PEFINDO
CREDIT RATING AGENCY

THE DEFAULT STUDY

OF CORPORATE AND CORPORATE DEBT SECURITIES RATED BY PEFINDO

PERIOD OF 2007–2024

ECONOMIC RESEARCH DIVISION, PT PEFINDO

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EXECUTIVE SUMMARY

In 2024, debt instruments and issuing companies generally demonstrated better performance compared to previous years, with an overall improvement in default rates that remained low. Although in 2024, three companies from the construction, mining, and property industries rated by PEFINDO failed to meet their financial obligations, the value of instruments that defaulted in 2024 was less than in previous years, namely an accumulation of IDR582.4 billion from the three companies that defaulted. This condition reflects a bond market that has begun to recover compared to 2022 and 2023, when default cases accumulated to IDR2.00 trillion and IDR5.12 trillion, respectively, and have not recurred among companies that had previously defaulted. The defaults involving the three companies and their instruments occurred at relatively low initial credit ratings, namely at A- (single-A minus) (three notches above the investment grade threshold) and BBB (triple-B) (one notch above the investment grade threshold).

Defaults in debt instruments and issuing companies only occurred in companies with relatively lower credit ratings. The AAA (triple-A) rating has remained intact, with a default rate of 0.00% throughout 2007–2024. Additionally, default rates for instruments rated AA (double-A) and A (single-A) continued on a downward trend, declining to 0.27% and 1.64% from 0.29% and 1.83%, respectively. With maintained low default rates, the A rating remains a favorite among investors, offering relatively higher yields compared to higher-rated categories while carrying lower risks than lower-rated categories. The BBB (triple-B) rating group has a relatively higher default rate than other rating categories.

The cumulative default rate of debt instruments rated and published by PEFINDO from 2007 to 2024 declined to 1.26%, while the default rate for issuing companies during the same period remained at 8.07%. By sector, the default rates for debt instruments and issuing companies in the non-financial institution (non-FIN) sector were 2.95% and 11.03%, respectively. Meanwhile, in the financial institution (FIN) sector, the rates were 0.08% and 2.95%, respectively.

PEFINDO noted that from 2007 to 2024, defaults occurred in 11 out of 67 debt instrument industry classifications and 11 out of 65 issuer industry classifications. The highest default rates since 2007 occurred in the shipping industry (SHIP), both for debt instruments and issuing companies. The majority of defaults in both instruments and issuers were due to the companies' failure to meet coupon payments at rates of 0.82% and 4.04%, respectively.

The calculation of PEFINDO's One-Year Rating Transition and Cumulative Average Default Rate indicates improving conditions at higher rating levels. One-year rating transitions for issuers and debt instruments with higher credit ratings show better consistency and stability, a higher likelihood of experiencing upgrades, and a lower likelihood of downgrades or defaults compared to lower-rated counterparts. Meanwhile, the results of the 17-year Cumulative Average Default Rate calculation for debt instruments and issuers show a similar pattern: the longer the time horizon, the higher the default rate for each rating category. In terms of credit rating, the lower the rating (non-investment grade), the higher the default rate compared to the investment grade.

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1. INTRODUCTION

The global economy in 2024 still faces various challenges that are not easy. The ongoing geopolitical conflict between Russia and Ukraine, as well as Israel's invasion of Palestine, has increased geopolitical risks and market uncertainty due to disruptions in the global supply chain, particularly in energy and food commodities. Disruptions in ports and key trade routes, as well as sanctions from various countries that restrict exports, have caused commodity price volatility, especially crude oil, making price pressure a major challenge to address.

Disrupted supply chains and rising commodity prices have contributed to supply-side inflation in various countries, including the United States (US) and European nations. The rise in food prices, also supported by a spike in housing costs due to limited housing supply in the US, prompted the Federal Reserve (the Fed) to keep interest rates higher for a longer period than initially expected. Similarly, inflation in Europe during 2024 remained above the European Central Bank (ECB) target of 2%. The ECB maintained its main refinancing rate at around 4.5% throughout 2024 until the end of the second quarter. By the end of the second quarter, central banks in Europe began easing monetary policy as price pressures started to subside and geopolitical risks decreased. The easing of monetary policy in the US only began in September 2024 due to relatively sticky inflation, which proved harder to reduce than initially anticipated.

Indonesia, as an emerging market, is also affected by the ongoing dynamics and has responded to global developments to maintain inflation control and prevent capital outflows. Bank Indonesia kept its interest rate at 6% until the end of the first quarter and raised it once to 6.25% in April 2025 due to volatility in oil prices and foreign capital outflows caused by rising geopolitical risks. The reduction in the BI Rate started in September 2024, bringing the rate back to 6%, just one day before the Fed announced a 50-basis-point cut, which lowered the Fed Funds Rate from 5.25%-5.50% to 4.75%-5.00%. After the cut, interest rates were maintained through the end of 2024 as part of efforts to stabilize the exchange rate.

The Indonesian economy has been impacted by both domestic factors and pressures from the global economy. The surge in energy prices due to geopolitical conflicts has affected the domestic economy. However, the shock has been mitigated with government energy subsidies and social assistance disbursement as a social safety net. However, the global economic slowdown, particularly in China and Europe, has also pressured Indonesia's export demand. On the other hand, the tight monetary policy from the United States, particularly the high interest rates maintained by the Fed, has caused capital outflows from emerging markets and weakened the rupiah. Additionally, uncertainty over economic policies due to the election process still looms and affects the investment climate.

The uncertainty surrounding the global and domestic economic conditions has also affected the business prospects of various companies in several industrial sectors, including those that experienced defaults in 2024, such as the construction, mining, and property sectors. Although sector conditions contributed to the pressures, the internal conditions of each company remained the main factor that caused defaults in each sector. This combination of factors is reflected in the income and financial obligations of issuers.

The domestic mining sector has been affected by price pressures on commodities, particularly coal and nickel. Price increases in 2023, due to the risks of war disrupting supply chains, gradually

subsided along with the weaker global growth outlook due to sustained high interest rates. The weakening of global economic growth contributed to a decline in energy commodity demand. Major consumers, such as China, throughout 2024, faced deflation risks and a property crisis, which pressed down economic growth. Additionally, overproduction in China's industries and energy transition policies in developed countries have also pressured the mining sector. The transition to renewable energy in countries like the US and the EU has reduced demand for coal.

The construction sector has also been significantly affected by global economic uncertainty, leading to price increases in raw materials and construction materials. Additionally, the high debt burden, which has been looming for several years, has been one of the main reasons for the pressured performance of companies in the construction sector, especially state-owned construction enterprises (BUMN Karya). BUMN Karya is highly dependent on government projects or public infrastructure projects. However, several strategic projects, such as the development of the Nusantara National Capital City (*Ibu Kota Nusantara/* IKN), have often experienced schedule adjustments and funding issues, affecting the cash flow of construction companies. High interest burdens, delayed project payments, and slow cash generation from these projects have contributed to the performance of companies in the construction sector.

The global property sector has been pressured due to high interest rates in several countries. The sustained high interest rates have affected mortgage rates and borrowing costs for property developers to build new projects. Difficulties in property sales in Indonesia have caused many developers to rely on government incentives, such as VAT subsidies (PPN DTP). The decline in property sales has disrupted cash flow for companies, making it difficult for them to meet financial obligations, such as interest and principal payments.

Throughout 2024, PEFINDO recorded three rated companies that experienced defaults in fulfilling their financial obligations, specifically related to their debt securities. The first company is PT Kapuas Prima Coal Tbk (ZINC), operating in the mining sector, with an issuance value of IDR23.00 billion. The default by ZINC reflects the issuer's severely weak financial position, amid limited ability to export its concentrate products due to prolonged smelter construction. The second default case involves PT Wijaya Karya (Persero) Tbk (WIKA), from the construction sector, with an issuance value of IDR184.00 billion. WIKA's default indicates a weak financial and liquidity profile, which is a consequence of its previous expansion risks and a volatile business environment. The third case involves PT PP Properti Tbk (PPRO), from the property sector, with an issuance value of IDR375.40 billion. The default by PPRO reflects a combination of deteriorating credit profile due to persistently weak pre-sales performance and limited financial capacity to complete ongoing projects, alongside constrained potential support from its parent company. As a result, the total accumulated value of defaulted instruments in 2024 amounts to IDR582.4 billion. This figure represents a decline compared to the previous two years, where defaults reached IDR2.00 trillion in 2022 and IDR5.12 trillion in 2023. This indicates that default risk in 2024 has become relatively more stable compared to 2022 and 2023.

Going forward, we expect the risk of default in 2025 to improve and remain at a relatively low level. This is supported by the economy still being maintained by strong consumption and solid investment. Support from the government through expansionary fiscal policy and accommodative monetary policy is expected to maintain domestic economic resilience amidst risks from the global economy, which are expected to continue to pose challenges. Several risks that previously triggered

defaults in several companies are also expected to relatively subside and restore the conditions of each company.

PEFINDO prepares a default study report containing a review of the default rates of issuing companies and debt instruments that are rated and published by PEFINDO, both in general and based on classifications such as sector, industry, initial rating, causes of default, as well as a review of the one-year rating transition matrix and the Cumulative Average Default Rate over the same period. The report aims to provide a better understanding of risks for stakeholders in the Indonesian capital market, particularly those related to the corporate bond market. Therefore, this default study report is expected to serve as one of the references for stakeholders in assessing the development and risks of the national corporate bond market.

