

Exeter Automobile Receivables Trust

Case Study

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ABS-EE Filing Data

The Exeter Automobile Receivables Trust 2022-6 is an asset backed security comprised of subprime auto loans. The monthly loan level reporting data has the following characteristics:

- 31,635 auto loans
- 19 months of data from 2022-10-01 to present

Accessing the Data

To access, download, and aggregate the monthly asset data files, see `01-SEC-Scraping.R` in the associated github repo found [here](#). All associated scripts, quarto documents, and data files can also be found in the repository.

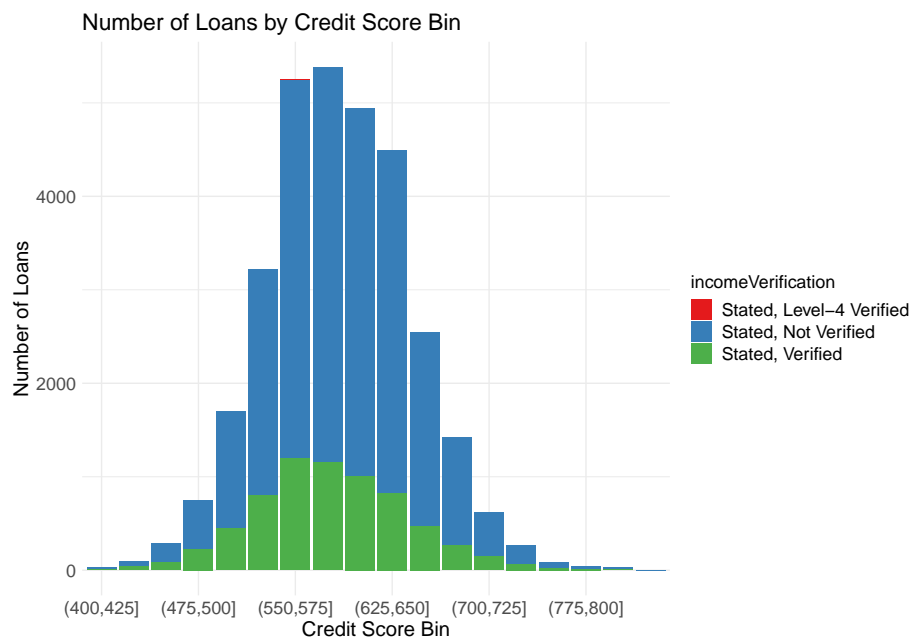
A. Exploratory Analysis

This section of the report seeks to identify relevant trends and features of the dataset to better understand asset-backed securities.

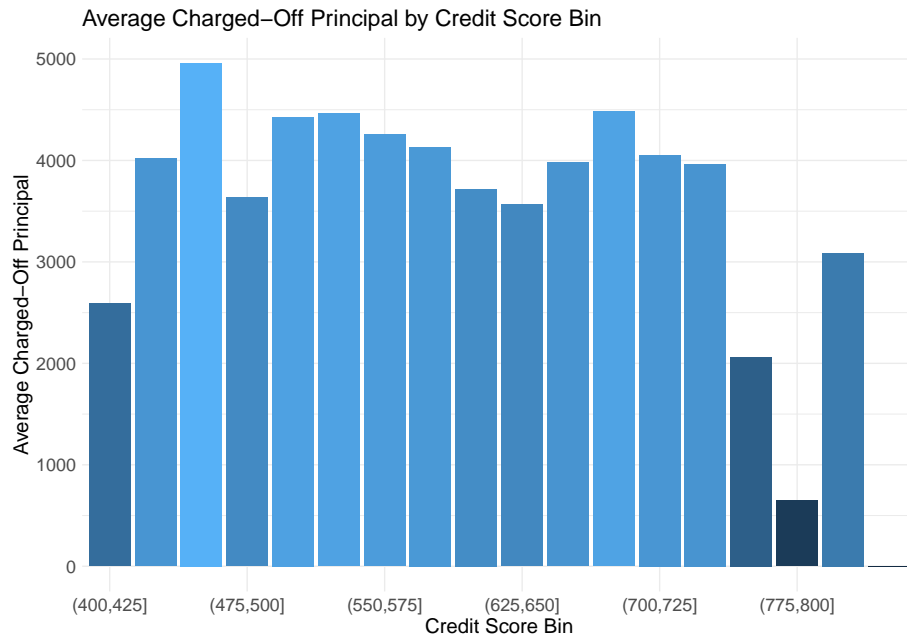
Obligor Credit Scores

The following plots identify relevant characteristics of the underlying loan pool in terms of credit scores.

