Research Report

26 January 2024

Research on Cash Flow Forecast and Asset Backed Securitization for Daily Revenue Obligations

Analyst Contacts

Vincent Tong +852-2860 7125
Assistant Director of Credit Ratings
vincent_tong@ccxap.com

Christy Liu +852-2860 7130
Credit Analyst
christy_liu@ccxap.com

Elle Hu +852-2860 7120
Executive Director of Credit Ratings
elle_hu@ccxap.com

Client Services

Hong Kong +852-2860 7111

Summary

The Daily Revenue Obligation ("DRO") offers a contractual right in the form of a contract to secure a predetermined percentage of daily revenue for businesses within a specific time frame. This unique financing tool is capable of addressing the funding gap for small and micro enterprises ("SMEs"), especially startups, by offering a flexible financing method that better matches the cash flow of the enterprises. At the same time, investors can automatically receive a share of the daily revenue from SMEs, realizing a relatively effective way to exit from their investment. The Daily Revenue Portfolio ("DRP") is a composite product formed by packaging multiple DROs, encompassing SMEs from different industries, categories, and regions, representing a relatively high diversified asset. However, the business activities of SMEs are susceptible to multiple factors, the cash flows generated are volatile and uncertain.

This report introduces the cash flow forecast model and the credit analysis framework of asset-backed securitization for DRO. CCXAP employs machine learning models combined with historical performance of DROs and macroeconomic trends, and taking into full account the probability of the store closure, the correlation of store closure under the same brand, and the possibility of stores temporarily closing and then resuming operations, to forecast DRO cash flows. A cash flow waterfall is constructed based on the transaction structure of the DRO securitization product, which leads to the expected loss rate and expected duration of the DRO securitization product, and in turn corresponds to different credit ratings.

The report will elaborate on the characteristics of DRO securitization products, including the risk diversification of their underlying assets and the correlation of credit performance among SMEs operating under different brands. On this basis, CCXAP has proposed a comprehensive rating approach aimed at providing a more accurate and reliable credit assessment method for DRO securitization products. This method includes a cash flow forecast model for predicting the cash flow of DRO, a SME evaluation model to assess the credit status of SMEs, and a

credit rating model specifically designed for DRO securitization products, which together constitute a comprehensive credit evaluation system.

We hope that, through this report, investors and market regulators are able to gain a deeper understanding of the rating mechanisms of DRO securitization products, and helps promote the healthy development of the asset securitization market. In addition, we believe that this finding will also help standardize the rating process of DRO securitization products, reduce rating errors, and enhance the transparency and credibility of ratings.

Business Model and Asset Characteristics of DRO

DRO is a contract signed between investors and SMEs, stipulating the investment and daily revenue sharing relationship between the two parties within a certain period of time. The contract mainly specifies the investment amount, sharing time frame, and sharing ratio. The investment amount primarily refers to the investor's portfolio needs, and the sharing time frame mainly refers to the payback period and survival period of the SMEs, determined through negotiation between the two parties. The determination of the daily revenue sharing ratio is based on the proportion of investment, the profit margin of a SME's store, sharing time frame, and the amount of repayment, negotiated between the parties. Generally, the greater the proportion of investment in a SME store, the higher the profit margin of the store and the higher the daily sharing ratio, and vice versa. As the sharing time elapses and the repayment amount accumulates to a certain level, the daily sharing ratio will also decrease in a stepwise manner until it reaches zero. The following table shows the basic characteristics of a DRO.

Exhibit 1. Basic Characteristics of DRO

Expected Total Cash Inflow During the Contract Duration (RMB thousand)	892.0
Investment Amount (RMB thousand)	730.0
Daily Revenue of SMEs (RMB thousand)	10.0
Contract Duration (days)	1,000
Sharing Rules	Before the cumulative inflow amount exceeds the investment amount, the sharing ratio is 10%; after exceeding the investment amount, the sharing ratio is 6%
IRR (%)	18.1

Source: CCXAP research

Normally, through technical means, as well as cooperation with banks, payment companies, and brand merchants, the initiators of DRO can automatically collect daily revenue information from SMEs and automatically extract the daily DRO entitlement revenue share in cash. In addition, the initiators of DRO typically use blockchain technology to implement a One Dollar, One Code to ensure investors' rights to every dollar of revenue.

DRO is a highly diversified asset type. Historical data shows that the assets deployed by DRO institutions are distributed across 31 provinces, autonomous regions, and municipalities in the country, with a low concentration of single brands. The investments of Micro Connect also cover cities and districts of different levels, mainly concentrated in new tier 1 and tier 1 cities, accounting for more than 60% of the total investment.

Currently, DRO is mainly deployed in four major industries in China's consumer sector, including catering, service, retail, and recreation industries. Among these, the catering industry has a higher proportion, accounting for 41.3% of the total investment amount. DRO has also made detailed divisions within the four industries, establishing a five-level classification system of Industry-Business Type-Category-Brand-Store, covering 36 business types and 122 categories.

