CLO Methodology RFC and Current CLO Landscape

US and European CLOs

October 1, 2020

Agenda

» CLO methodology RFC

- ❑ Summary and background

» Current CLO landscape

- ❑ Corporate default rates have risen
- ❑ Credit metrics continue gradual recovery
- ❑ Rating reviews largely completed

1

CLO methodology RFC: summary and background

Summary of the proposal

Existing mechanics

We infer the default probabilities of the obligors included in a CLO from the Moody's Default Probability Rating of each obligor. Currently, we analyze an obligor whose ratings we have placed on review or to which we have assigned a negative outlook as follows:

- If assigned a negative outlook, adjust down by one notch from the obligor's rating;
- If on review for possible downgrade, adjust down by two notches from the obligor's rating;
- If on review for possible upgrade, adjust up by one notch from the obligor's rating.

Proposed mechanics

Under our proposal, we would adjust down by one notch if the obligor's rating is on review for possible downgrade and up by one notch if the rating is on review for possible upgrade. In addition, we would not apply adjustments based on an obligor's rating outlook status.

Summary of the proposal - impact

Impact on WARF

On average, Moody's calculated WARF is expected to improve by about 10% (or slightly more than 300 points) from the current averages of 3272 for US CLOs and 3295 for European CLOs.

- Our modeling of CLOs typically assumes certain portfolio-wide characteristics of the CLO's collateral. With respect to default probability, the key measure is the Weighted Average Rating Factor (WARF) of the portfolio, which is calculated as the par-weighted average of the rating factor of each of the assets in the portfolio

Modelled rating impact

If the methodology is updated as proposed, based on a sampling of a large number of representative transactions, we generally expect the following rating impact attributable solely to the methodology change.

- We expect an overall positive impact of a one notch upgrade that will affect around 8% of the approximately 7,000 outstanding rated CLO tranches in the US and EMEA.
- The impact will be concentrated mostly on tranches we currently rate Ba and higher.

Summary of the proposal - background

Background

In our current modeling approach to rating collateralized loan obligations (CLOs) we adjust the rating levels of individual corporate obligors where we have assigned negative outlooks or have placed rating on review for upgrade or downgrade. These adjustments are made in our calculation of the weighted average rating factor (WARF) from which we infer the default probability of a CLO portfolio.

With the benefit of a significantly longer ratings history for Corporate Family Ratings (CFRs), one which includes significant economic downturns, we have re-examined our existing assumptions. Our updated empirical analysis indicates that ratings we place on review for downgrade or upgrade have changed, on average, one notch upon conclusion of the review. The average rating change resulting from outlooks is significantly smaller.

Empirical background

1

Rating reviews are strong predictors of near-term rating actions and, on average, ratings change one notch upon conclusion of a review.

- » On average, a rating on review for downgrade has migrated down slightly less than one notch, while a rating on review for upgrade has moved up slightly more than one notch.

2

Outlooks convey meaningful information about rating transitions over the medium and long term, but less so over the near term.

- » On average, ratings have changed a half notch upon conclusion of a positive or negative outlook, compared to nearly zero notches upon conclusion of a stable outlook.
- » Three months after being assigned a negative outlook, 91% of ratings remained at the same rating level, while 97% of ratings assigned a positive outlook remained at the same rating level.

3

Rating reviews provide stronger signals than rating outlooks about future rating transitions in the near term.

- » Most rating reviews result in a rating change at conclusion, while most rating outlooks result in a rating affirmation.
- » Adjusting current ratings for outlook status does not provide optimal future rating transition prediction.

Note: all ratings referenced here are corporate family ratings (CFR)

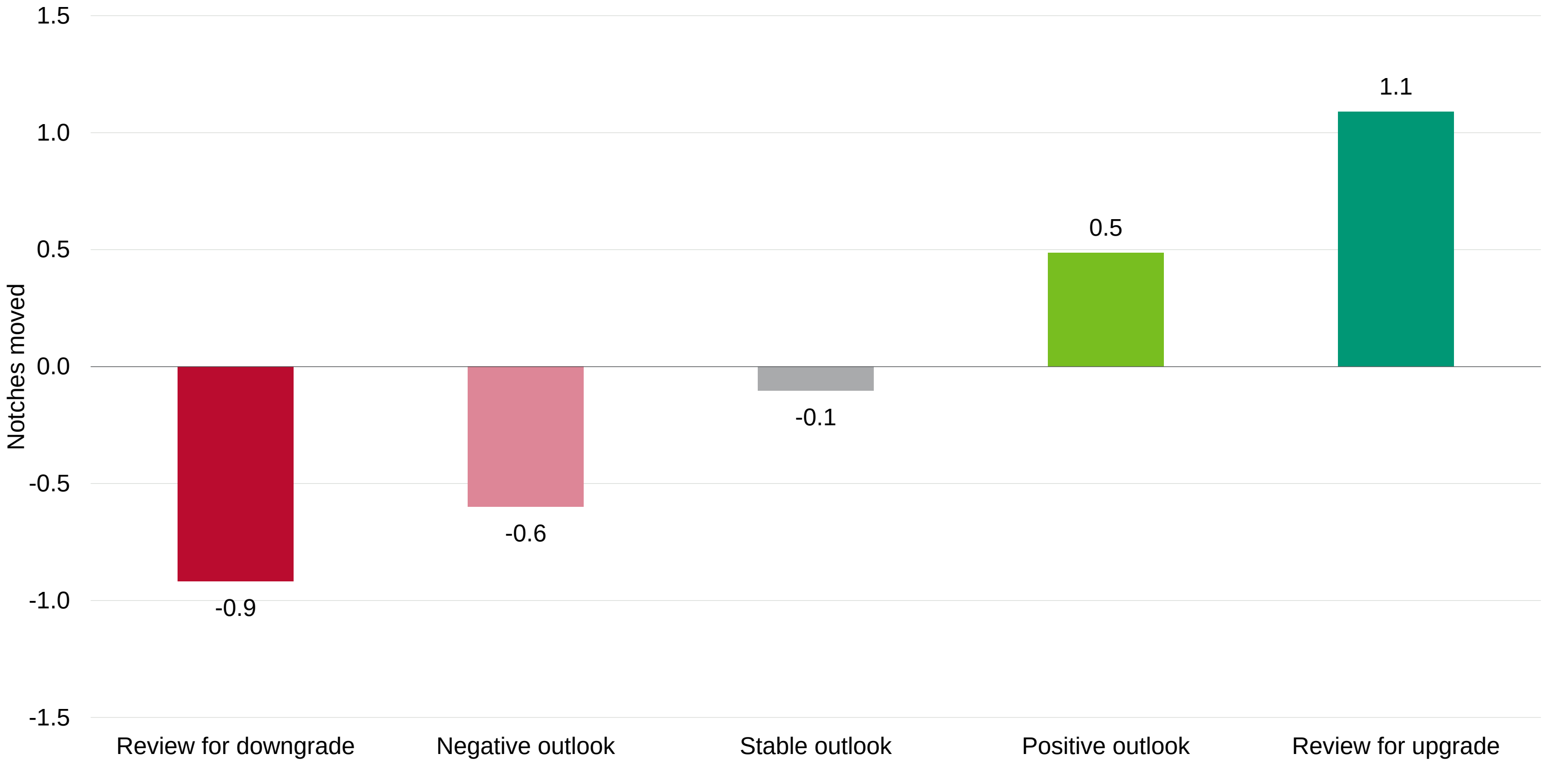
Average rating migrations for reviews and outlooks

On average, ratings move one notch upon conclusion of a rating review and half a notch upon conclusion of a positive or negative outlook

» The chart shows the average rating notches moved upon conclusion of a rating review and outlook calculated from January 2000 to July 2020.

