

Insights

The role of CLOs in a diversified portfolio

Judging by conversations with investors, collateralised loan obligations (CLOs) have become popular. This paper focuses on the debt tranches of CLOs and asks whether they can play a role in asset allocation processes. Our conclusion is that the various CLO tranches provide a flexible suite of risk/reward possibilities and that they can play an important role in optimal portfolios (based on an analysis of historical returns in the US and Europe).

Main conclusions

- The global market capitalisation of the CLO asset class now exceeds \$1.2 trillion¹, with around two-thirds of that in AAA tranches.
- There have been surprisingly few defaults in the data available since 1993, with none in the AAA and AA-rated categories (based on Moody's Ratings data).
- Historical returns suggest that CLO debt tranches offer a range of risk-reward possibilities (see Figure 1), with lower quality tranches offering higher returns but with higher volatility.
- Given the return proximity of the various tranches to other asset categories (AAA is similar to cash, B is similar to stocks, for example), it would be unsurprising if they could play a role in asset allocation processes.
- Optimisation results, based on historical returns, suggest that CLOs feature in optimal allocations all along the efficient frontier (for example, AAA-rated CLOs dominate allocations at the low volatility end of the efficient frontier, while B-rated CLOs dominate the high volatility end - only AAA, BBB and B tranches were considered in the optimisation exercise).
- That analysis was based on US data from 2012 to 2025 (the longest data history available), which may penalise longer duration fixed income assets, given the rise in interest rates and yields over that period. An alternative analysis based on a period that does not have such a trend in rates gives broadly similar results.
- There may be some evidence of cyclicalities in the relative performance of CLOs but there is no consistent link with central bank rate cycles. CLO yield spreads are currently mixed versus historical norms. We think they are reasonable.

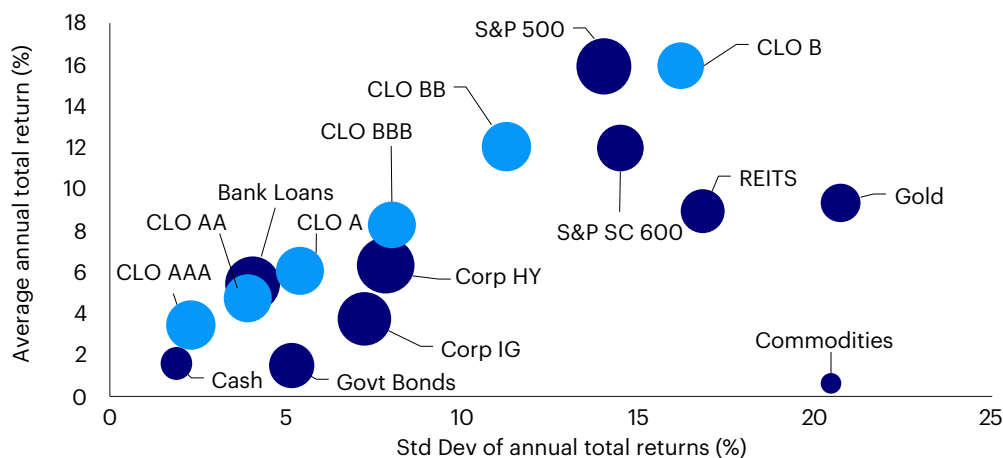


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Executive summary

- CLOs have become a sizeable asset class and are the subject of investor interest.
- Historical data suggests that CLO debt tranches could play a strategic role within multi-asset portfolios, and this is confirmed by our optimisation work. We think that AAA-rated tranches are the most likely to be broadly used.
- There is some evidence of cyclicalities of returns relative to other assets, but the evidence is mixed when it comes to the influence of central bank policy cycles. Spreads are mixed when compared to historical norms, but we think they are reasonable.

Figure 1 – Risk versus reward for US assets (2012-2025)



Notes: **Past performance is no guarantee of future results.** Based on calendar year returns from 2012 to 2025. Size of bubbles is in proportion to the average correlation with other assets shown in the chart (CLO tranches are proxied by Bank Loans when it comes to the correlation calculations with other assets, to avoid overrepresentation of the CLO asset class). Returns are total returns in USD unless stated otherwise and are based on the following indices: Cash (ICE BofA 0-3m Treasury Total Return Index), Gold (London bullion market spot price in USD/troy ounce), Commodities (S&P GSCI), Govt Bonds (ICE BofA US Treasury Index), Corp IG (ICE BofA US Corporate Index), Corp HY (ICE BofA US High Yield Index), S&P 500 (S&P 500 Index), S&P SC 600 (S&P Small Cap 600 Index), REITS (GPR General US Index), Bank Loans (S&P UBS Leveraged Loan Index), CLO returns are based on JP Morgan US CLOIE indices for each rating tranche. Source: S&P UBS, ICE BofA, GPR, JP Morgan, S&P GSCI, Bloomberg, LSEG Datastream and Invesco Strategy & Insights.

For professional/institutional/qualified/accredited investors only

1. As of 30 June 2026, based on JP Morgan indices

Introduction to CLOs

Investor discussions suggest Collateralised Loan Obligations (CLOs) have become popular. This paper explores the potential role of CLO debt tranches within a multi-asset framework, based on available data from US and European markets.

What is a CLO?

A CLO is a limited life financial structure that usually pools together broadly syndicated loans (assets) - typically senior secured loans from diverse corporate borrowers (see glossary of terms) - and finances the purchase by issuing multiple tranches of debt (liabilities), plus an equity tranche. These tranches are organised in a “waterfall” structure, meaning that the most senior debt (AAA-rated) receives principal and interest payments first, while junior debt tranches and equity are first in line to absorb any losses. CLOs are actively managed by specialist CLO managers who oversee loan selection, trading in compliance with portfolio guidelines and tests (including for over-collateralisation and interest coverage which can help ensure structural integrity for investors).

No defaults in AAA and AA tranches in the 1993-2025 period

A CLO usually holds hundreds of loans across industries and regions, which can reduce idiosyncratic credit risk. Further, their floating rate nature can minimise interest rate sensitivity. These factors and the coverage/collateral tests mentioned above may have contributed to the limited default history in the debt tranches (see Figure 2a). According to Moody's Ratings, there have been no principal defaults on Aaa and Aa-rated CLOs in the dataset that starts in 1993. The one default in the A category was a distressed exchange credit event in July 2009. Otherwise, the highest number of impairments has been in the Ba category, with around 2% of CLOs in that tranche impaired since 1993, with an implied loss rate of 1.1% (according to Invesco Private Credit team calculations).

Global market cap. exceeds \$1.2trn

In terms of the size of the asset base, the market capitalisation of CLOs included in the JP Morgan US CLOIE indices was US\$0.9trn on 30 June 2026 (source: JP Morgan), compared to \$1.5trn for the S&P UBS US Leveraged Loan Index (source: S&P UBS) and \$1.5trn for the Bloomberg US Corporate High Yield Index (source Bloomberg). As shown in Figure 2b, the AAA tranche dominates the US CLO market, with around 70% of total market capitalisation. In Europe, the market capitalisation of CLOs included in the JP Morgan Euro CLOIE indices was €0.3trn on 30 June 2026 (source: JP Morgan), compared to €0.5trn for the S&P UBS Western Europe Leveraged Loan Index (source: S&P UBS) and €0.4trn for the Bloomberg Pan-European High Yield Index (source Bloomberg). The euro CLO market is also dominated by the AAA tranche, with a weighting of around 66%.

Figure 2a – Global CLO principal defaults by tranche (1993-2025, based on original rating)

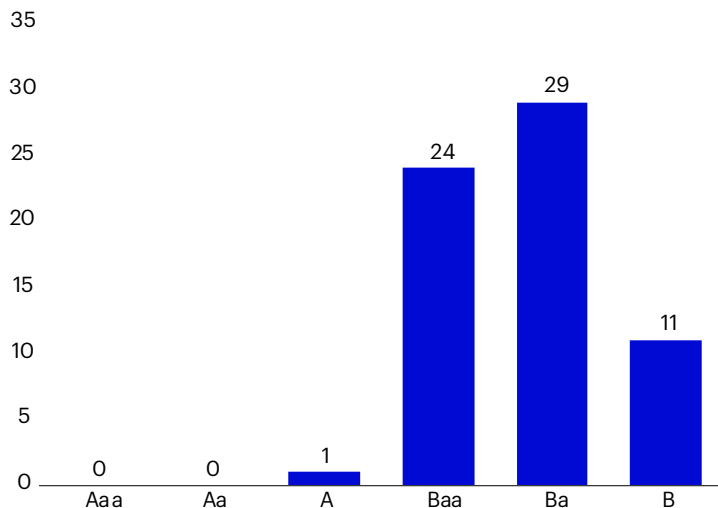
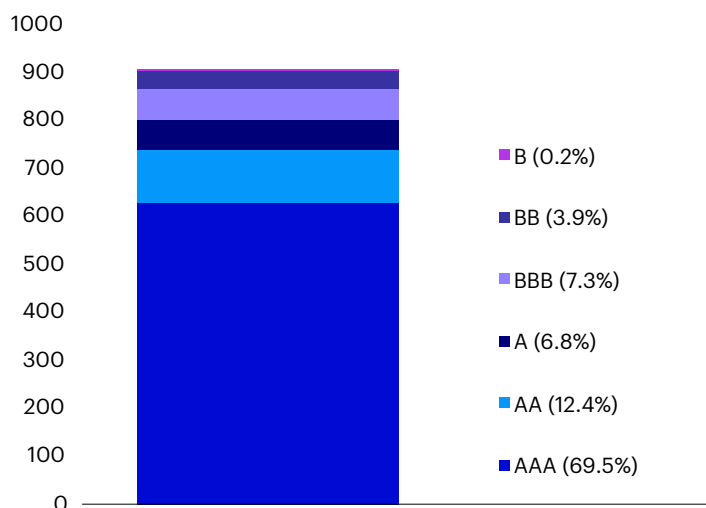


Figure 2b – Market capitalisation of US CLOs by tranche, as of 30 June 2026 (US dollars billion)



Notes: **Past performance is no guarantee of future results.** Figure 2a shows the total number of resolved and unresolved principal defaults over the period 1993-2025, across US, Europe and Asia Pacific, using the original ratings of CLOs. It is based on data from Moody's Ratings (Default and loss rates of global CLOs: 1993-2025). Figure 2b is based on JP Morgan US CLOIE indices. Source: Moody's Ratings, JP Morgan, Bloomberg L.P., and Invesco Strategy & Insights.

