Janus Henderson
INVESTORS

A CASE FOR EUROPEAN COLLATERALISED LOAN OBLIGATIONS (CLOs)



Marketing communication | Outside of the U.S.: For professional and qualified investors only | Not for onward distribution

Past performance does not predict future returns. The value of an investment and the income from it can fall as well as rise and you may not get back the amount originally invested.

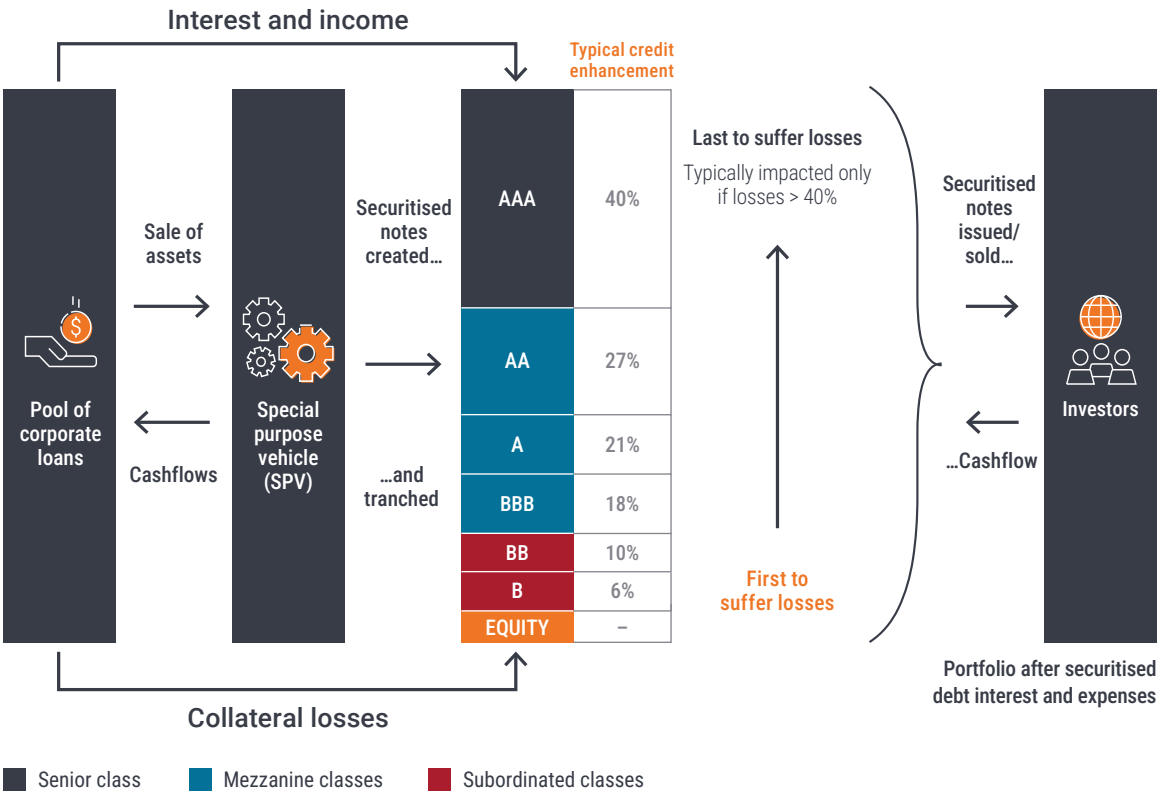
KEY TAKEAWAYS

- The higher yield and defensive income profile of floating rate investments such as CLOs has attracted asset allocators looking to improve portfolio diversification.
- Relative value favours AAA CLOs which can offer enhanced spread and yield compared to investment grade (IG) corporate credit. History shows that AAA CLOs also deliver better risk-adjusted returns over the long term and during volatile markets.
- The diversity within the market and European regulatory environment necessitate an active approach to investing in CLOs, which can fully evaluate the risk and return potential of each distinct deal and capture relative value to optimise returns.

What are CLOs?

A collateralised loan obligation (CLO) – a portfolio of corporate (leveraged) loans rated below investment grade that have been securitised – can be thought of as analogous to a mini bank (as an aggregator of loans). These are broadly syndicated loans to large companies, which typically have enterprise valuations in excess of €1 billion and often many multiples of this.

Figure 1: CLO structure and credit enhancement



Source: Janus Henderson Investors. For illustrative purposes only. Credit enhancement: Used in securitisation to improve the credit quality and ratings of the debt tranches. The percentages shown include a small amount of excess spread. Excess spread is the net income earned on the loan portfolio after payment of securitised debt interest and operational expenses.

The first CLO was issued in the 1990s and specialist CLO managers – of which there are currently 67 in Europe[1] – have built up their experience and expertise in this market. They select a portfolio of corporate loans and hold them in a special purpose vehicle (SPV). This SPV issues different tranches of debt, which are ranked in priority and therefore credit quality based on the order of their claim to interest and principal cashflows from the loan pool.

Should a loan default, any losses are allocated from the bottom of the CLO structure, starting with the equity. Each subsequent tranche provides protection against portfolio losses to more senior notes. The first line of defence, however, is the net income earned on the loan portfolio after payment of securitised debt interest and operational expenses. This net income, often referred to as excess spread, is redirected from the equity holders if needed to help offset portfolio losses. Typically, portfolio losses need to be above 40% before the most senior bonds rated AAA start to be impacted. Loans owned by a CLO are also secured. While the type of security and recovery following default can vary, history shows that average recoveries have typically been in excess of 60%[2]. This suggests that all the loans in a typical CLO portfolio could default and the AAA notes still be fully repaid. While clearly illustrative, this shows the inherent structural protections against loss with AAA CLOs.