» The averages in the chart reflect a mix of rating transition outcomes, including ratings that do not experience any change, ratings that move a single notch and ratings that move more than one notch.

Average rating change upon conclusion of a rating review or outlook
January 2000 to July 2020



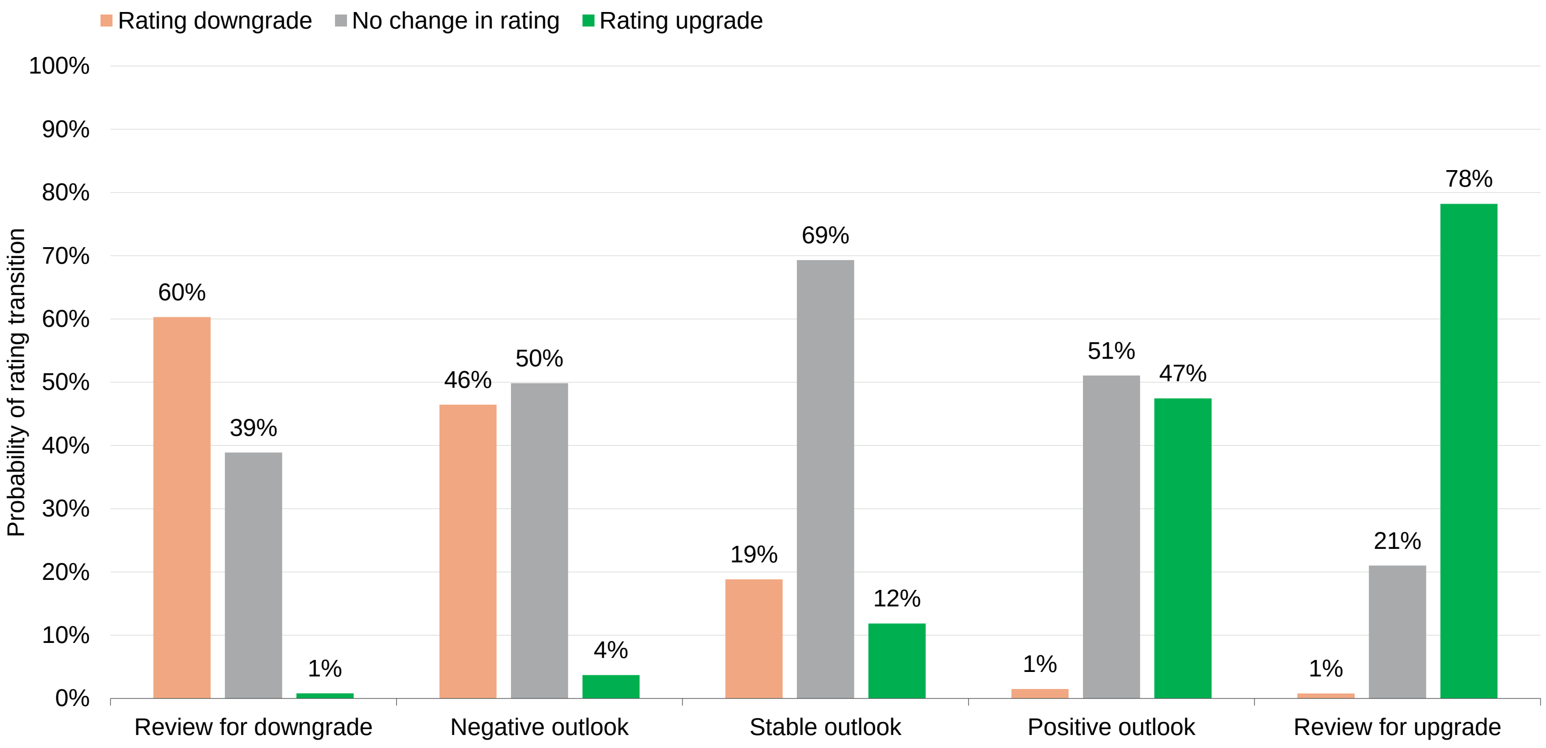
Source: Moody's Investors Service

Historical rating transition rates

Most rating reviews conclude with a rating change while most outlooks do not

- » The chart shows the proportion of ratings that were upgraded, downgraded or unchanged upon conclusion of a rating review or outlook.
- » Rating reviews lead to rating transitions significantly more often than outlooks.

Average rating transition rates upon conclusion of a rating review and outlook
January 2000 – July 2020



Source: Moody's Investors Service

Description of prediction delta analysis

The prediction delta framework allows us to assess the informational content of watchlists and outlooks to help predict future rating transitions.

» Rating reviews and outlooks are sometimes treated as signals to predict future rating transitions.

» An adjustment method describes the number of notches that the current rating is adjusted for every rating review and outlook status.

» Prediction delta =

abs { [Current rating level adjusted for review or outlook status] – [Rating level at conclusion] }

