

**PEFINDO'S CORPORATE AND CORPORATE DEBT SECURITIES
DEFAULT STUDY**

2007–2019

By:

Economic Research Division¹

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Executive Summary

Uncertainty continued to envelop the global economy in the first half of 2019. The US-China trade war, heated geopolitical conditions, the contraction of global foreign direct investment, and the reversal of the inverted yield curve for US government bonds indicate the heightened risk to the global economy. For the writer, these could pose a threat to the increased default rate of domestic corporate debt in terms of increased volatility, due to the transmission of the global economy to the domestic market, particularly from the exchange rate channel and financial market asset prices.

In Indonesia, unstable political conditions at the beginning of the year were driven by the general elections and a simultaneous presidential election on April 17, 2019, making the situation in the corporate debt market relatively wait and see. This began to turn around in the second half of 2019, starting with the upgrade in Indonesia's sovereign rating by S&P Global Ratings at the end of May, coupled with a reduction in political tension, as well as decreasing the benchmark interest rate (BI-7 Day Reverse Repo Rate) by Bank Indonesia to provide better liquidity space for domestic debt issuers. Even though there were pressures in several sectors, during 2019 they were overcome by the absence of instruments/ companies issuing debt securities rated by PEFINDO that experienced default.

This made the accumulated default rate of corporate bonds rated by PEFINDO in 2007-2019 decrease. Based on the debt instruments, the default rate in 2019 decreased from 0.92% in 2018 to 0.79% at the end of 2019. According to the issuer companies, the default rate shrank from 3.91% at the end of 2018 to only 3.72% at the end 2019.

Referring to PEFINDO's Corporate and Corporate Debt Securities Default Study 2007-2018, the assumptions used in this study are the same, as well as the analysis indicators used: transition matrix and cumulative average default rate.

For this reason, we hope PEFINDO's Corporate and Corporate Debt Securities Default Study 2007–2019 can be additional literature for stakeholders in the domestic financial market, specifically the corporate debt market. This study uses the perspective of PEFINDO as the leading debt rating agency in Indonesia, with more than 26 years of experience.

Figure 1. One-Year Transition Matrix of the Debt Instrument

From/To	Σ Issuance Value (IDR billion)	AAA	AA	A	BBB	BB	B	CCC	D	NR
AAA	963,057.94	85.71%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	14.29%
AA	896,276.41	6.31%	80.38%	1.38%	0.00%	0.00%	0.00%	0.00%	0.00%	11.93%
A	467,511.73	0.29%	3.32%	79.46%	3.75%	0.54%	0.03%	0.00%	0.30%	12.32%
BBB	79,872.70	0.00%	0.00%	7.26%	75.12%	3.55%	0.35%	0.97%	3.04%	9.70%
BB	5,175.50	0.00%	0.00%	0.00%	0.00%	6.99%	0.00%	2.90%	30.91%	59.19%
B	400.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	70.00%	0.00%	30.00%
CCC	1,205.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	68.46%	31.54%

Figure 2. One-Year Transition Matrix of the Issuer Company

From/To	Σ Issuer (Unit)	AAA	AA	A	BBB	BB	B	CCC	D	NR
AAA	119	99.16%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.84%
AA	289	4.84%	87.89%	3.11%	0.00%	0.00%	0.00%	0.00%	0.00%	4.15%
A	420	0.00%	5.48%	84.05%	4.29%	0.71%	0.00%	0.00%	0.48%	5.00%
BBB	148	0.00%	0.00%	3.38%	79.73%	3.38%	0.68%	1.35%	1.35%	10.14%
BB	8	0.00%	0.00%	0.00%	0.00%	25.00%	0.00%	0.00%	25.00%	50.00%
B	1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%
CCC	3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	33.33%	66.67%

Figure 3. Cumulative Average Default Rate of the Debt Instrument

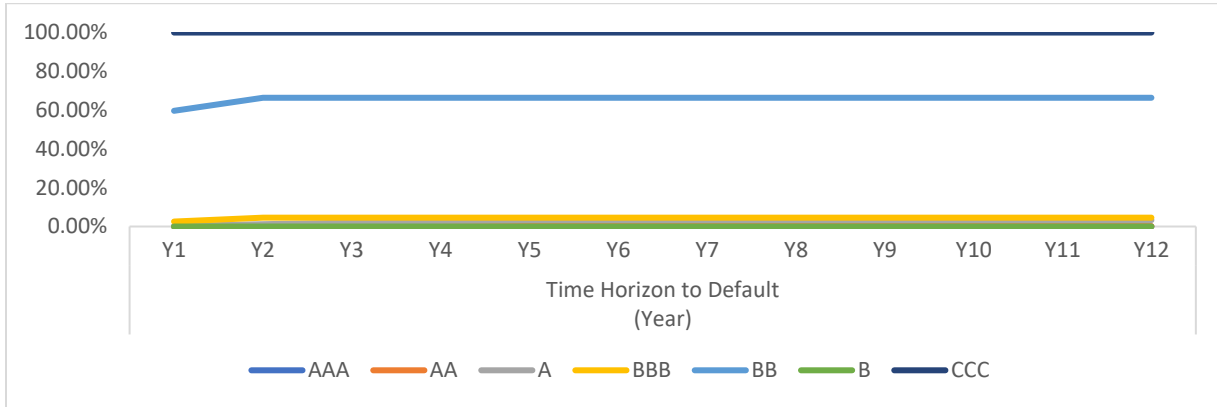
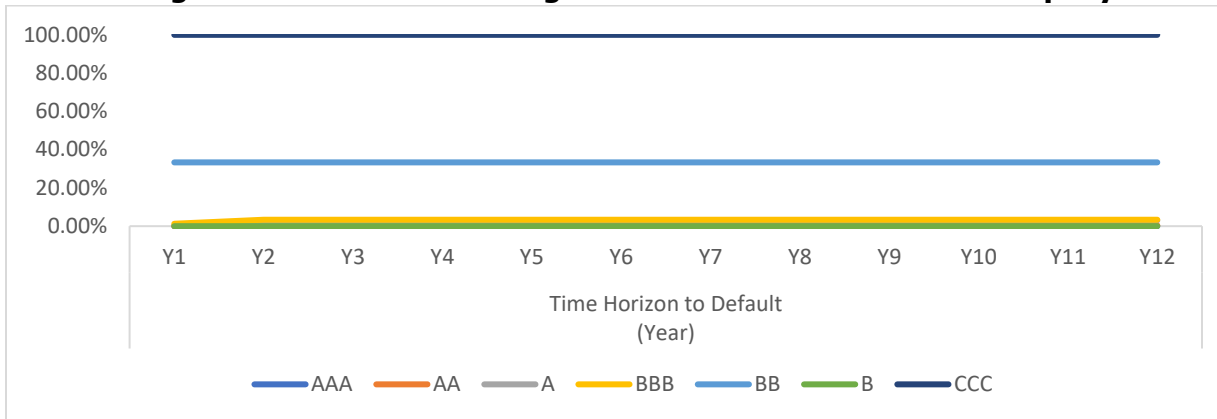


Figure 4. Cumulative Average Default Rate of the Issuer Company



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1. Preliminary

Uncertainty enveloped the global economy in the first half of 2019. The trade war between the United States and China had not yet reached a deal. The majority of central banks maintained their benchmark interest rates after tightening liquidity since the second half of 2018. The global economy was also increasingly burdened by the US imposing sanctions on Iran and threats to eight Iranian oil-importing countries. As a result, Brent oil prices passed the USD70 per barrel threshold on April 5, 2019.

The flow of foreign direct investment (FDI) at the global level also experienced a contraction. Based on data from the United Nations Conference on Trade and Development (UNCTAD) in its 2019 World Investment Report, developed countries experienced a drastic decline in FDI by 27% since 2004. The opposite occurred in developing countries. FDI to developing countries rose 2% and increased the share of FDI flow by 54% of global FDI. The signal of a recession came from the inverted yield curve showing there would be a high level of risk in the global financial market in the short term.

These risks led the World Bank and International Monetary Fund (IMF) to cut their prospects for global economic growth during 2019. The World Bank cut the outlook for global economic growth to 2.6% (YoY), and the IMF lowered it to 3.3% (YoY). Growth prospects were down by 0.3%, respectively, compared to their estimates at the end of 2018.

