THE DEFAULT STUDY

OF CORPORATE AND CORPORATE DEBT SECURITIES RATED BY PEFINDO

PEFINDO
CREDIT RATING AGENCY

Period of
2007–2023

ECONOMIC RESEARCH DIVISION, PT PEFINDO

EXECUTIVE SUMMARY

In 2023, debt securities instruments and issuing companies generally showed quite good performance, with the default rate being maintained and only occurring in companies with relatively low ratings. Debt instruments and issuing companies with an AAA (triple-A) rating are still maintained, with the default rate at 0.00% throughout 2007-2023. In addition, the default rate on instruments with AA (double-A) and A (single-A) rating groups decreased to 0.29% and 1.83% from 0.30% and 2.09%, respectively. With a maintained default rate, A rating is still a favorite among investors in investing because the returns are relatively higher than the ratings above but have lower risk than those below. The initial rating of BBB (triple-B) is a group that has a relatively higher default rate than other rating groups.

In 2023, two companies from the construction and mining industries rated by PEFINDO failed to fulfill their financial obligations. The accumulated value of instruments that experienced default in 2023 reached IDR5.11 trillion. The defaults that occurred in both companies and their instruments occurred at relatively low initial ratings, namely at initial ratings of A- (single-A minus) (three notches above the investment grade limit) and BBB (triple-B) (one notch above the investment grade limit).

The default rate for debt instruments rated by PEFINDO and whose ratings are published cumulatively from 2007 to 2023 is still maintained at 1.34%, while the default rate of the issuing company for the same period is 6.94%. If we look at the sector, the default rates for debt instruments and issuing companies in the non-financial institution (non-FIN) sector are 3.21% and 9.42%, respectively. Meanwhile, in the financial institution (FIN) sector, it was 0.08% and 2.56%, respectively.

PEFINDO noted that during 2007-2023, defaults occurred in 11 industries out of 67 debt instrument industry classifications and 65 issuing company industry classifications. The highest default rate from 2007 to 2023 occurred in the shipping industry (SHIP), both in debt instruments and the issuing company. Most default rates on debt instruments and issuing companies are caused by the company's failure to fulfill coupon payments, amounting to 0.87% and 3.70%, respectively.

PEFINDO's One-Year Rating Transition and Cumulative Average Default Rate calculations show increasingly better conditions at higher ratings. Rating transition after one year for issuing companies and debt instruments with higher ratings has better rating consistency and stability, a higher chance of experiencing a rating upgrade, and a lower chance of experiencing a downgrade or default than lower-ranked ones. Meanwhile, the results of calculating the Cumulative Average Default Rate over 15 years for debt instruments and issuing companies have the same pattern. The longer the period, the greater the default rate for each rating. Meanwhile, regarding ratings, the lower the rating, the greater the default rate.

CONTENTS

1. INTRODUCTION

The global economy in 2023 faces various challenges, one of which comes from high uncertainty. High uncertainty at the worldwide level occurs due to the high escalation of geopolitical conflicts and will continue to increase at the end of 2023. Previously, there was a war between Russia and Ukraine, which is still ongoing to this day. Israel's invasion of Palestine since October 2023 has also exacerbated global economic uncertainty due to increasing geopolitical risks. It will also give rise to very high volatility in international financial markets throughout 2023. The consequences of the Israeli invasion of Palestine have also raised concerns regarding the potential for oil prices to rise if the conflict lasts for a long time and on a broader scale. Apart from that, it is also feared that this conflict will disrupt the supply chain due to the disruption of logistics shipping routes due to the conflict spreading to the Red Sea. The moderation in commodity prices that has occurred throughout 2023 may have less of an impact on reducing inflation due to this conflict.

The escalation of this geopolitical conflict threatens efforts to reduce inflation throughout 2023. Various countries in the world are still trying to overcome the problem of the spike in inflation that has occurred since 2022 due to supply chain disruption from the Russia-Ukraine war, which has caused energy and food prices to rise. Central banks are continuing their trend of tightening monetary policy, hoping to reduce inflation soon. The Federal Reserve (The Fed), the United States (US) central bank, has aggressively raised interest rates by 525 bps since March 2022, currently at 5.25%-5.50%. It is the most aggressive cycle of interest rate increases ever. The same policy maneuver was also carried out by various other major central banks, such as the Bank of England, European Central Bank, Bank of Canada, and various central banks in other developed countries. However, inflation will still make it difficult to decline to the target level as the labor market remains tight. This aggressive increase in interest rates has had an impact on the financial balance of the business sector. For example, in the first half of 2023, we saw some banking collapses in the United States, which could not withstand the rapid pace of interest rate increases being pursued. Overall, the aggressive monetary policy that continues in 2023 has put pressure on global economic growth and experienced a slowdown.

Conditions occurring in the global economy have also challenged Indonesia's economic performance. After experiencing excellent growth in 2022 with an achievement of 5.31%, Indonesia's economic growth in 2023 moderated to 5.05%. However, economic growth can still be relatively solid amidst conditions in countries experiencing significant recessions and slowdowns. Strong public consumption can still support domestic economic growth, even though the trade balance surplus is starting to come under pressure as exports are moderated due to the end of the commodity price super-cycle. Indonesia's leading export commodities, such as coal and palm oil, which previously made a significant contribution to the domestic economy, experienced a decline in price in line with weak global demand and thus eroded the trade balance surplus.

The moderation in domestic economic growth is also caused by high-interest rates, which are still maintained by the central bank to reduce inflation and maintain exchange rate stability. Indonesia's inflation, which had risen sharply at the end of 2022, has been reduced to within the target range since May 2023. However, the central bank can still not reduce its benchmark interest rate as the spread between domestic and US interest rates is in the narrowest range throughout history. This is being done to maintain the stability of the Rupiah exchange rate against the US Dollar. However, relatively high interest rates at the level of 6.0% have put pressure on the financial balance in the

domestic business sector. Borrowing costs by corporations have become relatively more expensive than in the previous year, which in the corporate debt market is reflected in the increase in the average coupon for corporate debt issuance throughout 2023.

Global economic conditions, which are still shrouded in uncertainty, combined with high interest rates and falling commodity prices, have impacted the performance of domestic business activities. These conditions have affected business prospects for companies in several industries, including issuers' income and financial obligations. In 2023, PEFINDO noted that two companies rated by PEFINDO experienced failure to fulfill their financial obligations, namely PT Waskita Karya (Persero) Tbk (WSKT) from the construction industry and PT Ricobana Abadi (RICO) from the mining industry. The total accumulated value of instruments that experienced default in 2023 is IDR5.11 trillion. Defaults at WSKT occurred four times in 2023, with a total issuance value of IDR4.72 trillion. Meanwhile, RICO's default occurred with an instrument value of IDR0.40 trillion. The increase in the value of instruments that default is quite significant, although the number of companies in default is not significantly different from previous years. In 2022, there was one company; in 2021, there were two companies; and in 2020, four companies were in default.

