

# Carlyle U.S. CLO 2016-4 Rating Report

## Non-NRSRO Rating

Tranche Name	EJR Rating*
A1R	AA (sf)
A2R	A- (sf)
BR	BB- (sf)
CR	B (sf)
DR	CCC- (sf)



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**(844) 495 5244**

Prepared on Dec 30, 2020  
\*Non-NRSRO Rating

## Rating Summary

Tranche Name	EJR Implied Rating	EJR Final Rating* Non-NRSRO Rating	Other NRSROs EJR Equivalent Rating	Current Interest OC (%)	Current Principal OC (%)	Current Subordination* (assets at MV) (%)	Current Subordination* (assets at Par) (%)	Interest Rate
A1R	AA (sf)	AA (sf)	AAA	288.18	117.97	36.38	38.70	LIBOR_3MO + 1.08
A2R	A- (sf)	A- (sf)	AA+	288.18	117.97	20.91	23.79	LIBOR_3MO + 1.45
BR	BB- (sf)	BB- (sf)	A	288.18	117.97	12.80	15.97	LIBOR_3MO + 2.10
CR	B (sf)	B (sf)	BB+	253.52	110.66	7.04	10.42	LIBOR_3MO + 2.80
DR	CCC- (sf)	CCC- (sf)	B+	217.46	105.8	2.77	6.30	LIBOR_3MO + 5.40
SUBORD	NR	NR	N/A	N/A	N/A	-7.57	-3.66	N/A

\*EJR's rating assumes that all collateral assets receive an one notch downgrade

\*Current Subordination = (Collateral Value - (Pari-Passu Balance + Senior Balance)) / Collateral Value

\*MV = Market prices reported by the trustee on the latest report (when available)

\*Par = Par Value

## Transaction Summary

We are providing the rating of Carlyle U.S. CLO 2016-4 as a Non-NRSRO rating. The transaction closed on December 01, 2016. It had a reinvestment period, which ended on July 20, 2021. It has a maturity date of October 20, 2027. The deal was refinanced on October 22, 2018. The investments were callable as of January 20, 2020. The Dealer and Trustee were Citigroup and State Street Bank and Trust Company, respectively. The issued notes are collateralized by 99.91% senior secured loans, cash, and eligible investments with the balance of the portfolio consisting of 0.09% second lien loans and senior unsecured loans. Carlyle GMS CLO Management serves as the collateral manager.

## Quantitative Analysis

### Key Credit Metrics

Metrics	Number
SENIOR TRANCHE SUBORDINATION (%)	36.38
DIVERSITY SCORE	70
EJR WEIGHTED AVERAGE RATING SCORE	5127.89
WEIGHTED AVERAGE LIFE (Years)	4.6
CCC+ OR LESS (%)	18.23

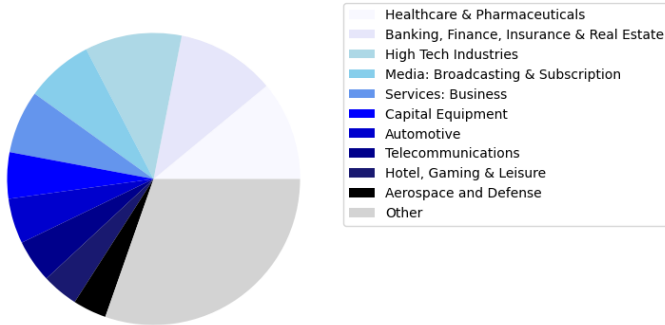
As of December 30, 2020, the total balance of the underlying assets was approximately \$492.51M. The diversity score of the portfolio was 70. EJR's weighted average rating score and weighted average life (years) of the collateral were 5127 and 4.6, respectively. 18.23% of the portfolio's assets were rated CCC+ or less by other NRSROs. Senior tranche subordination was 36.38%.

## Portfolio Characteristics

### Industry Concentration

Industry Name (Top 5)	Current Balance (M)	Weight (%)	Gross Coupon (%)	Gross Margin	Market Price (\$)
Healthcare & Pharmaceuticals	54.04	10.99	3.90	3.48	98.45
Banking, Finance, Insurance & Real Estate	53.85	10.91	3.71	3.33	98.75
High Tech Industries	52.76	10.68	4.47	3.96	95.04
Media: Broadcasting & Subscription	36.87	7.46	3.89	3.51	96.84
Services: Business	34.16	6.97	5.23	4.43	95.31

Top 10 Industry Contribution

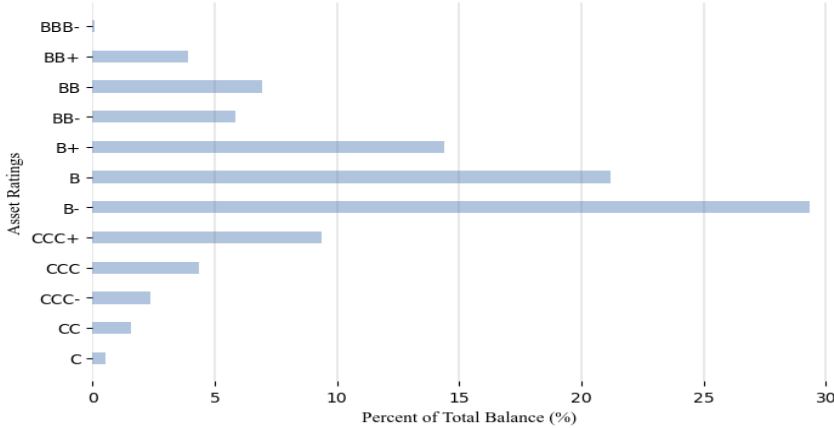


The top 5 industries constituted 47.0% of the underlying portfolio with a total current balance of \$231.7M. The top 5 industries are Healthcare & Pharmaceuticals, Banking, Finance, Insurance & Real Estate, High Tech Industries, Media: Broadcasting & Subscription, and Services: Business. The top 10 industries constituted 69.6% of underlying portfolio.