Indonesia's economy faced challenges in 2019. The trade war and volatility in Brent oil prices were challenges for its trade balance, making the rupiah vulnerable to depreciation. The diversification of economic drivers was also a classic challenge for the Indonesian economy. On the expenditure side, the household consumption sector accounted for 63.27% of GDP in 2019. Pressure on the investment sector saw the distribution of this sector decline from 33.03% in 2018 to 32.85 % in 2019. During 2019, the Indonesian government issued several policies to support the investment climate, including the tax holiday. It was rewarded by an increase in the nation's sovereign rating from BBB- to BBB by S&P Global Ratings.

Central banks globally showed a dovish stance, initiated by the US Federal Reserve (Fed), which lowered its benchmark interest rate to drive the global economy from the monetary side, followed by almost all other central banks. Up to the end of the first half of 2019, Bank Indonesia (BI) showed caution by maintaining its interest rate (BI-7 Day Reverse Repo Rate-BI7DRRR) at 6.00%. BI interest rate cuts only began in the first month of the second semester (July) in 2019. For the first time, BI slashed its interest rate from 6% to 5.75% - by 25 basis points (bps). BI gradually decreased the rate by 25 bps each month until October 2019, reaching 5%, where it stayed until the end of 2019.

The dovish stance of most central banks and global uncertainty provided enough positive sentiment for the domestic debt market at the beginning of the year. Many foreign investors moved their funds from developed countries to developing countries, including Indonesia. From the end of December 2018 until the beginning of February 2019, foreign investors recorded net purchases of government bonds of IDR32.4 trillion. As a result, in the secondary market foreign investors held 37.9% (IDR923.8 trillion) of government bonds. This helped encourage a positive performance for the domestic corporate debt market, and was followed by a decrease in corporate bond yields in line with decreasing yields on the government bond market.

The decline in government bond yields saw challenges ahead of the middle of the year, mainly due to inflation and the rupiah. Inflation was depressed throughout Ramadhan and Eid Mubarak, causing investors to ask for higher yields. Indonesia's vulnerable trade balance amid fluctuating world oil prices caused the rupiah to depreciate in this period and tended to volatile. In the corporate bond market, in addition to the high cost of funds in the middle of the year due

to the lowering of the benchmark interest rate by Bank Indonesia, political conditions were unstable due to the legislative and presidential elections on April 17, 2019, with corporate bond issuers adopting a wait and see attitude. As a result, the issuance of corporate debt during the first quarter of 2019 was only IDR25.5 trillion, down IDR4.9 trillion compared to the same period in 2018.

Entering the second half of 2019, the bond markets of developing countries, including Indonesia, were still an attractive market for foreign investors as a result of accommodative monetary policies in developed countries. Significant volatility and correction still occurred in developing countries' bond markets. Investment flow into Indonesia, particularly the domestic bond market, was well maintained in the second half after a slashing of the benchmark interest rate by Bank Indonesia. The corporate bond market drove the new issuance due to a decrease in the cost of funds. Data from IBPA showed corporate bond yields for 3-year and 5-year tenor fell by 153 bps (7.698%) and 131 bps (7.940%), respectively, as of September 2019.

Despite many challenges for the Indonesian economy due to global uncertainty and high rupiah and bond market volatility, overall, PEFINDO believes the domestic corporate bond market was relatively well maintained throughout 2019, both in terms of yield and risk. The yield of the corporate bond market was still quite attractive. In terms of risk, particularly the risk of default, PEFINDO notes no debt instruments or issuers defaulted in 2019.

2. Research Methodology

2.1. Used Assumptions

This study used assumptions that are used as a reference in collecting, processing, analyzing, and interpreting the data. The assumptions used in this study are the same as those used in PEFINDO's Corporate and Corporate Debt Securities Default Study 2007–2018. These assumptions are quite different from PEFINDO's Corporate Default Study 1996-2015. The differences are mainly on assumptions regarding default and not rated. The assumptions used in this paper are as follows:

1. The population used as data is if a company issues a debt instrument rated and published by PEFINDO. Therefore, the term "debt instrument" is all types of debt instruments issued by a company. The unit used to measure the instrument is the issuance value. The company issuing the debt instruments is referred to as the "issuer company," and the unit used is the "company unit".
 2. The rating of each year during the observation period (2007-2019), 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, 2012.
 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 of 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.

If the issuer company is declared to be in default, it will become a new entity when it re-issues the debt instrument.

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.

2.2. Data and Source of Data

The data used in this study meets the assumptions described in the previous section. The data source used in this study is PEFINDO publication data. This data is found in Indonesia rating highlights (IRH), rating announcements (RA), press releases (PR), rating rationales (RR), and other data sources originating from PEFINDO that have been published. The observation period used was from 2007 to 2019. The restriction of the observation period and the total population (data) included in the study were carried out solely so the debt instrument and the issuer company could be more easily monitored and analyzed.

The data used in this paper is divided into two groups: data for the debt instrument and data for the issuer company. The data structure for the debt instrument and the issuer company have the following data elements (variables):

1. Debt instrument data

- ISIN
 - Code of the issuer company
 - Name of the issuer company
 - Sector code of the issuer company
 - Sector name of the issuer company
 - Industry code of the issuer company
 - Industry name of the issuer company
-

- Name of the debt instrument
- Issuance value of the debt instrument
- Initial rating of the debt instrument
- Listing date of the debt instrument
- Maturity date of the debt instrument
- Default date of the debt instrument
- Rating history 2007-2019.

2. Issuer company data

- Code of the issuer company
- Name of the issuer company
- Sector code of the issuer company
- Sector name of the issuer company
- Industry code of the issuer company
- Industry name of the issuer company
- Listing date of the issuer company
- Initial rating of the issuer company
- Default date of the issuer company
- Rating history 2007-2019.

2.3. Default Rate

Referring to data distribution, the default rate is calculated for the debt instrument and the issuer company annually during the observation period. The calculation of the default rate for debt instruments and the issuer company on an annual basis during the observation period is also carried out by division based on sector, industry, and initial rating.

The default rate based on Cutler and Edeler (1958) is 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

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

Explanation:

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

2. Issuer Companies

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

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. Rating Transition Matrix

The rating transition matrix is used to measure the percentage of ranking transitions in a given time. In the Default Study by the global rating agencies, the matrix is usually used only to measure the percentage of the rating transition of companies rated by the rating agency, and the percentage is calculated based on company/entity units. Because the matrix only views the migration of the rating within a certain time, in the calculation there is the possibility a company/entity will be counted more than once. However, in this paper, in addition to calculating the percentage of rating transition at a certain time for the issuer company, PEFINDO also makes the matrix for the debt instrument. The calculation of the percentage of the rating transitions takes the same analogy with calculations based on company/entity units, but with different units. The unit used to calculate the percentage of ranking transition for the debt instruments is to use the issuance value for each rating. This is because using the same analogy with the calculation based on the company/entity unit, in the calculation there is the possibility the value of the debt instruments will be calculated more than once.

The calculation of the elements in the rating transition matrix in this paper, both for the debt instrument and issuer company, uses the Markov Chain. 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 the probability P_{ij} that equals:

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

where for all conditions of $i_0, i_1, i_2, \dots, i_{n-1}, i_n = i, j$ and all of $t \geq 0$, 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 probability value P_{ij} represents the probability 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 probability of 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 a one-step transition probability matrix as follows:

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

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

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

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 time 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:

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

2.5. 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 time period. After creating a static pool, the second step is to calculate the marginal default probability.

