



PEFINDO
CREDIT RATING AGENCY



THE DEFAULT STUDY

OF CORPORATE AND
CORPORATE DEBT SECURITIES
RATED BY PEFINDO

2007 - 2022

**ECONOMIC RESEARCH DIVISION
OF PT PEFINDO**

PT Pemeringkat Efek Indonesia (PEFINDO)
Equity Tower, 30th Floor, Sudirman Central Business District Lot 9
Jl. Jendral Sudirman Kav. 52 – 53, Jakarta 12190, Indonesia
Telephone : +62 21 509 684 69, Fax : +62 21 509 684 68
www.pefindo.com

EXECUTIVE SUMMARY

The global economy in 2022 is faced with the challenge of continuing to recover from the impact caused by the Covid-19 pandemic. On the other hand, Russia-Ukraine geopolitical tensions since the beginning of 2022 and the imposition of sanctions that followed have also caused supply chain disruptions in various commodities around the world, which then caused energy and food prices to soar. Domestic supply conditions and each country's policy responses resulted in varying inflationary pressures. As a result, various central banks around the world adopted a policy of monetary tightening, which resulted in a slowdown in growth in various countries and in the world. Amid a global economic slowdown, Indonesia's economic recovery in 2022 was able to record good results and was higher than the growth before the Covid-19 pandemic. In the full year, Indonesia's economic growth recorded an impressive growth of 5.31%. This impressive achievement was supported by the recovery in household consumption, which is the main contributor to the economy, as well as high export growth due to the commodity price windfall. However, on the other hand, Indonesia is also not free from the global economic turmoil that has occurred. The strengthening of the United States Dollar due to the increase in the Fed's benchmark interest rate has put pressure on capital outflows and depreciated the rupiah.

Based on these conditions, uncertainty remains a challenge for the country's business activities. These challenges also have an impact on the company's business and financial performance, affecting its ability to meet financial obligations and the company's default rate in 2022. PEFINDO notes that one of its rated companies, PT Waskita Beton Precast Tbk. (WSBP), has failed to meet its financial obligations in 2022. This condition is better than in 2020 and 2021, where default occurred in 4 (four) and 2 (two) companies, respectively. The fewer annual default incidents show the recovery of the business world in Indonesia.

The default rate of Debt Instruments rated by PEFINDO, and its ranking published cumulatively from 2007 to 2022 was 1,01% by 2022, while the issuing Company failed at 6.16%. The default rate is divided into several sectors, industries, and initial ratings. The default rates for Debt Instruments and issuing companies were 2.37% and 7.97%, respectively, in the non-financial sector. Meanwhile, it was 0.09% and 2.74% in the financial institutions sector (FIN). PEFINDO noted that defaults occurred in ten industries, both in Debt Instruments and Issuing Companies. The shipping industry (SHIP) has the highest default rate until 2022, both for Debt Instruments and issuing companies. Most default rates on Debt Instruments and Issuing companies were caused by the company's failure to fulfill coupon payments, respectively 0.82% and 3.79%. BBB's initial rating has the highest default rate until 2022 for both the Debt Instrument and the issuing company. Debt Instruments with an initial rating of BBB have a default rate of 9.01% while issuing companies with an initial rating of BBB have a default rate of 11.63%.

In the 1-year rating transition matrix, from 2007 to 2022, higher ratings for Debt Instruments and Issuing Companies show better consistency (remain at the same rating) compared to lower ratings. In addition to having good consistency, higher ratings tend to have a higher percentage of upgrading compared to lower ranks. If the percentage of consistency and rating increase is greater at a higher rating, a different condition is indicated by a lower rating. Lower ratings tend to have a greater percentage of migrating to D ratings (default) in the following year, compared to higher ratings. Meanwhile, the calculation results of the Cumulative Average Default Rate over a span of 15 years, for both Debt Instruments and Issuer Companies, have the same pattern. The longer the time span, the higher the default rate of each rating. Meanwhile, with regard to ratings, the lower the rating, the greater the default rate.

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1. Introduction

After the global economy faced the Covid-19 Pandemic in 2020 and 2021, the global economy will face challenges to continue its recovery in 2022. Bank Indonesia projects the global economy to grow 3.00% in 2022 after growing 6.00% in 2021. Global risks are triggered by the war between Russia and Ukraine, which has again increased global political and economic fragmentation. Russia-Ukraine geopolitical tensions and the subsequent imposition of sanctions have disrupted world commodity supply chains and caused energy and food prices to soar. Russia is the world's third largest oil producer after Saudi Arabia and the United States, while Ukraine accounts for 10% of supply in the world wheat market, 15% in the corn market, and 50% in the world sunflower oil market. This disruption then triggered high inflation in the world, in addition to those caused by increased prices due to increased aggregate demand in line with higher economic growth.

Inflationary pressures varied between countries, influenced by domestic supply conditions and the policy responses pursued by each country. Political and economic fragmentation in developed countries has slowed demand and increased uncertainty on global financial markets. Global inflation is expected to increase from 5.70% in 2021 to 9.10% in 2022. This triggered monetary policy tightening, which had previously been implemented by several central banks, particularly in developed countries, resulting in a slowing of global economic growth.

Amid a global economic slowdown, Indonesia's economic recovery in 2022 produced positive results, outperforming growth prior to the Covid-19 pandemic. This is reflected in Indonesia's economic growth of 5.01% in the fourth quarter of 2022. (YoY). In the full year, Indonesia's economy grew by an impressive 5.31%. (YoY). This achievement was supported by the recovery in household consumption, which so far has been the main contributor to the economy. In addition, economic growth was also supported by high export growth due to the commodity price windfall. Exports grew by double digits, reaching 14.93% (YoY). Meanwhile, imports grew 6.25% (YoY), driven by increased imports of capital goods and raw materials. The economic recovery has provided more jobs and pushed the unemployment rate down. All business sectors will experience growth in 2022. The transportation and warehousing sector are the sector with the highest growth of 16.99% (YoY), followed by the accommodation and food and beverage sector, which grows by 13.81% (YoY) which is driven by increasing community mobility and increasing tourist visits, both foreign and domestic. This means that the quality of economic growth is also getting better.

On the other hand, the Indonesian economy in 2022 will also be exposed to the global economic turmoil that has occurred. The strengthening of the United States dollar due to the aggressive increase in the Fed's benchmark interest rate has resulted in outflows of foreign capital and depreciating pressure on the rupiah. The rupiah has depreciated by approximately 9.10% year to date. In addition, Indonesia is also experiencing inflationary pressure due to rising food and energy commodity prices. The increase in the price of fuel oil (BBM) in September 2022 had increased inflation, which was quite high. Pressure on the exchange rate and rising inflation prompted Bank Indonesia to take steps to tighten monetary policy, whereby at the end of the fourth quarter, the BI 7-Day Reverse Repo Rate (BI7DRR) was raised by 25 basis points to 5.50%.

