S&P Global Ratings

Default, Transition, and Recovery:

2017 Annual European Corporate Default Study And Rating Transitions

September 5, 2018

Key Takeaways

- In 2017, there were 16 European corporate defaults, affecting $12 billion in debt. By comparison, 14 entities with $22 billion of debt defaulted in 2016.

- The annual European corporate default rate was 1.0% in 2017, up from 0.8% in 2016, and the speculative-grade default rate increased to 2.4% from 1.9% in the previous year.

- In absolute terms, the consumer/service sector saw the most defaults, and the energy and natural resources was the sector with the highest default rate.

- There were more upgrades than downgrades among European corporates in 2017, with the downgrade rate (including defaults) decreasing to 7.2% from 10.7% in 2016, while the upgrade rate increased to 11.7% from 8.8% in the previous year.

- Relative to long-term averages, this represented positive credit performance, with the upgrade rate significantly higher than its long-term average and the downgrade rate lower.

- Our ratings continued to differentiate creditworthiness, with all of the defaulting entities that we rated at the beginning of the year classified in the 'B' category or lower at that time. The one-year Gini coefficient--which measures the rank ordering power of ratings--rose to 96.1% in 2017.

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During 2017, there was heightened uncertainty over the political landscape in many European countries, as well as potential shifts in wider global dynamics following the previous year's U.S. presidential election. However, European corporate credit performance continued to be broadly positive. Accommodative monetary policy kept credit spreads on a tightening trend throughout the year and corporate debt issuance increased, while the economic environment improved substantially.

The European financial and nonfinancial corporate default count remained low, despite increasing slightly to 16 in 2017 from 14 the previous year (see chart 1). The consumer/service sector saw the

most European defaults, partly due to credit stress from changing customer preferences and the rise of online spending. Companies exposed to energy price volatility led much of the default activity at the start of the year, but the number of defaults in this area slowed during the second half of the year as energy prices recovered.

The annual default rate for European corporates rated by S&P Global Ratings was 1.0% in 2017, up from 0.8% in 2016. No corporate issuers that we rated investment-grade at the beginning of 2017 defaulted during the year. The speculative-grade default rate increased to 2.4% from 1.9% a year earlier, while remaining below its 27-year weighted average of 2.7% (see table 1).

Table 1

European Corporate Default Summary

	Defaults (no.)			Default rate (%)			Total debt outstanding (bil. $)
	Overall*	Investment-grade	Speculative-grade	Overall	Investment-grade	Speculative-grade	
1991	2	0	2	1.52	0.00	66.67	N/A
1992	0	0	0	0.00	0.00	0.00	N/A
1993	1	0	1	0.51	0.00	20.00	N/A
1994	0	0	0	0.00	0.00	0.00	N/A
1995	1	0	1	0.31	0.00	9.09	N/A
1996	0	0	0	0.00	0.00	0.00	N/A
1997	0	0	0	0.00	0.00	0.00	N/A
1998	0	0	0	0.00	0.00	0.00	N/A
1999	6	0	6	0.91	0.00	6.32	0.9
2000	4	1	3	0.54	0.16	2.56	0.6
2001	13	1	11	1.45	0.14	8.46	2.7
2002	23	1	18	2.07	0.13	12.59	16.2
2003	9	2	6	0.84	0.25	3.70	13.7
2004	3	0	3	0.30	0.00	1.60	1.3
2005	2	0	2	0.19	0.00	0.93	0.0
2006	4	0	4	0.37	0.00	1.78	0.0
2007	2	0	2	0.18	0.00	0.96	0.5
2008	9	1	5	0.54	0.11	2.50	80.1
2009	22	1	17	1.60	0.11	8.72	39.7
2010	4	0	2	0.18	0.00	1.02	9.3
2011	4	0	4	0.35	0.00	1.59	5.0
2012	9	0	7	0.59	0.00	2.26	19.7
2013	16	0	13	1.07	0.00	3.46	17.8
2014	6	0	5	0.37	0.00	0.98	1.7
2015	15	0	12	0.81	0.00	1.96	10.6
2016	14	0	12	0.80	0.00	1.93	22.0
2017	16	0	15	0.99	0.00	2.37	11.9

Table 1

European Corporate Default Summary (cont.)

	Defaults (no.)			Default rate (%)			Total debt outstanding (bil. $)
	Overall*	Investment-grade	Speculative-grade	Overall	Investment-grade	Speculative-grade	
Average	6.9	0.3	5.6	0.61	0.03	5.98	13.3
Weighted average	8.9	0.3	7.3	0.67	0.04	2.75	12.6
Median	4	0	4	0.51	0.00	1.96	9.3
Standard deviation	6.9	0.5	5.6	0.55	0.07	12.97	19.2
Minimum	0	0	0	0.00	0.00	0.00	0.0
Maximum	23	2	18	2.07	0.25	66.67	80.1

*This column includes companies that we no longer rated prior to default. Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®. N/A--Not available.

Chart 1

Annual Corporate Defaults By Number Of Issuers
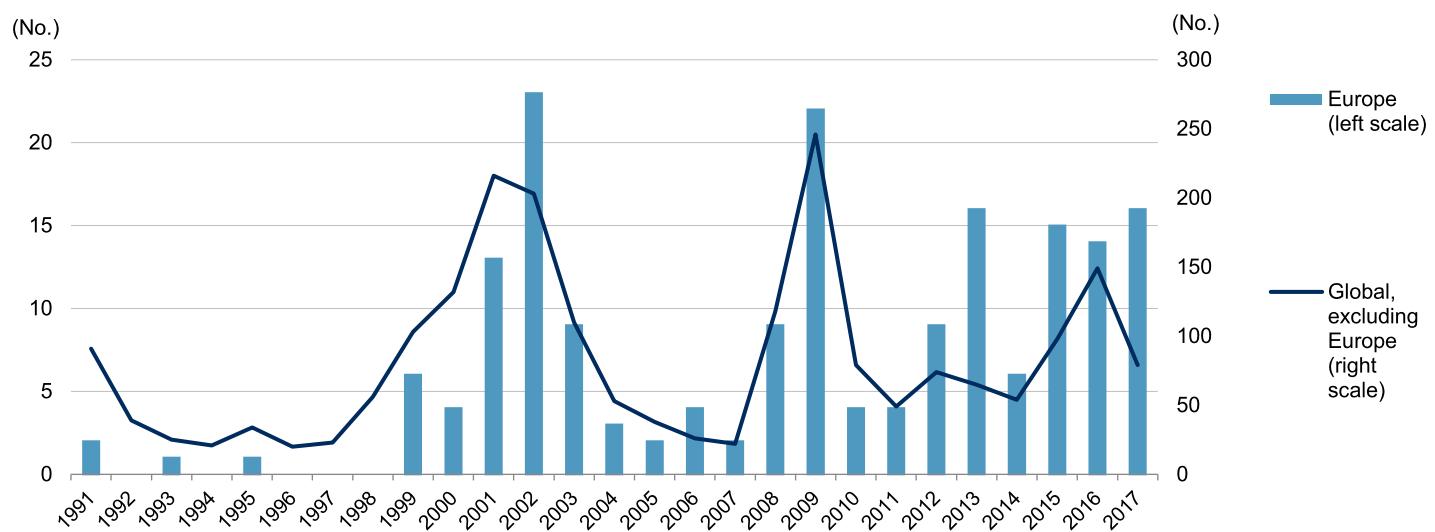
Note: Includes companies that we no longer rated prior to default. Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®.

European corporate ratings stability decreased slightly in 2017. For the 1,517 European corporates that we rated at the beginning of 2017, the proportion of ratings that remained unchanged during the year decreased to 70.2% from 71.4% in 2016. We lowered 7.2% of our European corporate ratings during the year (including entities that defaulted) and raised 11.7%, giving a downgrade-to-upgrade ratio of 0.62x, down from 1.22x in 2016.

The mix of upgrade and downgrade activity in 2017 was similar for both the nonfinancial and

financial sectors. Of the 999 European nonfinancial companies that we rated at the beginning of 2017, we rated about 9.5% lower at the end of the year (including entities that defaulted) than at the beginning, while about 10.2% had higher ratings. Similarly, the downgrade rate for the 518 European financial companies was about 2.7% (including entities that defaulted), with an upgrade rate of 14.5%.

Our credit ratings continue to serve as effective indicators of relative creditworthiness. The one-year Gini coefficient for European corporates was 96.1% in 2017, up from 87.8% in 2016. From 1981-2017, the one-year weighted-average Gini coefficient was 90.4%, the three-year average was 85.6%, and the five-year average was 83.3%.

We base this study on our public and confidential issuer credit ratings for both nonfinancial and financial companies, but we exclude credit estimates, which we typically base on private information that we receive from investors. We include European industrials, utilities, financial institutions--including banks, brokerages, asset managers, and other financial entities--and insurance companies. We base our calculations of default and transition rates on the number of issuer credit ratings rather than the affected debt volumes. Where we refer to the weighted-average values of certain statistics across different time periods, we weight the statistics for each time period by the number of issuer credit ratings outstanding at the beginning of each period. Further details of our calculation approaches and the terminology we use in this study are in Appendix I, including a list of the European countries that we included. Further details on the Gini coefficient methodology are in Appendix II.

2017 Summary

Below are further key observations from our review of European corporate defaults and rating transitions in 2017:

- The global default tally stood at 95 in 2017, down from 163 in 2016, with the decline largely due to a recovery in oil and other commodities prices during the year. However, Europe bucked this wider trend, with a slight year-on-year increase in defaults, reaching 16 (including four confidentially rated issuers), up from 14 in 2016.

- About 40% of the European defaulters in 2017 were from the consumer/service sector, followed by 25% from the energy and natural resources sector (see table 2).

- As of Jan. 1, 2017, we publicly rated 11 of the European corporate issuers that defaulted over the following year, all in the speculative-grade rating categories. We had previously rated a 12th defaulting company--Toisa Ltd.-- but we no longer rated it at the start of 2017.

- Of the 11 defaulters that we publicly rated at the beginning of 2017, we rated one in the 'B' category and the rest in the 'CCC'/'C' category.

- We also rated all of these European corporates in the speculative-grade categories when we initially assigned them ratings.

- We estimate that the volume of debt-affected defaulters in 2017 was $12 billion, down from $22 billion in 2016. The 95 global defaulters accounted for about $105 billion in debt.

- Expressing defaults as a proportion of the rated universe, the European speculative-grade corporate default rate increased to 2.4% in 2017. By contrast, the speculative-grade corporate default rate fell to 3.0% in the U.S., 2.4% globally, and 1.0% in the emerging markets (see chart 2).

- The average time to default from initial rating for all 16 issuers that defaulted in 2017 was

almost six years.

- The proportion of European corporates that we rate in the speculative-grade categories had been rising since 2009, but this trend began to level off in 2016. At year-end 2017, issuers rated 'BB+' or lower accounted for 42% of all European corporate ratings, compared with the same figure at the end of 2016, but only 18% at the end of 2009 (see chart 3).

Table 2

European Corporate Defaults, 2017

Company name	Reason for default	Country	Industry	Debt amount (mil. $)	Default date	Rating one year prior to default	Rating three years prior to default	First rating	Date of first rating
Avanti Communications Group PLC	Distressed Exchange	U.K.	Telecommunications	685	Jan. 27, 2017	B-	B-	B-	Sept. 27, 2013
Toisa Ltd.	Chapter 11	U.K.	Energy and natural resources	0	Jan. 29, 2018	NR	NR	BB-	July 19, 2001
Agrokor d.d. (Adria Group B.V.)	Missed Interest	Croatia	Consumer and service sector	985	May 8, 2017	B	B	B+	March 30, 2000
CGG	Missed Interest	France	Energy and natural resources	3,036	May 18, 2017	CCC+	B+	BB	Nov. 6, 2000
Frigoglass SAIC	Missed Interest	Greece	Consumer and service sector	250	May 23, 2017	CCC+	BB-	BB-	May 7, 2013
Novartex	Distressed Exchange	France	Consumer and service sector	1,442	June 6, 2017	CCC+	-	CCC+	Jan. 20, 2015
Norske Skogindustrier ASA	Missed Interest	Norway	Forest and building products and homebuilders	298	July 18, 2017	CCC-	-	CCC-	April 29, 2016
Pinnacle Holdco S.a.r.l.	Missed Principal/Interest	Luxembourg	High technology, computers and office equipment	516	Oct. 18, 2017	B-	B	B	Aug. 7, 2012
Pacific Drilling S.A	Chapter 11	Luxembourg	Energy and natural resources	2,500	Nov. 12, 2017	CCC-	B	B	Nov. 12, 2012
Sterling Mid-Holdings Ltd.	Distressed Exchange	Jersey	Financial institutions	745	Nov. 27, 2017	CCC+	-	CCC+	Aug. 23, 2016
Bibby Offshore Holdings Ltd.	Distressed Exchange	U.K.	Energy and natural resources	261	Dec. 6, 2017	B	B+	B+	July 4, 2014
Elli Investments Ltd.	Missed Interest	U.K.	Health care / chemicals	703	Dec. 18, 2017	CCC-	B-	B-	Aug. 3, 2012

Note: Excludes confidentially rated issuers. Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®. N/A--Not applicable.

No European corporates that we rated higher than 'B' at the beginning of 2017 defaulted during the year. Most of the 2017 European defaults came from the 'CCC'/'C' rating categories. The default rates for the 'B' and 'CCC'/'C' rating categories were 0.3% and 28.6%, respectively (see table 3).