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, ..., 2019) 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, ..., 2019) and not defaulted until year t . According to Fons (1994), marginal default probability is calculated with the formulation as follows:

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

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

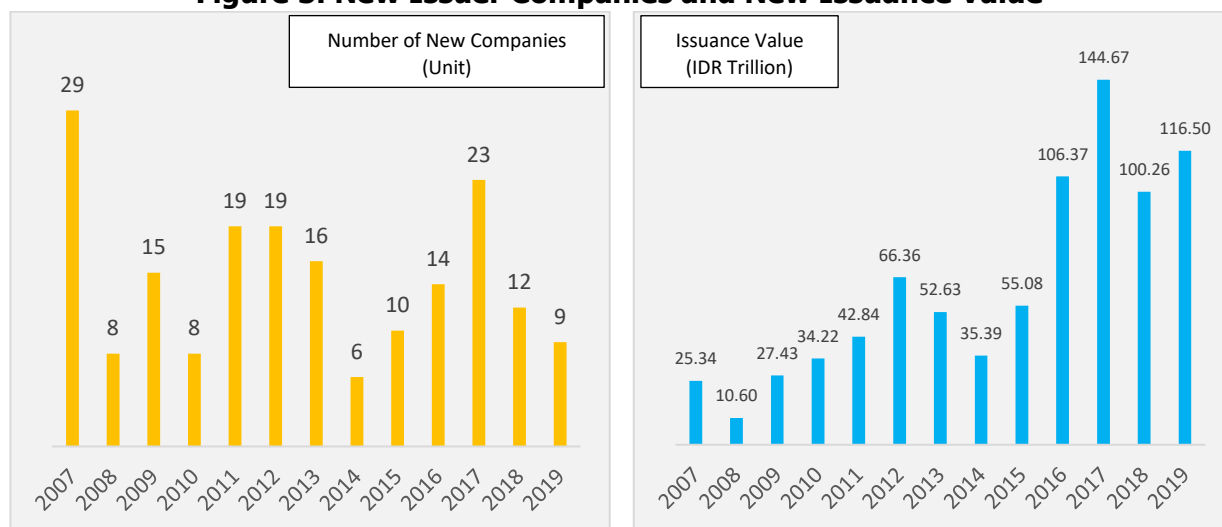
$$D_t(R) = D_{t-1}(R) + d_t(R) \dots\dots\dots (8)$$

3. Analysis

3.1. Overview

The number of new issuer companies that have been rated by PEFINDO and the issuing of debt instruments have decreased since 2017. In this paper, the issuer company will be declared a new issuer company when it issues debt instruments for the first time. In 2019, only nine new issuer companies issued debt instruments. New issuer companies that issued debt instruments in 2019 were dominated by companies classified as in the non-financial institution sector, and the majority have an A (Single-A) rating.

Figure 5. New Issuer Companies and New Issuance Value



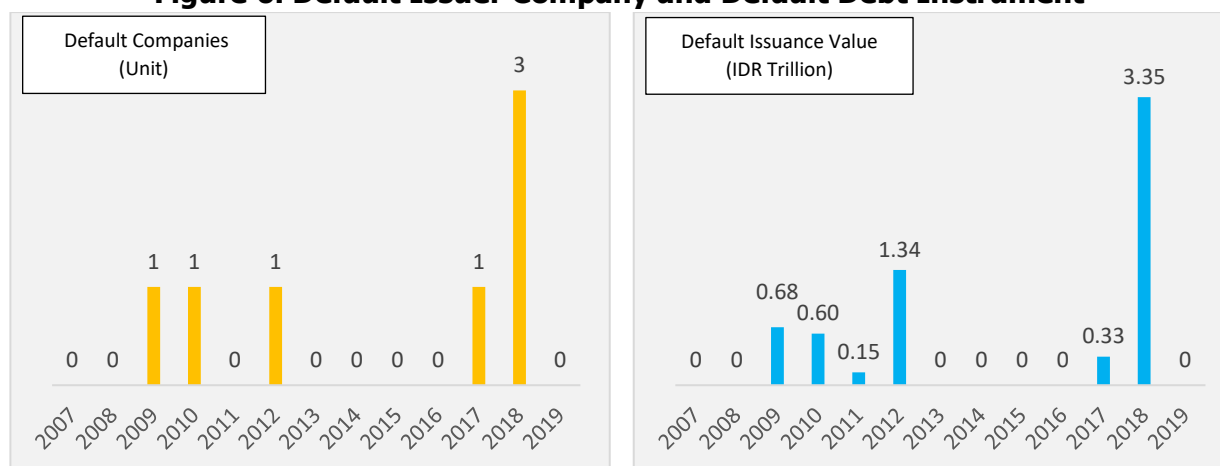
Source: PEFINDO Database (2020)

Almost every year during the observation period, the number of new issuer companies was just under 20 companies. Only in 2007 and in 2017 did the number of new issuer companies reach above that amount. For 2007, the number of new issuer companies was relatively large (29 companies) because that year was the beginning of the observation. If the beginning of the observation period is set back a few years, for example starting in 2004, these 29 companies are likely to be dispersed into new issuer companies from 2004 to 2007. The spread of new issuer companies is based on data compiled, and there are several issuer companies that issued debt instruments before 2007. However, because the observation period of the data used in this paper began in 2007, so the 29 companies were listed as new issuers based on debt instruments that were issued in 2007. In 2017, the number of new issuer companies issuing debt instruments was 23. The number of new companies issuing debt instruments in 2017 was driven by the low cost of funds in the bond market due to low yield. This is also evident from the issuance value of the debt instruments rated and published by PEFINDO in 2017.

The issuance value of debt instruments rated and published during the observation period peaked in 2017, rising significantly from 2016. Before 2016, the debt instrument issuance value was always under IDR100 trillion. However, the low cost of funding in the bond market in 2017 pushed the issuance value of debt instruments that were rated and published in 2017 to jump 36% to IDR144.67 trillion compared to the previous year (2016). In 2018 the issuance value decreased to IDR100.26 trillion, it increased again in 2019 to IDR116.50 trillion.

During 2016-2019, the issuance value of debt instruments rated and published by PEFINDO was dominated by bonds with a value of IDR377.95 trillion. Bonds and medium-term notes (MTN) recorded the largest issuance value in 2017, with IDR118.45 trillion and IDR15.32 trillion, respectively. The infrastructure funds (DINFRA) debt instrument emitted in 2019, while commercial securities (SBK) were re-issued for the first time in 2019 after being undeveloped and defaulted since 1998. DINFRA was issued by one investment manager, a group of one of the state-owned banks with the issuance value of IDR1.30 trillion issued in five instruments. DINFRA was created as an investment solution and alternative financing for infrastructure development in Indonesia. SBK was re-emitted in 2019 to encourage short-term funding as funding besides bank credit and to deepen the financial markets in Indonesia. The purpose of the re-issuance of SBK is contained in Bank Indonesia Regulation (PBI) Number 19/9/ PBI/2017.

Figure 6. Default Issuer Company and Default Debt Instrument



Source: PEFINDO Database (2020)

The increase in issuance value is always related to the risk of default. During the observation period, the issuance value experienced default of IDR6.45 trillion from seven issuer companies. The debt instruments that defaulted together with the companies that issued the instruments were also classified into several sectors and industries, and based on the initial rating of the instruments when they were listed for the first time.

As of 2019, the default rate of debt instruments was 0.79%, while the default rate of issuer companies was 3.72%. From 2007 to 2019, the cumulative issuance value was IDR817.69 trillion, while in the same period the cumulative issuance value that experienced default was IDR6.45 trillion. By dividing the cumulative default issuance value by the cumulative issuance value based on the formulation in Equation 1, the default rate for debt instruments for 2019 is 0.79%. This method is also applied to calculate the default rate for the issuer company and to calculate the default rate for other years in the observation period.

The default rate for the debt instrument and the issuer company for each year during the observation period is presented in Table 1 (below). The highest default rate for debt instruments occurred in 2012 while for the issuer companies this occurred in 2018. If we look back at Figure 2, the debt instrument experienced the largest default in 2018. However, due to the cumulative of issuance value always increasing relative largely each year, it makes the debt instrument's default rate relatively small in 2018.

Figure 7. Annual Default Rate

Year	Default Rate (Issuer Company)	Default Rate (Debt Securities Instrument)
2007	0.00%	0.00%
2008	0.00%	0.00%
2009	1.92%	1.07%
2010	3.33%	1.31%
2011	2.53%	1.01%
2012	3.06%	1.34%
2013	2.63%	1.07%
2014	2.50%	0.94%
2015	2.31%	0.79%
2016	2.08%	0.61%
2017	2.40%	0.52%
2018	3.91%	0.92%
2019	3.72%	0.79%

Source: PEFINDO Database (2020)