2. Review of The Default Rate

2.1 Data and Data Sources

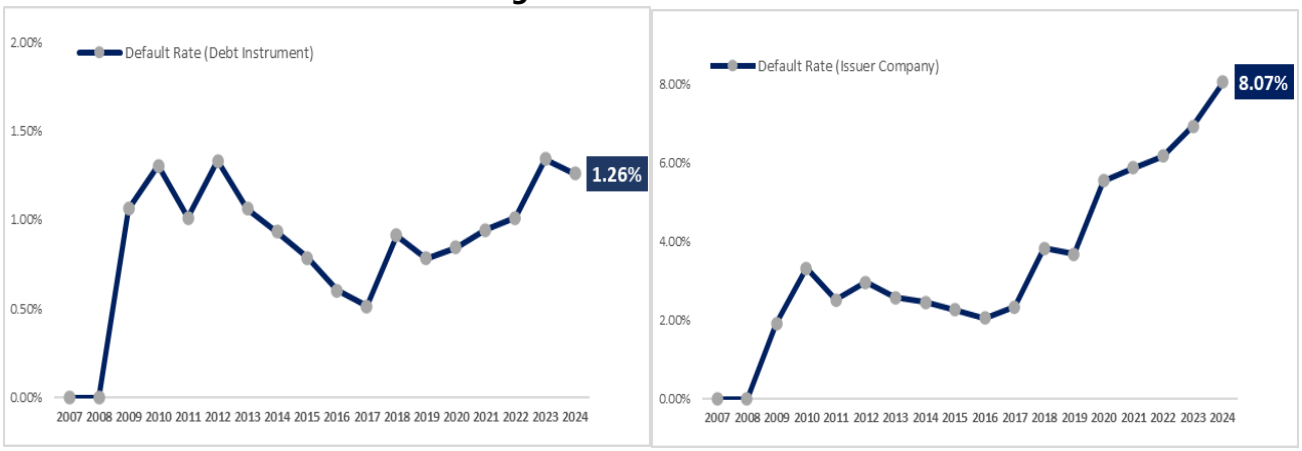
The population used as data is if a company issue a debt instrument rated and published by PEFINDO during the observation period (2007-2024). The data is divided into two groups: debt instrument data and issuing company data. The data sources used in this research come from the Indonesia Rating Highlight (IRH), Rating Announcement (RA), Press Release (PR)/Rating Summary, Rating Rationale (RR), and other data sources originating from PEFINDO. The limitations of the observation period and population size (data) included in the research are carried out solely so that the debt instruments and the issuing company can be better monitored and analyzed.

2.2 Overview

From 2007 to 2024, the cumulative value of debt securities issuance and the number of issuing companies amounted to IDR1,360.59 trillion and 223 companies, respectively. In 2024, there were seven new issuing companies that issued debt instruments (published). An issuer entity is classified as new when it issues a debt instrument for the first time. All seven new issuers came from the Non-Financial Institution sector, with the majority (57.14%) receiving an A (Single-A) rating.

In terms of debt instrument issuance value, the value of instruments rated by PEFINDO in 2024 amounted to IDR127.44 trillion (only published ratings). This issuance value includes debt securities issued both through public offerings and private placements (not registered in KSEI). Of the IDR127.44 trillion in total issuance in 2024, around 50.20% was issued by companies in the Non-Financial Institution sector, and 49.80% by companies in the Financial Institution sector. Furthermore, based on the initial rating, approximately 40.40% of the total issuance in 2024 came from instruments rated A (Single-A), followed by 39.51% with a AAA (Triple-A) rating. The high value of corporate bond issuance rated A (Single-A) is driven by market demand for bonds with this rating, as they offer relatively high coupons while maintaining lower risk compared to lower-rated instruments.

Figure 1. Annual Default Rate



Source: PEFINDO Database (2025)

In 2024, three companies defaulted: PT Wijaya Karya (Persero) Tbk (WIKA), PT Kapuas Prima Coal Tbk (ZINC), and PT PP Properti Tbk (PPRO), with a total value of defaulted instruments amounting to IDR582.40 billion.

PPRO defaulted three times during 2024. The first was due to the company's inability to pay the coupon for the Shelf Registration Bond II Phase IV, which matured on October 16, 2024, with an issuance value of IDR163.50 billion. The second default occurred due to the failure to pay the coupon for the Shelf Registration Bond II Phase I, maturing on November 28, 2024, with an issuance value of IDR47.90 billion. The final default was the result of the company's inability to pay the coupon for the Shelf Registration Bond II Phase III, maturing on December 2, 2024, with an issuance value of IDR164.00 billion. Therefore, PPRO recorded a total default value of IDR375.40 billion in 2024. Aside from PPRO, another default in 2024 involved PT Wijaya Karya (Persero) Tbk (WIKA), due to the failure to repay the principal of the Shelf Registration Sukuk Mudharabah I/2020 Series A, amounting to IDR184 billion, during the remedial period following its maturity on December 18, 2023.

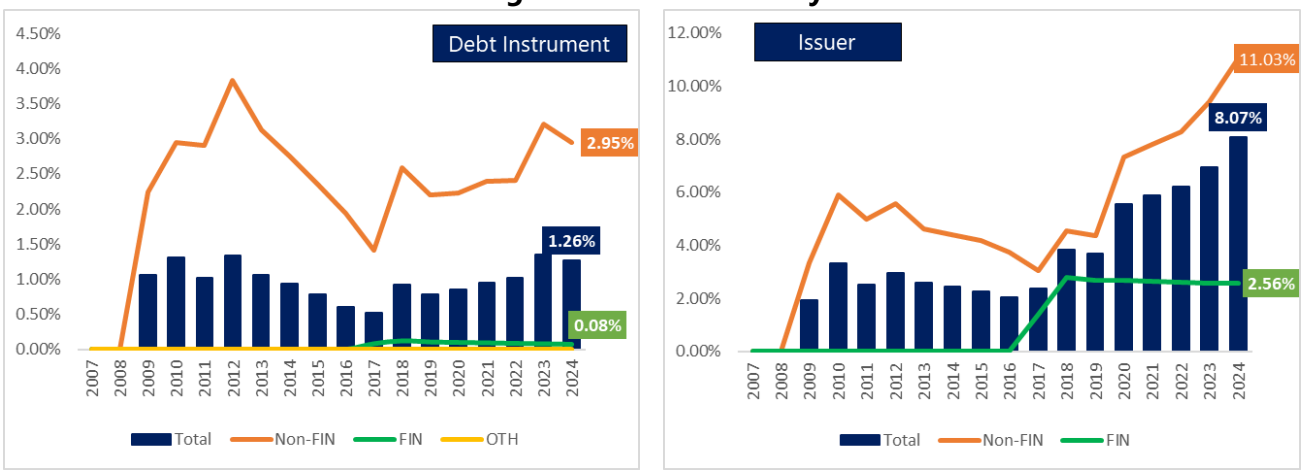
Another case of default also occurred with PT Kapuas Prima Coal Tbk (ZINC) due to the company's inability to repay the principal of the 2018 Bond I during the remedial period, which ended on January 4, 2024. The bond, with a value of IDR23 billion, matured on December 21, 2023. Furthermore, during the entire observation period from 2007 to 2024, the total issuance value of defaulted debt instruments amounted to approximately IDR17.16 trillion, originating from 18 issuing companies. Based on the formula in Equation 1 (see Appendix 1), the debt instrument default rate for the 2007–2024 period was 1.26%, while the issuer default rate over the same period was 8.07%. This debt instrument default rate represents a slight decrease compared to 2023, when it stood at 1.34%. However, the default rate based on the number of issuers increased compared to 2023, which was at 6.94%.

2.3 Default Rate by Sector

The classification of sectors for debt instruments is divided into three categories: Non-Financial Institution (Non-FIN), Financial Institution (FIN), and Others (OTH). The Non-FIN sector consists of

debt instruments issued by non-financial companies. The FIN sector includes debt instruments issued by financial institutions such as banks, insurance companies, securities firms, and others. The Others (OTH) sector consists of debt instruments not categorized under either the Non-FIN or FIN sectors. Debt instruments classified as Others (OTH) include Asset-Backed Securities (ABS), infrastructure funds (DINFRA), or debt instruments issued by local governments. However, since no local government has issued debt instruments during the observation period, the instruments included in the Others (OTH) sector are limited to ABS and DINFRA. The sector classification for issuing companies is divided into only two sectors: Non-Financial Institution (Non-FIN) and Financial Institution (FIN). This follows the same definitions used in the classification of debt instruments. The FIN sector consists of companies that are financial institutions, while the Non-FIN sector consists of issuing companies that are non-financial institutions.

Figure 2. Default Rate by Sector



Source: PEFINDO Database (2025)

The default rate for debt instruments in the Non-FIN sector in 2024 was 2.95%. Meanwhile, the default rate in the FIN sector has been declining since 2019, then remained relatively stable, and stood at 0.08% in 2024. No defaults were recorded in the OTH sector throughout the observation period. Based on issuing companies, the default rate in the Non-FIN sector increased to 11.03% in 2024. This increase occurred because three companies in the Non-FIN sector defaulted in 2024, while no equivalent new issuers entered the market that year. In contrast, the default rate in the FIN sector was 2.56% in 2024.

2.4 Default Rate by Industry

PEFINDO classifies 67 industries for debt instruments and 65 industries for issuing companies. This difference occurs because the EBA and DINFRA instruments do not have an issuer in the form of a corporate entity. Therefore, neither is included in the publishing company's industry classification.