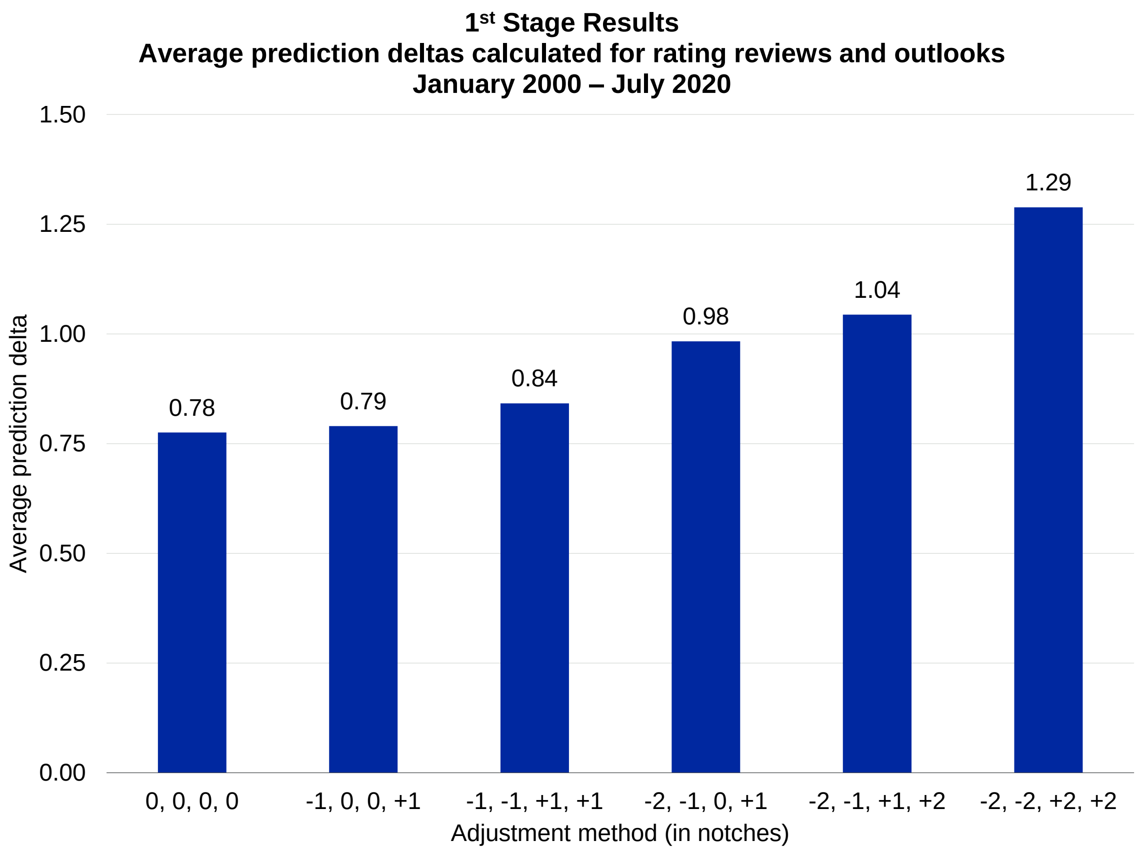
» The average prediction delta is a measure of the predictive power of an adjustment method, with a low average prediction delta indicating that an adjustment method has a high predictive power.

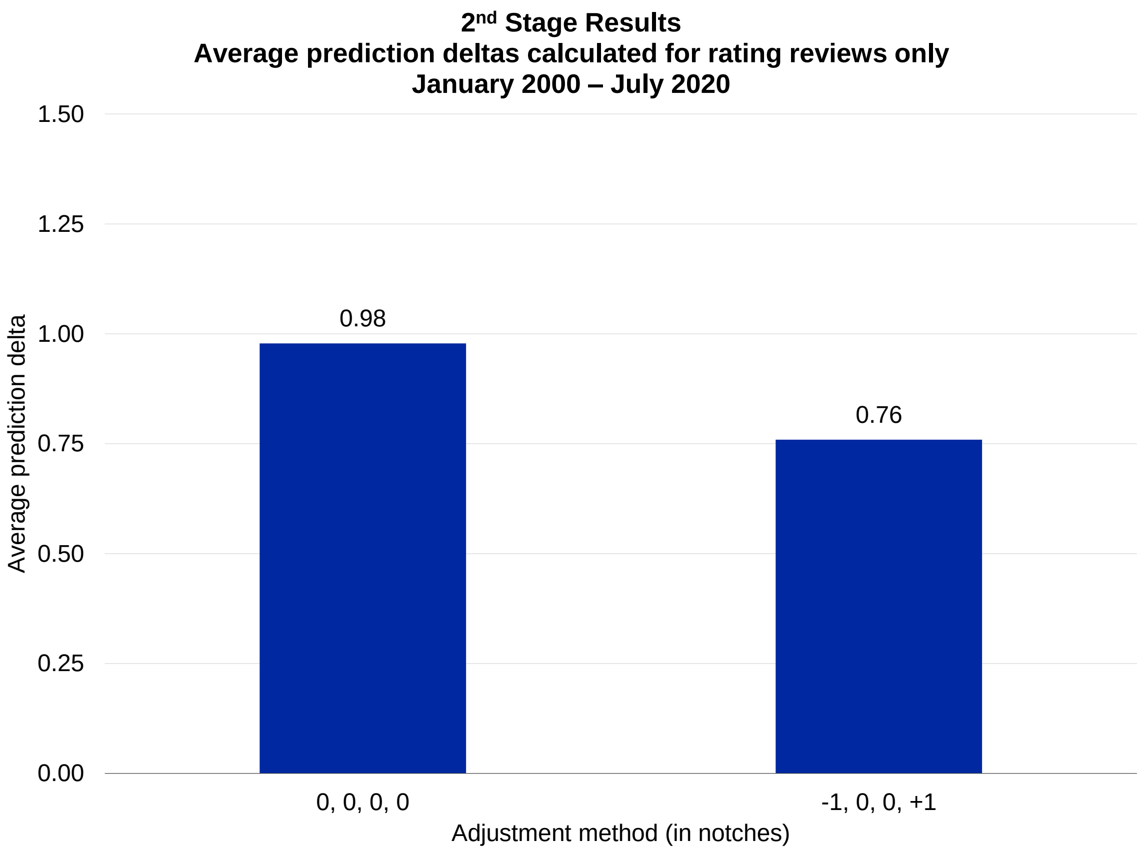
Adjust methods considered in prediction delta analysis

	Adjustment to current rating (in notches)			
Adjustment method	Review for downgrade	Negative outlook	Positive outlook	Review for upgrade
0, 0, 0, 0	0	0	0	0
-1, 0, 0, +1	-1	0	0	+1
-1, -1, +1, +1	-1	-1	+1	+1
-2, -1, 0, +1	-2	-1	0	+1
-2, -1, +1, +2	-2	-1	+1	+2
-2, -2, +2, +2	-2	-2	+2	+2

Results of prediction delta analysis

-1, 0, 0, +1 notches adjustment method is near-optimal in both stages





Source: Moody’s Investors Service

2

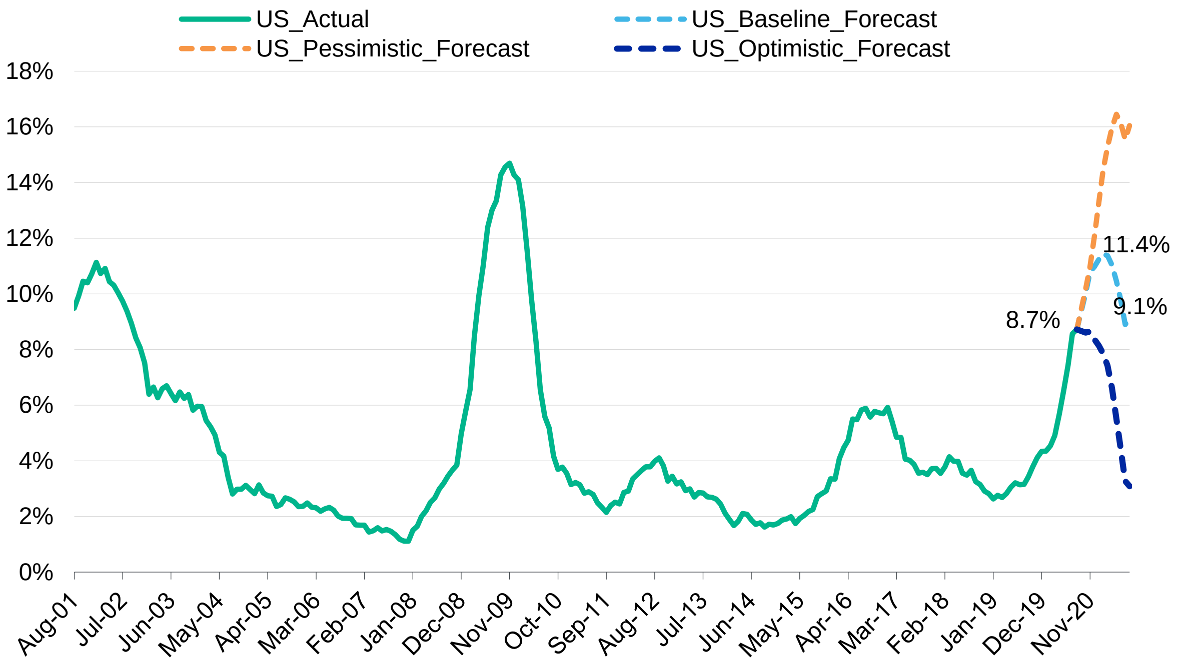
Current CLO Landscape:

Credit metrics continue gradual recovery despite pickup in defaults

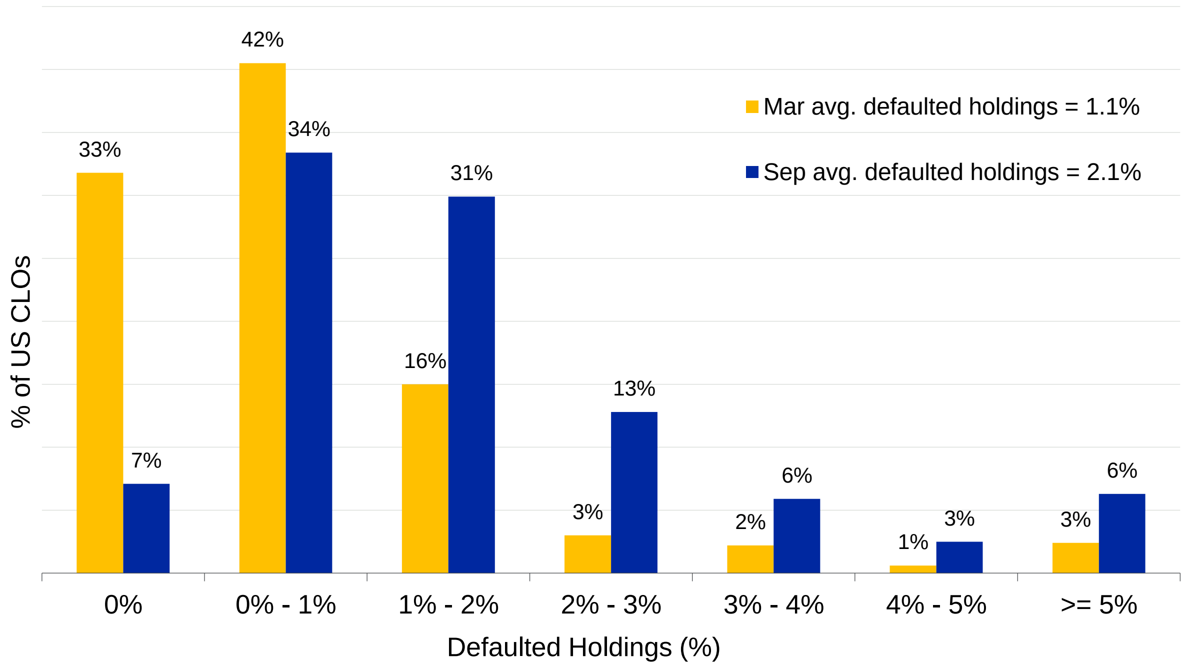
Corporate default rates are rising

- US speculative-grade default rate expected to peak at 11.4%, by Q1 2021
- CLO defaulted-asset holdings increased, but remain low at an average of 2.1%