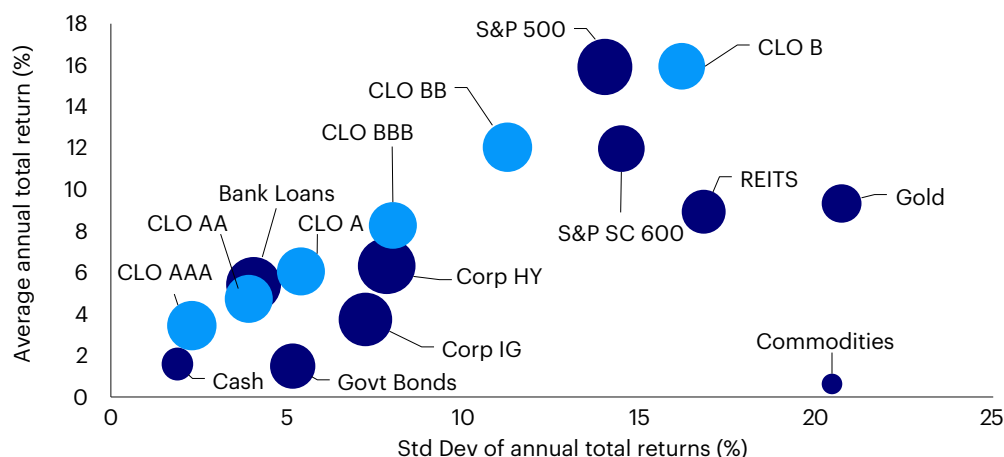


US CLOs have offered a range of risk-reward trade-offs, with a relatively consistent inverse relationship between quality and returns.

What does history tell us about the performance of CLOs?

Figure 3 compares historical US CLO debt tranche performance with that of other US assets over the 2012-25 period (the furthest back that CLO indices allow us to go). Based on that data, it seems that CLOs present investors with a spectrum of risk-reward possibilities that may be useful in an asset allocation process.

Figure 3 – Risk versus reward for US assets (2012-2025)



Notes: **Past performance is no guarantee of future results.** Based on calendar year returns from 2012 to 2025. Size of bubbles is in proportion to the average correlation with other assets shown in the chart (CLO tranches are proxied by Bank Loans when it comes to the correlation calculations with other assets, to avoid overrepresentation of the CLO asset class). Returns are total returns in USD unless stated otherwise and are based on the following indices: Cash (ICE BofA 0-3m Treasury Total Return Index), Gold (London bullion market spot price in USD/troy ounce), Commodities (S&P GSCI), Govt Bonds (ICE BofA US Treasury Index), Corp IG (ICE BofA US Corporate Index), Corp HY (ICE BofA US High Yield Index), S&P 500 (S&P 500 Index), S&P SC 600 (S&P Small Cap 600 Index), REITS (GPR General US Index), Bank Loans (S&P UBS Leveraged Loan Index), CLO returns are based on JP Morgan US CLOIE indices for each rating tranche. Source: S&P UBS, ICE BofA, GPR, JP Morgan, S&P GSCI, Bloomberg, LSEG Datastream and Invesco Strategy & Insights.

Over the period considered, AAA-rated CLOs have resembled cash (with more return and more volatility). AA and A-rated CLOs have been similar to bank loans and have offered higher returns with less volatility than government bonds and investment grade credit (IG). BBB-rated CLOs have resembled high yield credit (HY), while the more volatile BB and B tranches have produced equity-like returns. Figure 4 shows the calendar year ranking of CLO tranches, with the inverse relationship between credit quality and returns surprisingly consistent (2022 is perhaps the best example of a year when quality was rewarded).

Figure 4 – Annual ranking of US CLOs and cash by total returns in US dollars (2012-2025)

2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
B 44.3%	B 23.0%	BB 4.2%	A 2.4%	B 23.7%	B 30.6%	B 2.9%	BB 10.8%	BB 8.0%	B 28.4%	Cash 1.5%	B 26.8%	B 36.7%	B 11.6%
BB 38.9%	BB 13.0%	BBB 3.4%	AA 1.7%	BB 20.3%	BB 17.0%	Cash 1.8%	BBB 8.9%	B 6.2%	BB 11.2%	AAA 1.1%	BB 24.5%	BB 19.2%	BB 9.1%
BBB 29.7%	BBB 10.8%	A 1.9%	AAA 1.3%	BBB 11.2%	BBB 8.8%	AAA 1.7%	A 6.7%	BBB 5.5%	BBB 4.3%	AA -0.2%	BBB 17.7%	BBB 11.8%	BBB 7.1%
A 20.1%	A 7.3%	AAA 1.4%	Cash 0.0%	A 6.9%	A 4.4%	AA 1.0%	AA 5.9%	A 4.6%	A 3.1%	A -1.7%	A 13.4%	A 9.3%	A 6.3%
AA 14.1%	AA 3.5%	AA 1.1%	BBB 0.0%	AA 5.4%	AA 3.4%	BB 0.4%	AAA 4.6%	AA 3.0%	AA 2.1%	BBB -2.8%	AA 10.9%	AA 8.2%	AA 5.9%
AAA 5.0%	AAA 1.9%	B 1.1%	BB -4.2%	AAA 3.2%	AAA 2.8%	A -0.1%	B 4.2%	AAA 2.5%	AAA 1.4%	BB -3.8%	AAA 8.7%	AAA 7.1%	AAA 5.4%
Cash 0.1%	Cash 0.0%	Cash 0.0%	B -10.2%	Cash 0.2%	Cash 0.8%	BBB -0.7%	Cash 2.2%	Cash 0.5%	Cash 0.0%	B -6.4%	Cash 5.1%	Cash 5.3%	Cash 4.3%

Notes: **Past performance is no guarantee of future results.** Based on calendar year total returns from 2012 to 2025. Returns are based on the following indices: Cash is the ICE BofA 0-3m Treasury Total Return Index, AAA is the JP Morgan US CLOIE AAA index, AA is the JP Morgan US CLOIE AA index, A is the JP Morgan US CLOIE A index, BBB is the JP Morgan US CLOIE BBB index, BB is the JP Morgan US CLOIE BB index and B is the JP Morgan US CLOIE B index. Source: ICE BofA, JP Morgan, Bloomberg L.P., LSEG Datastream, and Invesco Strategy & Insights.

There is less data in Europe, but the same principles seem to apply.

Turning to European markets, Figure 5 shows a similar pattern of historical asset returns, though the timeframe is shorter due to data limitations. The period considered is perhaps too short to be considered representative, but the patterns are broadly similar to what has been seen in the US. Notably, returns across CLO debt tranches have been higher in the lower rated segments, but with more volatility.

Further, the relationship with other asset categories seems to follow the same pattern as in the US:

- AAA-rated CLO returns most closely resemble those of cash, with higher volatility and higher returns.
- AA and A-rated CLO returns are similar to those of bank loans, though with lower returns.
- BBB-rated CLO returns resemble those of high yield, though with higher returns and lower volatility in Europe (though the volatility was slightly higher in the US).
- BB-rated CLO returns are somewhere between HY and equities.
- B-rated CLO returns resemble those of the equity asset class, giving similar returns with lower volatility in Europe (but higher in the US).

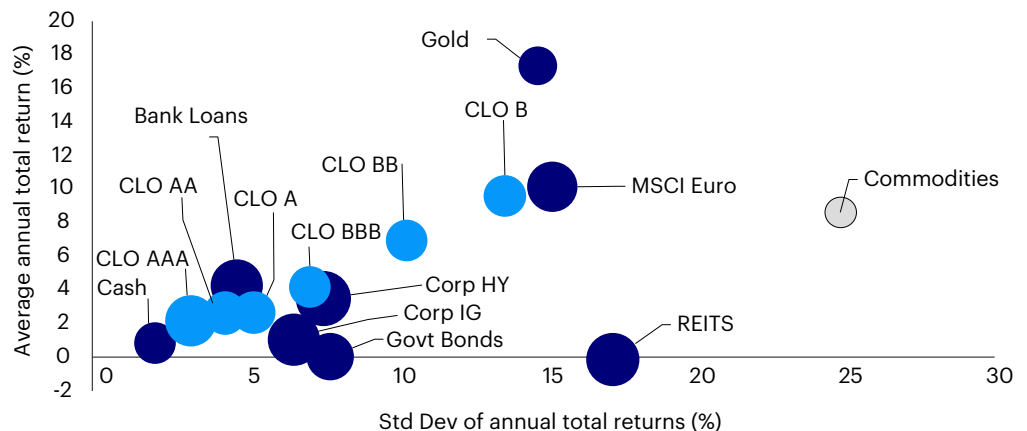
CLOs offer flexibility...