Uncertainty in the global and domestic economies presents a challenge for business activities, affecting business prospects such as income and the financial obligations of issuers. PEFINDO noted that one company that PEFINDO rated failed to fulfill its financial obligations during 2022, namely PT Waskita Beton Precast Tbk. (WSBP). The default was caused by WSBP's inability to pay coupons for Continuous Bonds I Phase I and II of 2019, worth IDR2.00 trillion. As a result, this will have an impact on the company's default rate in 2022. The number of companies that have failed to pay has decreased when compared to previous years, where 2 companies defaulted in 2021 and 4 companies defaulted in 2020. However, there are still several companies that are delaying their payment obligations, resulting in a downgrade of the rating in 2022. This indicates that the condition of domestic companies continues to improve after being hit by the Covid-19 pandemic.

PEFINDO prepared a default study report, which contains a review of the default rate of issuing companies and Debt Instruments rated and published by PEFINDO based on total classification, sector, industry, initial rating, and reasons for default, review 1-year rating transition matrix and the Cumulative Average Default Rate during the same period. This report was prepared with the aim of providing a better understanding of the risk side for stakeholders in the Indonesian capital market, especially the corporate Debt Market. Therefore, it is hoped that this Default Study Report will be able to become a reference for stakeholders in viewing the development and risk of national corporate debt securities.

2. Research Methodology

2.1 Data dan Source Data

The population used as data is if a company issues a Debt Instrument that is rated and published by PEFINDO during the observation period (2007-2022). Data is divided into two groups, namely data for Debt Instruments and data for Issuing Companies. The data sources used in this study came from Indonesia Rating Highlights (IRH), Rating Announcements (RA), Press Releases (PR)/Rating Summary, Rating Rationale (RR), and other data sources from PEFINDO. The restriction of the observation period and the total of population (data) included in the study were carried out solely so that the Debt Instruments and Issuing Companies could be more easily monitored and better analyzed.

2.2 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 follow:

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 Issuer 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 (2007-2022), either the rating of the Debt Instrument or the Issuer Company, is the rating as of December 31 of that year.

Example : If a Debt Instrument or Issuer Company is rated AA+ (Double A Plus) in 2012, then it is the rating of Debt Instrument or Issuer Company as of December 31, 2020.

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

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 Issuer Company is unable to meet part or all the principal or interest on the Debt Instrument when (or even before) it is due.

- 4.2. Default for the Issuer 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 Issuer Company is declared as default, then the Issuer Company will be considered as the new entity when the company issues a new Debt Instrument or if the company has another instrument that still listing (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 Issuer Companies is where the Issuer Company is no longer rated by PEFINDO. NR will be given to an Issuer 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).

2.3 Default Rate Theory

The default rate is calculated based on the Debt Instrument and Issuer Company on an annual basis during the observation period. The calculation of the default rate for Debt Instruments and Issuer Companies on annual basis during the observation period is also carried out by dividing by sector, industry, initial rating, and reason of default.

Cutler and Edeler (1958), said that the default rate the ratio of cumulative values based on discrete time, which is commonly used by the global 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 Issuer Company, the value used for the calculation of the default rate is the "unit" of the Issuer Company. The formulation for calculating the default rate for Debt Instruments and Issuer Companies is as follows:

1. The Debt Instrument

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

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. Issuer Companies

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

Explanation:

DeR_t : Default rate at time t .

DI_k : Total Issuer Companies that have defaulted at time k .

I_k : Total Issuer Companies at time k .

2.4 Theory of Rating Transition Matrix

The Rating Transition Matrix is a matrix that is used to calculate the percentage of transitional ratings that occur 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 certain 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, it is possible that a Debt Instrument value will 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:

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

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 state i , will make a transition into state j (Ross, 2007).

Based on equation (3), we can write $P_{ij} = P(X_1 = j | X_0 = i)$ 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:

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

One of estimation methods for calculating the P_{ij} value that will be used to fill the elements contained in the matrix \mathbf{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:

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

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:

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

2.5 Theory of Cumulative Average Default Rate

Cumulative average default rate describes the rate of default of the Debt Instrument or the Issuer Company in a year within a certain time horizon. In general, to calculate the cumulative average default rate, the first step is to create a static pool. The static pool is a change in a rating of the instrument debt or the Issuer Company within a certain period. After creating a static pool, the second step is to calculate the Marginal Default Rate.

If $m_t^Y(R)$ is the amount of issuance value of the Debt Instrument or number of the Issuer Company which has rating R (AAA, AA, A, BBB, BB, B, CCC), which is still the amount of issuance value of the Debt Instrument or number of the Issuer Company that has rating 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 number of the Issuer 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), 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:

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

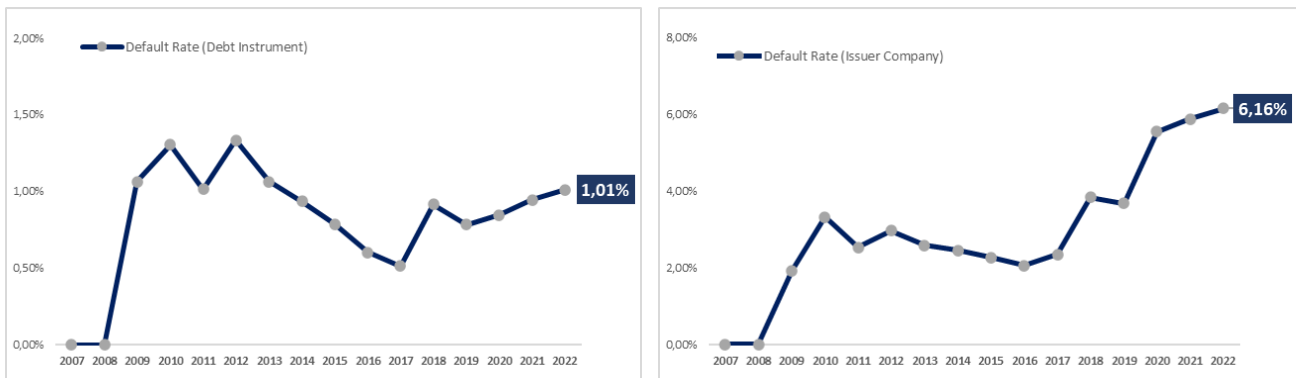
3. Analysis

3.1 Overview

Between 2007 and 2022, the total value of debt issuance and the number of issuing companies will be IDR1,132.30 trillion and 211, respectively. In 2022, an additional seven publishing houses will issue Debt Instruments. When an entity issues its first Debt Instrument, it is declared as a new issuer. Of the IDR 132.97 trillion issuance value of instruments in 2022, around 62.78% of this value is issued by companies from the Non-Financial Institution sector and around 48.72% of IDR83.29 trillion are instruments rated A (Single-A). In 2022, there will be an additional seven new entities issuing Debt Instruments. An Issuing Company will be declared as a new Issuing Company when it first issues a Debt Instrument. The seven new Issuer Companies come from the Non-Financial Institution sector, and 85,71% of whom the majority have an A (Single-A) initial rating. In terms of the issuance value of Debt Instruments, the instrument issuance value in 2022 is IDR132.97 trillion

(Published). The recorded issuance values are debt securities issued through a public offering or without a public offering (not registered with KSEI). This value is the second highest value after 2017 during the observation period. Of the IDR132.97 trillion issuance value of instruments in 2022, around 62.78% of this value is issued by companies from the Non-Financial Institution sector and around 48.72% of IDR83.29 trillion are instruments rated A (Single-A).

