LSEG Yield Book

An Introduction to Yield Book CLO Prepayment Model

Summary

A Collateralized Loan Obligation (CLO) is a structured securitization product that is mostly backed by a group of corporate loans below investment grade. Each CLO has a manager responsible for selecting loans at deal origination and managing the portfolio during the reinvestment period. The Yield Book CLO prepayment model is a deal level model aiming to predict the rate at which loans exit the collateral portfolio before maturity (excluding defaults). The model combines refinancing rate and turnover rate to calculate the overall prepayment speed, using market drivers and deal attributes. This paper provides an overview of the CLO prepayment model in terms of model framework, drivers, assumption, specification and performance.

LSEG DATA & ANALYTICS

Overview and approach

A Collateralized Loan Obligation (CLO) is a structured product backed by corporate loans below investment grade. The CLO manager selects and manages loans during reinvestment period to maintain portfolio quality and balance. The reinvestment period is typically five years. After this period, the CLO enters a 3–5-year amortization phase, focusing on repaying principal to investors. Both assets and liabilities in a CLO are typically floating rate instruments, making them less sensitive to interest rate changes.

A leveraged loan is a type of financing for companies with high debt levels or lower credit ratings, typically rated in the single-B range. These loans are often senior secured debt, giving lenders' repayment priority, and feature floating interest rates based on a benchmark like SOFR. They usually have terms of 5-7 years with a bullet repayment structure, where most of the principal is repaid at maturity (and about 1% of principal is amortized before maturity). New leveraged loans often include a soft call protection, requiring a premium if refinanced or repriced within a specified period, usually six months.

CLO prepayment is defined as a loan exiting the CLO collateral portfolio before its maturity (vs. a loan gets paid off partially or fully before maturity in a typical mortgage), excluding default resolution. There are three sources of loan prepayment: refinancing, manager selling, and deal calls (deal liquidated/redeemed before deal maturity). Among them, refinancing is primarily influenced by tightening spreads. Manager selling is driven by the manager's efforts to maintain or enhance portfolio credit quality. Deal calls are mainly triggered by weak equity performance and/or significant loan price appreciation.

The CLO prepayment model consists of two submodels (refinancing and turnover). We combine the manager selling and deal call/redemption together as turnover given both are reflected in the collateral portfolio turnover activities. Within the turnover model, we further break the model down to two stages, one for within reinvestment period and the other for out of reinvestment period.

The output is a vector of monthly prepayment rates through deal life.

Modelling Data

The raw data used for model development is mainly from two sources:

- CLO Trustee reports (LSEG LPC) – performance history of distinct CLO deals from January 2018 to August 2025.
- LSEG LPC monthly new institutional loan spread – monthly observations from December 2019 to August 2025.

The data is pre-processed to be ready for statistical regression and model calibration.

For the model setup, a wide range of relevant variables were considered, and we settled down to the following list.

- For the refinancing model:
  - **Leveraged loan new issue market spread**: leveraged loan new issue market spread, which has negative correlation with the projected refinancing rate, i.e. higher new issue spread, lower refinancing rate, everything else being equal. For private credit/middle market CLO deals, given the new issue spread is generally higher, we will apply a 200bps adjustment to the new issue spread.
  - **Weighted average spread (WAS):** monthly weighted average spread of the CLO collateral portfolio, which has positive correlation with the projected refinancing rate, i.e. higher WAS, higher refinancing rate, everything else being equal.
  - **Par-plus loan percentage (Parplus %):** percentage of loans priced over 100 of the CLO collateral pool, which has positive correlation with the projected refinancing rate, i.e. higher Parplus %, higher refinancing rate, everything else being equal.
  - **Weighted average time to maturity (WATM)** –weighted average time to maturity in years of the CLO collateral portfolio, which has negative correlation with the projected refinancing rate, i.e. lower WATM, higher refinancing rate, everything else being equal.
- For the turnover model:
  - **Years from end of reinvestment period (EORP)** – defined as deal reinvestment end date – deal report date (in years). Before EORP, the closer to EORP, the higher turnover rate, and post EORP, the further away from EORP, the higher turnover rate in general, everything else being equal.

- **Weighted average life (WAL)** –weighted average life of CLO collateral pool, which has positive correlation with the projected turnover rate, i.e. higher WAL, higher turnover rate, everything else being equal.
- **Weighted average price (WAP)** – weighted average price of CLO collateral pool as of the trustee report date, which has positive correlation with the projected turnover rate, i.e. higher WAP, higher turnover rate, everything else being equal.
- **CCC exposure** (**CCC %**) – percentage of loans rated CCC/Caa or below by S&P, Moody's or Fitch. To account for assets rated by different rating agencies, we take the lowest rating from the three agencies. The CCC% has positive correlation with the projected turnover rate, i.e. higher CCC%, higher turnover rate, everything else being equal.
- **Cov-lite exposure** –covenant-lite loan percentage of the CLO collateral portfolio, which has negative correlation with the projected turnover rate, i.e. lower cov-lite exposure, higher turnover rate, everything else being equal.
- **WAS over WARF ratio (only used in post EORP stage)** – weighted average spread over weighted average rating factor, which has negative correlation with the projected turnover rate, i.e. higher WAS over WARF ratio, lower turnover rate, everything else being equal.
- **Seasonality** – quarter of the year as of the trustee report date, which has negative correlation with the projected turnover rate, i.e. later in the year, lower turnover rate, everything else being equal.