The European CLO market has been steadily growing over time and is now around €250 billion[3]. Nevertheless, CLOs are missing from most major indices and many investors have little CLO exposure. Higher-rated CLOs are primarily held by large institutional investors looking for yield enhancement, such as bank treasuries, asset managers, pensions and endowments, hedge funds, family offices and insurance companies. European CLOs are usually quoted as spread to EURIBOR and are therefore typically floating rate, where the interest rate is adjusted periodically according to this underlying benchmark rate.

Two sides of the same coin – high yield and loans

The companies that finance themselves through loans are generally no different from those companies that finance themselves through high yield (HY) bonds. Indeed, in many instances individual companies will have issued both HY bonds and loans. CLOs are a very important institutional funding source for corporates – with the European CLO market sized at around 60% of the loans market, as represented by the European leveraged loan index (Figure 2). Similarly, the European CLO market is around 60% of the size of the European HY market (Figure 3). The importance of the CLO market has grown over recent years in Europe and the US, both in terms of the proportion of the loan market it helps to finance and its scale relative to the HY market.

Figure 2: CLO market as proportion of loans market

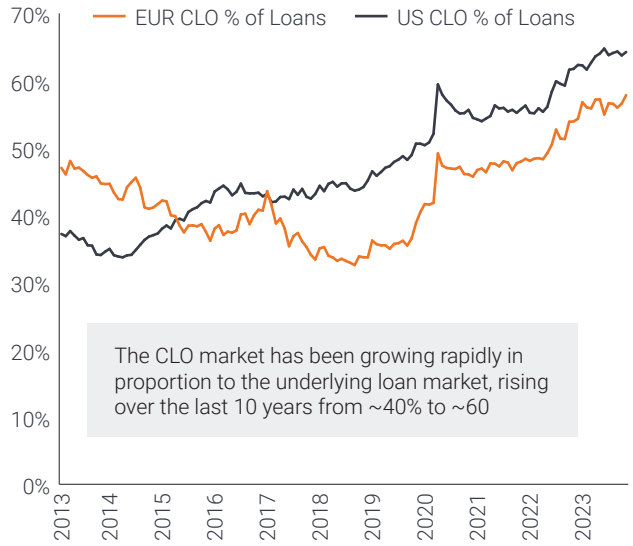
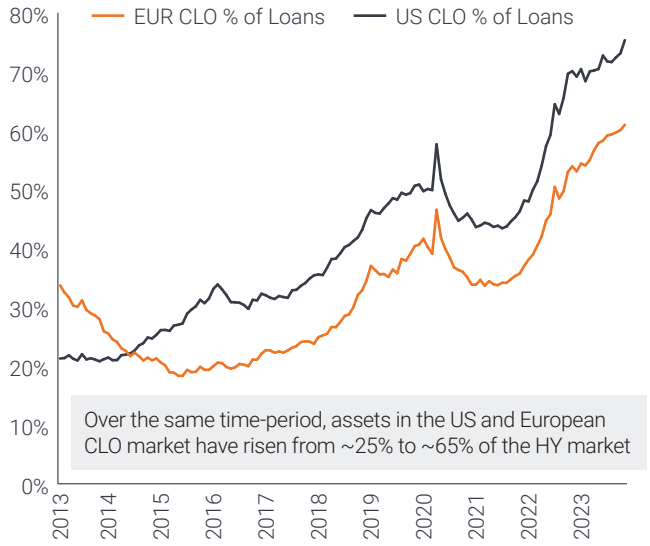


Figure 3: CLO market as proportion of HY market



Source: Janus Henderson Investors, BofA Securities CLO Factbook, as at 10 November 2023. For illustrative purposes only.

[1] Source: Janus Henderson Investors, Bloomberg, Intex Calc and JPMorgan Indices, as at 29 November 2024.
[2] Source: UBS, as at 31 December 2024.
[3] Source: Janus Henderson Investors, Bloomberg and Intex Calc, as at 31 December 2024.

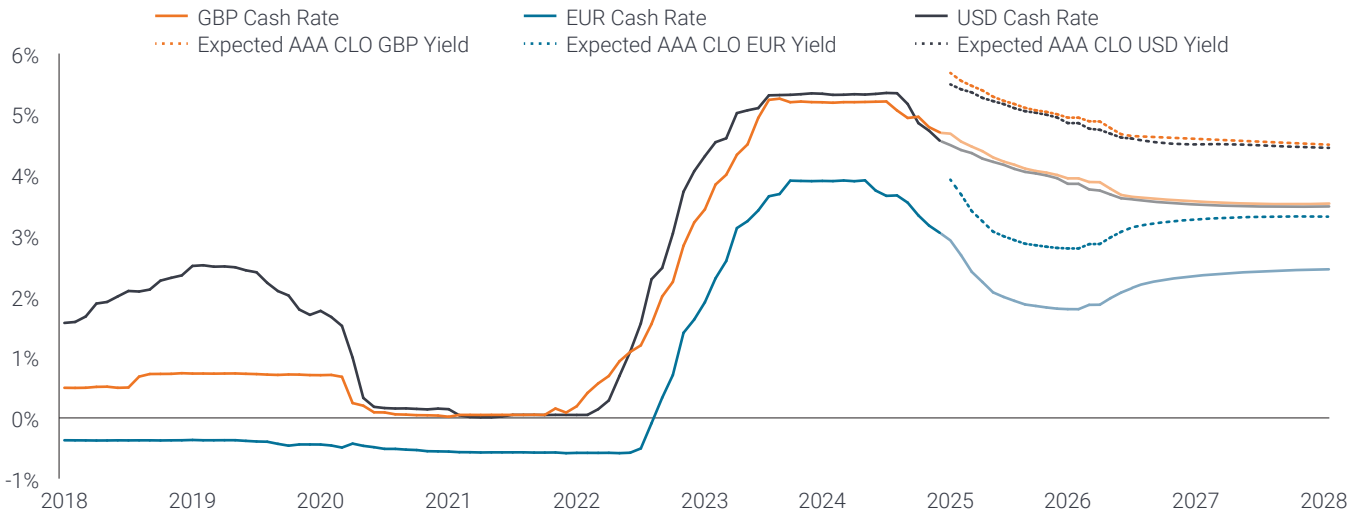
Why CLOs now?