The following is a list of industries for debt instruments and issuing companies used in this default study:

Figure 3. List of Industrial Classifications

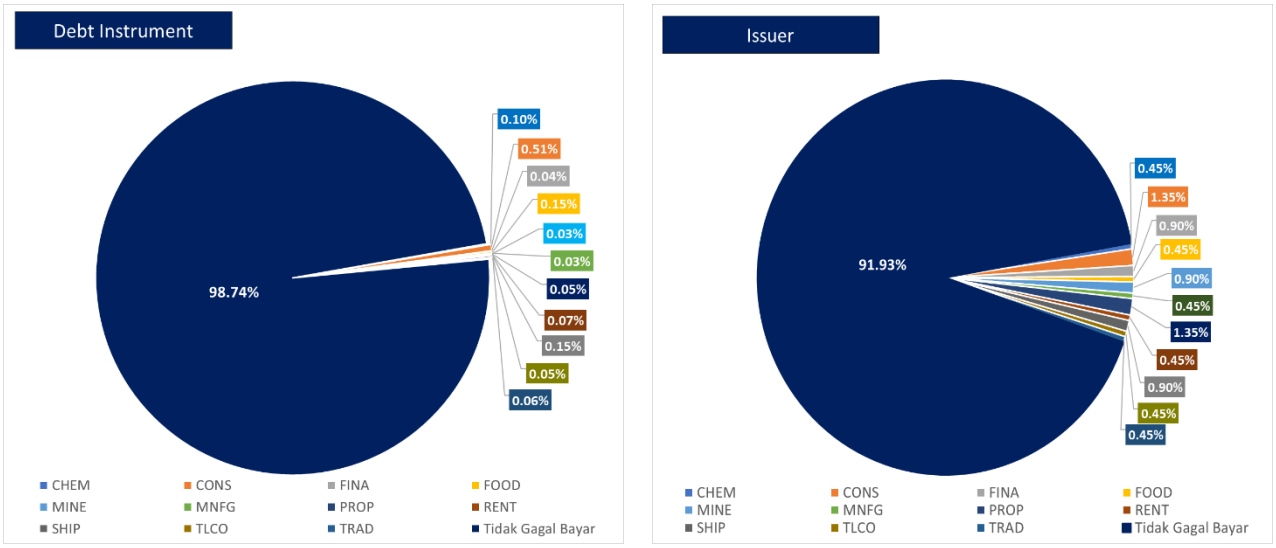
No.	Kode	Nama Industri
1	ABSE**	Securitization
2	AERO	Aerospace and Defense
3	ANHS	Animal Feed and Husbandry
4	AQUA	Aquaculture
5	ARLN	Airline
6	ARPT	Airport
7	AUCO	Automotive Component
8	AUTO	Automotive
9	BANK	Banking
10	BCON	Business and Consumer Services
11	CEME	Cement
12	CHEM	Chemical
13	CONS	Construction
14	COUR	Courier Services and Logistics
15	DINF**	Infrastructure Financing (DINFRA)
16	EPCC	Engineering Procurement & Construction
17	FERT	Fertilizer
18	FINA	Multifinance
19	FISH	Fishery
20	FOOD	Food and Beverage
21	GASD	Gas Distribution
22	HAPP	Household Appliance & Office Equipment
23	HEAL	Healthcare
24	HLDC	Investment Holding Company
25	HLDF	Investment Holding Company
26	HLDG	Holding Company
27	HLDI	Investment Holding Company
28	HOTL	Hotel
29	IBRO	Insurance Brokers
30	INSR	Insurance and Guarantee
31	ITEQ	Information Technology and Services
32	LESR	Tourism and Leisure
33	MEDA	Media
34	METL	Metal
35	MINC	Mining Contractor
36	MINE	Mining
37	MNFG	Manufacturing
38	OFIN	Other Financial Services
39	PHAM	Pharmaceutical
40	PLAN	Plantation
41	POWR	Power and Energy
42	PRJF	Project Financing
43	PROP	Property
44	PRPK	Printing and Packaging
45	PULP	Pulp and Paper
46	PWRT	Power Rental
47	RAIL	Railway Transportation Infrastructure
48	REIT	Real Estate Investment Trust (REIT)
49	RENT	Vehicle Rental and Transportation
50	REST	Restaurant
51	RETL	Retail
52	SCRT	Securities
53	SFIN	Non-Multifinance Financing
54	SHIP	Shipping
55	SPFI	Special Purpose Financial Institution
56	SPRT	Seaport
57	SUBN	Subnational Entity
58	SUGA	Sugar Refinery
59	TEXT	Textile
60	TIMB	Woodbase and Agro
61	TLCO	Telecommunication
62	TOBA	Tobacco
63	TOLL	Toll Road
64	TOWR	Telecommunications Tower
65	TRAD	Trading and Distribution
66	WASE	Waste Management
67	WATR	Clean Water Processing

Note: ** Industries that are not in the Publishing Company's Industry classification.
Source: PEFINDO Database (2025)

Since the assumption of default is based on debt instruments issued by the issuing companies, the industries experiencing defaults in this report are the same for both debt instruments and issuing companies. The only difference lies in the magnitude or default rate of each industry between debt instruments and issuing companies.

Until 2024, PEFINDO recorded defaults in 11 industries, both in terms of debt instruments and issuing companies. Other industries have never experienced defaults during the observation period and thus have a default rate of 0.00%. The 11 industries that experienced defaults are: Chemicals (CHEM), Construction (CONS), Financing Companies (FINA), Food and Beverages (FOOD), Manufacturing (MNFG), Property (PROP), Vehicle Leasing and Transportation (RENT), Shipping (SHIP), Telecommunications (TLCO), Trade and Distribution (TRAD), and Mining (MINE).

Figure 4. Percentage of Default and Non-Default by Industry



Source: PEFINDO Database (2025)

From 2007 to 2024, PEFINDO recorded that 91.93% of all issuing companies were in industries outside the 11 industries that experienced defaults. Similarly, 98.74% of all debt instruments were in sectors outside the 11 sectors that experienced defaults.

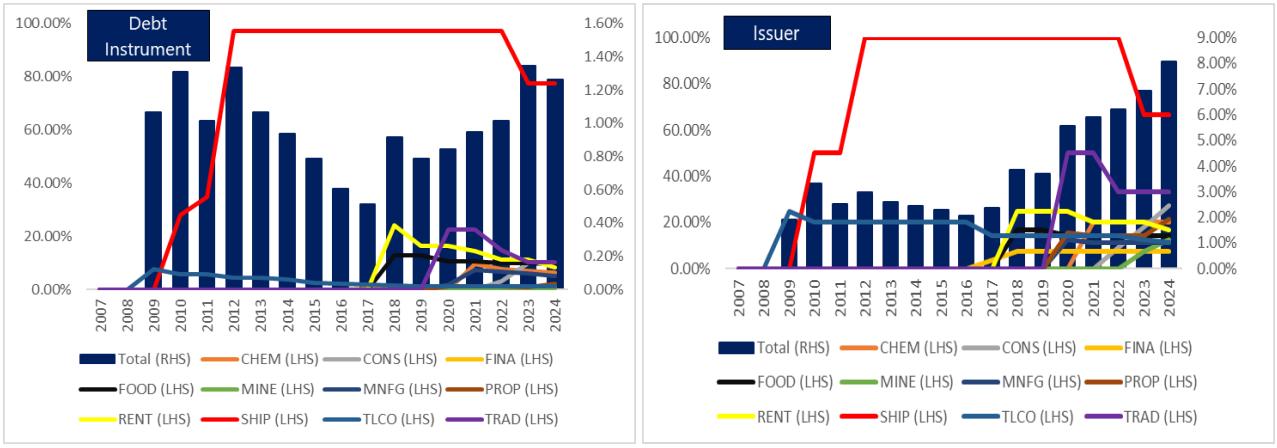
In terms of debt instruments, the industry with the highest default rate from 2007 to 2024 was the shipping industry (SHIP). This industry had a default rate of 77.41% due to defaults by PT Arpeni Pratama Ocean Line Tbk in 2010 and 2011 (IDR0.75 trillion) and PT Berlian Laju Tanker Tbk in 2012 (IDR1.40 trillion). However, the default rate in the shipping industry decreased in 2023 (from 97.21% previously) due to the addition of a new issuer in the shipping industry rated by PEFINDO in August 2023.

Meanwhile, the financing company (FINA) industry had the lowest default rate compared to the other 11 industries that reported defaults up to 2024. The default rate in the financing company industry continued to decline until 2024, dropping to 0.24% (from 0.26% in 2023). This decrease occurred because the financing company industry was active in issuing corporate debt instruments. The financing company industry dominated debt instrument issuance in 2024, with an addition of approximately IDR18.27 trillion.

For the other eight industries that experienced defaults, the default rates up to 2024 varied, including: RENT: 8.23% (down from 11.30% in 2023); TRAD: 10.28% (unchanged from 2023); FOOD: 9.56% (down from 9.79% in 2023); CONS: 9.97% (up from 9.78% in 2023); CHEM: 6.49% (down from 6.97% in 2023); MNFG: 5.22% (down from 6.00% in 2023); TLCO: 1.21% (unchanged from 2023); PROP: 2.02% (up from 1.01% in 2023); MINE: 0.58% (down from 0.66% in 2023).

Among the industries that experienced defaults, the shipping industry (SHIP) had the highest default rate, while the financing company industry (FINA) had the lowest default rate from 2007 to 2024. However, the default percentages differ when calculated based on the number of issuing companies, as opposed to debt instruments.

Figure 5. Default Rate by Industry



Source: PEFINDO Database (2025)

From 2007 to 2024, the default rate for issuing companies in the shipping industry was 66.67%. In contrast, the financing company industry had a default rate of 7.41%, with two companies defaulting in 2017 and 2018. For the other nine industries, the default rates from 2007 to 2024 were as follows:

Trade (TRAD): 33.33%; Construction (CONS): 27.27% (2023: 18.18%); Property (PROP): 21.43% (2023: 14.29%); Chemicals (CHEM): 20.00%; Rental (RENT): 16.67% (2023: 20.00%); Food (FOOD): 14.29%; Mining (MINE): 12.50% (2023: 7.69%); Telecommunications (TLCO): 11.11% (2023: 12.50%); Manufacturing (MNFG): 11.11%.