Apart from defaulting, several companies have postponed their payment obligations, resulting in their ratings experiencing a downgrade in 2023. Looking ahead, we expect the risk of default in 2024 to be better. This assumes that uncertainty is easing and the prospect of interest rate cuts is starting to emerge. A decrease in interest rates will reduce pressure on companies' financial leverage, which in turn will also improve their financial risks. A decrease in interest rates will also positively impact the business processes previously affected by the high interest rates. Lower interest rates will spur product demand. In theory, reducing interest rates would encourage increased household consumption as the outlook for corporate income and employment improves. As a result, PEFINDO hopes that there will be improvements in debt securities issuers' business prospects and profits.

PEFINDO prepares the default study report, which contains a review of the default level of issuing companies and debt instruments rated and published by PEFINDO based on overall classification, sector, industry, initial rating, causes of default, and a review of the rating transition matrix of One-Year and Cumulative Average Default Rate during the same period. This report was created to provide a better understanding of the risks for stakeholders in the Indonesian capital market, especially those related to the corporate debt securities market. Therefore, this default study report will become a reference for stakeholders in looking at the development and risks of national corporate debt securities.

2.   Review of The Default Rate

2.1   Data and Data Sources

The population used as data is if a company issues a debt instrument rated and published by PEFINDO during the observation period (2007-2023). 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 2023, the cumulative value of debt securities issuance and the number of issuing companies are IDR1,233.15 trillion and 216 company units, respectively. In 2023, there are the addition of six new issuing companies (published) that issue debt instruments. An issuing entity will be declared a new entity when it first issues a debt instrument. Most of the five new issuing companies come from the Non-Financial Institution sector, and the other company comes from the Financial Institution sector. Of the 216 company units, 83.33% have an A rating (Single-A).

In terms of the issuance value of debt instruments, the issuance value of instruments rated by PEFINDO in 2023 is IDR100.85 trillion (published). The recorded issuance value represents debt securities issued through a public offering or without a public offering (not registered with KSEI). Of the IDR100.85 trillion value of instrument issuance in 2023, around 51.72% of this value was issued by companies from the Financial Institution sector, and 47.44% came from the Non-Financial Institution sector. Furthermore, if we look at the initial rating, around 43.89% of the total issuance value in 2023 are instruments rated A (Single-A), followed by 42.32% with a rating of AAA (Triple-A). The high value of the issuance of corporate debt securities rating of A (Single-A) is due to the market demanding a lot of debt securities with this rating because, apart from offering a high coupon, the risks involved are relatively lower compared to ratings below it.

Figure 1. Annual Default Rate
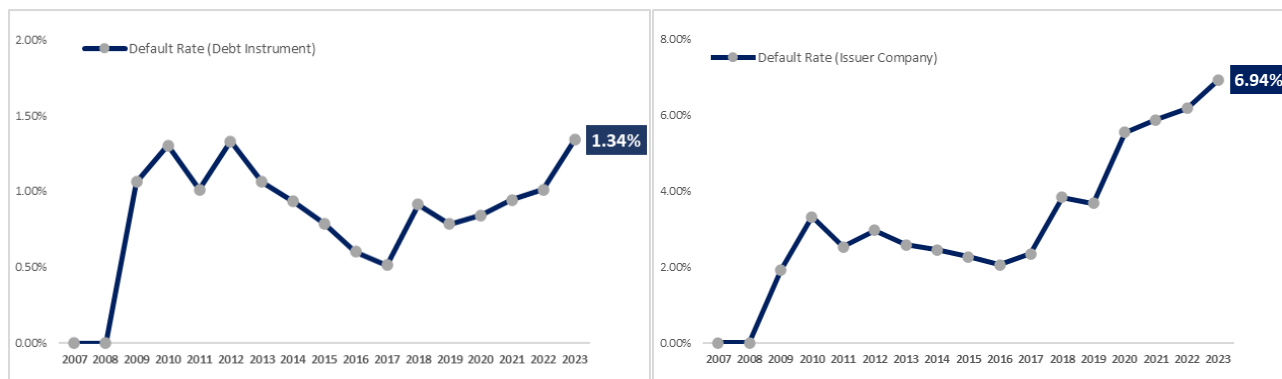
Source: PEFINDO Database (2024)

In 2023, two companies experienced default, namely PT Waskita Karya (Persero) Tbk (WSKT) and PT Ricobana Abadi (RICO), with the total value of instruments defaulted amounting to IDR5.11 trillion. The default at WSKT happened four times in 2023. First, it was caused by the Company's inability to pay off the coupon of the Shelf Registration Bond IV Phase I Year 2020, which matured on May 6, 2023, with an issuance value of IDR135.50 billion. Second, it was due to the Company's inability to pay off the principal and coupon of the Shelf Registration Bond III Phase II Year 2018 Series B, which matures on June 16, 2023, with an issuance value of IDR2,276.50 billion. The third case of default was

caused by the Company's inability to pay off the coupon of the Shelf Registration Bond III Phase III Year 2018 Series B, which matured on September 29, 2023, with an issuance value of IDR941.75 billion. Lastly, WSKT experienced default due to its inability to pay the coupon of the Shelf Registration Bond III Phase IV Year 2019 Series B, which matures on November 16, 2023, with an issuance value of IDR1,361.75 billion. Therefore, in 2023, WSKT recorded a total default of IDR4,715.50 billion. Apart from WSKT, another company that experienced default in 2023 is RICO due to its inability to extend the grace period for settling MTN principal payments due on December 16, 2023, with an issuance value of IDR400 billion. Judging from the number of companies, conditions in 2023 are slightly worse than in 2022, when only one company (IDR2 trillion) experienced default.

Furthermore, if we look at the entire observation period from 2007 to 2023, the value of the issuance of debt instruments that experienced default was around IDR16.58 trillion, originating from 15 debt-issuing companies. Based on the formula in Equation 1 (see Appendix 1), the default rate for debt instruments for the 2007-2023 period is 1.34%, while the default rate for the issuing company in the same period is 6.88%. The percentage of default rates increased slightly compared to 2022, which were respectively at 1.01% and 6.16%.

2.3 Default Rate by Sector

The sector classification of debt instruments is divided into three sectors. These three sectors are the Non-Financial Institution (Non-FIN) sector, the Financial Institution sector (FIN), and the other sector (OTH). The Non-FIN sector consists of debt instruments from issuing companies other than financial institutions. The FIN sector consists of debt instruments from financial institutions, such as banks, insurance, securities, and others. The other sector (OTH) consists of debt instruments that do not originate from the Non-FIN sector and the FIN sector, such as Asset-Backed Securities (EBA), infrastructure funds (DINFRA), or debt instruments issued by regional governments. However, because no Regional Government has issued a debt instrument during the observation period, the debt instruments included in the other sector (OTH) are only EBA and DINFRA. The sector classification of the issuing company is only divided into two sectors, namely the Non-Financial Institution sector (Non-FIN) and the Financial Institution sector (FIN). This refers to the same meaning as the classification of debt instruments. The FIN sector consists of companies from financial institutions. Meanwhile, Non-FIN is a non-financial institution issuing companies.

