

PEFINDO'S CORPORATE DEFAULT AND RATING TRANSITION STUDY (1996 – 2015)

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INTRODUCTION

PEFINDO publishes “Corporate Default and Rating Transition Study” to provide information on the consistency of PEFINDO’s rating result with the default rate, which is often used as a proxy for probability of default. As part of our commitment to support the development of Indonesian fixed income securities, we have made effort to expose our rating performance through this publication.

PT Pemeringkat Efek Indonesia (PEFINDO) was established in December 1993 in the form of a limited liability company as the first credit rating agency in Indonesia with the license from Bapepam No. 39/PM-PI/1994 issued on August 13, 1994. The establishment was under the initiatives of the Indonesian Capital Market Supervisory Agency (Badan Pengawas Pasar Modal/BAPEPAM) and Central Bank (Bank Indonesia). The company is set to provide corporate, long-term and short-term debt ratings to support the Indonesian capital market, as required by Indonesia Financial Service Authority (OJK) through its regulation that requires listed debts/bonds to have ratings from an independent credit rating agency such as PEFINDO. Central bank also has a regulation that requires all commercial papers held or traded by banks to have ratings. PEFINDO started to commercially operate in late 1994, and as to date it is recognized as the leading credit rating agency in Indonesia.

We had assigned as well as monitored the solicited ratings of 579 eligible entities throughout the period of 1995 to 2015, encountering defaults from 116 entities. Most defaulters occurred in 1998 to 1999, and decreased in line with the recovery of the country’s economy. The recent 2008 global financial crisis has not made significant impact on Indonesian companies on our portfolio, reflected on very few defaults years after 2008, with only 12 defaults until the end of 2015.

Overall, the results and statistics of PEFINDO’s default studies had followed the premise that ratings have negatively correlated with the default probabilities, in other words, the higher the rating, the lower the likelihood of default and vice versa. Meanwhile, average default rate has been stable during the years under review resulting from relative small number of defaulters, while at the same time the number of rating population grew.

DATA & POPULATION

The ratings data used in the study refer to issuer or corporate ratings (Corporate Credit Rating/CCR), not to issue or instrument ratings, and as a result, the defaults were counted in units, not in currency or rupiah value. Accordingly, when issuer rating and issue rating is different, then we use the Corporate Credit Ratings (CCR). In this study, we reviewed the performance of only solicited ratings outstanding from December 31, 1995 to December 31, 2015 (both published and unpublished ratings).

In terms of business lines, there were sectors that showed higher frequency of defaults than others (**Figure 1**). For instance, Property & Banking represent the highest probability of defaults. Some refinements on industry classification were applied to the population, resulting in a slightly different version from the previous study. We also regroup some of the industries to show better differentiation among 45 business lines, as tabulated in **Appendix 2**.

The default data count is conditional on no earlier default. Meaning, in this study, a rated entity in the population can have only one default event through the years of observation. So, whenever we find multiple defaulter cases from identical entity, some omission or inclusion will be applied, depending on the nature of the default. After the first default, notably, an entity could stay in default status in the subsequent years, fade away, or be rerated to non-default rating category. When the entity stays in its default status, then it would be omitted from the next year default calculation, until the default status was removed (upgraded) to other rating category. When the rerated entity migrates to a non-default status (rated other than ‘idD’ or ‘idSD’), it will be recognized as a new entity, and the counting continues. This procedure aims to avoid double counting of defaults from the rating level the entity was initially originated.

Figure 1. Default Statistics Among Entities Across Industries (1996 - 2015)

No	% Defaulters of Total Eligible Population	Defaulter Count	Industry Count	Business Line
1	3.28%	19	60	Property
2	1.73%	10	63	Banking
3	1.55%	9	31	Manufacturing
4	1.55%	9	11	Pulp and Paper
5	1.38%	8	14	Textile
6	1.21%	7	9	Investment Holding Company
7	1.21%	7	59	Multifinance
8	0.69%	4	40	Insurance & Guarantee
9	0.69%	4	8	Toll Road
10	0.69%	4	7	Shipping
11	0.69%	4	16	Telecommunication
12	0.52%	3	14	Automotive
13	0.52%	3	8	Woodbase & Agro
14	0.35%	2	7	Hotel
15	0.35%	2	13	Chemical
16	0.35%	2	17	Construction
17	0.35%	2	4	Fishery
18	0.35%	2	16	Mining
19	0.35%	2	7	Poultry
20	0.35%	2	5	Cement
21	0.35%	2	9	Vehicle Rental & Transportation
22	0.17%	1	11	Food & Beverage
23	0.17%	1	9	Media
24	0.17%	1	8	Seaport
25	0.17%	1	3	Printing & Packaging
26	0.17%	1	11	Trading & Distribution
27	0.17%	1	35	Plantation
28	0.17%	1	5	Retail
29	0.17%	1	10	Securities
30	0.17%	1	5	Information Technology & Services
31	0.00%	0	1	Airport
32	0.00%	0	3	Gas Distribution
33	0.00%	0	6	Pharmaceutical
34	0.00%	0	1	Other Financial Services
35	0.00%	0	4	Mining Contractor
36	0.00%	0	2	Healthcare
37	0.00%	0	5	Power & Energy
38	0.00%	0	3	Tourism & Leisure
39	0.00%	0	8	Subnational Entity
40	0.00%	0	9	Clean Water Processing
41	0.00%	0	3	Household Appliance & Office Equipment
42	0.00%	0	3	Fertilizer
43	0.00%	0	1	Engineering Procurement & Construction
44	0.00%	0	8	Securitized
45	0.00%	0	7	Tobacco
	20.03%	116	579	

DEFINITION & METHODOLOGY

Definition

A default is defined as a failure of a company to provide payments to meet its financial obligations, in part or a whole, in a timely manner. PEFINDO records a default in its first occurrence of a missed payment of a financial obligation, for both rated and un-rated debts. The definition excludes financial obligations under bona fide commercial dispute. If on the due date, a company misses its payment, either in the form of interest or principal, but makes the payment within its grace period, PEFINDO regards the incident to be a non-default. A selective default ("SD") is also classified as a default.