The modelling data variables and the corresponding sources are summarized in Exhibit 1.

Exhibit 1 – Modelling Data Summary

Data Category	Variables	Source
Prepayment	Refinancing rate + turnover rate	CLO Trustee report / LSEG
Deal attributes	Weighted average spread (WAS) Par plus loan percentage Weighted average time to maturity (WATM) Years from end of reinvestment period (EORP) Weighted average life (WAL) CCC exposure Cov-Lite exposure WAS over WARF ratio	
Market input	Leveraged loan new issue market spread	LSEG LPC

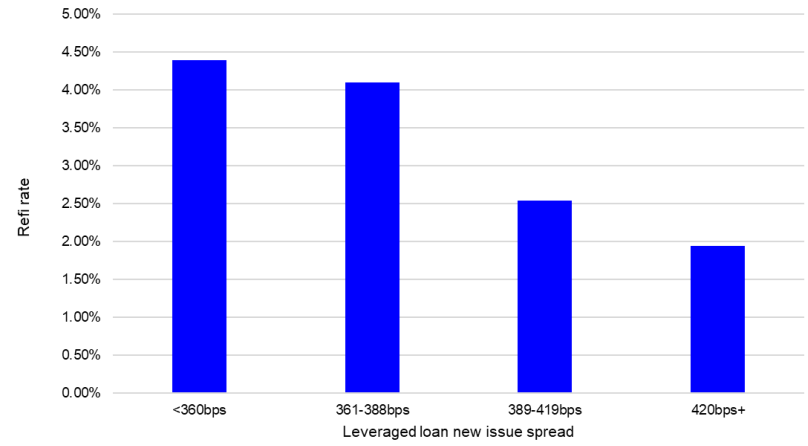
Model Drivers

A wide range of variables and their transformations are considered and finally settled to the following list: for the refinancing model, model drivers include leveraged loan new issue market spread, weighted average spread, par-plus loan percentage and weighted average time to maturity; for the turnover model, model drivers include years from end of reinvestment period, weighted average life, weighted average price, CCC exposure, cov-lite exposure and seasonality.

For Refinancing Model

Leveraged loan new issue market spread – The new issue market spread indicates the potential cost of capital for loan refinancing at market rate. Hence, the lower new issue loan spread, the higher incentive for borrowers to refinance their existing debts.

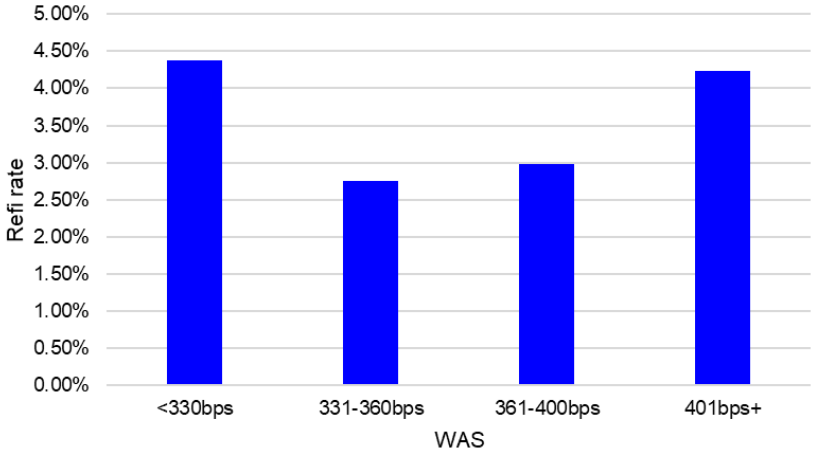
Exhibit 2 – Leveraged loan new issue market spread vs. refinancing rate



Source: LSEG LPC, LSEG Yield Book (August 2025)

Weighted average spread – The weighted average spread (WAS) of current pool is a deal level metrics showing the average financing cost of the collateral pool. Hence, the higher WAS, the higher refinancing incentive. The exception is the low-end of the WAS bucket which has a higher refi rate as the collateral loans are generally higher quality and are likely to get refinanced.

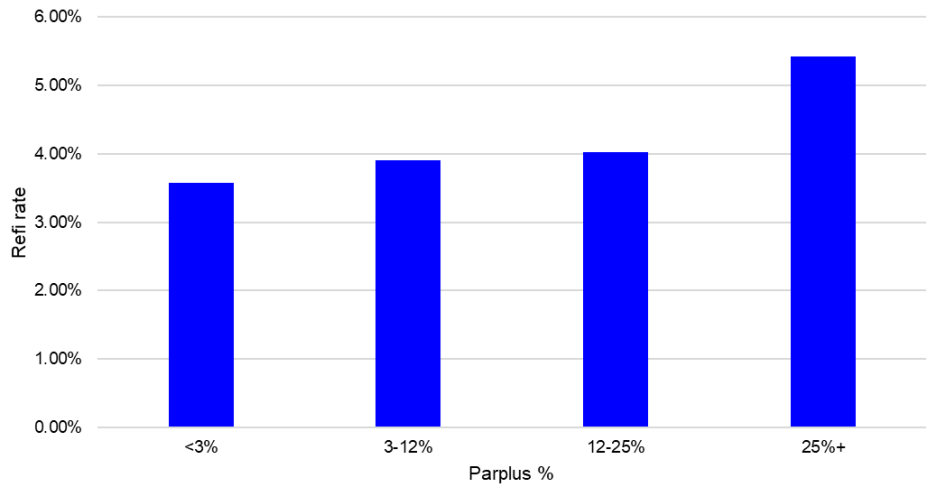
Exhibit 3 – Weighted average spread (WAS) vs. refinancing rate



Source: LSEG LPC, LSEG Yield Book (August 2025)

Par-plus percentage (Parplus%) – the percentage of loans in deal's collateral pool with a reported market price > 100. Loans are usually priced at par or with certain discount. When a loan is priced above par, issuers have the incentive to refinance the loan to lower borrowing cost.