The income return from a CLO security is made up of a credit spread and an underlying cash rate based on EURIBOR. This income will therefore go up and down with moves in the cash rate. The market consensus is that we are past the recent peak of interest rates globally, however, there remain a range of macro and political factors that make the future path of rates highly uncertain.

Moreover, when interest rates decrease, the spread component of floating rate credit instruments becomes a more significant factor in their overall yield, often attracting more investment as investors seek to maintain income levels. Figure 4 illustrates how moving into AAA CLOs and earning an assumed 1% credit spread can help sustain income levels should cash rates decline as the market expects. Additionally, in a flat or inverted yield curve environment (where short-term rates are similar to or higher than long-term rates), floating rate instruments can be advantageous, providing attractive income carry opportunities without the need to take on duration risk unnecessarily.

Figure 4: Retaining higher yields as cash rates fall

Moving into AAA CLOs can provide mitigation



Source: Janus Henderson Investors, Bloomberg, as at 26 November 2024.

Note: Chart showing historic cash rates, forward rates on USD, GBP and EUR OIS curves. Expected AAA CLO yields are the sum of the respective USD, GBP and EUR forwards curves with an assumed 100bps worth of credit spread for AAA CLOs. For illustrative purposes only. **There is no guarantee that past trends will continue, or that forecasts will be realised. Past performance does not predict future returns.**

In our view, AAA CLOs enable investors to capture the interesting income characteristics described above without taking meaningful credit risk. They also bring portfolio diversification benefits.

Figure 5: Seeking yield while attempting to mitigate risk



Income

CLOs typically provide higher yields than other credit investments with similar ratings.

High-quality

Historically experienced lower defaults vs comparable products with similar ratings.

Diversification

A compelling alternative to investment grade corporates.

Source: Janus Henderson Investors.

Why AAA CLOs?

In addition to the benefits of helping to maintain cash-based returns described above, AAA CLOs can also offer relative value opportunities. When looking at the opportunity of AAA CLOs versus IG credit, in our view, investors can access better yield, better credit quality and compelling relative value, with the added advantage of negligible sensitivity to interest rate changes.

Relative value favours AAA CLO

To achieve a similar level of credit spread and yield available in AAA CLOs, investors would need to move down the credit spectrum into BBB-rated corporate credits (Figure 6). These AAA CLO yields are based on conservative estimates of the forward euro rates curve that is forecast to decline over time. This means there is potential for yield upside should interest rates not decline as expected. Shorter average spread duration for AAA CLOs, as can be seen in Figure 6, also helps to mitigate sensitivity to market credit spread moves.

Figure 6: Relative value favours AAA CLO

	Credit Spread (bps)[1]	Total Yield (EUR) (%)[2]	Spread Duration (years)[3]	Interest Rate Duration (years)[4]
AAA CLO	105	3.2	3.3	0.2
IG Corporates	90	3.2	4.6	4.5
AAA Corporates	52	2.8	5.9	6.0
AA Corporates	54	2.8	4.7	4.7
A Corporates	82	3.1	4.8	4.7
BBB Corporates	102	3.3	4.5	4.3

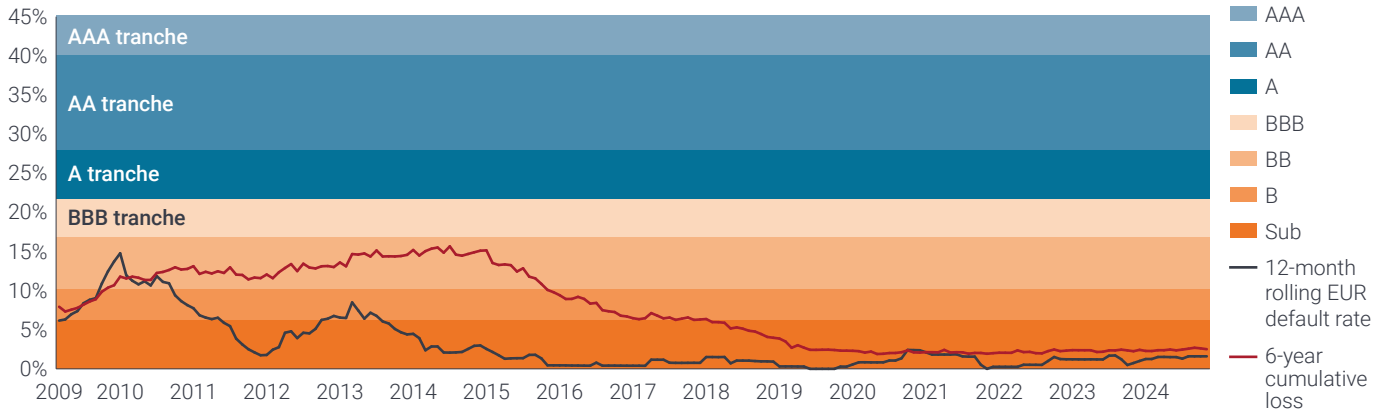
Source: Janus Henderson Investors, JP Morgan, ICE indices, Bloomberg, as at 31 December 2024. [1] For CLO, based on Discount Margin; for corporate credit, Swap OAS. [2] For CLO, total yield is calculated as credit spread plus the swap rate corresponding to average life. This is the 4-year Euro SWAP rate for CLO; for corporate credit, Yield-to-worst is presented. [3] For CLO, based on average life estimates and spread duration for credit indices. Spread duration is a measure of how much a bond's price changes in response to a change in its credit spread. [4] Credit indices based on effective duration. For AAA CLO, based on estimates. **Yields may vary and are not guaranteed.** The above are the Team's views and should not be construed as advice and may not reflect other opinions in the organisation.