Hence, when looking at historical returns across the Europe and the US, it seems that CLO debt tranches offer a lot of flexibility and could perhaps be used to replicate the returns offered by a broader range of asset categories (from cash to equities).

...exploring their role within diversified portfolios

The following sections will examine a number of questions, with a focus on the US given the limited European data history:

1. Can certain CLO tranches be used to replace other assets in an asset allocation framework?
 - a. AAA-rated CLOs for cash
 - b. BBB-rated CLOs for HY
 - c. B-rated CLOs for equities
2. Under what circumstance do CLOs perform particularly well/poorly.

Figure 5 – Risk versus reward for European assets (2018-2025)

Notes: **Past performance is no guarantee of future results.** Based on calendar year returns from 2018 to 2025. Size of bubbles is in proportion to the average correlation with all other assets shown in the chart (CLO tranches are proxied by Bank Loans when it comes to the correlation calculations with other assets, to avoid overrepresentation of the CLO asset class). A hollow bubble shows that the average correlation with other assets was negative. Returns are total returns in euros unless stated otherwise and are based on the following indices: Cash (ICE BofA Euro Currency 3-Month Deposit Bid Rate Average Index), Gold (London bullion market spot price converted to euro/troy ounce), Commodities (S&P GSCI converted to euros), Govt Bonds (ICE BofA Euro Government Index), Corp IG (ICE BofA Euro Corporate Index), Corp HY (ICE BofA Euro High Yield Index), MSCI Euro (MSCI Euro Index), REITS (FTSE EPRA Nareit Eurozone Index), Bank Loans (S&P UBS Western Europe Leveraged Loan Index, hedged to euros), CLO returns are based on JP Morgan Euro CLOIE indices for each rating tranche. Source: S&P UBS, ICE BofA, FTSE EPRA Nareit, JP Morgan, MSCI, S&P GSCI, Bloomberg, LSEG Datastream and Invesco Strategy & Insights.



Before introducing CLOs, a benchmark efficient frontier is established based on six US assets. Optimal allocations are dominated by cash and stocks.

The role of CLOs in optimal portfolios: setting the benchmark

This analysis is purposefully limited to a small number of US assets with which to compare CLOs (cash, gold, government bonds, investment grade credit, high yield credit and stocks). Using annual data from 2012 to 2025, an efficient frontier is constructed (see Figure 6a), along which we can describe optimal allocations among those six assets (Figure 6b).

Any conclusions drawn from this analysis must be treated with caution, given the limited time span involved. Further, the time period covered is one in which bond returns have been lower than usual, given the low yields that that existed around 2012. For example, Figure 6a shows that government bond returns were lower than cash returns over the period considered. We wouldn't normally expect that to be the case over a 14-year time span.

With those caveats in mind, Figure 6a shows that the efficient frontier ran from cash to stocks (S&P 500) over the period considered, which is not unusual in these types of analyses (when going to higher levels of volatility than given by stocks, the returns decline, so those points cannot be considered to be on the efficient frontier). It should then come as no surprise that cash and stocks dominate the optimal allocations shown in Figure 6b. Cash is dominant at the low volatility end of the efficient frontier and stocks dominate the high volatility end (it isn't strictly true to say that the efficient frontier runs from cash, as the lowest volatility point also includes a small portion of government bonds). Cash also benefits from its limited correlation with other assets, as shown by the size of the bubbles.

A limited role for fixed income assets...

Not surprisingly, given the low returns noted above, bonds barely feature in the optimal allocations. Government bonds and high yield are present at very low levels of volatility, but investment grade does not feature at all.

...but a more important role for gold

Finally, gold delivered the second highest return over the period considered but with higher volatility than stocks (and with similar correlation to other assets), so it is not surprising that gold plays a more limited role than stocks in the optimal allocations.

Introducing CLOs

In the following pages we will introduce AAA, BBB and B-rated CLOs to the analysis to see if they could play any role in the optimal solutions. They will first be introduced on a one-by-one basis, then as a group.

Figure 6a – Risk versus reward for US assets and the efficient frontier (2012-2025)

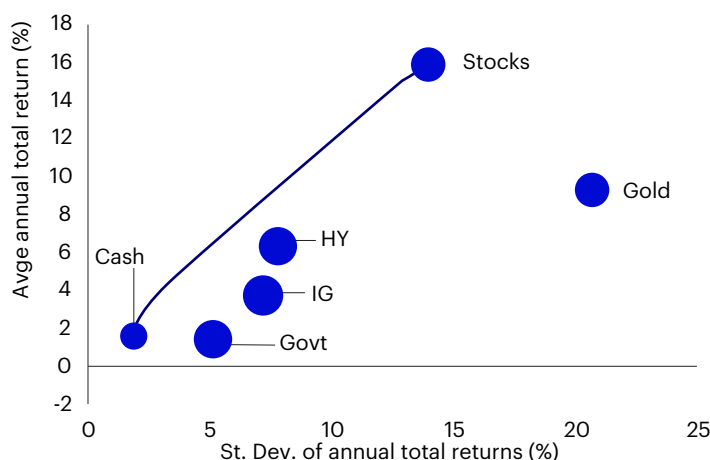
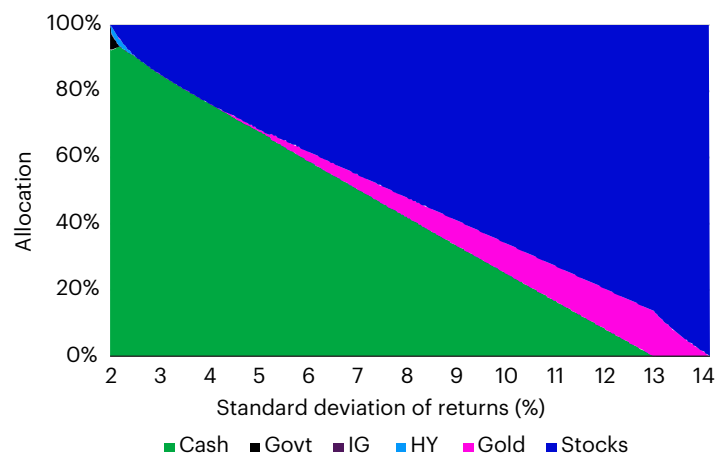


Figure 6b – Optimal allocations along the efficient frontier for US assets (2012-2025)



Notes: **Past performance is no guarantee of future results.** Figure 6a is based on calendar year returns from 2012 to 2025. Size of bubbles is in proportion to the average correlation with all other assets shown in the chart. Returns are total returns in USD unless stated otherwise and are based on the following indices: Cash (ICE BofA 0-3m Treasury Total Return Index), Gold (London bullion market spot price in USD/troy ounce), Govt (ICE BofA US Treasury Index), IG (ICE BofA US Corporate Index), HY (ICE BofA US High Yield Index), Stocks (S&P 500 Index). Figure 6b shows the optimal allocations along the efficient frontier, based on the data shown in Figure 6a. Source: ICE BofA, LSEG Datastream and Invesco Strategy & Insights.



AAA-rated CLOs largely replace cash in optimal portfolios.

The role of AAA-rated CLOs in optimal portfolios

The evidence shown in Figure 3 suggested the possibility that AAA-rated CLOs could play a role in optimal allocations across US assets.

Figure 7a shows the same information but now only includes the AAA tranche of CLOs. The efficient frontier still runs largely from cash to stocks (the lowest volatility allocation also includes AAA CLOs and government bonds). Interestingly, AAA CLOs are very close to the efficient frontier, which again suggests they are likely to play a role in optimal allocations.

Again, bearing in mind the caveats about the length and peculiarity of the data observation period, Figure 7b looks very similar to Figure 6b, except that AAA-rated CLOs have largely replaced cash in the optimal allocations. The only exception is at the very lowest volatility level, where the low volatility of cash plays an important role, along with AAA CLOs and government bonds.

However, as we move along the efficient frontier (towards higher volatility), cash is rapidly replaced by AAA CLOs, which dominate the allocations until the mid-volatility levels and remain present into the higher volatility range. As risk appetite increases, stocks play an increasing role (taking over from AAA CLOs) until they completely dominate at the highest volatility point. Gold also plays a role in the higher volatility areas.

As for traditional fixed income assets, they play a limited role, which is no surprise given the relatively low returns. Government bonds are present in the very lowest volatility segment of the efficient frontier but neither IG nor HY feature in any of the optimal allocations. We shall explore later whether this changes when we focus on a period when interest rates and yields showed no trend.