3.2. Default Rate Per Sector

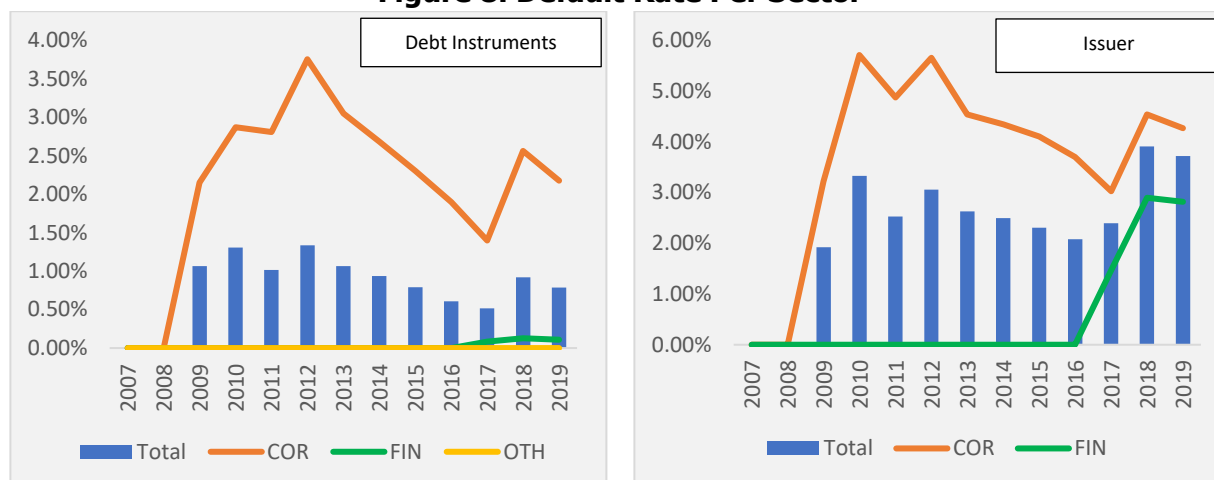
The classification of sectors in debt instruments is divided into three: the Corporate (COR), Financial Institution (FIN) and Other sectors (OTH). The COR sector consists of debt instruments from companies issuing debt instruments in addition to financial institutions such as banks, insurance and securities. The FIN sector consists of debt instruments from companies issuing debt instruments which are financial institutions. Other sectors (OTH) consist of debt instruments that are not from the corporate and financial institutions sectors. Debt instruments in the OTH category 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: the corporate sector (COR) and the financial institution sector (FIN). This refers to the same meaning as the classification of the debt instrument. The FIN sector consists of issuer companies classified as financial institutions, while COR is non-financial issuer companies.

The highest default rate for debt instruments occurred in the COR sector in 2012 at 3.76%, making the default rate rise to 1.34%. After 2012 and as of 2017, the default rate of the sector declined with the increasing issuance value of debt instruments in the COR sector each year. Although the COR default rate rose again in 2018 to 2.56%, but in 2019 the COR sector recorded a decline to 2.18%. The FIN sector occurred for the first time in 2017 and continued to rise in 2018, with the default rate at 0.09% and 0.13% respectively. The FIN default rate also declined in 2019 at 0.11%. The OTH sector was relatively non-existent throughout the observation period.

For issuer companies, the highest default rate occurred in the COR sector in 2010 at 5.71%, due to a low increase in new companies issuing debt instruments. Default in the FIN sector started in 2017 at 1.47%, jumping in 2018 to 2.90% before declining to 2.82% in 2019.

Figure 8. Default Rate Per Sector



Source: PEFINDO Database (2020)

3.3. Default Rate per Industry

The number of debt instrument industries in this paper is divided into 40 industries, while the number of issuer company industries is 38. This difference is because the ABS instrument and the DINFRA instrument do not have issuers in the form of a corporate entity. Therefore, they are not included in the industry classification of the issuer company. The following is a list of industries for debt instruments and issuer companies used in this default study:

Figure 9. List of Industrial Classifications

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

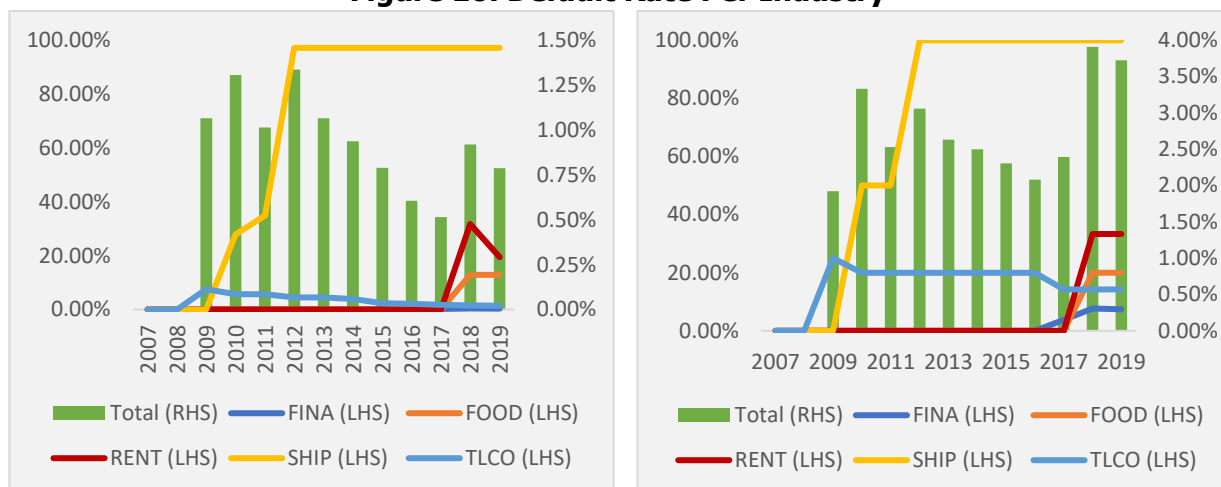
Explanation: **Industries not included in the Issuer Company Industry classification.

Source: PEFINDO Database (2020)

Because the default assumption is based on the debt instrument issued by the issuer company, industries that have defaulted in this paper will be the same, both for the debt

instrument and the issuer company. The difference between the two lies only in the industry's default rate for the debt instrument and issuer company. As of 2019, PEFINDO noted default only occurred in five industries, both for the debt instrument and issuer company. Industries other than the five did not experience a default during the observation period, so the default rate is 0.00%. The five industries were finance companies (FINA), food and beverage (FOOD), vehicle rental and transportation (RENT), shipping (SHIP), and telecommunications (TLCO).

Figure 10. Default Rate Per Industry



Explanation: Debt Securities Instrument (Left), Issuer Companies (Right)
Source: PEFINDO Database (2020)

For debt instruments, the highest default rate as of 2019 was the shipping industry (SHIP) at 97.21%. Its default rate was the same from 2012 to 2019, because there were no debt instruments issued in the industry. FINA had the lowest default rate until 2019, although a default occurred in 2018 due to a fraud case by a finance company. The default rate was 0.35% as of 2019. The low rate is likely due to the issuance of debt instruments rated and published by PEFINDO which are still dominated by the finance and banking industries. For the other three industries, the default rate until 2019 was 19.42% (RENT), 12.88% (FOOD), and 1.34% (TLCO).

For issuer companies, the highest and lowest default rates up to 2019 are still owned by the same industries as the debt instrument described in the previous section – finance and shipping. Even with the same industries, the issue company default rate is different from the debt instrument default rate. The issuer company default rate for SHIP is 100%, and for FINA 7.41%. SHIP has had the same default rate since 2012 because of no new companies issuing debt instruments. Since 2012, only two shipping companies have issued debt instruments, and both defaulted on the debt instruments they issued. Despite having the lowest default rate compared to other industries, the finance company default rate jumped significantly since the first default in 2017, at 3.85%. The soaring default rate in this industry from 2017 to 2019 is likely caused by not many new companies issuing debt instruments. For the other three industries, the default rate until 2019 is 33.33% (RENT), 20.00% (FOOD), and 14.29% (TLCO).

3.4. Default Rate per Initial Rating

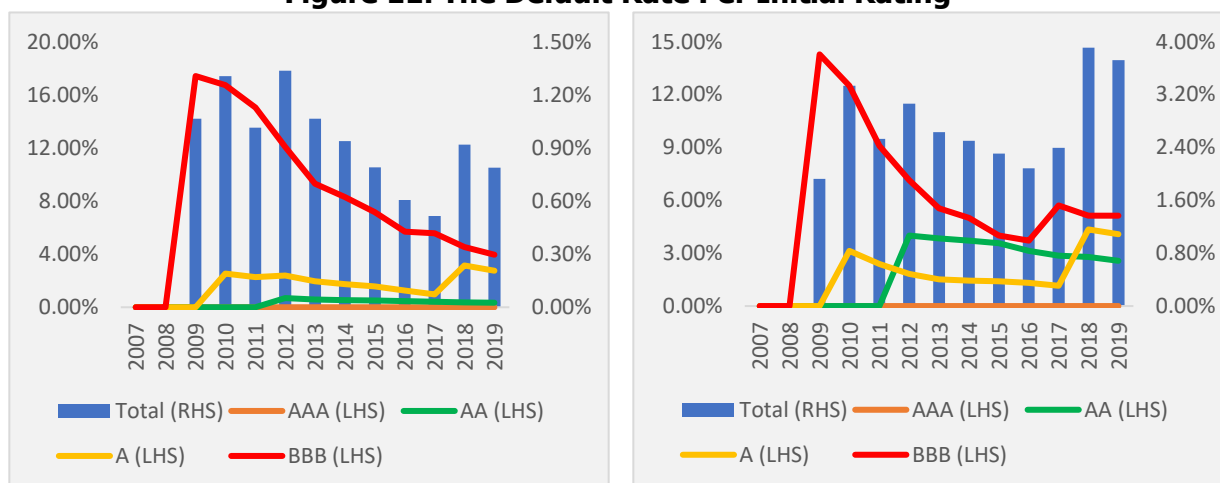
The initial rating is the rating first received by the issuer company or debt instrument. For the issuer company, the initial rating is the rating received when issuing the debt instrument for

the first time - when the company becomes a new issuer for the first time. The initial debt instrument rating is the rating received by the instrument when listed or emitted in the capital market for the first time. During the observation period, the initial rating recorded for the debt instrument and issuer company is AAA, AA, A, BBB.

