Structured Finance

China

See China's ABS Through the Lens of Domestic Structured Finance Ratings

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Contacts

Primary Analyst

Name	Ke Chen, PhD
Title	Senior Director
Direct	(852) 3615 8316
E-mail	ke.chen@pyrating.com

Secondary Analyst

Name	Shiyu Wang, PhD
Title	Analyst
Direct	(86) 755 8287 1237
E-mail	shiyu.wang@pyrating.com

Summary

China's asset-backed securities (ABS) market has seen tremendous growth in recent years. Since the first transaction in 2005, the market has developed into the largest ABS market in Asia and second largest globally. As China's financial sector continues to open up, it is becoming increasingly convenient for international investors to access China's bond market via channels such as Bond Connect. While international investors can easily access and have shown great interest in China's ABS market, investments are still concentrated solely in auto loan ABS, the asset sector they are most familiar with given how difficult it is for them to fully comprehend the risks associated with most underlying assets and structures in China.

In the course of this research, we attempt to bridge the gaps in understanding by studying the rating transitions of the structured finance ratings issued by domestic rating agencies in China. We start with a review of the unique market structures of China's ABS markets before analysing the characteristics of the structured finance rating transitions in China. We further examine the rating performance of the fee income rights ABS, which is a distinctive asset sector in China's ABS market. Moreover, we provide comparisons between the corporate and structured finance rating transitions and attempt to explain the findings. The following highlights some of the key findings:

- Significant variations in the frequency and magnitude of the upgrades and downgrades in China's structured finance ratings have been identified. The number of upgrades significantly exceeds the number of downgrades in China's structured finance ratings. However, the magnitude of the downgrades is larger than the magnitude of upgrades on average.

- Using China's corporate rating transition as a benchmark, we find that the structured finance securities are less likely to be downgraded than similarly rated corporate securities; however, once a downgrade has occurred, the magnitude of the rating downgrade is generally higher in structured finance ratings than in corporate ratings.

- The structured finance rating transitions demonstrate different patterns across issuance markets and asset sectors. Upgraded transactions are evenly distributed in the Corporate ABS and Credit ABS markets, while Corporate ABS contributed to almost all of the downgrades. In terms of asset sectors, the fee income rights ABS transactions account for the majority of downgrades, while the securitisation transactions backed by existing credit assets represent the largest proportion of upgrades.

- The primary reasons for downgrading a fee income rights ABS are: (1) an unexpected shortfall of the cashflows generated by the underlying assets; and (2) the deterioration in the credit quality of the originators or the third parties who provide the credit enhancements.

- The observed features of structured finance rating transitions in China are primarily driven by the following factors: (1) the types of underlying assets; (2) the operational risks associated with originators and servicers; (3) the counterparty risks of transaction participants; (4) the idiosyncratic and systemic risks embedded in the securities; and (5) the failure to achieve insolvency remoteness.

PENGYUAN 鵬元國際

Introduction

China's ABS market has experienced explosive growth in the past few years and developed into the second largest securitisation market in the world (see Exhibit 1). By the end of 2019, the total issuance volume of China's ABS market approached RMB7.81 billion (US$1.1 billion), with RMB5.08 billion (US$0.7 billion) in outstanding volume. China's ABS market has expanded both in the size and range of securitised asset types. Securitisation has been applied to a wide range of assets within China, from traditional residential mortgages, corporate loans, auto loans, and consumer loans, to trade receivables, aircraft leases, and intellectual property assets (see Exhibit 2).

Exhibit 1: ABS Newly Issued Volumes 2012-2019
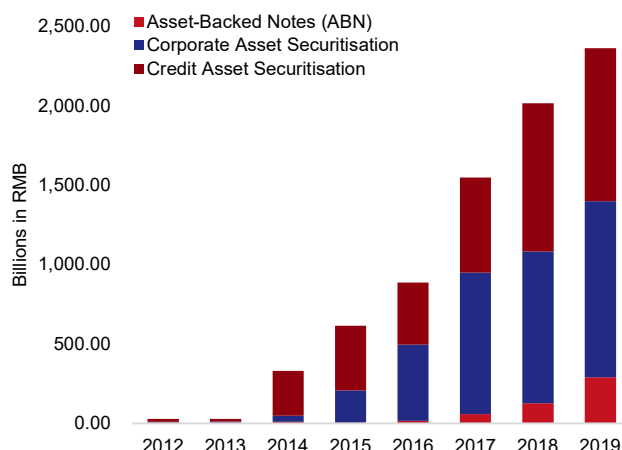
Source: CNABS, Pengyuan International

Exhibit 2: ABS Asset Class Distribution by Outstanding Volume
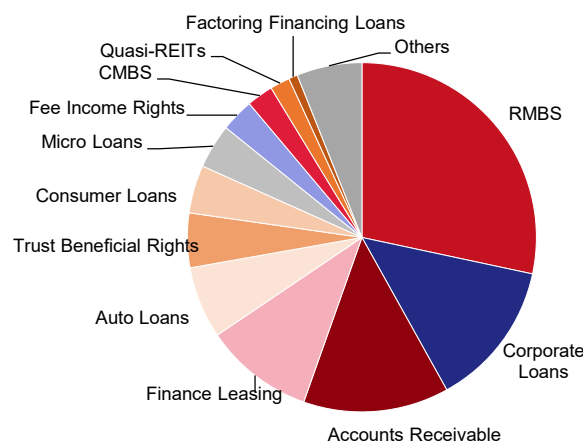
Source: CNABS, Pengyuan International
Remark: Others sectors include airline ticket receivables, insurance loans, finance leasing, entrusted loans, note income rights, provident funds, and rights of stock pledged repo.

As China's ABS market continues to grow, international investors have shown great interest in participating in the market. Assessing the opportunities and challenges inherent within China's ABS market requires a solid understanding of the market structure and its unique characteristics.

This research attempts to shed light on China's ABS market through an evaluation of the structured finance ratings issued by domestic rating agencies in China. Credit ratings are of particular importance in understanding ABS products. Compared to traditional bond markets, the ABS market has a higher reliance on credit ratings as a source of information given the product complexity and lack of expertise. While domestic credit rating agencies have long been criticised for issuing ratings using an inflated ratings scale with which international investors are unfamiliar, we believe the ratings given by domestic rating agencies do still contain useful information regarding the relative ranking of ABS products' creditworthiness. In addition, our findings are primarily based on an analysis of China's structured finance rating transitions, which provide information regarding changes in relative creditworthiness instead of the absolute credit risk level.

Market Structure and Asset Classification of China's Securitisation Market

Before we delve into the analysis of structured finance ratings in China, it is useful to discuss some distinguishing features of China's ABS market. Securitisation was introduced to China following the experience of the US and other developed markets. However, having evolved in a unique environment, China's ABS market has developed its own features and deviated from the more developed markets in many aspects. It is therefore important to understand those differences and how they affect security's creditworthiness.

Segmented Securitisation Market

China has four segregated ABS markets, supervised by different regulators, which are comprised of different originators and provide different issuance platforms and structures. Under these segmented legal and regulatory regimes, securitisation products demonstrate different characteristics and performances in these markets. Exhibit 3 presents comparisons of the four securitisation markets.

Exhibit 3: China's Asset Securitisation Markets

	Credit ABS	Corporate ABS	Asset-Backed Note	Asset-Backed Plan
Regulators	PBOC and CBIRC	CSRC	NAFMII	CBIRC
Originators	Financial institutions	All types of institutions	Non-financial institutions	All types of institutions
Issuance Market	Interbank Bond Market	Securities Exchange Markets	Interbank Bond Market	Insurance asset-trading platforms
SPV	SPT	Security companies / their fund subsidiary	SPT/Originators	Insurance asset-management companies

Credit ABS' are issued under the Credit Assets Securitization (CAS) scheme, which is regulated by the People's Bank of China (PBOC) and the China Banking and Insurance Regulatory Commission (CBIRC). Under the CAS scheme, CBIRC-regulated banks and non-banking financial institutions entrust their 'credit assets' to a special purpose trust (SPT). On behalf of the SPT, the trustee issues the Credit ABS notes in the China Interbank Bond Market (CIBM). By the end of 2019, 777 securitisation transactions with a total volume of RMB3.7 billion had been issued under the CAS scheme, equalling about 46% of the total issuance volume on China's ABS market.