The default rate for Non-FIN sector debt instruments in 2023 is 3.21%. Meanwhile, the default rate in the FIN sector has continued to decline since 2019, then remained relatively stable, and was at 0.08% in 2023. Meanwhile, there were no defaults in the OTH sector during the observation period. According to the issuing company, the default rate in the Non-FIN sector has increased to 9.42% in 2023. This increase occurred because there were two companies in the Non-FIN sector that experienced default in 2023 but this was not accompanied by the addition of new companies that were equivalent to issuing debt securities in 2023. Meanwhile, the default rate for the FIN sector was 2.56% in 2023.

Figure 2. Default Rate by Sector
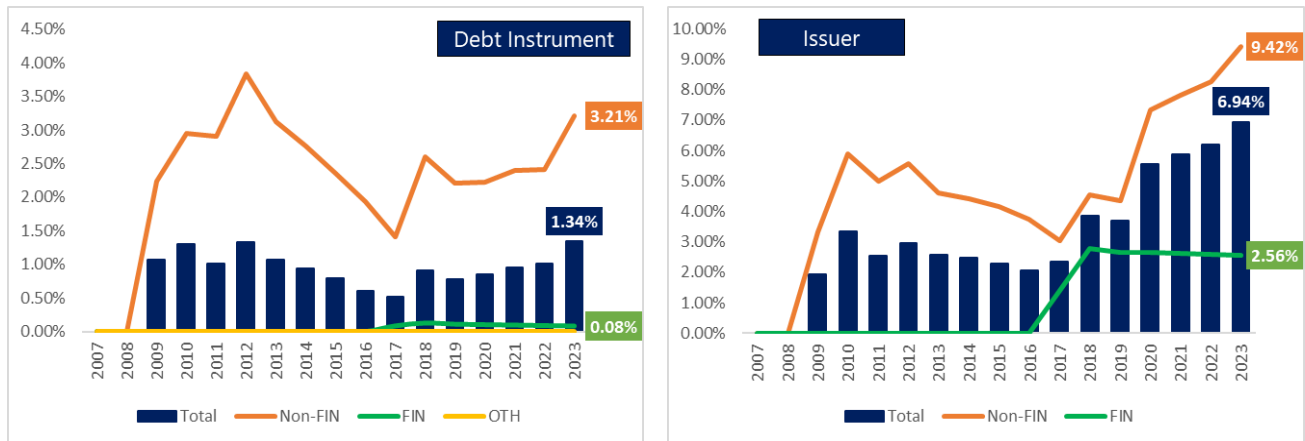
Source: PEFINDO Database (2024)

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	No.	Kode	Nama Industri
1	ABSE**	Securitization	35	MINC	Mining Contractor
2	AERO	Aerospace and Defense	36	MINE	Mining
3	ANHS	Animal Feed and Husbandry	37	MNFG	Manufacturing
4	AQUA	Aquaculture	38	OFIN	Other Financial Services
5	ARLN	Airline	39	PHAM	Pharmaceutical
6	ARPT	Airport	40	PLAN	Plantation
7	AUCO	Automotive Component	41	POWR	Power and Energy
8	AUTO	Automotive	42	PRJF	Project Financing
9	BANK	Banking	43	PROP	Property
10	BCON	Business and Consumer Services	44	PRPK	Printing and Packaging
11	CEME	Cement	45	PULP	Pulp and Paper
12	CHEM	Chemical	46	PWRT	Power Rental
13	CONS	Construction	47	RAIL	Railway Transportation Infrastructure
14	COUR	Courier Services and Logistics	48	REIT	Real Estate Investment Trust (REIT)
15	DINF**	Infrastructure Financing (DINFRA)	49	RENT	Vehicle Rental and Transportation
16	EPCC	Engineering Procurement & Construction	50	REST	Restaurant
17	FERT	Fertilizer	51	RETL	Retail
18	FINA	Multifinance	52	SCRT	Securities
19	FISH	Fishery	53	SFIN	Non-Multifinance Financing
20	FOOD	Food and Beverage	54	SHIP	Shipping
21	GASD	Gas Distribution	55	SPFI	Special Purpose Financial Institution
22	HAPP	Household Appliance & Office Equipment	56	SPRT	Seaport
23	HEAL	Healthcare	57	SUBN	Subnational Entity
24	HLDC	Investment Holding Company	58	SUGA	Sugar Refinery
25	HLDF	Investment Holding Company	59	TEXT	Textile

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

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 (2024)

Because the assumption of default is based on the debt instrument issued by the issuing company, the industries experiencing default in this study will be the same, whether on the debt instrument or the issuing company. The difference between these two only lies in the magnitude or level of industry default on debt instruments and the issuing company.

In 2023, there are additional records of new industries experiencing default, namely the case of default at PT Ricobana Abadi from the mining industry. Thus, from 2007 to 2023, PEFINDO recorded defaults in 11 industries, both in debt instruments and the issuing company. Meanwhile, other industries have never experienced a default during the observation period, so their default rate is 0.00%. Meanwhile, 11 industries that experienced default were Chemical (CHEM), Construction (CONS), Finance Companies (FINA), Food and Beverage (FOOD), Manufacturing (MNFG), Property (PROP), Vehicle Rental and Transportation (RENT), Shipping (SHIP), Telecommunications (TLCO), Trade and Distribution (TRAD), and the addition of a new industry that experienced default, namely the Mining (MINE).

Figure 4. Percentage of Default and Non-Default by Industry
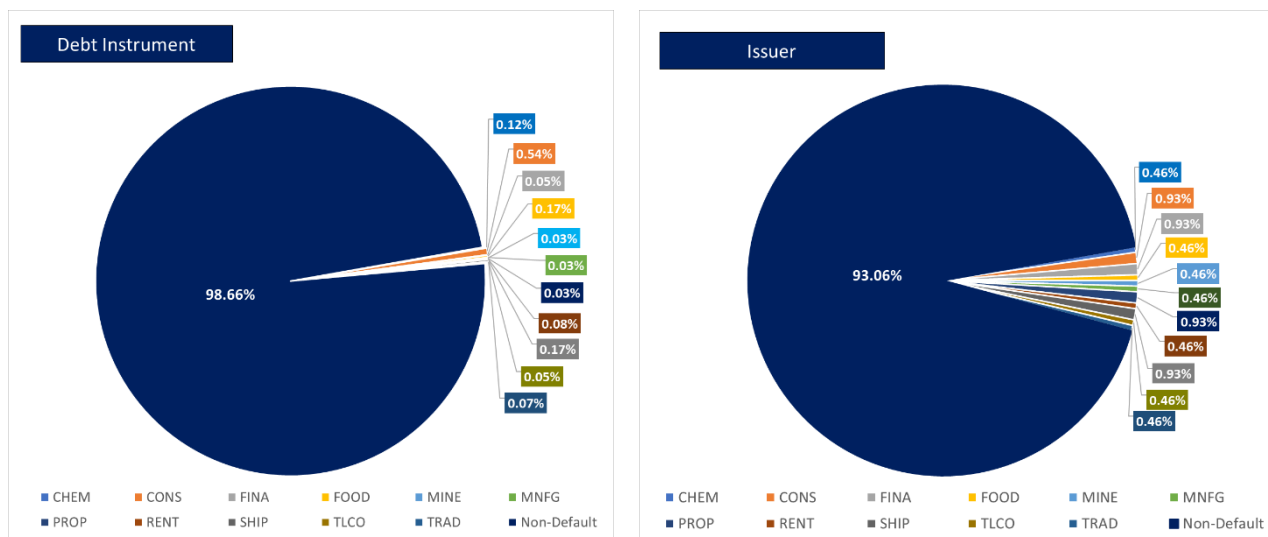
Source: PEFINDO Database (2024)

