns.

This white paper aims to help investors better understand European ABS as an asset class, including its opportunities and risks.

Introduction

ABS are bonds ('securities') that are covered ('backed') by a specific collateral (a pool of 'assets'), hence 'asset-backed securities'. In general, the underlying pool of assets are loans from one category and one jurisdiction, for example residential mortgages in the United Kingdom, car loans in Germany, student loans in the United States or credit card loans in France. Pooling these loans together into an ABS allow the issuers (banks or other financial institutions) of these loans to access large scale funding in capital markets in a more cost-efficient manner than selling these underlying loans on a stand-alone basis. Furthermore, by selling these pooled loans banks can manage the credit risk exposure on their balance sheet and free up capital for further lending activities. From an investor perspective, pooling these loans in an ABS offers greater diversification and provides liquidity in secondary markets, which is not the case for the loans on a stand-alone basis. In the following sections we will deep dive into the structure, risks, characteristics and opportunities of the European ABS market.

Structure of ABS

ABS are created through a process called 'securitization'. This means that individual loans are pooled together by buying these loans from the original lender and structuring these in a Special Purpose Vehicle (SPV) with the purpose of issuing new securities (bonds). In practice, this happens by selling individual loans that are on the banks' balance sheet to the SPV. The capital required for the purchase of the loans by the SPV comes from the participants in the ABS (the investors). The SPV is therefore the owner of the ABS. Future cash flows are no longer belonging to the original provider of the loans (the bank) but to the investors in the ABS. The risks and



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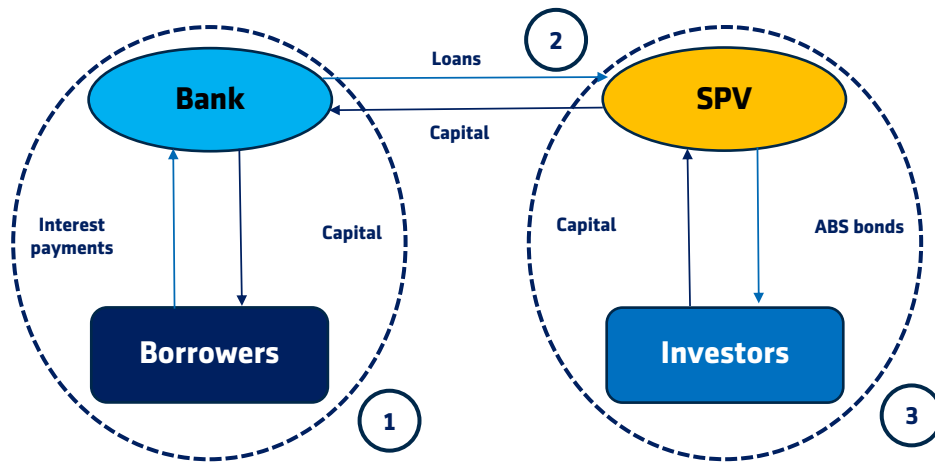


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returns of the underlying loans are passed on by the bank to the ABS investor. The SPV is established as a separate legal entity which isolates the assets in the SPV from the risk and liabilities of the originator (bank). The SPV is therefore considered to be bankruptcy remote. Figure 1 below shows this securitization process schematically.

Figure 1: Securitization process of ABS



Source: Aegon Asset Management (2024).

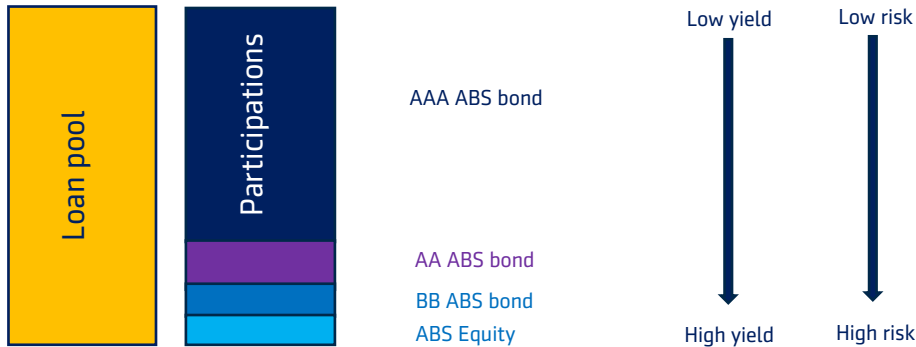
Risk – return profile

The SPV issues ABS bonds from the underlying loan pool according to a pay-through structure, this implies that the cash flows of the underlying loans are paid through to different bonds within the SPV structure. Within the ABS pay-through structure, different bonds are issued which differ in their creditworthiness (senior, mezzanine, equity), interest compensation, credit risk, maturity profile, etc. The SPV typically issues different ABS bonds that vary strongly in their risk and return profile as is shown in Figure 2. It is common to speak about ‘tranches’ when referring to these different ABS bonds. By issuing ABS bonds with different risk-return profiles, it is possible to issue an ABS tranche with an AAA credit rating, higher than the average credit rating of the underlying loans. This can be achieved by issuing so-called mezzanine tranches with a subordinated position (and therefore a lower rating), as well as an equity or first-loss tranche. These tranches run significantly more credit risk, as a big portion of the risk of the underlying loan pool is shifted towards these tranches. The yields on the various ABS bonds in the structure are determined by the entitlement to cash flows resulting from the underlying loans and the extent to which losses on the underlying loans are incurred, the so-called cashflow waterfall.