Exhibit 2. Industrial Distribution

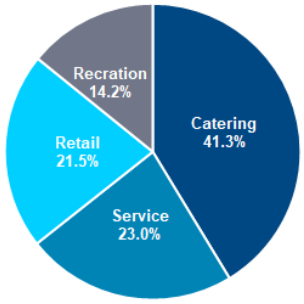


Exhibit 3. City Category

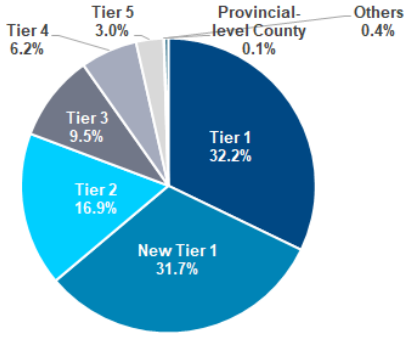
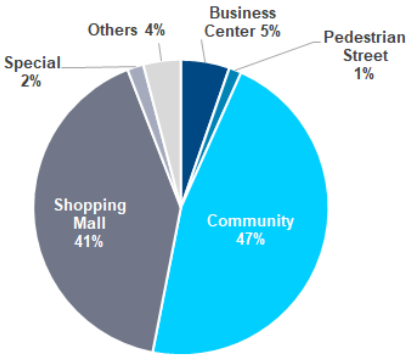


Exhibit 4. Commercial Circle



Source: Company information, CCXAP research

Cash Flow Forecast Model for DRO

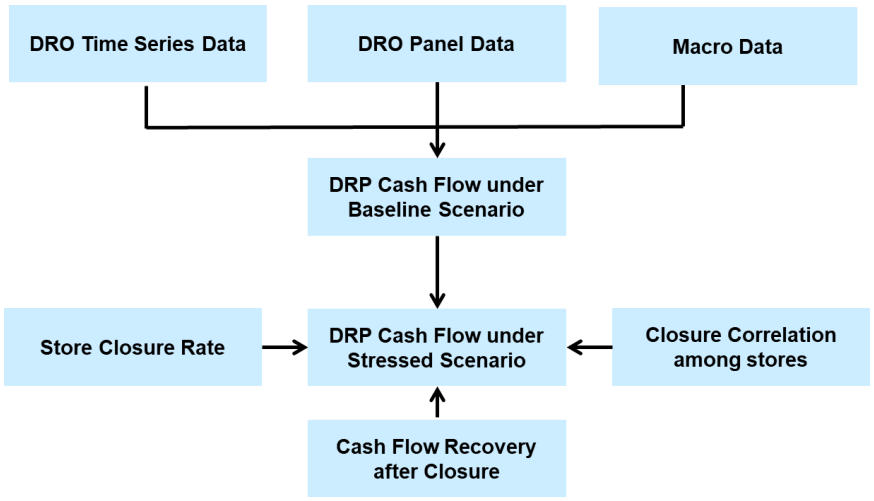
The ability of underlying assets to generate stable cash flows is the basis for asset securitization. In DRO securitization products, the underlying asset is the share amount derived from multiplying the revenue of SMEs by the sharing ratio. The business activities of SMEs are easily affected by multiple factors, and the cash flows generated are volatile and uncertain. Therefore, the initial step in constructing the DRO securitization rating model is to predict the future cash flows that SMEs can generate.

The survival cycle of SMEs is generally short, usually not exceeding 5 years. This phenomenon may be due to the disadvantages of SMEs in terms of capital, technology, market, making them more susceptible to economic fluctuations and market competition. When analysing the cash flows of SMEs, it is usually necessary to rely on revenue information collected by DRO investment institutions due to their short survival cycle and lack of long-term effective public historical data. This data can reflect the past operating conditions of SMEs and provide a basis for predicting their future cash flows. In addition to historical data, we also consider the impact of the macroeconomic environment when predicting the cash flows of SMEs. The macroeconomic environment, such as GDP growth rate, inflation rate, interest rate, and industry policy, can have significant impact on the business activities of SMEs. During economic boom periods, SMEs may experience sales growth and profit increases; during economic downturns, they may face declining revenues and cash flow constraints. To more accurately predict the cash flows of SMEs, CCXAP will conduct analyses combining various data. This includes historical revenue data of SMEs, which record the revenues of SMEs over a past period; specific details of each DRO, such as industry, region, business hub, operating area, and lease period, which help analyse the cash flow conditions of SMEs under specific conditions; as well as macroeconomic data, which provide risks and opportunities that SMEs may encounter in the overall economic background.

In historical data, we found that SMEs might be forced to close due to various external and internal factors, leading to an interruption or even complete cessation of cash flows. Reasons for closure vary widely and may include intensified market competition, rising rents, poor management, broken capital chains, and policy changes. Moreover, once a SME closes its store for reasons other than the operator's personal issues, it will often have an impact on other SMEs operating the same brand or in the same industry. Through the analysis of historical data, it has been found that there is a strong correlation among the closure probabilities of SMEs operating the same brand, which means the failure of one SME may indicate that other SMEs of the same brand also face similar risks.

Therefore, when predicting the future cash flows of SMEs, CCXAP will comprehensively consider factors such as the closure rate of SMEs, the correlation of closure rates among enterprises in the same industry, and the possibility of SMEs temporarily closing and resuming operations, to construct a more comprehensive and accurate cash flow prediction model.

Exhibit 5. DRO Cash Flow Modelling



Source: CCXAP research

1. Baseline Cash Flow Forecast

The baseline cash flow generated by each DRO is based on the daily operating revenue of a SME store and the revenue sharing ratio. Typically, the sharing ratio is determined when the DRO contract was signed. There may still be certain tax and fees in the process of clearing and collecting the daily business revenue of SMEs. We made assumptions based on a fixed tax rate and fee rate in the model.