From 2007 to 2023, PEFINDO recorded that 93.06% of the total issuing companies were from other industries outside of 11 industries that experienced default. Furthermore, 98.66% of the total debt instruments were instruments in other sectors apart from 11 sectors that experienced default. In debt instruments, the highest default rate from 2007 to 2023 is the shipping industry (SHIP). This

industry has a default rate of 77.41% due to default at 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 has decreased from 97.21% in the previous year, due to the addition of one issuing company in the shipping industry sector rated by PEFINDO in August 2023.

Meanwhile, the financing company (FINA) industry has the lowest default rate compared to 11 other industries that reported default until 2023. The default rate for the financing company industry continues to move steadily until 2023 and is down to 0.26% (2022: 0.29%). The decline in the default rate in this industry occurred because the financing company industry was active in issuing corporate debt securities. The financing company industry is dominant in issuing debt securities in 2023, with an addition of around IDR16.46 trillion.

Then, for eight other industries experiencing default, the default rate up to 2023 varies, including RENT: 11.30% (unchanged from 2022); TRAD: 10.28% (down from 2022: 14.63%); FOOD: 9.79% (unchanged from 2022); CONS: 9.78% (up from 2022: 3.04%); CHEM: 6.97% (down from 2022: 7.83%); MNFG: 6.00% (down from 2022: 6.57%); TLCO: 1.21% (down from 2022: 1.23%); and PROP: 1.00% (down from 2022: 1.05%). Meanwhile, a new industry experiencing default, the mining industry (MINE), had a default rate of 0.66% until 2023, which was in line with a default that occurred at one mining company at the end of 2023.

Figure 5. Default Rate by Industry
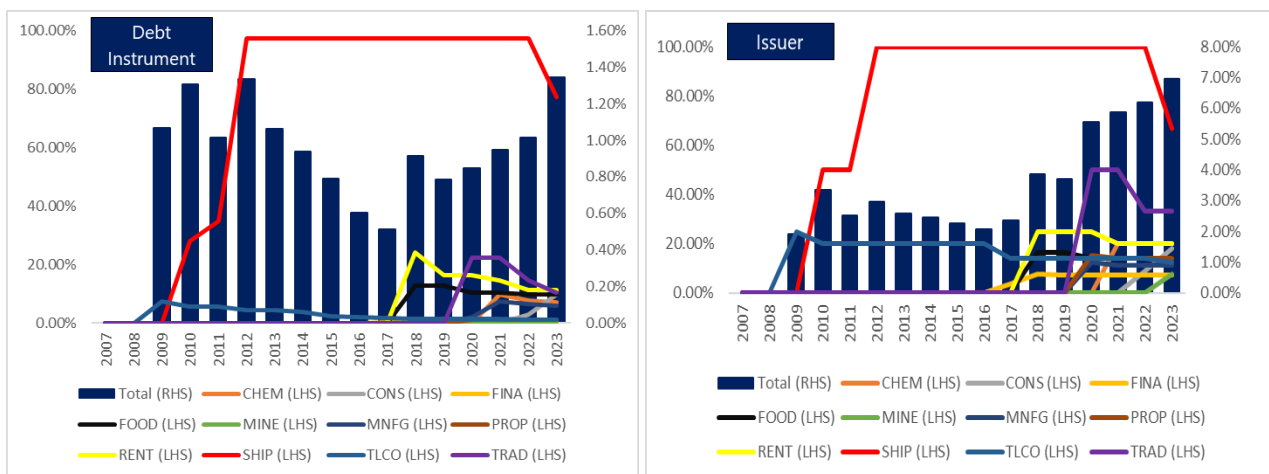
Source: PEFINDO Database (2024)

In the issuing companies, among the industries that experienced default, the highest and lowest default rates from 2007 to 2023 were still held by the same industries as the debt instruments, namely the shipping industry and the financing company industry. However, their default percentage is different when compared to calculations based on debt instruments because they use a population of companies. From 2007 to 2023, the default rate for issuing companies in the shipping industry (SHIP) was 66.67%. However, the shipping industry's default rate has decreased due to the addition of one issuing company in the related sector in August 2023. Meanwhile, the financing company (FINA) industry has a default rate of 7.41%, with the number of companies experiencing default of two companies, each respectively, in 2017 and 2018. For nine other industries, the default rate from 2007

to 2023 is TRAD: 33.33%; RENT: 20.00%; CHEM: 20.00%; CONS: 18.18% (2022: 9.09%); FOOD: 14.29%; PROP: 14.29%, TLCO: 12.50% (2022: 14.29%); MNFG: 11.11%; and MINE: 7.69%.

2.5 Default Rate per Initial Rating

The initial rating is the rating that is first assigned to the issuing company or debt instrument at the time of listing. For calculations based on the issuing company, the initial rating is the rating assigned to the company when it first issues the debt instrument. In other words, it was when the company first became a new issuing company. Meanwhile, the initial rating on a debt instrument is the rating received by an instrument when it is first listed or issued on the capital market. During the observation period, the initial ratings recorded for the debt instruments were AAA, AA, A, BBB, A1, and A3. A1 and A3 ratings are ratings for short-term instruments. Meanwhile, the initial ratings for the issuing company are AAA, AA, A, and BBB.

Calculations regarding the default rate based on the initial rating are carried out to provide information regarding the level of risk inherent in the initial rating. In other words, it explains how likely corporate debt securities will default if they have a particular rating.