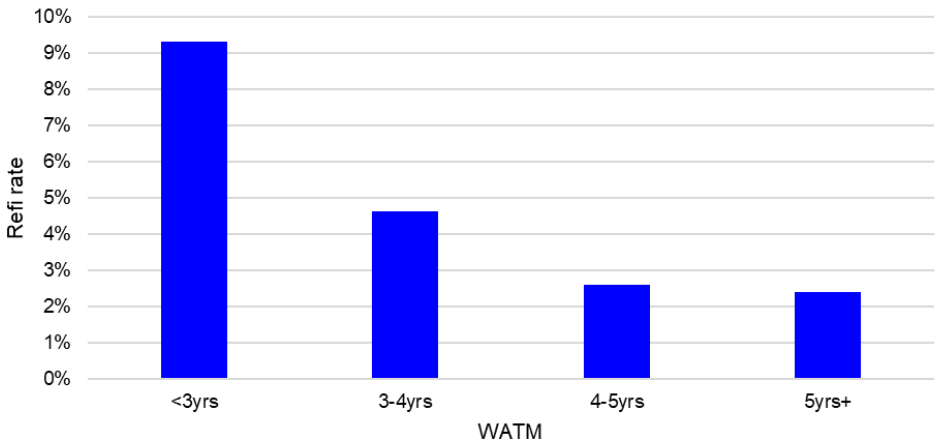
Exhibit 4 – Par-plus percentage vs. refinancing rate



Source: LSEG LPC, LSEG Yield Book (August 2025)

Weighted average time to maturity (WATM) – Loan borrowers typically do not rush to prepay their debt until it is approaching maturity. Hence, the deals with lower weighted average time to maturity (WATM) tend to have a higher refinance rate.

Exhibit 5 – Weighted average time to maturity vs. refinancing rate

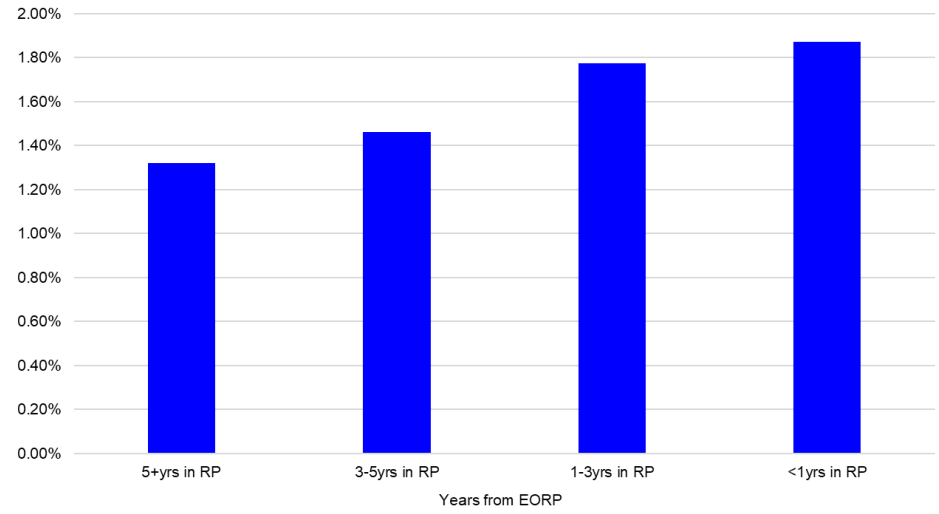


Source: LSEG LPC, LSEG Yield Book (August 2025)

For Turnover Model – in reinvestment period (RP)

Years from end of reinvestment period (RP) – for deals in RP, the turnover rate increases as deal approaches the end of reinvestment period.

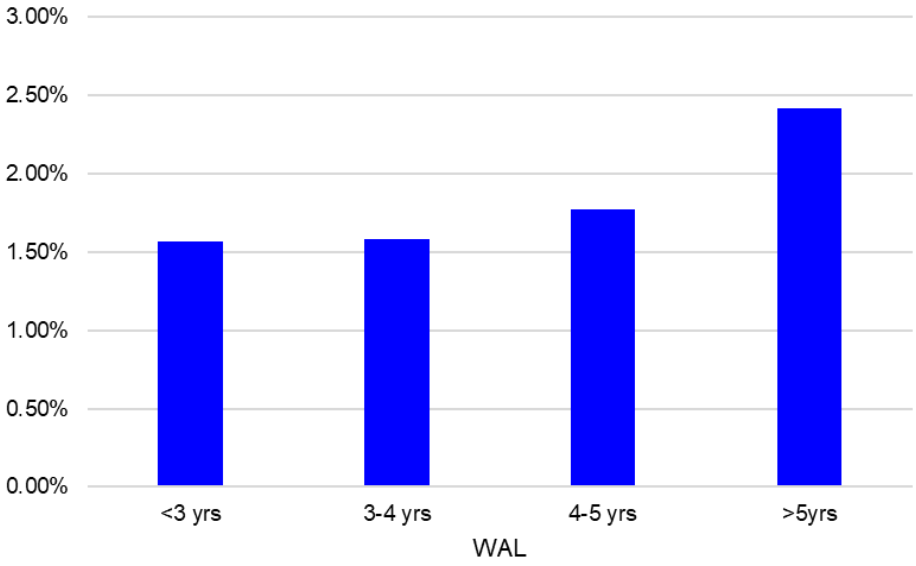
Exhibit 6 – Years from EORP vs. turnover rate (in RP)