For DRP, its expected cash flow is the sum of the expected cash flows generated by each DRO, which is

$$NCF_i = \sum_{t=1}^{T} R_i^t D_i^t (1 - Fee_i - Tax_i)$$

$$NCF_{DRP} = \sum_{i=1}^{m} NCF_i$$

NCF_i is the expected net cash flow from DROi, T is the expected duration of the DRO securitization product, R_i^t is the expected revenue of a store given the time period of t, D_i^t is the revenue sharing ratio given the time period of t, Fee_i is the expected fee rate for DROi, Tax_i is the expected tax rate for DROi, NCF_{DRP} is the net expected cash flow for a DRP within the duration of the asset securitized product.

Based on the operational region (city, area, business hub), industry (industry, business type, brand, category), as well as operating area, lease period, rent, and other panel data of SMEs, we can analyse the characteristics of SMEs in more detail. At the same time, due to the advantage of DRO's daily sharing, we can precisely observe the income information of each SME from the date of investment. These high-frequency enterprise-level data support the use of time series forecasting methods to predict the cash flows of each DRO. Currently, commonly used time series forecasting methods include exponential smoothing, ARIMA, SARIMA, machine learning, deep learning. By comparing the regression effects of different models, CCXAP has decided to use random forests for prediction.

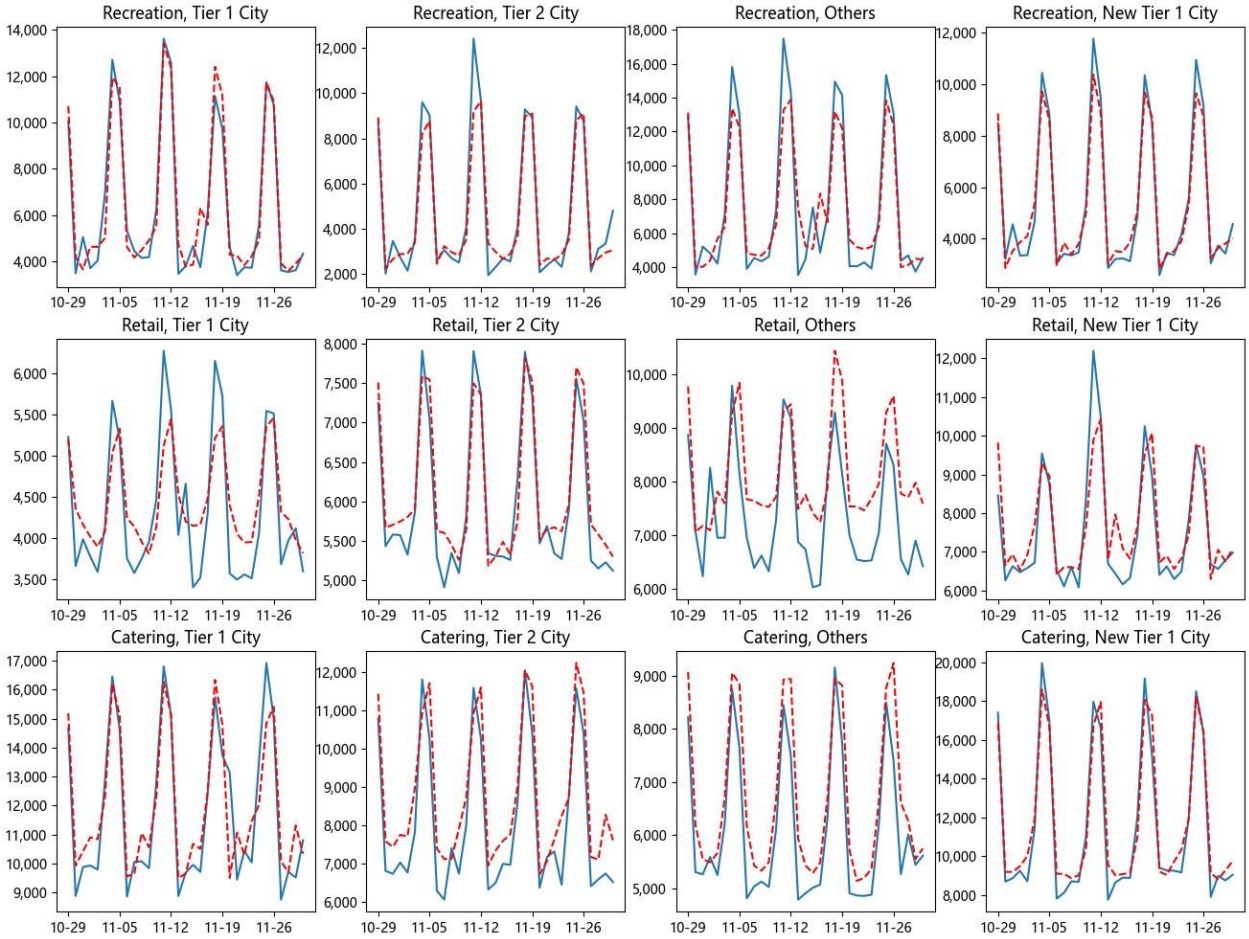
2. Random Forest Model

The random forest is an ensemble learning method that combines strategies based on weak classifiers (decision trees) to form a strong classifier. Random forests construct several decision tree models through resampling technology with replacement and random feature value selection, and the final result of the model is formed by averaging the regression results of multiple decision trees. Random forests have the following advantages: (1) compared to linear regression, random forests are easier to achieve better fitting results; (2) considering the scale of historical data, it is difficult to use cross-validation sets and other methods to make the model more generalizable, and the random forest based on replacement random sampling technology reduces the problem of overfitting due to too many parameters and overly complex models; (3) random forests training is faster.