The China Securities Regulatory Commission (CSRC) supervises Corporate ABS under the Asset-Backed Specific Plan (ABSP), which is a specific asset management plan of securities companies. The securitisation bonds under the ABSP scheme are issued and traded in the exchange markets. While the framework could technically cover assets generated by all corporates, the typical originators under the ABSP scheme are non-financial institutions and financial leasing companies. The underlying assets for ABSP are specified using a "Negative List", which means assets that are not on the list are eligible to be securitised under ABSP. By the end of 2019, 2,929 securitisation transactions with a total volume of RMB3.78 billion had been issued under the ABSP scheme, accounting for about 47% of the total issuance volume of China's ABS market.

The National Association of Financial Market Institutional Investors (NAFMII) supervises Asset-Backed Notes (ABN). The ABNs are issued in the CIBM by non-financial institutions. The size of the ABN market had been relatively small until NAFMII amended the ABN guidelines in December 2016. Under the new guidelines, the ABN transactions can be issued with the SPT structure, which provides better bankruptcy remoteness protection for investors than the previous structure. With the SPT structure, the issuance volume surged to RMB512 billion by the end of 2019.

The Asset Backed Plan (ABP), issued by insurance asset management companies, is regulated by the CBIRC. The market scale of ABP is the smallest amongst the four securitisation markets. We did not include the transactions issued under the ABP scheme in our sample during the course of this research.

China's Asset-Backed Securitisation Classification

Another unique feature of China's securitisation market is its underlying asset types. Different from the typical classification framework used in developed markets, China's securitisation products are generally classified based on their issuance market and whether the underlying assets are existing credit assets or fee-income rights (see Exhiibt 4).

In an exisiting credit asset securitisation, there is an exisiting claim to a cashflow. On the other hand, the contractual right to a cashflow is established in the future with regards to fee income rights securitisation. Since the cashflows are to be generated in the future, the performance of the underlying assets in the fee income rights securitisation depends on the originators' business and revenue, meaning there is an originator dependence in the fee income rights securitisation. Given the nature of the underlying assets, corporations are typical issuers of the fee income rights securitisation, while the securisations issued by finanical firms are generally based on the exisiting credit asset securitisation. As a result, the main issuance markets of the fee income rights securitisation are Corporate ABS and ABN.

The issuance of the fee income rights securitisation accounts for a much higher percentage of China's securitisation market than in developed markets. By the end of 2019, 274 fee income rights securitisation transactions with a total volume of RMB262.8 billion had been issued, which is around 7% of the total issuance volume under Corporate ABS.

**Exhibit 4: China's Asset Securitisation Classification**
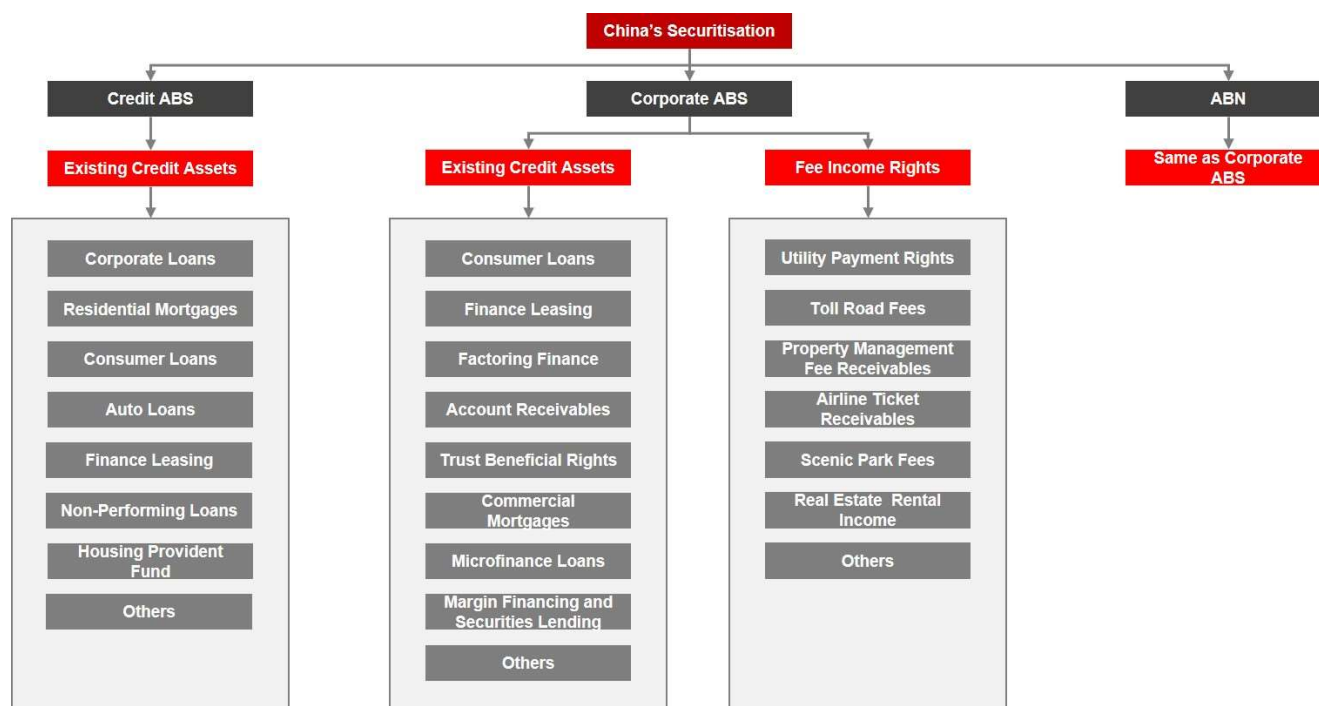
China's Structured Finance Rating Transitions

With market structures and product features in mind, we conducted a statistical analysis of rating transitions for the structured finance ratings issued by China's domestic rating agencies. The sample covers domestic ratings for structured finance products issued from 2007 to 2019. Exhibits 5-10 present the number of upgrades and downgrades from several perspectives: magnitude of transitions, markets, time of transitions, and original ratings. As we can see from the exhibits, whilst the rating transitions in China's ABS market share certain common features with developed markets, they also demonstrate their own particular characteristics. The following are some highlights we observed from the data:

- The number of upgrades significantly exceeds the number of downgrades in China's structured finance ratings. Over the sample period, the total number of rating transitions is 820, where upgrades occurred 741 times and downgrades 79 times (see Exhibit 5). A total of 583 securitisation transactions were involved: among them, 555 were upgraded and 28 were downgraded.[1]

- The magnitude of downgrades is larger on average than the magnitude of upgrades. In our sample, the average upgrade is about 1.6 notches, with the majority of them a one-notch migration. Only eight tranches experienced a six- or more-notch upgrade. On the other hand, the average downgrade is about five notches. While the majority of the downgrades are a one-notch migration as well, 18 downgrades were larger than 10 notches and four tranches were downgraded by 17 notches.

- Corporate ABS and ABN contributes to all of the downgrades (see Exhibits 6 and 7). While upgraded transactions are evenly distributed in the Corporate ABS and Credit ABS markets, 99% of the downgrades occurred in the Corporate ABS market. The different distribution of the upgrades and downgrades in the two markets may be a result of the different underlying asset types in the markets.

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[1]When we count the rating transitions, we use the following criteria: if a rating agency changes the ratings on three ABS tranches in the same ABS deal, we consider them as three rating transitions. If the rating agency changes the ratings again on two of the three ABS tranches, we count them as two other rating transitions. In this case, there exist a total of five rating transitions. However, if two rating agencies conduct the same rating action on the same ABS tranche, we only consider it as one rating transition.