Table 3

Annual European Corporate Default Rate By Rating Modifier (%)

Year	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC/C
1991	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	N/A	N/A	0.00	N/A	N/A	N/A	N/A	100.00	100.00
1992	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	N/A	N/A	N/A	N/A	N/A	N/A
1993	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	N/A	0.00	50.00	N/A	N/A
1994	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	N/A	N/A	0.00	N/A	0.00
1995	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	33.33	0.00	0.00
1996	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
1997	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	N/A
1998	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	N/A
1999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.55	0.00	0.00	9.09	18.18	50.00
2000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.45	0.00	0.00	0.00	0.00	0.00	10.53	33.33
2001	0.00	0.00	0.00	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00	7.69	6.45	15.38	13.33	42.86
2002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.92	0.00	0.00	0.00	3.03	6.90	11.76	9.09	44.44	75.00
2003	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.06	2.00	0.00	0.00	0.00	0.00	0.00	0.00	60.00
2004	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	42.86
2005	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.04	0.00	0.00	0.00	14.29
2006	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.79	2.44	5.56	16.67
2007	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	4.76	25.00
2008	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	2.94	2.70	11.76	25.00
2009	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00	2.94	0.00	20.00	18.75	57.14
2010	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	10.53
2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.70	3.85	14.29
2012	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.17	0.00	0.00	3.70	25.00
2013	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.35	0.00	18.42	25.00
2014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.31	4.08	3.57
2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.02	1.64	32.14
2016	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.40	5.45	13.79
2017	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	0.49	0.00	28.57
Average	0.00	0.00	0.00	0.00	0.00	0.06	0.02	0.04	0.04	0.22	0.00	0.33	0.99	1.01	6.00	11.02	30.22
Median	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	0.49	3.96	25.00
Standard deviation	0.00	0.00	0.00	0.00	0.00	0.20	0.12	0.18	0.21	0.78	0.00	1.11	2.21	2.71	12.15	21.51	25.34
Minimum	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

Annual European Corporate Default Rate By Rating Modifier (%) (cont.)

Year	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC/C
Maximum	0.00	0.00	0.00	0.00	0.00	0.91	0.65	0.92	1.06	3.45	0.00	4.55	7.69	11.76	50.00	100.00	100.00

Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®. N/A--Not applicable.

Chart 2

### Annual Speculative-Grade Corporate Default Rate By Region
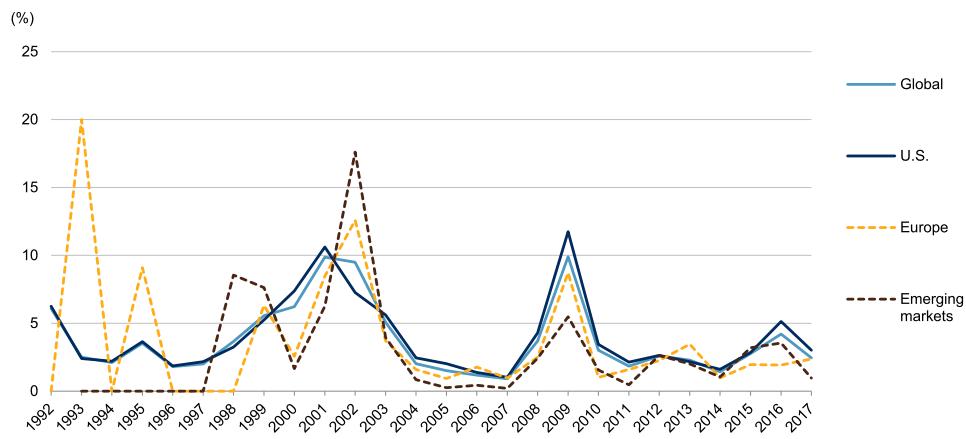
Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®.

Chart 3

European Corporate Speculative-Grade Default Rate Versus Prevalence Of Speculative-Grade Issuers

Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®.

Table 4

Rating Classification Of New European Corporate Ratings*

Year	AAA	AA	A	BBB	BB	B	CCC/C	Total	Investment-grade (%)	Speculative-grade (%)
			Original Rating							
1981	2							2	100.0	0.0
1982	5		1					6	100.0	0.0
1983	6	2	1		1			10	90.0	10.0
1984	4	3						7	100.0	0.0
1985	1	2	2					5	100.0	0.0
1986	8		1	1				10	100.0	0.0
1987	4	7	2					13	100.0	0.0
1988	3	10	1				1	15	93.3	6.7
1989	3	15	4			1		23	95.7	4.3
1990	11	14	11					36	100.0	0.0
1991	5	13	9	2	1			30	96.7	3.3
1992	4	13	14	7		2		40	95.0	5.0
1993	7	17	22	9		1		56	98.2	1.8
1994	4	18	36	13	2	4		77	92.2	7.8
1995	1	8	18	12	5	2		46	84.8	15.2
1996	8	24	41	18	7	3		101	90.1	9.9
1997	4	22	32	30	14	12		114	77.2	22.8
1998	2	33	52	19	23	27	1	157	67.5	32.5
1999	4	26	44	36	24	22		156	70.5	29.5
2000	3	20	46	40	17	21		147	74.1	25.9
2001	3	26	51	50	27	7		164	79.3	20.7
2002	1	12	29	27	28	13	1	111	62.2	37.8
2003		4	23	36	18	22		103	61.2	38.8
2004	3	5	45	26	33	33	1	146	54.1	45.9
2005	1	16	29	28	15	40	2	131	56.5	43.5
2006	2	11	24	24	11	25	1	98	62.2	37.8
2007	3	18	38	19	24	19	1	122	63.9	36.1
2008		20	44	15	10	9	2	100	79.0	21.0
2009		6	29	19	10	13	13	90	60.0	40.0
2010		6	15	13	15	49	7	105	32.4	67.6
2011	1	3	14	20	21	61	6	126	30.2	69.8
2012		3	14	26	19	65	4	131	32.8	67.2
2013		4	28	29	31	128	12	232	26.3	73.7
2014		3	15	33	34	129	4	218	23.4	76.6
2015		2	14	30	31	84	5	166	27.7	72.3
2016		1	13	25	21	82	11	153	25.5	74.5

Table 4

Rating Classification Of New European Corporate Ratings* (cont.)

Year	AAA	AA	A	BBB	BB	B	CCC/C	Total	Investment-grade (%)	Speculative-grade (%)
				Original Rating						
2017		1	11	41	33	107	6	199	26.6	73.4
Total	103	388	773	648	475	981	78	3446	55.5	44.5

*Includes issuers that were assigned a new rating after default, as well as issuers that received a rating for the first time. Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®.

Segmenting by sector, the 2017 European corporate default rate was highest for energy and natural resources companies at 5.4%, although this was down from 10.0% in 2016 (see table 5). Prolonged stress in the oil and gas sector, which continued from mid-2014 through 2016, led to an increase in defaults. However, the rate of defaults has declined since energy prices began to recover in 2017, following OPEC production cuts.

Furthermore, the consumer/service, health care/chemicals, and telecommunications sectors' default rates rose to 3.9%, 0.8%, and 1.7%, respectively, in 2017, from 0% in 2016. In fact, the consumer/service sector led the European sector-level default count in 2017, with six defaults, as issuers faced shifting consumer preferences and some traditional retailers struggled to compete with growing online spending.

Table 5

Annual European Corporate Default Rate By Industry (%)

Year	Aerospace / automotive/ capital goods / metal	Consumer / service sector	Energy and natural resources	Financial institutions	Forest and building products / homebuilders	Health care / chemicals	High technology / computers / office equipment
1991	12.50	0.00	0.00	0.00	n/a	0.00	25.00
1992	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1993	0.00	0.00	0.00	0.00	0.00	0.00	12.50
1994	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1995	0.00	0.00	0.00	0.69	0.00	0.00	0.00
1996	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1999	2.44	0.00	0.00	0.00	0.00	0.00	0.00
2000	2.00	0.00	0.00	0.00	0.00	0.00	0.00
2001	4.48	1.49	0.00	0.00	0.00	2.56	0.00
2002	2.56	1.37	0.00	0.33	0.00	2.17	0.00
2003	0.00	1.27	3.57	0.00	0.00	0.00	0.00
2004	2.17	0.00	0.00	0.00	0.00	0.00	0.00
2005	0.00	1.23	0.00	0.00	0.00	0.00	0.00
2006	1.77	0.00	0.00	0.00	0.00	0.00	0.00
2007	0.98	1.47	0.00	0.00	0.00	0.00	0.00

Table 5

Annual European Corporate Default Rate By Industry (%) (cont.)

2008	0.00	4.35	0.00	0.28	0.00	1.85	0.00
2009	2.22	4.84	0.00	0.28	2.86	1.85	7.14
2010	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2011	0.00	0.00	0.00	0.00	2.86	1.75	0.00
2012	0.93	0.00	2.38	0.00	0.00	0.00	0.00
2013	0.84	0.00	2.04	0.32	7.69	0.00	0.00
2014	0.00	2.52	3.51	0.00	0.00	0.00	0.00
2015	0.66	0.00	6.15	1.23	2.00	0.00	0.00
2016	1.33	0.00	10.00	0.30	1.79	0.00	2.38
2017	0.72	3.87	5.36	0.30	1.61	0.83	2.08
Average	1.32	0.83	1.22	0.14	0.72	0.41	1.82
Weighted average	1.03	1.11	2.17	0.16	1.13	0.46	1.05
Median	0.66	0.00	0.00	0.00	0.00	0.00	0.00
Standard deviation	2.51	1.45	2.49	0.28	1.69	0.82	5.38
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	12.50	4.84	10.00	1.23	7.69	2.56	25.00

Year	Insurance	Leisure time / media	Real estate	Telecommunications	Transportation	Utility
1991	0.00	0.00	n/a	0.00	0.00	0.00
1992	0.00	0.00	n/a	0.00	0.00	0.00
1993	0.00	0.00	n/a	0.00	0.00	0.00
1994	0.00	0.00	n/a	0.00	0.00	0.00
1995	0.00	0.00	0.00	0.00	0.00	0.00
1996	0.00	0.00	0.00	0.00	0.00	0.00
1997	0.00	0.00	0.00	0.00	0.00	0.00
1998	0.00	0.00	0.00	0.00	0.00	0.00
1999	0.00	0.00	0.00	0.00	17.24	0.00
2000	0.00	0.00	0.00	2.63	7.14	0.00
2001	1.03	6.06	0.00	6.67	3.33	0.00
2002	0.96	3.03	0.00	24.44	0.00	0.84
2003	0.92	0.00	0.00	8.82	2.70	0.82
2004	0.00	0.00	0.00	0.00	0.00	0.81
2005	0.00	0.00	0.00	0.00	2.44	0.00
2006	0.00	0.00	0.00	1.92	2.27	0.00
2007	0.00	0.00	0.00	0.00	0.00	0.00
2008	0.00	0.00	0.00	0.00	2.08	0.00

Table 5

Annual European Corporate Default Rate By Industry (%) (cont.)

2009	0.00	10.00	7.14	6.82	2.38	0.00
2010	0.00	4.26	0.00	0.00	0.00	0.00
2011	0.00	4.08	0.00	0.00	0.00	0.00
2012	0.00	3.85	0.00	1.75	4.00	0.00
2013	0.00	5.45	5.00	1.59	4.35	0.00
2014	0.00	0.00	0.00	0.00	0.00	0.00
2015	0.00	0.93	0.00	0.00	1.64	0.00
2016	0.00	0.86	0.00	0.00	0.00	0.00
2017	0.00	0.00	0.00	1.67	0.00	0.00
Average	0.11	1.43	0.53	2.09	1.84	0.09
Weighted average	0.09	1.67	0.56	2.53	1.98	0.12
Median	0.00	0.00	0.00	0.00	0.00	0.00
Standard deviation	0.31	2.57	1.78	5.07	3.59	0.26
Minimum	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	1.03	10.00	7.14	24.44	17.24	0.84

N/A--Not applicable. Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®.

The aggregate 2017 default rates for all nonfinancial corporates for the trailing one-, three-, and 10-year time horizons were higher than their 1991-2017 long-term averages (see table 6). The same was true for financial companies.

Table 6

European Corporate Average Cumulative Default Rates By Sector (%)

	Financial institutions			Insurance			All financials*			All nonfinancials		
Year	One-year	Three-year	10-year	One-year	Three-year	10-year	One-year	Three-year	10-year	One-year	Three-year	10-year
1991	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.85	3.70	0.00
1992	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.88	0.00
1993	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.22	3.85	0.00
1994	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1995	0.69	0.00	0.00	0.00	0.00	0.00	0.52	0.00	0.00	0.00	1.22	0.00
1996	0.00	0.93	0.00	0.00	0.00	0.00	0.00	0.68	0.00	0.00	0.00	0.00
1997	0.00	0.69	0.00	0.00	0.00	0.00	0.00	0.52	0.00	0.00	0.00	0.00
1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.70
1999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.83	0.00	5.88
2000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.04	1.63	3.85
2001	0.00	0.00	0.00	1.03	1.11	0.00	0.26	0.30	0.00	2.50	4.59	0.00
2002	0.33	0.00	0.00	0.96	2.06	0.00	0.49	0.57	0.00	3.32	6.48	1.22

Table 6

European Corporate Average Cumulative Default Rates By Sector (%) (cont.)