Figure 1. Annual Default Rate



Source: Database PEFINDO (2023)

In 2022, only one company will experience default, and the issuance value will be IDR2.00 trillion, namely PT Waskita Beton Precast Tbk. (WSBP). The default that occurred at the WSBP company was due to the company's inability to pay coupons for Continuous Bonds I Phase I and II of 2019 which matured in January 2022. Judging from the number of companies, this condition was better compared to 2021 where there were 2 companies (IDR1.73 trillion), and in 2020 there were 4 companies (IDR1.29 trillion). Furthermore, when viewed from the entire observation period from 2007 to 2022, the issuance value of debt instrument that experienced default was around IDR11.46 trillion, with 13 issuers. Debt instruments that experience default along with the company issuing them are also classified into several sectors and industries based on the initial rating of the instrument when it was first listed and the initial rating of the issuing company when it first issued the Debt Instrument. Based on the formula in equation 1, the Debt Instrument default rate in 2022 is 1.01%, while the Issuer Company default rate is 6.16% in the same year. The percentage of default rate increased slightly when compared to last 2021 due to additional defaults by PT Waskita Beton Precast Tbk. (WSBP) with an issuance value of IDR 2.00 trillion.

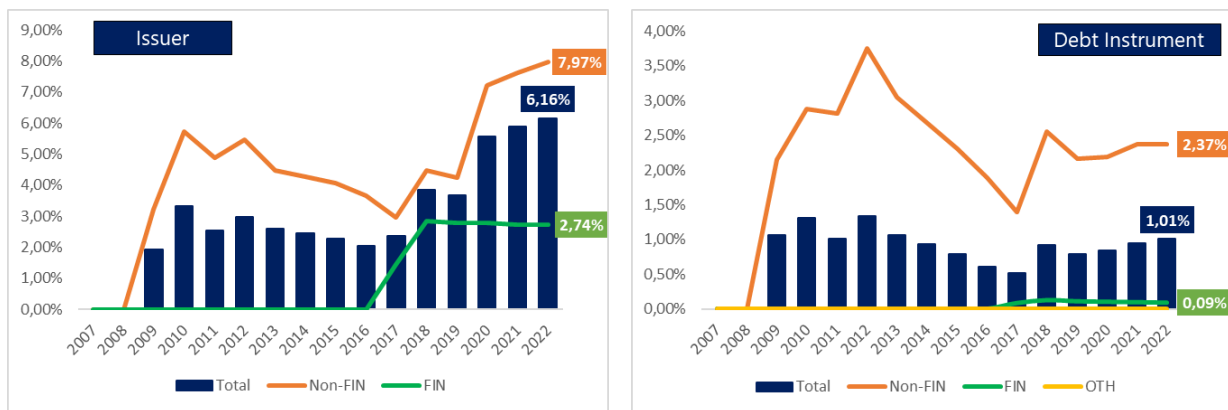
3.2 Default Rate Per Sector

The classification of sectors in Debt Instruments is divided into three: the Non-Financial Institution (Non-FIN), Financial Institution (FIN) and other sectors (OTH). The Non-FIN sector consists of Debt Instruments from companies issuing in addition to financial institutions such as banks, insurance, and securities. The FIN sector consists of is financial institutions. Other sectors (OTH) consist of Debt Instruments that are not from the corporate and financial institutions sectors. Debt Instruments in the OTH sector include asset-backed securities (ABS), infrastructure funds (DINFRA),

and Debt Instruments issued by municipal governments. Because no municipal governments issued Debt Instruments during the observation period, the Debt Instruments included in OTH were only ABS and DINFRA.

The sector classification of the Issuer Companies is divided into two sectors, namely the Non-Financial Institution (Non-FIN) and Financial Institution (FIN). This refers to the same meaning as the classification of the Debt Instrument. The FIN sector is financial institutions, while Non-FIN is non-financial Issuer Companies.

Figure 2. Default Rate Per Sector



Source: Database PEFINDO (2023)

The default rate of Non-FIN sector Debt Instruments in 2022 is 2.37%. However, the default rate for the FIN sector has continued to decline since 2019, then is relatively stable, and is at 0.09% in 2022. Meanwhile, there were no defaults in the OTH sector during the observation period. Based on the Issuing Companies, the default rate in the Non-FIN sector will continue to increase to 7.97% until 2022. This increase occurs because there are companies in the Non-FIN sector that experience default in 2022 but are not accompanied by the addition of new companies issuing debt securities in 2022. Meanwhile, the FIN sector default rate was 2.78, experiencing a steady decline since 2020.

3.3 Default Rate per Industry

PEFINDO classifies the industry for Debt Instrument into 42 industries while the industry for Issuing Companies is 40 industries. This difference is because EBA instruments and DINFRA instruments do not have issuers in the form of corporate entities. Therefore, both are not included in the industrial classification of the Issuing Company. The following is a list of industries for Debt Instruments and Issuers used in this default study:

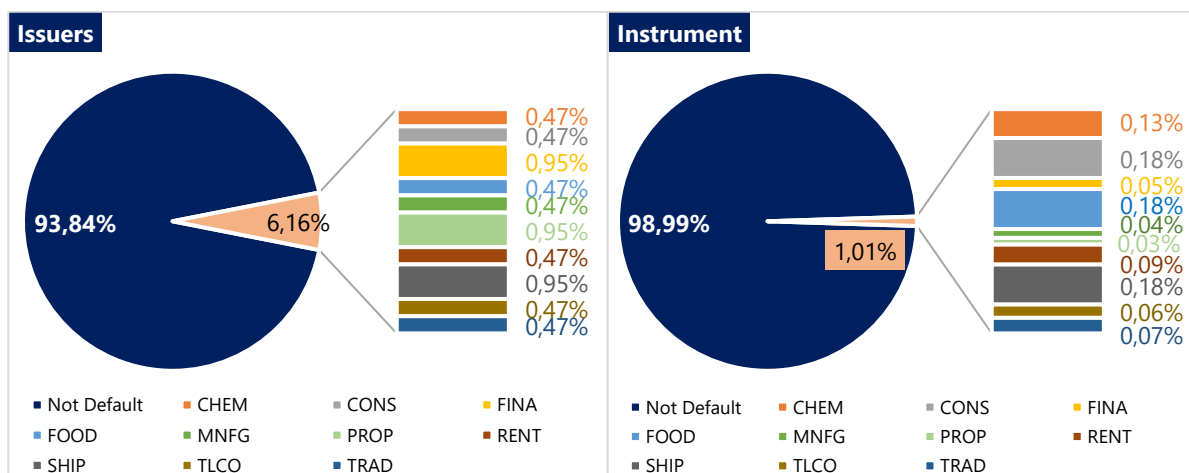
Figure 3. List of Industrial Classifications