Exhibit 5: Number of Rating Transitions by Magnitude
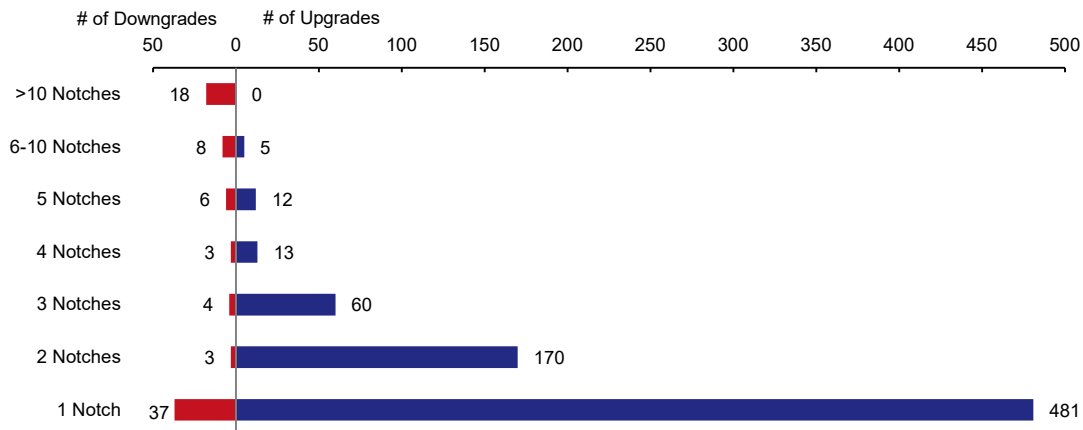
Source: Wind, Pengyuan International

Exhibit 6: Downgrade Distribution by Market

Source: Wind, Pengyuan International

Exhibit 7: Upgrade Distribution by Market
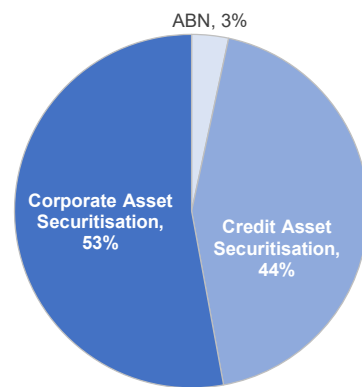
Source: Wind, Pengyuan International

- Most of the upgrades happened from 2015 to 2019 and had an upward trend (see Exhibit 8). The rising trend can be mainly attributed to the increasing issuance of and credit benefits for subordinated tranches when senior tranches get gradually paid off. Forty-three out of 79 downgrades occurred in 2018, owing to the large number of credit events of the transaction participants, such as originators and guarantors. Most upgraded transactions were issued from 2014 to 2018, while the downgraded transactions were mainly issued before 2017 – especially in 2015 (see Exhibit 9). China's regulators have strengthened the supervision of the securitisation market since 2017, which has reduced operational risks and promoted the creditworthiness of the transactions in China's ABS markets.

Exhibit 8: Number of Rating Transitions by Calendar Year
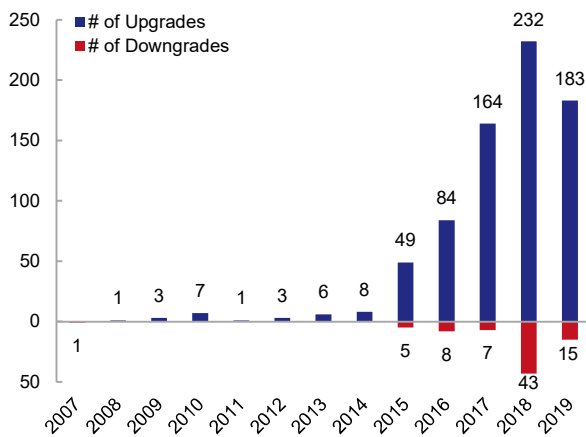
Source: Wind, Pengyuan International

Exhibit 9: Number of Rating Transitions by Vintage
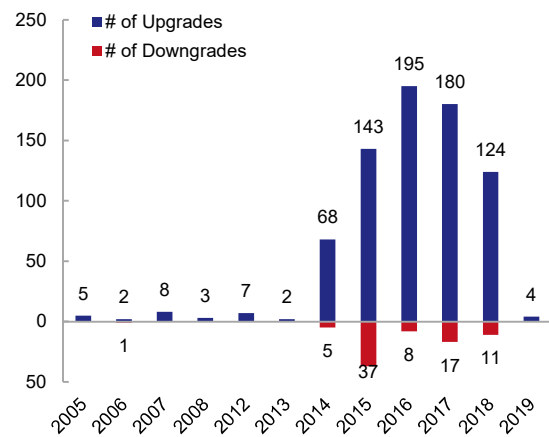
Source: Wind, Pengyuan International

- The securities rated 'AA+' and 'AA' accounted for the highest proportion of downgrades and upgrades respectively (see Exhibit 10). The original rating categories of downgraded securities concentrated in 'AAA', 'AA+', and 'AA', with 21.52%, 62.03% and 13.92% respectively. On the other hand, the original rating categories of upgraded securities ranged from 'BBB-' to 'AA+', where the top three categories are 'AA+' (32.79%), 'AA' (38.73%), and 'AA-' (14.71%).

Exhibit 10: Number of Rating Transitions by Original Rating Category
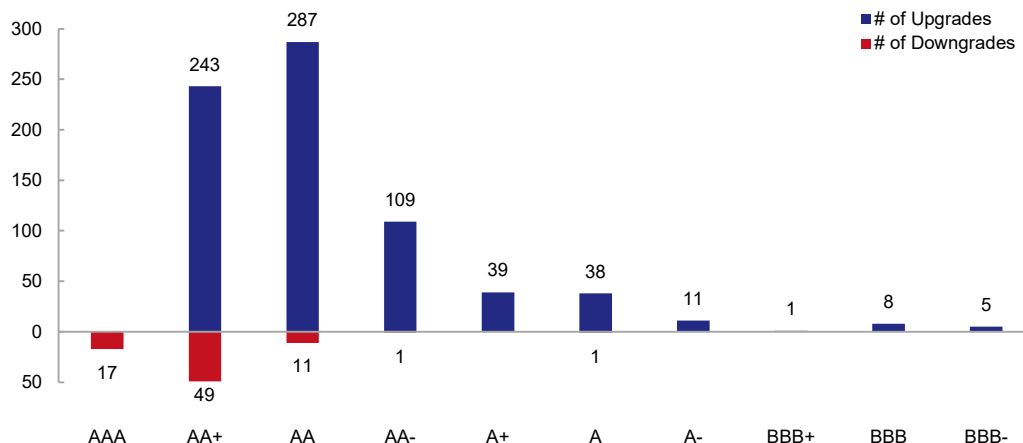
Source: Wind, Pengyuan International

Rating Transitions in Various Markets and Sectors

Exhibits 11 and 12 present the number of downgrades and upgrades in different ABS markets and asset sectors in China. There are some significant differences in the structure finance rating transitions across different markets and asset sectors. With the exception of one transaction from the ABN market, all downgrades happened in the Corporate ABS market. In contrast, Credit ABS transactions did not experience any downgrades over the sample period. In terms of asset sectors, fee income rights ABS, finance leasing ABS, CMBS, and account receivables ABS experienced the most downgrades, accounting for 91.1% of total downgrades. In addition, most of the transactions downgraded by more than 10 notches are fee income rights ABS and CMBS. It is worth noting that China's CMBS shares a lot of similarities with the fee income rights ABS. That means the fee income rights type ABS represents the majority of the sharpest downgrades and account for more than 60% of total downgrades.

We observed a large number of upgrades in all three ABS markets because, if the underlying assets perform as expected, securitisation products tend to be upgraded as the credit enhancement level increases over time due to the received payments. Finance leasing ABS, micro-loan ABS and account receivable ABS are the top three asset sectors experiencing the most upgrades in the Corporate ABS market, while collateralized loan obligations (CLO), auto loan ABS, and finance leasing ABS accounted for most upgrades in the Credit ABS market.