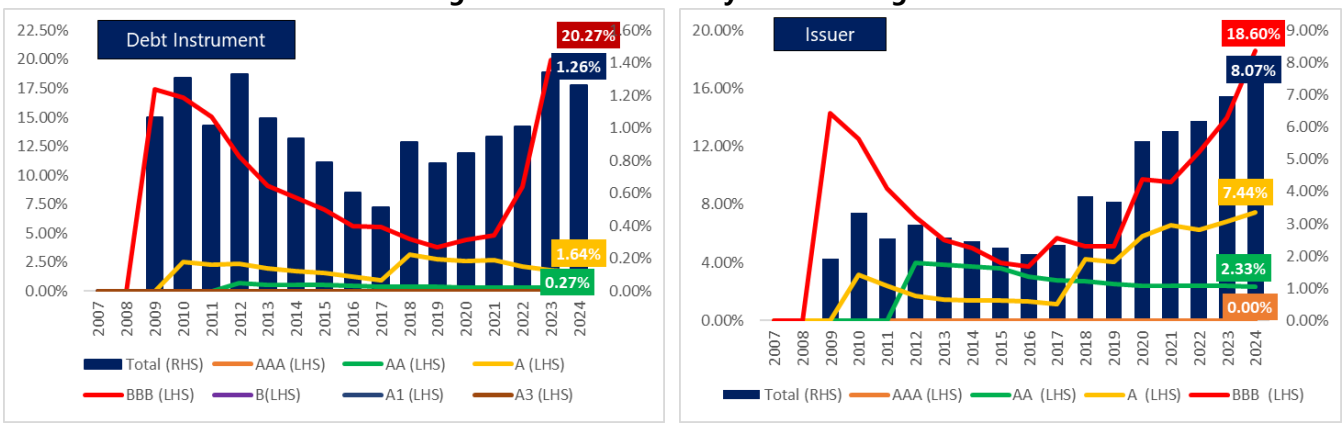
2.5 Default Rate by Initial Rating

Initial Rating refers to the credit rating assigned to a bond or issuer at the time of its first listing or issuance. For issuer-based calculations, the initial rating is the one assigned when a company first issues a debt instrument, marking its debut as a bond issuer. Conversely, for debt instruments, the initial rating is the one assigned when the instrument is first listed or issued in the capital market. During the observation period, the recorded initial ratings for debt instruments were AAA, AA, A, BBB, A1, and A3. Ratings A1 and A3 pertain to short-term instruments, while the initial ratings for issuers were AAA, AA, A, and BBB.

Calculating default rates based on initial ratings provides insights into the inherent risk associated with each rating tier. In other words, it illustrates the likelihood of corporate debt instruments defaulting if they possess a particular initial rating.

For debt instruments, the default rates up to 2024 have decreased compared to the previous year for the initial ratings of AA and A. The default rate for AA-rated instruments decreased to 0.27% from 0.29% at the end of 2023. The default rate for A-rated instruments decreased to 1.64% from 1.83% at the end of 2023. Conversely, the default rate for BBB-rated instruments increased to 20.27% by 2024 (from 19.91% in 2023), due to additional defaults in the property and mining industries, both with initial BBB ratings.

Figure 6. Default Rate by Initial Rating



Source: PEFINDO Database (2025).

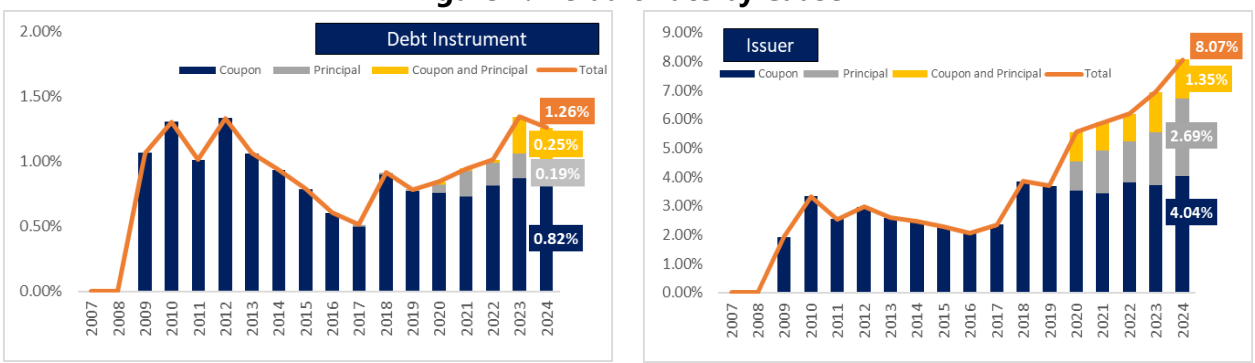
Meanwhile, for initial ratings of AAA, A1, and A3, the default rates during the observation period were 0.00%. In other words, no debt instruments with initial ratings of AAA, A1, or A3 experienced defaults during the observation period. This data reaffirms the consistency with the hypothesis that higher ratings and shorter durations are associated with lower default rates compared to lower ratings and longer durations.

For issuers, the default rate for those with an initial rating of BBB up to 2024 was 18.60%. The default rates for issuers with initial ratings of AA and A up to 2024 were 2.38% and 7.44%, respectively. Meanwhile, issuers with an initial rating of AAA had a default rate of 0.00% from 2007 to 2024; in other words, no issuers with an initial rating of AAA experienced defaults on the debt instruments they issued.

2.6 Default Rate by Cause

Estimating the default rate based on causes provides information regarding the magnitude of the default rate based on several reasons that cause debt instruments and companies to experience default. In the general definition, debt securities and companies are considered to be in default if a company fails to pay one or more of its financial obligations that are due. Specifically, default occurs if you fail to fulfill coupon payments, meet principal payments, or fulfill both interest and principal payments.

Figure 7. Default Rate by Cause



Source: PEFINDO Database (2024).

From 2007 to 2023, cumulatively, the value of debt securities issuances that defaulted was IDR17,16 trillion. Meanwhile, the number of issuing companies that experienced defaults was 18.

In debt instruments, from the default rate of 1.26% up to 2024, 0.82% or IDR11.13 trillion of which occurred due to the company's failure to fulfill coupon payments, while 0.19% or IDR2.58 trillion failed to fulfill principal payment and 0.25% or IDR3.45 trillion due to failure to fulfill principal and coupon payments. Meanwhile, from the default rate for issuing companies of 8.07%, there were 4.04% or nine companies that experienced default due to the company's failure to fulfill coupon payments, then 2.69% or six of them because they failed to fulfill principal payments, and 1.35% or three of them because they failed to fulfill principal and coupon payments.

2.7 One-Year Rating Transition Matrix

The Rating Transition Matrix is a matrix that shows the percentage change in rating over a certain period. The rows in the Rating Transition Matrix represent the initial rating. Meanwhile, the column in the Rating Transition Matrix states the change in rating at some point in time. Meanwhile, the elements in the matrix are the proportion of changes in rating categories in rows to rating categories in columns. This study uses a One-Year Rating Transition Matrix. Thus, a change in rating in the matrix is a change in rating within one year after the initial rating was issued.

Figure 8. One-Year Transition Matrix of the Debt Instrument

Dari/Ke	∑ Issuance Amount (IDR billion)	AAA	AA	A	BBB	BB	B	CCC	D	NR
2024										
AAA	2,279,515.18	82.30%	0.59%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	17.11%
AA	1,397,384.78	5.67%	78.14%	1.21%	0.00%	0.14%	0.00%	0.00%	0.00%	14.84%
A	1,043,042.37	0.15%	4.67%	75.34%	3.14%	0.28%	0.01%	1.28%	0.33%	14.78%
BBB	218,945.65	0.00%	0.28%	3.79%	70.56%	2.09%	0.14%	0.39%	5.04%	17.72%
BB	11,121.50	0.00%	0.00%	0.00%	0.00%	19.90%	0.00%	11.97%	17.08%	51.05%
B	3,358.38	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	23.71%	0.00%	76.29%
CCC	15,757.70	0.00%	0.00%	0.00%	0.00%	0.00%	18.39%	40.30%	28.84%	12.48%
2023										
AAA	2,040,856.58	83.49%	0.68%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	15.83%
AA	1,314,338.53	5.48%	79.50%	1.32%	0.00%	0.15%	0.00%	0.00%	0.00%	13.54%
A	897,560.38	0.18%	5.52%	75.72%	3.72%	0.34%	0.02%	0.00%	0.39%	14.12%
BBB	204,263.02	0.00%	0.33%	4.37%	73.77%	2.42%	0.16%	0.44%	3.16%	15.36%
BB	11,121.50	0.00%	0.00%	0.00%	0.00%	20.45%	0.00%	12.30%	17.56%	49.69%
B	1,181.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	70.00%	0.00%	30.00%
CCC	4,248.00	0.00%	0.00%	0.00%	0.00%	0.00%	20.30%	44.49%	21.44%	13.77%

Source: PEFINDO Database (2024)