Micro Connect provided historical data of 10,604 DRO contracts deployed from 1 December 2021 to 30 November 30 2023. CCXAP divided SMEs into several groups based on the city category and industry in which they operate, and predicted the average daily revenue of SMEs in that group based on the historical average daily revenue of SMEs within each group. We noticed that after excluding the interference of factors such as holidays, the revenue of SMEs usually shows a fluctuation pattern with a seven-day cycle. Moreover, the revenue of SMEs will significantly increase during legal holidays. Therefore, we chose the revenue data of the previous seven days and whether the target day is a holiday as model parameters, which can obtain better prediction results.

We reorganized the historical time series data into 327 data groups, each data group includes the average revenue and other characteristic parameters of all SMEs in that group over the past seven days, among which 297 data groups were used as training sets, and 30 data groups were used as testing sets. We built the model through the training set and then observed the fitting effect of the model on the testing set. The figure below shows the comparison of the predicted values and true values within the time span from 29 October 2023 to 30 November 2023. As can be seen from the figure, the fitting effect of the prediction model is relatively good, and it can accurately capture the trends and characteristics of the daily revenue of SMEs.

Exhibit 6. Regression Results



	Training Set	Testing Set
r^2	0.96	0.81

Note: The blue solid line is the real value and the red dotted line is the predicted value.

Source: CCXAP research

Our model has been able to accurately predict DRO cash flows, and the accumulation of data also helps us reduce the variance of prediction results and make the model more generalizable. At the same time, CCXAP will establish a data monitoring mechanism to verify the predictive performance of the model and further optimize the model in a timely manner according to changes in predictive performance.

3. Major Factors Affecting DRO Cash Flow

Based on the baseline cash flow prediction model described above, we can more accurately predict DRO cash flows. We will then analyse other pressure factors affecting DRO cash flows on this basis. When constructing stressed cash flow, CCXAP fully considered the probability of SMEs closing the stores, the correlation between SMEs operating the same brand, and the impact of SMEs recovering operations after closure on cash flows.

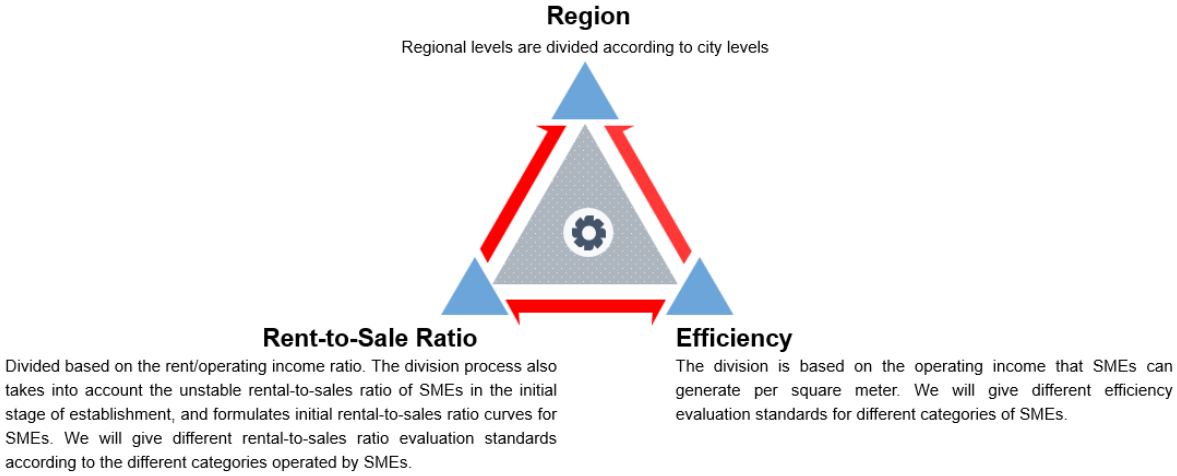
(1) Store Closure Rate

SMEs typically face high operational uncertainty, and the stability of their business income is affected by various factors. For example, fluctuations in market demand, changes in raw material costs, adjustments to policies and

regulations, natural disasters, or other unforeseen events can all cause instability in the income of SMEs, or even situations where income cannot be generated. This instability in income may lead to significant revenue declines, further resulting in the inability for DRO to effectively obtain cash flows, and thereby significantly affecting the net cash flow of DRO.

To deal with this uncertainty in the operating conditions of SMEs and to better assess its impact on DRO, CCXAP has developed a SME evaluation scoring system. This system comprehensively considers the characteristics of the region where each SME is located, operational data, and the current macroeconomic situation to assess the risk of possible store closure of SMEs during the existence of DRO securitized assets. According to this scoring system, the closure probability of SMEs increases over time, meaning that as the operating time extends, the risk of closure is gradually rising. Based on the results obtained from the evaluation scoring system, CCXAP has divided the risk levels of SMEs into eight different levels, namely L1 to L8. L1 represents the risk level with the lowest risk, and L8 represents the risk level with the highest risk.