Exhibit 11: Number of Downgrades by Markets and Sectors
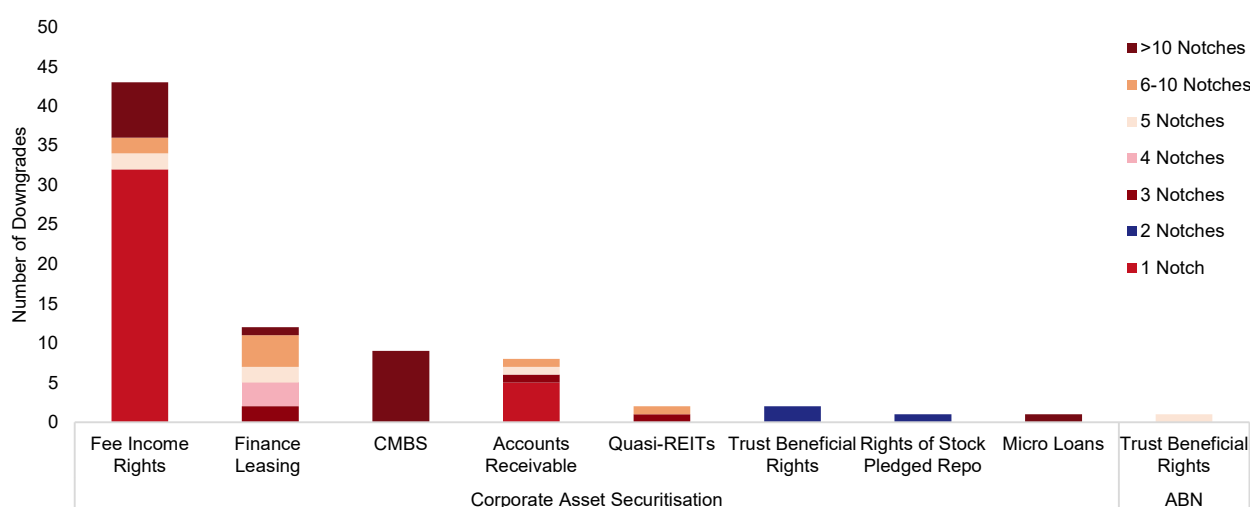
Source: Wind, Pengyuan International

Exhibit 12: Number of Upgrades by Markets and Sectors
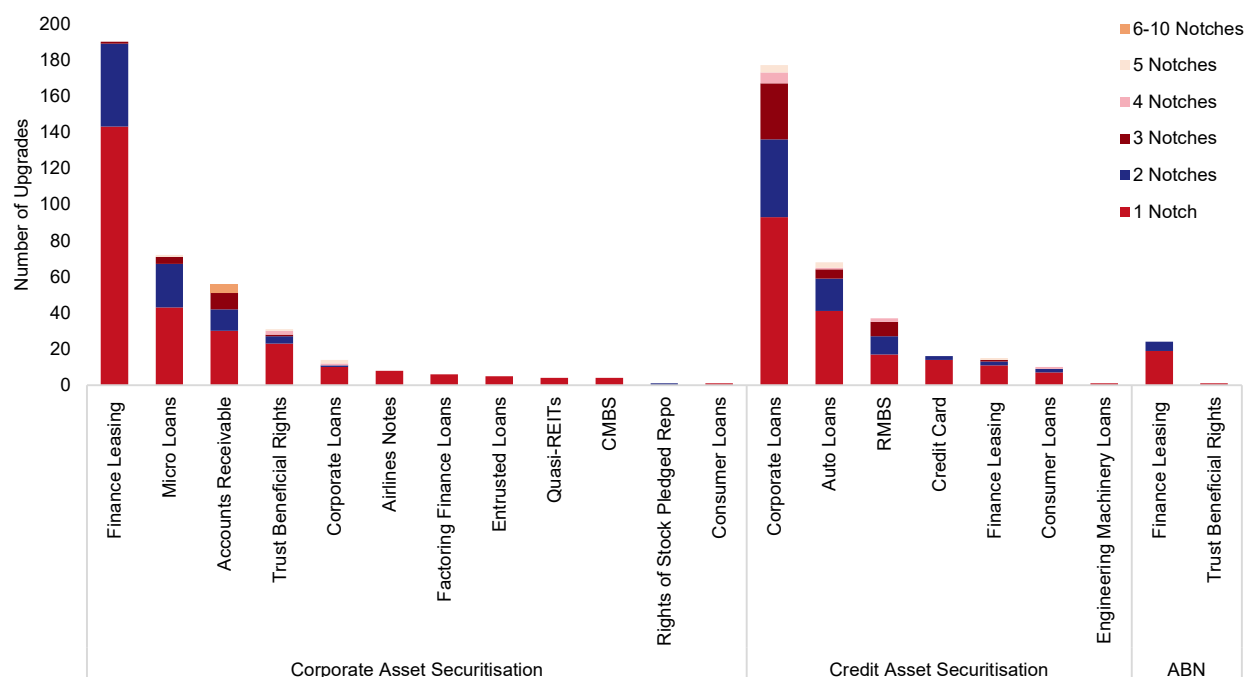
Source: Wind, Pengyuan International

Fallen Angels: Transitions from Investment-Grade Ratings to Speculative-Grade Ratings

In the bond market, a fallen angel is a bond downgraded from an investment-grade rating to a speculative-grade rating. Since the downgrade from investment grade (BBB- or above) to speculative grade (BB+ or below) is much more significant than a downgrade within the same class, 'fallen angel rate' is frequently used as a measure of credit rating transitions. In this research, we define the fallen angel in China's ABS market using a similar concept but with a different cut-off rating level. In particular, we refer to a fallen angel as an ABS note that was rated 'AA' or above but has since been downgraded to 'AA-' or below.

Exhibit 13: China's ABS Fallen Angels Summary

| Transaction	Tranche	Originator	Ratings After Downgrade	Ratings Before Downgrade	Downgrade Magnitude (Notches)	Underlying Asset Type
Huaxia Sanpower 2016-1	16 Sanpower B	Sanpower Group Co. LTD	BB	AA	-9	Quasi-REITs
Rongxin 2018-1	Rongxin L Senior A, Rongxin L Senior B	Rongxin Leasing Co., LTD	BB, CCC	AA+, AA	-10 -14	Finance Leasing
Gan Micro Loan 2015-1	Gan Micro Loan B	Fenyi County Micro Loan Co. LTD	B	AA+	-13	Micro Loans
Hazhuanji 2015-1	Hachanglu 04, Hachanglu 05, Hachanglu 06	Harbin Airport Dedicated Road Co. LTD	B	AA+	-13	Fee Income Rights
Qinghui 2016-1	Qinghui 1 Senior	Qinghui Leasing Co. LTD	C (Default)	AAA	-18	Finance Leasing
Hongbo 2017-1	PR Hongbo 01, 17 Hongbo 02, 17 Hongbo 03, 17 Hongbo 04, 17 Hongbo 05, 17 Hongbo 06, 17 Hongbo 07, 17 Hongbo 08, 17 Hongbo 09	Harbin Gong Da High-tech Enterprise Development Co. Ltd.	B+ (Default)	AA+	-12	CMBS
Debang Huaxin 2018-1	Huaxin 01A	Shanghai Huaxin International Group Co. LTD	CC	AAA	-17	Accounts Receivable
Pingan Kaidi 2015-1	Kaidi 04, Kaidi 05	Longhui Kaidi Green Energy Development Co. LTD	BBB-	AA+	-8	Fee Income Rights
Pingyin Kaidi 2015-2	Kaidi 2 Senior 3, Kaidi 2 Senior 4, Kaidi 2 Senior 5, Kaidi 2 Senior 6	Chingyang Kaidi Green Energy Development Co. LTD	C (Default)	AA+	-17	Fee Income Rights
Bogang Leasing 2015-1	PR Leasing 02、PR Leasing 03	Bohai Steel Group (Tianjin) Financial Leasing Co. LTD	BB	AAA	-11	Finance Leasing
Gongyi Gas 2015-1	Gongyi Gas 05, Gongyi Gas 06	Gongyi Gas Co. LTD	BBB	AA	-6	Fee Income Rights

Tianfeng 2017-2	TF 17 B	TF Securities Co. LTD	A+	AA	-2	Rights of Stock Pledged Repo
Huirong 2017-1	17 Huirong C	Anhui Guoyuan Trust Co. LTD	BBB+	A	-2	Trust Beneficial Rights
PekingU Science Park 2018-1	18 PekingU Science ABN001 Senior	Peking University Science and Technology Park Construction and Development Co. LTD	A (Default)	AAA	-5	CMBS

Source: Wind, Pengyuan International

By the end of 2019, there were 31 fallen angels in China's ABS market, involving 14 ABS transactions (see Exhibit 13). With the exception of one ABN transaction (PekingU Science Park 2018-1), all fallen angels are Corporate ABS. Among the fallen angels, 20 notes were rated 'AA+' originally, accounting for 64.52% of the total (see Exhibit 14). Fee income rights ABS, CMBS, and finance leasing ABS are the top three asset sectors with the largest number of fallen angels (see Exhibit 15). In terms of the magnitude of the downgrade, 22 fallen angels were downgraded by more than 10 notches, among which one CMBS (Qinghui 1 Senior) was downgraded by 18 notches, with four fee income rights ABS and one account receivable ABS downgraded by 17 notches. Fifteen fallen angels eventually defaulted on principal and interest.