Structural protection and defaults

There has never been a default of a A, AA, or AAA CLO in Europe, even through the macro stresses of the GFC period (Figure 8 overleaf). Figure 7 helps to illustrate why this has been the case. It shows typical rankings of the various debt tranches in a European CLO. Against this, we have overlayed historic rolling sub-IG default rates and estimated cumulative losses (assuming a 60% recovery rate follows a loan default). The cumulative loss line peaks at nearly 16%, materially below the level needed to start to impact the value of a typical A-rated tranche.

Even in environments of high default rates, structural protections in CLOs, such as capturing excess spread when needed to absorb the impact of portfolio loan default losses and covenants (or triggers) that control principal cashflows, have helped to materially reduce losses to BBB and BB-rated tranches. With 40% credit enhancement to a typical AAA CLO, this would also imply losses of more than two and a half times the GFC peak level are needed in order to start to incur a potential loss on a AAA bond.

Figure 7: Historical cumulative loan losses vs CLO tranche protection



Source: Credit Suisse, UBS, as at 31 October 2024. Loss rate calculated based on cumulative defaults and 60% recovery rate. **Past performance does not predict future returns.** For illustrative purposes only.

Figure 8 provides longer term impairment (or default loss) rates for CLOs and supports their inherent resilience when compared with corporate bonds.

Figure 8: 10-year impairment rate by original rating (1993-2017)

Tranche	Euro CLOs	US CLOs	Euro corporate
AAA	0.0%	0.0%	0.1%
AA	0.0%	0.0%	0.7%
A	0.0%	0.2%	2.2%
BBB	0.5%	2.3%	3.5%
BB	5.3%	4.2%	15.7%

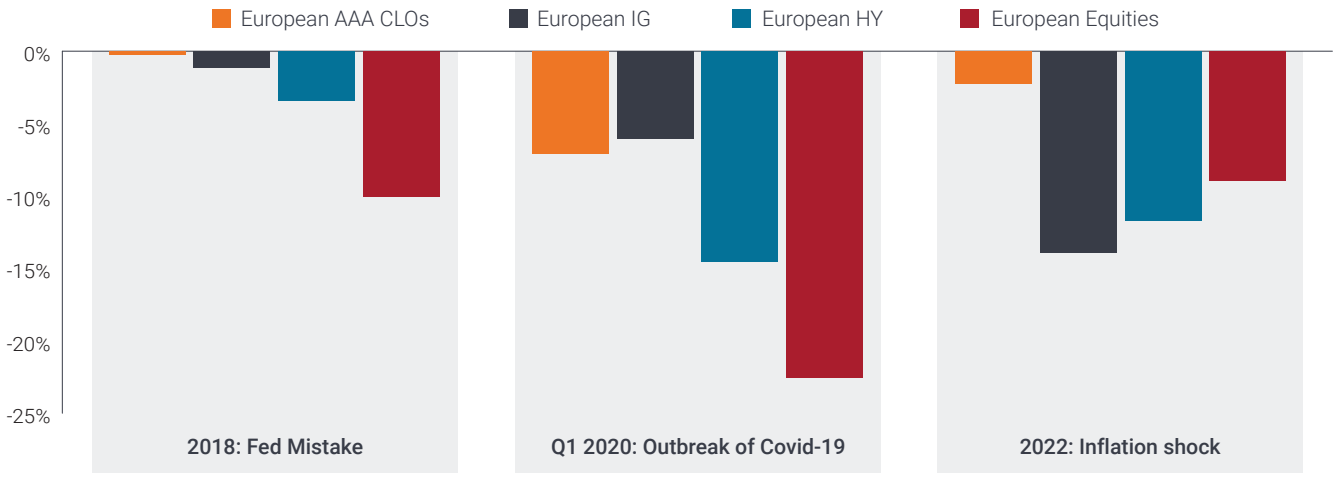
Source: Moody's Investors Services, as at 31 October 2024: **Past performance does not predict future returns.** For illustrative purposes only.

Performance in drawdowns: equivalent or lower mark-to-market risk compared to IG corporates

The mark-to-market risk of AAA CLOs compared to other European asset classes can be evaluated by looking at their performance during volatile markets. We do this in Figure 9 by focusing on a few particularly volatile periods:

- **2018 Fed hike mistake** – the US Federal Reserve's decision to hike interest rates, perceived as a mistake, led to market volatility across bonds and equities. Compared to Euro IG and HY and equities, the impact on European CLOs was negligible, demonstrating their stability in the face of interest rate adjustments.
- **Outbreak of the pandemic** – The uncertainty and economic disruption triggered by the COVID-19 pandemic drove a widespread sell-off across various asset classes. AAA CLOs performed largely in line with Euro IG.
- **2022 Inflation shock and rate hikes** – Fears around inflation and rate hikes in Europe and globally drove volatility in Euro IG, HY and equities, contrasting to the minimal drawdown experienced by CLOs. The floating rate nature of CLOs provided a buffer against the market volatility experienced by fixed-rate asset classes like Euro IG and HY.