Figure 9. One-Year Transition Matrix of the Issuer Company

Dari/Ke	∑ Issuing companies (Unit)	AAA	AA	A	BBB	BB	B	CCC	D	NR
2024										
AAA	246	95.12%	1.22%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.66%
AA	437	4.81%	86.04%	2.75%	0.00%	0.00%	0.00%	0.00%	0.00%	6.41%
A	641	0.16%	4.99%	84.09%	4.37%	0.47%	0.00%	0.16%	0.62%	5.15%
BBB	263	0.00%	0.38%	4.18%	75.67%	3.42%	0.38%	1.14%	3.04%	11.79%
BB	21	0.00%	0.00%	0.00%	0.00%	38.10%	0.00%	9.52%	14.29%	38.10%
B	3	0.00%	0.00%	0.00%	0.00%	0.00%	33.33%	33.33%	0.00%	33.33%
CCC	9	0.00%	0.00%	0.00%	0.00%	0.00%	11.11%	22.22%	44.44%	22.22%
2023										
AAA	220	94.55%	1.36%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.09%
AA	414	4.59%	86.47%	2.90%	0.00%	0.00%	0.00%	0.00%	0.00%	6.04%
A	601	0.00%	5.16%	83.53%	4.66%	0.50%	0.00%	0.17%	0.67%	5.32%
BBB	249	0.00%	0.40%	3.61%	75.90%	3.61%	0.40%	1.20%	2.81%	12.05%
BB	20	0.00%	0.00%	0.00%	0.00%	35.00%	0.00%	10.00%	15.00%	40.00%
B	2	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	50.00%	0.00%	50.00%
CCC	7	0.00%	0.00%	0.00%	0.00%	0.00%	14.29%	28.57%	28.57%	28.57%

Source: PEFINDO Database (2024)

The higher ratings tend to have a higher probability of staying at the same rating over time than lower ratings. Higher ratings tend to stay at the same level in the following year. For debt instruments, the highest consistency is shown by the AAA rating. The AAA rating remains at the same level in the following year, with a percentage of 82.37%. This means that from the IDR2,279.52 trillion worth of AAA-rated issuances, IDR1,877.56 trillion will retain the AAA rating in the following year.

Meanwhile, based on the issuing companies, the AAA rating also demonstrates the best consistency compared to lower ratings. The AAA rating has a consistency rate of 95.12% for remaining at the AAA rating in the following year. This means that out of 246 companies with an AAA rating, 234 companies will retain the AAA rating in the following year.

In addition to having good consistency, higher ratings tend to have a higher percentage of upgrading compared to lower ratings. In the Debt Instrument Transition Matrix, the percentage of AA-rated instruments upgraded to AAA in the following year is 5.86%. Meanwhile, the percentage of AA-rated instruments downgraded to A is 1.14%. Of the cumulative issuance value of AA-rated debt instruments, amounting to IDR1,397.38 trillion, IDR81.86 trillion was upgraded to AAA in the following year, and only IDR15.86 trillion was downgraded to A in the following year. Meanwhile, in the Issuing Companies Transition Matrix, the percentage of AA-rated companies upgraded to AAA is 4.81%. On the other hand, the percentage of AA-rated companies downgraded to A is 2.75%. Of the 437 companies with an AA rating, 21 companies reported an upgrade from AA to AAA, and 12 companies experienced a downgrade from AA to A in the following year.

The opposite condition occurs with lower ratings. Lower ratings tend to have a higher percentage of migrating to a D rating (default) in the following year compared to higher ratings. The rating with the highest percentage of migrating to a D rating in the following year, both in debt instruments and issuing companies, is the BBB rating. The percentage of BBB-rated debt instruments migrating to D (default) in the following year is 17.08%. However, what about the CCC rating? Compared to the situation at the end of 2023, the condition in 2024 is slightly different. In 2023, the highest percentage of migration to a D rating (default) was for CCC-rated instruments. However, in 2024, CCC-rated instruments have a higher percentage of upgrading to a BB rating (66.04%) compared to downgrading. This condition aligns with the credit rating action on PT Wijaya Karya (Persero) Tbk's debt instruments, reflecting the government's State Capital Injection (*Penyertaan Modal Negara/* PMN) to WIKA when it faced financial difficulties. Although only one company's rating was upgraded, the significant issuance value of WIKA's upgrade to BB significantly influenced the transition matrix in 2024.

Meanwhile, for issuing companies, the rating with the highest percentage of migration to a D rating (default) in the following year is still held by the CCC rating, with a percentage of 44.44%. However, compared to the situation at the end of 2022, the condition in 2024 has significantly improved amidst global uncertainty and high interest rates, which continue to pressure companies' financial performance. This condition is more pronounced for companies with lower ratings. In 2024, the percentage of CCC-rated companies migrating to D (default) in the following year is higher than in 2023, at 28.57%. Additionally, the percentage of CCC-rated companies upgrading to a B rating is 11.11% (lower than in 2023: 14.29%).

The B rating for debt instruments and issuing companies has shown a 0.00% transition rate to a D rating (default). This low percentage is due to PEFINDO's limited monitoring of debt instruments and issuing companies with a B rating during the observation period. In fact, over the past three years, only two companies under monitoring have held a B rating. However, this rating has shown a 33.33% chance of downgrading to a CCC rating in 2023 for issuing companies. Meanwhile, for debt instruments, the probability of a downgrade to a CCC rating was 8.34%.

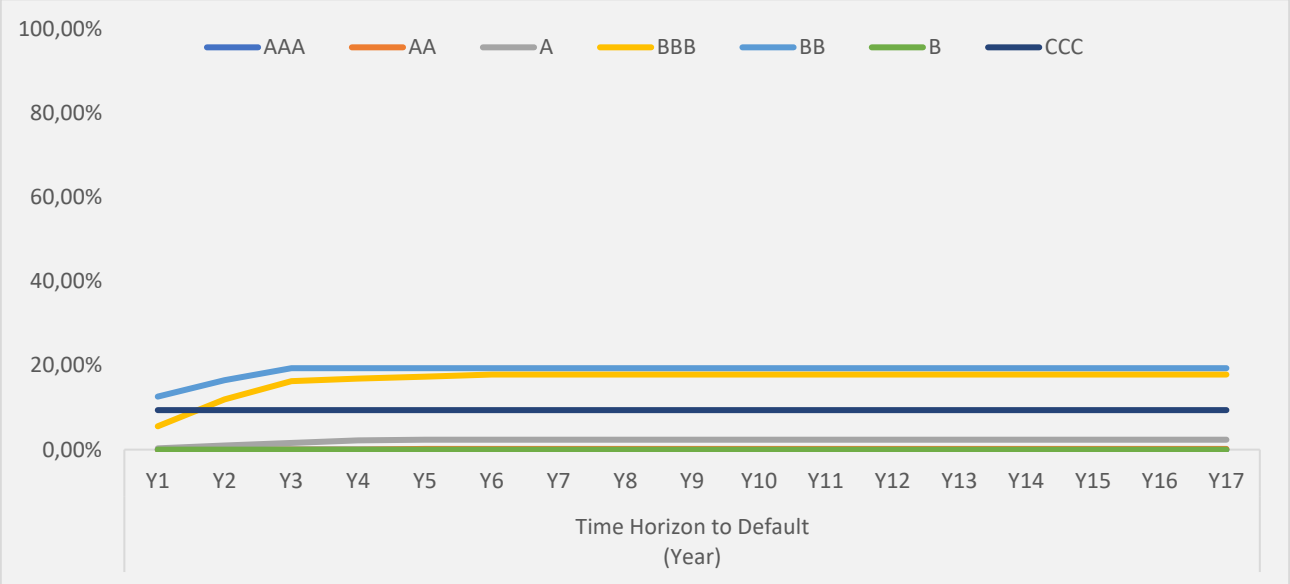
2.8 *Cumulative Average Default Rate*

This study calculates the Cumulative Average Default Rate for the ratings of AAA, AA, A, BBB, BB, B, CCC, and the time horizon from the first year to the seventeenth year. The default rate with a 17-year time horizon is the default rate based on historical data for that period. Overall, the Cumulative Average Default Rate between debt instrument ratings and issuing company ratings shows the same pattern. As the time horizon lengthens, the default rate for each rating category increases. Additionally, the lower the rating (below investment grade), the higher the default rate.

Debt instruments rated AAA, B, and CCC have a constant default rate throughout the 17-year time horizon. The AAA and B ratings have a default rate of 0.00%. The low default rate for the AAA rating (0.00%) indicates that there were no default occurrences for this rating during the observation period. Meanwhile, debt instruments with a B rating also have a default rate of 0.00%, which is primarily due to PEFINDO's limitations in monitoring B-rated debt instruments during the observation

period. However, despite the limited observation, no debt instruments with a B rating were downgraded to a D rating (default).

Figure 10. Cumulative Average Default Rate of the Debt Instrument



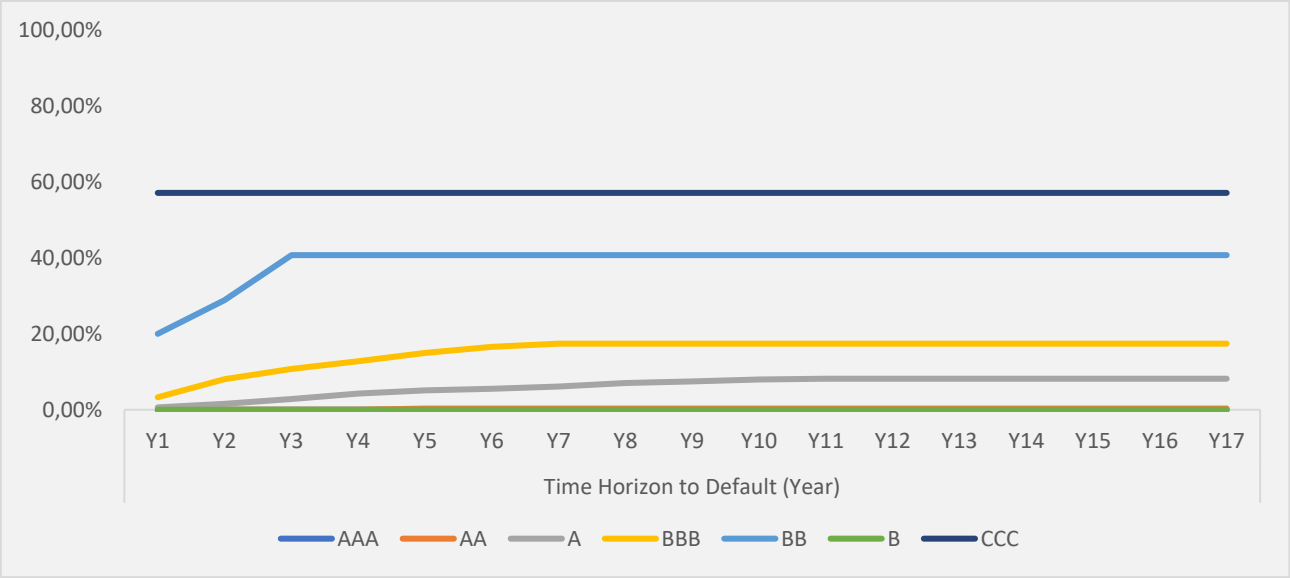
Source: PEFINDO Database (2025)