Figure 6. Default Rate by Initial Rating
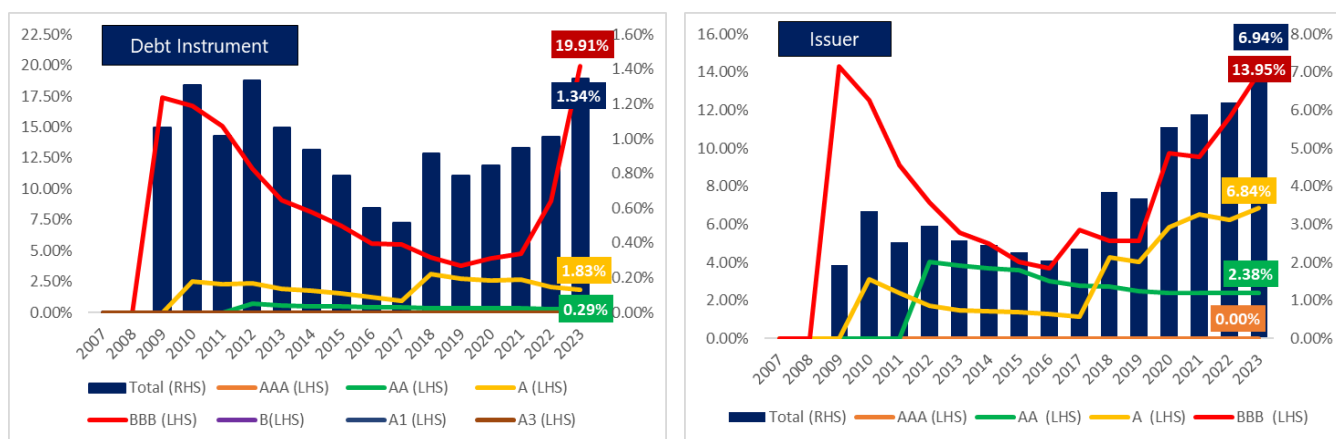
Source: PEFINDO Database (2024).

In debt instruments, the default rate until 2023 has decreased from the previous year for the initial ratings of AA and A. The default rates for ratings AA and A have decreased to 0.29% and 1.83%, respectively, from the previous ones of 0.30% and 2.09% at the end of 2022. On the other hand, the default rate for the initial BBB rating increases to 19.91% until 2023 (2022: 9.01%), which is in line with the company's defaults in the construction and mining industries, with an initial BBB rating.

Meanwhile, for the initial ratings of AAA, A1, and A3, the default rate during the observation period was 0.00%. In other words, no debt instruments rated AAA, A1, and A3 experienced default during the observation period. The data again confirms consistency with the hypothesis that higher ratings and shorter terms have lower default rates than lower ratings.

Meanwhile, the default rate for Issuing Companies with a BBB rating until 2023 is 13.95%. The default rates for initial ratings of AA and A until 2023 are 2.38% and 6.48%, respectively. Meanwhile,

the initial AAA rating had a default rate of 0.00% from 2007 to 2023; in other words, no issuing company with an initial AAA rating experienced default on the debt instruments it 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.

From 2007 to 2023, cumulatively, the value of debt securities issuances that defaulted was IDR16.58 trillion. Meanwhile, the number of issuing companies that experienced defaults was 15 companies.

Figure 7. Default Rate per Reason
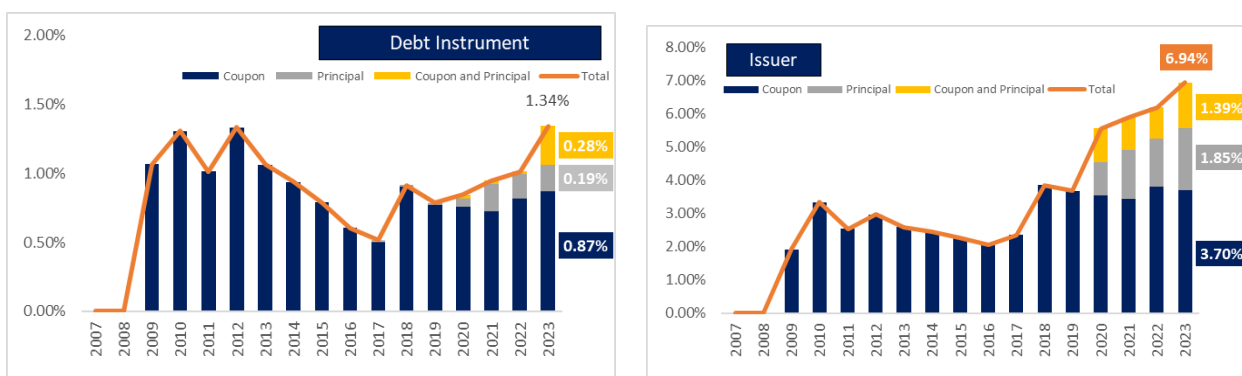
Source: PEFINDO Database (2024).

In debt instruments, from the default rate of 1.34% up to 2023, 0.87% or IDR10.76 trillion of which occurred due to the company's failure to fulfill coupon payments, while 0.19% or IDR2.37 trillion failed to fulfill principal payment and 0.28% or IDR3.45 trillion due to failure to fulfill principal and coupon payments. Meanwhile, from the default rate for issuing companies of 6.94%, there were 3.70% or eight companies that experienced default due to the company's failure to fulfill coupon payments, then 1.85% or four of them because they failed to fulfill principal payments, and 1.39% or three of them because they failed to fulfill principal and coupon payments.

2.7 One-Year Rating Transition Matrix

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	Σ Nilai Penerbitan (Rp miliar)	AAA	AA	A	BBB	BB	B	CCC	D	NR
2023										
AAA	2,040,856.58	82.30%	0.59%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	17.11%
AA	1,314,338.53	5.67%	78.14%	1.21%	0.00%	0.14%	0.00%	0.00%	0.00%	14.84%
A	897,560.38	0.15%	4.67%	75.34%	3.14%	0.28%	0.01%	1.28%	0.33%	14.78%
BBB	204,263.02	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	1,181.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	23.71%	0.00%	76.29%
CCC	4,248.00	0.00%	0.00%	0.00%	0.00%	0.00%	18.39%	40.30%	28.84%	12.48%
2022										
AAA	1,787,795.38	83.49%	0.68%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	15.83%
AA	1,201,201.63	5.48%	79.50%	1.32%	0.00%	0.15%	0.00%	0.00%	0.00%	13.54%
A	759,440.26	0.18%	5.52%	75.72%	3.72%	0.34%	0.02%	0.00%	0.39%	14.12%
BBB	176,474.15	0.00%	0.33%	4.37%	73.77%	2.42%	0.16%	0.44%	3.16%	15.36%
BB	10,821.50	0.00%	0.00%	0.00%	0.00%	20.45%	0.00%	12.30%	17.56%	49.69%
B	400.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	70.00%	0.00%	30.00%
CCC	3,848.00	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	Σ Perusahaan Penerbit (Unit)	AAA	AA	A	BBB	BB	B	CCC	D	NR
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%
2022										
AAA	196	94.39%	1.53%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.08%
AA	385	4.42%	87.01%	2.86%	0.00%	0.00%	0.00%	0.00%	0.00%	5.71%
A	564	0.00%	5.50%	83.16%	4.96%	0.53%	0.00%	0.00%	0.71%	5.14%
BBB	231	0.00%	0.43%	3.46%	75.76%	3.46%	0.43%	0.87%	2.60%	12.99%
BB	19	0.00%	0.00%	0.00%	0.00%	36.84%	0.00%	10.53%	15.79%	36.84%
B	1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%
CCC	6	0.00%	0.00%	0.00%	0.00%	0.00%	16.67%	33.33%	16.67%	33.33%

Source: PEFINDO Database (2024)

A higher rating indicates consistency in remaining at the same rating, which is better than a lower rating. Higher ratings tend to stay at the same rating in the following year. In debt instruments, consistency is best demonstrated by the AAA rating. The AAA rating remained the same in the following year, with a percentage of 82.30%. This means that out of IDR2,040,856.58 billion of issuance value with AAA rating, IDR1,679,594.45 billion will remain in the rating of AAA in the following year.