US speculative grade one-year default rates

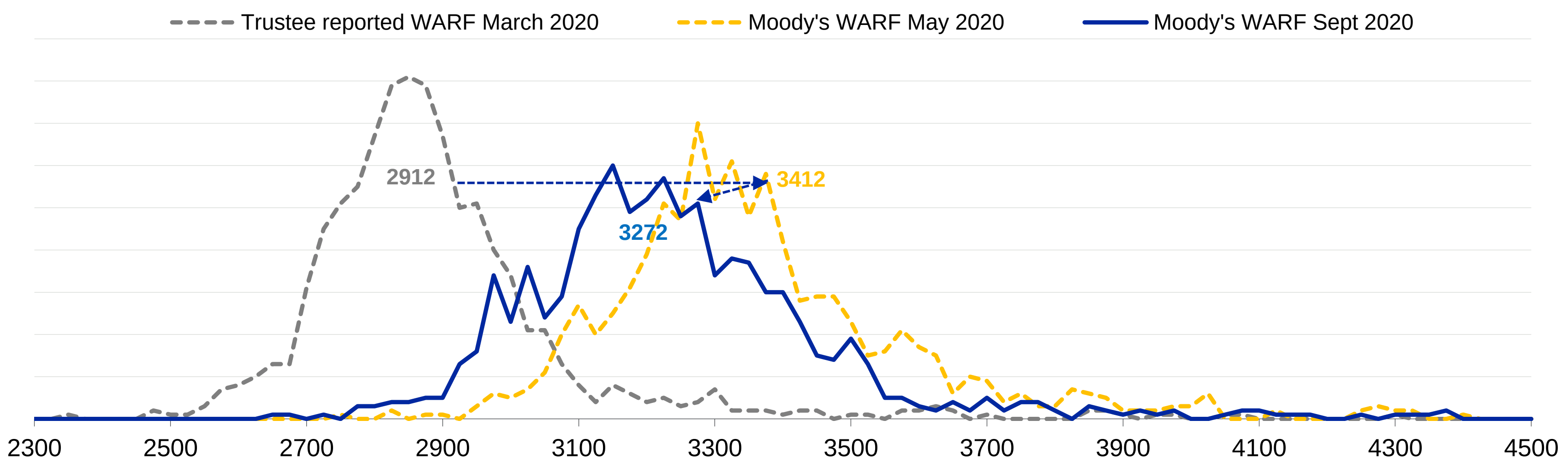


% of US CLOs by defaulted-assets holdings (%) in their portfolios



Source: Trustee reported data; Moody's Investors Service

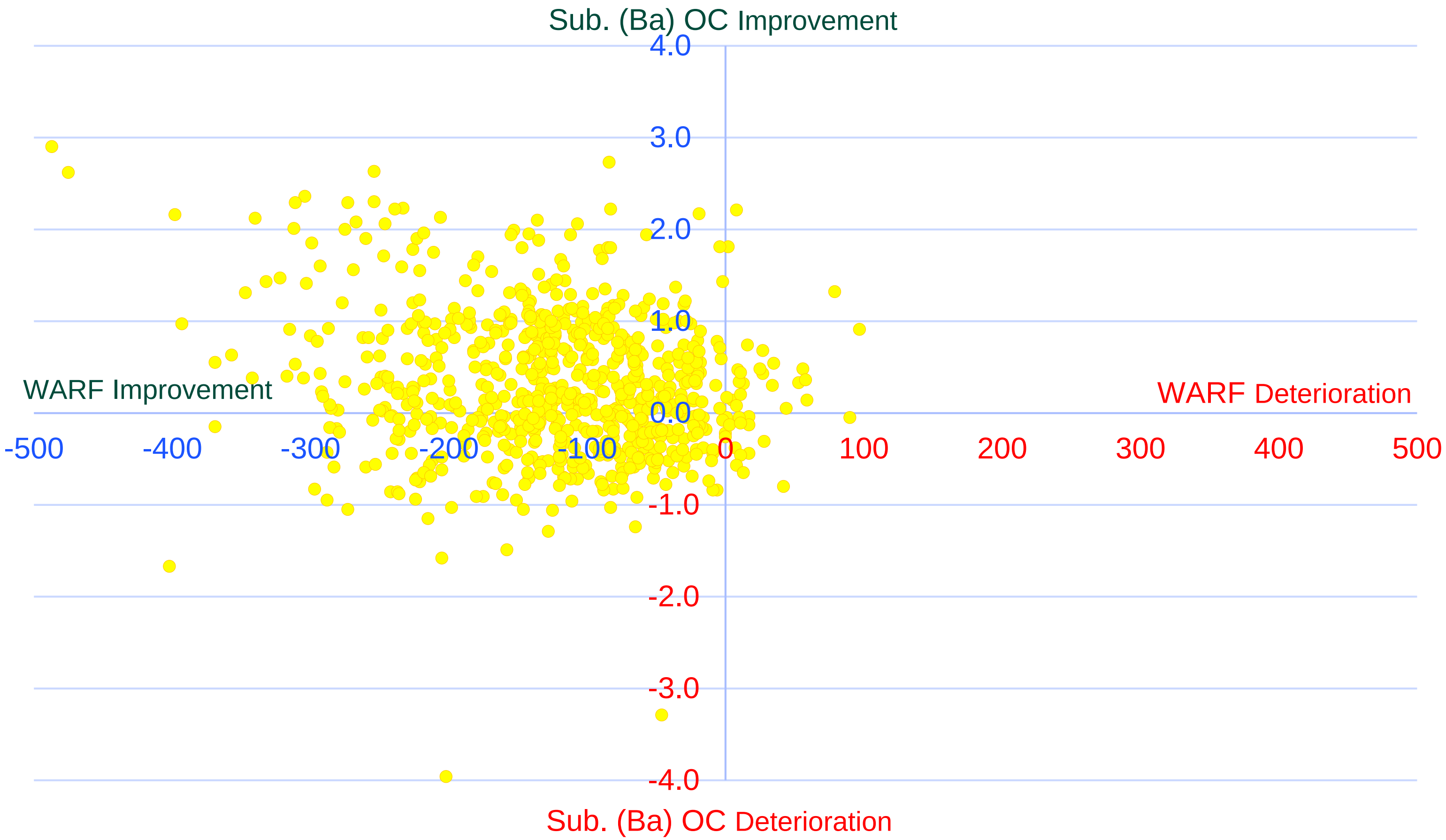
US CLO WARF continues to improve as of Sept



BSL CLO WARF	March 2020	May 2020	September 2020
WARF Average	2912	3412	3272
WARF Std. dev.	230	326	292

Source: Trustee reported data; Moody's Investors Service. BSL stands for broadly syndicated loans

WARF improved in most US CLOs, while changes in OC were uneven across transactions



May-Sep change	% of reinvesting CLOs
Improved WARF & OC	60%
Improved WARF/Deteriorated OC	35%
Improved OC/Deteriorated WARF	3%
Deteriorated WARF & OC	2%
Total	100%

Source: Trustee reported data, Moody's Investors Service. Reinvesting CLOs only.

Most watchlisted US CLO ratings have been resolved

Downgrades concentrated at Ba/B level

Broad rating category	Watchlisted tranches	Resolved
Aaa (sf)	0	NA
Aa (sf)	9	89%
A (sf)	74	86%
Baa (sf)	426	87%
Ba (sf)	441	86%
B or below (sf)	186	89%
Total	**1136**	**87%**

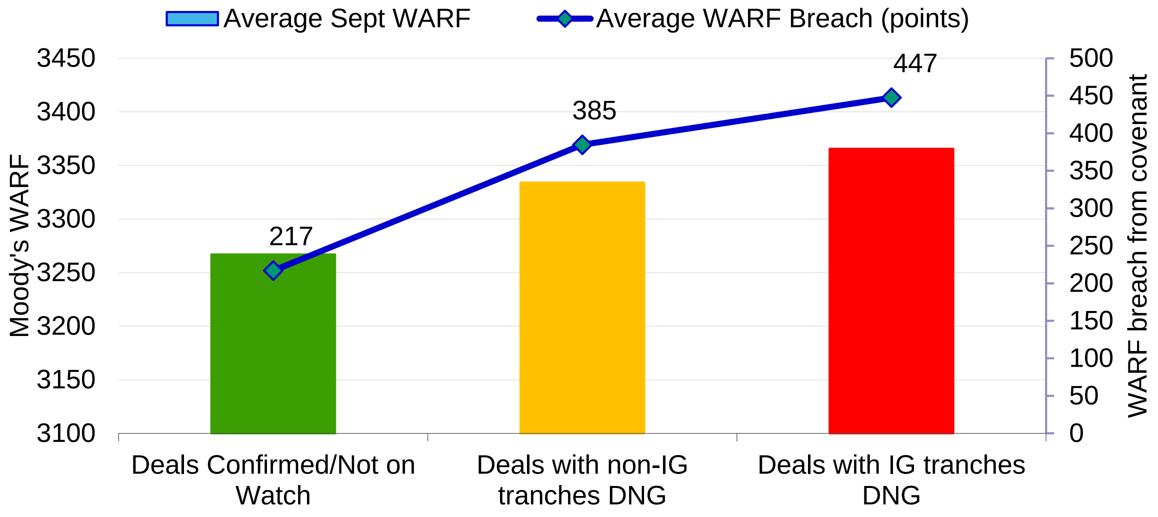
Source: Moody's Investors Service as of 28 September 2020