The main reasons for downgrading the fallen angels include: (1) the deterioration in the credit quality of the originators or the third parties who provide the credit enhancements (e.g. Huaxia Sanpower 2016-1, Hongbo 2017-1, Debang Huaxin 2018-1, Pingan Kaidi 2015-1, Pingyin Kaidi 2015-2, Gan Micro Loan 2015-1, Hazhuanji 2015-1, and PekingU Science Park 2018-1); and (2) the unexpected shortfall of the cashflows generated by the underlying assets (e.g. Qinghui 2016-1, Bogang Leasing 2015-1, Rongxin 2018-1, Hazhuanji 2015-1, and Tianfeng 2017-2).

Exhibit 14: Fallen Angel Distribution by Original Rating Category
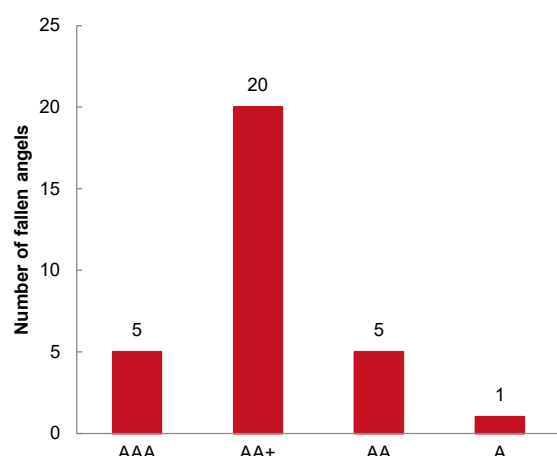
Source: Wind, Pengyuan International

Exhibit 15: Fallen Angel Distribution by Sector
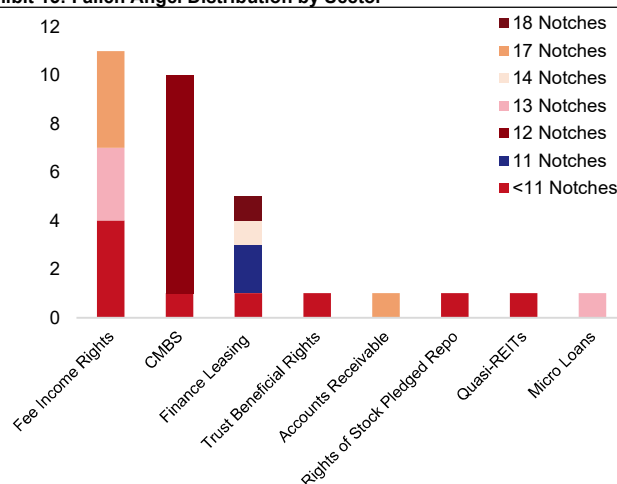
Source: Wind, Pengyuan International

Comparing Structured Finance and Corporate Rating Transactions in China

In this section, we use corporate ratings as a benchmark to illustrate the distinctive features of the structured finance rating transitions in China. The annual rating transition matrix is calculated to compare the structured finance and corporate rating transitions of the ratings issued by China's domestic rating agencies. A one-year rating transition rate in each cell of the matrix is the weighted average percentage of ratings at the beginning of each year that end up in each rating level at the end of the same year.

Exhibits 16 and 17 present the structured finance and corporate annual rating transition matrices, where each row represents an initial rating category and each column represents a rating one year later. In the matrices, the cells with the darker red colour contain higher transition rates. As demonstrated in the exhibits, both corporate and structured finance ratings are very stable in the high rating categories (AA or above). The percentage of unchanged ratings for AAA is above 99% for both corporate and structured finance ratings. In addition, the exhibits illustrate that the structured finance securities are less likely to be downgraded than similarly rated corporate securities. There are fewer dark red cells (higher transition rates) that lie below the main diagonal in Exhibit 16 than in Exhibit 17.

Exhibit 16: Structured Finance Annual Rating Transition Matrix 2015-2019

	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC	CC	C
AAA	99.84	0.07	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.02	0.00	0.01	0.00	0.00
AA+	10.01	88.29	1.02	0.07	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.29	0.13	0.00	0.00	0.00	0.13
AA	10.83	13.17	75.64	0.22	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AA-	15.45	11.93	9.83	58.67	0.00	0.00	0.00	0.00	4.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A+	11.83	6.14	7.53	3.34	71.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A	10.30	4.47	1.35	3.55	2.96	75.16	0.00	0.00	0.00	0.00	0.00	2.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A-	0.00	18.34	0.00	0.00	0.00	8.68	72.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BBB+	0.00	0.00	0.00	0.00	16.93	0.00	0.00	83.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BBB	0.00	0.00	0.00	0.00	25.00	0.00	0.00	0.00	75.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BBB-	5.28	3.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	91.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BB+																			
BB	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BB-																			
B+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00
B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	52.86	0.00	0.00	0.00	47.14
B-																			
CCC																			
CC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00
C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00

Source: Wind, Pengyuan International

**Exhibit 17: Corporate Annual Rating Transition Matrix 2015-2019**

	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC	CC	C
AAA	99.11	0.63	0.13	0.00	0.00	0.03	0.00	0.00	0.03	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.04
AA+	8.12	90.29	0.88	0.28	0.00	0.08	0.00	0.00	0.02	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.03	0.25
AA	0.02	5.40	92.85	0.93	0.15	0.09	0.01	0.03	0.06	0.01	0.01	0.05	0.00	0.00	0.04	0.00	0.00	0.05	0.29
AA-	0.00	0.00	11.03	84.92	1.91	0.42	0.14	0.04	0.32	0.00	0.07	0.14	0.03	0.00	0.11	0.00	0.00	0.10	0.76
A+	0.00	0.00	0.77	5.66	82.71	2.73	0.53	0.30	2.25	0.00	0.00	0.59	0.00	0.00	0.75	0.00	0.00	0.99	2.73
A	0.00	0.00	1.53	0.99	1.98	75.41	0.00	2.52	0.00	0.00	1.51	1.60	0.00	0.00	2.59	1.53	1.60	1.53	7.20
A-	0.00	0.00	0.00	0.00	1.63	0.00	92.47	4.49	1.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BBB+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	81.94	0.00	0.00	3.53	0.00	0.00	0.00	0.00	3.53	0.00	0.00	11.00
BBB	0.00	0.00	4.23	0.00	0.00	1.22	0.00	1.22	63.60	0.00	6.15	8.98	0.00	0.00	7.22	0.00	0.00	0.00	7.37
BBB-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	53.36	0.00	1.98	0.00	0.00	0.00	0.00	0.00	22.22	22.44
BB+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	68.97	5.28	0.00	7.41	0.00	0.00	18.34	0.00	0.00
BB	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	49.39	0.00	3.37	0.00	0.00	0.00	24.91	22.33
BB-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
B+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00
B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.39	9.17	10.58	9.17	29.70
B-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.62	0.00	18.76	44.62
CCC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00
CC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	57.01	42.99
C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00

Source: Wind, Pengyuan International

The average one-year upgrade rates are 6.66% and 7.58% respectively for structured finance and corporate ratings, while the average one-year downgrade rates are 0.63% and 3.30% respectively. On average, the one-year upgrade and downgrade rates for structured finance ratings are both lower than those of corporate ratings. As shown in Exhibit 18, the annual downgrade rates for structured finance ratings issued on or after 2015 are all below the downgrade rates for corporate ratings. On the other hand, the annual upgrade rates are relatively similar for structured finance ratings and corporate ratings over the past five years (see Exhibit 19). The upgrade rates demonstrate a downward trend for both structured finance and corporate ratings.

Exhibits 20 and 21 show the transition rates by rating category. For corporate ratings, high rating categories demonstrate high credit stability, while low rating categories have high downgrade rates. However, there is no obvious increasing or decreasing pattern for structured finance downgrade or upgrade rates.