Source: LSEG LPC, LSEG Yield Book (August 2025)

Weighted average life (WAL) – Deals with longer WAL tend to have higher turnover rate, as managers will try to trade out assets with longer average life to satisfy the mandatory WAL test for the portfolio.

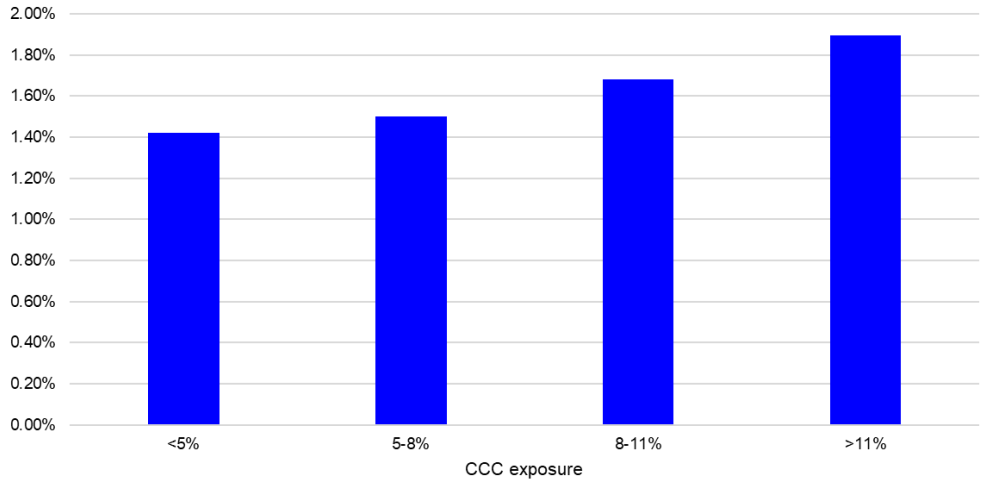
Exhibit 7 – Weighted average life vs. turnover rate



Source: LSEG LPC, LSEG Yield Book (August 2025)

CCC exposure – Deals with higher CCC[1] exposure tend to have higher turnover rate, as managers would like to sell out lower rated loans and buy higher quality loans.

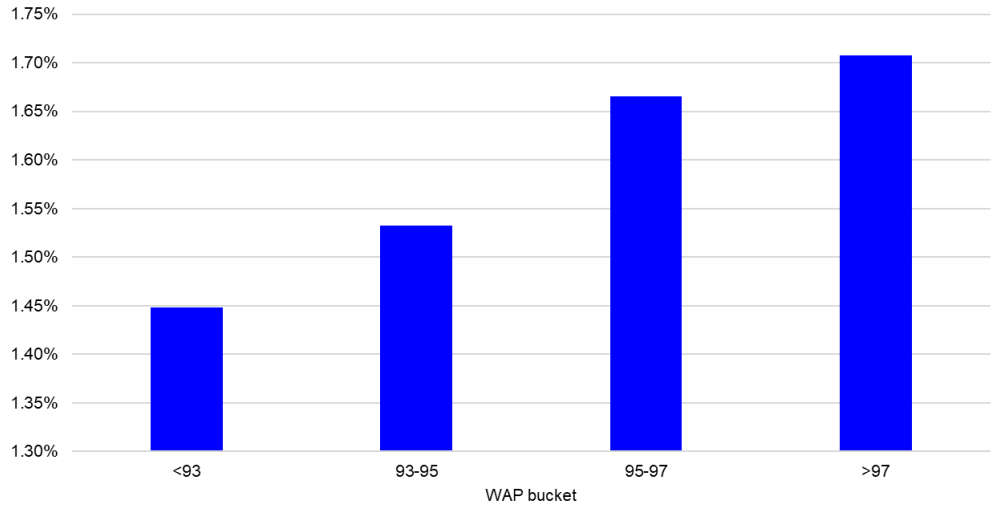
Exhibit 8 – CCC exposure vs. turnover rate



Source: LSEG LPC, LSEG Yield Book (August 2025)

Weighted average price (WAP) – With a higher weighted average price (WAP), CLO deals have a higher selling rate as managers tend to capitalize on the price gain.