In essence, the coupon on ABS bonds is tied to a floating and fixed component, namely the short-term interest rate (i.e. 3-month Euribor) and a fixed spread depending on the amount of credit risk. This credit spread or premium is established when the ABS bond is issued but may vary due to market conditions. The ABS bonds issued in the European market typically have a floating interest rate, although the interest rates on the underlying loans might be of a fixed nature. The interest rates on ABS bonds are constructed to be floating by using derivatives (i.e. interest rate swaps) in the SPV structure.

*The SPV is
bankruptcy
remote in the
securitization
structure*

Figure 2: Illustration of ABS pay-through structure



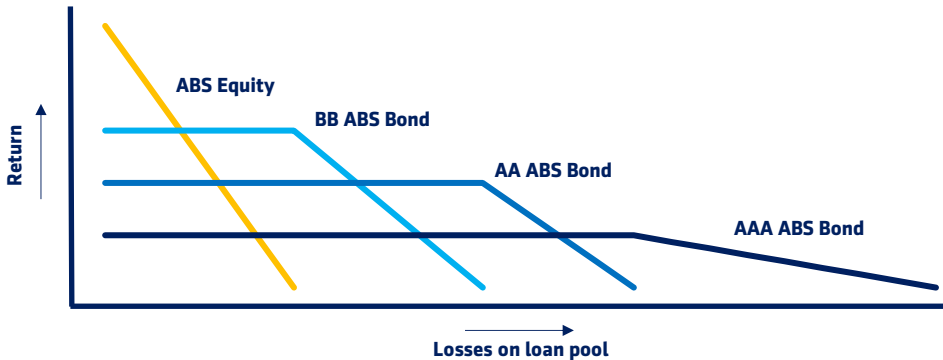
The most senior tranche will always be the largest in ABS issue

Source: Aegon Asset Management (2024).

In terms of yield potential, the equity tranche has the highest return, but it must also absorb the first losses. These losses occur when the underlying loans cannot be repaid by the borrowers. If the losses are such that they are higher than the equity tranche, the remaining losses are absorbed by the mezzanine tranches (the subordinated positions). Only when these mezzanine tranches are fully written off, the senior tranche (highest rated bonds) needs to bear the residual losses. Therefore, the lower the rating of a tranche in an ABS issue, the earlier the tranche must absorb losses. The flip side is that the lower rated risk tranches offer a higher potential return (yield compensation). Payments of the underlying collateral towards the different tranches in an ABS issue, in the form of interest and principal, follow a predetermined schedule that prioritizes payments to senior bonds over that of subordinated bonds. The payment schedule of an ABS issue is explained in official documents upon issuance of an ABS, commonly known as the cash flow waterfall. Figure 3 below, depicts the distribution of cash flows and losses of the various ABS bonds in an issue. In general, the most senior tranche will always be the largest tranche in the ABS issue. Depending on factors like the quality of the collateral, the extent of credit enhancement and other risks, the ABS bonds are assigned a credit rating. In the section “risk profile ABS” the concept of credit enhancement techniques within the ABS structure will be further discussed.

Scenario analyses are used to determine under which scenarios an ABS bond is able to meet its obligations for timely interest payments and ultimate principal payoff. In the ABS market, the investor can thus make a well-informed choice about the desired risk-return profile. For example, the investor can choose a safer investment by purchasing the AAA tranche, but if the investor has a positive opinion on the underlying collateral and considering the expected economic scenarios, a lower-rated tranche can be selected for which the potential return is higher because of the higher risk. In this way, an ABS investor can select the risk tranche that suits their specific risk-return profile. The information that is available to investors includes a wide variety of metrics like the deal structure, the extent to which tranches are protected against losses in the underlying loan pool but also on the underlying loans themselves. For example, the types of mortgages, LTV ratios or the geographical distribution of the borrowers. Other relevant data can include information about the age, income and other debts of the borrower. Based upon this detailed information at the individual loan level, it is possible to carry out solid research on the creditworthiness of the ABS bonds in an ABS issue.

Figure 3: Illustration of losses on ABS depending on tranches



Source: Aegon Asset Management (2024).

Types of ABS and their characteristics



- Residential Mortgage-Backed Securities (RMBS) are ABS securities with a underlying pool of residential mortgage loans
- RMBS represent the majority of the European ABS market with nearly 50% of the European ABS outstanding and are issued in numerous countries
- Typically, upon default of an underlying loan, recoveries are considered to be higher as the underlying collateral are secured by houses which can be seized and sold upon default of the borrower
- RMBS are generally tied to 1 specific jurisdiction/country as the mortgage market differs widely between jurisdictions
- Relative to other ABS types, RMBS have longer durations as the repayment scheme of mortgages is generally longer



- Commercial Mortgage-Backed Securities (CMBS) are commercial mortgage loans secured by real estate collateral
- Typically, CMBS cover a smaller part of the European ABS market and are more concentrated in certain jurisdictions like the United Kingdom
- Compared to RMBS, CMBS are considered to be riskier, have higher yields and provide less diversification as the number of loans in the pool is more limited
- CMBS generally have penalties in place that restrict the borrowers from prepaying the loans during the duration of the loans, thus ensuring the cash flows received by investors
- CMBS tend to be more exposed to loss clustering which implies that the credit risk on the underlying loans in the pool generally move together.



- Consumer ABS is an overarching category that consists of auto loans, credit card loans, student loans, etc.
- Auto ABS represent a considerable part of the European ABS market whereas Credit Card ABS are more concentrated in certain jurisdictions. Student loans are mainly tied to the US market.