Meanwhile, according to the issuing company, the AAA rating also shows the best consistency compared to lower ratings. The AAA rating has a percentage of 94.55% to remain in the AAA rating for the following year. This means that of the 220 issuing companies with AAA rating, as many as 208 issuing companies will remain at AAA rating in the following year.

Apart from having good consistency, higher ratings tend to have a higher percentage of upgrades compared to lower rankings. In the Debt Instrument Transition Matrix, the percentage of AA ratings rising to AAA ratings in the following year was 5.67%. Meanwhile, the percentage of AA ratings downgraded to A ratings was 1.21%. Of the cumulative value of debt securities issued with an AA rating of IDR1,314,338.53 billion, IDR74,551.35 billion experienced a rating increase (upgrade) to AAA in the following year, and only IDR 15,864.19 billion (1.21%) experienced a downgrade to A in the following year. Meanwhile, in the Issuing Company Transition Matrix, the AA rating that was upgraded to AAA was 4.59%. Meanwhile, the AA rating dropped to an A rating was 2.90%. Of the 414 companies issuing debt instruments with AA rating, 19 companies reported an increase in their rating from AA to AAA, and as many as 12 companies experienced a decrease in their rating from AA to A in the following year.

The opposite condition occurs at low ratings. Lower ratings tend to have a greater percentage of migrating to a D rating (default) in the following year compared to higher ratings. The rating with the largest percentage to migrate to a D rating (default) in the following year, either on the debt instrument or the company issuing the debt instrument, is the CCC rating. The percentage of CCC rating moving to D rating (default) in the following year for debt instruments is 28.84%. Meanwhile, based on the issuing company, the percentage is 28.57%. However, when compared with conditions at the end of 2022, conditions in 2023 experienced quite a significant increase because they were overshadowed by conditions of high-interest rates, which then put pressure on the company's financial performance. This condition will be more pronounced in companies with lower ratings. In 2023, the percentage of CCC rating moving to D rating (default) in the following year is higher than in 2022. For debt instruments, the percentage is 21.44%, while for the issuing company, it is 16.67%. Furthermore, the percentage of CCC's rating moving up to a B rating based on the debt instrument and the issuing company, respectively, amounted to 18.39% (lower than 2022: 20.30%) and 14.29% (lower than 2022: 16.67%).

Meanwhile, rating B on debt instruments and the issuing company has a percentage of 0.00% to move to a D rating (default). This low percentage occurred because, during the observation period, PEFINDO had limitations in monitoring debt securities and issuing companies with a B rating. However, this rating has the opportunity to lower to CCC rating at 23.71% in 2023.

2.8 *Cumulative Average Default Rate*

This study estimates the Cumulative Average Default Rate for ratings AAA, AA, A, BBB, BB, B, and CCC and the time horizon from the first year to the sixteenth year. The default rate with a time horizon of 16 years is the default rate based on historical data with that time horizon. Overall, the Cumulative Average Default Rate between the debt instrument rating and the issuing company rating shows the same pattern. The longer the time horizon, the greater the default rate for each rating category. In addition, the lower the rating, the greater the default rate.

Figure 10. Cumulative Average Default Rate of the Debt Instrument
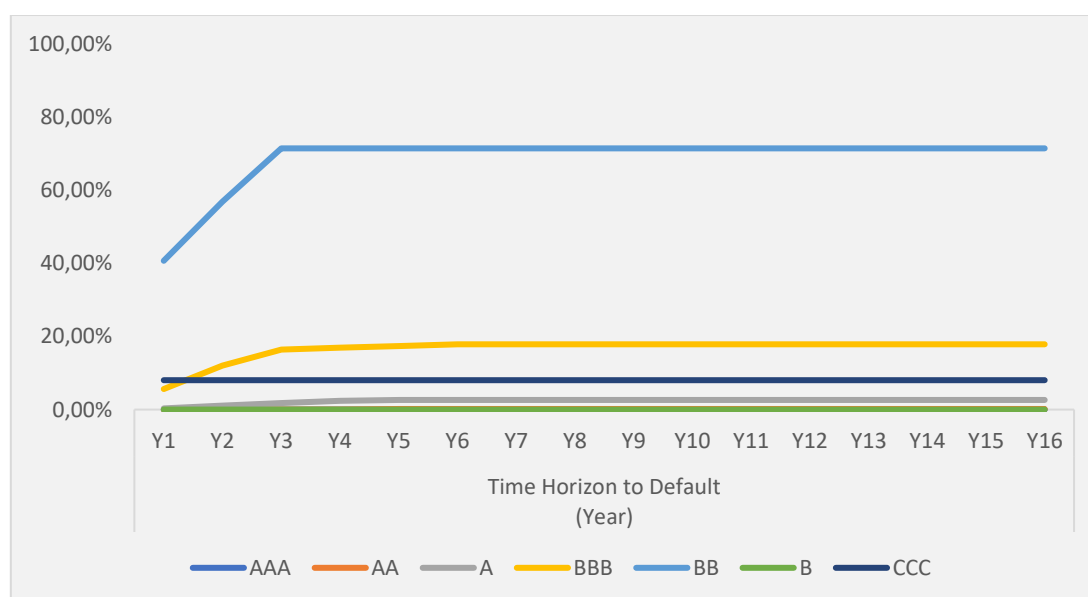
Source: PEFINDO Database (2024)

Debt instruments rated AAA, B, and CCC have a constant default rate throughout the 16-year time horizon. AAA ratings and B ratings have a default rate of 0.00%, while CCC ratings have a default rate of 8.04%. The low default rate at the AAA Rating (0.00%) indicates no default events at this rating during the observation period. Meanwhile, debt instruments with a rating of B also have a default rate of 0.00%, which is more because, during the observation period, PEFINDO had limitations in the monitoring population for debt securities with a rating of B.

The percentage of debt instruments rated AA continued to show a constant default rate of 0.00% during the first to fourth years but then experienced default for the first time in the fifth year, causing the percentage to increase to 0.17%. The default rate is constant with the same value until the sixteenth year. Cases of default with an AA rating only occurred once in 2012 in one of the shipping companies, and there was no additional case until 2023. Meanwhile, the default rate for debt instruments with an A rating in the first to fourth years is 0.33%, 1.05%, 1.79%, and 2.41%, respectively. Then, the percentage increases to 2.63% in the fifth year. Meanwhile, up to the sixteenth year, the percentage remained unchanged like the fifth year. The chance of default on debt instruments rated AA or A is relatively very low and within a fairly long period after the rating is active. Debt instruments with an A rating are in great demand on the market because, apart from offering a high coupon, the

risks involved are relatively lower than the ratings below. This can be proven by the relatively small chance of default.