In this section, the calculation of the default rate based on the initial rating is performed to provide information on how much the default rate is based on the initial rating. This is made to provide information to investors who invest in corporate debt securities by buying the instruments and holding them to maturity (hold to maturity). With the default rate at the initial rating, it is hoped corporate debt investors will know how much the risk of the default of the corporate bond on a specified rating when an instrument is issued, or the risk of the issuer company that will issue debt instruments.

For debt instruments, the default rate in 2019 decreased from the previous year for the initial rating AA, A, and BBB. The default rate for the three initial ratings was 0.35%, 2.75%, and 3.96% respectively. For the initial AAA rating, the default rate during the observation period was 0%. In other words, no debt instrument with the AAA rating experienced default during the observation period. The default rate until 2019 for each initial rating also shows the higher rating relatively has a lower default rate than the lower rating.

Figure 11. The Default Rate Per Initial Rating



Explanation: Debt Securities Instrument (Left), Issuer Companies (Right)
Source: PEFINDO Database (2020)

For issuer companies, the default rate in 2019 decreased for the initial rating AA and A compared to the previous year at 2.56% and 4.08%, respectively. For the initial rating BBB, the default rate in 2019 was the same as in 2018 at 5.13%. The initial rating AAA has had a default rate of 0% since 2007. In other words, no issuer companies with an initial rating of AAA defaulted on debt instruments they issued from 2007 to 2019.

3.5. One-Year Rating Transition Matrix

The rating transition matrix shows changes in the quality of the rating over time. The rows in the matrix state the initial rating, while the columns state the change in the rating at a later time. The elements in the matrix are the proportion of the change in rating in the rows to the rating in the columns. In this paper, the matrix used is the one-year transition matrix. This means that a change in the rating in the matrix is a change in the rating within one year.

Figure 12. One-Year Transition Matrix of the Debt Instrument

From/To	Σ Issuance Value (Rp billionr)	AAA	AA	A	BBB	BB	B	CCC	D	NR
AAA	963,057.94	85.71%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	14.29%
AA	896,276.41	6.31%	80.38%	1.38%	0.00%	0.00%	0.00%	0.00%	0.00%	11.93%
A	467,511.73	0.29%	3.32%	79.46%	3.75%	0.54%	0.03%	0.00%	0.30%	12.32%
BBB	79,872.70	0.00%	0.00%	7.26%	75.12%	3.55%	0.35%	0.97%	3.04%	9.70%
BB	5,175.50	0.00%	0.00%	0.00%	0.00%	6.99%	0.00%	2.90%	30.91%	59.19%
B	400.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	70.00%	0.00%	30.00%
CCC	1,205.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	68.46%	31.54%

Source: PEFINDO Database (2020)

Figure 13. One-Year Transition Matrix of the Issuer Company

From/To	Σ Penerbit (Unit)	AAA	AA	A	BBB	BB	B	CCC	D	NR
AAA	119	99.16%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.84%
AA	289	4.84%	87.89%	3.11%	0.00%	0.00%	0.00%	0.00%	0.00%	4.15%
A	420	0.00%	5.48%	84.05%	4.29%	0.71%	0.00%	0.00%	0.48%	5.00%
BBB	148	0.00%	0.00%	3.38%	79.73%	3.38%	0.68%	1.35%	1.35%	10.14%
BB	8	0.00%	0.00%	0.00%	0.00%	25.00%	0.00%	0.00%	25.00%	50.00%
B	1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%
CCC	3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	33.33%	66.67%

Source: PEFINDO Database (2020)

The higher rating of the debt instrument and issuer company shows better consistency than a lower rating. This consistency can be seen from the percentage of a rating that remains at the same level for the following year. For the debt instrument, the best consistency is showed by the AAA rating. The AAA rating remains in the same rating in the following year with a percentage of 85.71%. This means that from IDR963,057.94 billion issuance value which has the AAA rating, IDR825,427.94 billion (85.71%) will stay at AAA in the following year. For the issuer company, the AAA rating also shows the best consistency compared to the lower ratings. The AAA rating has a percentage of 99.16% to stay at AAA in the following year. This means that out of the 119 issuer companies with the AAA rating, 118 will stay at AAA in the following year.

Besides having good consistency, the higher rating tends to have a larger enough percentage to upgrade than the lower rating. In the debt instrument transition matrix, the percentage of AA ratings upgraded to AAA in the following year is 6.31%, while the percentage downgraded to A is 1.38%. This means that from the issuance value of debt instruments worth IDR896,276.41 billion for the AA rating, IDR56,534.50 billion (6.31%) is upgraded to AAA in the following year, while IDR12,386, 20 billion (1.38%) is downgraded to A. For the issuer company transition matrix, AA ratings upgraded to AAA were 4.84%, and 3.11% downgraded to A. This shows that of 289 issuer companies with the AA rating issuing a debt instrument, there was a rating upgrade from AA to AAA by 14 companies and a rating downgrade from AA to A by nine companies in the following year.

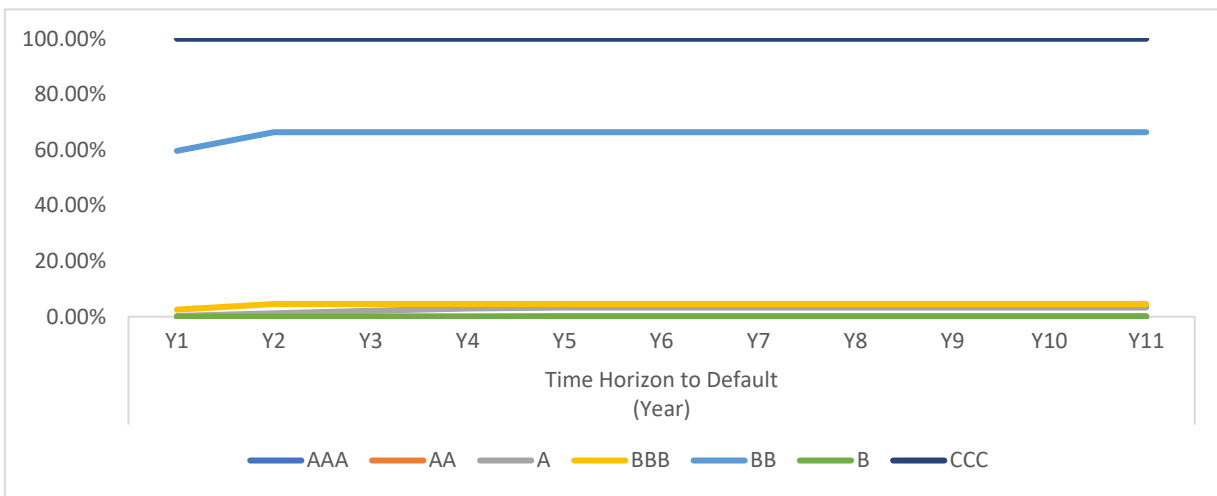
If the percentage of the consistency and rating upgrade is greater at a higher rating, then different conditions are shown by lower ratings. Lower ratings tend to have a greater percentage to migrate to the D rating (default) in the following year compared to higher ratings. The rating with the largest percentage to migrate to D in the following year, either for the debt instrument or issuer company, is CCC. The percentage change of CCC to migrate to D in the following year

for the debt instrument is 68.46%, while for the issuer company it is 33.33%. B rated debt instruments and issuer companies stand at 0.00% to migrate to D because, during the observation period, PEFINDO has a limited history to monitor debt instruments and issuer companies rated B.