### Rating of Underlying Assets

Other NRSROs EJR Equivalent Rating (Bottom 5)	Current Balance (M)	Weight (%)	Gross Coupon (%)	Gross Margin	Market Price (\$)
CCC+	46.19	9.39	4.93	4.46	93.51
CCC	21.54	4.37	4.96	4.22	88.25
CCC-	11.61	2.37	5.43	4.70	74.84
CC	7.82	1.59	5.18	3.73	68.43
C	2.53	0.51	8.50	7.50	74.62

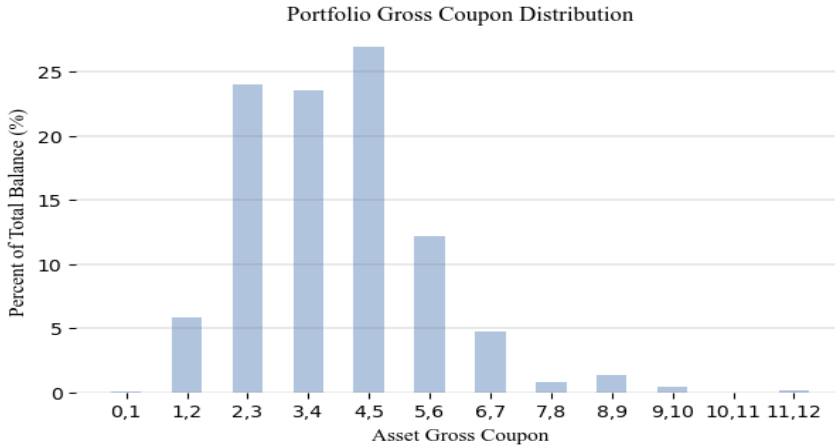
Portfolio Rating Distribution



The current ratings of the underlying assets range from BBB- to C. An amount equal to 18.23% of the underlying assets have ratings equal to or below CCC+, with a total balance of \$20.76M. (Note: The current current ratings are other NRSROs ratings as of December 30, 2020.)

### Gross Coupon of Underlying Assets

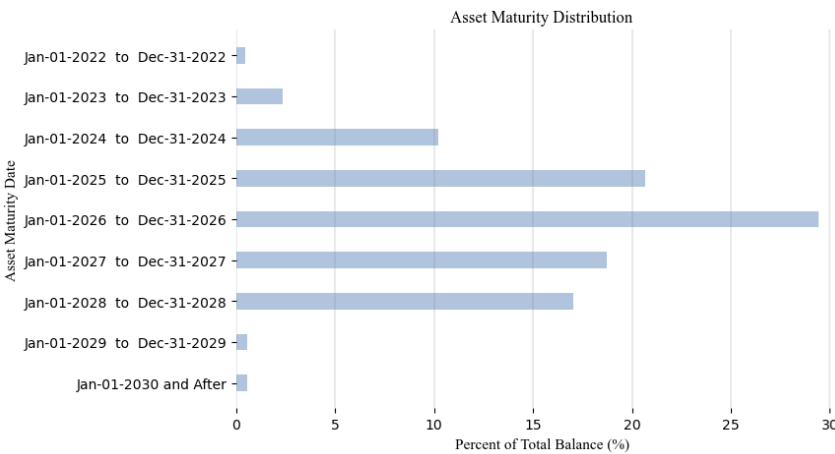
Coupon Range (Top 5)	Current Balance (M)	Weight (%)	Gross Coupon (%)	Gross Margin	Market Price (\$)
> 4.0% but ≤ 5.0%	132.80	26.90	4.60	3.89	95.54
> 2.0% but ≤ 3.0%	118.48	24.01	2.62	2.40	96.77
> 3.0% but ≤ 4.0%	116.08	23.58	3.57	3.16	96.84
> 5.0% but ≤ 6.0%	59.91	12.14	5.50	4.89	96.81
> 1.0% but ≤ 2.0%	28.61	5.82	1.81	1.85	97.02



Gross coupon of the underlying assets ranges from 0.22% to 12.0%. The weighted average gross coupon of the portfolio is approximately 4.0%.

### Maturity of Underlying Assets

Maturity Time Range (Top 5)	Current Balance (M)	Weight (%)	Gross Coupon (%)	Gross Margin	Market Price (\$)
Jan-01-2026 to Dec-31-2026	144.80	29.41	3.94	3.60	95.14
Jan-01-2025 to Dec-31-2025	101.74	20.65	4.25	3.60	95.95
Jan-01-2027 to Dec-31-2027	92.40	18.71	3.98	3.63	97.39
Jan-01-2028 to Dec-31-2028	84.03	17.03	3.95	3.48	99.21
Jan-01-2024 to Dec-31-2024	50.33	10.20	4.57	3.75	91.20



The underlying assets have maturity dates from January 11, 2021 to January 31, 2029. 13.0% of the underlying assets will mature within 3 years, while another 37.5% of the underlying assets have maturities beyond 5 years.

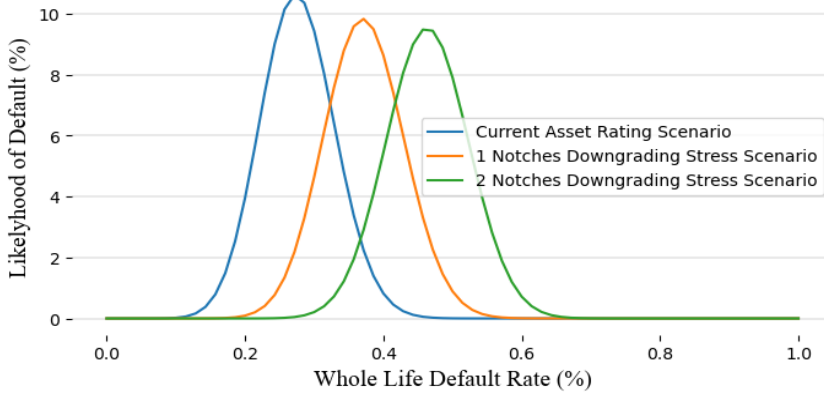
### Seniority of Underlying Assets

Assets Priority	Current Balance (M)	Weight (%)	Gross Coupon (%)	Gross Margin	Market Price (\$)
Senior Secured	492.51	99.91	4.16	3.66	95.92

There are 505 assets in the underlying collateral pool, 99.91% are senior secured loans, and 0.09% with lower seniority.