In the first figure, the distribution of credit scores and associated income verification statuses, reinforce the “subprime” label and the associated risk of this security. With relatively low credit and a small number of verified income statuses (3 and above), the borrowers in this asset likely pose a higher risk of default.

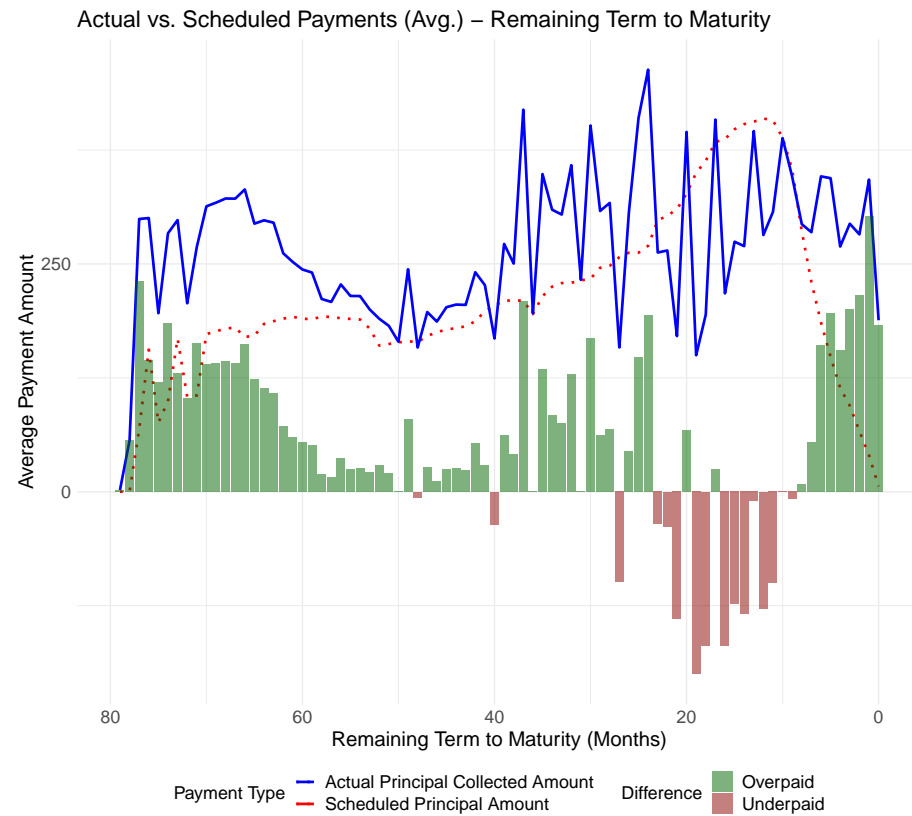


Next, I analyzed the difference in the average charged-off principal by asset since inception. I was expecting individuals with lower credit scores to have a significantly higher average value than those on the right. While individuals with a credit score greater than 750 are significantly lower (aside from an outlier in the final bin), there is no clear relationship between credit score and the average charged-off amount on the loan. This demonstrates the need to analyze obligor risk beyond simple metrics like credit score.