Exhibit 18: Structured Finance & Corporate Annual Downgrade Rate
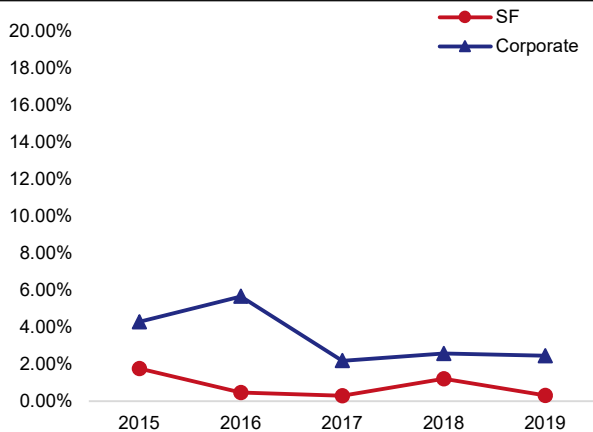
Source: Wind, Pengyuan International

Exhibit 19: Structured Finance & Corporate Annual Upgrade Rate
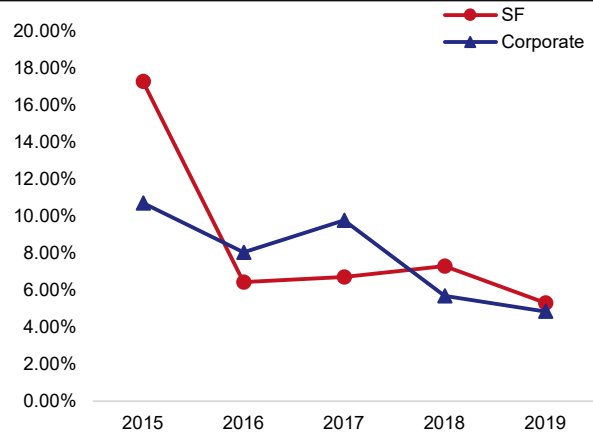
Source: Wind, Pengyuan International

Exhibit 20: SF & Corporate Downgrade Rate by Rating Category
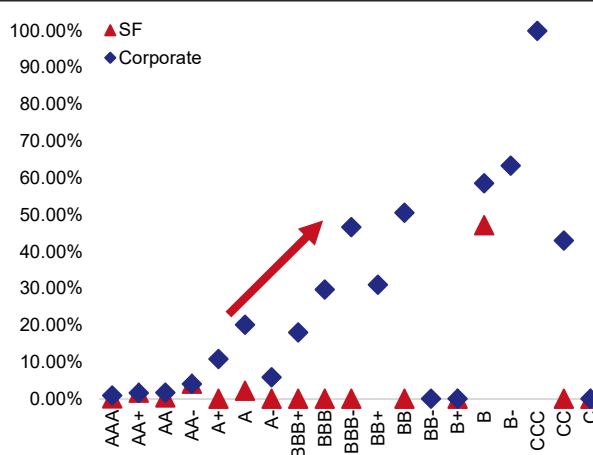
Source: Wind, Pengyuan International

Exhibit 21: SF & Corporate Upgrade Rate by Rating Category
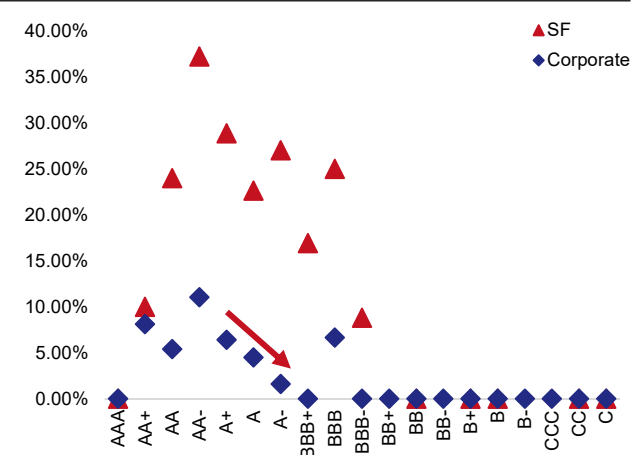
Source: Wind, Pengyuan International

Multiyear transition matrices are also calculated for periods of two or more years, as shown in the Appendix. A summary of the computed multiyear transition matrices is given in Exhibit 22. We can see from the exhibit that the rating stability decreases for both structured finance and corporate ratings as the observation period becomes longer. Ratings are more stable and less likely to be downgraded in structured finance than those in corporate, not only within a one-year horizon but also within a two-, three-, four-, and five-year horizon.

Exhibit 22: Structured Finance & Corporate Multiyear Average Transition Rate
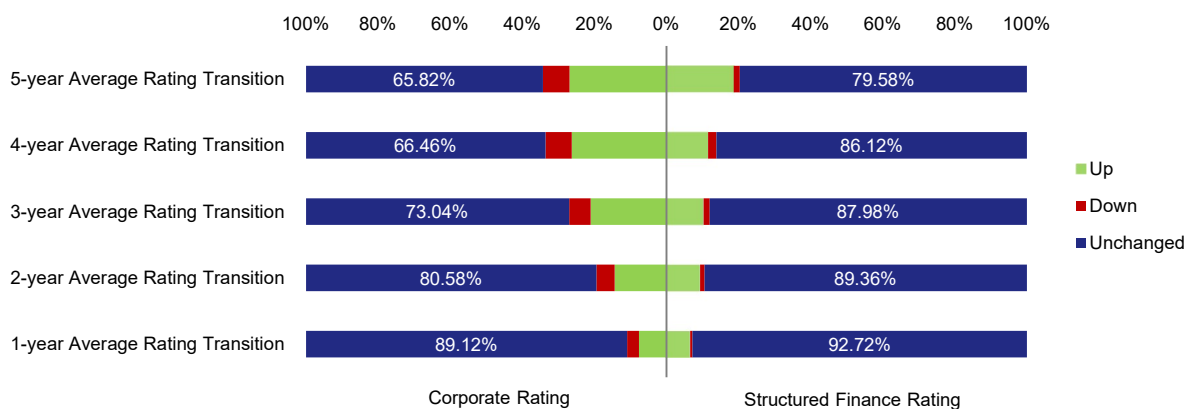
Source: Wind, Pengyuan International

Exhibits 23 and 24 show the notches per downgrade or upgrade in structured finance and corporate ratings. As shown in the exhibits, the magnitude of the rating transition is higher in structured finance ratings than in corporate ratings. The annual average notches per downgrade for structured finance ratings were 4.91 notches in 2019, after peaking at around 7.08 notches in 2018. In contrast, the annual average notches per downgrade for corporate ratings are around 2.93 notches (see Exhibit 23). The average notch per upgrade is generally higher for structured finance ratings than those for corporate ratings over the past five years (see Exhibit 24).

Exhibit 23: SF & Corporate Average Notches per Downgrade

Source: Wind, Pengyuan International

Exhibit 24: SF & Corporate Average Notches per Upgrade

Source: Wind, Pengyuan International

Interpretations of Findings

The features observed with the structured finance rating transitions in China may be driven by various factors, including: (1) the types of underlying assets; (2) the operational risks associated with originators and servicers; (3) th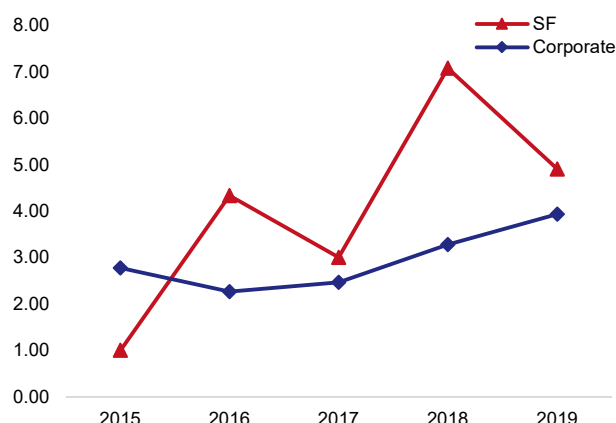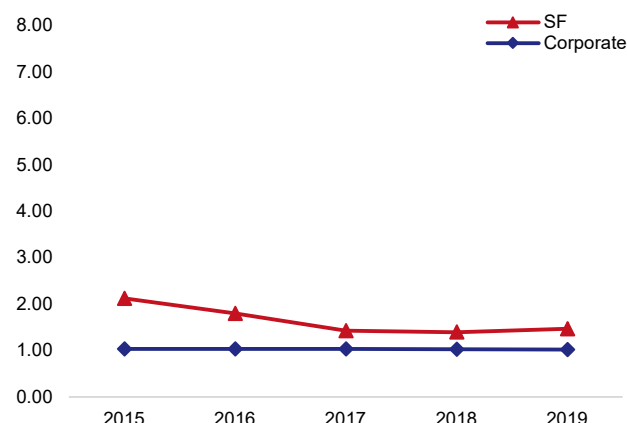e counterparty risks of transaction participants; (4) the idiosyncratic and systemic risks embedded in the securities; and (5) the failure to achieve insolvency remoteness. With consideration given to all these factors, we summarise the possible interpretations for the findings below.