No.	Ticker	Industry	No.	Ticker	Industry
1	ABSE	Asset Backed Securities **	22	MINC	Mining Contractor
2	ANHS	Animal Feed and Animal Husbandry	23	MINE	Mining
3	ARPT	Airport	24	MNFG	Manufacture
4	AUTO	Automotive	25	PHAM	Pharmacy
5	BANK	Banking	26	PLAN	Plantation
6	CEME	Cement	27	POWR	Electricity & Energy
7	CHEM	Chemical	28	PROP	Property
8	CONS	Construction	29	PULP	Pulp & Paper
9	COUR	Courier and Logistics Services	30	RENT	Vehicle Rental & Transportation
10	DINF	DINFRA **	31	REST	Restaurant
11	EPCC	Procurement & Construction Engineering	32	RETL	Retail
12	FERT	Fertilizer	33	SCRT	Security
13	FINA	Multifinance	34	SHIP	Shipping
14	FINN	Finance Industry	35	SPFI	Special Financial Institutions
15	FISH	Fisheries	36	SPRT	Seaports
16	FOOD	Food and Beverage	37	SUGA	Sugar Processing
17	HEAL	Healthcare	38	TIMB	Woodbase & Agro
18	HLDI	Holding Investment Company	39	TLCO	Telecommunication
19	ITEQ	Information Technology & Information Services	40	TOBA	Tobacco
20	LESR	Tourism & Recreation Objects	41	TOLL	Toll Road
21	MEDA	Media	42	TRAD	Trading & Distribution

Explanation: **Industries not included in the Issuer Company Industry classification.
Source: PEFINDO Database (2023)

Because the default assumption is based on the Debt Instrument issued by entities, industries that have defaulted in this paper will be the same, both for the Debt Instrument and the Issuers. The difference between the two lies only in the industry's default rate for the Debt Instrument and Entity Issuers.

Figure 4. Percentase of Default and Non-Default Per Industry



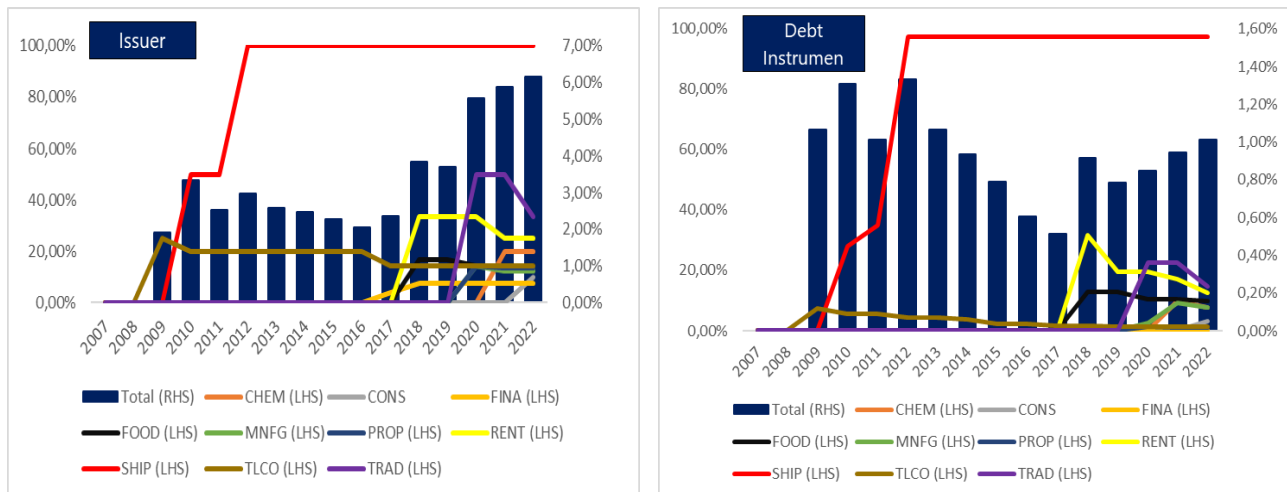
Source: Database PEFINDO (2023)

From 2007 until 2022, PEFINDO noted that 93.84% of the total issuers were other industries outside of the ten industries that experienced default. Furthermore, 98.99% of the total debt instruments were instruments other than the ten sectors that experienced default. In debt instruments, the highest default rate from 2007 to 2022 is the shipping industry (SHIP). This industry has a default rate of 97.21% due to defaults that occurred at PT Arpeni Pratama Ocean Line Tbk in 2010 and 2011 IDR0.75 trillion and PT Berlian Laju Tanker Tbk in 2012 with a value of IDR1.40 trillion. The default rate of this industry is still the same from 2012 to 2022 because there has been no additional issuance of debt instruments from this industry.

Meanwhile, the finance company industry (FINA) has the lowest default rate when compared to ten other industries that report defaults until 2022. The default rate for the finance company industry until 2022 has fallen to 0.29%. The decline in the default rate in this industry occurred because this industry is active in issuing corporate debt securities. Together with the banking industry, the finance company industry is the dominant industry in issuing debt securities.

Then, for seven other industries that have experienced default, most default rates until 2022 have decreased from 2021. They include 14.63% (TRAD); 12.71% (RENT); 9.79% (FOOD); 7.84% (MNFG); 7.83% (CHEM); 1.23% (TLCO); and 1.05% (PROP). Meanwhile, a new industry that was recorded to have failed to pay, namely the Construction Industry (CONS) with a default rate of 3.11% until 2022 along with a default that occurred at one construction company in early 2022.