Exhibit 7. Evaluation and Scoring System for SMEs



Source: CCXAP research

(2) Correlation

DRO is a typical securitized underlying asset with small amounts and high dispersion. The SMEs involved in DRO are spread across different regions and industries. For these enterprises, their operating conditions are influenced by macroeconomic factors, but normally there is no significant correlation between them. This means that the operational success or failure of one SME does not directly affect another SME. However, through the analysis of historical data, we have found that SMEs operating the same brand tend to close around the same time. This trend is particularly evident among the top five brands in terms of the number of closures, with more than 90% of SMEs under these brands having already closed. This indicates that although there is usually little or no closure correlation among SMEs operating different brands, there is a strong correlation in closure among enterprises operating the same brand.

To reflect this phenomenon, we constructed a correlation matrix of SMEs based on assumptions about closure correlation by brand. The dimension of this matrix is T×T, where T represents the number of DROs in DRP. As shown in the figure, we extracted five SMEs from three brands (A, B, D) to construct a correlation matrix. In this matrix, only when two SMEs operate the same brand, the correlation coefficient between them is assigned the value of r_1. In all other cases, when SMEs belong to different brands, the correlation coefficient between them

is r_2. The value of r_1 is much greater than r_2, indicating a stronger correlation between SMEs operating the same brand.

Exhibit 8. Correlation Matrix

	A-1	B-1	A-2	D-1	B-2	
A-1	1	r_2	r_1	r_2	r_2	
B-1	r_2	1	r_2	r_2	r_1	…
A-2	r_1	r_2	1	r_2	r_2	
D-1	r_2	r_2	r_2	1	r_2	
B-2	r_2	r_1	r_2	r_2	1	
	…					

Source: CCXAP research

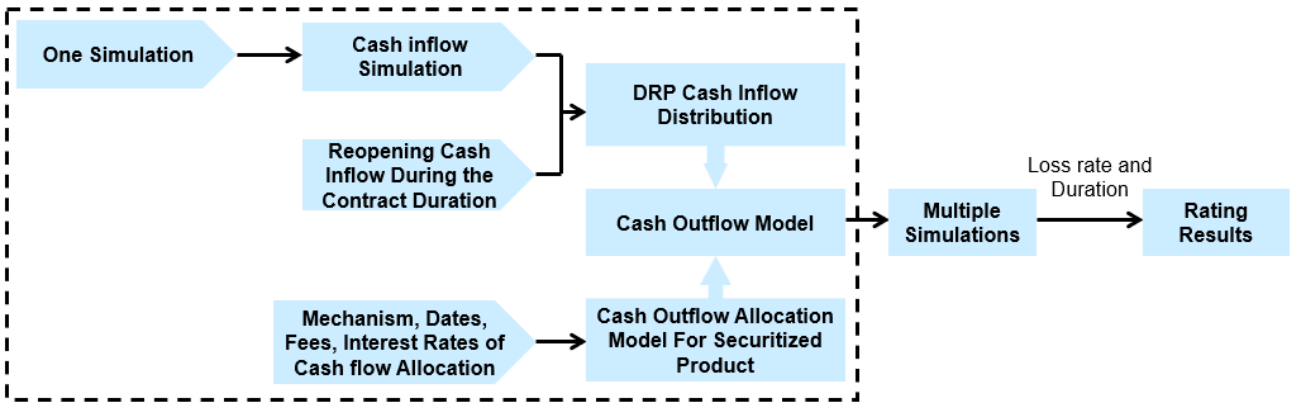
(3) Recovery Rate

The closure of SMEs is a common phenomenon in actual business operations. One scenario is that SMEs shut down completely after closing. In this case, the enterprise no longer has sales of products or services and naturally cannot generate any new cash flows. Another scenario is that SMEs may temporarily close for various reasons, such as operational strategy adjustments, store renovations, and seasonal business adjustments. In this case, SMEs may reopen after a period of time. If a SME can successfully resume operations, its cash flow will also be restored. In this case, the interruption of the cash flow of SMEs may only be temporary. Considering these two different closure scenarios, CCXAP introduced a recovery parameter when predicting the cash flows of SMEs. This parameter aims to quantify the potential cash flows of those SMEs that temporarily close but may ultimately resume operations. By adding a recovery parameter, the cash flow prediction model can more accurately reflect the possible changes in cash flows of SMEs over a future period. However, under stress scenarios, the recovery rate may be affected. For example, during economic downturns or market turmoil, the likelihood of temporarily closed enterprises resuming operations may decrease, and the recovery rate will be reduced accordingly. This means that our predictions of cash flows may be more pessimistic under stress scenarios, reflecting the higher risks faced by SMEs.

Asset Backed Securitization for DRO

Asset backed securitization redistributes the returns and risks of the underlying assets through a prioritized/subordinated cash flow payment sequence. To assess the credit risk of securities at different tranches, we have constructed a quantitative analysis model for asset backed securitization products. On the inflow side, we make assumptions on key indicators such as closure rates and correlations based on DRO benchmark cash flow forecasts to obtain the distribution of DRP cash inflows. On the outflow side, we construct a cashflow waterfall based on the transaction structure to determine whether the DRP cash inflows can timely and fully repay the interest and principal of the rated securities. Through several Monte Carlo simulations, we obtain the expected loss rate and expected duration of the securities at different tranches, and then determine whether they meet the loss rate requirements for the target rating with the same duration.