The percentage of debt instruments with an AA rating continues to show a constant default rate of 0.00% from the first year to the fourth year, but then experiences a default for the first time in the fifth year, causing the percentage to increase to 0.17%. This default rate remains constant at the same level until the seventeenth year. The default case at the AA rating only occurred once in 2012 with a shipping company, and there have been no additional cases until 2024. Meanwhile, the default rate for debt instruments with an A rating in the first to fourth years is 0.96%, 1.62%, and 2.16%, respectively. Then, the percentage increases to 2.36% in the fifth year. However, until the seventeenth year, the percentage remains unchanged from the fifth year. The default risk for debt instruments with both AA and A ratings is relatively low and remains so over a long period after the rating is active. Debt instruments with an A rating are highly favored by the market because, in addition to offering high coupons, the associated risks are relatively lower compared to lower ratings. This is evidenced by the relatively small default probability, even over a relatively long period.

For comparison, the BBB rating has a default rate of 5.55% in the following year. The percentage continues to rise, reaching 17.85% in the sixth year, and then remains unchanged until the seventeenth year. Meanwhile, the BB rating has a cumulative default rate of 12.61% in the first year and continues to rise to 19.36% in the third year. This value remains stable until the seventeenth year.

Issuing companies with AAA, B, and CCC ratings have a constant default rate throughout the 17-year period. The AAA and B ratings have a default rate of 0.00%, while the CCC rating has a default rate of 57.14%. Issuing companies with a B rating have a default rate of 0.00% due to PEFINDO's limitations in monitoring companies with a B rating, that is, only two companies were recorded during the past three years of observation.

Figure 11. Cumulative Average Default Rate of the Issuer Company



Source: PEFINDO Database (2025)

Issuing companies with an AA rating experience a default for the first time in the fifth year at a rate of 0.30%. This default rate remains constant at the same value until the seventeenth year. The default rate for issuing companies with a BBB rating continues to rise from the first year (3.28%) to the sixth year (16.56%) before stabilizing starting in the seventh year at 17.41%. Meanwhile, issuing companies with a BB rating have a default rate of 20.00% in the first year, which then rises to 40.74% in the third year, and this value remains stable until the seventeenth year.

Appendix 1: Research Methodology

A1.1 Assumptions

This report uses several assumptions as a reference in collecting, processing, analyzing, and interpreting data based on the required debt instrument data. The assumptions used are as follows:

1. The following term for data entry:
   a. The debt instrument is all types of debt instruments issued by a company. The unit used to measure the instrument is the "issuance value".
   b. The issuing company is the company issuing the debt instruments. The unit used is the "company unit".

2. The rating of each year during the observation period (2007–2024), either the rating of the debt instrument or the issuing company, is the rating as of December 31 of that year.

   Example : If a debt instrument or issuing company is rated AA+ (Double A Plus) in 2020, it is the rating of the debt instrument or issuing company as of December 31, 2020.

3. A rating with the same letter but a different sign, both the rating of the debt instrument or the issuing company, will be considered the same or equivalent in the data analysis.

   Example : Rating A+ (Single A Plus), A (Single A), and A- (Single A Minus) will be considered as A.

4. Conditions of default:

   4.1. The default for the debt instrument is a condition in which it is declared as in default during the period it is held by the investor. The default on the debt instrument occurs if the issuing company is unable to meet part or all of the principal or coupon on the debt instrument when (or even before) it is due.
   4.2. The default for the issuing company is a condition in which the issuer experiences default on the debt instrument it issued.

   In the calculation of the Rating Transition Matrix and the Cumulative Average Default Rate, if the issuing company is declared as default, the issuing company will be considered as the new entity when the company issues a new debt instrument or if the company has another instrument that is still outstanding (not yet due date). Meanwhile, using the same analogy, if the instrument defaults and is restructured, or if other factors cause the instrument to remain active, the instrument will be treated as a new instrument with the same issuance value until it matures.

5. Conditions of Not Rated (NR):
   5.1. NR for the debt instrument is where it is no longer rated by PEFINDO. NR will be given under one of two conditions: one year after the maturity year or one year after the year of the early repayment.
   5.2. NR for issuing companies is where the issuing company is no longer rated by PEFINDO. NR will be given to an issuing company one year after its rating expires, and it is not rated again by PEFINDO after the expiration year.

   In the case of the rating of the debt instrument being withdrawn after experiencing default, it is still categorized as a default debt instrument or is not included in NR (not rated).

A1.2 Default Rate Theory

The default rate is calculated based on the debt instrument and the issuing company on an annual basis during the observation period. The calculation of the default rate for debt instruments and issuing companies on an annual basis during the observation period is also carried out by dividing by sector, industry, initial rating, and reason for default.

Cutler and Edeler (1958) said that the default rate is the ratio of cumulative values based on discrete time, which is commonly used by global credit rating agencies. The default rate at time t will be in the form of a percentage of the ratio between the cumulative value of the default value up to time t, compared to the cumulative value of the total value up to time t. For the debt instrument, the value used for the calculation of the default rate is the "issuance value" of the debt instrument, while for the issuing company, the value used for the calculation of the default rate is the "unit" of the issuing company. The formulation for calculating the default rate for debt instruments and issuing companies is as follows:

1. Debt instrument

$$DeR_t = \frac{\sum_{k=1}^{t} DIV_k}{\sum_{k=1}^{t} IV_k}, k = 1, 2, \cdots, t \quad (1)$$

Explanation:

DeR_t : Default rate at time *t*.
DIV_k : Total issuance value of the debt instruments that defaulted at time *k*.
IV_k : Total issuance value of debt instruments at time *k*.

2. Issuing companies

$$DeR_t = \frac{\sum_{k=1}^{t} DI_k}{\sum_{k=1}^{t} I_k}, k = 1, 2, \cdots, t \quad (2)$$

Explanation:

DeR_t : Default rate at time *t*.

DI_k : Total issuing companies that have defaulted at time *k*.

I_k : Total issuing companies at time *k*.

A1.3 Theory of Rating Transition Matrix

The Rating Transition Matrix is a matrix used to calculate the percentage of transitional ratings occurring within a given period. The rating transition matrix is typically used in the global rating agencies' default study report only to measure the percentage of rating transitions for companies rated by the rating agencies, and this percentage is calculated based on the company/entity unit. The rating transition matrix only considers ranking migration at a specific time, so a company/entity may be counted more than once in its calculations. However, in this study, PEFINDO has created a Rating Transition Matrix for debt instruments in addition to measuring the percentage of rating transitions for issuing companies within a specific time frame. The ranking transition percentage is calculated in the same manner as the calculation based on company/entity units but with different units. The issuance value for each rating is used to calculate the rating transition percentage for debt instruments. Because it uses the same analogy as calculations based on company/entity units, a debt instrument value may be calculated more than once in the calculation.

The Markov Chain approach is used in this study to calculate the percentage in the rating transition matrix for both debt instruments and issuing companies. Markov chain is a technical approach used to estimate changes that may occur in the future. Transition measurement with the Markov Chain uses a stochastic approach based on historical data held during the observation period. Measurement of the transition with the Markov Chain uses a stochastic approach based on historical data held during the observation period. Mathematically, the stochastic process $(X_t\ ,\ t = 0, 1, 2, 3, \dots)$ is done by taking a finite number, or it can be counted, and if $X_t = i$ is state i at time t, and the process can move from state i to state j with P_{ij} that equals:

$$P_{ij} = P(X_{t+1} = j \mid X_t = i, X_{t-1} = i_{t-1}, \dots, X_1 = i_1, X_0 = i_0) \quad (3)$$

where for all conditions of $i_0, i_1, i_2, \dots, i_{n-1}, i_n = i, j$ and all $t \geq 0$, then the process in equation (3) is called the Markov Chain.

In this equation, it can be said that for the Markov Chain, the conditional distribution for the condition X_{t+1} is independent of the previous state $X_0, X_1, X_2, \dots, X_{t-1}$ and only depends on the present state. The value of P_{ij} represents that the process, when in the state i, will make a transition into the state j (Ross, 2007).