Exhibit 9 – Weighted average price vs. turnover rate

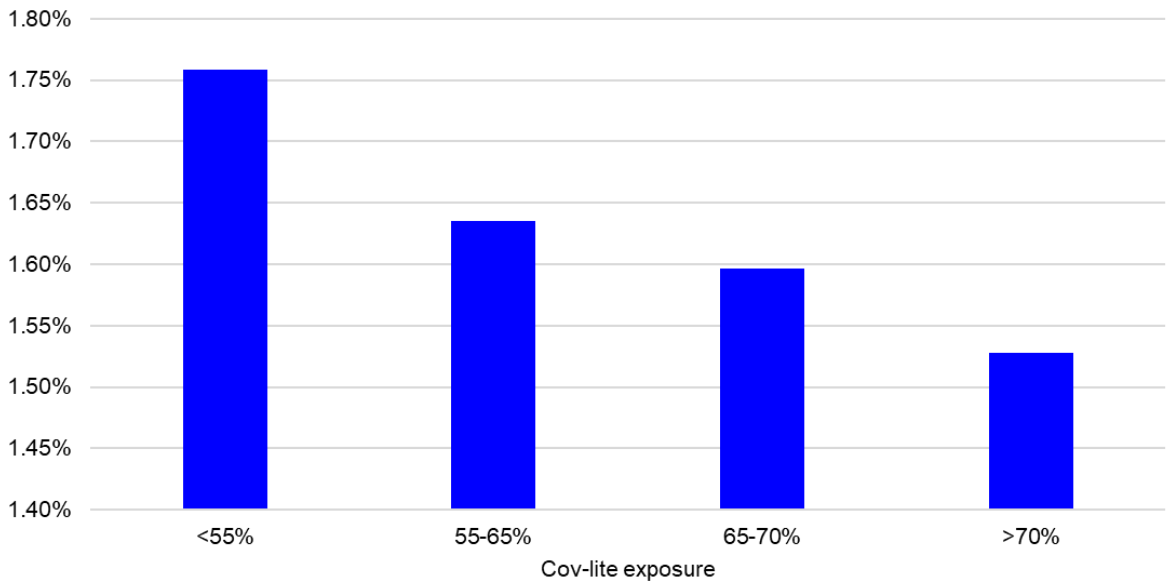


Source: LSEG LPC, LSEG Yield Book (August 2025)

[1] To account for loans rated by different rating agencies, we take the combination of Moody's, S&P and Fitch ratings to calculate the CCC exposure

Covenant-lite exposure – Cov-lite assets are generally higher quality. Managers tend to focus their selling efforts on lower-quality assets (non cov-lite assets), resulting in higher turnover rates for deals with lower cov-lite exposure.

Exhibit 10 – Cov-lite loan exposure vs. turnover rate

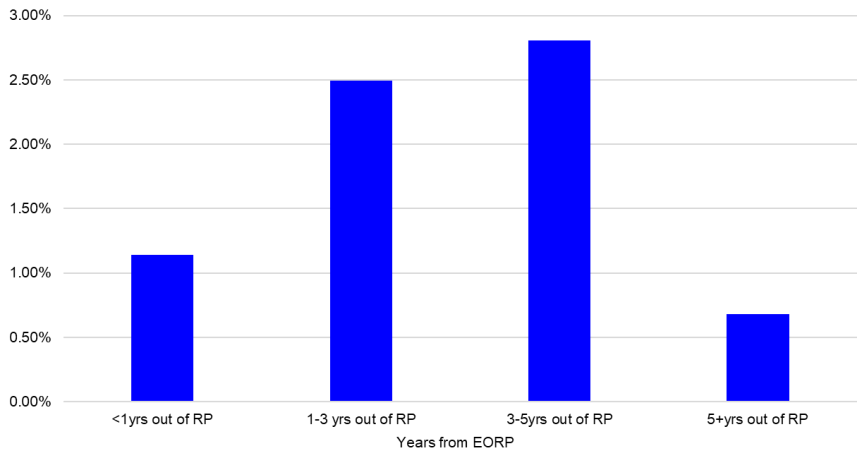


Source: LSEG LPC, LSEG Yield Book (August 2025)

For Turnover Model – out of reinvestment period (RP)

Years from EORP – Years from the end of the reinvestment period (EORP) exhibit a barbell-shaped correlation with turnover rates for deals out of the reinvestment period. Shortly after passing the EORP, managers prioritize maintaining collateral balance to ensure the deal remains viable, leading to lower turnover rates. As time progresses, managers increasingly sell assets to repay liability tranches. Moreover, the likelihood of deal calls rises as the deal loses its appeal to equity holders due to reduced flexibility. For deals that are more than 5 years out of the reinvestment period, the collateral pool typically consists of residual assets. These assets are generally illiquid, resulting in a low turnover rate.