Year	Financial institutions			Insurance			All financials*			All nonfinancials		
	One-year	Three-year	10-year	One-year	Three-year	10-year	One-year	Three-year	10-year	One-year	Three-year	10-year
2003	0.00	0.35	0.93	0.92	3.09	2.56	0.24	1.04	1.37	1.31	8.41	0.00
2004	0.00	0.33	0.69	0.00	1.92	2.08	0.00	0.74	1.04	0.54	5.08	0.79
2005	0.00	0.00	0.00	0.00	0.92	1.92	0.00	0.24	0.48	0.34	2.06	1.92
2006	0.00	0.00	0.00	0.00	0.00	2.82	0.00	0.00	0.78	0.65	1.27	3.50
2007	0.00	0.00	0.00	0.00	0.00	3.85	0.00	0.00	1.00	0.34	1.01	6.10
2008	0.28	0.00	0.00	0.00	0.00	3.33	0.19	0.00	0.91	0.87	1.47	8.26
2009	0.28	0.89	0.00	0.00	0.00	3.09	0.18	0.60	0.85	3.07	3.40	8.81
2010	0.00	0.56	0.35	0.00	0.00	3.09	0.00	0.37	1.04	0.37	3.83	9.77
2011	0.00	0.28	0.33	0.00	0.00	1.92	0.00	0.18	0.74	0.67	3.79	6.25
2012	0.00	0.00	0.32	0.00	0.00	0.92	0.00	0.00	0.47	1.08	2.04	3.56
2013	0.32	0.31	0.31	0.00	0.00	0.00	0.19	0.18	0.23	1.73	2.50	3.08
2014	0.00	0.31	0.30	0.00	0.00	0.00	0.00	0.19	0.21	0.61	2.93	3.54
2015	1.23	1.60	1.55	0.00	0.00	0.00	0.74	0.96	1.07	0.85	3.32	4.58
2016	0.30	1.22	2.08	0.00	0.00	0.00	0.19	0.74	1.39	1.13	2.06	5.78
2017	0.30	1.54	1.98	0.00	0.00	0.00	0.19	0.93	1.30	1.40	3.17	6.79
Average	0.14	0.33	0.33	0.11	0.34	0.95	0.12	0.30	0.48	1.06	2.73	3.24
Median	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.23	0.85	2.50	3.50
Standard deviation	0.28	0.50	0.61	0.31	0.80	1.36	0.19	0.35	0.52	1.06	2.14	3.11
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	1.23	1.60	2.08	1.03	3.09	3.85	0.74	1.04	1.39	3.85	8.41	9.77

*All financials refers to financial institutions and insurance combined. Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®.

Cumulative Default Rates

Our default studies all show a clear negative correspondence between ratings and defaults: the higher the issuer rating, the lower the observed default frequency and vice versa. This relationship remains the same over time (see chart 4 and tables 7-8). For example, on average, from 1981-2017, European corporate issuers rated in the 'AA' category had a 0% default rate in the following year, a 0.03% default rate in the second year, and 0.05% default rate in the third year. By comparison, issuers rated in the 'B' category recorded, on average, a default rate of 2.3% in the first year, 5.9% in the second, and 9.0% in the third.

We note that Europe has fewer entities rated in the 'CCC'/'C' categories than other regions, so the cumulative average default rate for this category may be less meaningful. The European population of speculative-grade issuers only started to gain critical mass in 1996, so cumulative average default rates are only now starting to fall more into line with global default rates.

Chart 4

European Corporate Cumulative Average Default Rates, 1981-2017
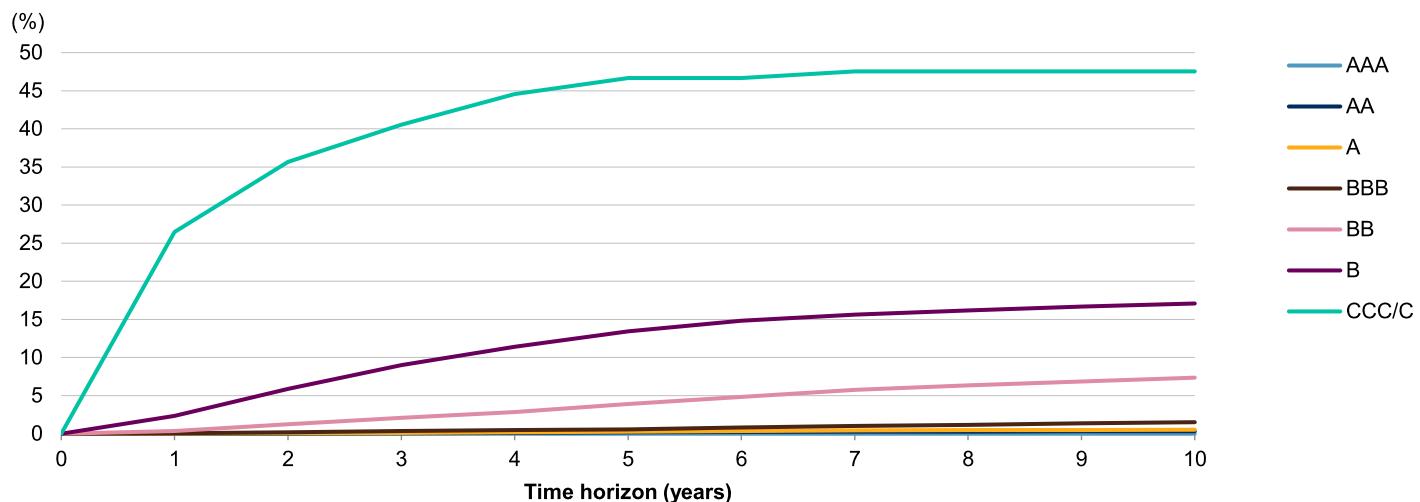
Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®.

Table 7

Corporate Cumulative Average Default Rates (%)

	Time horizon (years)									
	1	2	3	4	5	6	7	8	9	10
Europe (1981–2017)										
AAA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AA	0.00	0.03	0.05	0.11	0.17	0.23	0.26	0.30	0.33	0.33
A	0.04	0.08	0.12	0.17	0.26	0.34	0.45	0.49	0.51	0.53
BBB	0.07	0.21	0.35	0.49	0.59	0.81	1.02	1.18	1.36	1.52
BB	0.37	1.24	2.10	2.83	3.91	4.83	5.77	6.37	6.84	7.36
B	2.34	5.90	9.01	11.40	13.45	14.83	15.63	16.19	16.69	17.09
CCC/C	26.48	35.67	40.54	44.55	46.68	46.68	47.54	47.54	47.54	47.54
Investment-grade	0.04	0.10	0.17	0.24	0.32	0.43	0.54	0.60	0.66	0.71
Speculative-grade	2.73	5.35	7.49	9.15	10.69	11.76	12.63	13.18	13.64	14.09
All rated	0.66	1.28	1.77	2.14	2.47	2.73	2.96	3.09	3.21	3.32
Global (1981–2017)										
AAA	0.00	0.03	0.13	0.24	0.35	0.46	0.51	0.60	0.65	0.71
AA	0.02	0.06	0.12	0.22	0.32	0.43	0.53	0.60	0.68	0.75
A	0.06	0.14	0.24	0.37	0.51	0.66	0.85	1.01	1.17	1.34
BBB	0.17	0.49	0.84	1.26	1.70	2.13	2.50	2.87	3.23	3.58
BB	0.68	2.13	3.83	5.53	7.11	8.57	9.81	10.92	11.90	12.77

Corporate Cumulative Average Default Rates (%) (cont.)

	Time horizon (years)									
	1	2	3	4	5	6	7	8	9	10
B	3.59	8.25	12.26	15.44	17.88	19.88	21.48	22.76	23.90	24.95
CCC/C	26.82	36.03	41.03	43.97	46.22	47.13	48.33	49.23	50.08	50.71
Investment-grade	0.10	0.26	0.45	0.68	0.92	1.17	1.40	1.61	1.82	2.03
Speculative-grade	3.75	7.31	10.39	12.90	14.95	16.64	18.05	19.23	20.27	21.21
All rated	1.50	2.95	4.22	5.29	6.18	6.94	7.57	8.12	8.60	9.05

Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®.

European Corporate Cumulative Average Default Rates By Rating Modifier, 1981-2017 (%)

	Time horizon (years)									
Rating	1	2	3	4	5	6	7	8	9	10
AAA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AA+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AA	0.00	0.00	0.00	0.08	0.17	0.25	0.34	0.43	0.53	0.53
AA-	0.00	0.05	0.11	0.16	0.22	0.28	0.28	0.28	0.28	0.28
A+	0.00	0.00	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
A	0.07	0.14	0.18	0.22	0.26	0.39	0.54	0.59	0.59	0.59
A-	0.03	0.07	0.11	0.22	0.43	0.52	0.67	0.72	0.78	0.85
BBB+	0.04	0.18	0.38	0.54	0.60	0.73	1.00	1.22	1.45	1.63
BBB	0.05	0.10	0.22	0.29	0.36	0.75	0.83	0.93	1.03	1.25
BBB-	0.16	0.42	0.51	0.72	0.95	1.07	1.36	1.52	1.70	1.70
BB+	0.00	0.00	0.16	0.16	0.56	1.23	1.72	2.01	2.01	2.01
BB	0.24	0.89	1.46	1.94	3.04	3.24	3.46	3.70	4.23	4.51
BB-	0.85	2.72	4.54	6.25	7.99	9.88	11.98	13.24	14.05	15.23
B+	0.83	3.07	5.50	7.38	9.23	9.93	10.33	10.56	11.06	11.34
B	1.93	5.32	8.24	10.82	13.21	14.82	15.78	16.49	16.88	17.70
B-	6.69	13.67	18.75	22.00	23.99	26.79	28.42	29.64	30.32	30.32
CCC/C	26.48	35.67	40.54	44.55	46.68	46.68	47.54	47.54	47.54	47.54
Investment-grade	0.04	0.10	0.17	0.24	0.32	0.43	0.54	0.60	0.66	0.71
Speculative-grade	2.73	5.35	7.49	9.15	10.69	11.76	12.63	13.18	13.64	14.09
All rated	0.66	1.28	1.77	2.14	2.47	2.73	2.96	3.09	3.21	3.32

Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®.

Rating Transitions

In 2017, upgrades outpaced downgrades for the first time in three years. The overall downgrade-to-upgrade ratio was 0.5x excluding defaults (see table 9), or 0.6x including defaults. The downgrade-to-upgrade ratio including defaults for nonfinancial corporates exceeded the equivalent ratio for financials for the third consecutive year as the ratio for financials continued to decline sharply, indicating that upgrades strongly exceeded downgrades among European financials for the second year in a row (see chart 5). This reflects the greater stability among financial companies since the years that immediately followed the financial crisis. However, in 2017, upgrades also exceeded downgrades for nonfinancials. This mainly resulted from the gradual recovery in energy prices throughout the year, although pressures have been growing in the consumer/service sector.

Generally, European investment-grade issuers tend to exhibit greater credit stability (as measured by the frequency of rating transitions) than their speculative-grade counterparts. For instance, about 93% of European corporates rated in the 'AA' category at the beginning of 2017 were still rated in that category at the end of the year, whereas the comparable measure for issuers rated in the 'B' category was only 70% (see table 10).

The 2017 pattern correlates with the long-term ratings behavior trend among all global rated issuers. This study--in line with our previous default studies--confirms that when we assign higher ratings to companies, they are generally more stable than lower ratings. On average, of all of the European corporates that we rated in the 'A' category, 87% retained a rating in the same category after one year, whereas only 71% of those rated in the 'B' category retained the same rating category a year later (see table 11). Lower ratings also tend to exhibit less stability than higher ratings over multiyear time horizons (see table 12).

Table 9

Summary Of Annual European Corporate Rating Activity

	Issuers	Upgrades (%)	Downgrades (%)*	Defaults (%)	Withdrawals (%)	Changed ratings (%)	Unchanged ratings (%)	Downgrade/upgrade ratio*
1981	11	0.0	9.1	0.0	0.0	9.1	90.9	N/A
1982	13	0.0	0.0	0.0	7.7	7.7	92.3	N/A
1983	18	0.0	11.1	0.0	0.0	11.1	88.9	N/A
1984	28	3.6	17.9	0.0	0.0	21.4	78.6	5.0
1985	35	2.9	2.9	0.0	0.0	5.7	94.3	1.0
1986	40	10.0	5.0	0.0	0.0	15.0	85.0	0.5
1987	50	2.0	2.0	0.0	4.0	8.0	92.0	1.0
1988	61	9.8	3.3	0.0	3.3	16.4	83.6	0.3
1989	74	8.1	2.7	0.0	1.4	12.2	87.8	0.3
1990	96	1.0	10.4	0.0	1.0	12.5	87.5	10.0
1991	132	2.3	18.2	1.5	0.0	22.0	78.0	8.0
1992	161	1.9	18.6	0.0	1.9	22.4	77.6	10.0
1993	198	1.5	12.6	0.5	2.5	17.2	82.8	8.3
1994	248	4.0	14.1	0.0	3.2	21.4	78.6	3.5

Table 9

Summary Of Annual European Corporate Rating Activity (cont.)