Based on equation (3), we can write $P_{ij} = P(X_1 = j \mid X_0 = i)$ as a one-step transition from state i to state j on the Markov Chain. Values of P_{ij} can also be expressed in the form of the matrix $N \times N$ expressed as the one-step transition matrix as follows:

$$\boldsymbol{P} = \begin{bmatrix} P_{11} & P_{12} & \cdots & P_{1N} \\ P_{21} & P_{22} & \cdots & P_{2N} \\ \vdots & \vdots & \ddots & \vdots \\ P_{N1} & P_{N2} & \cdots & P_{NN} \end{bmatrix}, \text{ with } P_{ij} \geq 0\ ;\ \sum_{j=1}^{N} P_{ij} = 1\ ;\ i, j = 1, 2, \cdots, N \quad (4)$$

One of estimation methods for calculating the P_{ij} value that will be used to fill the elements contained in the matrix $\boldsymbol{P}$ is the Cohort Method. According to Christensen et al. (2004), the estimator for $p_{ij}(t_k)$ in one time period with $t_0, t_1, t_2, \ldots, t_T$ is a discrete time point with time intervals $\Delta t_k = t_{k+1} - t_k$ and can be written as follows:

$$\hat{p}_{ij}(t_k) = \frac{n_{ij}(\Delta t_k)}{n_i(t_k)} \quad (5)$$

Where $n(\Delta t_k)$ is the number of observations that move from condition i to condition j between periods t_k and t_{k+1} and $n_i(t_k)$ is the number of observations in state i at time t_k. If it is assumed that the period is homogeneous and we have data from time t_0 to time t_T, the most likely predictors for p_{ij} are as follows:

$$\hat{p}_{ij}(t_k) = \frac{\sum_{k=0}^{n-1} n_{ij}(\Delta t_k)}{\sum_{k=0}^{n-1} n_i(t_k)} \quad (6)$$

A1.4 Theory of *Cumulative Average Default Rate*

The cumulative average default rate describes the default rate of the debt instrument or the issuing company in a year within a specific time horizon. In general, the first step is to create a static pool to calculate the cumulative average default rate. The static pool is a change in the rating of the instrument debt or the issuing company within a certain period. After creating a static pool, the second step is calculating the marginal default rate.

If $m_t^Y(R)$ is the amount of issuance value of the debt instrument or the number of the issuing company rated R (AAA, AA, A, BBB, BB, B, CCC), which is still the amount of issuance value of the debt instrument or the number of the issuing company rated R (AAA, AA, A, BBB, BB, B, CCC) until year *Y* (2007, 2008, ..., 2020) and then defaulted in year t. If $n_t^Y(R)$ is the issuance value of the debt instrument or the number of the issuing company rated R (AAA, AA, A, BBB, BB, B, CCC) up to year *Y* (2007, 2008, ..., 2020) and not defaulted until year t. According to Fons (1994), the marginal default rate is calculated with the formulation as follows:

$$d_t(R) = \frac{\sum_{Y=2007}^{T} m_t^Y(R)}{\sum_{Y=2007}^{T} n_t^Y(R)} \quad (7)$$

After the marginal default rate is obtained, the cumulative average default rate for year t is obtained by the formula:

$$D_t(R) = D_{t-1}(R) + d_t(R) \quad (8)$$

Appendix 2: Survival Pool Cumulative Average Default Rate
(Based on Debt Instrument)

A2.1. AAA Rating (triple-A)

AAA		Time Horizon to Default																
Year Pool	Issuance Value (Rp Billion)	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17
2007	1,000.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2008	1,000.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2009	5,310.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2010	11,348.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2011	15,034.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2012	22,809.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2013	42,771.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2014	89,832.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	114,055.60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2016	164,474.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	237,813.35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	257,608.14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2019	294,347.90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020	283,903.08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	246,486.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	253,061.19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023	237,551.41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2024	257,268.91	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Summary Statistic																		
Withdrawn Issuance Value		**389,877**	**377,865**	**249,839**	**231,563**	**105,440**	**98,236**	**26,244**	**23,171**	**7,146**	**5,646**	**3,451**	**0**	**0**	**0**	**0**	**0**	**0**
Defaultable Issuance Value		**2,145,800**	**1,767,935**	**1,518,096**	**1,286,532**	**1,181,093**	**1,082,857**	**1,056,613**	**1,033,442**	**1,026,296**	**1,020,650**	**1,017,199**	**1,017,199**	**1,017,199**	**1,017,199**	**1,017,199**	**1,017,199**	**1,017,199**
Default Issuance Value		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Marginal Default Probabilities		**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%**
Cumulative Default Probabilities		**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%**

A2.2. AA Rating (double-A)

AA		Time Horizon to Default																
Year Pool	Issuance Value (Rp Billion)	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17
2007	10,500.00	0	0	0	0	900	0	0	0	0	0	0	0	0	0	0	0	0
2008	16,600.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2009	36,511.74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2010	65,009.76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2011	89,995.96	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2012	126,754.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2013	130,128.51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2014	87,716.78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	72,900.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2016	84,033.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	85,691.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	94,904.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2019	96,764.41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020	93,066.17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	110,625.91	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	113,136.90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023	83,046.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2024	80,711.76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Summary Statistic																		
Withdrawn Issuance Value		**216,898**	**225,295**	**195,306**	**184,466**	**118,710**	**117,902**	**45,174**	**44,738**	**17,020**	**17,870**	**16,565**	**2,195**	**2,195**	**0**	**0**	**0**	**0**
Defaultable Issuance Value		**1,261,199**	**1,035,904**	**840,597**	**656,131**	**537,421**	**418,618**	**373,444**	**328,706**	**311,686**	**293,816**	**277,251**	**275,056**	**272,861**	**272,861**	**272,861**	**272,861**	**272,861**
Default Issuance Value		**0**	**0**	**0**	**0**	**900**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Marginal Default Probabilities		**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.17%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**
Cumulative Default Probabilities		**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.17%**	**0.17%**	**0.17%**	**0.17%**	**0.17%**	**0.17%**	**0.17%**	**0.17%**	**0.17%**	**0.17%**	**0.17%**	**0.17%**	**0.17%**

A2.3. A Rating (single-A)

A		Time Horizon to Default																
Year Pool	**Issuance Value (Rp Billion)**	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**	**Y9**	**Y10**	**Y11**	**Y12**	**Y13**	**Y14**	**Y15**	**Y16**	**Y17**
2007	11,525.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2008	15,000.00	0	600	150	900	0	0	0	0	0	0	0	0	0	0	0	0	0
2009	16,817.00	0	0	1340	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2010	14,469.00	0	1340	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2011	20,834.00	1340	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2012	33,432.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2013	38,278.00	0	0	0	0	900	0	0	0	0	0	0	0	0	0	0	0	0
2014	43,754.00	0	0	0	1900	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	52,608.78	0	0	1900	0	150	0	0	0	0	0	0	0	0	0	0	0	0
2016	62,798.47	0	2100	0	260	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	80,931.39	50	0	491	266.12	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	78,419.96	0	150	926.12	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2019	86,619.46	150	1426.12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020	95,237.82	1426.12	0	184	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	108,715.38	0	184	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	138,120.12	184	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023	145,482.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2024	167,312.63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Summary Statistic																		
Withdrawn Issuance Value		**160,785**	**165,995**	**134,284**	**129,631**	**65,721**	**59,542**	**7,840**	**8,256**	**781**	**781**	**2,281**	**0**	**0**	**0**	**0**	**0**	**0**
Defaultable Issuance Value		**1,049,570**	**880,425**	**740,340**	**605,719**	**536,671**	**476,079**	**468,239**	**459,983**	**459,202**	**458,421**	**456,140**	**456,140**	**456,140**	**456,140**	**456,140**	**456,140**	**456,140**
Default Issuance Value		**3,150**	**5,800**	**4,991**	**3,326**	**1,050**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Marginal Default Probabilities		**0.30%**	**0.66%**	**0.67%**	**0.55%**	**0.20%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**
Cumulative Default Probabilities		**0.30%**	**0.96%**	**1.62%**	**2.16%**	**2.36%**	**2.36%**	**2.36%**	**2.36%**	**2.36%**	**2.36%**	**2.36%**	**2.36%**	**2.36%**	**2.36%**	**2.36%**	**2.36%**	**2.36%**

A2.4. BBB Rating (triple-B)

BBB		Time Horizon to Default																
Year Pool	Issuance Value (Rp Billion)	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17
2007	2,275.00	0	675	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2008	2,625.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2009	2,450.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2010	1,610.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2011	2,410.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2012	2,310.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2013	3,970.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2014	5,183.80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	5,967.88	0	42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2016	11,462.88	332	1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	17,962.88	2100	0	200	200	0	400	0	0	0	0	0	0	0	0	0	0	0
2018	21,945.26	0	541	300	0	400	23	0	0	0	0	0	0	0	0	0	0	0
2019	23,679.26	1141	300	0	400	23	0	0	0	0	0	0	0	0	0	0	0	0
2020	36,104.02	0	2000	4715.5	70.9	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	36,518.19	2000	4715.5	234.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	27,788.87	4715.5	398.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023	14,682.64	374.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2024	11,844.67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Summary Statistic																		
Withdrawn Issuance Value		**38,501**	**38,469**	**23,501**	**15,008**	**9,016**	**7,971**	**2,206**	**2,206**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Defaultable Issuance Value		**192,290**	**143,158**	**109,985**	**89,527**	**79,840**	**71,446**	**68,817**	**66,612**	**66,612**	**66,612**	**66,612**	**66,612**	**66,612**	**66,612**	**66,612**	**66,612**	**66,612**
Default Issuance Value		**10,663**	**9,672**	**5,450**	**671**	**423**	**423**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Marginal Default Probabilities		**5.55%**	**6.76%**	**4.96%**	**0.75%**	**0.53%**	**0.59%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**
Cumulative Default Probabilities		**5.55%**	**11.93%**	**16.29%**	**16.92%**	**17.36%**	**17.85%**	**17.85%**	**17.85%**	**17.85%**	**17.85%**	**17.85%**	**17.85%**	**17.85%**	**17.85%**	**17.85%**	**17.85%**	**17.85%**

A2.5. BB Rating (double-B)