### Stress Analysis

Portfolio Whole Life Default Rate Distribution



In EJR's view, the credit quality for syndicated loans has been under pressure recently. Unfortunately, ratings on some loans may be cut multiple notches with little notice. In EJR's base case, we took an one notch cut to the underlying assets to reflect the credit quality of each tranche created by market pressure. In EJR's stress case, we assumed a two notch cut to the underlying assets. According to EJR's Default Probability Table, the base case and stress case weighted average whole life default rate of probability can increase to 37.21% and 46.38%, respectively, from its current level of 27.67%.

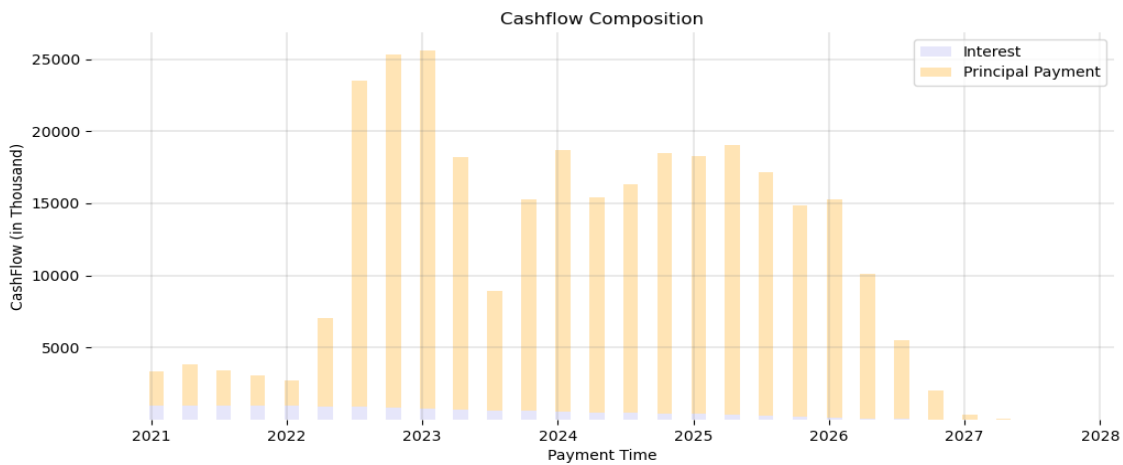
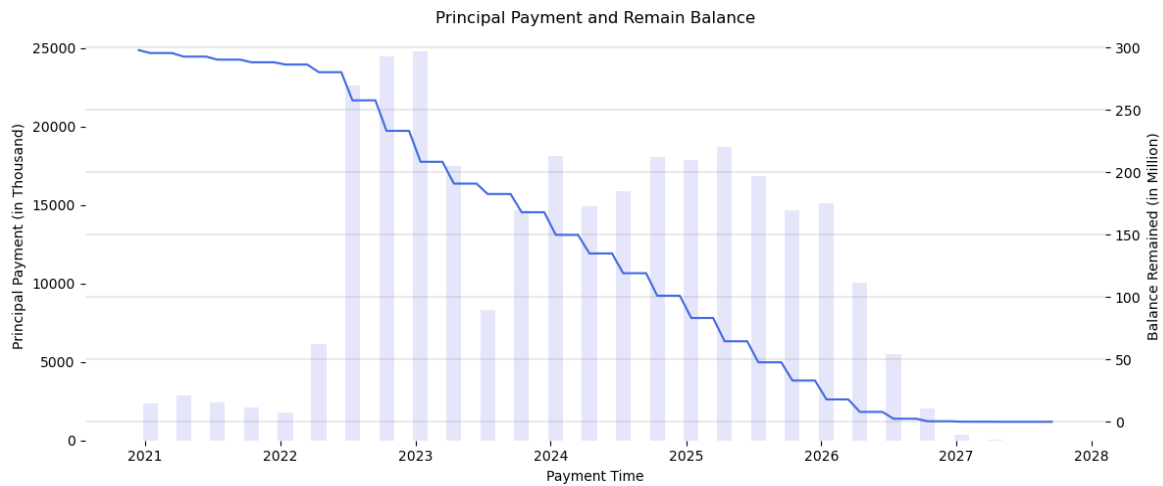
## Estimated Loss Information

Estimated loss is one of the key considerations in EJR's structured finance ratings. In times of stress when economic conditions are deteriorating, default rates and loss severity are more likely to increase relative to a portfolio's initial or base case default and loss severity levels. That is a tranche with higher rating should be able to withstand greater stress and sustain lower losses than a tranche with a lower rating. For example, a tranche with AAA rating should be able to survive the great depression scenario (the highest default and loss severity levels experienced if they were to occur in the future). An 'AA' rated tranche would be more susceptible to an adverse economic impact than the 'AAA' rated tranche, but nonetheless should be able to withstand such effects better than a tranche with a lower rating. EJR creates different stress levels based on different target tranche ratings (from AAA to B+). The detailed estimated loss (%) information of each tranche under each stress level is detailed in the below table:

Stress Level	A1R	A2R	BR	CR	DR
Estimated Loss Under AAA (sf) Stress	0.00	43.27	96.05	96.74	96.07
Estimated Loss Under AA+ (sf) Stress	0.00	23.14	94.39	96.16	95.5
Estimated Loss Under AA (sf) Stress	0.00	20.57	93.88	96.07	95.42
Estimated Loss Under AA- (sf) Stress	0.00	18.04	93.25	95.98	95.33
Estimated Loss Under A+ (sf) Stress	0.00	0.00	80.28	95.41	95.16
Estimated Loss Under A (sf) Stress	0.00	0.00	77.61	95.28	95.05
Estimated Loss Under A- (sf) Stress	0.00	0.00	74.69	95.15	94.94
Estimated Loss Under BBB+ (sf) Stress	0.00	0.00	39.92	93.46	94.64
Estimated Loss Under BBB (sf) Stress	0.00	0.00	35.93	92.92	94.48
Estimated Loss Under BBB- (sf) Stress	0.00	0.00	31.97	92.28	94.3
Estimated Loss Under BB+ (sf) Stress	0.00	0.00	0.00	58.76	91.37
Estimated Loss Under BB (sf) Stress	0.00	0.00	0.00	25.7	84.7
Estimated Loss Under BB- (sf) Stress	0.00	0.00	0.00	0.00	66.07
Estimated Loss Under B+ (sf) or Lower Rating Stress	0.00	0.00	0.00	0.00	18.91

## Tranche A1R

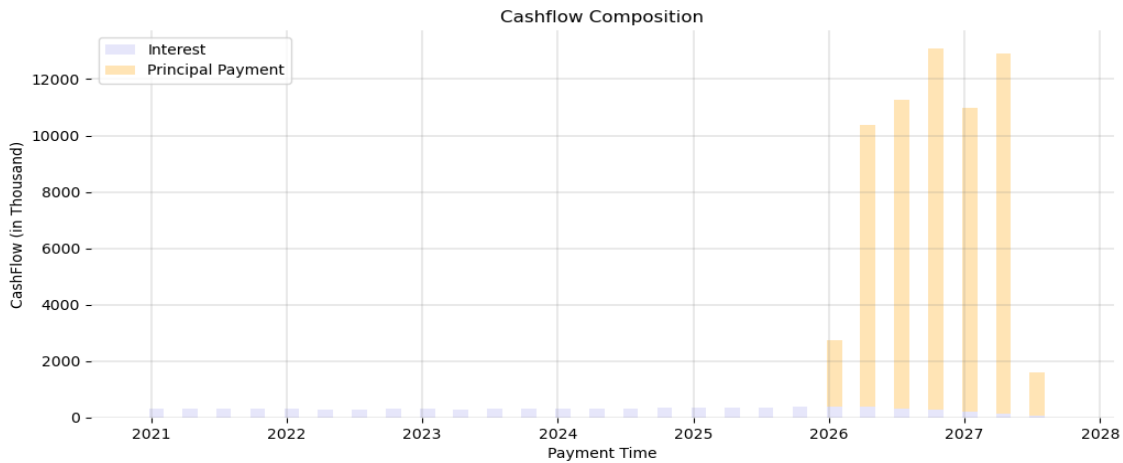
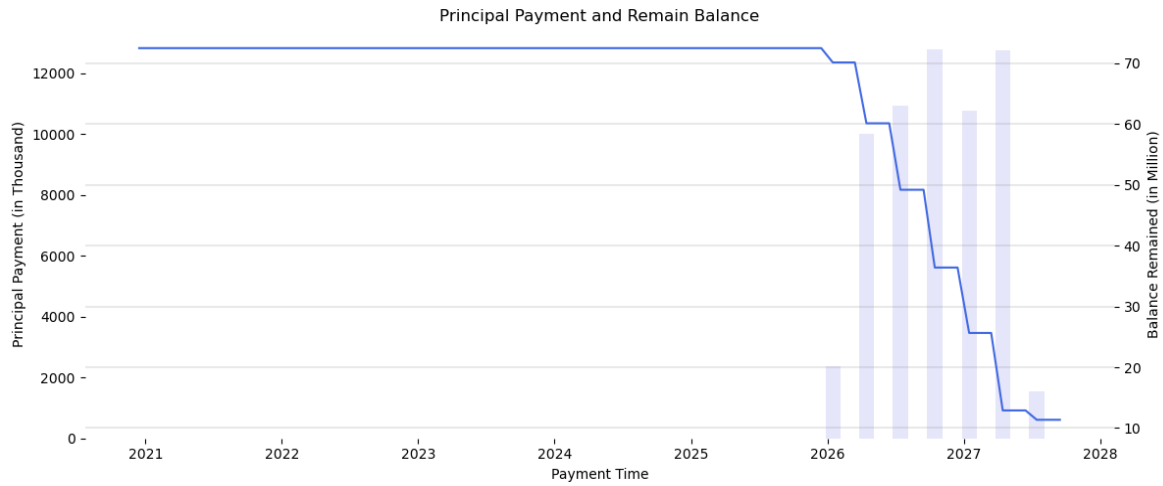
Tranche Information 1	Content 1	Tranche Information 2	Content 2
ORIGINAL BALANCE (\$ Million)	302.5	IC TEST TRIGGER	115.00
CURRENT BALANCE (\$ Million)	298.07	CURRENT IC	288.18
TRANCHE SPECIFIC STRESSED PD	72.56	OC TEST TRIGGER	113.10
EJR MODEL IMPLIED RATING	AA (sf)	CURRENT OC	117.97
UNCOVERED BALANCE (assets at MV) (\$ Million)	0	UNCOVERED RATIO (assets at MV) (%)	0.00
UNCOVERED BALANCE (assets at Par) (\$ Million)	0	UNCOVERED RATIO (assets at Par) (%)	0.00



According to the weighted average cashflow output (under EJR's AA (sf) stress level of the whole life default rate, and assuming 50% loss will happen evenly in the first year, remaining 50% will happen evenly in the next 4 years), the payment window for this tranche ranges from December, 2020 to October, 2027. The current principal balance of the tranche is \$298.07M, by the end of the payment period (October, 2027), \$298.06M will be paid off. The remaining principal outstanding should be \$0.01M (which represents 0.0% of the tranche balance). Total interest payments of the tranche will total approximately \$13.72M.