So, based on US asset returns since 2012, it would appear that AAA-rated CLOs could play an important role in optimal portfolios. In fact, they would have a role from the lowest to nearly the highest volatility points on the efficient frontier, largely taking the traditional role of cash. The interest rate spread versus cash appears to have enabled higher returns, with little uplift in volatility.

Figure 7a – Risk versus reward for US assets (incl. AAA CLOs) and the efficient frontier (2012-2025)

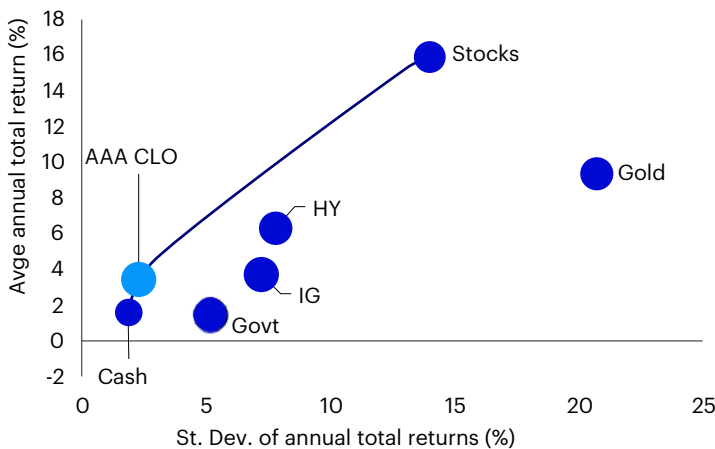
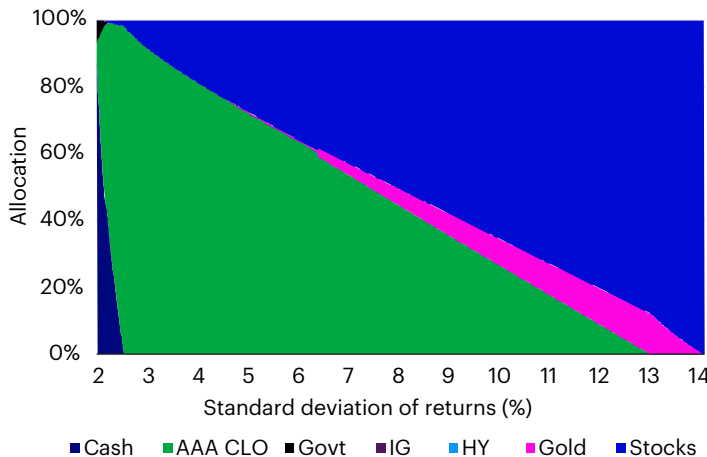


Figure 7b – Optimal allocations along the efficient frontier for US assets (2012-2025, incl. AAA CLOs)



Notes: **Past performance is no guarantee of future results.** Figure 7a is based on calendar year returns from 2012 to 2025. Size of bubbles is in proportion to the average correlation with all other assets shown in the chart. Returns are total returns in USD unless stated otherwise and are based on the following indices: AAA CLO (JP Morgan US CLOIE AAA Index), Cash (ICE BofA 0-3m Treasury Total Return Index), Gold (London bullion market spot price in USD/troy ounce), Govt (ICE BofA US Treasury Index), IG (ICE BofA US Corporate Index), HY (ICE BofA US High Yield Index), Stocks (S&P 500 Index). Figure 7b shows the optimal allocations along the efficient frontier, based on the data shown in Figure 7a. Source: ICE BofA, JP Morgan, Bloomberg L.P., LSEG Datastream and Invesco Strategy & Insights.

The role of BBB-rated CLOs in optimal portfolios

The evidence shown in Figure 3 suggested the possibility that BBB-rated CLOs could play a role in optimal allocations across US assets, perhaps replacing high yield, which has a similar risk-reward profile. Remember that in Figure 6b, high yield played a limited role in optimal portfolios, and only at the low volatility end of the efficient frontier and never exceeding an allocation of 2.2%. In fact, its role is so limited it is hard to see in Figure 6b.

As shown in Figure 8a, the BBB CLO asset category offered higher returns than high yield over the 2012-2025 period, with similar volatility. As such it is closer to the efficient frontier and may therefore play a more important role in optimal portfolios, especially as it is less correlated to the other assets in the study (the size of the bubbles is in proportion to the average pairwise correlation with the other assets in the chart).

Indeed, that turns out to be the case. Though cash dominates the low volatility part of the efficient frontier and stocks dominate the high volatility spectrum, Figure 8b shows that BBB CLOs could play an important role in optimal portfolios along most of the efficient frontier. Again, it must be caveated that this conclusion is based on data from the 2012-2025 time period.

At the very lowest volatility point on the efficient frontier, the optimal allocation is largely cash (92.0%) but also includes government bonds (7.2%) and BBB CLOs (0.8%). As we move along the efficient frontier, government bonds disappear relatively quickly, the role of cash diminishes and those of BBB CLOs and stocks increase. Eventually, gold starts to feature. Neither IG nor HY feature in the optimal allocations at any point on the efficient frontier.

At the highest volatility levels, stocks dominate and cash, BBB CLOs and gold eventually disappear. The highest BBB CLO allocation (47.5%) occurs in the mid-upper volatility segment of the efficient frontier.

In conclusion, BBB CLOs not only replace high yield within optimal portfolios, but they also take on a much bigger role. In fact, they not only eliminate the role of high yield, but they also diminish the allocations to cash and stocks.



BBB-rated CLOs not only replace HY in optimal portfolios, but they also reduce the role of cash and stocks.

Figure 8a – Risk versus reward for US assets (incl. BBB CLOs) and the efficient frontier (2012-2025)

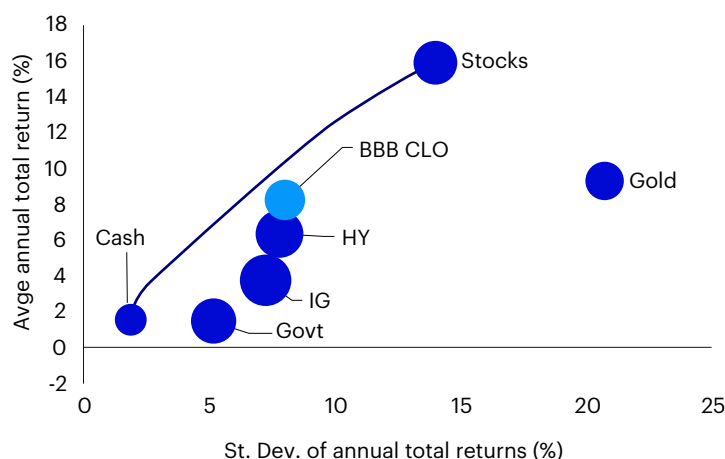
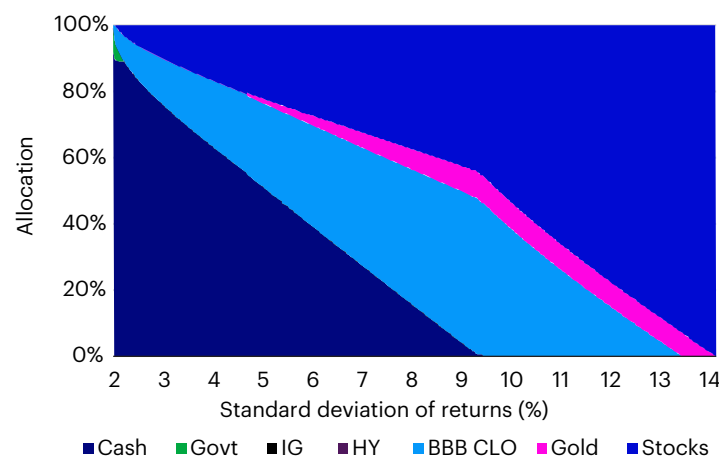


Figure 8b – Optimal allocations along the efficient frontier for US assets (2012-2025, incl. BBB CLOs)



Notes: **Past performance is no guarantee of future results.** Figure 8a is based on calendar year returns from 2012 to 2025. Size of bubbles is in proportion to the average correlation with all other assets shown in the chart. Returns are total returns in USD unless stated otherwise and are based on the following indices: BBB CLO (JP Morgan US CLOIE BBB Index), Cash (ICE BofA 0-3m Treasury Total Return Index), Gold (London bullion market spot price in USD/troy ounce), Govt (ICE BofA US Treasury Index), IG (ICE BofA US Corporate Index), HY (ICE BofA US High Yield Index), Stocks (S&P 500 Index). Figure 8b shows the optimal allocations along the efficient frontier, based on the data shown in Figure 8a. Source: ICE BofA, JP Morgan, Bloomberg L.P., LSEG Datastream and Invesco Strategy & Insights.



B-rated CLOs have offered high returns with high volatility and appear in optimal allocations at most points on the efficient frontier.

The role of B-rated CLOs in optimal portfolios

The evidence shown in Figure 3 suggested the possibility that B-rated CLOs could play a role in optimal allocations across US assets. With slightly higher returns than stocks over the 2012-2025 period, with higher volatility, it will be interesting to see whether B CLOs could replace stocks within optimal allocations. This could be helped by the fact that B CLOs have less correlation to other assets than stocks (smaller bubbles denote lower average pairwise correlation).

As can be seen in Figure 9a, B-rated CLOs would be at the extreme end of the efficient frontier using data from the 2012-2025 period, which is not surprising as it is the asset class with the highest returns (among those included in this study).