	Issuers	Upgrades (%)	Downgrades (%)*	Defaults (%)	Withdrawals (%)	Changed ratings (%)	Unchanged ratings (%)	Downgrade/upgrade ratio*
1995	319	6.3	15.0	0.3	0.3	21.9	78.1	2.4
1996	366	7.4	11.7	0.0	3.6	22.7	77.3	1.6
1997	456	6.8	8.8	0.0	5.5	21.1	78.9	1.3
1998	545	6.6	10.3	0.0	8.6	25.5	74.5	1.6
1999	658	6.2	13.2	0.9	11.2	31.6	68.4	2.1
2000	739	7.3	13.8	0.5	7.8	29.5	70.5	1.9
2001	826	6.1	16.2	1.5	7.3	31.0	69.0	2.7
2002	919	5.1	20.2	2.1	6.1	33.5	66.5	4.0
2003	956	5.1	16.8	0.8	6.3	29.1	70.9	3.3
2004	995	6.9	6.3	0.3	7.5	21.1	78.9	0.9
2005	1066	11.0	10.3	0.2	10.7	32.2	67.8	0.9
2006	1077	12.5	9.7	0.4	7.5	30.2	69.8	0.8
2007	1091	14.1	7.9	0.2	8.8	31.0	69.0	0.6
2008	1113	6.8	19.0	0.5	6.9	33.3	66.7	2.8
2009	1125	3.6	24.1	1.6	8.7	38.0	62.0	6.6
2010	1097	6.7	12.8	0.2	5.7	25.4	74.6	1.9
2011	1144	10.3	18.4	0.3	7.3	36.4	63.6	1.8
2012	1178	7.1	23.0	0.6	7.7	38.5	61.5	3.2
2013	1214	8.9	13.4	1.1	5.6	29.0	71.0	1.5
2014	1362	10.4	9.0	0.4	7.0	26.7	73.3	0.9
2015	1483	9.3	11.1	0.8	8.5	29.7	70.3	1.2
2016	1509	8.8	9.9	0.8	9.1	28.6	71.4	1.1
2017	1517	11.7	6.2	1.0	10.9	29.8	70.2	0.5
Weighted average		8.2	13.2	0.7	7.5	29.5	70.5	2.1
Average		6.3	11.8	0.4	5.2	23.7	76.3	2.7
Median		6.7	11.1	0.3	6.1	25.4	74.6	1.7
Standard deviation		3.7	5.9	0.5	3.6	9.0	9.0	2.7
Minimum		0.0	0.0	0.0	0.0	5.7	61.5	0.3
Maximum		14.1	24.1	2.1	11.2	38.5	94.3	10.0

*Excludes downgrades to 'D', shown separately in the default column. Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®. N/A--Not applicable.

Chart 5

European Downgrade-To-Upgrade Ratio By Sector*
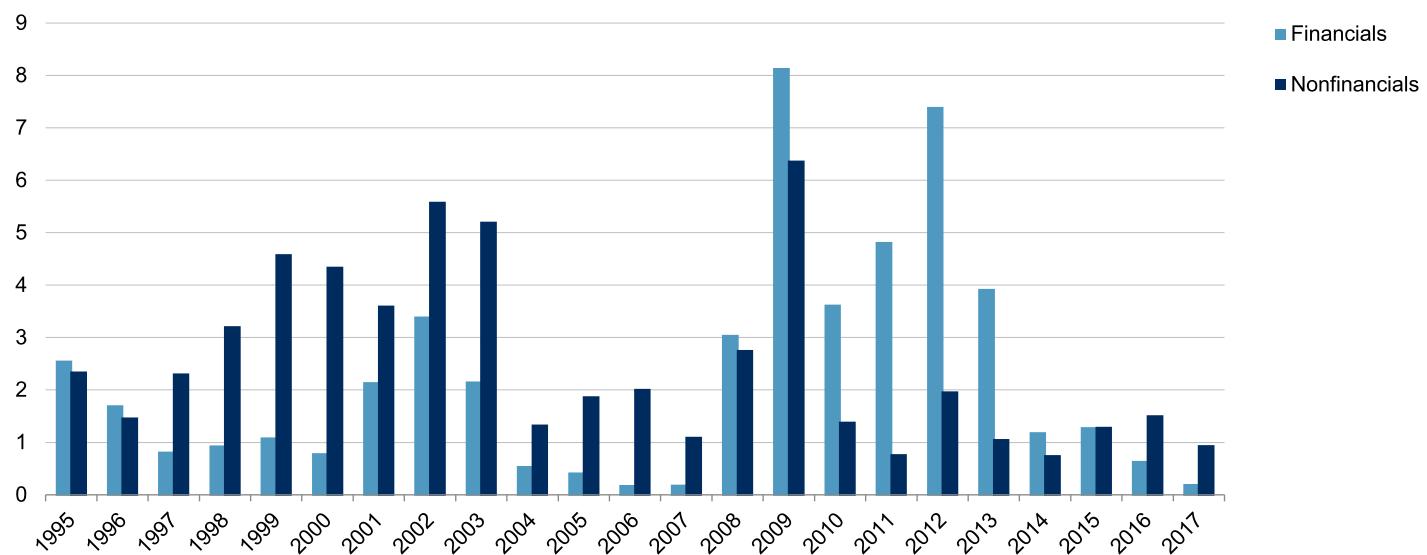
*The downgrade-to-upgrade ratio is calculated by dividing the number of rating downgrades, including defaults, by the number of upgrades. Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®.

Table 10

2017 Corporate Transition Rates: European Versus Global (%)

From/to	AAA	AA	A	BBB	BB	B	CCC/C	D	NR
Europe									
AAA	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AA	0.00	93.07	0.00	0.00	0.00	0.00	0.00	0.00	6.93
A	0.00	0.26	90.36	2.34	0.00	0.00	0.00	0.00	7.03
BBB	0.00	0.00	3.79	89.39	2.02	0.00	0.00	0.00	4.80
BB	0.00	0.00	0.00	8.41	78.97	2.80	0.00	0.00	9.81
B	0.00	0.00	0.00	0.00	4.04	70.35	3.23	0.27	22.10
CCC/C	0.00	0.00	0.00	2.04	0.00	10.20	38.78	28.57	20.41
Global									
AAA	64.29	35.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AA	0.00	92.56	4.17	0.00	0.00	0.00	0.00	0.00	3.27
A	0.00	0.44	93.36	2.36	0.00	0.00	0.00	0.00	3.84

Table 10

2017 Corporate Transition Rates: European Versus Global (%) (cont.)

From/to	AAA	AA	A	BBB	BB	B	CCC/C	D	NR
BBB	0.00	0.00	2.33	90.00	2.67	0.11	0.00	0.00	4.89
BB	0.00	0.00	0.08	3.57	80.56	4.63	0.00	0.08	11.09
B	0.00	0.00	0.00	0.00	3.65	75.68	4.14	0.98	15.54
CCC/C	0.00	0.00	0.00	0.41	0.00	16.80	38.11	26.23	18.44

Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®.

Table 11

One-Year Weighted-Average Corporate Transition Rates (%)

From/to	AAA	AA	A	BBB	BB	B	CCC/C	D	NR
Europe (1981-2017)									
AAA	87.01	9.20	0.46	0.11	0.00	0.00	0.11	0.00	3.10
	(8.67)	(7.72)	(1.37)	(0.91)	(0.00)	(0.00)	(0.76)	(0.00)	(4.47)
AA	0.29	86.01	9.74	0.58	0.00	0.00	0.00	0.00	3.39
	(0.68)	(7.18)	(6.37)	(1.19)	(0.00)	(0.00)	(0.00)	(0.00)	(2.40)
A	0.01	1.89	87.12	5.76	0.17	0.04	0.00	0.04	4.98
	(0.05)	(1.86)	(4.73)	(3.38)	(0.35)	(0.44)	(0.00)	(0.09)	(2.05)
BBB	0.00	0.11	4.21	84.10	3.75	0.34	0.09	0.07	7.33
	(0.00)	(1.38)	(1.92)	(4.20)	(2.68)	(0.54)	(0.29)	(0.22)	(2.99)
BB	0.00	0.00	0.08	5.47	73.49	7.04	0.37	0.37	13.17
	(0.00)	(0.00)	(0.66)	(2.59)	(6.98)	(3.66)	(1.03)	(0.89)	(4.72)
B	0.00	0.00	0.04	0.32	6.38	70.93	4.22	2.34	15.77
	(0.00)	(0.00)	(0.24)	(0.57)	(3.29)	(6.68)	(2.62)	(3.88)	(5.68)
CCC/C	0.00	0.00	0.00	0.35	0.00	12.54	41.81	26.48	18.82
	(0.00)	(0.00)	(0.00)	(0.78)	(0.00)	(11.65)	(18.89)	(17.81)	(10.90)
Global (1981-2017)									
AAA	86.99	9.12	0.53	0.05	0.08	0.03	0.05	0.00	3.15
	(7.20)	(7.27)	(0.83)	(0.25)	(0.25)	(0.17)	(0.35)	(0.00)	(2.43)
AA	0.51	86.95	7.91	0.50	0.05	0.07	0.02	0.02	3.97
	(0.53)	(5.25)	(4.18)	(0.68)	(0.19)	(0.21)	(0.07)	(0.08)	(1.87)
A	0.03	1.72	88.00	5.22	0.30	0.12	0.02	0.06	4.52
	(0.09)	(1.03)	(3.63)	(2.15)	(0.39)	(0.26)	(0.07)	(0.11)	(1.74)
BBB	0.01	0.10	3.45	85.79	3.73	0.49	0.11	0.17	6.16
	(0.04)	(0.16)	(1.63)	(3.77)	(1.51)	(0.69)	(0.22)	(0.25)	(1.58)
BB	0.01	0.03	0.12	4.88	77.19	6.79	0.58	0.68	9.72
	(0.06)	(0.09)	(0.25)	(1.86)	(4.36)	(3.08)	(0.75)	(0.84)	(2.31)

Table 11

One-Year Weighted-Average Corporate Transition Rates (%) (cont.)

From/to	AAA	AA	A	BBB	BB	B	CCC/C	D	NR
B	0.00	0.02	0.08	0.18	5.05	74.34	4.44	3.59	12.28
	(0.00)	(0.08)	(0.20)	(0.22)	(2.01)	(4.11)	(2.12)	(3.22)	(2.29)
CCC/C	0.00	0.00	0.12	0.21	0.59	13.18	43.46	26.82	15.63
	(0.00)	(0.00)	(0.43)	(0.66)	(0.95)	(7.82)	(8.81)	(11.07)	(5.32)

Note: Figures in parentheses are weighted standard deviations. NR--Not rated. Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®.

Table 12

Three-Year Weighted-Average Corporate Transition Rates (%)

From/to	AAA	AA	A	BBB	BB	B	CCC/C	D	NR
Europe (1981-2017)									
AAA	64.74	23.58	2.43	0.12	0.23	0.00	0.12	0.00	8.79
	(15.08)	(12.67)	(3.40)	(0.76)	(1.22)	(0.00)	(0.83)	(0.00)	(8.84)
AA	0.78	63.36	22.93	2.55	0.36	0.00	0.03	0.06	9.94
	(1.46)	(11.83)	(9.46)	(2.43)	(0.56)	(0.00)	(0.13)	(0.17)	(4.32)
A	0.03	4.42	66.88	13.13	1.03	0.20	0.11	0.12	14.09
	(0.11)	(3.31)	(7.51)	(3.74)	(1.52)	(0.61)	(0.35)	(0.21)	(4.02)
BBB	0.00	0.31	9.87	60.74	7.03	1.28	0.29	0.38	20.09
	(0.00)	(2.57)	(2.88)	(6.15)	(3.29)	(1.02)	(0.61)	(0.82)	(4.98)
BB	0.00	0.00	0.50	12.00	41.05	11.20	0.91	2.27	32.07
	(0.00)	(0.00)	(1.03)	(3.47)	(8.97)	(3.62)	(1.25)	(2.92)	(8.47)
B	0.00	0.00	0.00	1.01	11.62	34.91	4.44	9.55	38.48
	(0.00)	(0.00)	(0.00)	(1.41)	(3.67)	(8.05)	(2.17)	(8.14)	(10.31)
CCC/C	0.00	0.00	0.00	0.48	1.44	13.88	10.05	41.63	32.54
	(0.00)	(0.00)	(0.00)	(1.24)	(2.76)	(13.84)	(10.77)	(19.56)	(17.95)
Global (1981-2017)									
AAA	65.48	22.09	2.35	0.32	0.19	0.08	0.11	0.13	9.24
	(11.50)	(12.18)	(1.73)	(0.76)	(0.45)	(0.29)	(0.42)	(0.37)	(5.25)
AA	1.21	66.14	18.53	2.06	0.35	0.22	0.03	0.12	11.33
	(0.81)	(9.41)	(6.17)	(1.38)	(0.50)	(0.45)	(0.07)	(0.18)	(4.09)
A	0.06	4.07	68.85	11.72	1.30	0.44	0.09	0.25	13.21
	(0.10)	(2.07)	(6.33)	(2.73)	(0.98)	(0.62)	(0.14)	(0.28)	(3.47)
BBB	0.02	0.28	8.42	64.66	7.11	1.64	0.30	0.87	16.70
	(0.06)	(0.39)	(3.01)	(6.88)	(1.98)	(1.31)	(0.37)	(0.95)	(3.29)
BB	0.01	0.06	0.51	11.08	47.04	11.58	1.25	3.96	24.51
	(0.06)	(0.13)	(0.70)	(3.26)	(7.08)	(2.60)	(0.91)	(3.45)	(4.04)
B	0.00	0.03	0.21	0.78	10.23	41.46	4.67	12.57	30.05

Table 12

Three-Year Weighted-Average Corporate Transition Rates (%) (cont.)

From/to	AAA	AA	A	BBB	BB	B	CCC/C	D	NR
	(0.05)	(0.11)	(0.42)	(0.78)	(3.17)	(5.56)	(1.66)	(7.35)	(4.82)
CCC/C	0.00	0.00	0.14	0.61	1.63	16.86	10.54	40.65	29.57
	(0.00)	(0.00)	(0.52)	(1.23)	(1.71)	(6.86)	(6.08)	(12.43)	(8.81)

Note: Figures in parentheses are weighted standard deviations. NR--Not rated. Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®.