Methodology

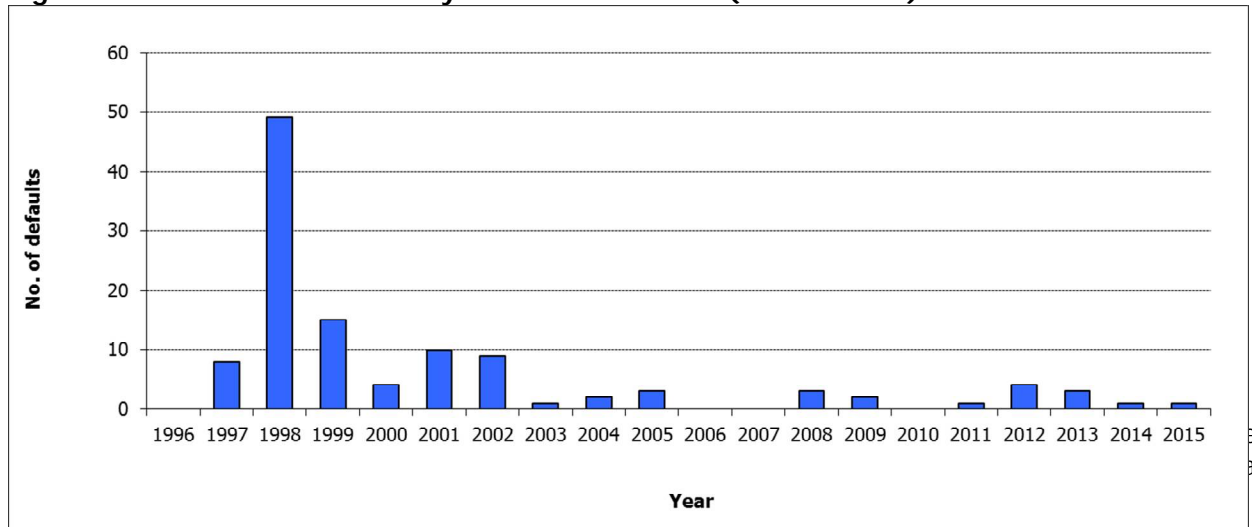
The calculation begins with the formation of static pools. Each static pool is formed on the first day of each year covered by this study and followed from that point forward. All companies included in the study are assigned to one or more static pools. In case of default of a company, the default is assigned to the static pools the company belongs to. The pools are static in the sense that their membership remains constant over time. Thus, each static pool for a particular year has permanent members of issuers.

For instance, the static pool of 1996 consists of all companies rated as of Jan 1, 1996 at 00:00 hours, including the surviving ratings in 1995 that are still outstanding as of Jan. 1, 1996. Any new ratings in 1996 after Jan 1, 1996, will be included in the next year static pool (1997). Public information ("pi") ratings are excluded from this study. Ratings that have defaulted as well as those have been withdrawn (Not Rated or "NR") are taken out from the subsequent static pools. Once defaulted, an entity may not enter into the static pools under the same identity, but must be given a new name or code.

Consider the following example: A company was rated as "BBB" in mid-1995, then had its rating lowered to "BB" in 1996 and maintained at "BB" in 1997. The rating is expired (withdrawn) in mid-1998, and then defaulted in 1999. The company would belong to 1996 static pool in "BBB" category, and static pools of 1997 and 1998 in the "BB" category. It would not be a member of 1999 static pool since it was not rated on Jan 1, 1999. As such, the default in 1999 would be assigned to all three static pools the company belongs to. In the case that the same company were to be rated in 2001 (after having gone through a restructuring process), the company would be regarded as a different entity than the one previously defaulted. In other words, an entity may not default more than once during its life time.

A rating is expired or withdrawn when the entity's debt or obligation is paid off or extinguished. A rating could also be withdrawn at the entity's request, or due to lack of cooperation of the entity, especially those who are experiencing financial difficulties, to provide all the necessary information for PEFINDO to keep servicing the rating.

Figure 2. First Time Defaulters By Year of Occurrence (1996 – 2015)



TRANSITION ANALYSIS

Once we have formed the static pool, we could also conduct a transition analysis to measure the stability of our ratings, by observing the rating migration for a certain time period. The analysis also indicates the probability of a certain rating being upgraded or downgraded to another rating category during a period of time. This is done by comparing the ratings at the beginning of a time period with the ratings at the subsequent period. In this study, we only observe one-year transition rate. To compute one-year rating transition rates by rating category, the rating of a particular entity in each particular year is compared to the rating at the following year. In this calculation, multiple defaults from the same entity may also be included. Each one-year transition matrix displays all eligible rating movements from the beginning of the year through year-end. An eligible issuer that remains populated for more than one year is counted as many times as the number of years it is rated (outstanding).

The results of transition analysis are summarized in Figure 3. As illustrated, for each rating category listed in the matrix's left-most column, there are ten pairings listed in rows. The second left-most column under Σ Rtg [#] heading shows the number of population for each rating transition. The remaining columns correspond to the ratings from 'idAAA' to 'idD,' plus an entry for NR (Not Rated).