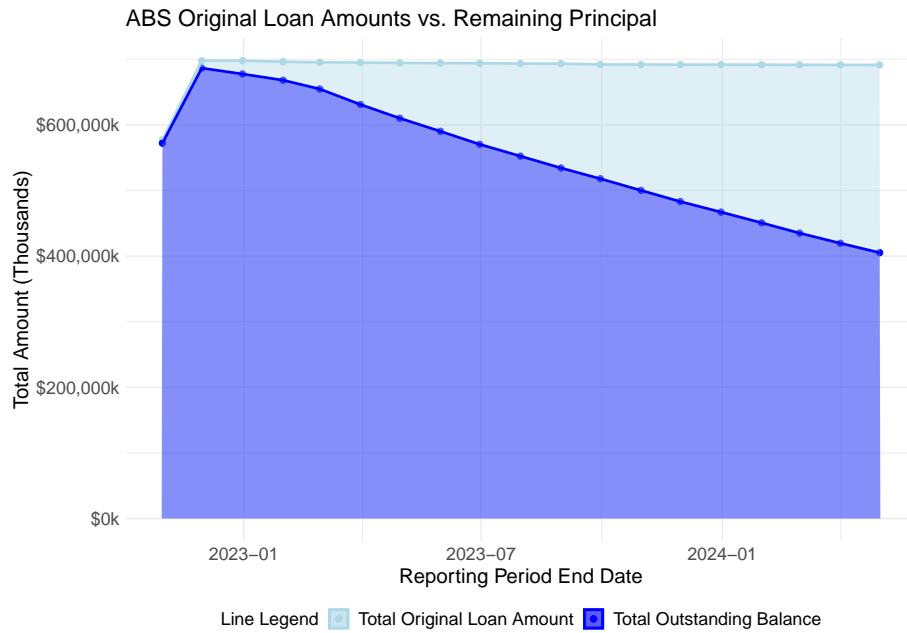
Payment Patterns

The following plot highlights the differences in actual and scheduled principal payments by remaining term to maturity. The tendency of individuals to cover their scheduled payments early in the term reflects a determination to pay down the overall principal and avoid heightened interest payments. This pattern continues for some time but eventually turns as the loans near maturity (around 20 remaining months). This could be a result of overpaying earlier in the term or individuals falling behind on payments. Then, in the final months of the loan term, individuals fulfill their financial obligations and pay outstanding principal amounts. Understanding the tendency of individuals to over/under pay in terms of the remaining time to maturity gives us a better idea of borrower payment behavior in the underlying loan pool.



Total Outstanding Loan Balance

At the highest level, I wanted to understand the total loan amount and how this value is paid down over time. The figure below shows a simple time series of the overall loan amount and the total balance remaining aggregated at the monthly level. In terms of time to maturity, the ABS is still early in its overall life. After the first few months in which individual loans accumulate, there is a stable decline in overall principal amount as borrowers make payments against their loan balance.



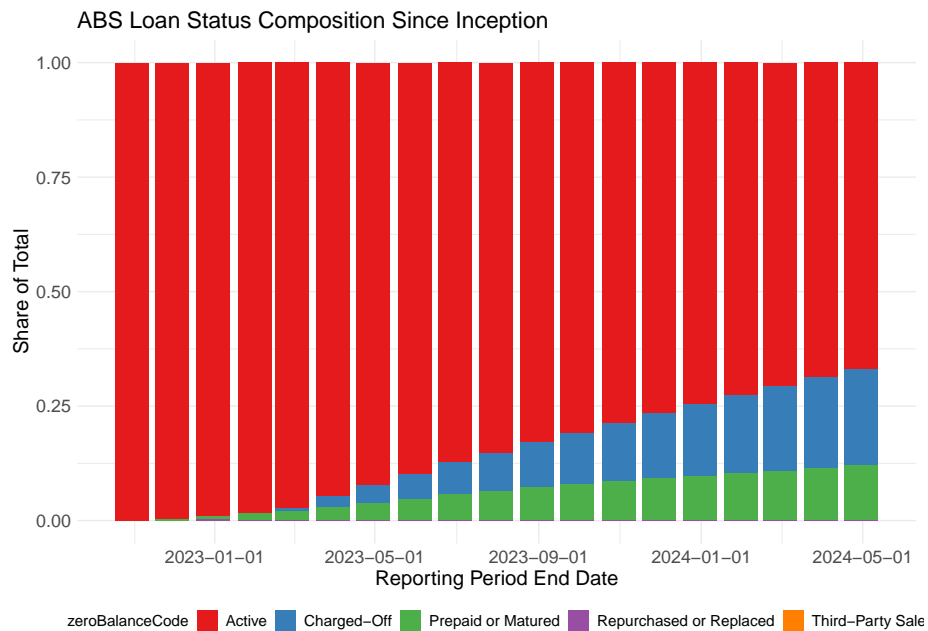
Principal, Interest, and Charge-Offs Over Time

With the above trend in mind, I wanted to understand how principal and interest payments as well as the total charged-off principal change over time. The figure below shows the monthly totals for each respective metric. Interest and principal, as expected, change in a similar fashion and mirror the pattern of the overall remaining loan balance. However, charged-off principal varies in its rate of change after the original accumulation of assets.