Exhibit 9. Quantitative Model



Source: CCXAP research

1. DRP Cash Inflows

We use the random forest model to forecast the DRO benchmark cash flow, taking into account the closure probability of SMEs, as well as the impact of the brand on the closure correlation of SMEs, and introduce key indicators such as closure rates and correlations to construct the DRP cash inflows under stressed scenarios. For each simulation:

Firstly, based on assumptions about the closure correlation of SMEs, we construct a set of correlated random arrays following a uniform distribution:

$$U = (u_1, u_2, u_{3,} \cdots u_n)$$

Then, according to the closure rate of SMEs, we use the inverse function to determine the closure time of an individual SME in this simulation:

$$\tau_i = F_i^{-1}(U)$$

Assume that the survival time of SMEs is s_i, if $\tau_i \leq s_i$, the SME does not close the store during this simulation, and the DRO cash flow is consistent with the benchmark; if $\tau_i > s_i$, the SME closes the store, and all cash flow from DRO after τ_i is lost. At the same time, DROs that suffer losses during the simulation will also consider their hypothetical recovery situation.

Finally, we aggregate the DRO cash flows to obtain the DRP cash inflows under stress scenarios.

2. Cash Outflow Model

The cash outflow model is mainly based on the cash flow distribution order set by the transaction structure, taking into account the size and expected yield of each tranche of securities and transaction costs, and combining it with credit triggers to construct the cashflow waterfall of the transaction. The purpose of cash flow analysis is to determine whether the simulated DRP cash inflows can repay the interest and principal of the rated securities timely and fully.

3. Rating Outcome Determination

Through several Monte Carlo simulations, CCXAP will calculate the expected loss rate and expected duration of securities at different tranches. Finally, based on the target rating preset by CCXAP, it is determined whether the rated securities can meet the loss rate requirements of the target rating with the same duration.

4. Sample Demonstration

Based on the above rating method, we randomly extracted 500 DROs from historical data to construct DRP. The SMEs within the DRP cover 62 categories and 110 brands, distributed across 26 provinces, municipalities, and autonomous regions. Assuming that there is no permanent closure, we predict that DRP will have a cash inflow of RMB 89.3 million in the next 12 months.

Assuming the securitization product has a duration of one year and pays out monthly.

Exhibit 10. DRP Features

Amount		Terms	
Estimated Total Cash Inflow (RMB million)	89.3	Weighted Average Contract Duration (months)	42.1
Total Invested Amount (RMB million)	194.5	Longest Contract Duration of a DRO (months)	121.7
Outstanding Investment Amount (RMB million)	163.4	Shortest Contract Duration of a DRO (months)	6.6
Number of DROs	500	Weighted Average Remaining Duration (months)	38.5
Average Estimated Cash Inflow of DRO (RMB million)	0.2	Weighted Average Invested Duration (months)	3.6
Weighted Average Invested Amount (RMB million)	0.9	Longest Invested Duration of a DRO (months)	12.3
Weighted Average Outstanding Investment Amount (RMB million)	0.7	Shortest Invested Duration of a DRO (months)	0.1
Top three DROs with the Highest Cash Inflows (%)	0.1		

Source: CCXAP research

At the same time, we evaluate SMEs based on their operating regions, industries, and performance to provide key assumptions for the closure rate of SMEs, and construct the correlation matrix for DRP based on the brands operated by SMEs. DRP can no longer share the revenue of that SME due to closures, resulting in a loss to the DRP benchmark cash flow. In extreme cases, such as brand in decline, widespread closures of SMEs operating that brand could cause a significant proportion of losses to the DRP benchmark cash flow. As measured by our evaluation model for SMEs, the SMEs in sample DRP are mainly concentrated at level L5.

Exhibit 11. DRP Benchmark Cash Inflow Distribution

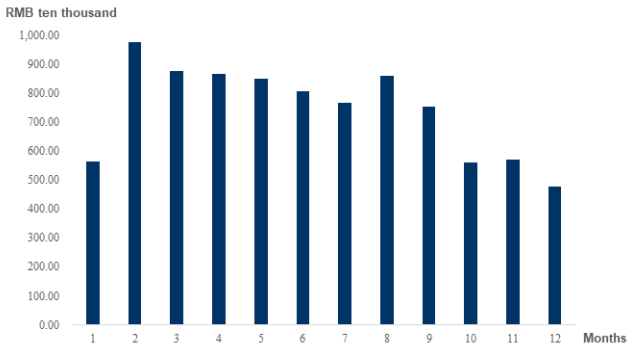
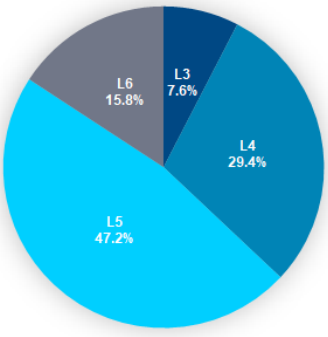