Figure 9: Minimal downside risk in AAA CLOs

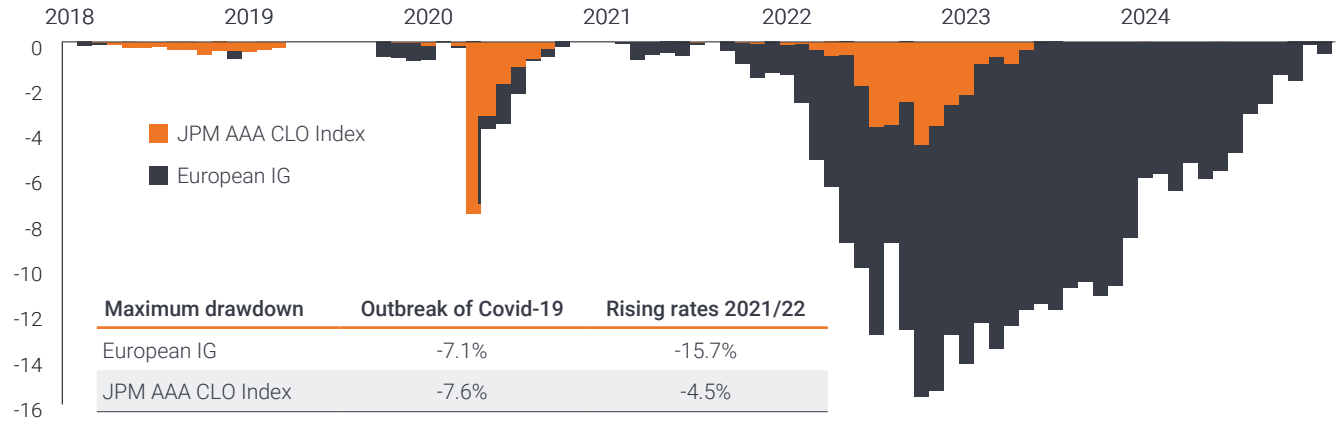


Source: Janus Henderson Investors, JP Morgan, Citi, Bloomberg. EUR returns. For European AAA CLOs: JP Morgan European AAA CLO Index. European IG: ICE BofA Euro Corporate Bond Index. European High Yield: ICE BofA European Currency Non-Financial High Yield 2% Constrained Index. European Equities: MSCI Europe.

Note: 2018 and 2022 periods correspond to calendar year returns. For illustrative purposes only. **Past performance does not predict future returns.**

Figure 10 expands this further by looking at the length and depth of drawdowns during these periods. The orange or black bars mark the drawdown point from the previous high watermark. When these bars disappear (reach zero), it marks when the asset class has retraced returns to that high watermark. It again highlights the resilience of AAA CLOs, showing minimal drawdowns during the 2018 rate event and a swift recovery post-COVID, against a slightly more prolonged recovery of IG credit. During 2022, the drawdown of AAA CLOs was shallower and recovery quicker, partly due to its floating rate nature, unlike the more severe and lasting impacts on Euro IG, which has more rates duration and has not yet recovered.

Figure 10: Shallow and brief drawdowns relative to traditional corporate credit



Maximum drawdown	Outbreak of Covid-19	Rising rates 2021/22
European IG	-7.1%	-15.7%
JPM AAA CLO Index	-7.6%	-4.5%

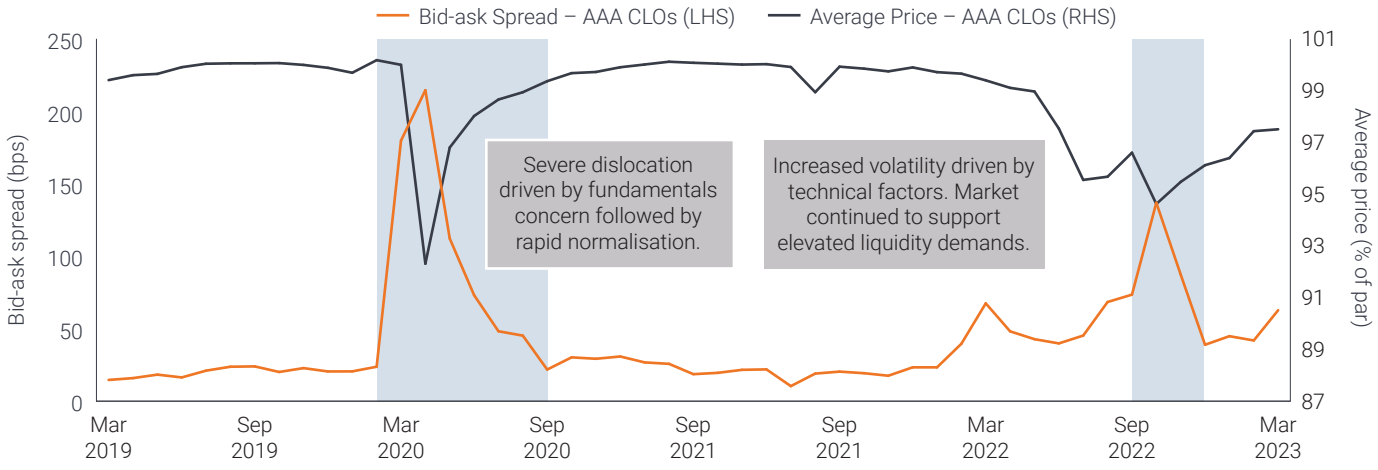
Source: Janus Henderson Investors, Bloomberg, JP Morgan, as at 31 December 2024.
Note: Chart showing cumulative drawdowns. JPM AAA CLO Index: JP Morgan European CLOIE AAA index. European IG Index: ICE BofA Euro Corporate Bond Index. Drawdown returns from 31 December 2017 to 31 October 2024. **Past performance does not predict future returns.**

Liquidity holds up during market volatility

The GFC created a stigma around securitised debt generally, tarnishing it as 'risky' and 'illiquid'. Some have viewed CLOs through this lens, however, a deeper dive into historical defaults and performance during volatile markets and quick recoveries challenges this view. As an active investor in CLOs for more than 15 years, experience tells us that liquidity is also far better than many might perceive.

The 2022 Liability-Driven Investment (LDI) crisis[4] underscored this, when about €3.3 billion of AAA CLOs[5] traded over a short time horizon. The real liquidity test, however, is the ability to raise funds efficiently without excessive costs. In October 2022, at the height of the LDI crisis, the average liquidity cost for AAA CLOs – the difference between the bid and offer on a specific bond or the bid-ask spread – was around 1.4%, against a backdrop of a 5% average cash price decline (Figure 11). So whilst both bid-ask spreads and prices felt the impact of absorbing these volumes, markets remained functional with rational pricing observed. It can also be seen how market conditions quickly normalised after this, as shown in Figure 11.