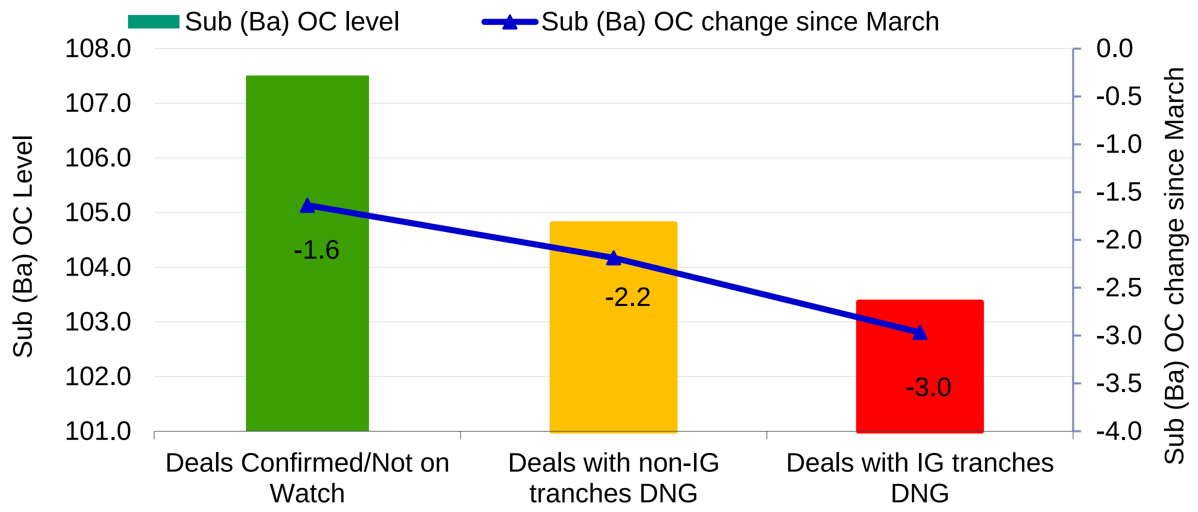
- **Average rating movement is -0.63 notches*, for tranches placed on watch**
  - We downgraded at least one watchlisted tranche in 60% of the deals reviewed and confirmed all watch-listed tranches in remaining 40%.
  - 72% of the downgraded tranches were one notch and remaining 28% of the tranches were multi-notch actions.
  - 66% of the multi-notch downgrades were concentrated at the single-B level.
  - Improvement in performance metrics and market conditions has led to many rating confirmations.

Note: calculated based on the number of tranches

Credit performance, transaction features drive rating action differences

More negatively impacted CLOs exhibited worse WARF breaches and OC erosion



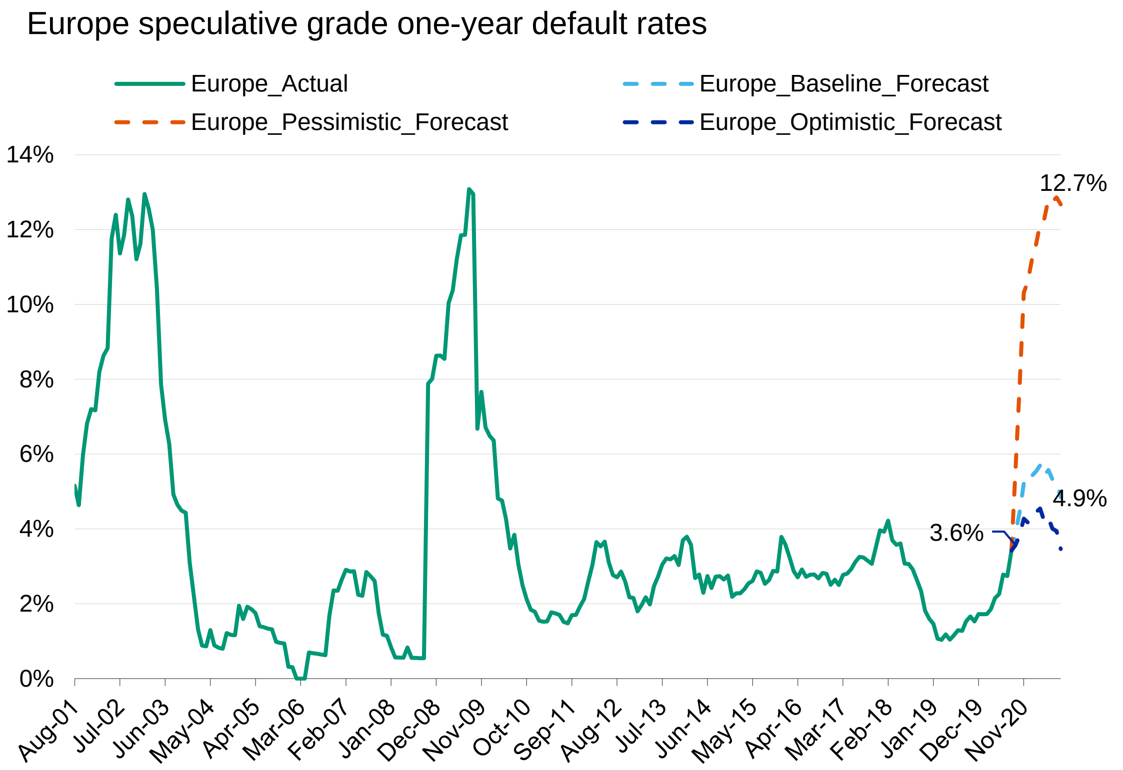


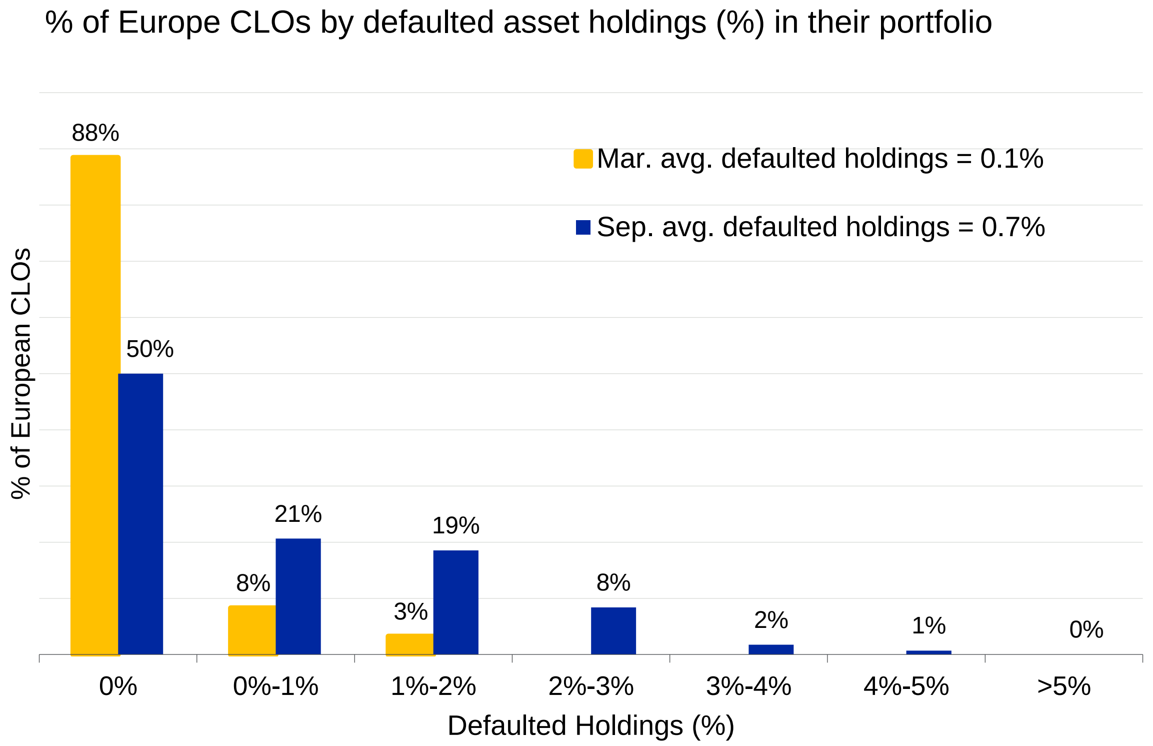
Source: Trustee reported data, Moody's Investors Service.