3.6. Cumulative Average Default Rate

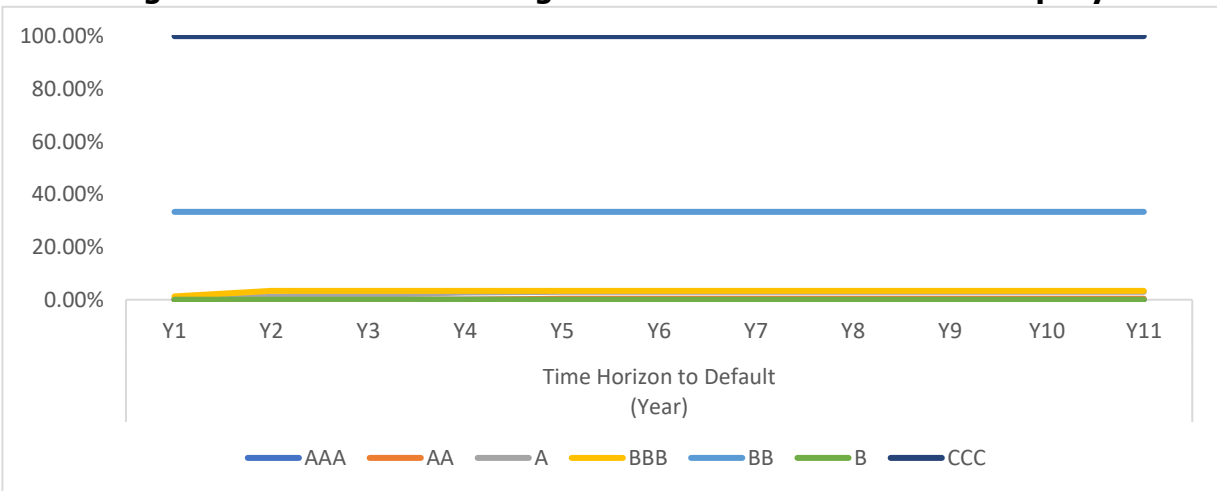
The cumulative average default rate in this paper is calculated for ratings AAA, AA, A, BBB, BB, B, CCC for the time horizon from the first year to the twelfth year. The default rate in the 12-year time horizon is the default rate based on historical data in the time horizon. Overall, the cumulative average default rate between the debt instrument rating and the issuer company rating has the same pattern. The longer the time horizon, the higher the default rate of each rating. The lower the rating the greater the default rate.

Figure 14. Cumulative Average Default Rate of the Debt Instrument



Source: PEFINDO Database (2020)

Figure 15. Cumulative Average Default Rate of the Issuer Company



Source: PEFINDO Database (2020)

Debt instruments with AAA, B, and CCC ratings have a constant default rate throughout the 12-year time horizon. The AAA and B ratings have a default rate of 0.00%, while CCC is 100.00%. Debt instruments rated B have a default rate of 0.00%, but not because no instrument with that rating has defaulted within the 12-year time horizon. This is because, during the observation period, PEFINDO has a limited history to monitor debt instruments rated B. Debt instruments rated AA were in default for the first time in the fifth year at 0.18%, and the default rate was constant with that value until the twelfth year. The default of debt instruments rated A in the first to fourth years was 0.28%, 1.21%, 2.09%, and 2.98%, respectively, while the default rate rose again to 3.30% in the fifth year and remained at that value until the twelfth year. Debt instruments rated BBB and BB show the same pattern in increasing the default rate. The BBB rating has a default rate of 2.56% in the first year, which then rose to 4.56% in the second year, and stayed at that value to the twelfth year. As for the BB rating, the default rate was 59.66% in the first year, rising to 66.37% in the second year, and that value lasted until the twelfth year.

Issuer companies rated AAA, BB, B, and CCC have a constant default rate throughout the 12-year time horizon. AAA and B have a default rate of 0.00%, with BB and CCC at 33.33% and 100.00%, respectively. B rated issuer companies have a default rate of 0.00%, but not because none defaulted within the 12-year time horizon. This was because, during the observation period, PEFINDO had a limited history to monitor B rated issuer companies. AA rated issuer companies experienced default for the first time in the fifth year at 0.38%, and the rate remained constant until the twelfth year. The default rate of A rated issuer companies in the first to fourth years was 0.45%, 1.16%, 1.92%, and 2.72%, respectively, rising to 2.99% in the fifth year and staying at that value until the twelfth year. BBB rated issuer companies had a default rate of 1.26% in the first year, rising to 3.36% in the second year, and staying at that value to the twelfth 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 Poll	Issuance Value (IDR Billion)	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12
2007	1,000.00	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	-
2009	5,310.00	0	0	0	0	0	0	0	0	0	0	-	-
2010	11,348.50	0	0	0	0	0	0	0	0	0	-	-	-
2011	15,034.50	0	0	0	0	0	0	0	0	-	-	-	-
2012	22,809.50	0	0	0	0	0	0	0	-	-	-	-	-
2013	42,771.50	0	0	0	0	0	0	-	-	-	-	-	-
2014	89,832.00	0	0	0	0	0	-	-	-	-	-	-	-
2015	114,055.60	0	0	0	0	-	-	-	-	-	-	-	-
2016	164,474.85	0	0	0	-	-	-	-	-	-	-	-	-
2017	237,813.35	0	0	-	-	-	-	-	-	-	-	-	-
2018	257,608.14	0	-	-	-	-	-	-	-	-	-	-	-
2019	292,352.90	-	-	-	-	-	-	-	-	-	-	-	-
Summary Statistic													
Withdrawn Issuance Value		137,630	128,692	67,495	52,736	21,379	16,605	8,996	7,947	1,995	0	0	0
Defaultable Issuance Value		1,117,781	989,089	921,594	868,858	847,479	830,874	821,879	813,932	811,937	811,937	811,937	811,937
Default Issuance Value		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%
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%

1.b. Rating-AA (double-A)

AA		Time Horizon to Default											
Year Poll	Issuance Value (IDR Billion)	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12
2007	10,500.00	0	0	0	0	900	0	0	0	0	0	0	0
2008	16,600.00	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	-	-
2010	65,009.76	0	0	0	0	0	0	0	0	0	-	-	-
2011	89,995.96	0	0	0	0	0	0	0	0	-	-	-	-
2012	126,564.82	0	0	0	0	0	0	0	-	-	-	-	-
2013	129,938.93	0	0	0	0	0	0	-	-	-	-	-	-
2014	87,527.20	0	0	0	0	0	-	-	-	-	-	-	-
2015	72,700.00	0	0	0	0	-	-	-	-	-	-	-	-
2016	83,133.00	0	0	0	-	-	-	-	-	-	-	-	-
2017	84,791.00	0	0	-	-	-	-	-	-	-	-	-	-
2018	93,004.00	0	-	-	-	-	-	-	-	-	-	-	-
2019	94,864.41	-	-	-	-	-	-	-	-	-	-	-	-
Summary Statistic													
Withdrawn Issuance Value		106,908	113,926	102,955	99,508	61,907	59,562	19,625	19,625	4,120	3,470	1,970	0
Defaultable Issuance Value		884,233	770,306	667,351	567,843	505,936	445,474	425,849	406,224	402,104	398,634	396,664	396,664
Default Issuance Value		0	0	0	0	900	0	0	0	0	0	0	0
Marginal Default Probabilities		0.00%	0.00%	0.00%	0.00%	0.18%	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%	0.18%	0.18%	0.18%	0.18%	0.18%	0.18%	0.18%	0.18%

1.c. Rating-A (single-A)