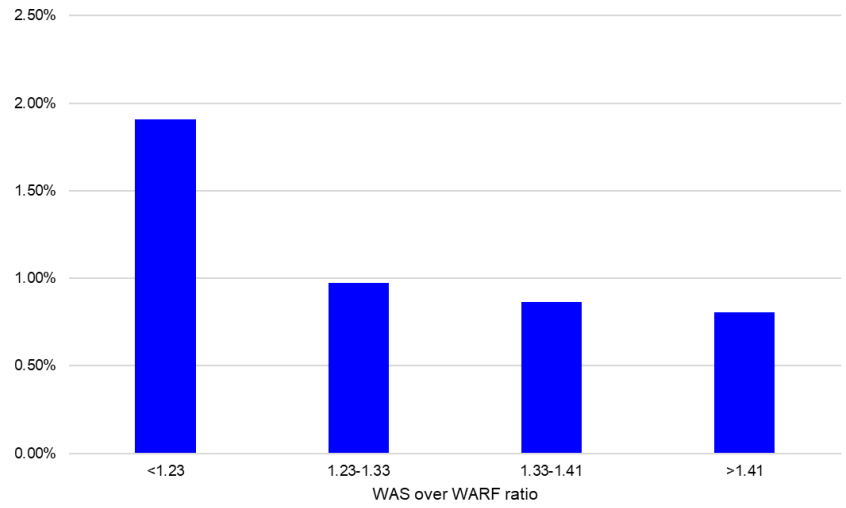
Exhibit 11 – Years from EORP vs. turnover rate (out of RP)



Source: LSEG LPC, LSEG Yield Book (August 2025)

Weighted average spread over weighted average rating factor ratio – Higher WAS over WARF ratio reflects better risk/return profile and optimal portfolio composition. We see lower manager selling rate with higher WAS over WARF ratio for out of RP deals.

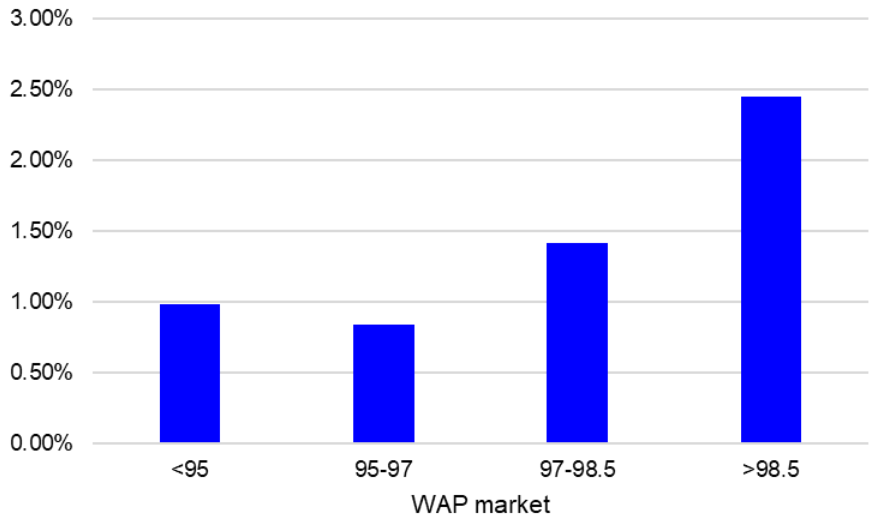
Exhibit 12 – WAS over WARF ratio vs. turnover rate (out of RP)



Source: LSEG LPC, LSEG Yield Book (August 2025)

Weighted average price (WAP) – With a higher weighted average price (WAP), CLO deals have a higher selling rate as managers tend to capitalize on the price gain.

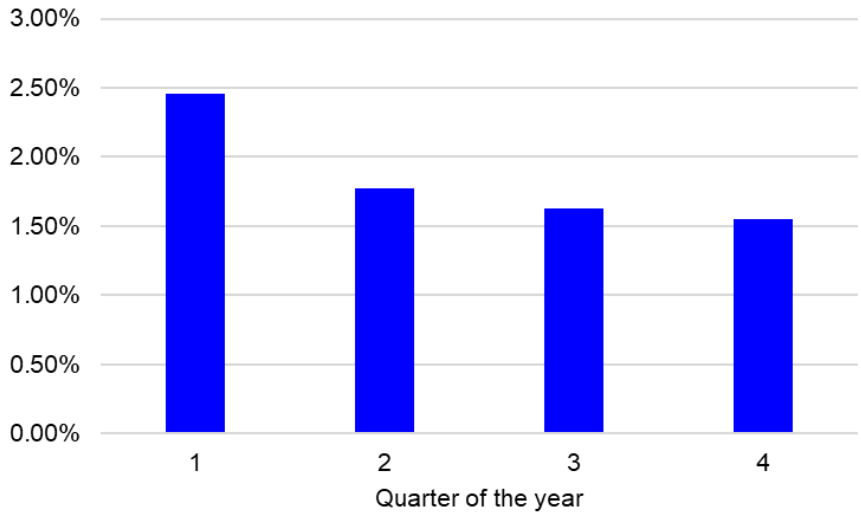
Exhibit 13 – Weighted average price vs. turnover rate (out of RP)



Source: LSEG LPC, LSEG Yield Book (August 2025)

Seasonality – Manager turnover rate has seasonality. The earlier part of the year usually sees higher selling rates while selling slows down towards year end. This trend may result from managers rebalancing portfolios following the start of a new calendar or fiscal year, taking advantage of new opportunities, or aligning with strategic goals.