First, the underlying asset portfolio is fixed in most structured finance transactions and the transaction structure would rarely change once the transaction has been set up. Should the performance of underlying assets be consistent and stable, the credit performance of underlying assets and the transaction would be more predictable than that of corporate issuers. Therefore, it is less likely that the structured finance securities would be revised due to inaccurate credit performance expectations. Furthermore, in structured finance, if the underlying asset portfolio starts to perform worse than expectations, it is unlikely that the performance can be turned around over time. This may help explain why we typically observe more stable ratings in structured finance than in corporate ratings, but once rating revisions occur, structured finance ratings tend to change in larger steps than corporate ratings.

Second, operational or counterparty risks of transaction parties may lead to multi-notch downgrades in structured finance. ABS transactions rely highly on deal participant parties being able to perform their obligations. A failure to perform by a transaction party may affect the performance of the transaction and cause a multi-notch downgrade of the rated securities. This is particularly true for weak underlying assets structured with high credit enhancement levels. Such transactions are not sensitive to small changes in performance of the underlying assets. However, if their servicer, originator, credit enhancement providers, or other counterparties default or commit fraud, the transactions are most likely to experience sharp rating downgrades.

Third, for ABS transactions with well-diversified and homogeneous asset pools (such as RMBS and consumer loan ABS), idiosyncratic default risk is diversified and mitigated, but the transactions are still exposed to systemic risk. Downgrades of such structured finance transactions typically happen when aggregate economic conditions deteriorate (in other words, systemic risk). Once the systemic risk explodes, it may lead to large-scale simultaneous defaults of underlying assets, resulting in large-magnitude rating downgrades. In contrast, corporate rating transitions could be caused by various factors, such as the macroeconomic and industrial environment, and corporate-management status. Those factors are less likely to take effect at the same time. With consideration given to interactions between management and changing environments, credit rating

agencies typically take a gradual approach to adjust corporate ratings. Therefore, compared to structured finance rating revisions, the frequency of corporate rating downgrades is higher but the magnitude is lower.

Fourth, the design of senior-subordinated structures results in a higher leverage of mezzanine tranches relative to the underlying asset pools. For example, for an ABS transaction with 85% senior tranche, 10% mezzanine tranche, and 5% junior tranche, when the default rate of the underlying assets exceeds 15%, its mezzanine tranche investors may be faced with a 100% loss even if recovery is considered, since the mezzanine is paid off after the senior tranche. In contrast, for a corporate bond, even if the credit quality of the corporate deteriorates, investors may suffer less than a 100% loss or even no losses at all when considering recovery. This may partially explain the larger size of rating downgrades in structured finance ratings than in corporate ratings.

Fifth, since structured finance rating methodology applies more quantitative tools than corporate rating, it relies more on key input parameters, such as the default rate, default correlation, default time distribution, recovery rate, recovery time and prepayment rate of underlying assets. The estimations of these parameters are based on historical performance data provided by originators and model assumptions. Should the historical data not therefore be sufficient enough to cover a complete economic cycle or model assumptions not be robust, these estimators may be biased, which could lead to large-magnitude rating transitions. The risk is referred to as the model risk. The underestimated systemic risk and default correlation used in the credit rating agencies' models have long been blamed for the large-magnitude downgrades during the subprime crisis.

Why do Fee Income Rights ABS Downgrade the Most?

The majority of the above explanations can be applied to structured finance ratings across the markets. However, some of them are more relevant to China's ABS market. As mentioned in the previous sections, the fee income rights type ABS experienced the majority of large-magnitude downgrades in China's ABS market. A better understanding of the downgrades in this asset sector would certainly help us to identify the reasons behind the observed features in China's structured finance rating transitions.

The fee income rights ABS is subject to a similar ratings approach with the transactions backed by existing credit assets, both including the analysis of the credit quality of the securitised assets, financial structure and cashflow mechanics, legal structure, and transaction participants. However, these two types of ABS are distinguished by the nature of cashflows, relevant risks, and the degree of isolation from the originator's risks.

In fee income rights ABS, the cashflows are generated in the future and depend on the business performance of the originator. The major risks are related to the originator's business and source of revenue. For fee income rights assets, it is difficult to predict their credit risk because the cashflows could be volatile and affected by various factors, such as the going-concern ability of the originator, industry development and competition, regional economic situation, etc. On the other hand, the main risks affecting the transactions backed by existing credit assets are default risk, recovery risk, prepayment risk, etc. The cashflows generated by the existing credit assets are more predictable given that the underlying asset pool is often fixed and historical performance data is more relevant.

In China, it is difficult to effectively isolate the underlying asset pool from the originator's insolvency risk for fee income rights ABS. The transactions backed by existing credit assets can achieve bankruptcy remoteness through a 'true sale' or other well-arranged transactional legal structure, while fee income rights ABS find this difficult in China. Unlike the cashflow generated by existing credit assets, which mainly depend on the obligors' repayment of principal and interest, the cashflows of the fee income rights' assets rely on the continued operation of the originator. In addition, most originators act as servicers in China's ABS market, which results in a strong dependence on the asset cashflow collection and distribution on the credit quality of originators. In general, it is hard for fee income rights ABS to achieve isolation from the insolvency risk of the originator in terms of the legal, economic, and operational isolation. A failure to perform by the originators will have a direct impact on the principal and interest repayment of fee income rights ABS transactions.

The main credit enhancement measures used in fee income rights ABS are subordination, overcollateralization (OC) and excess spread, and third-party protection. Since the underlying assets of fee income rights ABS are not well diversified, the credit support provided by subordination is limited. OC does not help much either due to the highly uncertain nature of future cashflows. Besides, in China's fee income rights ABS, third-party support providers are typically entities that have close relationships with the originator. That means there exists a strong correlation between the performance of the third-party support providers, originator, and underlying assets, leading to less efficient credit support from third-party protection. Therefore, the credit enhancement methods generally used in the fee income rights ABS are all related to the performance of the originator and can only provide limited credit support.

Appendix: Multiyear Rating Transition Matrices

Exhibit 25: Structured Finance Two-Year Rating Transition Matrix 2015-2019

	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC	CC	C
AAA	99.75	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.03
AA+	11.14	85.37	2.02	0.10	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.00	0.00	0.43	0.38	0.00	0.00	0.00	0.38
AA	21.50	15.52	61.93	0.48	0.11	0.13	0.00	0.00	0.22	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AA-	27.04	14.06	10.23	48.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A+	15.43	13.39	7.25	4.00	59.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A	12.21	0.88	3.16	3.37	4.51	75.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A-	21.93	0.00	0.00	0.99	0.00	0.99	76.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BBB+	0.00	0.00	0.00	0.00	45.66	0.00	0.00	54.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BBB																			
BBB-	18.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	81.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BB+																			
BB	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BB-																			
B+																			
B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	100.00