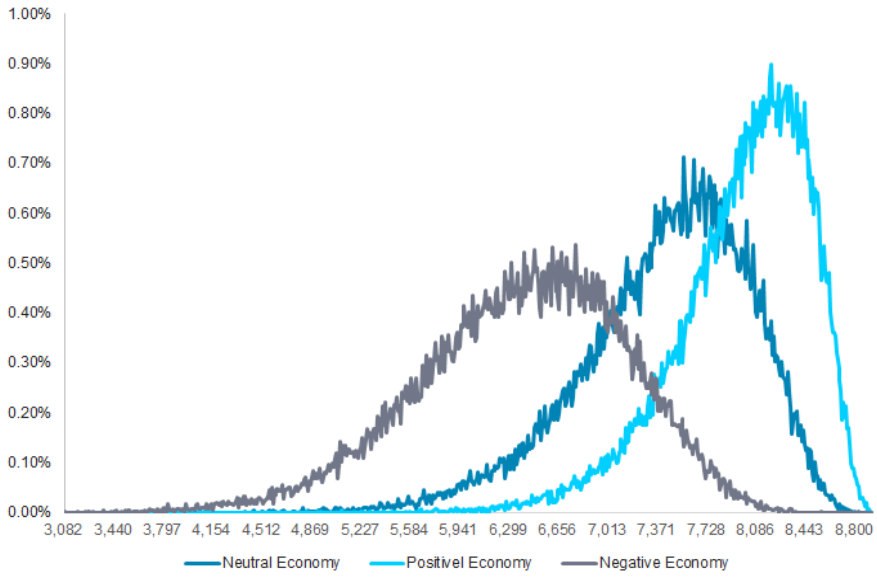
Exhibit 12. DRO Level Distribution



Source: CCXAP research

The following figure shows the probability distribution of DRP benchmark cash flow loss rates under different economic environments. Under neutral economic growth assumptions, the probability of DRP benchmark cash flow experiencing a loss of less than 30% is around 95.4%. When the economic growth is more favourable to SME operations, the operating risk of SMEs decreases, thus the probability of losses occurring in DRP benchmark cash flow is lower. When the economic growth does not provide a favourable environment for SME operations, the operating risk of SMEs is higher, thus the probability of losses occurring in DRP benchmark cash flow is higher. Of course, the operating risk of SMEs is also related to their own characteristics. Additionally, due to the emergence of new business models, the correlation between some SMEs may significantly increase.

Exhibit 13. DRP Cash Flow Distribution under Different Assumptions (Unit: RMB 10,000)



Source: CCXAP research

Exhibit 14. DRP Cash Flow Loss Ratio under Three Scenarios

	Neutral Expectation on Economic Growth	Positive Expectation on Economic Growth	Negative Expectation on Economic Growth
Average Cash Flow Loss Rate	16.9%	10.6%	28.4%
Probability of Loss Rate ≤ 10%	15.7%	53.1%	0.3%
Probability of Loss Rate ≤ 30%	95.4%	99.7%	59.9%
Probability of Loss Rate ≤ 50%	99.9%	100.0%	98.9%

Source: CCXAP research

Limitations of the Model and Rating Method

1. Deterioration in SME Operating Conditions

If the operating conditions of SMEs deteriorate, this may directly affect the cash flow. In extreme cases, the closure or bankruptcy of SMEs may lead to a significant decline in DRO value, resulting in the risk of investors in securitization products partially or fully lose the principal. CCXAP has considered the possibility of permanent

closure of SMEs and the correlation of closure rates within the same industry when constructing the cash flow model, as SMEs operating in the same industry or brand may be affected by similar operating environments and market competition. By simulating different scenarios, it is possible to assess the potential loss to DRP cash flow under various adverse conditions. This type of simulation analysis helps to reveal the potential impact of asset recovery and cash flow dynamics on investors in securitization products under different operating environments.

2. Limitations of Model Predictions and Historical Data

Credit rating of securitization products includes a reasonable prediction of the future performance of the underlying assets, and the mathematical methods and quantitative models used are based on certain theoretical assumptions. There may be differences between real situations and theoretical assumptions, thus there is a certain degree of modelling risk. We have tried methods such as Exponential Smoothing (Holt Winters), Time Series Analysis (ARIMA, SARIMA), Machine Learning (Random Forest), Deep Learning (LSTM), to predict the future revenue of SMEs as accurately as possible, but there is no single method that has been verified to be more accurate for time series data predictions.

Additionally, SMEs are lack of long-term effective public historical data, and our predictions mainly rely on daily income information obtained by SMEs from the date of investment according to the DRO contract. Historical data is short in duration and has not experienced a complete economic cycle, so the assumptions or parameter estimates used in quantitative analysis may have some errors compared to actual situations. As historical data accumulates, CCXAP will continue to develop algorithms and perform rolling validations in order to make benchmark cash flow predictions closer to reality, and we have reason to believe that as historical data accumulates, the variance of the model will decrease.