It should then be no surprise that B-rated CLOs play an important role in optimal allocations at the highest volatility levels (see Figure 9b). Perhaps more surprising is that they appear in optimal allocations all the way along the efficient frontier, except for at the very lowest volatility point. At that minimum volatility point, the optimal allocation is 92.4% cash and 7.6% government bonds.

As we move away from that minimum volatility point, B-rated CLOs and then stocks quickly start to appear and the roles of cash and government bonds decline, with the latter playing no further role once we move away from the extremely low volatility range. Cash continues to feature until the mid-to-upper reaches of the volatility spectrum, by which time gold has started to appear (in a limited fashion and over a relatively short volatility range).

The optimal allocations are then dominated entirely by stocks and B-rated CLOs, until the latter becomes the only remaining asset at the very highest volatility point. The apparent discontinuity in the weightings at those upper volatility levels, coincides with the disappearance of gold from the allocations. Gold has high volatility but lower than average correlation with other assets. When it disappears, perhaps the emphasis switches to B-rated CLOs, given that they display higher volatility than stocks (as we move up the efficient frontier, we are seeking more volatility).

In summary, B-rated CLOs appear in optimal allocations along almost the entire length of the efficient frontier and to some extent take on the same role as stocks. The roles of cash and gold are also diminished by the introduction of B CLOs.

Figure 9a – Risk versus reward for US assets (incl. B CLOs) and the efficient frontier (2012-2025)

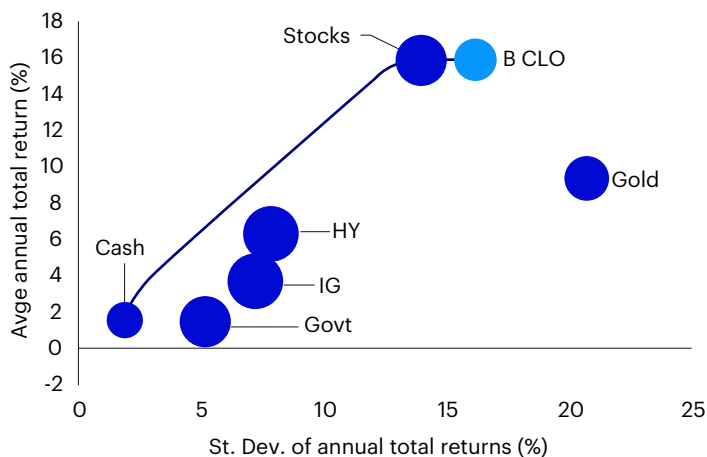
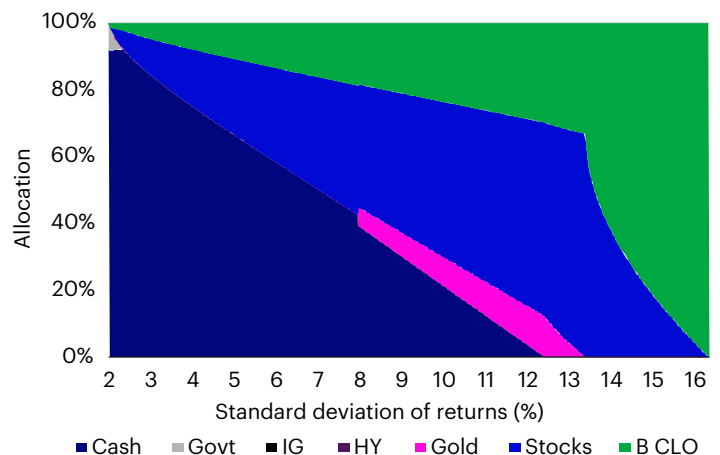


Figure 9b – Optimal allocations along the efficient frontier for US assets (2012-2025, incl. B CLOs)



Notes: **Past performance is no guarantee of future results.** Figure 9a is based on calendar year returns from 2012 to 2025. Size of bubbles is in proportion to the average correlation with all other assets shown in the chart. Returns are total returns in USD unless stated otherwise and are based on the following indices: B CLO (JP Morgan US CLOIE B Index), Cash (ICE BofA 0-3m Treasury Total Return Index), Gold (London bullion market spot price in USD/troy ounce), Govt (ICE BofA US Treasury Index), IG (ICE BofA US Corporate Index), HY (ICE BofA US High Yield Index), Stocks (S&P 500 Index). Figure 9b shows the optimal allocations along the efficient frontier, based on the data shown in Figure 9a. Source: ICE BofA, JP Morgan, Bloomberg L.P., LSEG Datastream and Invesco Strategy & Insights.

Including all three CLO tranches in optimal portfolios

So, it has been established that when introduced individually, AAA, BBB and B-rated CLOs could play an important role in the optimal allocations across US assets, using data from the 2012-2025 period. Given that they all play slightly different roles in those optimal allocations, it may be interesting to see what happens when all three tranches are used together.



Based on historical data, it would appear that CLO debt tranches could play an important role in asset allocation processes.



However, there are caveats and further examination is needed.

Figure 10a gives a reminder of where they feature in risk-return space for the period considered. It should again be apparent why they may play a role within optimal allocations, given their proximity to the efficient frontier. The question being what happens when they are all in the mix.

Figure 10b gives the answer. All three of the considered CLO tranches makes an appearance in the optimal allocations, though with different roles:

- At least one of the considered CLO tranches is present all along the efficient frontier.
- AAA-rated CLOs dominate the low volatility spectrum of the efficient frontier, except for the very lowest volatility sample where the biggest weightings go to cash.
- BBB-rated CLOs are present in the mid-volatility spectrum, though with a smaller role than in the case where no other CLOs were present. They are also briefly present at the very lowest volatility levels (hard to see).
- B-rated CLOs continue to dominate the high end of the volatility spectrum, just as they did when no other CLOs were present.

So, this analysis of US historical data could lead us to conclude that CLO debt tranches may play an important role in a US asset allocation framework. However, that conclusion comes with at least two important caveats: first, no allowance has been made for liquidity constraints (for example, though Figure 2b suggests that the market capitalisation of AAA-rated CLO tranches is adequate, that of B-rated tranches is small). Second, and as already mentioned, the time period under study is relatively short and starts with very low interest rates and yields that normalise upward in the latter stages of the sample period. This could penalise the outcomes for longer-duration assets, which is why the following section includes an analysis that tries to remove that upward bias in rates.

Figure 10a – Risk versus reward for US assets (incl. CLOs) and the efficient frontier (2012-2025)

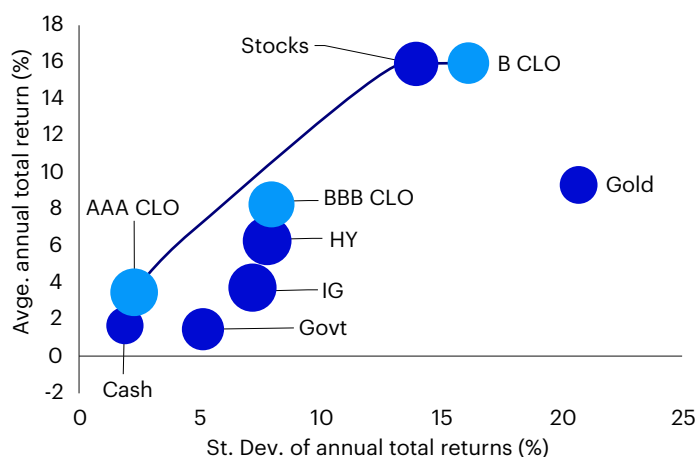
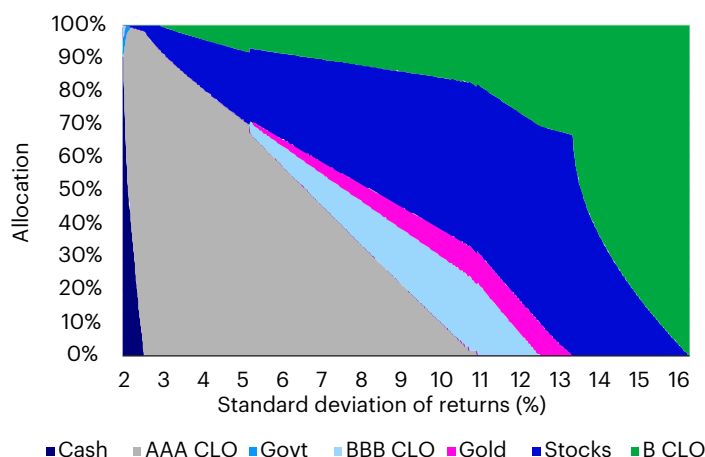


Figure 10b – Optimal allocations along the US asset efficient frontier (2012-2025, incl. CLOs)