Figure 5. Default Rate Per Industry



Source: Database PEFINDO (2023)

In Issuing Companies, among industries that experience default, the highest and lowest default rates from 2007 to 2022 are still held by the same industry as in Debt Instruments, namely the shipping industry and the finance company industry. Although, their default percentage is different when compared to calculations based on Debt Instruments because it uses a different numerator and denominator. From 2007 to 2022, the default rate for Issuing Companies in the Shipping industry (SHIP) is 100%, this is because there are only two companies that have issued debt

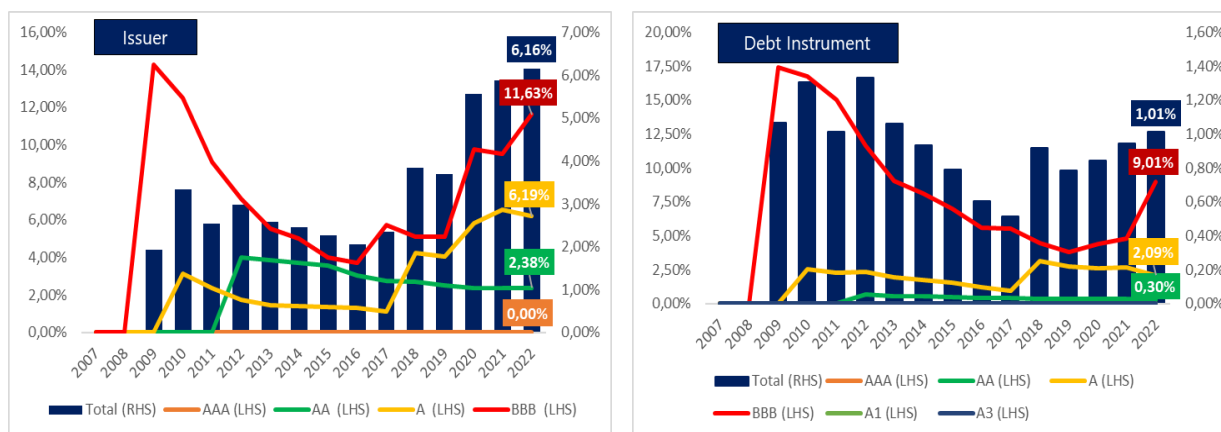
securities in this industry (rated PEFINDO), and both have defaulted. and there will be no additional additions until 2022. Meanwhile, multifinance industry (FINA) has a default rate of 7.41% with the number of companies experiencing defaults of two company units, in 2017 and 2018 respectively. For the other eight industries, the default rate from 2007 to 2022 is 33.33% (TRAD); 25.00% (RENT); 20.00% (CHEM); 14.29% (FOOD, TLCO); 13.33% (PROP); and 12.50% (MNFG); and 10.00% (CONS).

3.4 Default Rate per Initial Rating

The initial rating is the first rating received by the Issuing Company or Debt Instrument. For calculations based on the Issuing Company, the initial rating is the rating received by the company when it first issues the Debt Instruments. In other words, it was the first time it became the new Issuers. 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 debt instruments were AAA, AA, A, BBB, A1 and A3. Ratings A1 and A3 are ratings for short-term instruments. Meanwhile, the initial ratings for Issuer Companies are AAA, AA, A, and BBB.

Calculation of the default rate based on the initial rating is carried out to provide information regarding the level of risk inherent in the initial rating. In other words, it explains how big the chance of corporate bonds will default if they have a certain rating.

Figure 6. Default Rate Per Initial Rating



Source: Database PEFINDO (2023).

The default rate for Debt Instruments until 2022 has decreased from the previous year for initial ratings AA and A. AA and A default rates fell to 0.30% and 2.09%, respectively, from the previous 0.32% and 2.65% at the end of 2021. On the other hand, the default rate for initial BBB rating increase to 9.01% each year until 2022 (2021; 4.80%) in line with defaults that occur in companies in the construction industry that is rated early BBB. Meanwhile, the initial ratings are AAA, A1, and A3, the default rate during the observation period is 0.00%. In other words, there were no debt instruments rated AAA, A1 and A3 that experienced default during the observation period. The

data confirms consistency with the hypothesis that those with higher ratings have lower default rates than those with lower ratings.

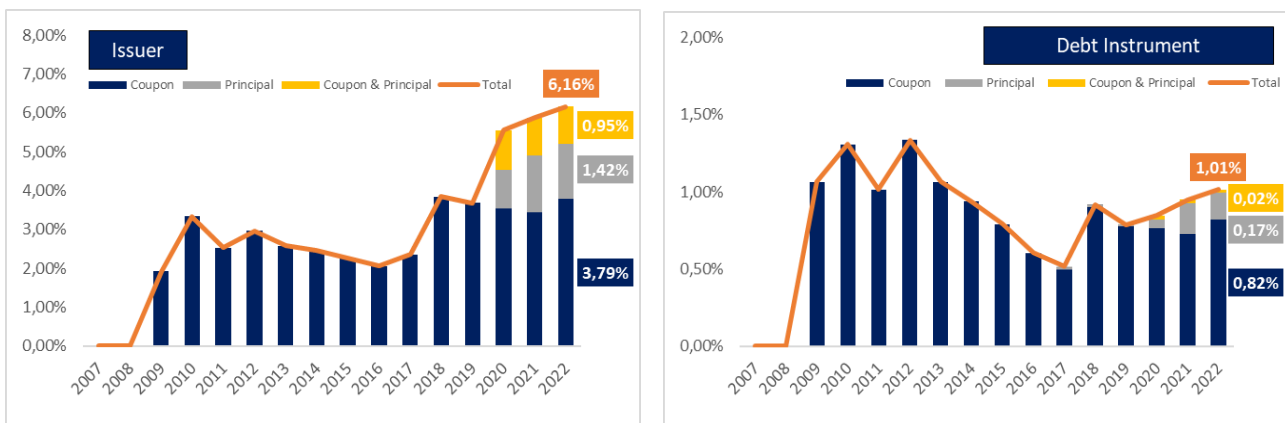
Meanwhile, for entities with BBB rating, default rate until 2022 is 11.63%. The default rates for initial ratings AA and A up to 2022 are 2.38% and 6.19%, respectively. Furthermore, the initial rating AAA has a default rate of 0.00% from 2007 to 2022 or in other words, no Issuer Company with an initial rating of AAA has defaulted on the debt instruments it issues.

3.5 Default Rate per Reason

The calculation of the default rate based on the cause is carried out to provide information about how high the default rate is based on several reasons that cause debenture instruments and companies to default. In a general definition, debentures and companies are in default if a company fails to pay one or more of its financial obligations that are due. Meanwhile default occurs if it fails to fulfill coupon payments, fulfill principal payments, or fulfill both interest and principal payments.

From 2007 to 2022, cumulatively, the issuance value of bonds that have defaulted is IDR11.46 trillion. Meanwhile, the number of issuing companies that failed to pay was 13 companies.

Figure 7. Default Rate per Reason



Source: Database PEFINDO (2023).

In Debt Instruments, from a default rate of 1.01% until 2022, 0.82% or IDR9.26 trillion, some of which occur due to the company's failure to fulfill coupon payments, 0.17% or IDR1.97 trillion. principal payments, and 0.02% or IDR0.23 trillion, among others, due to failure to meet principal and coupon payments. Meanwhile, from the default rate at the Issuing Company of 6.16%, there are 3.79% or 8 companies of which occurred due to the company's failure to fulfill coupon payments, then 1.42% or 3 of these companies were due to failure to fulfill payments principal, and 0.95% or 2 companies of which failed to meet principal and coupon payments.

3.6 One Year Rating Transition Matrix

Rating Transition Matrix is a matrix that shows the percentage change in rating within a certain time. Rows in the Rating Transition Matrix represent the initial rankings. Meanwhile, the column in the Rating Transition Matrix states the change in rank at some point thereafter. Meanwhile, the elements in the matrix are the proportion of changes in the ranking category in the row to the ranking category in the column. This study uses a 1-year Rating Transition Matrix. Thus, a change in rating on the Matrix is a change in rating for one year after the initial rating was published.