- Auto ABS and Credit Card ABS typically have relatively short durations caused by the shorter repayment schemes of the underlying loans



- Typically, yields are higher for Consumer ABS compared to RMBS
- Credit Card ABS have no security tied to the underlying collateral; in case a borrower is unable to fulfill its payments, Credit Card ABS are therefore said to be unsecured. The same accounts for Student loans. The debt of borrowers is not dischargeable, so if a borrower defaults in the loan pool, there are some options to recover some of the outstanding debt payments.
- The vehicles in Auto ABS serve as collateral, dependent on re-sale prices of the vehicle, losses are incurred when the borrower is unable to meet its payments



- Collateralized Loan Obligations (CLOs) are pooled corporate loans which mostly encompass corporates in the sub-investment grade segment. Generally, these loans are leveraged, implying that the loans are extended to companies which already have a significant amount of debt.
- Typically, CLOs are considered to be the higher-risk ABS segment with higher yield. In accordance with the higher expected risks for the underlying collateral, there is a higher probability of default.
- CLOs are mostly issued as European mixed, the underlying loan pool consists of corporate loans from several European countries. CLOs allow for some diversification among industries and countries, mitigating concentration risk in the loan pool.
- In ABS investment strategies, CLOs are typically added to enhance the return-risk profile.



- Small-Medium Enterprise (SME) ABS are like CLOs, corporate loans, but are typically granted to companies with smaller scale operations. The size of these enterprises is mostly determined by the number of employees and annual revenue.
- SME ABS include varying types of financing, including term loans, lines of credit, equipment financing, etc.
- SME ABS are generally considered to be less risky than CLOs because of the nature of the loans (i.e., not leveraged)
- SME ABS are issued in several European jurisdictions/countries and do not represent a large share of the total issuance in the European ABS market

The interest rate risk for ABS is substantially lower than for sovereign or corporate bonds

STS ABS: A capital-efficient solution for European insurers

With the introduction of the new legislation on securitization of 2019 by the European Union, a new framework was established. This framework enabled the issuance of so-called 'Simple, Transparent and Standardized' ABS, commonly abbreviated to STS ABS. This framework was introduced to increase investment activity in ABS by insurance companies and banks while providing reliability in the securitization process. Following the introduction of the Solvency II regulations, many insurers were effectively driven out of the ABS market as the capital charges on ABS were relatively high. With the introduction of STS ABS, the capital charges under Solvency II were significantly lowered, this is especially the case for ABS bonds with a lower credit rating which benefited the most. The yield pick-up compared to government bonds for highly rated ABS and the lower capital charges, makes STS ABS an attractive opportunity for insurance companies. Since the inception of STS ABS, the issuance has been relatively stable at +/- €70 billion a year.¹

Risks for European ABS and how to mitigate them

Investing in ABS entails a number of risks that often correspond with the risks an investor faces on other fixed income investments, like interest rate risk, credit risk, concentration risk and liquidity risk. Although there are similarities in the types of risks between ABS and other fixed income classes, the extent of those risks differs. Furthermore, ABS entails certain unique risks which are important to investors in ABS. This section will discuss these common and unique risks of ABS.

Interest rate risk

As touched upon in an earlier section of this paper, the ABS bonds are characterized by variable interest rate payments. The floating rate coupon on an European ABS bond that the investor receives is made up of two components, the 3-month Euribor (floating) and a spread (fixed) compensating for the credit risk. The coupon on an

¹AFME, Securitisation Data Report Q4 2023 (Mar 2024). Available at: [Securitisation Data Report Q4 2023 & 2023 Full Year | AFME](#)

ABS bond is periodically reset, typically quarterly, and reflects the floating nature of an European ABS bond. Moreover, the periodic adjustment of the interest rate in the coupon of an ABS bond implies that an ABS bond has a very low interest rate sensitivity (duration). The only interest rate sensitivity an investor faces is tied to the length of the reset period. By contrast, sovereign and corporate bonds often have fixed interest payments (fixed rate coupons). This makes the interest rate risk of ABS substantially lower than for sovereign or corporate bonds. However, in combination with interest rate swaps, ABS can be used as part of the interest rate hedging portfolio of institutional investors such as pension funds and insurance companies. In this way, ABS can still fit into a matching portfolio of an investor.