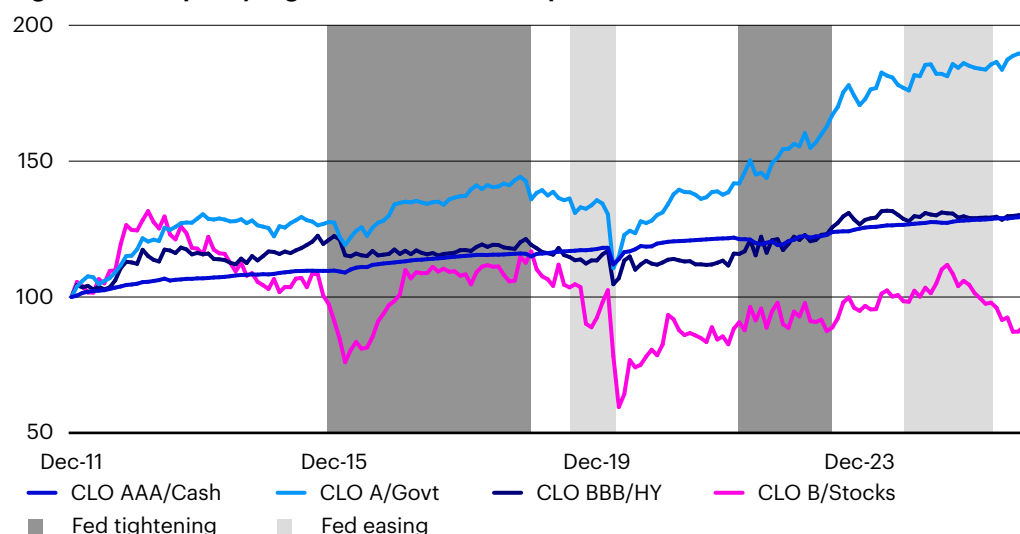


Notes: Past performance is no guarantee of future results. Figure 10a is based on calendar year returns from 2012 to 2025. Size of bubbles is in proportion to the average correlation with all other assets shown in the chart. Returns are total returns in USD unless stated otherwise and are based on the following indices: AAA CLO (JP Morgan US CLOIE AAA Index), BBB CLO (JP Morgan US CLOIE BBB Index), B CLO (JP Morgan US CLOIE B Index), Cash (ICE BofA 0-3m Treasury Total Return Index), Gold (London bullion market spot price in USD/troy ounce), Govt (ICE BofA US Treasury Index), IG (ICE BofA US Corporate Index), HY (ICE BofA US High Yield Index), Stocks (S&P 500 Index). Figure 10b shows the optimal allocations along the efficient frontier, based on the data shown in Figure 10a (assets with zero allocations throughout are excluded). Source: ICE BofA, JP Morgan, Bloomberg L.P., LSEG Datastream and Invesco Strategy & Insights.

The role of central banks, economic cycles and interest rate trends

As mentioned in earlier sections, the period for which we have CLO performance data includes a time when policy rates were exceptionally low, followed by upward normalisation. That had a knock-on effect on bond yields. Hence, when comparing CLO performance to other assets over the 2012-2025 period, the floating rate nature of CLOs may have been an advantage when compared to longer duration assets. In order to test this, the performance of various CLO tranches is compared to what we consider their closest comparator (based on the evidence in Figure 3), so that we can see whether Fed tightening or easing cycles have an effect (see Figure 11).

Figure 11 – Fed policy regimes and the relative performance of US CLOs



Notes: **Past performance is no guarantee of future results.** Based on monthly data from December 2011 to June 2026, with performance indices rebased to 100 on 30 December 2011 and showing total returns in US Dollars. "CLO AAA/Cash" shows the JP Morgan US CLOIE AAA Index divided by the ICE BofA 0-3m Treasury Total Return Index. "CLO A/Govt" shows the JP Morgan US CLOIE A Index divided by the ICE BofA US Treasury Index. "CLO BBB/HY" shows the JP Morgan US CLOIE BBB Index divided by the ICE BofA US High Yield Index. "CLO B/Stocks" shows the JP Morgan US CLOIE B Index divided by the S&P 500 Index. "Fed tightening" shows periods when the Federal Reserve was raising its policy rate. "Fed easing" shows periods when the Federal Reserve was reducing its policy rate.

Source: ICE BofA, JP Morgan, Bloomberg L.P., LSEG Datastream and Invesco Strategy and Insights.



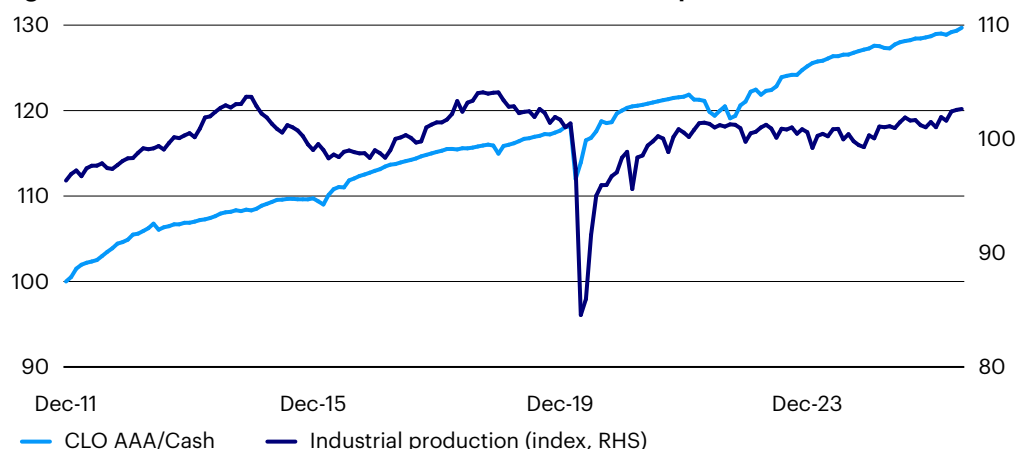
No clear evidence that Fed tightening or easing cycles have a consistent effect on CLO performance.

Bearing in mind the limited sample size, the results would appear to suggest that CLO tranches have underperformed the chosen benchmarks when the Fed embarks on tightening, though that effect is largely reversed well before the tightening is complete. Overall, there appears little consistent evidence that the outperformance by CLOs since 2012 was concentrated in periods of Fed tightening. Looking at the tightening from March 2022 to July 2023, which took the upper end of the Fed's policy range from 0.25% to 5.5%, A-rated CLOs clearly outperformed governments bonds but there was also outperformance outside of that episode.

The evidence for periods of Fed easing is mixed: that from August 2019 to March 2020 saw underperformance of CLO tranches versus the chosen benchmarks, whereas that from September 2024 to December 2025 did not (with the exception of B-rated CLOs versus stocks). Implicitly, it is assumed that the most recent easing cycle ended in December 2025.

The clear underperformance of CLOs versus the chosen benchmarks during the easing cycle that started in August 2019 was concentrated in the latter stages of the easing, which was also when the Covid pandemic was starting, at which time economies suffered a shutdown shock. Hence, the CLO performance at that stage may have been linked to a perceived cyclicity of CLOs. Indeed, Figure 12 shows that even AAA-rated CLOs suffered relative to cash as the US economy faltered (as judged by industrial production), which is interesting given the lack of AAA-rated CLO defaults shown in Figure 2a (likewise AA- and A-rated defaults).

Figure 12 – US AAA-rated CLOs versus cash and industrial production



Notes: **Past performance is no guarantee of future results.** Based on monthly data from December 2011 to June 2026, with performance indices rebased to 100 on 30 December 2011 and showing total returns in US Dollars. “CLO AAA/ Cash” shows the JP Morgan US CLOIE AAA Index divided by the ICE BofA 0-3m Treasury Total Return Index. Source: ICE BofA, JP Morgan, Bloomberg L.P., LSEG Datastream and Invesco Strategy & Insights

So, from the limited episodes available, there may be some evidence that CLOs have suffered relative to comparable assets when there is recession, which usually coincides with periods of Fed easing. Likewise, there may be evidence that CLOs outperform other assets when the Fed tightens but the longer-term outperforming trend doesn’t seem to rely on that.

In order to remove the effect of rising interest rates on the analysis conducted in earlier sections, Figures 13a and 13b show the results when the time frame is shortened to 2012-2021 (the Fed policy rate was 0.25% at the start and finish of that period, while the 10-year yield started at 1.88% and finished at 1.51%).

Though government bonds now play a bigger role in the optimal allocations (since fixed income returns are higher than in the 2012-25 period and government bond correlations with other assets are lower), neither IG nor HY (nor gold) play any role. Stocks dominate the higher parts of the volatility spectrum (the efficient frontier runs from near cash to stocks). Nevertheless, all three of the included CLO tranches still play an important role, especially the AAA tranche.



There may be an element of cyclicity to CLO performance, but the sample size is limited.

The broad conclusions about the role of CLOs are unchanged when the normalisation of rates is neutralised.