Figure 3: One Year Rating Transition Rate (1996-2015)

Rating From↓/To→	Σ Rtg [#]	idAAA	idAA	idA	idBBB	idBB	idB	idCCC	idD	NR
idAAA	91	96.70%	1.10%	1.10%	0.00%	0.00%	0.00%	0.00%	0.00%	1.10%
idAA	289	5.54%	88.24%	3.81%	0.00%	0.69%	0.00%	0.00%	1.04%	0.69%
idA	648	0.31%	7.72%	84.57%	3.24%	0.62%	0.00%	0.00%	2.47%	1.08%
idBBB	434	0.00%	0.69%	16.36%	64.98%	3.46%	1.15%	1.38%	9.22%	2.76%
idBB	77	0.00%	0.00%	6.49%	20.78%	19.48%	5.19%	3.90%	29.87%	14.29%
idB	23	0.00%	0.00%	0.00%	13.04%	13.04%	26.09%	4.35%	30.43%	13.04%
idCCC	7	0.00%	0.00%	0.00%	0.00%	0.00%	14.29%	0.00%	57.14%	28.57%

Source: PEFINDO's database

Figure 3 show that there is more consistency of the investment-grade ratings in comparison to the speculative-grade ratings. For instance, the idAA rating has 88.24% chance to remain in the same rating; on the other hand, idBB rating has only 19.48% chance to remain at idBB. It is also important to note that number of population plays a part to the calculation of the transition rate. One of the reasons that the transition rates of the lower-grade ratings are much lower than higher rated companies is that because the population of such lower rating companies is much smaller than the higher-rating

companies. It is also quite normal that companies with weak business profiles and weak financials show more volatility in the ratings performance in comparison to their higher-rated peers.

For example, let's look at the third row after the table header of Figure 3; It shows that for ('idA') rated companies at the beginning of a year, 84.57% of the rated entities maintain the rating at 'idA' in the subsequent year, while 7.72% had been upgraded to 'idAA,' and another 3.24% downgraded to 'idBBB,' whereas 0.62% had been downgraded to 'idBB,' and so on. The last column under 'NR' headings indicates percentage number of companies which are not rated (NR) in the subsequent year.

It is interesting to see a significant drop-off of rating stability in the "BBB" category (64.98%) in comparison to "A" category (84.57%), as it pertains to investors' appetite for generally acceptable rating. As investors, dominated by pension funds and insurance companies, usually require a minimum rating of "A" to invest in, it has resulted in larger pool of rating entities, followed by those in "BBB" category that are hopeful to earn the "A" rating. Another significant drop of rating stability to 19.48% in "BB" category merely shows investors' disinterest in investing in non-investment grade instruments.

OVERALL RESULTS OF 2015 DEFAULT STUDY

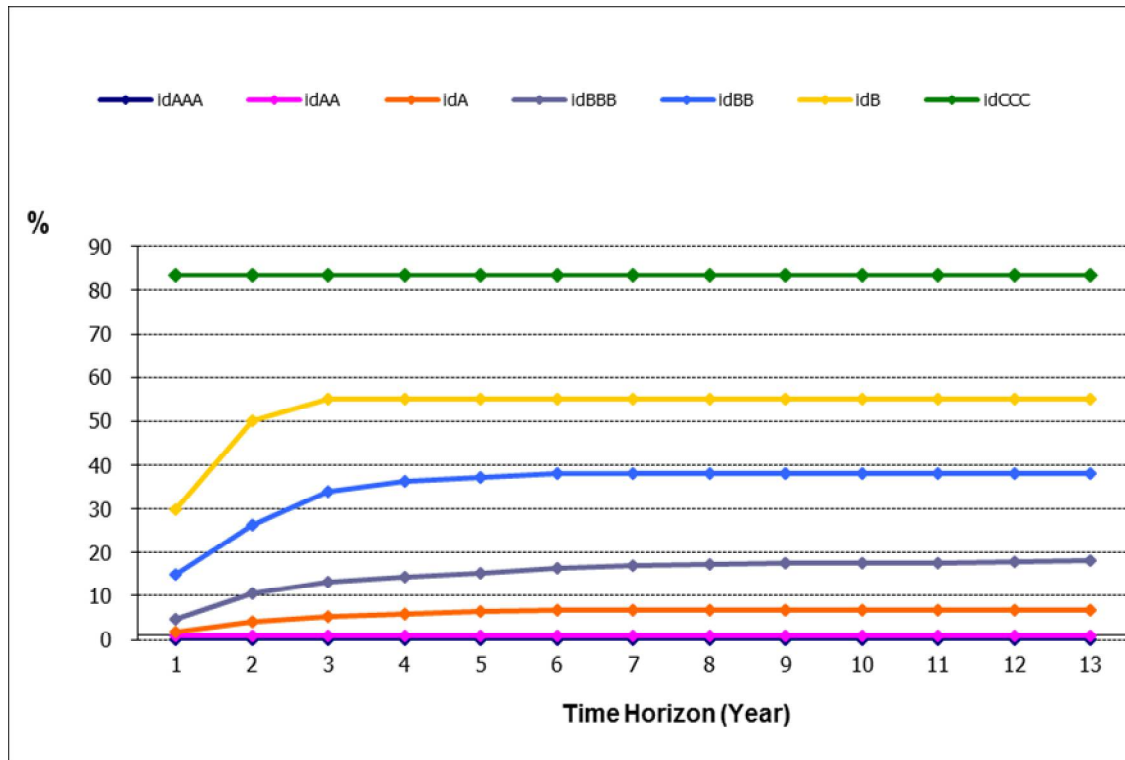
As a valuable tool to measure credit risk, ratings are expected to differentiate strong credits from weaker ones. An effective rating system should be able to produce both high ratings to those that are remote from default and in the other hand assign low ratings to issuers that ultimately default. AAA rated issuers, as expected, have been performing very well so far, without any record of default since the beginning year we rated those entities (**Appendix 1**). However, in general, default rates do not provide prediction of the current ratings' prescriptive debt repayment failure probability. Default rates represent the past performance of past ratings, whereas current ratings are PEFINDO's forward-looking opinions, which can only be validated by future performance of the ratings. Figure 4 and Figure 5 shows the default intensity for entities starting with a particular credit rating. For instance, issuers with credit rating of idBBB have an average default rate of 4.73 by the end of the first year (Y1), 10.64% by the end of the second year (Y2), and so on.