## Tranche A2R

Tranche Information 1	Content 1	Tranche Information 2	Content 2
ORIGINAL BALANCE (\$ Million)	72.5	IC TEST TRIGGER	115.00
CURRENT BALANCE (\$ Million)	72.5	CURRENT IC	288.18
TRANCHE SPECIFIC STRESSED PD	64.37	OC TEST TRIGGER	113.10
EJR MODEL IMPLIED RATING	A- (sf)	CURRENT OC	117.97
UNCOVERED BALANCE (assets at MV) (\$ Million)	0	UNCOVERED RATIO (assets at MV) (%)	0.00
UNCOVERED BALANCE (assets at Par) (\$ Million)	0	UNCOVERED RATIO (assets at Par) (%)	0.00

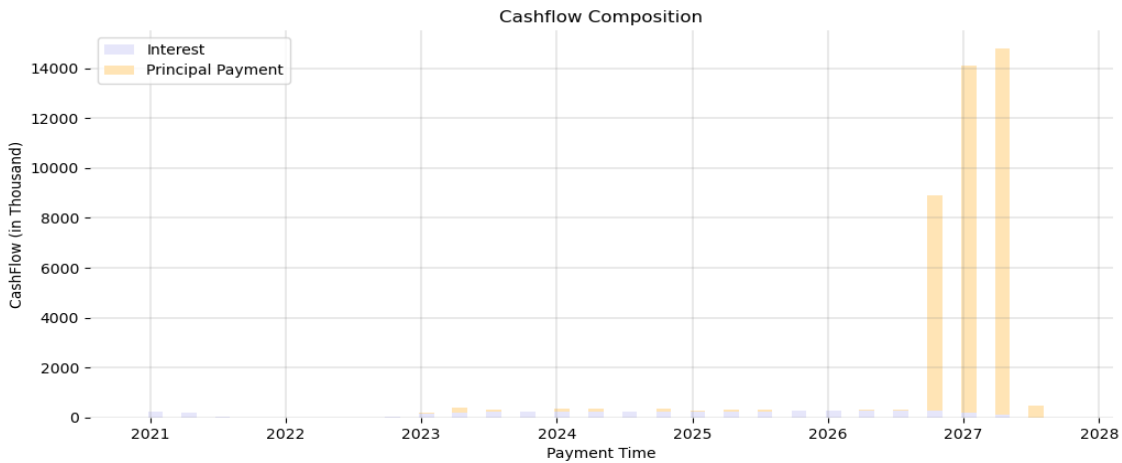
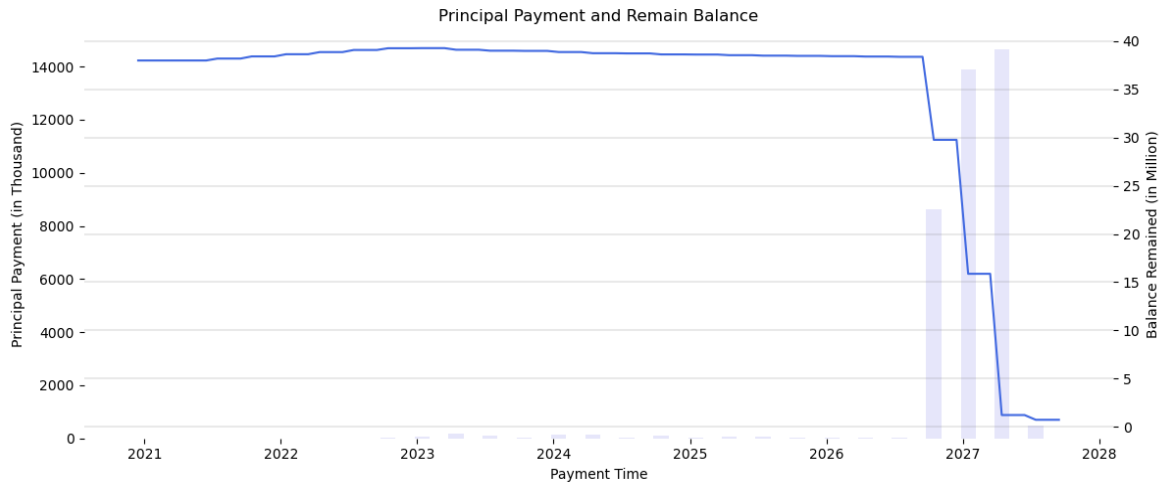


According to the weighted average cashflow output (under EJR's A- (sf) stress level of the whole life default rate, and assuming 50% loss will happen evenly in the first year, remaining 50% will happen evenly in the next 4 years), the payment window for this tranche ranges from December, 2020 to October, 2027. The current principal balance of the tranche is \$72.5M, by the end of the payment period (October, 2027), \$67.35M will be paid off. The remaining principal outstanding should be \$5.15M (which represents 7.1% of the tranche balance). Total interest payments of the tranche will total approximately \$8.32M.