- **Highlights of rating action considerations**
  - Manager trading activity positively impacted post-pandemic credit metrics for many deals.
  - We conduct sensitivity analysis based on forward views: WARF improvement and additional near term defaults.
  - Transaction's structural features matter: par credit enhancement, cost of capital, remaining reinvestment period, OC par haircuts.

European corporate default rates to rise but less than in the US

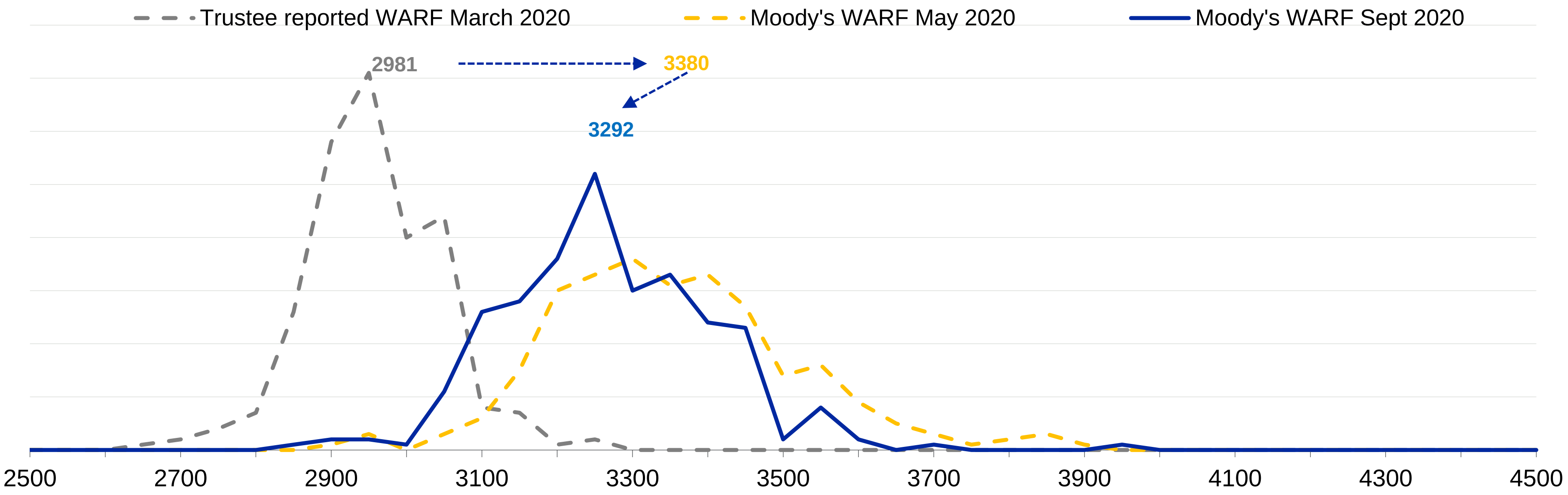
- Europe speculative-grade default rate expected to peak at 5.7%, by Q1 2021
- Half of European CLOs hold no defaulted assets in their portfolio





Source: Trustee reported data; Moody's Investors Service

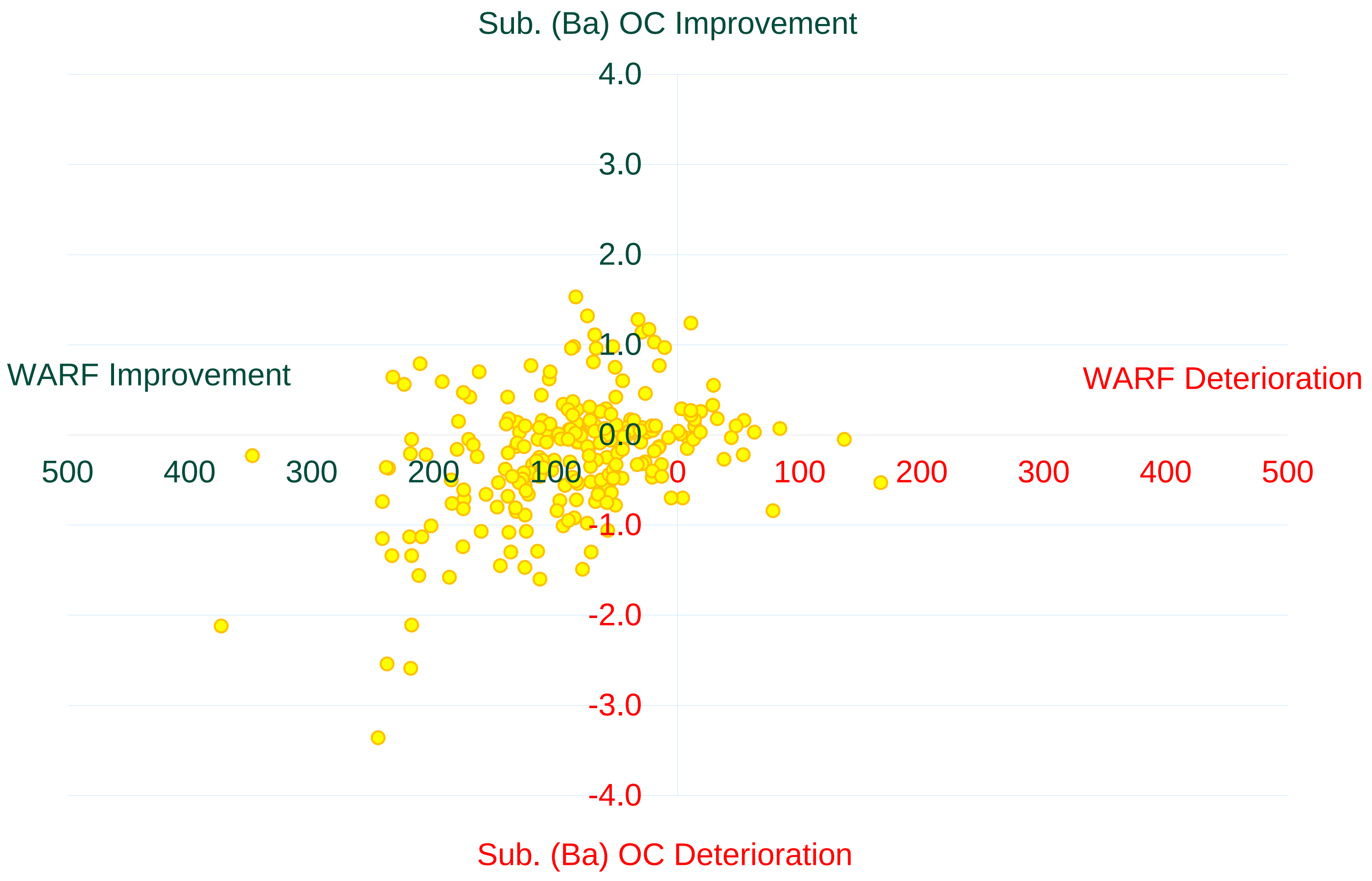
European CLO WARF also improved as of Sept