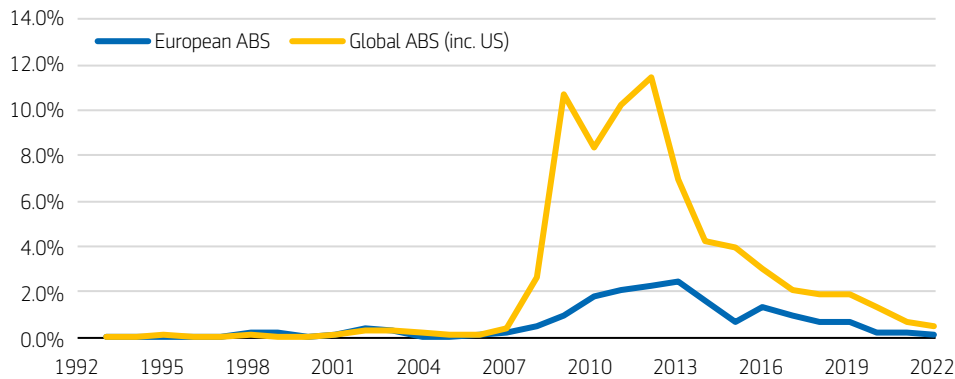
Credit risk

A distinct feature of ABS is that the credit risk is not solely caused by exposure to countries or companies, but predominantly by consumers. Credit risk for an ABS bond refers to the degree to which a borrower in the underlying loan pool is able to meet its payment obligations in a timely manner. The periodic payments from the ABS bond an investor receives, consist of two components, the coupon or interest rate on the loan and the principal. It is common for ABS bonds to be amortizing, which differs from traditional fixed income asset classes like corporate and sovereign bonds. This does not account for all types of ABS like CMBS, as this type of ABS generally has balloon payments. The extent to which borrowers in the loan pool can meet their payment obligations is reflected in the spread or credit risk premium on ABS bonds. Therefore, the underlying collateral base and quality of the loans in the pool accounts for a substantial portion of the credit spread. If the spread on ABS bond rises, the price of the bond will fall. In this case, the perceived credit risk on the ABS bond increases as investors demand higher compensation for the increase in risk.

As discussed in the section on the structure of ABS, the credit risk of an ABS bond is determined by its tranches and waterfall structure which allocate cash flows among different priority levels. Senior tranches have lower credit risk, as they receive payments before subordinate tranches which are more exposed to losses.

Senior tranches have lower credit risk, as they receive payments before subordinate tranches.

Figure 4: 1-year ABS default rates 1993-2022



Source: S&P Global Ratings Direct, Structured Finance report 2022. (April 2023).

When the loan payments in the underlying loan pool are insufficient to satisfy the expected cash flows on the ABS bonds and the structural provisions in place are also not sufficient to prevent losses, the ABS bonds are considered to be in default. Depending on the losses, this will first affect the equity tranche, then the subordinated tranche and so forth up to the senior tranche. Rating agencies assess the credit quality of the ABS issue and assign a corresponding rating. In Figure 4, the 1-year default rates are shown for a 30-year period. European ABS have a significantly lower default rate than Global ABS and in particular US ABS, this is especially evident for the period of the Global Crisis. Typically, the strong performance of European ABS is driven by the high-quality collateral and strong structural protection for investors in European ABS structures.

Concentration risk

The European ABS market is very diverse, in regard to the type of ABS (i.e. RMBS, Consumer ABS, etc.) and the jurisdictions/countries where these ABS are issued in. This allows investors to invest in a diversified portfolio of ABS securities and minimize concentration risk. In particular, RMBS are issued in many jurisdictions and make up the largest segment in the European ABS universe. Other types of ABS like Consumer ABS, SME loans and CMBS are more concentrated in certain jurisdictions. Consumer ABS are for example more concentrated in countries like Germany, The United Kingdom, France and Italy. CMBS are mainly issued in the United Kingdom. Typically, CLOs are issued as European-mixed and provide some sort of natural diversification among countries.² A more comprehensive overview of the ABS issuance and geographical distribution is given in the next section on the characteristics of the ABS markets and in the appendix.

Liquidity risk

Regarding the liquidity of European ABS, ABS proves to be highly liquid. The investment grade segment of European ABS tends to be more liquid than corporate credits and equally liquid compared to covered bonds. AAA-rated European ABS bonds are the most liquid.³ The sub-investment grade European ABS segment has typically lower liquidity corresponding to the smaller issue sizes. Furthermore, transactions costs of ABS have declined over the past 10 years, although transactions cost spiked during the corona pandemic.

Prepayment risk

Prepayment risk arises from borrowers returning a part of the principal of their loans before the scheduled maturity, thereby lowering their interest payments on the remaining outstanding principal. This is particularly evident for mortgage-based ABS. The consequence of prepaying loans for investors is that they are paid back at a faster rate which shortens the effective duration of the ABS bond. Prepaying loans distorts the expected cash flow of ABS bonds and makes an investor prone to reinvestment risk as the proceeds from the bond have to be reinvested earlier than expected. Secondly, borrowers tend to prepay in a declining interest environment when they are able to refinance their loans at a lower interest rate. In this case, an investor also faces lower interest rates and consequently lower yields on reinvested capital. The opposite applies to an increasing interest rate environment, no or little prepayments can be expected in such a situation. Senior tranches in ABS structures are the most impacted by accelerated prepayments due to the cash flow waterfall principle.

The European ABS market is very diverse, in regard to the type of ABS and the jurisdictions/countries these ABS are issued in.

²AFME, Securitisation Data Report Q4 2023 (Mar 2024). Available at: [Securitisation Data Report Q4 2023 & 2023 Full Year | AFME](#)

³AFME, Comparing CB, ABS and Corporate Bond Liquidity (Nov 2022). Available at: [Comparing CB, ABS and Corporate Bond Liquidity | AFME](#)

Risk mitigation and credit enhancement in ABS

Besides the aforementioned tranche structure and the accompanying waterfall mechanism for ABS issues, there are several other structures in place that enhance the credit quality of the ABS issue. These credit enhancements provides an investor in ABS with protection and cushioning against losses on the underlying loan pool. Furthermore, it enables the bonds in the ABS issue to achieve higher credit ratings. Typically, a distinction is made between internal and external credit enhancement mechanisms. Although there are several credit enhancement mechanisms, the focus will be on some key concepts regarding credit enhancement.