Figure 4. Cumulative Average Default Rates (1996 – 2015)

Rating	Population [#]	Time Horizon To Default [Years]										
		Y1 [%]	Y2 [%]	Y3 [%]	Y4 [%]	Y5 [%]	Y6 [%]	Y7 [%]	Y8 [%]	Y9 [%]	Y10 [%]	Y11 [%]
idAAA	126	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
idAA	353	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
idA	802	1.62	4.11	5.24	5.99	6.48	6.73	6.73	6.86	6.86	6.86	6.86
idBBB	592	4.73	10.64	13.18	14.36	15.37	16.55	17.06	17.40	17.57	17.57	17.57
idBB	121	14.88	26.45	33.88	36.36	37.19	38.02	38.02	38.02	38.02	38.02	38.02
idB	25	30.00	50.00	55.00	55.00	55.00	55.00	55.00	55.00	55.00	55.00	55.00
idCCC	13	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33

Source: PEFINDO's database

Figure 5. Chart On Cumulative Average Default Rates 1996-2015 [%]



AAA rated issuers, as expected, have been performing very well so far, without any record of default since the beginning year we rated those entities. Likewise for AA rated issuers, the cumulative default rate was very low at 0.85%, accounting for only 1 defaulter from the impact of the Asian financial crisis in 1997-1998 period.

MEASURING THE RELATIVE RATING PERFORMANCE

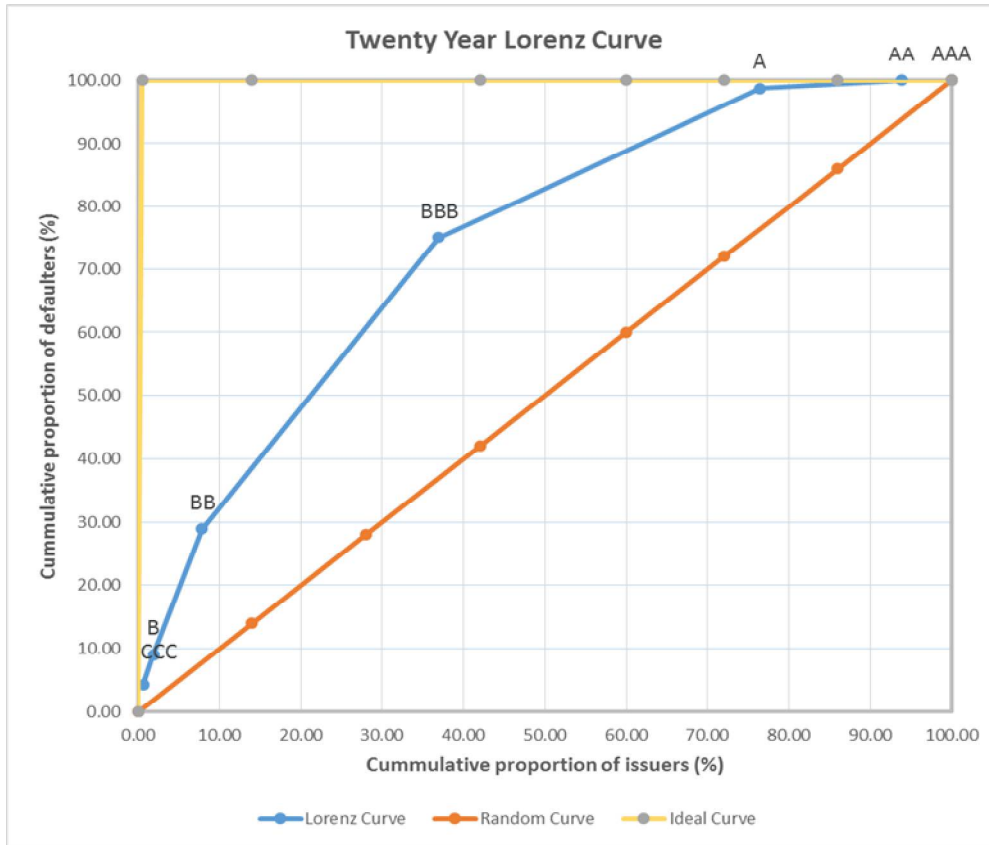
Gini Ratio

To measure relative ratings performance, we use the Lorenz curve as a graphical representation of the proportion of the distribution, and summarized with the Gini coefficient. The Lorenz curve was developed by Max O. Lorenz as a graphical representation of the proportionality of a distribution. With ratings, it is an indicator of the ratings' predictive strength. The Lorenz curve is derived by plotting out the cumulative proportion (percentage) of issuers by rating category at the X axis and the cumulative proportion (percentage) of defaulters by rating category at the Y axis. Then we compare the Lorenz curve an ideal curve (all defaults occur at the lowest rating) and a random curve (1 to 1 coefficient). For example, if 'CCC' rated entities made up 1% of the total population of issuers (X axis), and 20% of the defaulters (Y axis), then the coordinate (1, 20) would be the first point on the curve.

The Gini coefficient or ratio, ranging from 0 – 1, is a summary statistic of the Lorenz curve. The Gini ratio would be zero (0) if the ratings only randomly approximated the default risk, and it would be one (1) if the ratings perfectly ranked in order so that the defaults only occurred at the lowest rated entities. In summary, the higher the Gini ratio is, the higher the accuracy level of the ratings in indicating default rate in each of the rating category. However, it must be noted that the number of population of rating entities could play a factor into the equation. The greater the population of rated entities, the lesser the probability of the chance of distorted outcome due to the limited sample size.