Figure 11. Cumulative Average Default Rate of the Issuer Company
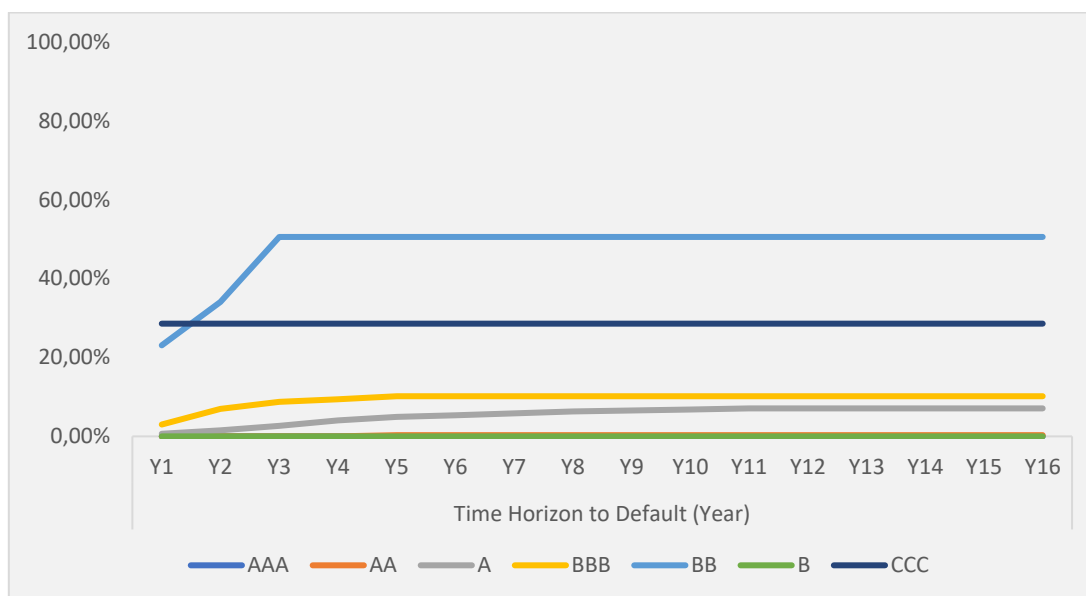
Source: PEFINDO Database (2024)

In comparison, the BBB rating had a default rate of 5.63% in the following year. The percentage continued to rise to 17.87% in the sixth year, which did not change until the sixteenth year. Meanwhile, the BB rating had a cumulative default rate of 40.75% in the first year. The percentage continued to rise to 71.53% in the third year and this value remained until the sixteenth year.

Issuers rated AAA, B, and CCC have constant default rates over 16 years. AAA and B ratings have a default rate of 0.00%, while CCC ratings have a default rate of 28.57%. Issuing companies with a B rating have a default rate of 0.00% due to PEFINDO's limitations in monitoring issuing companies with a B rating.

Issuing companies with an AA rating experienced default for the first time in the fifth year at 0.32%. The default rate is constant with the same value until the sixteenth year. The default rate for issuing companies with a BBB rating continued to increase from the first year (3.00%) to the fourth year (9.42%) before stabilizing starting in the fifth year at 10.17%. Meanwhile, issuing companies with a BB rating have a default rate of 23.08% in the first year, then increases to 50.55% in the third year and this value persists until the sixteenth 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 (2007-2023), 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. 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 the principal or coupon on the debt instrument when (or even before) it is due.
    4.2. 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 expired 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

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

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

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

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 occuring 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:

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

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:

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

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 $t_0, t_1, t_2, \dots, t_T$ is a discrete time point with time intervals $\Delta t_k = t_{k+1} - t_k$ and can be written as follows:

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

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:

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

A1.4 Theory of *Cumulative Average Default Rate*

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:

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

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

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

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
2007	1,000.00	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
2009	5,310.00	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
2011	15,034.50	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
2013	42,771.50	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
2015	114,055.60	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
2017	237,813.35	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
2019	294,347.90	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
2021	246,486.47	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
2023	237,551.41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Summary Statistic																	
Withdrawn Issuance Value		349,179	337,717	223,698	205,176	88,035	80,831	21,676	18,603	5,690	4,190	1,995	0	0	0	0	0
Defaultable Issuance Value		1,929,229	1,591,512	1,367,814	1,162,638	1,074,603	993,773	972,097	953,494	947,804	943,614	941,619	941,619	941,619	941,619	941,619	941,619
Default Issuance Value		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%
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%

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
2007	10,500.00	0	0	0	0	900	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
2009	36,511.74	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
2011	89,995.96	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
2013	130,128.51	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
2015	72,900.00	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
2017	85,691.00	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
2019	96,764.41	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
2021	110,625.91	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
2023																	
Summary Statistic																	
Withdrawn Issuance Value		195,084	202,932	179,440	171,984	109,963	109,155	43,574	43,138	17,020	17,870	16,565	2,195	2,195	0	0	0
Defaultable Issuance Value		1,202,300	999,369	819,929	647,945	537,982	427,927	384,353	341,215	324,195	306,325	289,760	287,565	285,370	285,370	285,370	285,370
Default Issuance Value		0	0	0	0	900	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%
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%

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
2007	11,525.00	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
2009	16,817.00	0	0	1340	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
2011	20,834.00	1340	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
2013	38,278.00	0	0	0	0	900	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
2015	52,608.78	0	0	1900	0	150	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
2017	80,931.39	50	0	491	266.12	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
2019	86,619.46	150	1426.12	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020	95,237.82	1426.12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	108,715.38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	138,120.12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023																	
Summary Statistic																	
Withdrawn Issuance Value		132,653	137,890	119,193	112,373	59,079	54,044	7,697	8,133	781	781	2,281	0	0	0	0	0
Defaultable Issuance Value		910,389	769,533	644,724	527,543	465,138	410,044	402,347	394,214	393,433	392,652	390,371	390,371	390,371	390,371	390,371	390,371
Default Issuance Value		2,966	5,616	4,807	3,326	1,050	0	0	0	0	0	0	0	0	0	0	0
Marginal Default Probabilities		0.33%	0.73%	0.75%	0.63%	0.23%	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		0.33%	1.05%	1.79%	2.41%	2.63%	2.63%	2.63%	2.63%	2.63%	2.63%	2.63%	2.63%	2.63%	2.63%	2.63%	2.63%