Loan Composition

In this section, I sought to understand the composition of the asset pool in more detail. The first step in this process was to identify how this composition changes over time in terms of loan status. The zero balance code in the dataset can tell us whether a particular asset has matured, defaulted, or been sold during a particular time period. The figure below shows each status as a percentage of the total asset pool allowing us to monitor the health of the security over time. The growth of charged-off and prepaid/matured assets remains steady over time, allowing us to more easily forecast this composition going forward.



B. Forecasting: Charged-Off Principal

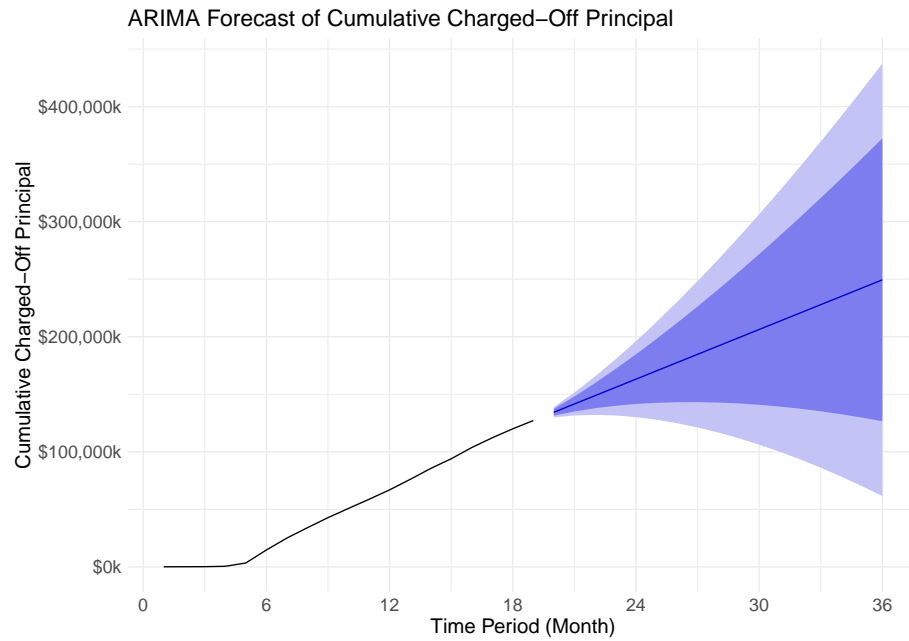
After familiarizing myself with the asset pool, its composition, and how the relevant account balances change over time, I was far better equipped to forecast charged-off principal for the 36th month of the deal.

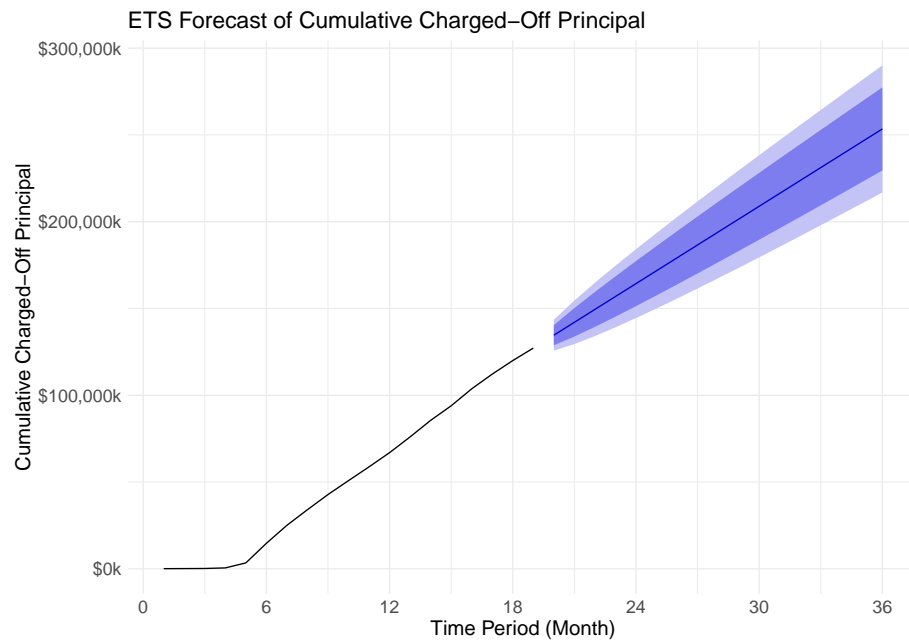
Prior to forecasting, I found the cumulative amount of charged-off principal over the life of the transaction:

Cumulative Value as of 04/30/2024: \$127,182,427

Method 1 - Traditional Forecasting Models (ARIMA, ETS)

At first, I used traditional statistical forecasting methods to predict the charged-off principal balance in month 36. Using two simple approaches, ARIMA and ETS, the following forecasts were produced.





The simplicity of the models produce less than ideal results that fail to account for the aforementioned rates of change (total outstanding principal, monthly principal payments, etc.). Taking a step back, I elected to predict charge-offs using more traditional methods of financial forecasting.

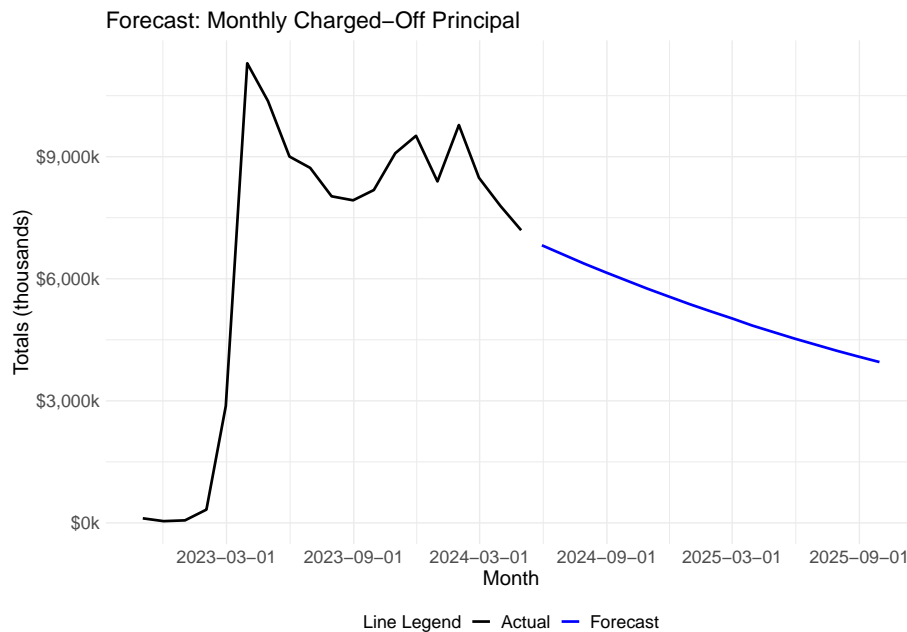
Method 2 - Past 12M Averages

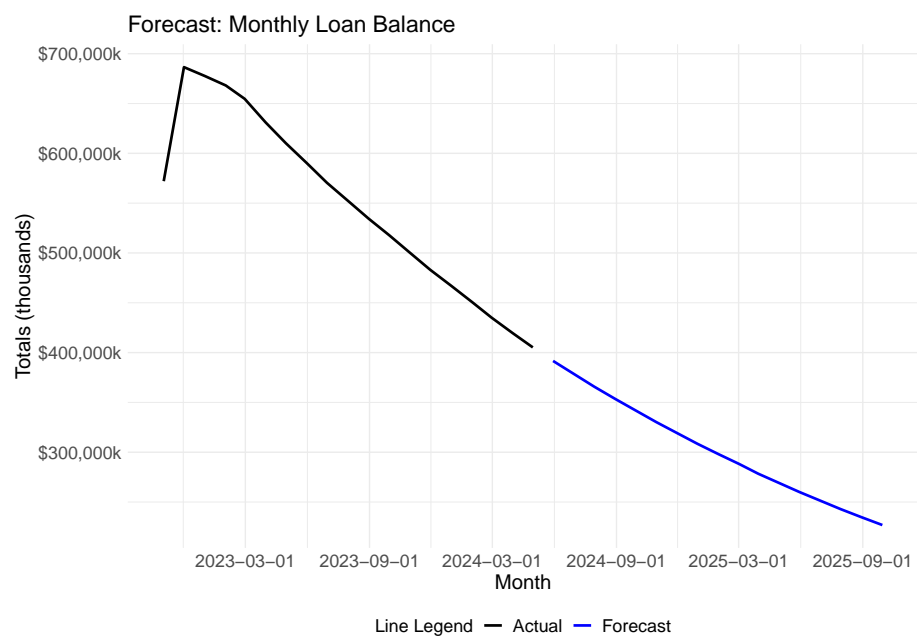
The following approach uses the historical rate of change of the outstanding loan balance in the transaction and the monthly total charge-offs as a percentage of this value. By taking the average of each over the past 12 months, I arrived at the following:

Average Change in Outstanding Balance Amount (P12M): -3.35%

Charge-Offs as a % of Outstanding Balance Amount (P12M): 1.74%