Figure 11: Active CLO market during market volatility with rapid normalisation of cost of liquidity



Source: Janus Henderson Investors, JP Morgan, as at March 2023. **There is no guarantee past trends will continue.**

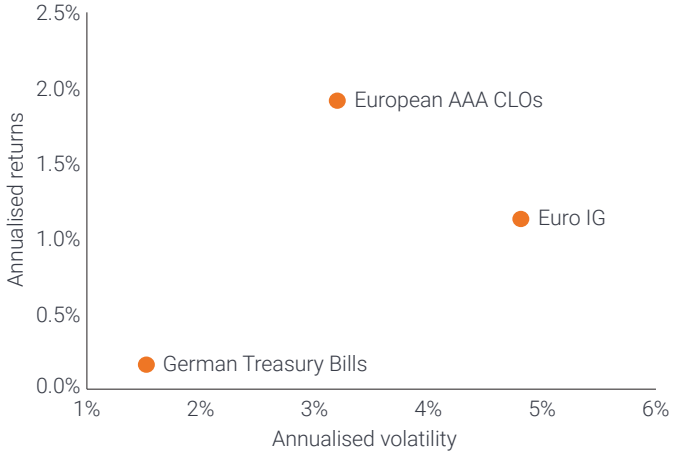
[4] This crisis affected UK defined benefit pension schemes, which had to quickly sell assets to meet margin calls after the government "mini-budget" announcement caused a sharp increase in gilt yields. [5] Source: Janus Henderson Investors and European CLO dealers, November 2023. Period covered 1 September 2022 to 30 November 2022.

Better risk-adjusted returns from AAA CLOs

Looking over a longer timeframe, AAA European CLOs demonstrate superior risk-adjusted returns with lower volatility compared to traditional IG assets such as Euro IG corporate bonds, as illustrated in Figure 12. For those looking to build diversified fixed income portfolios, in our view AAA CLOs present an efficient alternative, enhancing portfolio performance potential without added risk. As a manager of broadly diversified fixed income portfolios, this has certainly been our experience over many years.

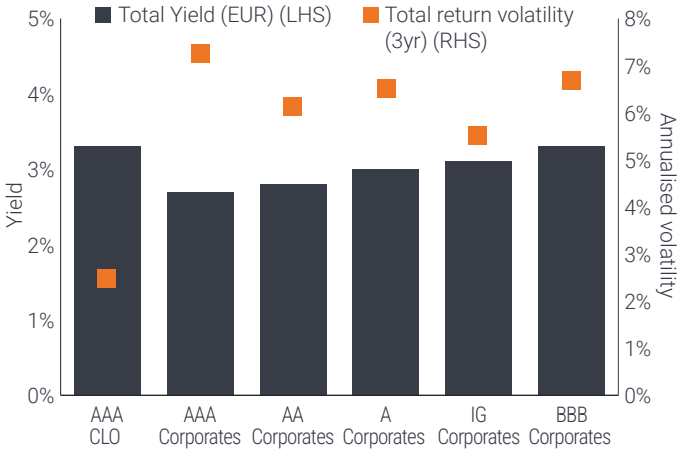
Another way to analyse potential return versus risk is to consider available yields today versus historic volatility of returns. Figure 13 analyses this for AAA CLOs versus corporate bonds. AAA CLO investors can access significantly higher income, capturing a total yield comparable to lower-rated BBB corporate credit, despite enjoying a much better overall risk profile.

Figure 12: 10-year annualised risk-adjusted returns stack up well relative to traditional fixed income



Source: Janus Henderson Investors, Bloomberg, JP Morgan, Citi, as at 30 November 2024. For European AAA CLO, returns from 29 December 2017 to 30 November 2024 are for JP Morgan European AAA CLO Index. Prior to this, returns are estimated using AAA CLO spread moves, assumed carry and cash returns. Cash returns are estimated using 1m Euribor. Euro IG Index: ICE BofA Euro Corporate Bond Index. German Treasury Bills: ICE BofA German Treasury Bill Index. **Past performance does not predict future returns.**

Figure 13: An attractive yield relative to corporates for a lower volatility asset



Source: Janus Henderson Investors, Bloomberg, ICE indices and JP Morgan, as at 31 October 2024. **Yields may vary and are not guaranteed.**

Why active?

Investing in CLOs leads inevitably to active management given the regulatory environment in Europe and diversity within the CLO space. With 67 managers issuing 640 deals, as shown in Figure 15, each one presents unique idiosyncratic risks and characteristics, driven by differences in collateral, management, and issuance year. These variances necessitate a focused approach to security selection, emphasising the importance of understanding each manager's strategy and the specific risks of their CLOs.

Figure 15: From CLO Index to Insight

	European AAA CLO universe	Passive exposure to the market	Opportunity in active
CLO MANAGER	**€250bn** of assets managed by **67** CLO managers	**19 market makers** with 10 processing the majority of the volume	Importance of **manager due diligence** in order to differentiate on risk management approaches
INDIVIDUAL CLOs	**641 ISINs, 100-200 loans per CLO,** with an average maturity of 5.5 yrs	**CLO structures are broadly the same**	**Lots of room for differentiation**
PORTFOLIO CHARACTERISTICS	Idiosyncratic risk profiles across CLO managers	**Technicals drive the market** – passively constructed portfolios' risk characteristics reflect a combination of index components and dealer inventory	Control over **manager concentration and portfolio risk characteristics**

Source: Janus Henderson Investors, Bloomberg and JPMorgan Indices, as at 29 November 2024. **Past performance does not predict future returns.**

While an active approach focuses on security selection, passive investment strategies, which do not distinguish between individual CLO structures or assess the quality of their management or collateral, can lead to portfolios that may not align with an investor's risk preferences, return expectations or desired collateral quality. This is particularly important during weaker macro environments and market dislocations. While fundamental default loss risk is not viewed as a primary concern for AAA CLOs given inherent structural protections for investors, in weaker environments material dispersion in the market prices of individual CLO deals can be seen.