A		Time Horizon to Default											
Year Poll	Issuance Value (IDR Billion)	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12
2007	11,525.00	0	0	0	0	0	0	0	0	0	0	0	0
2008	15,000.00	0	600.00	150.00	900.00	0	0	0	0	0	0	0	-
2009	16,817.00	0	0	1,340.00	0	0	0	0	0	0	0	-	-
2010	14,469.00	0	1,340.00	0	0	0	0	0	0	-	-	-	-
2011	20,834.00	1,340.00	0	0	0	0	0	0	-	-	-	-	-
2012	33,182.00	0	0	0	0	0	0	-	-	-	-	-	-
2013	38,028.00	0	0	0	0	900.00	-	-	-	-	-	-	-
2014	43,404.00	0	0	0	1,900.00	-	-	-	-	-	-	-	-
2015	52,369.20	0	0	1,900.00	-	-	-	-	-	-	-	-	-
2016	62,813.18	0	2,100.00	-	-	-	-	-	-	-	-	-	-
2017	80,946.10	50.00	-	-	-	-	-	-	-	-	-	-	-
2018	78,124.25	-	-	-	-	-	-	-	-	-	-	-	-
2019	86,423.75	-	-	-	-	-	-	-	-	-	-	-	-
Summary Statistic													
Withdrawn Issuance Value		57,593	59,606	53,094	66,415	34,677	31,723	1,116	1,116	0	0	1,500	0
Defaultable Issuance Value		496,342	435,347	378,213	308,408	270,931	238,308	237,192	236,076	236,076	236,076	234,576	234,576
Default Issuance Value		1,390	4,040	3,390	2,800	900	0	0	0	0	0	0	0
Marginal Default Probabilities		0.28%	0.93%	0.90%	0.91%	0.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Cumulative Default Probabilities		0.28%	1.21%	2.09%	2.98%	3.30%	3.30%	3.30%	3.30%	3.30%	3.30%	3.30%	3.30%

1.d. Rating-BBB (triple-B)

BBB		Time Horizon to Default											
Year Poll	Issuance Value (IDR Billion)	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12
2007	2,275.00	0	675.00	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	-
2009	2,450.00	0	0	0	0	0	0	0	0	0	0	-	-
2010	1,610.00	0	0	0	0	0	0	0	0	0	-	-	-
2011	2,410.00	0	0	0	0	0	0	0	0	-	-	-	-
2012	2,210.00	0	0	0	0	0	0	0	-	-	-	-	-
2013	3,870.00	0	0	0	0	0	0	-	-	-	-	-	-
2014	5,183.80	0	0	0	0	0	-	-	-	-	-	-	-
2015	5,967.88	0	42.00	0	0	-	-	-	-	-	-	-	-
2016	11,462.88	332.00	1,000.00	0	-	-	-	-	-	-	-	-	-
2017	17,962.88	2,100.00	0	-	-	-	-	-	-	-	-	-	-
2018	21,845.26	0	-	-	-	-	-	-	-	-	-	-	-
2019	22,929.26	-	-	-	-	-	-	-	-	-	-	-	-
Summary Statistic													
Withdrawn Issuance Value	7,744	9,102	6,788	4,928	3,015	2,740	0	0	0	0	0	0	0
Defaultable Issuance Value	95,058	83,524	75,019	70,091	67,076	64,336	64,336	64,336	64,336	64,336	64,336	64,336	64,336
Default Issuance Value	2,432	1,717	0	0	0	0	0	0	0	0	0	0	0
Marginal Default Probabilities	2.56%	2.06%	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	2.56%	4.56%	4.56%	4.56%	4.56%	4.56%	4.56%	4.56%	4.56%	4.56%	4.56%	4.56%	4.56%

1.e. Rating-BB (double-B)

BB		Time Horizon to Default											
Year Poll	Issuance Value (IDR Billion)	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12
2007	0.00	0	0	0	0	0	0	0	0	0	0	0	0
2008	0.00	0	0	0	0	0	0	0	0	0	0	0	-
2009	750.00	600.00	150.00	0	0	0	0	0	0	0	0	-	-
2010	200.00	0	0	0	0	0	0	0	0	0	-	-	-
2011	0.00	0	0	0	0	0	0	0	0	-	-	-	-
2012	740.00	0	0	0	0	0	0	0	-	-	-	-	-
2013	0.00	0	0	0	0	0	0	-	-	-	-	-	-
2014	0.00	0	0	0	0	0	-	-	-	-	-	-	-
2015	328.00	0	0	0	0	-	-	-	-	-	-	-	-
2016	181.00	0	0	0	-	-	-	-	-	-	-	-	-
2017	1,962.00	1,000.00	0	-	-	-	-	-	-	-	-	-	-
2018	1,014.50	0	-	-	-	-	-	-	-	-	-	-	-
2019	570.00	-	-	-	-	-	-	-	-	-	-	-	-
Summary Statistic													
Withdrawn Issuance Value	3,064	181	181	0	0	0	0	0	0	0	0	0	0
Defaultable Issuance Value	2,682	901	570	570	570	570	570	570	570	570	570	570	570
Default Issuance Value	1,600	150	0	0	0	0	0	0	0	0	0	0	0
Marginal Default Probabilities	59.66%	16.65%	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	59.66%	66.37%	66.37%	66.37%	66.37%	66.37%	66.37%	66.37%	66.37%	66.37%	66.37%	66.37%	66.37%

1.f. Rating-B (single-B)

B		Time Horizon to Default											
		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12
Year Poll	Issuance Value (IDR Billion)												
2007	0.00	0	0	0	0	0	0	0	0	0	0	0	0
2008	0.00	0	0	0	0	0	0	0	0	0	0	0	-
2009	0.00	0	0	0	0	0	0	0	0	0	0	-	-
2010	0.00	0	0	0	0	0	0	0	0	0	-	-	-
2011	0.00	0	0	0	0	0	0	0	0	-	-	-	-
2012	280.00	0	0	0	0	0	0	0	-	-	-	-	-
2013	0.00	0	0	0	0	0	0	-	-	-	-	-	-
2014	120.00	0	0	0	0	0	-	-	-	-	-	-	-
2015	0.00	0	0	0	0	-	-	-	-	-	-	-	-
2016	0.00	0	0	0	-	-	-	-	-	-	-	-	-
2017	0.00	0	0	-	-	-	-	-	-	-	-	-	-
2018	0.00	0	-	-	-	-	-	-	-	-	-	-	-
2019	0.00	-	-	-	-	-	-	-	-	-	-	-	-
Summary Statistic													
Withdrawn Issuance Value		120	280	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
Default Issuance Value		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%
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%

1.g. Rating-CCC (triple-C)

CCC		Time Horizon to Default											
Year Poll	Issuance Value (IDR Billion)	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12
2007	0.00	0	0	0	0	0	0	0	0	0	0	0	0
2008	675.00	675.00	0	0	0	0	0	0	0	0	0	0	-
2009	0.00	0	0	0	0	0	0	0	0	0	0	-	-
2010	150.00	150.00	0	0	0	0	0	0	0	0	-	-	-
2011	0.00	0	0	0	0	0	0	0	0	-	-	-	-
2012	0.00	0	0	0	0	0	0	0	-	-	-	-	-
2013	280.00	0	0	0	0	0	0	-	-	-	-	-	-
2014	0.00	0	0	0	0	0	-	-	-	-	-	-	-
2015	0.00	0	0	0	0	-	-	-	-	-	-	-	-
2016	100.00	0	0	0	-	-	-	-	-	-	-	-	-
2017	0.00	0	0	-	-	-	-	-	-	-	-	-	-
2018	0.00	0	-	-	-	-	-	-	-	-	-	-	-
2019	0.00	-	-	-	-	-	-	-	-	-	-	-	-
Summary Statistic													
Withdrawn Issuance Value		380	0	0	0	0	0	0	0	0	0	0	0
Defaultable Issuance Value		825	0	0	0	0	0	0	0	0	0	0	0
Default Issuance Value		825	0	0	0	0	0	0	0	0	0	0	0
Marginal Default Probabilities		100.00%	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		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

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

2.a. Rating-AAA (triple-A)

AAA		Time Horizon to Default											
Year Poll	Total Issuer (Unit)	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12
2007	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	-
2009	2	0	0	0	0	0	0	0	0	0	0	-	-
2010	3	0	0	0	0	0	0	0	0	0	-	-	-
2011	4	0	0	0	0	0	0	0	0	-	-	-	-
2012	6	0	0	0	0	0	0	0	-	-	-	-	-
2013	7	0	0	0	0	0	0	-	-	-	-	-	-
2014	14	0	0	0	0	0	-	-	-	-	-	-	-
2015	16	0	0	0	0	-	-	-	-	-	-	-	-
2016	19	0	0	0	-	-	-	-	-	-	-	-	-
2017	23	0	0	-	-	-	-	-	-	-	-	-	-
2018	25	0	-	-	-	-	-	-	-	-	-	-	-
2019	28	-	-	-	-	-	-	-	-	-	-	-	-
Summary Statistic													
Withdrawn Issuer		1	1	0	0	0	0	0	0	0	0	0	0
Defaultable Issuer		146	145	145	145	145	145	145	145	145	145	145	145
Default Issuer		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%
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%