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

From/To	Σ Issuance Value (IDR billion)	AAA	AA	A	BBB	BB	B	CCC	D	NR
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%	79.46%	1.36%	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%
2021										
AAA	1,541,308.92	83.79%	0.78%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	15.43%
AA	1,090,575.73	5.50%	80.46%	1.37%	0.00%	0.17%	0.00%	0.00%	0.00%	12.51%
A	650,724.88	0.21%	4.47%	76.89%	4.34%	0.39%	0.02%	0.00%	0.46%	13.23%
BBB	139,955.97	0.00%	0.41%	5.51%	74.34%	3.05%	0.20%	0.55%	2.55%	13.39%
BB	10,221.50	0.00%	0.00%	0.00%	0.00%	21.65%	0.00%	9.11%	18.59%	50.65%
B	400.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	70.00%	0.00%	30.00%
CCC	2,917.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	58.69%	28.28%	13.03%

Source: Database PEFINDO (2023)

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

From/To	∑ Issuer (Unit)	AAA	AA	A	BBB	BB	B	CCC	D	NR
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%
2021										
AAA	172	95.35%	1.74%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.91%
AA	354	4.24%	87.85%	2.82%	0.00%	0.00%	0.00%	0.00%	0.00%	5.08%
A	523	0.00%	4.97%	83.94%	5.35%	0.57%	0.00%	0.00%	0.76%	4.40%
BBB	208	0.00%	0.48%	3.85%	75.96%	3.85%	0.48%	0.96%	2.40%	12.02%
BB	16	0.00%	0.00%	0.00%	0.00%	43.75%	0.00%	6.25%	18.75%	31.25%
B	1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%
CCC	5	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	40.00%	20.00%	40.00%

Sourcer: Database PEFINDO (2023)

Higher ratings show better consistency of staying at the same rating than lower ratings. A higher rating tends to remain at the same rank one year later. For Debt Instruments, consistency is best demonstrated by AAA ratings. The AAA rating remained at the same level one year later with a percentage of 83.49%. This means that of the IDR1,787,795.38 billion issuance value that has an AAA rating, IDR1,492,715.58 billion will still be rated AAA in the following year. Meanwhile, based on the Issuer Company, the AAA rating also shows the best consistency compared to a lower rating. The AAA rating has a percentage of 94.39% to remain at AAA in the following year. This means that out of 196 Issuer Companies with AAA ratings, 185 Issuer Company Units will still be rated AAA in the following year.

In addition to having good consistency, higher ratings tend to have a higher percentage of upgrading compared to lower ranks. In the Debt Instrument Transition Matrix, the percentage of AA rating rising to AAA rating in the following year is 5.48%. Meanwhile, the percentage of AA rating downgraded to A rating was 1.36%. From the cumulative value of issuance of debt securities with an AA rating of IDR1,201,201.63 billion, IDR65,883.35 billion underwent an upgrade to AAA in the following year and only IDR16,387.79 billion (1.38%) which was downgraded to A in the following year. Meanwhile, in the Issuer Company Transition Matrix, the AA rating which was upgraded to AAA was 4.42%. Meanwhile, the AA rating that was downgraded to an A rating was 2.86%. Of the 385 companies issuing debt instruments rated AA, 17 companies reported an upgrade from AA to AAA and 11 companies experienced a downgrade from AA to A in the following year.

If the percentage of consistency and rating increase is greater for a higher rating, then the opposite condition is indicated by a lower rating. Lower ratings tend to have a greater percentage of

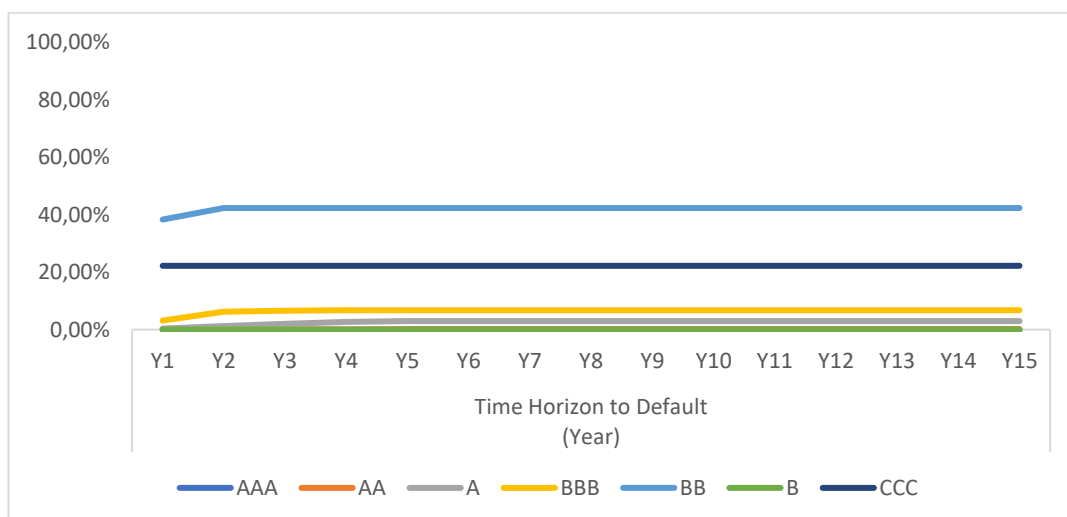
migrating to D ratings (default) in the following year compared to higher ratings. The rating with the largest percentage to migrate to a D rating (default) in the following year, for either the debt instrument or the debt instrument issuer company, is the CCC rating. The percentage change from CCC's rating to D (default) in the following year for debt instruments was 21.44%. Meanwhile, based on the Issuer Company, the percentage is 16.67%. However, when compared to conditions at the end of 2021, conditions in 2022 were recorded to be better. The percentage change in CCC's rating to D (default) in the next year in 2021 is higher than in 2022, namely 28.28% for debt instruments while 20.00% for issuing companies. Furthermore, the percentage change in CCC's rating increased to B rating based on the debt instrument and issuing company, respectively, by 20.30% (better than 2021: 0.00%) and 16.67% (better than 2021: 0.00%).

Meanwhile, rating B on the Debt Instrument and Issuer Company has a percentage of 0.00% to move to rank D (default). This low percentage occurred because, during the observation period, PEFINDO had limitations in monitoring debt securities and issuing companies with a B rating.

3.7 Cumulative Average Default Rate

This study calculates the cumulative Average Default Rate for ratings AAA, AA, A, BBB, BB, B, CCC and the time horizon from the first year to the fifteenth year. The default rate with a 15-year time horizon is the default rate based on historical data for that time horizon. Overall, the Cumulative Average Default Rate between the rating of the debt instrument and the rating of the issuing company shows the same pattern. The longer the time horizon, the higher the default rate for each rating category. Conversely, the lower the rating, the greater the default rate.