3. Concentration of DRP

Although historical data shows that DRO assets have high degree of dispersion in regions, industries, and brands, which helps reduce the impact of single risk. However, when these independent DROs are combined into a DRP, concentration risk may be inadvertently introduced. This risk may manifest in several ways. Firstly, economic fluctuations in specific regions or industries may have disproportionate impact on the overall portfolio. Secondly, changes in brand influence or market recognition may cause more pronounced cash flow fluctuations at the portfolio level. Finally, systemic risks associated with specific industries or brands may be amplified within the portfolio. Because of these potential concentration risks, the cash flow distribution of the DRP may differ significantly from the historical data of individual DRO assets. In this case, the cash flow prediction model parameters derived from historical data may no longer apply, affecting the accuracy and credibility of predictions and ratings. To reduce such risks, CCXAP will continue to explore the use of advanced statistical and machine learning methods, such as Kernel Regression and Neural Network models, to better capture the cash flow distribution characteristics of portfolio assets. Through these models, the cash flow dynamics of different DRP can be estimated more accurately, thereby providing more precise cash flow forecasts. These models can analyse data on a deeper level to identify hidden nonlinear relationships and complex interactive effects, which are crucial for understanding and predicting concentration risks. By simulating various possible economic environments and market conditions, we can help assess the performance of DRPs under different macroeconomic and specific industry environments. Ultimately, combining these model predictions with traditional credit assessment methods can provide a more comprehensive risk assessment for DRO securitization products, while also improving the adaptability and robustness of the rating method in a constantly changing market environment.

4. Limitations of Model Assumptions

The rating method proposed in this paper relies on judgments about the macroeconomic situation and a reasonable analysis of DRO's historical performance in several aspects. Our core assumptions in constructing DRPs are that the distribution of DRP assets, cash flow characteristics, and credit performance will remain consistent with historical data. If these assumptions are met, our prediction models and credit assessment framework are expected to provide relatively accurate results. However, the limitation of this method is that the actual economic environment and market conditions may change, and these changes may not be fully reflected in historical data. For example, new economic policies, industry transformations, or market events could cause DRP's actual performance to differ significantly from historical data. If such a situation occurs, the assumption parameters in our model may no longer apply, affecting the accuracy and reliability of the rating outcome. In addition, the characteristics of DRO assets may change due to the introduction of new technologies, restructuring of supply chains, changes in competitive landscapes, and changes in consumer behaviour, while our analysis is mainly based on historical data. If future characteristics of DRO assets cannot be accurately mined through historical data, then cash flow predictions and rating methods may need to be adjusted based on new information. Therefore, although historical data analysis provides us with a basic method for assessing DRO assets, we must remain alert to changes in economic environments and market conditions, and update our models and key assumptions in a timely manner. In practical applications, the over-reliance on historical data needs to be balanced with real-time market monitoring and analysis to ensure that the rating model can reflect the latest economic conditions and market dynamics.

Conclusion

In summary, CCXAP's research work provides a comprehensive and precise methodology for the rating of DRO securitization products. By using machine learning models to predict the future cash flows of SMEs, combined with Monte Carlo simulation analysis of cash flow fluctuations, and comprehensive consideration of the probability of store closures and the impact of business recovery, a cash flow prediction framework has been constructed. Combined with the cashflow waterfall of securitization transactions, a method for calculating expected loss rates and expected durations has been provided to assess the credit risk of different tranches of asset backed securities. Moreover, by analysing the fundamental asset risks and credit correlations of DRO securitization products, a comprehensive rating method has been proposed, which helps investors and regulators gain a deeper and more comprehensive understanding of the risks and value of asset securitization products. This not only helps market participants make more informed investment decisions but also lays the foundation for the robust development of the asset securitization market. Finally, CCXAP's research work is of significant importance for the standardization of the DRO securitization product rating process. A standardized rating process can effectively reduce rating errors, improve transparency and credibility, and thereby attract more investors to participate, promoting the liquidity and efficiency of the capital market. With the application and promotion of these research findings, it is expected that the asset backed securitization market will usher in a broader development prospect.

A credit rating is the analytical result of current credit worthiness and forward-looking opinion on the credit risk of a rated entity or a debt issue. Credit ratings issued by CCXAP are opinions on the current and relative future credit risk of the rated entities or debt issues, but do not address any other risks, including but not limited to liquidity risk, market price risk, and interest rate risk.

Credit ratings, non-credit assessments, and other opinions included in CCXAP’s publications are not recommendations for investors to buy, sell, or hold particular securities, nor measurements of market value of the rated entities or debt issues. While obtaining information from sources it believes to be reliable, CCXAP does not perform audit and undertakes no duty of independent verification or validation of the information it receives from the rated entities or third-party sources.

All information contained herein belongs to CCXAP and is subject to change without prior notice by CCXAP. CCXAP considers the information contained herein to be accurate and reliable. However, all information is provided on an "as is" and "as available" basis and CCXAP does not guarantee accuracy, adequacy, completeness, or timeliness of the information included in CCXAP’s publications.

To the extent where legally permissible, CCXAP and its directors, officers, employees, agents and representatives disclaim liability to any person or entity (i) for any direct or compensatory losses or damages, including but not limited to by any negligence on the part of, and any contingency within or beyond the control of CCXAP or any of its directors, officers, employees, agents or representatives, arising from or in connection with the information contained herein or the use of or inability to use any such information; and (ii) for any indirect, special, consequential, or incidental losses or damages whatsoever arising from or in connection with the information contained herein or the use of or inability to use any such information, even if CCXAP or any of its directors, officers, employees, agents or representatives is advised in advance of the possibility of such losses or damages.

China Chengxin (Asia Pacific) Credit Ratings Company Limited

Address: Suites 1904-1909, 19/F, Jardine House,
1 Connaught Place, Central, Hong Kong

Website: www.ccxap.com

Email: info@ccxap.com

Tel: +852-2860 7111

Fax: +852-2868 0656