Source: Wind, Pengyuan International

Exhibit 26: Corporate Two-Year Rating Transition Matrix 2015-2019

	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC	CC	C
AAA	98.22	1.41	0.17	0.06	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.05
AA+	15.91	80.75	1.79	0.63	0.04	0.11	0.00	0.00	0.07	0.03	0.00	0.03	0.00	0.00	0.04	0.00	0.03	0.00	0.57
AA	0.23	10.84	85.64	1.49	0.23	0.19	0.01	0.04	0.08	0.00	0.03	0.12	0.00	0.00	0.08	0.00	0.01	0.11	0.91
AA-	0.00	0.28	18.22	75.50	2.77	0.60	0.25	0.16	0.46	0.00	0.00	0.24	0.04	0.00	0.31	0.04	0.00	0.14	0.97
A+	0.00	0.00	3.06	8.67	77.58	3.45	0.68	0.00	1.30	0.00	1.31	0.38	0.00	0.00	0.00	0.38	0.00	0.31	2.87
A	0.00	0.00	5.22	1.28	2.55	75.38	0.00	3.25	0.00	0.00	1.95	0.00	0.00	0.00	0.00	1.28	0.00	1.97	7.12
A-	0.00	0.00	0.00	0.00	2.10	0.00	96.08	0.00	1.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BBB+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	86.36	0.00	0.00	4.55	0.00	0.00	0.00	0.00	0.00	0.00	4.55	4.55
BBB	0.00	0.00	5.45	0.00	0.00	1.57	0.00	1.57	76.22	0.00	2.15	0.00	0.00	0.00	7.16	0.00	2.15	0.00	3.72
BBB-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	68.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.65	2.55
BB+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	32.73	6.81	0.00	36.82	0.00	0.00	0.00	23.64	0.00
BB	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	49.15	0.00	0.00	4.73	0.00	0.00	35.02	11.10
BB-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B+																			
B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.07	11.82	13.64	11.82	28.65
B-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.62	0.00	18.76	44.62
CCC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		100.00	0.00
CC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.23	49.77
C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00

Source: Wind, Pengyuan International

Exhibit 27: Structured Finance Three-Year Rating Transition Matrix 2015-2019

	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC	CC	C
AAA	99.57	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.04
AA+	10.71	84.38	3.03	0.08	0.00	0.00	0.00	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.72	0.00	0.00	0.00	0.72
AA	26.47	15.05	56.64	1.17	0.00	0.00	0.00	0.00	0.45	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AA-	33.95	19.33	15.28	31.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A+	17.72	15.43	11.55	7.13	48.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A	15.73	3.60	3.60	0.00	2.03	75.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A-	0.00	0.00	1.76	0.00	0.00	1.76	96.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BBB+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BBB																			
BBB-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BB+																			
BB	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: Wind, Pengyuan International

Exhibit 28: Corporate Three-Year Rating Transition Matrix 2015-2019

	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC	CC	C
AAA	98.07	1.46	0.24	0.08	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AA+	23.50	72.23	2.16	0.84	0.11	0.10	0.05	0.00	0.10	0.00	0.00	0.05	0.00	0.00	0.05	0.00	0.05	0.00	0.77
AA	0.64	16.31	78.93	1.85	0.34	0.24	0.00	0.00	0.05	0.02	0.07	0.08	0.00	0.00	0.06	0.02	0.00	0.13	1.24
AA-	0.00	1.31	23.36	67.71	3.64	0.55	0.41	0.06	0.43	0.00	0.06	0.22	0.06	0.00	0.23	0.00	0.06	0.26	1.64
A+	0.00	0.00	5.67	9.01	74.95	3.96	0.96	0.00	1.49	0.00	0.97	0.53	0.00	0.00	0.00	0.00	0.00	0.53	1.92
A	0.00	0.00	10.89	0.00	3.58	68.17	0.00	4.55	0.00	0.00	2.73	0.00	0.00	0.00	0.00	1.79	0.00	2.76	5.52
A-	0.00	0.00	0.00	0.00	2.94	0.00	94.51	0.00	2.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BBB+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	76.16	0.00	0.00	6.37	0.00	0.00	0.00	4.73	0.00	0.00	6.37	6.37
BBB	0.00	0.00	7.64	0.00	0.00	2.20	0.00	2.20	76.71	0.00	0.00	0.00	0.00	3.01	0.00	0.00	3.01	0.00	5.22
BBB-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	96.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.58
BB+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.10	9.55	0.00	38.22	0.00	0.00	0.00	33.13	0.00
BB	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	49.15	0.00	0.00	4.73	0.00	0.00	35.02	11.10
BB-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
B+																			
B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	47.76	16.57	19.11	16.57	0.00
B-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.58	0.00	0.00	71.42
CCC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		100.00	0.00
CC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	43.63	56.37
C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00

Source: Wind, Pengyuan International

Exhibit 29: Structured Finance Four-Year Rating Transition Matrix 2015-2019

	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC	CC	C
AAA	99.36	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AA+	11.45	81.03	5.11	0.00	0.00	0.00	0.00	0.00	0.00	0.48	0.00	0.00	0.00	0.00	0.96	0.00	0.00	0.00	0.96
AA	32.66	12.55	52.41	0.80	0.00	0.00	0.00	0.00	1.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AA-	50.91	20.49	5.87	22.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A+	14.23	18.65	8.83	7.84	50.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A	29.64	3.96	9.10	0.00	5.14	52.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A-	0.00	4.46	0.00	0.00	0.00	4.46	91.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BBB+	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: Wind, Pengyuan International

Exhibit 30: Corporate Four-Year Rating Transition Matrix 2015-2019

	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC	CC	C
AAA	97.48	1.86	0.26	0.14	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AA+	30.36	64.32	2.58	1.20	0.17	0.17	0.08	0.00	0.08	0.00	0.00	0.08	0.00	0.00	0.09	0.00	0.00	0.00	0.85
AA	1.31	20.89	72.56	2.34	0.41	0.34	0.00	0.00	0.09	0.03	0.12	0.10	0.00	0.00	0.06	0.00	0.00	0.22	1.52
AA-	0.10	2.41	26.22	62.20	3.87	0.66	0.66	0.10	0.35	0.00	0.10	0.19	0.10	0.00	0.22	0.00	0.10	0.32	2.41
A+	0.00	0.00	4.54	9.95	74.92	4.87	0.00	0.87	0.00	0.00	0.87	0.87	0.00	0.70	0.00	0.00	0.00	0.87	1.57
A	0.00	0.00	14.73	2.90	5.80	52.90	0.00	7.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.90	0.00	4.47	8.94
A-	0.00	0.00	0.00	0.00	0.00	0.00	95.87	0.00	4.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BBB+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	92.34	0.00	0.00	0.00	0.00	0.00	0.00	7.66	0.00	0.00	0.00	0.00
BBB	0.00	0.00	0.00	0.00	0.00	3.57	0.00	3.57	74.67	0.00	0.00	0.00	0.00	4.88	0.00	0.00	4.88	0.00	8.44
BBB-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	94.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.80
BB+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.91	15.46	0.00	0.00	0.00	0.00	0.00	53.63	0.00
BB	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.31	0.00	0.00	7.66	0.00	0.00	46.37	7.66
BB-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
B+																			
B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.37	26.82	0.00	26.82	0.00
B-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
CCC																			
CC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.00	50.00
C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00

Source: Wind, Pengyuan International

Exhibit 31: Structured Finance Five-Year Rating Transition Matrix 2015-2019

	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC	CC	C
AAA	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AA+	15.56	73.33	11.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AA	44.44	16.67	38.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AA-	60.00	26.67	13.33		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A+	22.22	27.78	11.11	5.56	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A	22.22	22.22	22.22	0.00	0.00	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A-	25.00	0.00	0.00	0.00	0.00	25.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BBB+	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: Wind, Pengyuan International

Exhibit 32: Corporate Five-Year Rating Transition Matrix 2015-2019

	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC	CC	C
AAA	97.56	1.71	0.00	0.24	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AA+	29.61	65.07	2.66	1.24	0.18	0.18	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.71
AA	2.29	23.65	68.27	2.44	0.46	0.31	0.00	0.00	0.08	0.00	0.15	0.08	0.00	0.00	0.08	0.00	0.00	0.38	1.83
AA-	0.23	2.29	26.83	60.32	3.21	0.92	0.46	0.00	0.46	0.23	0.46	0.46	0.23	0.00	0.23	0.00	0.23	0.69	2.75
A+	0.00	1.45	4.35	7.25	82.61	2.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.45
A	0.00	0.00	7.69	3.85	7.69	73.08	0.00	3.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.85	0.00	0.00	0.00
A-	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BBB+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BBB	0.00	0.00	0.00	0.00	0.00	4.76	0.00	4.76	85.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.76
BBB-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	88.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.11
BB+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	80.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BB	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	85.71	0.00	0.00	0.00	0.00	0.00	14.29	0.00
BB-																			
B+																			
B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00
B-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
CCC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00		0.00
CC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	80.00	20.00
C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00

Source: Wind, Pengyuan International

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