Figure 10. Cumulative Average Default Rate of the Debt Instrument



Source: Database PEFINDO (2023)

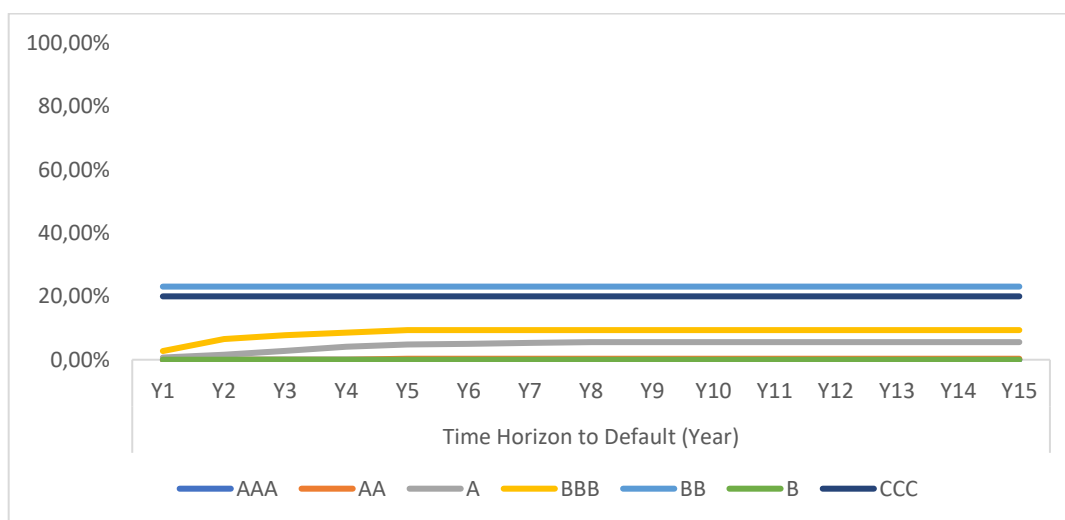
Debt instruments rated AAA, B and CCC have a constant default rate throughout the 15-year time horizon. Rating AAA and rating B have a default rate of 0.00%, while Rating CCC has a default rate of 22.19%. Debt instruments rated B have a default rate of 0.00% not because there are no

instruments with that rating that have defaulted within the 15-year time horizon. However, this is because during the observation period, PEFINDO has limitations in monitoring debt securities with a B rating, because the population of B ratings is very small and there are no default conditions yet.

The percentage of AA-rated debt instruments that defaulted for the first time in the fifth year was 0.15%. The default rate is constant at the same value until the fifteenth year. The default rate for debt instruments with an A rating in the first year to the fourth year is 0.38%; 1.20%; 2.03%; and 2.72%. Then, the percentage rose to 2.97% in the fifth year. Meanwhile, until the fifteenth year, the percentage remained unchanged like the fifth year.

Meanwhile, the BBB rating has a default rate of 3.15% in the first year. The percentage then rose to 6.75% in the fourth year, which did not change until the fifteenth year. Meanwhile, BB rating has a cumulative default rate of 38.28% in the first year. The percentage then rose to 42.29% in the second year, and this value lasted until the fifteenth year.

Figure 11. Cumulative Average Default Rate of the Issuer Company



Source: Database PEFINDO (2023)

Issuer companies with AAA, BB, B and CCC ratings have a constant default rate throughout the 15-year period. Rating AAA and rating B have a default rate of 0.00%, while Rating BB and CCC have a default rate of 25.00% and 20.00%, respectively. Issuer companies with a B rating have a default rate of 0.00%, not because there are no issuer companies with that rating that have defaulted on the 15-year time horizon. However, this was because during the observation period, PEFINDO had limitations in monitoring Issuer Companies with a B rating.

Issuer company with AA rating for the first-time experienced default in the fifth year of 0.35%. The default rate is constant at the same value until the fifteenth year. Before stabilizing starting in the eighth year at 5.76%, the default rate of Issuer Companies with rating A continued to increase from the first year (0.74%) to the seventh year (5.50%). Meanwhile, Issuer Companies with a BBB rating had a default rate of 2.45% in the first year, then rose to 8.69% in the fifth year and this value lasted from the fifth year to the fifteenth year.

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Appendix: 1. Survival Pool Cumulative Average Default Rate (Based on Issuance Value)

1.a. Rating-AAA (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
2007	1.000,00	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
2009	5.310,00	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
2011	15.034,50	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
2013	42.771,50	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
2015	114.055,60	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
2017	237.813,35	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
2019	294.347,90	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
2021	246.486,47	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
Summary Statistic																
Withdrawn Issuance Value	282.997	275.146	169.228	149.706	57.281	50.345	13.706	12.133	1.995	1.995	1.995	0	0	0	0	0
Defaultable Issuance Value	1.757.860	1.482.714	1.313.486	1.163.781	1.106.500	1.056.155	1.042.449	1.030.316	1.028.321	1.026.326	1.024.331	1.024.331	1.024.331	1.024.331	1.024.331	1.024.331
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%

1.b. Rating-AA (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
2007	10.500,00	0	0	0	0	900	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
2009	36.511,74	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
2011	89.995,96	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
2013	130.128,51	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
2015	72.900,00	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
2017	85.691,00	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
2019	96.764,41	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
2021	110.625,91	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	112.613,30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Summary Statistic																
Withdrawn Issuance Value	162.680	169.047	152.384	147.651	93.395	92.587	37.974	37.538	13.020	12.370	10.870	0	0	0	0	0
Defaultable Issuance Value	1.151.135	982.088	829.704	682.053	588.658	495.170	457.196	419.658	406.638	394.268	383.398	383.398	383.398	383.398	383.398	383.398
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%	0,15%	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%	0,15%	0,15%	0,15%	0,15%	0,15%	0,15%	0,15%	0,15%	0,15%	0,15%	0,15%	0,15%

1.c. Rating-A (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
2007	11.525,00	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
2009	16.817,00	0	0	1340	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
2011	20.834,00	1340	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
2013	38.278,00	0	0	0	0	900	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
2015	52.608,78	0	0	1900	0	150	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
2017	80.931,39	50	0	491	266,12	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
2019	86.619,46	150	1426,12	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
2021	108.715,38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	138.643,72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Summary Statistic																
Withdrawn Issuance Value	107.211	111.147	100.203	93.535	49.360	43.925	6.016	6.452	0	0	1.500	0	0	0	0	0
Defaultable Issuance Value	790.873	676.760	570.941	472.599	419.913	374.938	368.922	362.470	362.470	362.470	360.970	360.970	360.970	360.970	360.970	360.970
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	0,38%	0,83%	0,84%	0,70%	0,25%	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	0,38%	1,20%	2,03%	2,72%	2,97%	2,97%	2,97%	2,97%	2,97%	2,97%	2,97%	2,97%	2,97%	2,97%	2,97%	2,97%