The transitions at the more detailed rating modifier level (in other words, including the "plus" or "minus" identifiers in the rating) also generally exhibit the same relationship, although differences in sample sizes occasionally create slight variations between adjacent rating levels (see table 13).

Table 13

One-Year Weighted-Average Transition Rates For European Corporates By Rating Modifier, 1981-2017 (%)

From/to	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC/C	D	NR
AAA	87.0	6.9	1.6	0.7	0.1	0.3	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	3.1
	(8.7)	(6.8)	(2.6)	(1.6)	(0.5)	(1.0)	(0.0)	(0.0)	(0.9)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.8)	(0.0)	(4.5)
AA+	1.3	76.5	14.7	3.2	0.5	0.5	0.4	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5
	(3.3)	(13.3)	(11.6)	(4.8)	(1.4)	(1.5)	(1.2)	(0.8)	(0.0)	(0.8)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(3.3)
AA	0.2	1.3	78.5	10.5	3.8	1.2	0.5	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6
	(0.7)	(2.3)	(13.4)	(9.5)	(5.7)	(1.9)	(0.8)	(0.9)	(0.5)	(0.3)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(3.8)
AA-	0.1	0.1	3.7	77.0	11.5	2.5	0.9	0.3	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5
	(0.4)	(0.3)	(4.0)	(8.9)	(6.9)	(3.3)	(1.6)	(0.5)	(1.2)	(0.5)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(3.1)
A+	0.0	0.0	0.3	5.3	73.8	11.6	2.3	0.5	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.7
	(0.0)	(0.0)	(0.8)	(5.7)	(8.7)	(6.3)	(1.7)	(0.9)	(0.9)	(0.3)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(2.9)
A	0.0	0.1	0.1	0.5	5.3	75.4	10.0	2.3	0.8	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	5.1
	(0.0)	(0.5)	(0.3)	(1.3)	(4.2)	(8.5)	(5.9)	(2.3)	(1.2)	(0.5)	(0.2)	(0.2)	(0.0)	(0.9)	(0.0)	(0.0)	(0.0)	(0.2)	(3.2)
A-	0.0	0.0	0.1	0.1	0.6	6.8	75.7	8.7	2.1	0.8	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	4.4
	(0.1)	(0.0)	(0.3)	(0.4)	(2.5)	(4.9)	(7.3)	(3.8)	(3.6)	(0.9)	(0.6)	(0.3)	(0.2)	(0.8)	(0.0)	(0.0)	(0.0)	(0.1)	(2.4)
BBB+	0.0	0.0	0.0	0.1	0.2	0.7	7.7	72.6	9.4	1.5	0.5	0.6	0.2	0.1	0.0	0.0	0.1	0.0	6.1
	(0.0)	(0.0)	(0.2)	(0.4)	(0.4)	(1.7)	(4.1)	(6.8)	(5.2)	(1.8)	(0.8)	(0.9)	(0.3)	(0.4)	(0.2)	(0.0)	(0.3)	(0.2)	(2.8)
BBB	0.0	0.0	0.0	0.0	0.1	0.3	1.0	8.7	71.0	7.6	1.9	0.8	0.1	0.1	0.2	0.1	0.0	0.0	7.8
	(0.0)	(2.3)	(0.3)	(0.0)	(0.3)	(0.7)	(1.2)	(5.3)	(6.4)	(4.4)	(2.4)	(1.2)	(0.4)	(0.3)	(0.6)	(0.3)	(0.3)	(0.2)	(4.6)
BBB-	0.0	0.0	0.1	0.0	0.2	0.2	0.2	1.1	11.9	67.2	6.8	2.2	0.5	0.2	0.3	0.0	0.2	0.2	8.8
	(0.0)	(0.0)	(0.4)	(0.0)	(0.6)	(0.6)	(0.8)	(1.0)	(7.3)	(8.4)	(5.0)	(3.3)	(0.9)	(0.5)	(0.9)	(0.0)	(0.8)	(0.6)	(4.9)
BB+	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.9	12.9	59.8	9.2	2.9	1.3	0.4	0.1	0.3	0.0	11.5
	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(1.8)	(1.2)	(1.6)	(6.4)	(11.7)	(6.3)	(4.8)	(1.7)	(1.0)	(0.5)	(1.0)	(0.0)	(6.6)
BB	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.1	1.7	11.8	59.7	7.6	2.5	0.5	0.1	0.7	0.2	14.6
	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.6)	(1.1)	(2.0)	(2.7)	(6.1)	(10.8)	(4.8)	(2.9)	(1.3)	(0.6)	(1.9)	(0.9)	(8.7)

Table 13

One-Year Weighted-Average Transition Rates For European Corporates By Rating Modifier, 1981-2017 (%) (cont.)

From/to	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC/C	D	NR
BB-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	1.3	12.2	55.8	11.8	3.4	0.6	0.1	0.9	13.2
	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.9)	(1.0)	(3.9)	(5.5)	(10.9)	(6.0)	(2.7)	(1.3)	(0.5)	(2.0)	(6.2)
B+	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.1	0.2	0.6	2.9	10.6	54.7	11.5	2.4	1.3	0.8	14.6
	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.6)	(0.0)	(0.6)	(0.3)	(0.6)	(0.8)	(5.6)	(4.9)	(9.4)	(5.3)	(3.2)	(3.4)	(2.4)	(7.1)
B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	1.5	8.0	60.3	7.8	3.0	1.9	16.8
	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.4)	(0.6)	(0.6)	(1.3)	(1.9)	(4.3)	(10.2)	(3.8)	(3.2)	(4.2)	(6.1)
B-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.6	1.4	10.3	51.3	13.8	6.7	15.6
	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(1.3)	(0.0)	(0.0)	(0.0)	(1.2)	(1.8)	(5.8)	(12.7)	(7.4)	(9.1)	(9.8)
CCC/C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.3	2.1	10.1	41.8	26.5	18.8
	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.8)	(0.0)	(0.0)	(0.0)	(0.0)	(1.3)	(2.9)	(9.6)	(18.9)	(17.8)	(10.9)

Note: Figures in parentheses are weighted standard deviations. NR--Not rated. Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®.

Time To Default

Higher-rated corporates generally exhibit a longer time to default than their lower-rated counterparts when using issuers' original ratings as the reference point (see table 14). For example, European corporates that we initially rated in the 'B' category but that later defaulted took an average of 3.6 years to default--less than the average of 7.5 years for defaulting entities that we originally rated in the 'A' category. For the corporates that defaulted in 2017, the average number of years that elapsed between the initial rating date and the default date was 5.9 years.

Table 14

Time To Default From Original Rating For European Corporate Defaulters

Original rating	Defaults	Average years from original rating*	Median years from original rating	Standard deviation of years from original rating
AAA	0	N/A	N/A	N/A
AA	1	8.42	8.42	N/A
A	11	7.54	6.25	4.28
BBB	14	8.53	7.33	6.12
BB	37	5.09	4.50	3.75
B	95	3.59	2.81	2.61
CCC/C	27	1.40	1.11	1.50
Total	185	4.20	3.03	3.73

*Or Dec. 31, 1980, whichever is greater. N/A--Not applicable. Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®.

For the entire long-term history of European corporate defaults--185 from 1981-2017--the

average time to default across all rating categories was 4.2 years, compared with 5.8 years globally (see chart 6). The relationship between initial rating level and time to default is less clear in Europe, partly due to smaller sample sizes. For example, in the 37 years ended 2017, 1,473 global issuers with an initial rating in the 'B' category defaulted, of which only 95 were from Europe. In 2017, the most defaulters in Europe had 'B' as their initial rating categories, which now average 3.6 years to default.

As expected, the average time to default for all ratings (in other words, not just initial ratings) also shows that higher-rated corporates generally take longer to default, albeit somewhat shorter than their time to default from initial ratings (see chart 7).

Chart 6

Average Time To Default From Original Rating, 1981-2017

(Years)
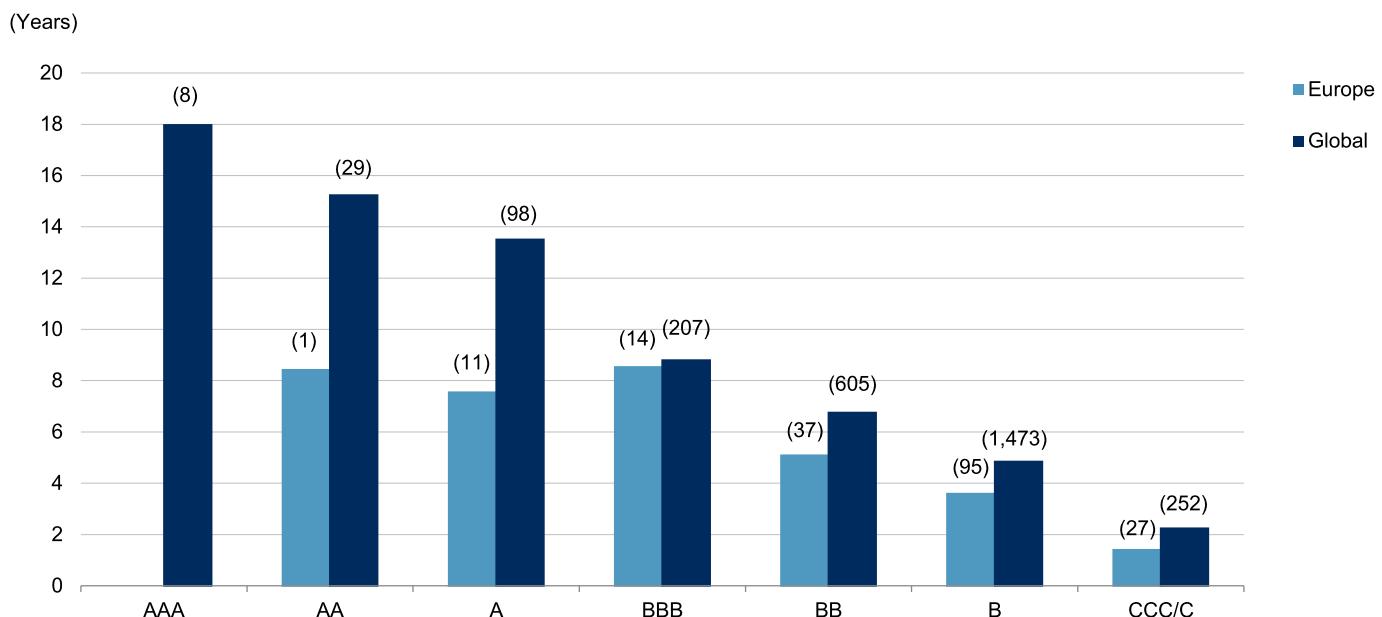
Note: Figures in parentheses indicate the number of observations making up the corresponding averages.
Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®.

Chart 7

Average Time To Default For European Defaulters, 1981-2017
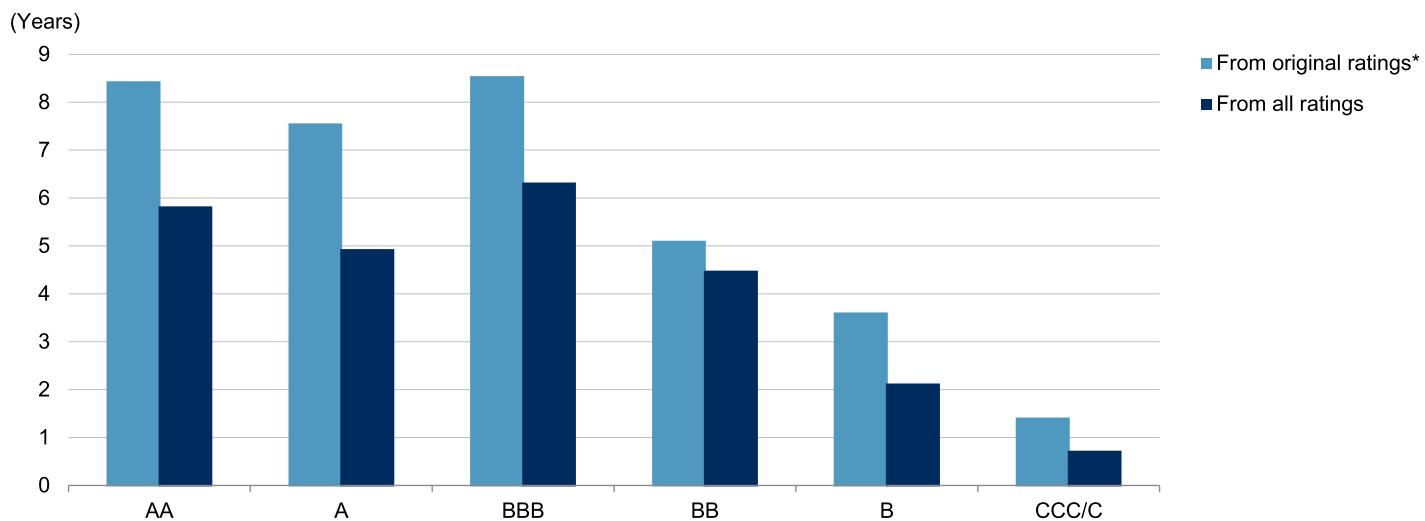
*Or Dec. 31, 1980, whichever is greater. The average time to default from post-original ratings includes ratings transitions as well as first rating. Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®.

Gini Coefficients And Lorenz Curves

Quantitative analysis of ratings performance shows that our European corporate ratings continue to correlate with the level of default risk across different time horizons.