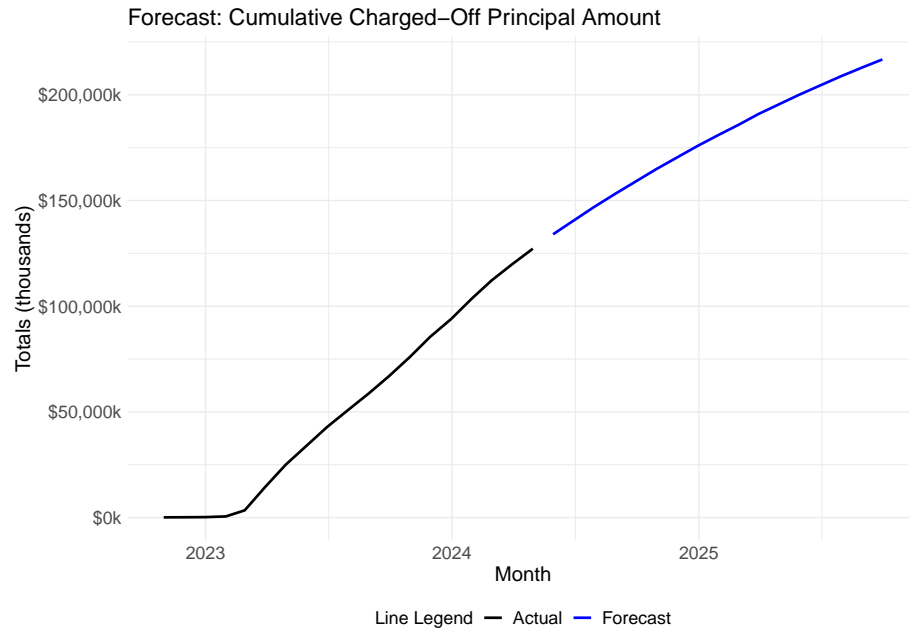
By accounting for the gradual decrease in the total outstanding loan balance and holding charge-offs at a steady 1.74%, we arrive at a more intuitive forecast. The two plots below show the effects of these two assumptions in the forecast period.





With projections for both components based on historical trends, we can forecast the cumulative charged-off principal for month 36. The forecast now reflects the fact that the increase in cumulative amount starts to slow as borrowers continue to make payments and total loan balance decreases.

Cumulative Value 09/30/2025: \$216,709,056



C. Kelley Blue Book Values

Vehicle Value Sources

For the final part of the case, it was important to understand the sources of vehicle value in the dataset. The number of loans for each value source are shown below.

vehicleValueSourceCode	Records
Invoice Price	356
Kelley Blue Book	2,857
Other	28,120

Top 10 Standard Deviations

For those vehicles where the Kelley Blue Book Value is used as the source of value, the Dodge Charger has the highest standard deviation.