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
2007	2,275.00	0	675	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
2009	2,450.00	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
2011	2,410.00	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
2013	3,970.00	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
2015	5,967.88	0	42	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
2017	17,962.88	2100	0	200	200	0	400	0	0	0	0	0	0	0	0	0	0
2018	21,945.26	0	541	300	0	400	0	0	0	0	0	0	0	0	0	0	0
2019	23,679.26	1141	300	0	400	0	0	0	0	0	0	0	0	0	0	0	0
2020	36,104.02	0	2000	4715.5	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	36,518.19	2000	4715.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	27,788.87	4715.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023	14,682.64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Summary Statistic																	
Withdrawn Issuance Value		36,201	36,141	21,550	13,314	8,466	7,421	1,956	1,956	0	0	0	0	0	0	0	0
Defaultable Issuance Value		182,745	136,316	105,492	86,962	77,897	70,076	67,720	65,764	65,764	65,764	65,764	65,764	65,764	65,764	65,764	65,764
Default Issuance Value		10,289	9,274	5,216	600	400	400	0	0	0	0	0	0	0	0	0	0
Marginal Default Probabilities		5.63%	6.80%	4.94%	0.69%	0.51%	0.57%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Cumulative Default Probabilities		5.63%	12.05%	16.40%	16.97%	17.40%	17.87%	17.87%	17.87%	17.87%	17.87%	17.87%	17.87%	17.87%	17.87%	17.87%	17.87%

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
2007	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
2009	750.00	600	150	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
2011	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
2013	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
2015	328.00	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
2017	1,962.00	1000	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
2019	570.00	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
2021	600.00	0	400	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
2023	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
Defaultable Issuance Value		4,663	2,012	1,181	781	781	0	0	0	0	0	0	0	0	0	0	0
Default Issuance Value		1,900	550	400	0	0	0	0	0	0	0	0	0	0	0	0	0
Marginal Default Probabilities		40.75%	27.34%	33.87%	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%
Cumulative Default Probabilities		40.75%	56.94%	71.53%	71.53%	71.53%	71.53%	71.53%	71.53%	71.53%	71.53%	71.53%	71.53%	71.53%	71.53%	71.53%	71.53%

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
2007	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
2009	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
2011	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
2013	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
2015	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
2017	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
2019	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
2021	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
2023	2177	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
Defaultable Issuance Value		2,457	2,177	2,177	2,177	2,177	2,177	2,177	2,177	2,177	2,177	2,177	2,177	2,177	2,177	2,177	2,177
Default Issuance Value		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%
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%

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
2007	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
2009	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
2011	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
2013	280.00	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
2015	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
2017	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
2019	781.00	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
2021	931.00	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
2023	11,509.70	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
Defaultable Issuance Value		15,228	13,072	12,291	11,510	11,510	11,510	11,510	11,510	11,510	11,510	11,510	11,510	11,510	11,510	11,510	11,510
Default Issuance Value		1,225	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Marginal Default Probabilities		8.04%	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%	0.00%	0.00%
Cumulative Default Probabilities		8.04%	8.04%	8.04%	8.04%	8.04%	8.04%	8.04%	8.04%	8.04%	8.04%	8.04%	8.04%	8.04%	8.04%	8.04%	8.04%

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
2007	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
2009	2	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
2011	4	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
2013	7	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
2015	16	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
2017	23	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
2019	28	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
2021	24	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
2023	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Summary Statistic																	
Withdrawn Issuer		9	7	5	5	4	4	3	3	2	1	0	0	0	0	0	0
Defaultable Issuer		237	230	225	220	216	212	209	206	204	203	203	203	203	203	203	203
Default Issuer		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%
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%

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
2007	7	0	0	0	0	1	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
2009	18	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
2011	30	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
2013	34	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
2015	23	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
2017	29	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
2019	30	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
2021	31	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
2023	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Summary Statistic																	
Withdrawn Issuer		25	25	25	24	21	15	10	8	7	7	7	4	4	4	1	0
Defaultable Issuer		412	387	362	338	317	301	291	283	276	269	262	258	254	250	249	249
Default Issuer		0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Marginal Default Probabilities		0.00%	0.00%	0.00%	0.00%	0.32%	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%	0.32%	0.32%	0.32%	0.32%	0.32%	0.32%	0.32%	0.32%	0.32%	0.32%	0.32%	0.32%

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
2007	17	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
2009	22	0	0	1	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
2011	32	1	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
2013	46	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0
2014	45	0	0	0	2	0	1	0	0	1	0	0	0	0	0	0	0
2015	47	0	0	2	0	2	0	0	1	0	0	0	0	0	0	0	0
2016	46	0	1	0	2	0	0	1	0	0	0	0	0	0	0	0	0
2017	47	1	0	2	1	0	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
2019	46	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
2020	45	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	38	0	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
Summary Statistic																	
Withdrawn Issuer		32	37	38	34	29	25	15	15	10	5	4	1	1	1	1	1
Defaultable Issuer		609	568	525	485	449	420	403	386	374	368	363	361	360	359	358	357
Default Issuer		4	5	6	7	4	2	2	2	1	1	1	0	0	0	0	0
Marginal Default Probabilities		0.66%	0.88%	1.14%	1.44%	0.89%	0.48%	0.50%	0.52%	0.27%	0.27%	0.28%	0.00%	0.00%	0.00%	0.00%	0.00%
Cumulative Default Probabilities		0.66%	1.53%	2.66%	4.06%	4.92%	5.37%	5.84%	6.33%	6.58%	6.83%	7.09%	7.09%	7.09%	7.09%	7.09%	7.09%

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
2007	5	0	1	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
2009	7	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
2011	7	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
2013	13	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
2015	17	0	1	0	0	1	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
2017	25	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	28	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2019	26	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020	26	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	23	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	18	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Summary Statistic																	
Withdrawn Issuer		30	31	27	25	11	10	5	3	3	2	2	1	0	0	0	0
Defaultable Issuer		233	195	160	132	120	109	104	101	98	96	94	93	93	93	93	93
Default Issuer		7	8	3	1	1	0	0	0	0	0	0	0	0	0	0	0
Marginal Default Probabilities		3.00%	4.10%	1.88%	0.76%	0.83%	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		3.00%	6.98%	8.73%	9.42%	10.17%	10.17%	10.17%	10.17%	10.17%	10.17%	10.17%	10.17%	10.17%	10.17%	10.17%	10.17%

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
2007	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
2009	1	1	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
2011	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
2013	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
2015	1	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
2017	3	1	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
2019	2	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
2021	3	0	1	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
2023	1	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
Defaultable Issuer		13	7	4	3	2	1	1	1	1	1	1	1	1	1	1	0
Default Issuer		3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Marginal Default Probabilities		23.08%	14.29%	25.00%	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		23.08%	34.07%	50.55%	50.55%	50.55%	50.55%	50.55%	50.55%	50.55%	50.55%	50.55%	50.55%	50.55%	50.55%	50.55%	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
2007	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
2009	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
2011	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
2013	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
2015	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
2017	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
2019	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
2021	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
2023	1	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
Defaultable Issuer		2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Default Issuer		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%	
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%	

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
2007	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
2009	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
2011	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
2013	1	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
2015	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
2017	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
2019	1	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
2021	1	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
2023	2	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
Defaultable Issuer		7	4	3	2	2	2	2	2	2	2	2	2	2	2	2	2
Default Issuer		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Marginal Default Probabilities		28.57%	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		28.57%	28.57%	28.57%	28.57%	28.57%	28.57%	28.57%	28.57%	28.57%	28.57%	28.57%	28.57%	28.57%	28.57%	28.57%	28.57%

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