BB		Time Horizon to Default																
Year Pool	Issuance Value (Rp Billion)	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17
2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2009	750.00	600	150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2010	200.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2012	740.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	328.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2016	181.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	1,962.00	1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	1,014.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2019	570.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020	3,695.00	300	0	400	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	600.00	0	400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	300.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2024	10406	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Summary Statistic																		
Withdrawn Issuance Value		**5,678**	**751**	**281**	**0**	**0**	**781**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Defaultable Issuance Value		**15,069**	**12,418**	**11,587**	**11,187**	**11,187**	**10,406**	**10,406**	**10,406**	**10,406**	**10,406**	**10,406**	**10,406**	**10,406**	**10,406**	**10,406**	**10,406**	**10,406**
Default Issuance Value		**1,900**	**550**	**400**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Marginal Default Probabilities		**12.61%**	**4.43%**	**3.45%**	**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%**
Cumulative Default Probabilities		**12.61%**	**16.48%**	**19.36%**	**19.36%**	**19.36%**	**19.36%**	**19.36%**	**19.36%**	**19.36%**	**19.36%**	**19.36%**	**19.36%**	**19.36%**	**19.36%**	**19.36%**	**19.36%**	**19.36%**

A2.6. B Rating (single-B)

B		Time Horizon to Default																
Year Pool	Issuance Value (Rp Billion)	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17
2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2012	280.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2014	120.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	781	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023	2177	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2024	8885	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Summary Statistic																		
Withdrawn Issuance Value		**901**	**280**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Defaultable Issuance Value		**11,342**	**11,062**	**11,062**	**11,062**	**11,062**	**11,062**	**11,062**	**11,062**	**11,062**	**11,062**	**11,062**	**11,062**	**11,062**	**11,062**	**11,062**	**11,062**	**11,062**
Default Issuance Value		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Marginal Default Probabilities		**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%**
Cumulative Default Probabilities		**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%**

A2.7. CCC Rating (triple-C)

CCC		Time Horizon to Default																
Year Pool	**Issuance Value (Rp Billion)**	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**	**Y9**	**Y10**	**Y11**	**Y12**	**Y13**	**Y14**	**Y15**	**Y16**	**Y17**
2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2008	675.00	675	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2010	150.00	150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2013	280.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2016	100.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2019	781.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020	931.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	931.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	400.00	400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023	11,509.70	207	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2024	23.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Summary Statistic																		
Withdrawn Issuance Value		**530**	**931**	**781**	**781**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Defaultable Issuance Value		**15,251**	**12,888**	**12,107**	**11,326**	**11,326**	**11,326**	**11,326**	**11,326**	**11,326**	**11,326**	**11,326**	**11,326**	**11,326**	**11,326**	**11,326**	**11,326**	**11,326**
Default Issuance Value		**1,432**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Marginal Default Probabilities		**9.39%**	**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%**
Cumulative Default Probabilities		**9.39%**	**9.39%**	**9.39%**	**9.39%**	**9.39%**	**9.39%**	**9.39%**	**9.39%**	**9.39%**	**9.39%**	**9.39%**	**9.39%**	**9.39%**	**9.39%**	**9.39%**	**9.39%**	**9.39%**

Appendix 3: Survival Pool Cumulative Average Default Rate (Based on Issuing Companies)

A3.1 AAA Rating (triple-A)

AAA		Time Horizon to Default																
Year Pool	Total Issuer (Unit)	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17
2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2009	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2010	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2011	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2012	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2013	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2014	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2016	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2019	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2024	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Summary Statistic																		
Withdrawn Issuer		**9**	**7**	**5**	**6**	**5**	**5**	**4**	**4**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Defaultable Issuer		**268**	**261**	**256**	**250**	**245**	**240**	**236**	**232**	**230**	**229**	**229**	**229**	**229**	**229**	**229**	**229**	**229**
Default Issuer		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Marginal Default Probabilities		**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%**
Cumulative Default Probabilities		**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%**

A3.2. AA Rating (double-A)

AA		Time Horizon to Default																
Year Pool	Total Issuer (Unit)	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17
2007	7	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
2008	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2009	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2010	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2011	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2012	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2013	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2014	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2016	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2019	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2024	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Summary Statistic																		
Withdrawn Issuer		**28**	**28**	**27**	**25**	**21**	**15**	**10**	**8**	**7**	**7**	**7**	**4**	**4**	**4**	**1**	**0**	**0**
Defaultable Issuer		**431**	**403**	**376**	**351**	**330**	**314**	**304**	**296**	**289**	**282**	**275**	**271**	**267**	**263**	**262**	**262**	**262**
Default Issuer		**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Marginal Default Probabilities		**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.30%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**
Cumulative Default Probabilities		**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.30%**	**0.30%**	**0.30%**	**0.30%**	**0.30%**	**0.30%**	**0.30%**	**0.30%**	**0.30%**	**0.30%**	**0.30%**	**0.30%**	**0.30%**

A3.3. A Rating (single-A)

A		Time Horizon to Default																
Year Pool	Total Issuer (Unit)	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17
2007	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2008	20	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
2009	22	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2010	24	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2011	32	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2012	41	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0
2013	46	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0
2014	45	0	0	0	2	0	1	0	0	1	1	0	0	0	0	0	0	0
2015	47	0	0	2	0	2	0	0	1	1	0	0	0	0	0	0	0	0
2016	46	0	1	0	2	0	0	1	2	0	0	0	0	0	0	0	0	0
2017	47	1	0	2	1	0	1	1	0	0	0	0	0	0	0	0	0	0
2018	45	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
2019	46	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
2020	45	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	41	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	38	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023	41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2024	45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Summary Statistic																		
Withdrawn Issuer		**33**	**38**	**40**	**35**	**30**	**26**	**15**	**15**	**10**	**5**	**5**	**0**	**1**	**1**	**1**	**1**	**0**
Defaultable Issuer		**655**	**613**	**567**	**525**	**487**	**457**	**440**	**422**	**408**	**401**	**394**	**393**	**392**	**391**	**390**	**389**	**389**
Default Issuer		**4**	**6**	**7**	**8**	**4**	**2**	**3**	**4**	**2**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**0**
Marginal Default Probabilities		**0.61%**	**0.98%**	**1.23%**	**1.52%**	**0.82%**	**0.44%**	**0.68%**	**0.95%**	**0.49%**	**0.50%**	**0.25%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**
Cumulative Default Probabilities		**0.61%**	**1.58%**	**2.80%**	**4.28%**	**5.07%**	**5.48%**	**6.13%**	**7.02%**	**7.47%**	**7.93%**	**8.17%**	**8.17%**	**8.17%**	**8.17%**	**8.17%**	**8.17%**	**8.17%**

A3.4. BBB Rating (triple-B)

BBB		Time Horizon to Default																
Year Pool	Total Issuer (Unit)	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17
2007	5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2008	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2009	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2010	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2011	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2012	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2013	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2014	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	17	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
2016	19	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	25	1	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0
2018	28	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
2019	26	3	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
2020	26	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	23	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	18	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023	15	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2024	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Summary Statistic																		
Withdrawn Issuer		**31**	**32**	**28**	**26**	**12**	**11**	**6**	**4**	**4**	**3**	**2**	**1**	**0**	**0**	**0**	**0**	**0**
Defaultable Issuer		**244**	**204**	**166**	**135**	**120**	**106**	**98**	**93**	**89**	**86**	**84**	**83**	**83**	**83**	**83**	**83**	**83**
Default Issuer		**8**	**10**	**5**	**3**	**3**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Marginal Default Probabilities		**3.28%**	**4.90%**	**3.01%**	**2.22%**	**2.50%**	**1.89%**	**1.02%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**
Cumulative Default Probabilities		**3.28%**	**8.02%**	**10.79%**	**12.77%**	**14.95%**	**16.56%**	**17.41%**	**17.41%**	**17.41%**	**17.41%**	**17.41%**	**17.41%**	**17.41%**	**17.41%**	**17.41%**	**17.41%**	**17.41%**

A2.5. BB Rating (double-B)

BB		Time Horizon to Default																
Year Pool	Total Issuer (Unit)	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17
2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2009	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2012	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2014	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2016	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2019	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020	5	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2024	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Summary Statistic																		
Withdrawn Issuer		**8**	**3**	**2**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Defaultable Issuer		**15**	**9**	**6**	**5**	**4**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**0**	**0**
Default Issuer		**3**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Marginal Default Probabilities		**20.00%**	**11.11%**	**16.67%**	**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%**
Cumulative Default Probabilities		**20.00%**	**28.89%**	**40.74%**	**40.74%**	**40.74%**	**40.74%**	**40.74%**	**40.74%**	**40.74%**	**40.74%**	**40.74%**	**40.74%**	**40.74%**	**40.74%**	**40.74%**	**0.00%**	**0.00%**

A2.6. B Rating (single-B)

B		Time Horizon to Default																
Year Pool	Total Issuer (Unit)	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17
2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2012	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2024	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Summary Statistic																		
Withdrawn Issuer		**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Defaultable Issuer		**3**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
Default Issuer		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Marginal Default Probabilities		**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%**
Cumulative Default Probabilities		**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%**

A2.7. CCC Rating (triple-C)

CCC		Time Horizon to Default																
Year Pool	Total Issuer (Unit)	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17
2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2008	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2013	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2016	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2019	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Summary Statistic																		
Withdrawn Issuer		**2**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Defaultable Issuer		**7**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Default Issuer		**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Marginal Default Probabilities		**57.14%**	**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%**
Cumulative Default Probabilities		**57.14%**	**57.14%**	**57.14%**	**57.14%**	**57.14%**	**57.14%**	**57.14%**	**57.14%**	**57.14%**	**57.14%**	**57.14%**	**57.14%**	**57.14%**	**57.14%**	**57.14%**	**57.14%**	**57.14%**

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