Skin in the game

In 2019, the European Union introduced new legislation, the so-called EU Securitisation Regulation Act, which set out a standard for future securitizations in the EU. According to this new legislation, the originator of the loans who sells the loans to an SPV, needs to retain a minimal of 5% (a so-called 'net material economic interest') in the ABS issue.⁴ In this way, risk is retained by the issuer of the underlying loans in the pool, which is commonly called "skin in the game". The rationale behind this mechanism is that it aligns the interests of the originator with that of the investors and prevents originators from inattentive securitisation processes. In practice, originators retain even more than 5% of the total outstanding ABS issue on their balance sheet which is mainly driven by the capital requirements that banks and other financial institutions face.

Overcollateralization

One of the most commonly used credit enhancement technique is overcollateralization. This encompasses the process in which the value of the loans that are transferred to the SPV is higher than the value of the issued ABS bonds in the SPV. The excess amount or "overcollateral" is used to absorb losses on the underlying loan pool. Typically, the excess amount, is not allocated to the tranches on a pro rata basis but is mainly used to protect the senior tranche bonds. So, there is some sort of prioritization. Overall, the overcollateralization is meant to enhance the credit quality of the whole ABS issue, in practice this enables the SPV to issue AAA-rated ABS bonds in the senior tranche. In the case of losses, investors are better protected when the ABS issue uses overcollateralization, especially for the senior tranche and to a lesser extent for the subordinated tranche.

Excess spread

The excess spread technique refers to a process where the weighted average coupon on the loans in the underlying pool is in excess of the weighted average cost of capital on the issued ABS bonds including periodic expenses. The excess spread is used to absorb losses in the underlying loan pool, as in the case of overcollateralization, the excess spread is mainly used to safeguard the credit quality of the senior tranche. If the excess spread is not used to cover losses, the excess spread can be put in a reserve account to cover future losses. Whereas overcollateralization focuses on the underlying collateral, excess spread focuses on the protection of cash flows to investors.

The rationale behind "Skin in the game" is that it aligns the interests of the loan originator with that of the investor in ABS.

⁴ESMA, Article 6 Risk Retention (2019). Available at: [Article 6 Risk retention | European Securities and Markets Authority \(europa.eu\)](https://www.esma.europa.eu/press-news/esma-news/article-6-risk-retention-european-securities-and-markets-authority).

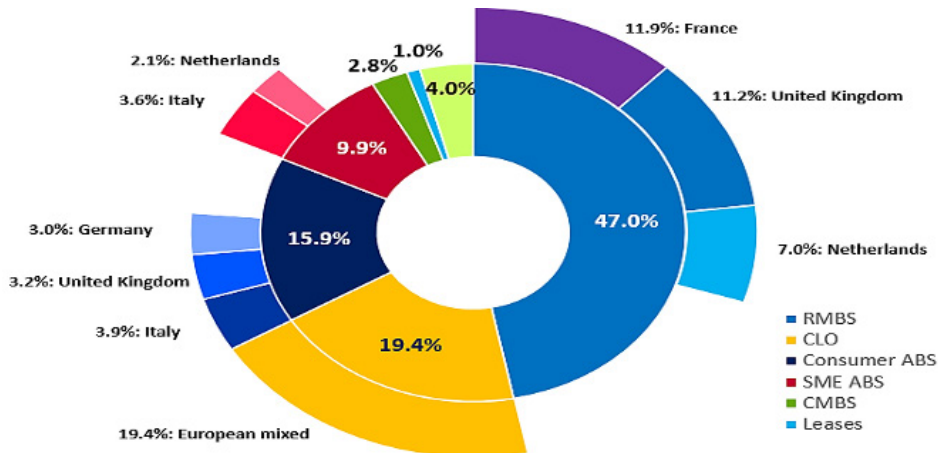
The techniques listed above are examples of internal credit enhancement techniques. External credit enhancement encompasses the use of credit default swaps, letters of credit, bank guarantees, etc.

Characteristics of the European ABS market

The European ABS market makes up a sizeable part of the overall European bond market. The total outstanding European ABS is €1,181 billion as of Q4 2023⁵, compared to €8,571 billion for the European government bond market⁶ and €2,590 billion for the European investment grade corporate bond market⁷. The total outstanding European ABS market can be divided into several sub-categories, the sub-categories are defined as discussed in the previous section. The categories considered are RMBS, CLOs, Consumer ABS, SME ABS and CMBS. Consumer ABS encompasses auto loans, credit card loans and student loans.

RMBS are the largest segment with 47% of the total European ABS outstanding.

Figure 5: European ABS outstanding by category and top-issuing countries



Source: Aegon Asset Management, AFME: Securitisation Report Q4 2023, (Mar 2024). Available at: [Securitisation Data Report Q4 2023 & 2023 Full Year | AFME](#)

Figure 5 shows the relative size of the sub-categories constituting the European ABS universe. RMBS are the largest segment with 47% of the total ABS outstanding. This segment comprises a wide variety of European countries although France, The United Kingdom and The Netherlands form a sizeable share of the RMBS market of around 30%. CLOs and Consumer ABS make up another substantial part of the total European ABS outstanding. CLOs are typically issued as European mixed and consist of corporate loans to companies throughout Europe. The appendix shows a more detailed breakdown of the sub-categories.