Exhibit 14 – Turnover rate by season

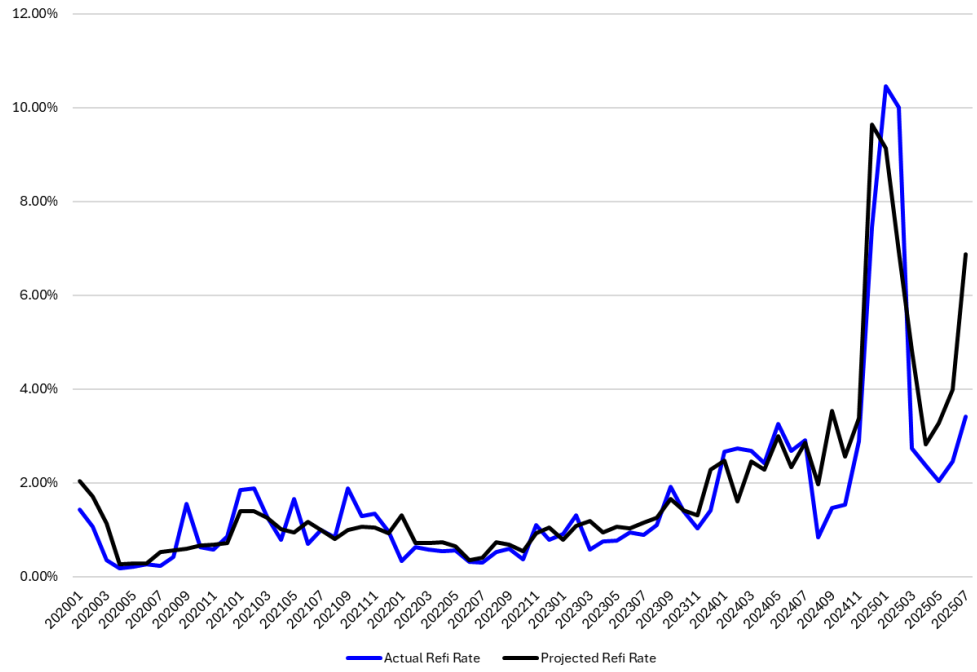


Source: LSEG LPC, LSEG Yield Book (August 2025)

Model Performance

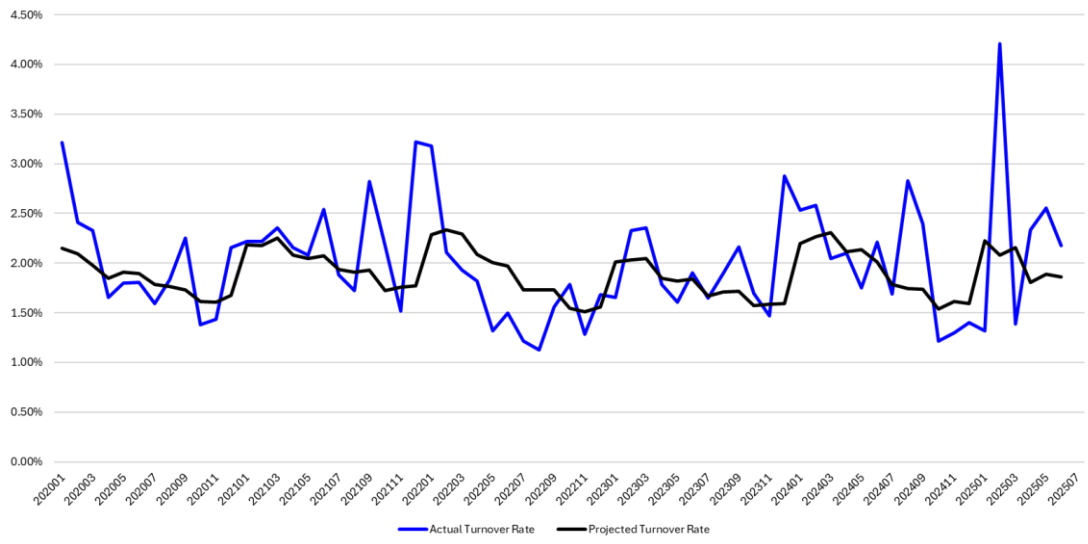
The prepayment model is evaluated based on statistical significance, business intuition and back testing results. As we modelled the refinancing rate and turnover separately, we show the back testing chart for each model and the combined outcome in the below exhibits.

Exhibit 12 – Actual and projected monthly refinancing rate



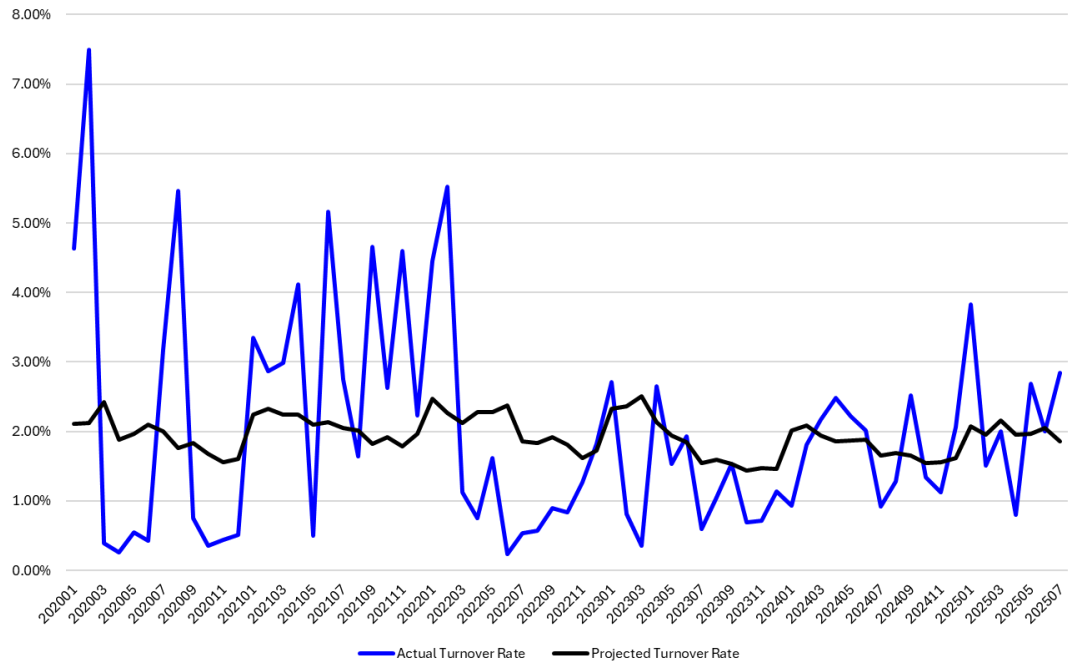
Source: LSEG, LSEG Yield Book (August 2025)