Tranche BR

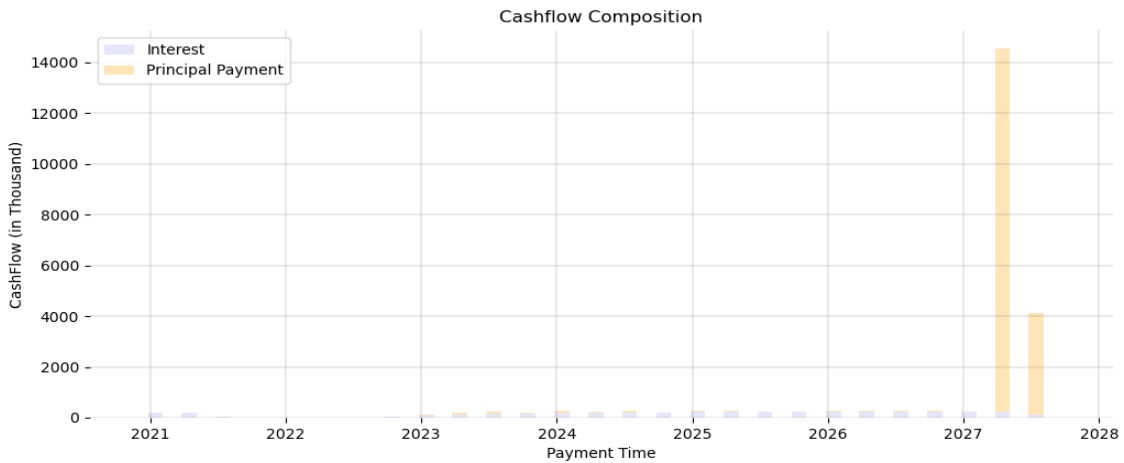
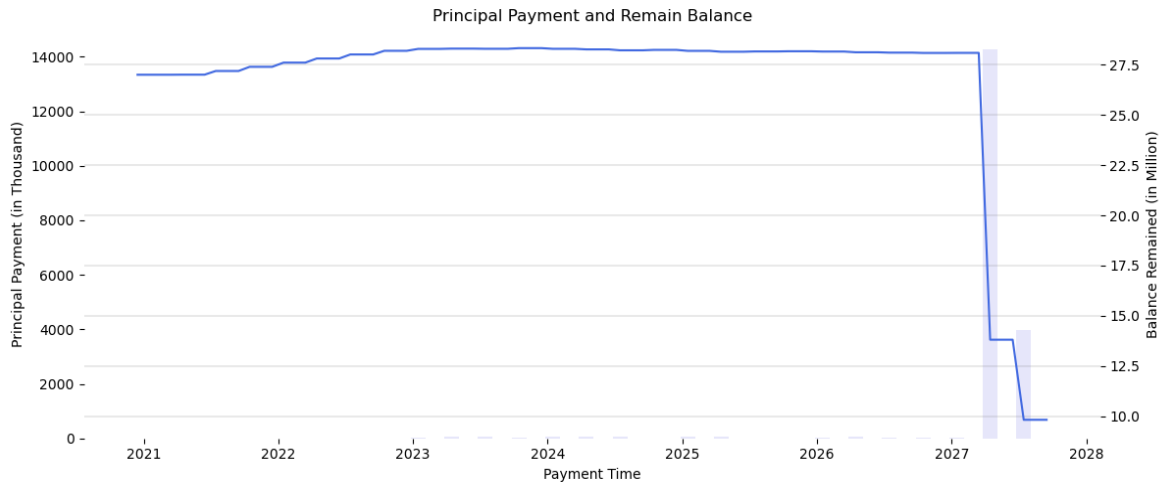
Tranche Information 1	Content 1	Tranche Information 2	Content 2
ORIGINAL BALANCE (\$ Million)	38	IC TEST TRIGGER	115.00
CURRENT BALANCE (\$ Million)	38	CURRENT IC	288.18
TRANCHE SPECIFIC STRESSED PD	55.81	OC TEST TRIGGER	113.10
EJR MODEL IMPLIED RATING	BB- (sf)	CURRENT OC	117.97
UNCOVERED BALANCE (assets at MV) (\$ Million)	0	UNCOVERED RATIO (assets at MV) (%)	0.00
UNCOVERED BALANCE (assets at Par) (\$ Million)	0	UNCOVERED RATIO (assets at Par) (%)	0.00



According to the weighted average cashflow output (under EJR's BB- (sf) stress level of the whole life default rate, and assuming 50% loss will happen evenly in the first year, remaining 50% will happen evenly in the next 4 years), the payment window for this tranche ranges from December, 2020 to October, 2027. The current principal balance of the tranche is \$38.0M, by the end of the payment period (October, 2027), \$39.35M will be paid off. The remaining principal outstanding should be \$0.04M (which represents 0.11% of the tranche balance). Total interest payments of the tranche will total approximately \$4.78M.