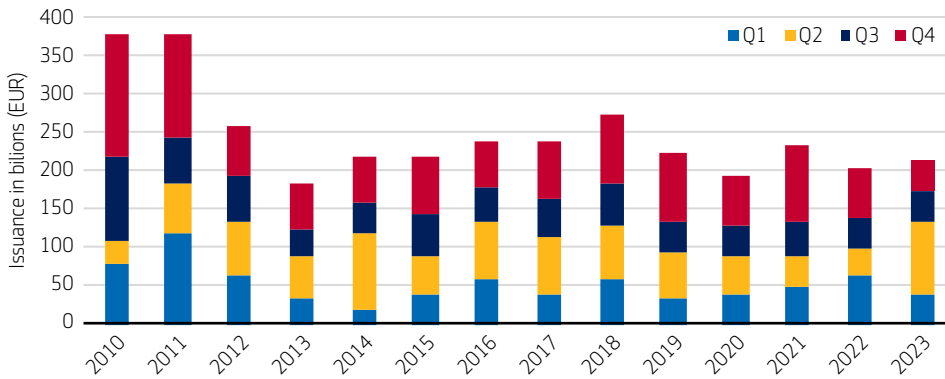
Regarding the total European ABS issuance, the average yearly issuance of ABS totaled approximately €220 billion over the past 10 years. Figure 6 shows a relatively constant issuance over this 10-year period. In the period before 2012, the issuance of European ABS was substantially larger with issuance above €350 billion.

⁵AFME, Securitisation Data Report Q4 2023 (Mar 2024). Available at: [Securitisation Data Report Q4 2023 & 2023 Full Year | AFME](#)

⁶Bloomberg, Bloomberg Euro Aggregate Government Total Return Index EUR as of Q4 2023.

⁷Bloomberg, Bloomberg Euro Aggregate Corporate Total Return Index EUR as of Q4 2023.

Figure 6: European ABS issuance

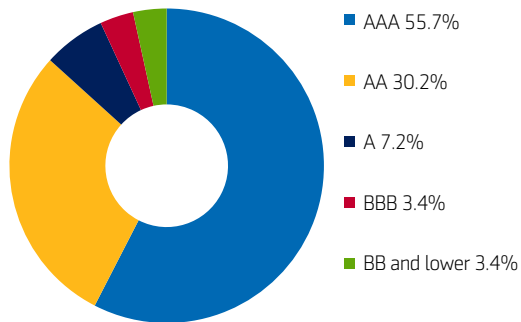


Source: AFME, Securitisation Data Report Q4 2024, (Mar 2024). The figures shown contain placed and retained ABS issuance as of Q4 2023.

More than half (55.7%) of the outstanding European ABS have a AAA rating.

Figure 7 shows the credit rating distribution of the outstanding European ABS, where more than half of the outstanding ABS are in the AAA segment (55.7%). If the total investment grade segment is taken into account, the outstanding ABS comprise nearly all of the issued ABS (96.6%). RMBS is the main contributor to the AAA segment of the outstanding issues, whereas CLOs account for most of the share of the lower credit ratings. The rating distribution as shown in Figure 7 corresponds with the purpose of the securitization process, namely the issuance of high rated (AAA) bonds protected by a layer of sub-investment grade bonds.

Figure 7: Credit rating ABS outstanding



Source: AFME, Securitisation Data Report Q4 2023, (Mar 2024). The figures shown contain placed and retained ABS issuance as of Q4 2023.

Conclusions

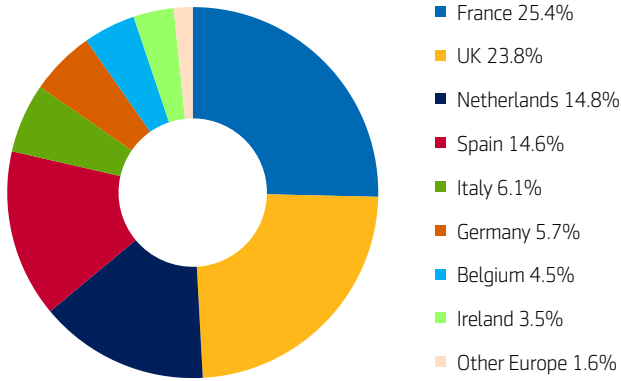
ABS is an asset class with specific opportunities and risks for investors to consider upon entering this market. In essence, ABS provide investors with attractive risk-adjusted returns while having exposure to risk factors that are not present in traditional fixed income asset classes like corporate credits and sovereign debt. ABS as an asset class can be a valuable addition to a fixed income portfolio as the bonds bear minimal interest rate risk. The figure below gives an overview of the identified opportunities and risks of investing in ABS. The appendix contains a more detailed overview of the composition of the segments in the European ABS market.

<p>Opportunities</p>	<ul style="list-style-type: none"> • ABS have minimal interest rate risk as the coupons on ABS bonds are tied to short-term interest rates which periodically reset (3-months). Due to the floating nature, ABS, will provide some hedge against inflation on the long-term. • Historically, ABS offer higher risk-adjusted returns than traditional fixed income asset classes such as government and corporate bonds • ABS have exposure to consumer risk, an alternative risk source compared to other traditional fixed income asset classes • ABS offer diversification with other asset classes • ABS are issued in a variety of European countries with varying collateral types (i.e., mortgages, credit card loans, auto loans, etc.). Therefore, an investor is able to minimize concentration risks.
<p>Risks</p>	<ul style="list-style-type: none"> • ABS are prone to credit risk. Credit risk is mitigated by credit enhancement techniques and the structure of ABS (i.e., tranches / cash flow waterfall). Although default rates are relatively low for European ABS, losses can be incurred, especially for lower rated bonds (equity tranches). • ABS are exposed to reinvestment risks following from prepayments. This risk is more pronounced for senior tranches. • For some types of European ABS, the issuing countries are concentrated (g., mortgages, credit card loans). Investors can mitigate this risk by diversifying among types of ABS.