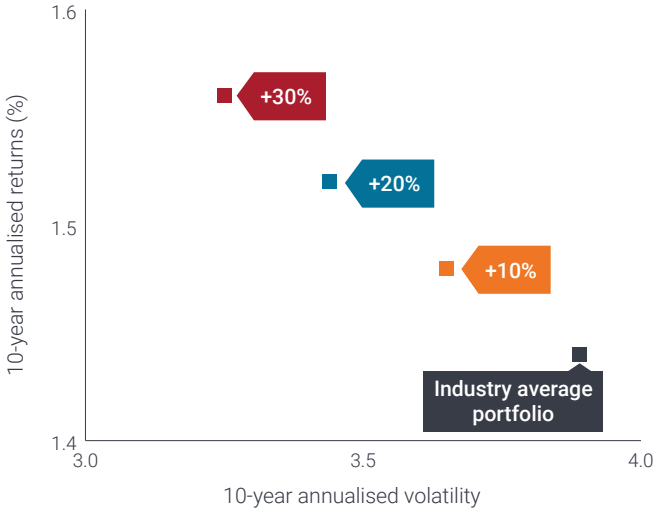
Active management involves understanding the risks and opportunities within different tranches of CLOs. Collateral quality can drive credit risk in junior tranches and increased market risk in AAA tranches during market dislocations. In benign markets, price variation isn't visible in AAA CLOs, but is in more junior tranches. However, when there is more severe market instability, dispersion between AAA CLOs emerges. A clear understanding of CLO manager "tiering", such as variation in collateral quality, is therefore key in managing risk across AAA-rated bonds. An active approach also allows portfolio optimisation in a range of other ways such as identifying the best part of spread curves to invest in or assessing the impact of early call on a bond's return.

Active management becomes especially critical in Europe, where regulatory requirements mandate thorough due diligence on CLO managers and their strategies. This regulatory environment compels investors to actively select CLOs based on an in-depth understanding of the collateral risks and management quality, differentiating between deals to construct a portfolio that aligns with investment goals and risk tolerance. In terms of our universe today, as defined by the JP Morgan European CLOIE AAA Index, we're invested in around 50% of the 67 managers of European CLOs with a view to optimising risk-adjusted returns and managing any downside risk for clients.

For investors looking to navigate the CLO market without the operational burdens of direct investment, Exchange-Traded Funds (ETFs) offer a solution. By investing through ETFs, clients can leverage the expertise of experienced managers who perform the necessary due diligence and underwriting, thereby gaining access to a curated selection of CLOs. This approach allows investors to benefit from the potential returns of CLOs while mitigating the challenges of active management and regulatory compliance.

We also believe that assessment of ESG risks is now an integral part of credit investing that requires both quantitative and qualitative expertise that is deployed through an active approach.

Figure 14: Results of adding 10%, 20% and 30% AAA CLO allocation to your fixed income portfolio



Source: Janus Henderson Investors, Bloomberg, Morningstar, JPMorgan. As at 30 November 2024. Indices used as representative in hypothetical portfolios: Global Bonds - Bloomberg Global Aggregate TR Hdg EUR; Euro IG - ICE BofA Euro Corporate TR EUR; Euro Govt. - Bloomberg Euro Agg GvtR TR EUR; Euro HY - Bloomberg Pan Euro HY TR EUR; Global HY - Bloomberg Global High Yield TR EUR; EM Debt - Bloomberg EM Hard Currency Agg TR USD; Bank Loans - Credit Suisse Western European Leveraged Loan TR Hdg EUR; US Bonds - Bloomberg US Agg Bond TR EUR; Convertibles - Refinitiv Europe CB TR EUR; Cash - ICE BofA EURCcy 3M Dep BdRt CM TR EUR (Cash). Average client portfolio is based on the average of Janus Henderson European clients' fixed income portfolios. Portfolios are hypothetical and performance is based on historic index returns. Investors should not assume they will have a similar investment experience. **Past performance does not predict future returns.**

For active fixed income investors, adding AAA CLOs can create a cornerstone of investment portfolios with different risk and return drivers. This is what our Portfolio Construction & Strategy Team have analysed by looking at the asset class make-up of a typical European client fixed income portfolio and how adding 10%, 20%, 30% of AAA CLOs improves the portfolio's risk-return dynamics.



Matthew Bullock
EMEA Head of Portfolio Construction & Strategy

> "History demonstrates that European AAA CLOs, due to their minimal correlation with conventional fixed income and robust risk-return attributes, have enhanced portfolio performance."

Why us?

At Janus Henderson, we benefit from a combination of broad expertise across global securitised markets (US$36 billion of AUM including US$21 billion of CLOs, 15 experts), a market-leading active securitised ETF platform in the US (nearly US$19 billion of AUM), long established investment in European CLOs and the Janus Henderson Tabula European ETF platform[6].

Investment Team for European CLOs

Stable and experienced team utilising qualitative and quantitative skillsets

PORTFOLIO MANAGEMENT



Colin Fleury
Head of Secured Credit, Portfolio Manager
38 years industry experience



Denis Struc
Portfolio Manager
19 years industry experience



Ian Bettney
Portfolio Manager
24 years industry experience



Kareena Moledina
Client Portfolio Manager Lead, EMEA
16 years experience

EXPERT ANALYSTS AND PORTOLIO MANAGERS

SARAH ASQUITH, ACA	STEVE NELSON	ZHULIN CHEN	DAVID HUANG, CFA	TIM ELLIOT	JESSICA SHILL
Research Analyst	**Research Analyst**	**Portfolio Analyst, Secured Credit**	**Portfolio Manager**	**Portfolio Manger**	**Portfolio Manager, Securitised Product Analyst**
Securitised expert 10 years experience	Securitised expert 25 years experience	CLO expert 3 years experience	Loan expert 10 years experience	Loan expert 28 years experience	US CLO expert 7 years experience

KEY INVESTMENT SUPPORT

QUANTITATIVE RESEARCH	FIXED INCOME TRADING	RISK MANAGEMENT	CORPORATE CREDIT RESEARCH
5 analysts 14 years average experience	17 traders 22 years average experience	7 analysts 13 years average experience	22 analysts 16 years average experience

Source: Janus Henderson Investors, as of 30 September 2024.
Note: Analysts include individuals who are considered both analysts and portfolio managers. Years of experience refers to industry experience.