## Tranche CR

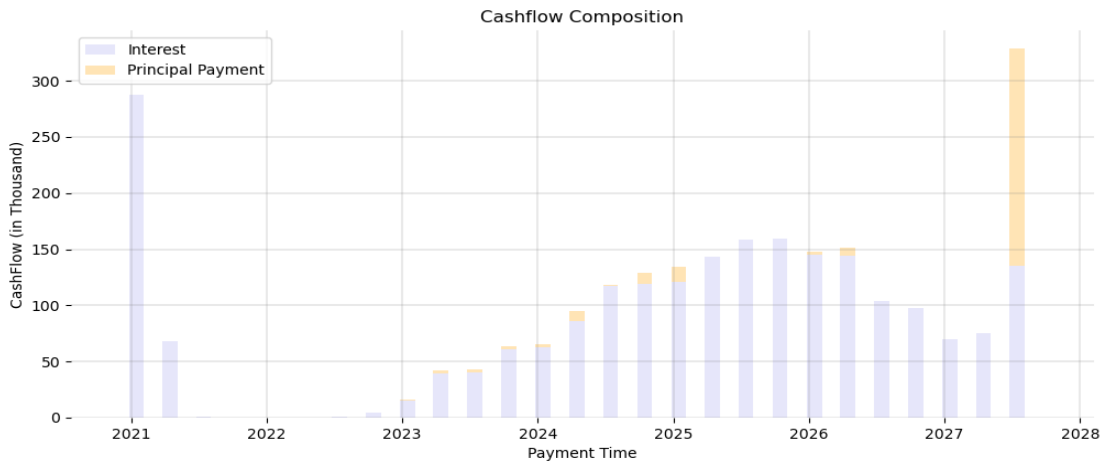
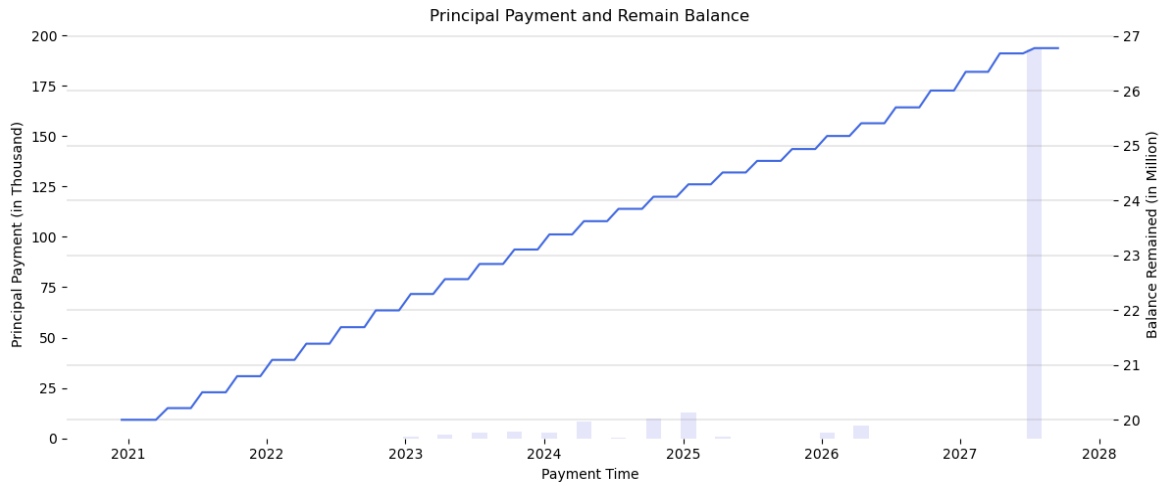
Tranche Information 1	Content 1	Tranche Information 2	Content 2
ORIGINAL BALANCE (\$ Million)	27	IC TEST TRIGGER	110.00
CURRENT BALANCE (\$ Million)	27	CURRENT IC	253.52
TRANCHE SPECIFIC STRESSED PD	44.65	OC TEST TRIGGER	107.60
EJR MODEL IMPLIED RATING	B (sf)	CURRENT OC	110.66
UNCOVERED BALANCE (assets at MV) (\$ Million)	0	UNCOVERED RATIO (assets at MV) (%)	0.00
UNCOVERED BALANCE (assets at Par) (\$ Million)	0	UNCOVERED RATIO (assets at Par) (%)	0.00



According to the weighted average cashflow output (under EJR's B (sf) stress level of the whole life default rate, and assuming 50% loss will happen evenly in the first year, remaining 50% will happen evenly in the next 4 years), the payment window for this tranche ranges from December, 2020 to October, 2027. The current principal balance of the tranche is \$27.0M, by the end of the payment period (October, 2027), \$28.15M will be paid off. The remaining principal outstanding should be \$0.59M (which represents 2.19% of the tranche balance). Total interest payments of the tranche will total approximately \$4.39M.

## Tranche DR

Tranche Information 1	Content 1	Tranche Information 2	Content 2
ORIGINAL BALANCE (\$ Million)	20	IC TEST TRIGGER	105.00
CURRENT BALANCE (\$ Million)	20	CURRENT IC	217.46
TRANCHE SPECIFIC STRESSED PD	37.21	OC TEST TRIGGER	104.70
EJR MODEL IMPLIED RATING	CCC- (sf)	CURRENT OC	105.80
UNCOVERED BALANCE (assets at MV) (\$ Million)	0	UNCOVERED RATIO (assets at MV) (%)	0.00
UNCOVERED BALANCE (assets at Par) (\$ Million)	0	UNCOVERED RATIO (assets at Par) (%)	0.00



According to the weighted average cashflow output (under EJR's CCC- (sf) stress level of the whole life default rate, and assuming 50% loss will happen evenly in the first year, remaining 50% will happen evenly in the next 4 years), the payment window for this tranche ranges from December, 2020 to October, 2027. The current principal balance of the tranche is \$20.0M, by the end of the payment period (October, 2027), \$14.68M will be paid off. The remaining principal outstanding should be \$12.35M (which represents 61.75% of the tranche balance). Total interest payments of the tranche will total approximately \$2.65M.

## **EJR's Key Rating Features & Differences Compare With Other NRSROs**

Below is a summary of EJ's approach (see our Methodology for a more complete description):

1. Our rating is derived from estimated losses.
2. To reflect the current bearish credit conditions, assets in the collateral pool are assumed to be one notch lower than that currently assigned by other NRSROs.
3. The probabilities of default and estimated losses utilized are generally more conservative than industry standards.
4. Similarly, the recovery rates applied are lower relative to industry benchmarks.
5. EJ's analysis is conducted using information and cash flow engines supplied by a recognized industry service provider.
6. Subject to economic conditions, EJ may cap its highest rating at "AA" and apply an additional downgrade of up to two notches for each tranche.

## **Difference Between Implied Rating and Assigned Rating**

There is no difference between model implied rating and final assigned rating.

## SEC Rule 17g-7(a) Disclosure

Below are the disclosures as required by Paragraph (a) of Rule 17g-7.

### 1. The symbol in the rating scale used to denote the credit rating categories and notches within categories and the identity of the obligor, security, or money market instrument as required by Paragraph (a)(1)(ii)(A) of Rule 17g-7:

There are three notches in each of EJR's rating category (e.g., A-(sf), A(sf) and A+(sf) for category A(sf)) except for AAA(sf), CC(sf), C(sf) and D(sf).

### 2. The version of the procedure or methodology used to determine the credit rating as required by Paragraph (a)(1)(ii)(B) of Rule 17g-7:

We are using the EJR CLO Methodology (Non-NRSRO) version 1 published by Apr 22, 2020, the General Methodology for Rating Asset Backed and Structured Finance Obligations version 1 published by May 29, 2020, and the Methodologies for Determining Credit Ratings (Main Methodology) version 14 published by Feb 03, 2020.