Appendix

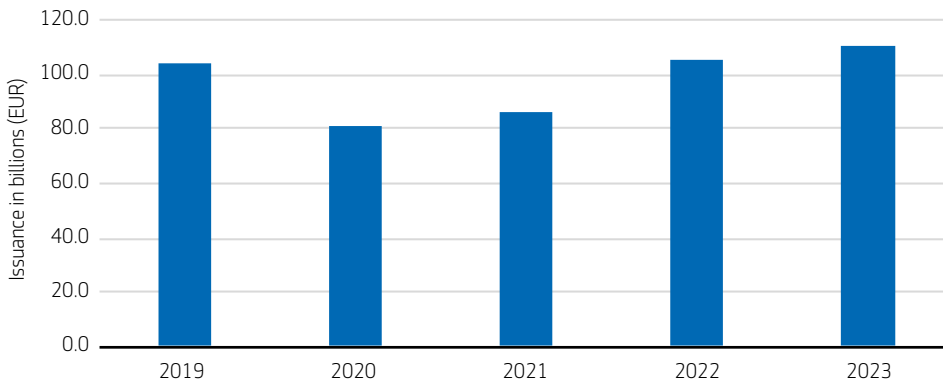
RMBS

RMBS outstanding as of Q4 2023



Source: AFME, Securitisation Data Report Q4 2023, (Mar 2024). The figures shown contain placed and retained ABS issuance as of Q4 2023.

RMBS issuance 2019 - 2023



Source: AFME, Securitisation Data Report Q4 2023, (Mar 2024). The figures shown contain placed and retained ABS issuance as of Q4 2023.

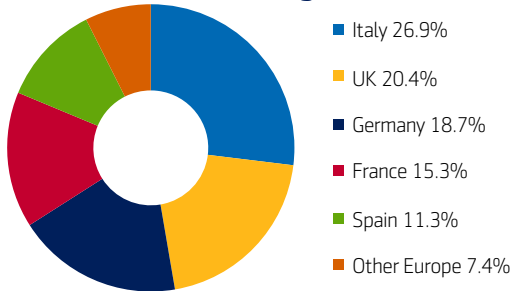
RMBS statistics

	Rating	Maturity	Coupon	Duration	Yield (YTM)	Spread
RMBS	AAA	2.8 years	5.1%	0.09	3.7%	66.9 bps

Source: Bloomberg, on basis of Bloomberg Pan-European Floating ABS Index unhedged EUR as of Q4 2023. Duration measures the interest sensitivity of the ABS bonds expressed as % price change of the bond when interest rate rise 1%. Spread above 3-month swap rate.

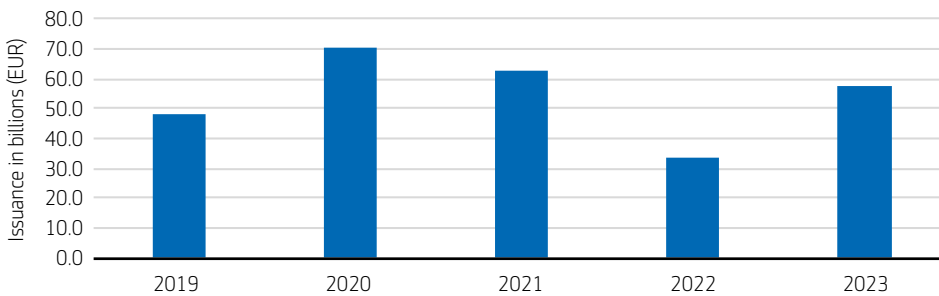
Consumer ABS

Consumer ABS outstanding as of Q4 2023



Source: AFME, Securitisation Data Report Q4 2023, (Mar 2024). The figures shown contain placed and retained ABS issuance as of Q4 2023.

Consumer ABS issuance 2019 - 2023



Source: AFME, Securitisation Data Report Q4 2023, (Mar 2024). The figures shown contain placed and retained ABS issuance as of Q4 2023.

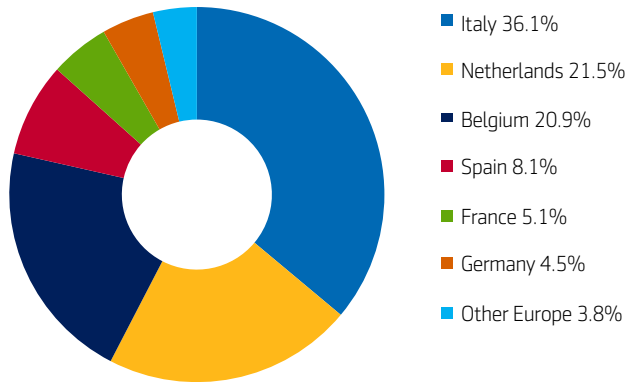
Consumer ABS statistics

	Rating	Maturity	Coupon	Duration	Yield (YTM)	Spread
Consumer ABS	AA+	1.8 years	4.7%	0.06	3.5%	69.8 bps
Auto ABS	AA+	1.6 years	4.6%	0.07	3.4%	57.9 bps
Credit Card ABS	AAA	1.6 years	5.0%	0.05	4.1%	67.7 bps
Other Consumer ABS	AA	2.2 years	4.9%	0.06	3.7%	92.7 bps

Source: Bloomberg, on basis of Bloomberg Pan-European Floating ABS Index unhedged EUR as of Q4 2023. Duration measures the interest sensitivity of the ABS bonds expressed as % price change of the bond when interest rate rise 1%. Spread above 3-month swap rate.