To measure ratings performance, we plot the cumulative share of defaulters against the cumulative share of issuers by rating in a Lorenz curve, which visually represents the ratings' rank ordering power and is summarized quantitatively by the Gini coefficient (see definitions and methodology in Appendix II).

Over the long term, the European corporate weighted-average one-year Gini coefficient was 90.4%, the three-year average was 85.6%, and the five-year average was 83.3% (see table 15 and charts 8-10).

Table 15

Corporate Gini Coefficients By Region (%)

Region	Time horizon			
	One-year	Three-year	Five-year	Seven-year
Global				
Weighted average	82.39	75.00	71.65	69.43
Average	85.09	78.17	74.12	70.84
Standard deviation	5.53	5.14	5.52	5.33

Corporate Gini Coefficients By Region (%) (cont.)

Region	Time horizon			
	One-year	Three-year	Five-year	Seven-year
U.S.				
Weighted average	80.70	72.84	69.40	67.30
Average	84.07	76.16	72.00	68.72
Standard deviation	6.94	6.75	6.92	6.42
Europe				
Weighted average	90.42	85.60	83.32	79.02
Average	93.02	90.97	87.60	81.89
Standard deviation	5.38	6.86	9.38	14.27

Note: Calculated over the period 1981-2017. Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®.

The Gini coefficients decline as the time horizon lengthens because longer time horizons allow more opportunities for credit degradation among higher-rated entities. In the one-year Lorenz curve for European corporates, for example, 95.6% of defaults occurred in the speculative-grade rating categories ('BB+' or lower), while these rating categories accounted for only 23.1% of all European corporate issuers (see chart 8). The five-year Lorenz curve shows that speculative-grade issuers accounted for 87.6% of defaulters and only 17.4% of the entire sample (see chart 10). If the rank ordering of ratings had little predictive value, the cumulative share of defaulting corporate entities and the cumulative share of all entities would be nearly the same, producing a Gini coefficient close to zero.

European Corporate One-Year Average Lorenz Curve, 1981-2017

Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®.

Chart 9

European Corporate Three-Year Average Lorenz Curve, 1981-2017
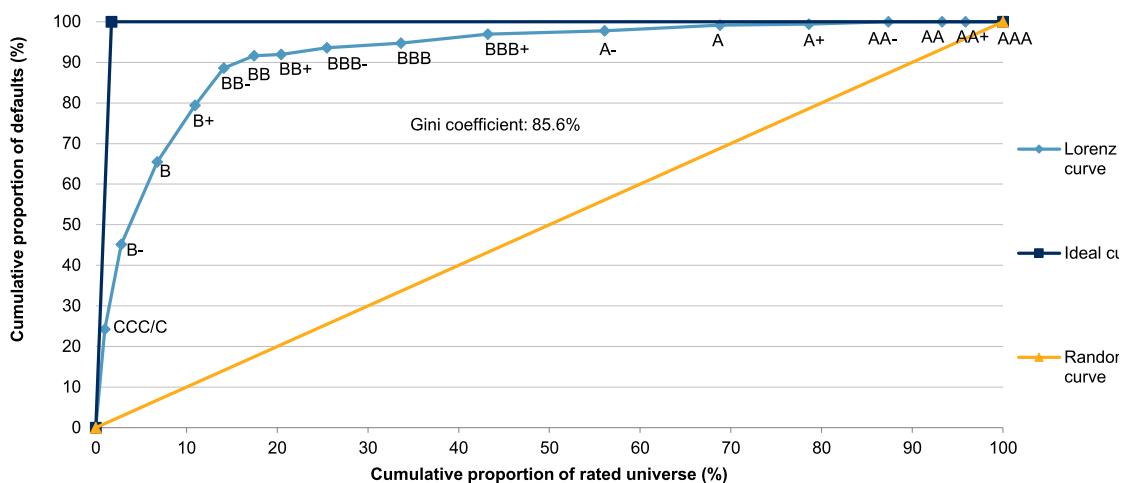
Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®.

Chart 10

European Corporate Five-Year Average Lorenz Curve, 1981-2017

Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®.

Appendix I: Calculation Approach And Definitions

This long-term corporate default and rating transition study uses S&P Global Market Intelligence's CreditPro® database of long-term local currency issuer credit ratings. The analysis excludes public information ("pi") ratings and ratings based on the guarantee of another company or government entity. We also do not include short-term issuer credit ratings. We do not require all issuers with debt that we rate to have an issuer credit rating. Therefore, if an issuer has rated debt but not an issuer credit rating, we assign a proxy rating so that the CreditPro® corporate dataset accurately represents the complete universe of ratings. The local currency senior unsecured rating is the preferred debt level rating used for the proxy because this rating is usually consistent with the issuer credit rating. In a small number of cases, we use the subordinated debt rating or the senior secured rating as the proxy.

An issuer credit rating is a forward-looking opinion about an obligor's overall creditworthiness. This opinion focuses on the obligor's capacity and willingness to meet its financial commitments as they come due. It does not apply to any specific financial obligation because it does not take into account the nature and provisions of any single obligation, its standing in bankruptcy or liquidation, statutory preferences, or the legality and enforceability of the obligation. Issuer credit ratings can be either long-term or short-term.

Our ongoing enhancement of the database used to generate this study could lead to outcomes that differ to some degree from those reported in previous studies. However, each annual default and transition study reports statistics back to Dec. 31, 1980, and is therefore self-contained and effectively supersedes all previous editions.

Issuers included in this study

The study analyzes the rating histories of 3,457 European companies that we rated as of Dec. 31, 1980, or that we first rated between that date and Dec. 31, 2017. These include industrials, utilities, financial institutions, and insurance companies in the region with long-term local currency ratings. Structured finance vehicles, public-sector issuers, and sovereign issuers are the subject of separate default and transition studies, and we exclude them from this study.

For the purposes of this study, Europe comprises Austria, Belgium, the British Virgin Islands, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Gibraltar, Greece, Guernsey, Hungary, Iceland, Ireland, the Isle of Man, Italy, Jersey, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, Montenegro, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, and the U.K.

To avoid overcounting, we exclude subsidiaries with debt that is fully guaranteed by a parent or with default risk that we consider identical to that of their parents. The latter case arises for companies with obligations that are not legally guaranteed by a parent but that have operating or financing activities that are so entwined with those of the parent that a default of one and not the other would be highly unlikely, in our view. At times, however, a parent's guarantee might not have yet covered some of these subsidiaries, or the relationship that combines the default risk of parent and subsidiary might have come to an end or might not have begun. We include such subsidiaries in the dataset for the period during which they had distinct and separate risk of default.

Issuers with withdrawn ratings

We withdraw ratings when an entity's entire debt is paid off or when the program or programs that we rate are terminated and the relevant debt extinguished. We may also withdraw corporate ratings at the issuer's request, as a result of a merger or acquisition, or when a company no longer provides all of the information we require to continue surveillance on the ratings.

Definition of default

For the purposes of this study, we deem 'D', 'SD', and 'R' issuer credit ratings as defaults. We assume the default takes place on the earliest of: the date that we revised the rating(s) to 'D', 'SD', or 'R'; the date the issuer missed a debt payment; the date a distressed exchange offer was announced; or the date the debtor filed for bankruptcy.

An obligor rated 'SD' (selective default) or 'D' is in default on one or more of its financial obligations, including rated and unrated financial obligations but excluding hybrid instruments classified as regulatory capital or in non-payment according to terms. We consider an obligor to be in default unless we believe that such payments will be made within five business days of the due date in the absence of a stated grace period, or within the earlier of the stated grace period or 30 calendar days. We assign a 'D' rating when we believe that the default will be a general default and that the obligor will fail to pay all or almost all of its obligations as they come due. We assign an 'SD' rating when we believe that the obligor has selectively defaulted on a specific issue or class of obligations but it will continue to meet its payment obligations on other issues or classes of obligations in a timely manner. We lower an obligor's rating to 'D' or 'SD' if it is conducting a distressed exchange offer, whereby one or more financial obligation is either repurchased for an amount of cash or replaced by other instruments with a total value that is less than par.

An obligor rated 'R' is under regulatory supervision owing to its financial condition. During the pendency of the regulatory supervision, the regulators may have the power to favor one class of obligations over others or pay some obligations and not others.

When an issuer defaults, we commonly subsequently withdraw the 'D' or 'SD' rating. For the purposes of this study, if an issuer defaults, we end its rating history at 'D'. If any defaulting entity reemerges from bankruptcy--or otherwise restructures its defaulted debt instruments, thereby reestablishing regular, timely payment on all its debts--we reenter this issuer into the database as a new entity. Its rating history after the default event is included in all calculations as entirely separate from its rating history prior to the earlier default.

Many practitioners use statistics from this default study to estimate "probability of default" and "probability of rating transition", based on observed historical default and transition frequencies. It is important to note that we do not ascribe a specific "default probability" to each rating category.

Calculations

Static pool methodology. S&P Global Fixed Income Research conducts its default studies on the basis of groups of ratings called static pools. For the purposes of this study, we form static pools by grouping issuers by rating category at the beginning of each year, quarter, or month that the database covers. Each static pool is followed from that point forward. We assign all companies included in the study to one or more static pools. When an issuer defaults, we assign that default

back to all of the static pools to which the issuer belonged.

S&P Global Fixed Income Research uses the static pool methodology to avoid certain pitfalls in estimating default rates. This is to ensure that default rates account for rating migration and to allow for the calculation of default rates across multiperiod time horizons. Some methods for calculating default and rating transition rates might charge defaults against only the initial rating on the issuer, ignoring more recent rating changes that supply more current information. Other methods may calculate default rates using only the most recent year's default and rating data, which may yield comparatively low default rates during periods of high rating activity because they ignore prior years' default activity.

The pools are static in the sense that their membership remains constant over time. Each static pool can be interpreted as a buy-and-hold portfolio. Because errors, if any, are corrected in each new update and because the criteria for inclusion or exclusion of companies in the default study are subject to minor revisions as time goes by, it is not possible to compare static pools across different studies. Therefore, every new update revises results back to the same starting date of Dec. 31, 1980, so as to avoid continuity problems.

Entities whose ratings we have withdrawn or discontinued--that is, revised to 'NR'--are surveilled with the aim of capturing a potential default. Because static pools only include entities with active ratings as of the beginning date of a given pool, we exclude companies with withdrawn ratings, as well as those that have defaulted, from subsequent static pools. If an entity has its rating withdrawn after the start date of a particular static pool and subsequently defaults, we will include it in that static pool as a default and categorize it into the rating category it was a member of at that time.

For instance, the 2001 static pool comprises all companies rated as of 12:01 a.m. Jan. 1, 2001. Adding those companies first rated in 2001 to the surviving members of the 2001 static pool forms the 2002 static pool. All rating changes that took place are reflected in the newly formed 2002 static pool through these entities' ratings as of 12:01 a.m. Jan. 1, 2002.

Consider the following example: An issuer is originally rated 'BB' in mid-2000, and we downgrade the company to 'B' in 2002. This is followed by a rating withdrawal in 2003 and a default in 2004. We would include this hypothetical company in the 2001 and 2002 static pools with the 'BB' rating that it held at the beginning of those years. Likewise, we would include it in the 2003 static pool with the 'B' rating. It would not be part of the 2004 static pool because it was not rated as of the first day of that year, and we would not include it in any pool after the last day of 2004 because we had withdrawn our rating on the company by then. Yet, each of the three static pools in which we include this company (2001-2003) would record its 2004 default at the appropriate time horizon.

Default rate calculation. We calculate annual default rates for each static pool, first in units and later as percentages of the number of issuers in each rating category. We combine these percentages to obtain cumulative default rates (CDRs) for the 37 years the study covers.

Issuer-weighted default rates. We base all default rates that appear in this study on the number of issuers rather than the currency amounts affected by defaults or rating changes. Although currency amounts provide information about the portion of the market that is affected by defaults or rating changes, issuer-weighted averages are a more useful measure of the performance of ratings.

Average CDR calculation. In this report, we also calculate and present average CDRs for different time horizons. For example, table 7 shows that the one-year average CDR for 'A'-rated European corporates has been 0.04%, and the three-year average has been 0.12%.

We first consider the static pool of ratings at the beginning of each calendar year. For each static pool, we calculate the marginal default rates for each calendar year after the static pool's formation. These one-year marginal default rates are "conditional on survival." For example, the marginal default rate for the third year is the number of defaults during the third year, divided by the number of ratings from the static pool that had "survived" (in other words, not moved to 'D') by the beginning of the third year. We then average the marginal default rates for each time horizon across static pools, weighting by the number of surviving ratings at the beginning of each time horizon, to give an average marginal default rate per time horizon, as well as average marginal survival rates (equal to one minus the average marginal default rate). Finally, the average CDR to each time horizon is calculated as one minus the product of marginal survival rates up to that time horizon.

Transition analysis

Transition rates compare issuer credit ratings at the beginning of a time period with ratings at the end of the period. To compute one-year rating transition rates by rating category, we compare the rating on each entity at the end of a particular year with the rating at the beginning of the same year. An issuer that remained rated for more than one year was counted as many times as the number of years it was rated. For instance, an issuer continually rated from the middle of 1984 to the middle of 1991 would appear in the seven consecutive one-year transition matrices from 1985 to 1991. If the rating on the issuer was withdrawn in the middle of 1991, it would be included in the column representing transitions to 'NR' in the 1991 transition matrix. Similarly, if it defaulted in the middle of 1991, it would be included in the column representing transitions to 'D' in the 1991 one-year transition matrix.