The Gini coefficient is a ratio of two areas: the area bounded by the Lorenz curve and the random curve divided by the area bounded by the ideal curve and random curve. In PEFINDO's case, the Gini ratio is 0.725 within the one-year rating period.

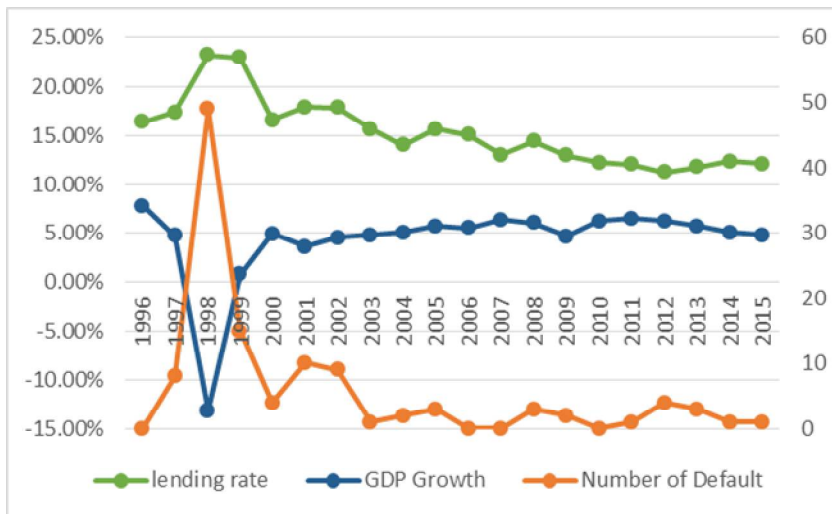
Figure 6. Twenty Year Relative Rating Performance



MACROECONOMICS INFLUENCE ON RATING PERFORMANCE

East Asian financial crisis has lead to Indonesian financial crisis in 1997-1998 followed by rupiah depreciation, hyper inflation and skyrocketing lending rate. Lending rate rose from 17.3% in 1997 to 23.1% in 1998, compared with 12.12% lending rate in 2015. This condition increased cost of fund rapidly and reduced investment spending and finally lead to economic crisis marked by negative GDP growth. This turbulence lead to an increase of defaulters from 8 in 1997 to 48 in 1998. The improvement of GDP in 1999-2000 followed by lower inflation, lending rate and stable rupiah reduced defaulters from 15 in 1999 to 4 in 2000.

Figure 7. Indonesian Macroeconomics Indicators and Number of Default

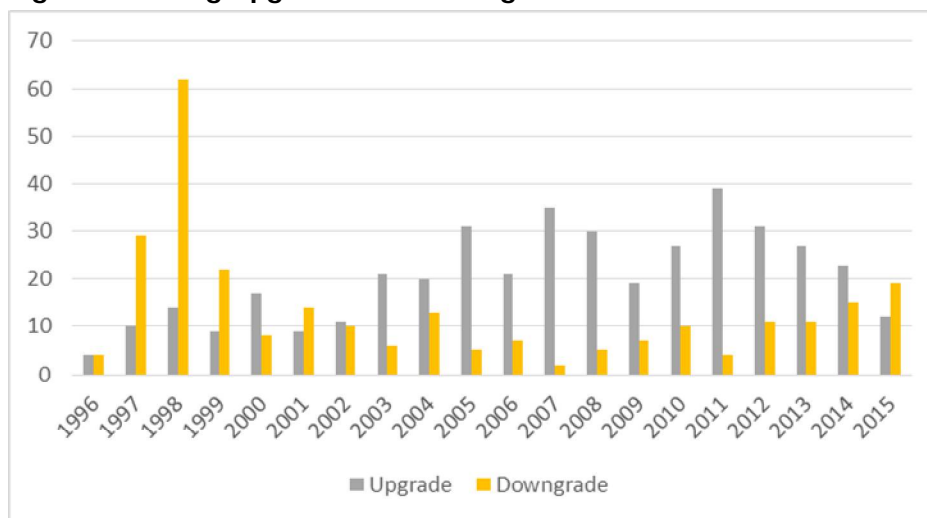


In 2001, Indonesian macroeconomic condition was vulnerable once again due to reduction of oil subsidy. Inflation up 9.3% to 12.5% followed by higher lending rate and lower GDP growth. Decline of aggregate

demand marked by lower GDP growth and higher cost of fund rose the defaulters from 4 in 2000 to 10 in 2001. In 2002- 2007 Indonesia enjoyed commodity price booming due to strong demand from emerging market. GDP growth continuously rose from 4.6% to 5.8% before global financial crisis period in 2008. Strong GDP growth was followed by declining trend on inflation and lending rate creating rapid growing of credit expansion. Liquidity was relatively loosen and it indirectly reduced number of defaulters from 9 in 2002 to none in 2007 in that period. However, there was 3 corporate defaults during global financial crisis in 2008.

Indonesian Government and Central Bank could maintain stable economic growth at sustainable level from 2009 to 2011 amid the declining economic growth trend of developed countries. Therefore, number of defaulters was minimum during the period. Lending rate directly appreciated and number of defaulters rose from 1 in 2011 to 4 in 2013. The decline of commodity price started in 2014 was not followed by increasing number of defaulters yet. However, the declining trend of GDP growth could be a threat for debtors in the future despite declining trend of lending rate.

Figure 8. Rating Upgrades and Downgrades



Further declining on economic growth resulted in higher rating downgrades in 2015 compared to previous year. There was 19 rating downgrades, higher than 12 rating upgrades in 2015, which also occurred in 2001 and Asian financial crisis period during 1997-1999. Rating downgrades were dominated by corporate companies and mostly triggered by increasing financial leverages.