1.d. Rating-BBB (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
2007	2.275,00	0	675	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
2009	2.450,00	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
2011	2.410,00	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
2013	3.970,00	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
2015	5.967,88	0	42	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
2017	17.962,88	2100	0	200	200	0	0	0	0	0	0	0	0	0	0	0
2018	21.945,26	0	541	300	0	0	0	0	0	0	0	0	0	0	0	0
2019	23.679,26	1141	300	0	0	0	0	0	0	0	0	0	0	0	0	0
2020	36.104,02	0	2000	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	36.518,19	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	27.788,87	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Summary Statistic																
Withdrawn Issuance Value	27.112	27.052	15.876	12.019	7.766	7.121	1.756	1.756	0	0	0	0	0	0	0	0
Defaultable Issuance Value	177.151	144.525	124.092	111.573	103.607	96.486	94.730	92.974	92.974	92.974	92.974	92.974	92.974	92.974	92.974	92.974
Default Issuance Value	5.573	4.558	500	200	0	0	0	0	0	0	0	0	0	0	0	0
Marginal Default Probabilities	3,15%	3,15%	0,40%	0,18%	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	3,15%	6,20%	6,58%	6,75%	6,75%	6,75%	6,75%	6,75%	6,75%	6,75%	6,75%	6,75%	6,75%	6,75%	6,75%	6,75%

1.e. Rating-BB (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
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	750,00	600	150	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
2011	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
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	328,00	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
2017	1.962,00	1000	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
2019	570,00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020	3.695,00	300	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	600,00	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
Summary Statistic																
Withdrawn Issuance Value	5.378	751	281	0	0	0	0	0	0	0	0	0	0	0	0	0
Defaultable Issuance Value	4.963	2.312	1.881	1.881	1.881	1.881	1.881	1.881	1.881	1.881	1.881	1.881	1.881	1.881	1.881	1.881
Default Issuance Value	1.900	150	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Marginal Default Probabilities	38,28%	6,49%	0,00%	0,00%	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	38,28%	42,29%	42,29%	42,29%	42,29%	42,29%	42,29%	42,29%	42,29%	42,29%	42,29%	42,29%	42,29%	42,29%	42,29%	42,29%

1.f. Rating-B (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
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	280,00	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	120,00	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	781	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Summary Statistic																
Withdrawn Issuance Value	120	280	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Defaultable Issuance Value	280	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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%

1.g. Rating-CCC (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
2007	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
2009	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
2011	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
2013	280,00	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	100,00	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
2018	-	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
2020	931,00	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
2022	400,00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Summary Statistic																
Withdrawn Issuance Value	530	150	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Defaultable Issuance Value	3.718	2.743	2.743	2.743	2.743	2.743	2.743	2.743	2.743	2.743	2.743	2.743	2.743	2.743	2.743	2.743
Default Issuance Value	825	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Marginal Default Probabilities	22,19%	0,00%	0,00%	0,00%	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	22,19%	22,19%	22,19%	22,19%	22,19%	22,19%	22,19%	22,19%	22,19%	22,19%	22,19%	22,19%	22,19%	22,19%	22,19%	22,19%

Appendix: 2. Survival Pool Cumulative Average Default Rate (Based on Issuer Companies)

2.a. Rating-AAA (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
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	2	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
2011	4	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
2013	7	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
2015	16	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
2017	23	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
2019	28	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
2021	24	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
Summary Statistic																
Withdrawn Issuer		8	6	4	4	3	3	2	2	0	0	0	0	0	0	0
Defaultable Issuer		212	206	202	198	195	192	190	188	188	188	188	188	188	188	188
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%	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%

2.b. Rating-AA (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
2007	7	0	0	0	0	1	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
2009	18	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
2011	30	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
2013	34	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
2015	23	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
2017	29	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
2019	30	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
2021	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	29															
Summary Statistic																
Withdrawn Issuer		22	21	21	19	17	10	7	8	5	4	4	1	1	0	0
Defaultable Issuer		392	371	350	331	314	303	296	288	283	279	275	274	273	273	273
Default Issuer		0	0	0	0	1	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%
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%

2.c. Rating-A (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
2007	17	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
2009	22	0	0	1	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
2011	32	1	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	0	0	0	0	0
2013	46	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
2014	45	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0
2015	47	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0
2016	46	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0
2017	47	1	0	2	1	0	0	0	0	0	0	0	0	0	0	0
2018	45	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
2019	46	1	1	0	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
2021	41	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
Summary Statistic																
Withdrawn Issuer	28	35	36	34	29	25	14	14	10	5	4	1	1	1	1	0
Defaultable Issuer	574	535	494	454	419	391	376	361	350	345	341	340	339	338	338	338
Default Issuer	4	5	6	6	3	1	1	1	0	0	0	0	0	0	0	0
Marginal Default Probabilities	0,70%	0,93%	1,21%	1,32%	0,72%	0,26%	0,27%	0,28%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%
Cumulative Default Probabilities	0,70%	1,62%	2,82%	4,10%	4,79%	5,03%	5,29%	5,55%	5,55%	5,55%	5,55%	5,55%	5,55%	5,55%	5,55%	5,55%

2.d. Rating-BBB (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
2007	5	0	1	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
2009	7	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
2011	7	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
2013	13	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
2015	17	0	1	0	0	1	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
2017	25	1	0	2	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
2019	26	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020	26	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	23	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	18	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	219	182	148	121	109	98	93	90	87	85	83	82	82	82	82	82
Default Issuer	6	7	2	1	1	0	0	0	0	0	0	0	0	0	0	0
Marginal Default Probabilities	2,74%	3,85%	1,35%	0,83%	0,92%	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	2,74%	6,48%	7,74%	8,51%	9,35%	9,35%	9,35%	9,35%	9,35%	9,35%	9,35%	9,35%	9,35%	9,35%	9,35%	9,35%

2.e. Rating-BB (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
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	1	1	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	1	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
2016	1	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
2018	1	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
2020	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	3	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
Summary Statistic																
Withdrawn Issuer		7	3	2	0	0	0	0	0	0	0	0	0	0	0	0
Defaultable Issuer		13	7	5	5	5	5	5	5	5	5	5	5	5	5	5
Default Issuer		3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Marginal Default Probabilities		23,08%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%
Cumulative Default Probabilities		23,08%	23,08%	23,08%	23,08%	23,08%	23,08%	23,08%	23,08%	23,08%	23,08%	23,08%	23,08%	23,08%	23,08%	23,08%

2.f. Rating-B (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
Summary Statistic																
Withdrawn Issuer		0	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%	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%

2.g. Rating-CCC (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
2007	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
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	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
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	1	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	1	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
2021	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
Summary Statistic																
Withdrawn Issuer		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Defaultable Issuer		5	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Default Issuer		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Marginal Default Probabilities		20,00%	0,00%	0,00%	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%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%

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