### 3. The main assumptions and principles used in constructing the procedures and methodologies used to determine the credit rating as required by Paragraph (a)(1)(ii)(C) of Rule 17g-7:

The credit rating assigned reflects EJR's judgement regarding the future credit quality of the issue. The major assumptions used to construct the methodologies include:

- 1). Past data reflects the performance and credit worthiness of the pooled assets and is useful for analysis.
- 2). Financial and credit information that EJR gets from the issuer or the third party is reliable and accurate.
- 3). The economy and regulation policies will remain stable in the foreseeable future.

Specific quantitative assumptions used in this credit analysis applied to the collateral assets, which include Default Rate and Recovery Rate. According to the methodology, EJR converts the collateral assets into numbers of identical independent assets with the same default rate and recovery rate. The number of these converted assets is the Diversity Score.

### 4. The potential limitations of the credit rating as required by Paragraph (a)(1)(ii)(D) of Rule 17g-7:

EJR's rating pertains solely to EJR's view of current and prospective credit quality. EJR's rating does not address pricing, liquidity or other risks associated with holding investments in the issuer. EJR ratings

- 1). Are not intended to address the value, price, price stability, liquidity, suitability, or merit of an investment.
- 2). Do not address investment merit, whether a particular rated security is suitable for a particular investor or suitable for an investor's risk tolerance.
- 3). Do not address whether the expected return of a particular investment is adequate for the inherent risk.
- 4). Do not address whether the market value of the security will remain stable over time.
- 5). Are not exact measures of the probability of default but are instead expressions of the relative credit risk of issuers and debt instruments.
- 6). Are not recommendations to buy, sell or hold any security.

### 5. Information on the uncertainty of the credit rating as required by Paragraph (a)(1)(ii)(E) of Rule 17g-7:

EJR's rating is dependent on numerous factors including the reliability, accuracy, and quality of the data used in determining the credit rating. The data is sourced from issuers' publicly disclosed reports, or from third-party data vendors. For solicited rating reports, EJR may also use the information provided by the client. In some cases, the information is limited because of issues such as the lack of reported data. Such shortcomings are not always readily apparent. EJR aims to identify such shortcomings and make adjustments using its best judgement.

### 6. Whether and to what extent third-party due diligence services have been used in taking the rating action as required by Paragraph (a)(1)(ii)(F) of Rule 17g-7:

EJR does not utilize third-party due diligence services.

### 7. How servicer or remittance reports were used, and with what frequency, to conduct surveillance of the credit rating as required by Paragraph (a)(1)(ii)(G) of Rule 17g-7:

EJR did not conduct surveillance of this rating.

### 8. A description of the data that were relied upon for the purpose of determining the credit rating as required by Paragraph (a)(1)(ii)(H) of Rule 17g-7:

EJR uses the third-party data vendor obtain essential data for ratings on this ABS product.

### 9. A statement containing an overall assessment of the quality of information available and considered in the credit rating as required by Paragraph (a)(1)(ii)(I) of Rule 17g-7:

The information used in this analysis is generally of high quality.

### 10. Information relating to conflicts of interest as required by Paragraph (a)(1)(ii)(J) of Rule 17g-7:

This rating is unsolicited.

**11. An explanation or measure of the potential volatility of the credit rating as required by Paragraph (a)(1)(ii)(K) of Rule 17g-7:**

EJR's rating aims to assess the possible loss of investing in the obligations. Factors which affect such projection, and in turn EJ's rating, include changes in the credit worthiness of the collateral assets, changes in the correlation between them, and overall economic changes.

**12. Information on the content of the credit rating as required by Paragraph (a)(1)(ii)(L) of Rule 17g-7:**

- 1). As this is a new credit rating, historical performance is not applicable.
- 2). As discussed in EJ's CLO Methodology, EJ attempts to calculate the weighted average default probability of the portfolio by using EJ's Weighted Average Rating Score (WARS) approach. EJ's ratings of CLO tranches are based on the estimated losses (EL) generated by applying default scenarios based on likelihood of occurrence. However, EJ's credit ratings are not based on absolute measures of probability of default and expected loss. EJ's credit ratings are opinions about the relative creditworthiness of an entity or an instrument.

**13. Information on the sensitivity of the credit rating to assumptions as required by Paragraph (a)(1)(ii)(M) of Rule 17g-7:**

See the section in this report entitled "Stress Analysis".

**14. If the credit rating is assigned to an asset-backed security, a description of: (i) the representations, warranties, and enforcement mechanisms available to investors; and (ii) how they differ from the representations, warranties, and enforcement mechanisms in issuances of similar securities, as required by Paragraph (a)(1)(ii)(N) of Rule 17g-7:**

Such information in this analysis is non-public. Hence EJ has determined that this disclosure doesn't apply to this report.

**Disclaimer**

**THIS RATING IS ISSUED IN RESPECT OF AN "ASSET-BACKED SECURITY". EGAN-JONES RATINGS COMPANY IS NOT REGISTERED AS A NATIONALLY RECOGNIZED STATISTICAL RATING ORGANIZATION IN RESPECT OF "ASSET-BACKED SECURITIES" AND THE RATING IS NOT BEING ISSUED OR MAINTAINED BY EGAN-JONES IN ITS CAPACITY AS AN NRSRO. EGAN-JONES MAKES NO REPRESENTATION OR WARRANTY THAT ANY SUCH NON-NRSRO RATING MEETS ANY CONDITIONS OR REQUIREMENTS FOR USE OF A RATING.**

## ATTESTATION FORM

In compliance with the US Securities and Exchange Commission (SEC) Rule 17g-7(a), the Egan-Jones analyst who published the report is responsible for the rating action and to the best knowledge of the person:

- 1) No part of the credit rating was influenced by any other business activities,
- 2) The credit rating was based solely upon the merits of the obligor, security, or money market instrument being rated, and
- 3) The credit rating was an independent evaluation of the credit risk of the obligor, security, or money market instrument.

### Analyst Signature:



KEVIN ZHANG  
Rating Analyst  
Date Prepared  
2020-12-30

### Reviewer Signature:



STEVE ZHANG  
Rating Analyst  
Date Reviewed  
2020-12-30