BSL CLO WARF	March 2020	May 2020	September 2020
WARF Average	2981	3380	3292
WARF Std. dev.	88	163	140

Source: Trustee reported data; Moody's Investors Service. BSL stands for broadly syndicated loans

WARF improved for most CLOs in Europe, but many deals also saw OC deterioration



May-Sept Change	% of reinvesting CLOs
Improvement WARF & OC	32%
Improvement WARF/ Deterioration OC	56%
Deterioation WARF/ Improvement OC	7%
Deterioation WARF& OC	5%
Total	100%

Source: Trustee reported data, Moody's Investors Service. Reinvesting CLOs only.

Most watchlisted European CLO ratings were resolved

Downgrades concentrated at single-B level

Broad rating Category	Watchlisted tranches	Resolved
Baa (sf)	120	84%
Ba (sf)	116	84%
B (sf)	115	84%
Total	**351**	**84%**

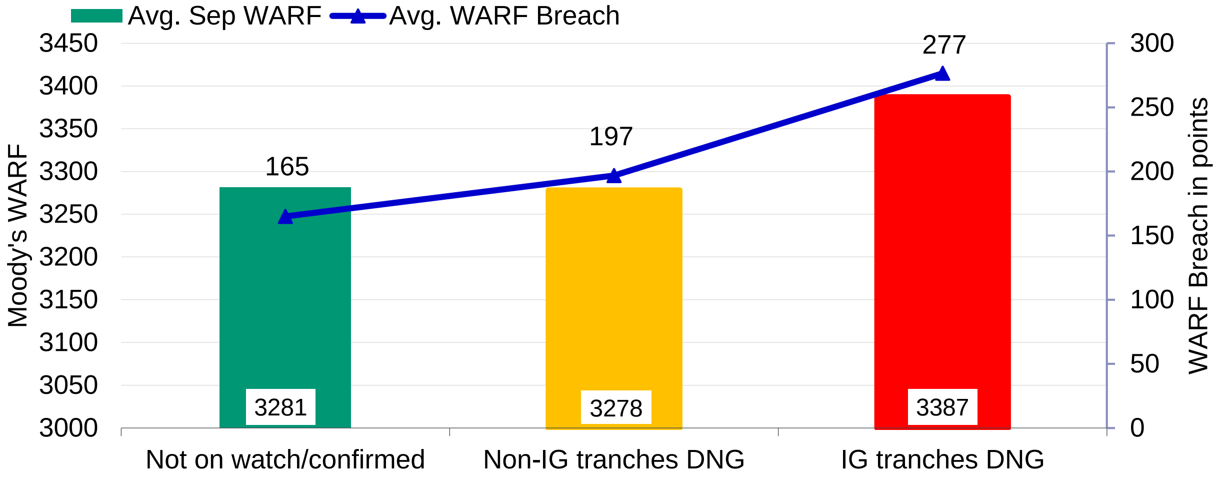
Source: Moody's Investors Service as of 28 September 2020

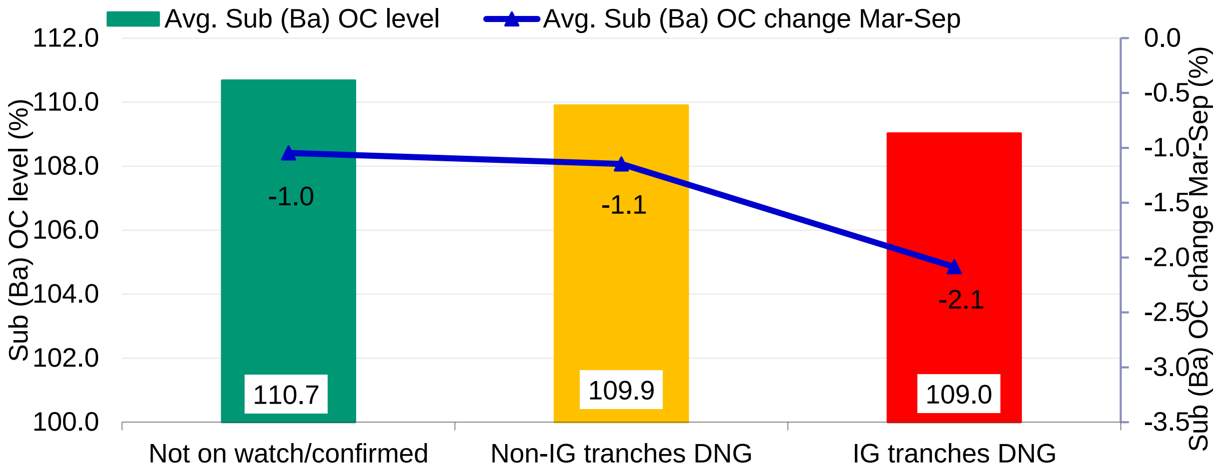
- **Average rating movement is -0.10 notches*, for tranches placed on watch**
  - We have downgraded at least one tranche in 29% of 97 reviewed deals and confirmed all Baa(sf)-B(sf) tranches in the remaining 71%.
  - 89% of the downgraded tranches were one notch and remaining 11% of the tranches were multi-notch.
  - 80% of the multi-notch downgrades were concentrated at the single-B level.

Note: calculated based on the number of tranches

Credit performance, transaction features drive rating action differences

More negatively impacted CLOs exhibited worse WARF breaches and OC erosion





Source: Trustee reported data, Moody's Investors Service. Deals not on watch/confirmed incorporate only reinvesting deals.

- **Highlights of rating action considerations**
  - European CLOs higher pre-pandemic OC cushion start point (no oil and gas crisis impact in 2016). Improvement in metrics and market conditions has led to many rating confirmations.
  - Manager trading activity positively impacted post-pandemic credit metrics for many deals.
  - We conduct sensitivity analysis based on forward views: WARF improvement and additional near term defaults.
  - Transaction's structural features matter: par credit enhancement, cost of capital, asset libor floors, remaining reinvestment period, OC tests and par haircuts

3

Q/A