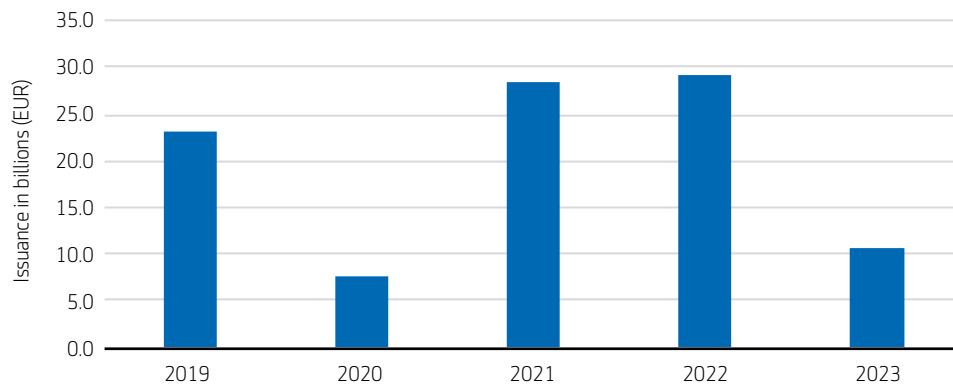
SME ABS

SME ABS outstanding as of Q4 2023



Source: AFME, Securitisation Data Report Q4 2023, (Mar 2024). The figures shown contain placed and retained ABS issuance as of Q4 2023.

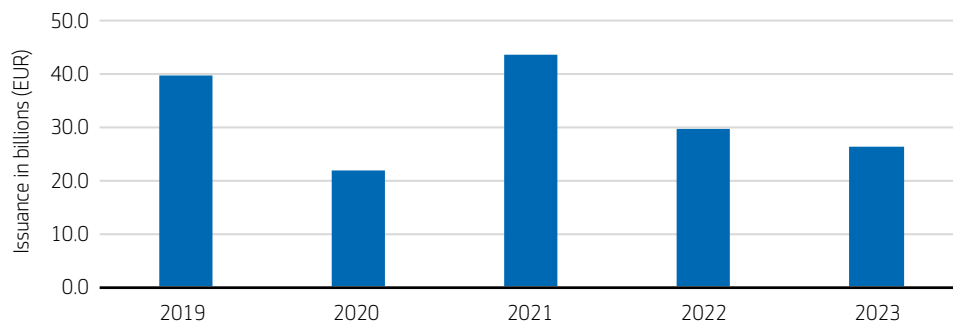
SME ABS issuance 2019 - 2023



Source: AFME, Securitisation Data Report Q4 2023, (Mar 2024). The figures shown contain placed and retained ABS issuance as of Q4 2023.

CLOs

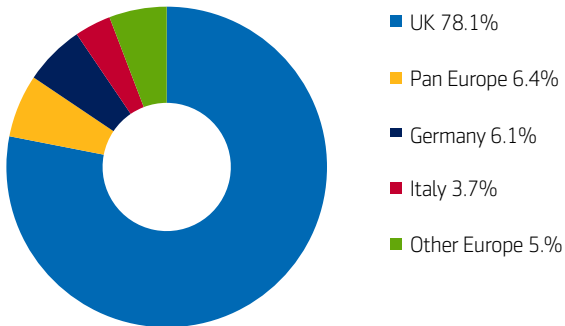
CLO issuance 2019 - 2023



Source: AFME, Securitisation Data Report Q4 2023, (Mar 2024). The figures shown contain placed and retained ABS issuance as of Q4 2023.

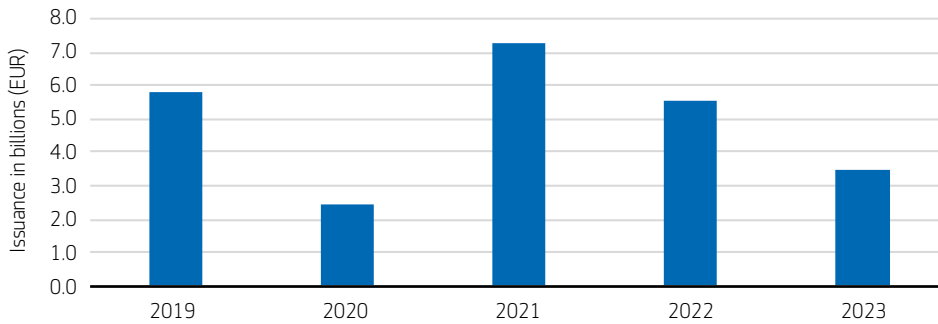
CMBS

CMBS outstanding as of Q4 2023



Source: AFME, Securitisation Data Report Q4 2023, (Mar 2024). The figures shown contain placed and retained ABS issuance as of Q4 2023.

CMBS issuance 2019 - 2023



Source: AFME, Securitisation Data Report Q4 2023, (Mar 2024). The figures shown contain placed and retained ABS issuance as of Q4 2023.

CMBS statistics

	Rating	Maturity	Coupon	Duration	Yield (YTM)	Spread
CMBS	BBB+	1.1 years	5.4%	0.11	13.3%	991.0 bps

Source: Bloomberg, on basis of Bloomberg Pan-European Floating ABS Index unhedged EUR as of Q4 2023. Duration measures the interest sensitivity of the ABS bonds expressed as % price change of the bond when interest rate rise 1%. Spread above 3-month swap rate.

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