Figure 13a – Risk versus reward for US assets (incl. CLOs) and the efficient frontier (2012-2021)

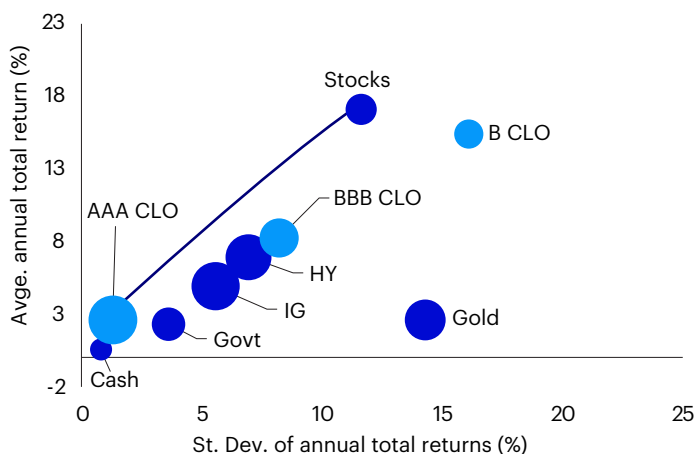
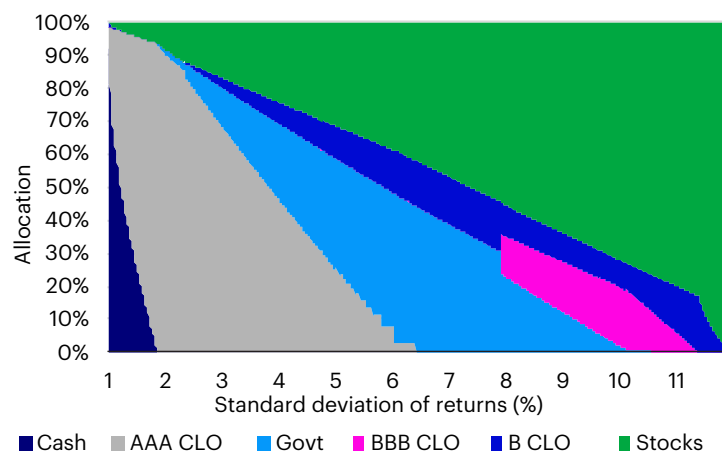


Figure 13b – Optimal allocations along the US asset efficient frontier (2012-2021, incl. CLOs)



Notes: **Past performance is no guarantee of future results.** Figure 13a is based on calendar year returns from 2012 to 2021. Size of bubbles is in proportion to the average correlation with all other assets shown in the chart. Returns are total returns in USD unless stated otherwise and are based on the following indices: AAA CLO (JP Morgan US CLOIE AAA Index), BBB CLO (JP Morgan US CLOIE BBB Index), B CLO (JP Morgan US CLOIE B Index), Cash (ICE BofA 0-3m Treasury Total Return Index), Gold (London bullion market spot price in USD/troy ounce), Govt (ICE BofA US Treasury Index), IG (ICE BofA US Corporate Index), HY (ICE BofA US High Yield Index), Stocks (S&P 500 Index). Figure 13b shows the optimal allocations along the efficient frontier, based on the data shown in Figure 13a (assets with zero allocations throughout are excluded). Source: ICE BofA, JP Morgan, Bloomberg L.P., LSEG Datastream and Invesco Strategy & Insights.

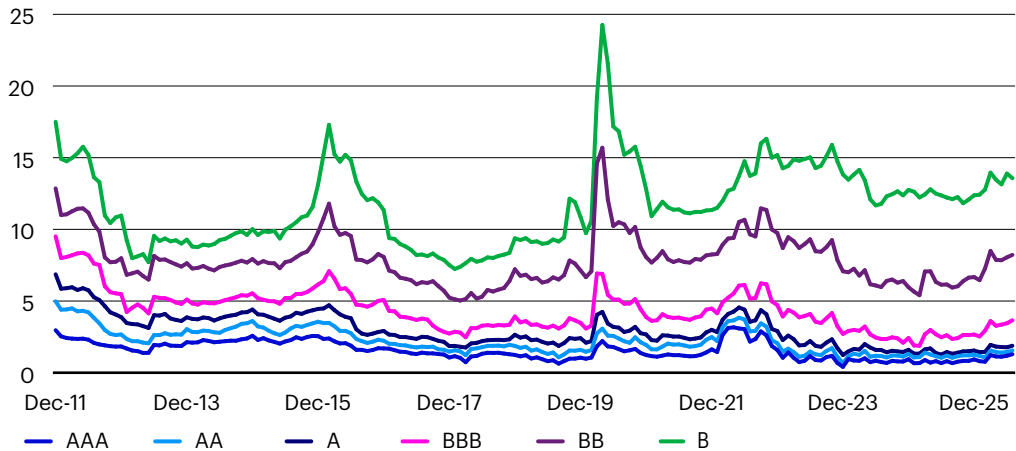


US CLO spreads (to cash rates) are mixed but have been widening and seem reasonable.

CLO yields give a mixed picture

As of 31 July 2026, US CLO yields ranged from 5.04% on the AAA tranche to 17.32% on the B tranche (based on the yield to worst on JP Morgan CLOIE indices). Those yields compare to a 3-month SOFR rate of 3.75% (see the glossary of terms). Figure 14 shows the spread versus that 3-month SOFR rate for the range of CLOs covered in this document. The spreads have been wider during periods of market uncertainty (the aftermath of the global financial crisis, Fed tightening at end-2015, the Covid pandemic and Fed tightening in 2022). However, the spreads have been trending up since December 2023 and are not extreme (in either direction), in our view (the spread on higher quality tranches is narrower than usual, while those on BB and B CLOs are wider than usual).

Figure 14 – US CLO tranche yield to worst minus 3-month cash rate (%)



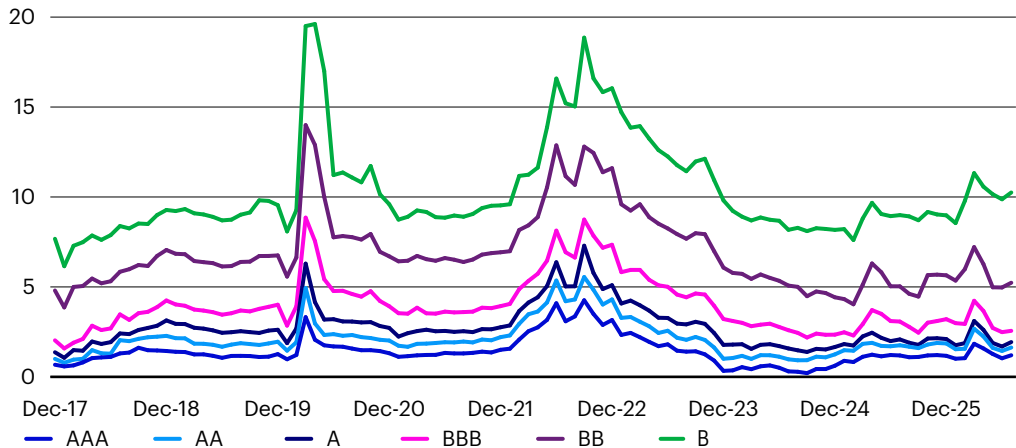
Notes: **Past performance is no guarantee of future results.** Based on monthly data from December 2011 to July 2026 (as of 31 July 2026). CLO yield to worst data is provided by JP Morgan. Three-month cash rates are LIBOR (then SOFR from March 2022). Source: JP Morgan, Bloomberg, LSEG Datastream and Invesco Strategy & Insights.



Euro CLO spreads are narrower than usual, but don't seem problematic (the data history is short).

Turning to euro CLOs, yield to worst ranged from 3.69% on the AAA tranche to 12.73% on the B tranche (as of 31 July 2026). That compares to a 3-month Euribor rate of 2.48%. Figure 15 shows the spreads on a range of euro CLOs, though the data history is shorter than for the US. Again, the spreads have been wider during moments of stress, but they bottomed during 2023/25 and have since been widening. The spreads on all tranches are narrower than usual (based on the history in Figure 15). A, BBB and BB spreads are the narrowest versus their own histories. As with US spreads, we conclude that the spreads are not extreme.

Figure 15 – Euro CLO tranche yield-to-worst minus 3-month cash rate (%)



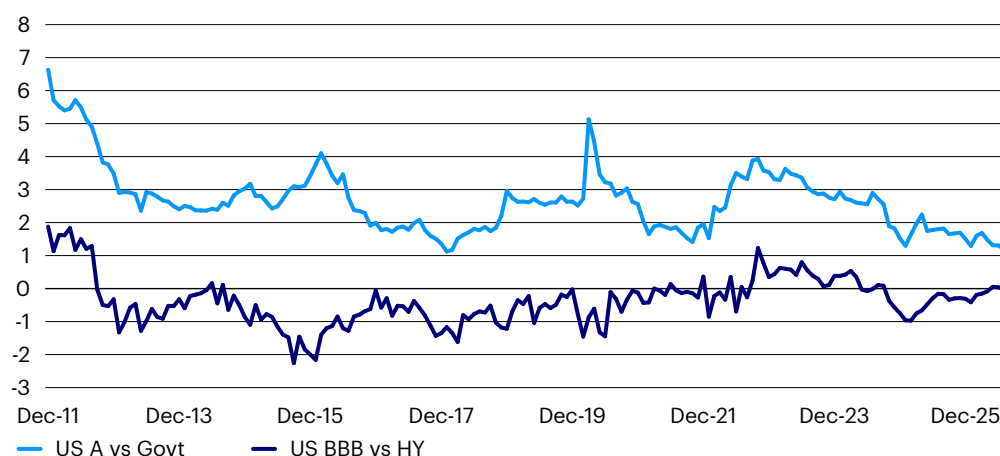
Notes: **Past performance is no guarantee of future results.** Based on monthly data from December 2017 to July 2026 (as of 31 July 2026). CLO yield to worst data is provided by JP Morgan. Three-month cash rates are Euribor. Source: JP Morgan, Bloomberg, LSEG Datastream and Invesco Strategy & Insights.