All 1981 static pool members still rated on Jan. 1, 2017, had 37 one-year transitions, while companies first rated on Jan. 1, 2017, had only one. Each one-year transition matrix displays all rating movements between rating categories from the beginning of the year through year-end. For each rating listed in the matrix's left-most column, there are nine ratios listed in the rows, corresponding to the rating categories from 'AAA' to 'D', plus an entry for 'NR'.

The only ratings considered in these calculations are those on entities at the beginning of each static pool and those at the end. All rating changes that occur in between are ignored. For example, if an entity was rated 'A' on Jan. 1, 2014, was downgraded to 'BBB' in the middle of the year, and then later upgraded to 'A' later in the year (with no other subsequent rating changes), this entity would only be included in the percentage of issuers that began the year as 'A' that also ended the year as 'A'. This approach also applies to transition matrices that span longer time horizons. If an issuer defaults or has its rating withdrawn in the middle of the year, then either a 'D' or 'NR' would be considered its rating as of Dec. 31 of that particular year.

Multiyear transitions

We also calculate multiyear transitions for periods of two to 10 years. In this case, we compare the rating at the beginning of the multiyear period with the rating at the end. For example, three-year transition matrices are the result of comparing ratings at the beginning of the years 1981-2015 with the ratings at the end of the years 1983-2017. Otherwise, the methodology is identical to the one we use for single-year transitions.

We calculate average transition matrices on the basis of the multiyear matrices just described. These average matrices are a true summary, the ratios of which represent the historical incidence of the ratings listed in the first column, changing to the ones listed in the top row over the course

of the multiyear period. Transition matrices that present averages over multiple time horizons are also calculated as issuer-weighted averages.

Rating modifiers

We use rating modifiers (plus and minus signs) to calculate the upgrade and downgrade rates, as well as the magnitude of rating changes throughout this study. However, some transition tables may only show full rating categories for practical reasons. In other words, the use of a rating category suggests that transitions from, for example, 'AA' to 'AA-' or from 'BBB+' to 'BBB-' are not considered to be rating transitions because the rating remained within the rating category.

Standard deviations

Many of the tables and charts in this study display averages of default rates, transition rates, and Gini coefficients. Often these are issuer-weighted averages. Default and transition rates can fluctuate, depending on many circumstances specific to particular time frames, industries, and geographic regions. As a supplement to many of the averages and time series we present in this study, we also show standard deviations to provide a gauge of the dispersion of data behind the averages.

For the transition matrices, the standard deviation for each cell in a given matrix is a weighted standard deviation, calculated using the data from each of the underlying static pool years that contribute to the averages, weighted by that static pool year's issuer base for each rating level. For example, in the average one-year transition matrix, each cell's weighted standard deviation is calculated from the series of that particular cell in each of the 37 static pools beginning with the 1981 static pool and ending with the 2017 static pool. The squared difference between each static pool's transition rate and the weighted average--which is the data point in each cell--is multiplied by each static pool's weight. These weights are based on each static pool rating level's contribution to the 37-year total issuer base for each rating level. We then divide this by the ratio of the total number of non-zero weights minus one and the total number of non-zero weights.

Regarding Gini coefficients, we derive their standard deviations from the time series of Gini coefficients for all of their constituent annual static pools. As an example, we calculate the standard deviation for the seven-year weighted average global Gini coefficient from the time series of all available seven-year Gini coefficients by static pool. In this case, these are the seven-year Gini coefficients beginning with the 1981 static pool through the 2011 static pool. We calculated standard deviations for Gini coefficients in this study as the standard deviations of a sample, rather than as the standard deviation of a population.

Appendix II: Gini Coefficient Methodology

We calculate Gini coefficients as one way to quantify our ratings' rank-ordering power of creditworthiness, based on observed default rates.

To measure relative ratings performance, we use the Lorenz curve as a graphical representation of the proportionality of a distribution, and we summarize this via the Gini coefficient. For this study, the Lorenz curve is plotted with the x axis showing the cumulative share of issuers, arranged by rating level, while the y axis represents the cumulative share of defaulters, also arranged by rating level. For both axes of the Lorenz curve, the observations are ordered from the low end of the ratings scale ('CCC'/'C') to the high end ('AAA'). As an example, if 'CCC'/'C' rated entities made up 10% of the total population of issuers at the start of the time frame examined (x axis) and 50% of

the defaulters (y axis), then the coordinate (10, 50) would be the first point on the curve.

We illustrate the procedure for calculating the Gini coefficient in chart 11. Area B is bounded by the random curve and the Lorenz curve, while area A is bounded by the Lorenz curve and the ideal curve. The Gini coefficient is defined as area B divided by the sum of area A and area B. The Gini coefficient can therefore range between 0% (if the Lorenz curve follows the random curve) and 100% (if the Lorenz curve follows the ideal curve). In general, therefore, the higher the Gini coefficient, the greater the link between our ratings and the securities' observed default propensity.

If our ratings only randomly approximated default propensity, the Lorenz curve would fall along the diagonal, shown as the "random curve" in chart 11, and the Gini coefficient would be 0%. On the other hand, if all defaults only occurred among the lowest-rated issuers, with no defaults among the higher-rated issuers, the Lorenz curve would lie along the line shown as the "ideal curve" in chart 11, and the Gini coefficient would be 100%. Typically, the observed Lorenz curve falls between the "ideal" and "random" curves, and we use the Gini coefficient as a summary statistic to quantify its proximity to the "ideal" curve.

Chart 11

Sample Lorenz Curve For Gini Coefficient Calculation
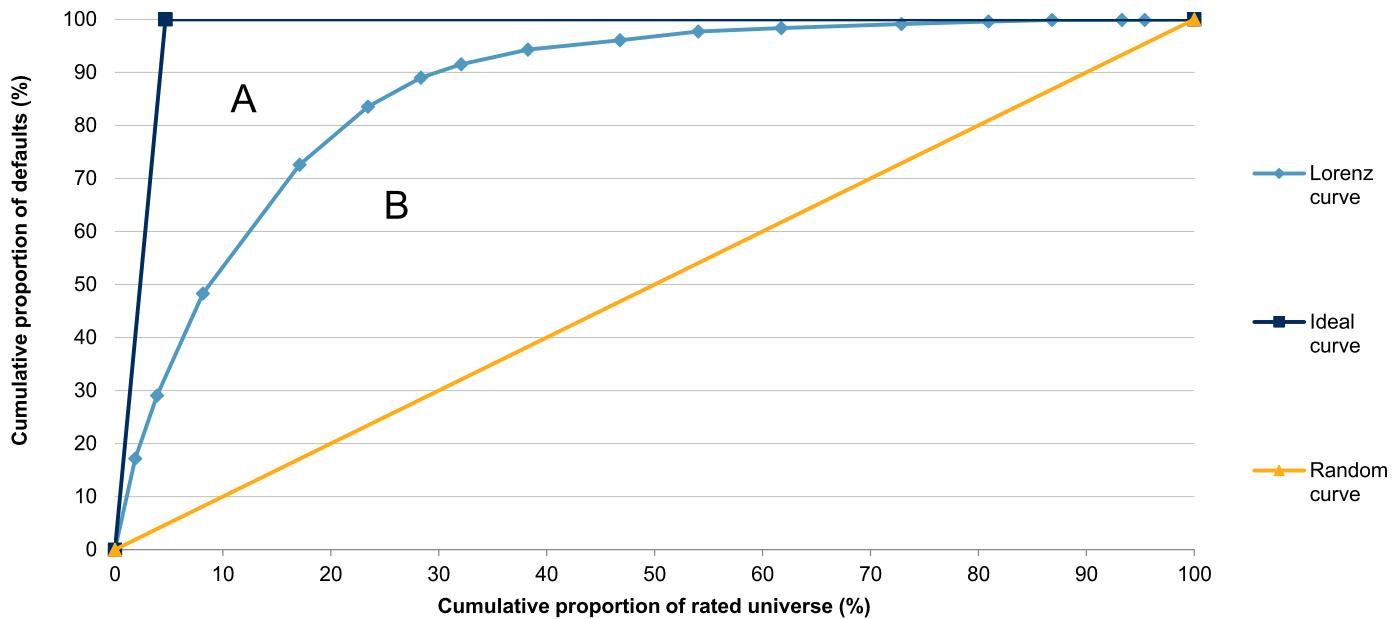
Source: S&P Global Fixed Income Research.

Appendix III: Detailed Cumulative Default And Transition Data

Table 16

Static Pool Cumulative Corporate Default Rate Among All European Ratings, 1981-2017 (%)

Year	Issuers	Time horizon (years)														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1981	11	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
1982	13	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
1983	18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1984	28	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
1985	35	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
1986	40	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
1987	50	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
1988	61	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
1989	74	0.00	0.00	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
1990	96	0.00	2.08	2.08	2.08	2.08	2.08	2.08	2.08	2.08	2.08	2.08	2.08	2.08	2.08	2.08
1991	132	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52
1992	161	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
1993	198	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51
1994	248	0.00	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.81	0.81	0.81	0.81	0.81	0.81	0.81
1995	319	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
1996	366	0.00	0.00	0.00	0.00	0.00	0.00	0.82	0.82	1.09	1.09	1.09	1.09	1.09	1.09	1.09
1997	456	0.00	0.00	0.00	0.00	0.00	0.88	1.75	1.97	1.97	1.97	1.97	1.97	1.97	1.97	1.97
1998	545	0.00	0.73	0.73	1.28	2.20	2.94	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30
1999	658	0.91	1.37	2.43	3.34	4.10	4.41	4.41	4.56	4.56	4.56	4.56	4.56	4.56	4.56	4.56
2000	739	0.54	1.76	3.65	4.33	4.60	4.60	4.74	4.87	4.87	5.01	5.01	5.01	5.01	5.01	5.14
2001	826	1.45	3.87	4.96	5.21	5.33	5.45	5.57	5.57	5.69	5.69	5.69	5.69	5.69	5.81	6.30
2002	919	2.07	2.94	3.16	3.26	3.48	3.59	3.70	3.81	3.81	3.81	3.92	4.03	4.13	4.57	4.68
2003	956	0.84	1.05	1.26	1.46	1.57	1.67	1.99	1.99	1.99	2.20	2.30	2.41	2.82	2.93	3.24
2004	995	0.30	0.50	0.70	0.80	1.11	1.51	1.51	1.51	1.71	1.81	1.81	2.21	2.31	2.61	
2005	1066	0.19	0.47	0.56	0.84	1.31	1.50	1.69	1.88	2.06	2.06	2.53	2.63	2.81		
2006	1077	0.37	0.56	0.84	1.58	1.76	2.04	2.32	2.60	2.60	3.06	3.25	3.44			
2007	1091	0.18	0.82	2.11	2.20	2.47	2.84	3.12	3.12	3.57	3.76	3.94				
2008	1113	0.54	2.07	2.16	2.43	2.88	3.23	3.32	3.77	3.95	4.13					
2009	1125	1.60	1.69	1.96	2.40	2.76	2.84	3.29	3.47	3.64						
2010	1097	0.18	0.55	1.00	1.46	1.55	2.10	2.46	2.64							
2011	1144	0.35	0.79	1.40	1.66	2.53	2.88	3.06								
2012	1178	0.59	1.36	1.70	2.55	2.97	3.23									

Table 16

Static Pool Cumulative Corporate Default Rate Among All European Ratings, 1981-2017 (%) (cont.)

Year	Issuers	Time horizon (years)														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2013	1214	1.07	1.48	2.31	2.72	3.21										
2014	1362	0.37	1.17	1.54	2.20											
2015	1483	0.81	1.55	2.36												
2016	1509	0.80	1.66													
2017	1517	0.99														
Summary statistics																
Marginal average		0.66	0.62	0.49	0.38	0.34	0.27	0.23	0.14	0.12	0.11	0.10	0.09	0.09	0.12	0.13
Cumulative average		0.66	1.28	1.77	2.14	2.47	2.73	2.96	3.09	3.21	3.32	3.42	3.50	3.59	3.70	3.83
Standard deviation		0.55	0.93	1.22	1.38	1.53	1.59	1.64	1.68	1.73	1.76	1.76	1.76	1.78	1.85	1.96
Median		0.30	0.55	0.84	1.32	1.35	1.50	1.52	1.51	1.52	1.43	1.35	1.22	1.09	1.02	0.94
Minimum		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
Maximum		2.07	3.87	4.96	5.21	5.33	5.45	5.57	5.57	5.69	5.69	5.69	5.69	5.69	5.81	6.30

Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®.

Table 17

Static Pool Cumulative Corporate Default Rate Among Investment-Grade European Ratings, 1981-2017 (%)

Year	Issuers	Time horizon (years)														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1981	10	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
1982	12	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
1983	17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1984	26	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
1985	33	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
1986	38	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
1987	47	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
1988	58	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
1989	71	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
1990	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
1991	129	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
1992	159	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
1993	193	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
1994	244	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.41	0.41	0.41	0.41	0.41	0.41

Table 17

Static Pool Cumulative Corporate Default Rate Among Investment-Grade European Ratings, 1981-2017 (%) (cont.)