2.b. Rating-AA (double-A)

AA		Time Horizon to Default											
Year Poll	Total Issuer (Unit)	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12
2007	7	0	0	0	0	1	0	0	0	0	0	0	0
2008	10	0	0	0	0	0	0	0	0	0	0	0	-
2009	17	0	0	0	0	0	0	0	0	0	0	-	-
2010	24	0	0	0	0	0	0	0	0	0	-	-	-
2011	30	0	0	0	0	0	0	0	0	-	-	-	-
2012	35	0	0	0	0	0	0	0	-	-	-	-	-
2013	34	0	0	0	0	0	0	-	-	-	-	-	-
2014	29	0	0	0	0	0	-	-	-	-	-	-	-
2015	23	0	0	0	0	-	-	-	-	-	-	-	-
2016	22	0	0	0	-	-	-	-	-	-	-	-	-
2017	28	0	0	-	-	-	-	-	-	-	-	-	-
2018	30	0	-	-	-	-	-	-	-	-	-	-	-
2019	28	-	-	-	-	-	-	-	-	-	-	-	-
Summary Statistic													
Withdrawn Issuer		12	9	11	12	11	7	2	1	1	0	0	0
Defaultable Issuer		305	296	285	273	262	254	252	251	250	250	250	250
Default Issuer		0	0	0	0	1	0	0	0	0	0	0	0
Marginal Default Probabilities		0.00%	0.00%	0.00%	0.00%	0.38%	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%	0.38%	0.38%	0.38%	0.38%	0.38%	0.38%	0.38%	0.38%

2.c. Rating-A (single-A)

A		Time Horizon to Default											
Year Poll	Total Issuer (Unit)	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12
2007	17	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	-
2009	23	0	0	1	0	0	0	0	0	0	0	-	-
2010	24	0	1	0	0	0	0	0	0	0	-	-	-
2011	32	1	0	0	0	0	0	0	0	-	-	-	-
2012	40	0	0	0	0	0	0	0	-	-	-	-	-
2013	45	0	0	0	0	1	0	-	-	-	-	-	-
2014	43	0	0	0	2	0	-	-	-	-	-	-	-
2015	45	0	0	2	0	-	-	-	-	-	-	-	-
2016	45	0	1	0	-	-	-	-	-	-	-	-	-
2017	45	1	0	-	-	-	-	-	-	-	-	-	-
2018	41	0	-	-	-	-	-	-	-	-	-	-	-
2019	46	-	-	-	-	-	-	-	-	-	-	-	-
Summary Statistic													
Withdrawn Issuer		18	27	25	19	17	15	5	6	1	1	1	0
Defaultable Issuer		448	419	391	369	349	333	328	322	321	320	319	319
Default Issuer		2	3	3	3	1	0	0	0	0	0	0	0
Marginal Default Probabilities		0.45%	0.72%	0.77%	0.81%	0.29%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Cumulative Default Probabilities		0.45%	1.16%	1.92%	2.72%	2.99%	2.99%	2.99%	2.99%	2.99%	2.99%	2.99%	2.99%

2.d. Rating-BBB (triple-B)

BBB		Time Horizon to Default											
Year Poll	Total Issuer (Unit)	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12
2007	5	0	1	0	0	0	0	0	0	0	0	0	0
2008	6	0	0	0	0	0	0	0	0	0	0	0	-
2009	6	0	0	0	0	0	0	0	0	0	0	-	-
2010	5	0	0	0	0	0	0	0	0	0	-	-	-
2011	7	0	0	0	0	0	0	0	0	-	-	-	-
2012	7	0	0	0	0	0	0	0	-	-	-	-	-
2013	11	0	0	0	0	0	0	-	-	-	-	-	-
2014	12	0	0	0	0	0	-	-	-	-	-	-	-
2015	17	0	1	0	0	-	-	-	-	-	-	-	-
2016	19	1	1	0	-	-	-	-	-	-	-	-	-
2017	25	1	0	-	-	-	-	-	-	-	-	-	-
2018	28	0	-	-	-	-	-	-	-	-	-	-	-
2019	26	-	-	-	-	-	-	-	-	-	-	-	-
Summary Statistic													
Withdrawn Issuer		15	16	13	12	5	5	1	0	2	2	2	0
Defaultable Issuer		159	141	125	113	108	103	102	102	100	98	96	96
Default Issuer		2	3	0	0	0	0	0	0	0	0	0	0
Marginal Default Probabilities		1.26%	2.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Cumulative Default Probabilities		1.26%	3.36%	3.36%	3.36%	3.36%	3.36%	3.36%	3.36%	3.36%	3.36%	3.36%	3.36%

2.e. Rating-BB (double-B)

BB		Time Horizon to Default											
Year Poll	Total Issuer (Unit)	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12
2007	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	-
2009	1	1	0	0	0	0	0	0	0	0	0	-	-
2010	0	0	0	0	0	0	0	0	0	0	-	-	-
2011	0	0	0	0	0	0	0	0	0	-	-	-	-
2012	1	0	0	0	0	0	0	0	-	-	-	-	-
2013	0	0	0	0	0	0	0	-	-	-	-	-	-
2014	1	0	0	0	0	0	-	-	-	-	-	-	-
2015	1	0	0	0	0	-	-	-	-	-	-	-	-
2016	1	0	0	0	-	-	-	-	-	-	-	-	-
2017	3	1	0	-	-	-	-	-	-	-	-	-	-
2018	0	0	-	-	-	-	-	-	-	-	-	-	-
2019	2	-	-	-	-	-	-	-	-	-	-	-	-
Summary Statistic													
Withdrawn Issuer		4	1	1	0	0	0	0	0	0	0	0	0
Defaultable Issuer		6	3	2	2	2	2	2	2	2	2	2	2
Default Issuer		2	0	0	0	0	0	0	0	0	0	0	0
Marginal Default Probabilities		33.33%	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		33.33%	33.33%	33.33%	33.33%	33.33%	33.33%	33.33%	33.33%	33.33%	33.33%	33.33%	33.33%

2.f. Rating-B (single-B)

B		Time Horizon to Default											
		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12
Year Poll	Total Issuer (Unit)												
2007	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	-
2009	0	0	0	0	0	0	0	0	0	0	0	-	-
2010	0	0	0	0	0	0	0	0	0	0	-	-	-
2011	0	0	0	0	0	0	0	0	0	-	-	-	-
2012	1	0	0	0	0	0	0	0	-	-	-	-	-
2013	0	0	0	0	0	0	0	-	-	-	-	-	-
2014	0	0	0	0	0	0	-	-	-	-	-	-	-
2015	0	0	0	0	0	-	-	-	-	-	-	-	-
2016	0	0	0	0	-	-	-	-	-	-	-	-	-
2017	0	0	0	-	-	-	-	-	-	-	-	-	-
2018	0	0	-	-	-	-	-	-	-	-	-	-	-
2019	0	-	-	-	-	-	-	-	-	-	-	-	-
Summary Statistic													
Withdrawn Issuer	0	1	0	0	0	0	0	0	0	0	0	0	0
Defaultable Issuer	1	0	0	0	0	0	0	0	0	0	0	0	0
Default Issuer	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%
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%

2.g. Rating-CCC (triple-C)

CCC		Time Horizon to Default											
Year Poll	Total Issuer (Unit)	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12
2007	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	-
2009	0	0	0	0	0	0	0	0	0	0	0	-	-
2010	0	0	0	0	0	0	0	0	0	0	-	-	-
2011	0	0	0	0	0	0	0	0	0	-	-	-	-
2012	0	0	0	0	0	0	0	0	-	-	-	-	-
2013	1	0	0	0	0	0	0	-	-	-	-	-	-
2014	0	0	0	0	0	0	-	-	-	-	-	-	-
2015	0	0	0	0	0	-	-	-	-	-	-	-	-
2016	1	0	0	0	-	-	-	-	-	-	-	-	-
2017	0	0	0	-	-	-	-	-	-	-	-	-	-
2018	0	0	-	-	-	-	-	-	-	-	-	-	-
2019	0	-	-	-	-	-	-	-	-	-	-	-	-
Summary Statistic													
Withdrawn Issuer		2	0	0	0	0	0	0	0	0	0	0	0
Defaultable Issuer		1	0	0	0	0	0	0	0	0	0	0	0
Default Issuer		1	0	0	0	0	0	0	0	0	0	0	0
Marginal Default Probabilities		100.00%	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		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

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