We did not measure post-default recovery rate because the scarcity of information on actual event of distressed exchange among conflicting parties (lender-borrower relationship). Among various default events, recovery rates generally tend to be more difficult to be measured in Indonesia. In general, priority of claims against collateral security on default recovery will relate on the type of liens (APHT, SKMHT, etc). When a lender is in a first lien position, it means that they are in the first or priority position to benefit from any liquidation of the collateral which secures the loan.

One of the primary purposes of PEFINDO's Corporate Default Study is to communicate the historical performance of PEFINDO's ratings as predictors of default for investors and regulators. PEFINDO's default studies also contribute to the transparency of the rating process and directly address the meaning of PEFINDO's long-term debt ratings scale.

Appendix 1a. Survival Pool Cumulative Average Default Rate For idAAA Rating (1996-2016)

Year Pool	Issuers [#]	Time horizon (years)																
		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17
1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
2001	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
2002	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2003	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-
2004	3	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-
2005	2	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
2006	1	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-
2007	1	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-
2008	1	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-
2009	3	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-
2010	6	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-
2011	5	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
2012	11	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
2013	15	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2014	20	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2015	27	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2016	27	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Summary - Survival Pool																		
A	Total Default [#]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G	Total Issuers [#]	126	99	72	52	37	26	21	15	12	11	10	9	7	4	2	1	0
B	Surviving Issuers [#]	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126
C	Conditional Marginal Average Default Rate [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D	Marginal Survival Rate [%]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
E	Cumulative Marginal Survival Rate [%]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
F	Cumulative Average Default Rate [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes:

A = Total Default [#]

B = Surviving Issuers (Cumulative Issuers; excluded issuers who were previously defaulted) [#]

C = Conditional Marginal Average Default Rate [%] = Total Default / Surviving Issuers = A/B

D = Marginal Survival Rate [%] = (100% - C)

E = Cumulative Marginal Survival Rate [%] = (100% - F)

F = Cumulative Average Default Rate [%] = (100% - E)

G = Total Issuers [#]

Appendix 1b. Survival Pool Cumulative Average Default Rate For idAA Rating (1996-2016)

	Year Pool	Issuers [#]	Time horizon (years)																
			Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17
	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1997	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1998	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2000	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
	2001	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	2002	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-
	2003	8	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
	2004	6	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-
	2005	7	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-
	2006	7	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-
	2007	9	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-
	2008	14	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-
	2009	22	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-
	2010	25	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-
	2011	26	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
	2012	36	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
	2013	43	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2014	48	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2015	43	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2016	42	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Summary - Survival Pool																			
A	Total Default [#]		3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G	Total Issuers [#]		353	311	268	220	177	141	115	90	68	54	45	38	31	25	17	2	0
B	Surviving Issuers [#]		353	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350
C	Conditional Marginal Average Default Rate [%]		0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D	Marginal Survival Rate [%]		99.15	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
E	Cumulative Marginal Survival Rate [%]		99.15	99.15	99.15	99.15	99.15	99.15	99.15	99.15	99.15	99.15	99.15	99.15	99.15	99.15	99.15	99.15	99.15
F	Cumulative Average Default Rate [%]		0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85

Notes:

A = Total Default [#]

B = Surviving Issuers (Cumulative Issuers; excluded issuers who were previously defaulted) [#]

C = Conditional Marginal Average Default Rate [%] = Total Default / Surviving Issuers = A/B

D = Marginal Survival Rate [%] = (100% - C)

E = Cumulative Marginal Survival Rate [%] = (100% - F)

F = Cumulative Average Default Rate [%] = (100% - E)

G = Total Issuers [#]

Appendix 1c. Survival Pool Cumulative Average Default Rate For idA Rating (1996-2016)

	Year Pool	Issuers [#]	Time horizon (years)																
			Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17
	1996	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1997	12	0	5	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	1998	16	5	2	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0
	1999	5	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2000	13	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	-
	2001	24	3	5	0	0	0	0	0	1	0	0	0	0	0	0	0	-	-
	2002	19	3	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-
	2003	17	0	0	0	0	0	1	0	0	0	0	0	0	0	-	-	-	-
	2004	38	0	0	0	0	1	1	0	0	0	0	0	0	-	-	-	-	-
	2005	39	0	0	0	0	1	0	0	0	0	0	0	-	-	-	-	-	-
	2006	50	0	0	1	1	0	0	0	0	0	0	-	-	-	-	-	-	-
	2007	48	0	1	1	0	0	0	0	0	-	-	-	-	-	-	-	-	-
	2008	55	0	1	0	0	1	0	0	0	-	-	-	-	-	-	-	-	-
	2009	35	0	0	0	1	0	0	0	-	-	-	-	-	-	-	-	-	-
	2010	37	0	0	2	0	0	0	-	-	-	-	-	-	-	-	-	-	-
	2011	42	0	2	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
	2012	52	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
	2013	62	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2014	75	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2015	77	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2016	83	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Summary - Survival Pool																			
A	Total Default [#]		13	20	9	6	4	2	0	1	0	0	0	0	0	0	0	0	0
G	Total Issuers [#]		802	719	642	576	505	453	411	374	339	284	236	118	147	109	92	73	49
B	Surviving Issuers [#]		802	789	769	760	754	750	748	748	747	747	747	747	747	747	747	747	747
C	Conditional Marginal Average Default Rate [%]		1.62	2.53	1.17	0.79	0.53	0.27	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D	Marginal Survival Rate [%]		98.38	97.47	98.83	99.21	99.47	99.73	100.00	99.87	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
E	Cumulative Marginal Survival Rate [%]		98.38	95.89	94.76	94.01	93.52	93.27	93.27	93.14	93.14	93.14	93.14	93.14	93.14	93.14	93.14	93.14	93.14
F	Cumulative Average Default Rate [%]		1.62	4.11	5.24	5.99	6.48	6.73	6.73	6.86	6.86	6.86	6.86	6.86	6.86	6.86	6.86	6.86	6.86