US spreads versus comparable asset yields give a mixed picture but may be distorted by the recent steepening of yield curves.

However, as has already been remarked, some of those CLO tranches perform like other assets. For example, A-rated CLOs have performed like government bonds in the past, so it may be interesting to compare their yield to that of government bonds. Likewise, BBB-rated CLOs have performed like HY bonds. Figure 16 shows those comparisons for the US market and the conclusions appear to vary. The spread between the CLO A yield and that of the 5-year US treasury is almost as narrow as at any time since the end of 2011. Bearing in mind the near-zero duration of CLOs (due to their floating rate structures), some of the changes in the spread to government yields could reflect nothing more than a steepening of yield curves, rather than a switch in preferences for CLOs versus treasuries. On the other hand, the BBB spread versus HY is wider than it has normally been over the period shown (not surprising given the tightness of HY spreads versus treasuries).

Figure 16 – US A and BBB CLO yield spreads versus other US assets (%)

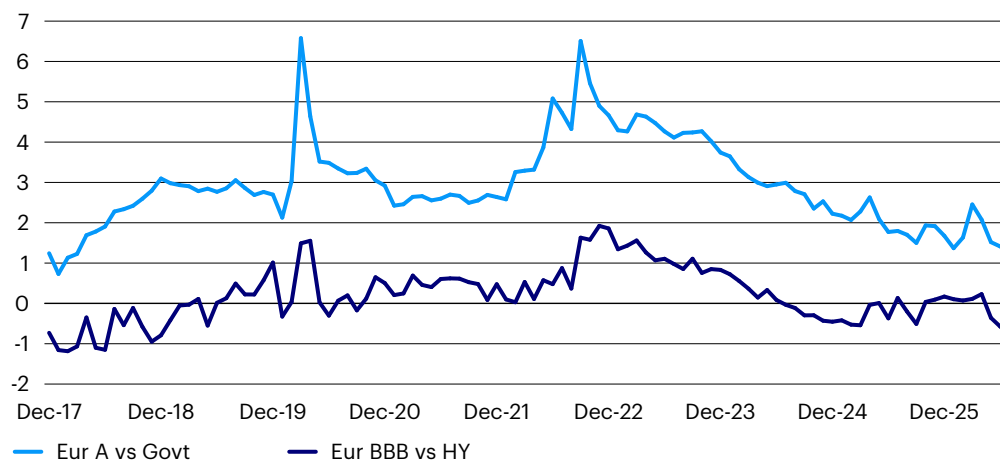


Notes: **Past performance is no guarantee of future results.** Based on monthly data from December 2011 to July 2026 (as of 31 July 2026). The chart compares CLO yield to worst on JP Morgan US CLOIE indices to the yield on other assets (CLO A tranche yield is compared to the 5-year US government yield-to-maturity and the CLO BBB tranche yield is compared to the ICE BofA US High Yield Index yield to worst).

Source: ICE BofA, JP Morgan, Bloomberg, LSEG Datastream and Invesco Strategy & Insights.

The picture in Europe is similar but different. Both the A and BBB spreads versus government bonds and HY, respectively, are tighter than normal (though with a shorter history than the US). As suggested above, some of the apparent tightness may come from the steepening of yield curves in recent years.

Figure 17 – Euro A and BBB CLO yield spreads versus other euro assets (%)



Notes: **Past performance is no guarantee of future results.** Based on monthly data from December 2017 to July 2026 (as of 31 July 2026). The chart compares CLO yield to worst on JP Morgan EUR CLOIE indices to the yield on other assets (CLO A tranche yield is compared to the 5-year eurozone government yield to maturity and the CLO BBB tranche yield is compared to the ICE BofA Euro High Yield Index yield to worst).

Source: ICE BofA, JP Morgan, Bloomberg, LSEG Datastream and Invesco Strategy & Insights.



Euro CLO spreads versus other asset yields are narrow, within the limited history available (the steepening of yield curves could be a factor).



CLOs are a \$1.2 trillion asset category with low (or no) default histories, that we think can play a role in asset allocation processes (especially AAA tranches).

Conclusions

Our analysis suggests that the market capitalisation of the global CLO market exceeds \$1.2 trillion, with AAA tranches accounting for more than two-thirds of that.

CLO defaults are relatively rare, with no defaults in the AAA and AA tranches since 1993 (the start of the Moody's Ratings dataset). There has only been one among A-rated tranches. The bulk of defaults have occurred in the Baa, Ba and B tranches (using the Moody's Ratings categories).

Though the data histories are short, it seems that higher quality CLO tranches have generated lower returns and lower volatility than the lower quality tranches, as we would expect.

The various CLO tranches appear to perform like other assets: AAA CLOs have been closest to cash (with higher volatility and higher returns); AA and A-rated CLO returns resemble those of senior secured loans; BBB-rated CLO returns resemble those of high yield; BB-rated CLO performance has been somewhere between high yield and stocks, while B-rated CLO performance has been similar to that of stocks.

To judge the potential role of CLOs in diversified portfolios, the analysis was limited to US assets, as it was deemed the European CLO index history was too short to draw meaningful conclusions (it started in December 2017). Starting with a benchmark set of six US assets for which optimal allocations were dominated by cash and stocks (with gold also featuring), three CLO tranches (AAA, BBB and B) were added individually and then as a group. The conclusion was that when optimising along the efficient frontier based on 2012-2025 data, all three CLO tranches feature significantly. AAA dominates the low end of the volatility spectrum, BBB features in the mid-volatility section and B dominates the high volatility end of the efficient frontier.

One of the problems in that analysis is that is based on a data period that included low interest rates that then normalised upward. To check whether that biased the analysis against longer duration fixed income assets, a second optimisation process was conducted using data from 2012-2021, a period over which there was no trend in rates and yields. The results were broadly similar to those using the full data history, with all three of the tested CLO tranches still featuring among optimal allocations. Government bonds played a more important role than in the original exercise but there was still no place for IG nor HY at any point on the efficient frontier.

There may be some evidence of cyclicalities in the relative performance of CLOs, with a short-lived negative impact during recessions (though the sample size is limited). There is no clear evidence that central bank policy cycles have a consistent effect on the relative performance of CLOs.

US CLO yield spreads versus cash are mixed versus historical norms. They appear tighter than normal in Europe, but the data history is short. Those spreads versus cash have been widening in recent years on both sides of the Atlantic. US spreads versus comparable assets are mixed, while those in Europe are again tighter than normal. Those spreads versus other assets may be depressed by the recent steepening of yield curves. Overall, spreads appear reasonable, in our view.

Our conclusion is that CLOs can play a role in asset allocation processes. AAA-rated CLOs are the most likely candidates for inclusion, in our view, given the results of our optimisation processes and given the size of those tranches. Our results suggest AAA CLOs most closely resemble cash, though with higher risk and higher reward. In theory, the tranches with lower credit ratings could also play a role (for example B-rated CLOs could be an alternative to stocks) but in practice we suspect the smaller market capitalisations will limit broad uptake.

Glossary of terms

Senior secured loans: (also known as senior loans or bank loans) are loans issued by banks to institutions (banks and other entities) that are the most senior, secured debt and, as such, sit at the top of the borrower's capital structure. When banks want to reduce their exposure to loans, they can be sold. Loans are often combined, repackaged and sold to investors who receive interest payments and principal repayment in return. Most leveraged loan indices only include loans that are rated below investment grade (they are called leveraged loans due to their frequent use in the financing of leveraged buyouts).

Efficient frontier: The efficient frontier is the set of optimal portfolios that offer the highest expected return for a defined level of risk or the lowest risk for a given level of expected return.

EURIBOR: Euro Interbank Offered Rate is based on the average interest rate at which a large panel of European banks borrow funds from one another. There are different maturities, ranging from one week to one year.

LIBOR: London Interbank Offered Rate was the average rate at which a panel of London banks said that they could borrow from each other in reasonable amounts. It was calculated daily on US dollars and a range of other currencies, across 15 terms (from overnight to one year). It was a measure of wholesale cash rates. Most LIBOR settings have now been discontinued and replaced by alternative risk-free reference rates, such as SOFR (US dollar), SONIA (sterling), €STR (euro) and SARON (Swiss franc), as part of the global benchmark reform programme.

SOFR: Secured Overnight Financing Rate is a broad measure of the cost of borrowing cash overnight collateralised by US treasury securities. The SOFR is calculated as a volume-weighted median of transaction-level tri-party repo data. It includes all trades in the Broad General Collateral Rate plus bilateral Treasury repurchase agreement (repo) transactions cleared through the Delivery-versus-Payment (DVP) service offered by the Fixed Income Clearing Corporation (FICC). 3-month SOFR is a forward-looking interest rate provided by the CME (Chicago Mercantile Exchange), based on transaction data from quarterly futures (3-month CME SOFR futures) using volume weighted average price (VWAP) methodology. CME also provides 1-month, 6-month and 12-month SOFR tenors. SOFR has now replaced LIBOR as the standard USD benchmark rate in financial contracts.

Yield to worst: Yield to worst is a measure of the lowest possible yield that can be received on a bond with an early retirement provision. By definition, it will be less than yield to maturity if a bond is callable.

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Data as of 31 July 2026 unless stated otherwise.

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