Exhibit 13 – Actual and projected monthly turnover rate for deals in reinvestment period



Source: LSEG, LSEG Yield Book (August 2025)

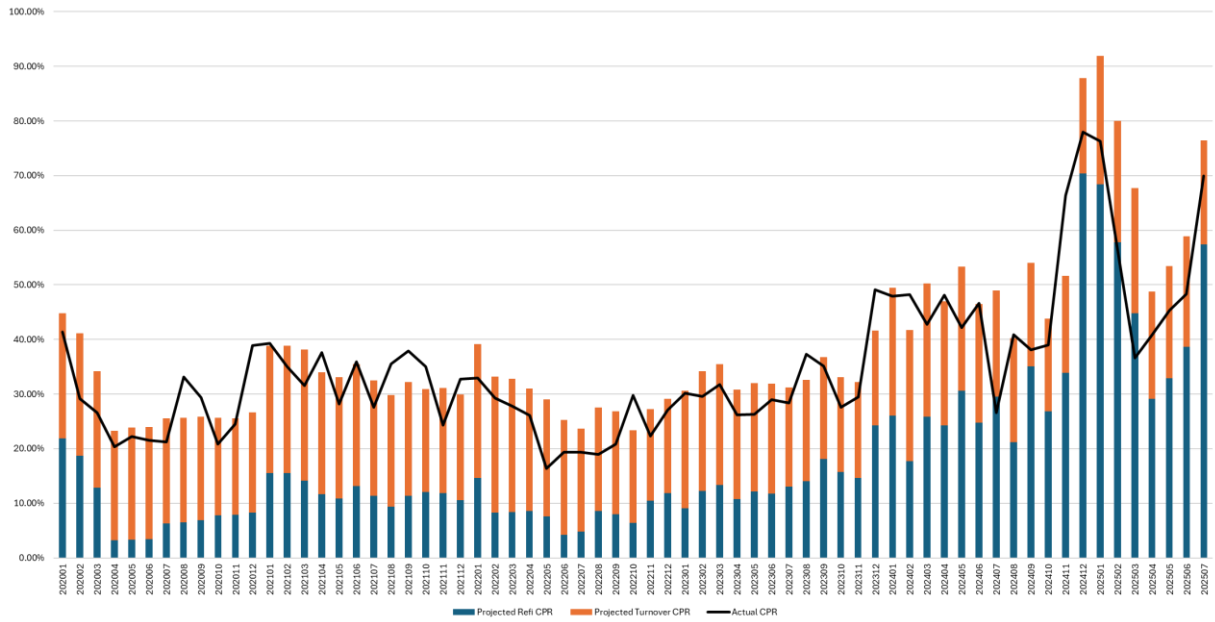
Exhibit 14 – Actual and projected monthly turnover rate for deals out of reinvestment period



Source: LSEG, LSEG Yield Book (August 2025)

The CLO Prepayment model is validated by comparing actual versus projected combined (refinancing + turnover) prepayment CPR. CPR is annualized prepayment rate and widely used in securitized product space.

Exhibit 15 – Actual and projected CPRs



Source: LSEG, LSEG Yield Book (August 2025)

Model Output

The output of the model is a vector of monthly prepayment rates through deal life, which can be fed to the CLO cash flow engine to project future cash flows for CLO bond analytics.

Model Usage

The model is applicable to BSL or Private Credit CLOs. Model also allows customized stress scenarios with key model drivers including collateral price and rating. For example, user can apply a price shock of 5 points down and a two-notch rating downgrade across collateral pool, and the changes will be reflected in the related variables including WAP, Par-plus percentage, CCC exposure and WAS over WARF ratio. The model output under different customized scenarios will feed into the cashflow engine for a wide range of analytics measures for different deal tranches.

About LSEG Yield Book

LSEG Yield Book is a trusted and authoritative source for fixed income analytics that enables market makers and institutional investors to perform complex analysis of their portfolios, benchmarks, trading decisions, historical performance, and risk. Yield Book products offer analytical insight into an extensive range of financial products in the fixed income space including governments, agencies, corporates, high yield, emerging markets, mortgages, ABS, CMBS, CMOs, CLOs, and derivatives. The platform utilizes dedicated centralized servers that help ensure reliable, prompt data delivery. Yield Book forms part of London Stock Exchange Group (LSEG)'s Data and Analytics division.

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