Notes:

A = Total Default [#]

B = Surviving Issuers (Cumulative Issuers; excluded issuers who were previously defaulted) [#]

C = Conditional Marginal Average Default Rate [%] = Total Default / Surviving Issuers = A/B

D = Marginal Survival Rate [%] = (100% - C)

E = Cumulative Marginal Survival Rate [%] = (100% - F)

F = Cumulative Average Default Rate [%] = (100% - E)

G = Total Issuers [#]

Appendix 1d. Survival Pool Cumulative Average Default Rate For idBBB Rating (1996-2016)

	Year Pool	Issuers [#]	Time horizon (years)																
			Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17
	1996	8	0	0	2	4	0	2	0	0	0	0	0	0	0	0	0	0	0
	1997	53	4	20	6	1	1	2	0	0	0	0	0	1	0	0	0	0	0
	1998	40	15	10	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	1999	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2000	6	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
	2001	20	3	1	0	0	1	0	0	0	1	0	0	0	0	0	0	-	-
	2002	16	1	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-
	2003	24	0	0	1	0	0	0	0	0	0	0	0	1	-	-	-	-	-
	2004	51	0	0	0	0	0	0	0	0	0	0	1	-	-	-	-	-	-
	2005	42	0	0	0	0	0	0	0	2	0	0	0	-	-	-	-	-	-
	2006	30	0	0	0	0	0	1	0	0	0	0	-	-	-	-	-	-	-
	2007	28	0	0	1	0	0	0	2	0	0	-	-	-	-	-	-	-	-
	2008	33	1	1	0	0	0	1	1	0	-	-	-	-	-	-	-	-	-
	2009	21	1	0	0	0	2	1	0	-	-	-	-	-	-	-	-	-	-
	2010	31	0	0	1	0	1	0	-	-	-	-	-	-	-	-	-	-	-
	2011	20	0	0	2	1	0	-	-	-	-	-	-	-	-	-	-	-	-
	2012	21	1	2	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
	2013	25	1	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2014	36	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2015	29	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2016	51	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Summary - Survival Pool																			
A	Total Default [#]		28	35	15	7	6	7	3	2	1	0	0	2	1	0	0	0	0
G	Total Issuers [#]		592	541	512	476	451	430	410	379	358	325	297	267	225	174	150	134	114
B	Surviving Issuers [#]		592	564	529	514	507	501	494	491	489	488	488	488	486	485	485	485	485
C	Conditional Marginal Average Default Rate [%]		4.73	6.21	2.84	1.36	1.18	1.40	0.61	0.41	0.20	0.00	0.00	0.41	0.21	0.00	0.00	0.00	0.00
D	Marginal Survival Rate [%]		95.27	93.79	97.16	98.64	98.82	98.60	99.39	99.59	99.80	100.00	100.00	99.59	99.79	100.00	100.00	100.00	100.00
E	Cumulative Marginal Survival Rate [%]		95.27	89.36	86.82	85.64	84.63	83.45	82.94	82.60	82.43	82.43	82.43	82.09	81.93	81.93	81.93	81.93	81.93
F	Cumulative Average Default Rate [%]		4.73	10.64	13.18	14.36	15.37	16.55	17.06	17.40	17.57	17.57	17.57	17.91	18.07	18.07	18.07	18.07	18.07

Notes:

A = Total Default [#]

B = Surviving Issuers (Cumulative Issuers; excluded issuers who were previously defaulted) [#]

C = Conditional Marginal Average Default Rate [%] = Total Default / Surviving Issuers = A/B

D = Marginal Survival Rate [%] = (100% - C)

E = Cumulative Marginal Survival Rate [%] = (100% - F)

F = Cumulative Average Default Rate [%] = (100% - E)

G = Total Issuers [#]

Appendix 1e. Survival Pool Cumulative Average Default Rate For idBB Rating (1996-2016)

	Year Pool	Issuers [#]	Time horizon (years)																
			Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17
	1996	4	0	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0
	1997	24	3	6	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	1998	18	7	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1999	10	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	2000	6	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	-
	2001	7	2	2	0	1	0	0	0	0	0	0	0	0	0	0	0	-	-
	2002	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-
	2003	3	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-
	2004	14	1	1	0	0	1	0	0	0	0	0	0	-	-	-	-	-	-
	2005	8	1	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-
	2006	4	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-
	2007	2	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-
	2008	5	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-
	2009	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-
	2010	3	0	0	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-
	2011	1	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
	2012	3	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
	2013	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2014	1	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2015	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2016	4	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Summary - Survival Pool																			
A	Total Default [#]		18	14	9	3	1	1	0	0	0	0	0	0	0	0	0	0	0
G	Total Issuers [#]		121	117	116	115	114	111	110	107	107	102	100	96	88	74	71	69	62
B	Surviving Issuers [#]		121	103	89	80	77	76	75	75	75	75	75	75	75	75	75	75	75
C	Conditional Marginal Average Default Rate [%]		14.88	13.59	10.11	3.75	1.30	1.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D	Marginal Survival Rate [%]		85.12	86.41	89.89	96.25	98.70	98.68	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
E	Cumulative Marginal Survival Rate [%]		85.12	73.55	66.12	63.64	62.81	61.98	61.98	61.98	61.98	61.98	61.98	61.98	61.98	61.98	61.98	61.98	61.98
F	Cumulative Average Default Rate [%]		14.88	26.45	33.88	36.36	37.19	38.02	38.02	38.02	38.02	38.02	38.02	38.02	38.02	38.02	38.02	38.02	38.02