An established global CLO platform

US CLO ETF STRATEGIES

#1 AAA CLO ETF in the US by AuM

#1 CLO ETF provider in the US by trading volume

16 Authorised Participants

The **largest securitised active ETF manager** with **US$18bn** of the US$22bn CLO ETF assets

EUROPEAN ETF PLATFORM

16 Authorised Participants and **over 30** ETF trading counterparties

Listed on **10 European exchanges**

Multi-region accessibility

US$1.5bn of European ETP assets

- Deep relationships in the global CLO ecosystem
- Established trading counterparties in the US and Europe
- US$21bn of CLOs managed globally

Source: Janus Henderson Investors and Morningstar, as at 16 December 2024 for securitised ETFs. Global CLO AuM is as at 31 December 2024.
[6] Source: Janus Henderson Investors, as of 30 September 2024, unless otherwise noted. Global CLO AuM is as at 31 December 2024.

FOR MORE INFORMATION, PLEASE VISIT JANUSHENDERSON.COM

Janus Henderson
INVESTORS

Important information

The views presented are as of the date published. They are for information purposes only and should not be used or construed as investment, legal or tax advice or as an offer to sell, a solicitation of an offer to buy, or a recommendation to buy, sell or hold any security, investment strategy or market sector. Nothing in this material shall be deemed to be a direct or indirect provision of investment management services specific to any client requirements. Opinions and examples are meant as an illustration of broader themes, are not an indication of trading intent, are subject to change and may not reflect the views of others in the organization. It is not intended to indicate or imply that any illustration/example mentioned is now or was ever held in any portfolio. No forecasts can be guaranteed and there is no guarantee that the information supplied is complete or timely, nor are there any warranties with regard to the results obtained from its use. Janus Henderson Investors is the source of data unless otherwise indicated, and has reasonable belief to rely on information and data sourced from third parties. Past performance does not predict future returns. Investing involves risk, including the possible loss of principal and fluctuation of value.

Not all products or services are available in all jurisdictions. This material or information contained in it may be restricted by law, may not be reproduced or referred to without express written permission or used in any jurisdiction or circumstance in which its use would be unlawful. Janus Henderson is not responsible for any unlawful distribution of this material to any third parties, in whole or in part. The contents of this material have not been approved or endorsed by any regulatory agency.

Janus Henderson Investors is the name under which investment products and services are provided by the entities identified in the following jurisdictions: (a) Europe by Janus Henderson Investors International Limited (reg no. 3594615), Janus Henderson Investors UK Limited (reg. no. 906355), Janus Henderson Fund Management UK Limited (reg. no. 2678531), (each registered in England and Wales at 201 Bishopsgate, London EC2M 3AE and regulated by the Financial Conduct Authority), Tabula Investment Management Limited (reg. no. 11286661 at 10 Norwich Street, London, United Kingdom, EC4A 1BD and regulated by the Financial Conduct Authority) and Janus Henderson Investors Europe S.A. (reg no. B22848 at 78, Avenue de la Liberté, L-1930 Luxembourg, Luxembourg and regulated by the Commission de Surveillance du Secteur Financier); (b) the U.S. by SEC registered investment advisers that are subsidiaries of Janus Henderson Group plc; (c) Canada through Janus Henderson Investors US LLC only to institutional investors in certain jurisdictions; (d) Singapore by Janus Henderson Investors (Singapore) Limited (Co. registration no. 199700782N). This advertisement or publication has not been reviewed by Monetary Authority of Singapore; (e) Hong Kong by Janus Henderson Investors Hong Kong Limited. This material has not been reviewed by the Securities and Futures Commission of Hong Kong; (f) South Korea by Janus Henderson Investors (Singapore) Limited only to Qualified Professional Investors (as defined in the Financial Investment Services and Capital Market Act and its sub-regulations); (g) Japan by Janus Henderson Investors (Japan) Limited, regulated by Financial Services Agency and registered as a Financial Instruments Firm conducting Investment Management Business, Investment Advisory and Agency Business and Type II Financial Instruments Business; (h) Australia and New Zealand by Janus Henderson Investors (Australia) Limited (ABN 47 124 279 518) and its related bodies corporate including Janus Henderson Investors (Australia) Institutional Funds Management Limited (ABN 16 165 119 531, AFSL 444266) and Janus Henderson Investors (Australia) Funds Management Limited (ABN 43 164 177 244, AFSL 444268); (i) the Middle East by Janus Henderson Investors International Limited, regulated by the Dubai Financial Services Authority as a Representative Office. This document relates to a financial product which is not subject to any form of regulation or approval by the Dubai Financial Services Authority ("DFSA"). The DFSA has no responsibility for reviewing or verifying any prospectus or other documents in connection with this financial product. Accordingly, the DFSA has not approved this document or any other associated documents nor taken any steps to verify the information set out in this document, and has no responsibility for it. The financial product to which this document relates may be illiquid and/or subject to restrictions on its resale. Prospective purchasers should conduct their own due diligence on the financial product. If you do not understand the contents of this document you should consult an authorised financial adviser. No transactions will be concluded in the Middle East and any enquiries should be made to Janus Henderson. We may record telephone calls for our mutual protection, to improve customer service and for regulatory record keeping purposes.

Outside of the U.S.: For use only by institutional, professional, qualified and sophisticated investors, qualified distributors, wholesale investors and wholesale clients as defined by the applicable jurisdiction. Not for public viewing or distribution. Marketing Communication.

Janus Henderson is a trademark of Janus Henderson Group plc or one of its subsidiaries. © Janus Henderson Group plc.

W-0125-958704-013126

400-20-958704