Notes:

A = Total Default [#]

B = Surviving Issuers (Cumulative Issuers; excluded issuers who were previously defaulted) [#]

C = Conditional Marginal Average Default Rate [%] = Total Default / Surviving Issuers = A/B

D = Marginal Survival Rate [%] = (100% - C)

E = Cumulative Marginal Survival Rate [%] = (100% - F)

F = Cumulative Average Default Rate [%] = (100% - E)

G = Total Issuers [#]

Appendix 1f. Survival Pool Cumulative Average Default Rate For idB Rating (1996-2016)

	Year Pool	Issuers [#]	Time horizon (years)																
			Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17
	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1997	3	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1998	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1999	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2000	5	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	-
	2001	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	2002	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-
	2003	2	1	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-
	2004	1	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
	2005	1	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-
	2006	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-
	2007	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-
	2008	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-
	2009	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-
	2010	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-
	2011	1	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
	2012	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
	2013	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2014	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2015	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2016	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Summary - Survival Pool																			
A	Total Default [#]		6	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G	Total Issuers [#]		25	25	25	25	24	24	23	23	23	23	23	23	22	21	19	15	12
B	Surviving Issuers [#]		25	19	15	14	14	14	14	14	14	14	14	14	14	14	14	14	14
C	Conditional Marginal Average Default Rate [%]		24.00	21.05	6.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D	Marginal Survival Rate [%]		76.00	78.95	93.33	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
E	Cumulative Marginal Survival Rate [%]		76.00	60.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00
F	Cumulative Average Default Rate [%]		24.00	40.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00

Notes:

A = Total Default [#]
 B = Surviving Issuers (Cumulative Issuers; excluded issuers who were previously defaulted) [#]
 C = Conditional Marginal Average Default Rate [%] = Total Default / Surviving Issuers = A/B
 D = Marginal Survival Rate [%] = (100% - C)

E = Cumulative Marginal Survival Rate [%] = (100% - F)
 F = Cumulative Average Default Rate [%] = (100% - E)
 G = Total Issuers [#]

Appendix 1g. Survival Pool Cumulative Average Default Rate For idCCC Rating (1996-2016)

	Year Pool	Issuers [#]	Time horizon (years)																
			Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17
	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1998	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1999	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2000	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
	2001	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	2002	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-
	2003	1	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-
	2004	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-
	2005	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-
	2006	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-
	2007	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-
	2008	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-
	2009	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-
	2010	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-
	2011	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
	2012	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
	2013	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2014	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2015	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2016	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Summary - Survival Pool																			
A	Total Default [#]		10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G	Total Issuers [#]		13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	10	10
B	Surviving Issuers [#]		13	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
C	Conditional Marginal Average Default Rate [%]		76.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D	Marginal Survival Rate [%]		23.08	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
E	Cumulative Marginal Survival Rate [%]		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	23.08	23.08
F	Cumulative Average Default Rate [%]		76.92	76.92	76.92	76.92	76.92	76.92	76.92	76.92	76.92	76.92	76.92	76.92	76.92	76.92	76.92	76.92	76.92

Notes:

A = Total Default [#]

B = Surviving Issuers (Cumulative Issuers; excluded issuers who were previously defaulted) [#]

C = Conditional Marginal Average Default Rate [%] = Total Default / Surviving Issuers = A/B

D = Marginal Survival Rate [%] = (100% - C)

E = Cumulative Marginal Survival Rate [%] = (100% - F)

F = Cumulative Average Default Rate [%] = (100% - E)

G = Total Issuers [#]

Appendix 2. Industry Classification

No	Business Code	Business Line	Sector Code
1	ARPT	Airport	COR
2	AUTO	Automotive	COR
3	BANK	Banking	FIN
4	CEME	Cement	COR
5	CHEM	Chemical	COR
6	WATR	Clean Water Processing	COR
7	CONS	Construction	COR
8	EPCC	Engineering Procurement & Construction	COR
9	FERT	Fertilizer	COR
10	FISH	Fishery	COR
11	FOOD	Food & Beverage	COR
12	GASD	Gas Distribution	COR
13	HEAL	Healthcare	COR
14	HOTL	Hotel	COR
15	HAPP	Household Appliance & Office Equipment	COR
16	ITEQ	Information Technology & Services	COR
17	INSR	Insurance & Guarantee	FIN
18	HLDI	Investment Holding Company	COR
19	MNFG	Manufacturing	COR
20	MEDA	Media	COR
21	MINE	Mining	COR
22	MINC	Mining Contractor	COR
23	FINA	Multifinance	FIN
24	OFIN	Other Financial Services	COR
25	PHAM	Pharmaceutical	COR
26	PLAN	Plantation	COR
27	ANHS	Poultry	COR
28	POWR	Power & Energy	COR
29	PRPK	Printing & Packaging	COR
30	PROP	Property	COR
31	PULP	Pulp and Paper	COR
32	RETL	Retail	COR
33	SPRT	Seaport	COR
34	ABSE	Securitized	OTH
35	SCRT	Securities	FIN
36	SHIP	Shipping	COR
37	SUBN	Subnational Entity	MUN
38	TLCO	Telecommunication	COR
39	TEXT	Textile	COR
40	TOBA	Tobacco	COR
41	TOLL	Toll Road	COR
42	LESR	Tourism & Leisure	COR
43	TRAD	Trading & Distribution	COR
44	RENT	Vehicle Rental & Transportation	COR
45	TIMB	Woodbase & Agro	COR

MUN = Municipal Entities (Province, City, Regency)

OTH = Structured Financing & Others

COR = Corporate Non Financial Institution

FIN = Financial Institution