Year	Issuers	Time horizon (years)														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1995	308	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
1996	349	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.29	0.57	0.57	0.57	0.57	0.57	0.57	0.57
1997	433	0.00	0.00	0.00	0.00	0.00	0.23	0.92	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
1998	502	0.00	0.00	0.00	0.20	0.60	1.20	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59
1999	563	0.00	0.00	0.18	0.53	1.07	1.42	1.42	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
2000	622	0.16	0.32	0.64	1.13	1.45	1.45	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.77
2001	696	0.14	0.43	1.15	1.44	1.44	1.58	1.58	1.58	1.58	1.58	1.58	1.58	1.58	1.72	2.30
2002	776	0.13	0.64	0.77	0.77	0.90	0.90	1.03	1.03	1.03	1.03	1.03	1.16	1.29	1.80	1.93
2003	794	0.25	0.25	0.25	0.25	0.25	0.38	0.63	0.63	0.63	0.63	0.76	0.88	1.39	1.51	1.51
2004	807	0.00	0.00	0.00	0.00	0.12	0.37	0.37	0.37	0.37	0.50	0.50	0.99	1.12	1.12	
2005	852	0.00	0.00	0.00	0.12	0.35	0.35	0.35	0.35	0.47	0.47	0.94	1.06	1.06		
2006	852	0.00	0.00	0.00	0.23	0.23	0.23	0.23	0.35	0.35	0.82	0.82	0.82			
2007	882	0.00	0.23	0.45	0.45	0.45	0.45	0.45	0.45	0.91	0.91	0.91				
2008	913	0.11	0.33	0.33	0.33	0.33	0.44	0.44	0.88	0.88	0.88					
2009	930	0.11	0.11	0.11	0.11	0.22	0.22	0.65	0.65	0.65						
2010	900	0.00	0.00	0.00	0.11	0.11	0.56	0.56	0.56							
2011	892	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
2012	868	0.00	0.00	0.00	0.00	0.00	0.00									
2013	838	0.00	0.00	0.00	0.00	0.00										
2014	851	0.00	0.00	0.00	0.00											
2015	871	0.00	0.00	0.00												
2016	887	0.00	0.00													
2017	883	0.00														
Summary statistics																
Marginal average		0.04	0.06	0.07	0.08	0.08	0.11	0.11	0.07	0.06	0.05	0.05	0.08	0.08	0.09	0.10
Cumulative average		0.04	0.10	0.17	0.24	0.32	0.43	0.54	0.60	0.66	0.71	0.76	0.84	0.92	1.01	1.10
Standard deviation		0.06	0.15	0.26	0.34	0.41	0.48	0.54	0.56	0.57	0.58	0.60	0.62	0.66	0.72	0.80
Median		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.35	0.37	0.32	0.16	0.00	0.00	0.00
Minimum		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
Maximum		0.25	0.64	1.15	1.44	1.45	1.58	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.80	2.30

Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®.

Table 18

Static Pool Cumulative Corporate Default Rate Among Speculative-Grade European Ratings, 1981-2017 (%)

Year	Issuers	Time horizon (years)														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1981	1	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
1982	1	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
1983	1	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
1984	2	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
1985	2	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
1986	2	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
1987	3	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
1988	3	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
1989	3	0.00	0.00	33.33	33.33	33.33	33.33	33.33	33.33	33.33	33.33	33.33	33.33	33.33	33.33	33.33
1990	4	0.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
1991	3	66.67	66.67	66.67	66.67	66.67	66.67	66.67	66.67	66.67	66.67	66.67	66.67	66.67	66.67	66.67
1992	2	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
1993	5	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
1994	4	0.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
1995	11	9.09	9.09	9.09	9.09	9.09	9.09	9.09	18.18	18.18	18.18	18.18	18.18	18.18	18.18	18.18
1996	17	0.00	0.00	0.00	0.00	0.00	0.00	11.76	11.76	11.76	11.76	11.76	11.76	11.76	11.76	11.76
1997	23	0.00	0.00	0.00	0.00	0.00	13.04	17.39	17.39	17.39	17.39	17.39	17.39	17.39	17.39	17.39
1998	43	0.00	9.30	9.30	13.95	20.93	23.26	23.26	23.26	23.26	23.26	23.26	23.26	23.26	23.26	23.26
1999	95	6.32	9.47	15.79	20.00	22.11	22.11	22.11	22.11	22.11	22.11	22.11	22.11	22.11	22.11	22.11
2000	117	2.56	9.40	19.66	21.37	21.37	21.37	21.37	22.22	22.22	23.08	23.08	23.08	23.08	23.08	23.08
2001	130	8.46	22.31	25.38	25.38	26.15	26.15	26.92	26.92	27.69	27.69	27.69	27.69	27.69	27.69	27.69
2002	143	12.59	15.38	16.08	16.78	17.48	18.18	18.18	18.88	18.88	18.88	19.58	19.58	19.58	19.58	19.58
2003	162	3.70	4.94	6.17	7.41	8.02	8.02	8.64	8.64	8.64	9.88	9.88	9.88	9.88	9.88	11.73
2004	188	1.60	2.66	3.72	4.26	5.32	6.38	6.38	6.38	7.45	7.45	7.45	7.45	7.45	9.04	
2005	214	0.93	2.34	2.80	3.74	5.14	6.07	7.01	7.94	8.41	8.41	8.88	8.88	9.81		
2006	225	1.78	2.67	4.00	6.67	7.56	8.89	10.22	11.11	11.11	11.56	12.44	13.33			
2007	209	0.96	3.35	9.09	9.57	11.00	12.92	14.35	14.35	14.83	15.79	16.75				
2008	200	2.50	10.00	10.50	12.00	14.50	16.00	16.50	17.00	18.00	19.00					
2009	195	8.72	9.23	10.77	13.33	14.87	15.38	15.90	16.92	17.95						
2010	197	1.02	3.05	5.58	7.61	8.12	9.14	11.17	12.18							
2011	252	1.59	3.57	6.35	7.54	11.51	13.10	13.89								
2012	310	2.26	5.16	6.45	9.68	11.29	12.26									
2013	376	3.46	4.79	7.45	8.78	10.37										
2014	511	0.98	3.13	4.11	5.87											
2015	612	1.96	3.76	5.72												

Table 18

Static Pool Cumulative Corporate Default Rate Among Speculative-Grade European Ratings, 1981-2017 (%) (cont.)

Year	Issuers	Time horizon (years)														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2016	622	1.93	4.02													
2017	634	2.37														
Summary statistics																
Marginal average		2.73	2.69	2.26	1.79	1.70	1.19	0.98	0.63	0.53	0.52	0.44	0.17	0.20	0.38	0.48
Cumulative average		2.73	5.35	7.49	9.15	10.69	11.76	12.63	13.18	13.64	14.09	14.46	14.61	14.78	15.10	15.51
Standard deviation		11.35	14.06	14.77	14.92	15.16	15.21	15.23	15.46	15.73	16.01	16.29	16.61	16.93	17.22	17.53
Median		1.02	3.46	6.17	7.58	9.09	10.70	11.76	13.27	14.83	13.78	12.44	12.55	11.76	14.58	17.39
Minimum		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
Maximum		66.67	66.67	66.67	66.67	66.67	66.67	66.67	66.67	66.67	66.67	66.67	66.67	66.67	66.67	66.67

Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®.

Table 19

One-Year Weighted-Average European Corporate Transition Matrix, 1981-2017 (%)

From/to	AAA	AA	A	BBB	BB	B	CCC/C	D	NR
AAA	87.01	9.20	0.46	0.11	0.00	0.00	0.11	0.00	3.10
	(8.67)	(7.72)	(1.37)	(0.91)	(0.00)	(0.00)	(0.76)	(0.00)	(4.47)
AA	0.29	86.01	9.74	0.58	0.00	0.00	0.00	0.00	3.39
	(0.68)	(7.18)	(6.37)	(1.19)	(0.00)	(0.00)	(0.00)	(0.00)	(2.40)
A	0.01	1.89	87.12	5.76	0.17	0.04	0.00	0.04	4.98
	(0.05)	(1.86)	(4.73)	(3.38)	(0.35)	(0.44)	(0.00)	(0.09)	(2.05)
BBB	0.00	0.11	4.21	84.10	3.75	0.34	0.09	0.07	7.33
	(0.00)	(1.38)	(1.92)	(4.20)	(2.68)	(0.54)	(0.29)	(0.22)	(2.99)
BB	0.00	0.00	0.08	5.47	73.49	7.04	0.37	0.37	13.17
	(0.00)	(0.00)	(0.66)	(2.59)	(6.98)	(3.66)	(1.03)	(0.89)	(4.72)
B	0.00	0.00	0.04	0.32	6.38	70.93	4.22	2.34	15.77
	(0.00)	(0.00)	(0.24)	(0.57)	(3.29)	(6.68)	(2.62)	(3.88)	(5.68)
CCC/C	0.00	0.00	0.00	0.35	0.00	12.54	41.81	26.48	18.82
	(0.00)	(0.00)	(0.00)	(0.78)	(0.00)	(11.65)	(18.89)	(17.81)	(10.90)

Note: Figures in parentheses are weighted standard deviations. Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®. NR--Not rated.

Table 20

Two-Year Weighted-Average European Corporate Transition Matrix, 1981-2017 (%)

From/to	AAA	AA	A	BBB	BB	B	CCC/C	D	NR
AAA	75.35	16.94	1.27	0.12	0.12	0.00	0.12	0.00	6.11
	(12.69)	(11.04)	(2.46)	(0.83)	(0.91)	(0.00)	(0.80)	(0.00)	(7.55)
AA	0.57	73.68	17.48	1.51	0.16	0.00	0.00	0.03	6.58
	(1.14)	(10.57)	(8.84)	(1.91)	(0.38)	(0.00)	(0.00)	(0.12)	(3.28)
A	0.01	3.38	75.98	10.08	0.54	0.12	0.04	0.08	9.78
	(0.05)	(2.67)	(6.91)	(4.07)	(0.98)	(0.49)	(0.21)	(0.15)	(3.07)
BBB	0.00	0.21	7.56	71.09	5.84	0.81	0.23	0.21	14.04
	(0.00)	(2.02)	(2.88)	(5.38)	(3.40)	(0.97)	(0.66)	(0.45)	(4.02)
BB	0.00	0.00	0.32	9.23	54.68	10.18	0.64	1.27	23.68
	(0.00)	(0.00)	(0.88)	(2.54)	(8.40)	(4.22)	(1.18)	(2.15)	(6.26)
B	0.00	0.00	0.04	0.69	9.96	49.88	4.94	6.20	28.29
	(0.00)	(0.00)	(0.26)	(0.98)	(4.18)	(8.41)	(2.53)	(6.60)	(8.31)
CCC/C	0.00	0.00	0.00	0.42	1.26	13.87	21.01	35.29	28.15
	(0.00)	(0.00)	(0.00)	(1.15)	(2.63)	(14.89)	(14.19)	(16.78)	(14.95)

Note: Figures in parentheses are weighted standard deviations. Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®. NR--Not rated.

Table 21

Three-Year Weighted-Average European Corporate Transition Matrix, 1981-2017 (%)

From/to	AAA	AA	A	BBB	BB	B	CCC/C	D	NR
AAA	64.74	23.58	2.43	0.12	0.23	0.00	0.12	0.00	8.79
	(15.08)	(12.67)	(3.40)	(0.76)	(1.22)	(0.00)	(0.83)	(0.00)	(8.84)
AA	0.78	63.36	22.93	2.55	0.36	0.00	0.03	0.06	9.94
	(1.46)	(11.83)	(9.46)	(2.43)	(0.56)	(0.00)	(0.13)	(0.17)	(4.32)
A	0.03	4.42	66.88	13.13	1.03	0.20	0.11	0.12	14.09
	(0.11)	(3.31)	(7.51)	(3.74)	(1.52)	(0.61)	(0.35)	(0.21)	(4.02)
BBB	0.00	0.31	9.87	60.74	7.03	1.28	0.29	0.38	20.09
	(0.00)	(2.57)	(2.88)	(6.15)	(3.29)	(1.02)	(0.61)	(0.82)	(4.98)
BB	0.00	0.00	0.50	12.00	41.05	11.20	0.91	2.27	32.07
	(0.00)	(0.00)	(1.03)	(3.47)	(8.97)	(3.62)	(1.25)	(2.92)	(8.47)
B	0.00	0.00	0.00	1.01	11.62	34.91	4.44	9.55	38.48
	(0.00)	(0.00)	(0.00)	(1.41)	(3.67)	(8.05)	(2.17)	(8.14)	(10.31)
CCC/C	0.00	0.00	0.00	0.48	1.44	13.88	10.05	41.63	32.54
	(0.00)	(0.00)	(0.00)	(1.24)	(2.76)	(13.84)	(10.77)	(19.56)	(17.95)

Note: Figures in parentheses are weighted standard deviations. Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®. NR--Not rated.

Table 22

Five-Year Weighted-Average European Corporate Transition Matrix, 1981-2017 (%)

From/to	AAA	AA	A	BBB	BB	B	CCC/C	D	NR
AAA	48.37	31.00	4.78	0.58	0.47	0.00	0.00	0.00	14.80
	(16.48)	(11.32)	(4.74)	(1.18)	(1.62)	(0.00)	(0.00)	(0.00)	(10.83)
AA	0.68	46.97	30.90	4.02	0.65	0.09	0.03	0.18	16.48
	(1.18)	(11.84)	(8.75)	(2.44)	(0.88)	(0.21)	(0.16)	(0.33)	(5.47)
A	0.05	5.63	52.82	16.61	1.97	0.33	0.15	0.29	22.15
	(0.16)	(3.72)	(7.88)	(4.07)	(1.69)	(0.39)	(0.50)	(0.37)	(5.32)
BBB	0.00	0.59	11.24	45.64	7.75	1.91	0.54	0.69	31.63
	(0.00)	(3.24)	(2.58)	(6.44)	(3.30)	(1.03)	(0.78)	(1.03)	(6.62)
BB	0.00	0.06	0.95	13.12	26.50	9.21	1.14	4.48	44.54
	(0.00)	(0.77)	(1.49)	(4.42)	(8.81)	(2.80)	(1.01)	(3.94)	(9.75)
B	0.00	0.00	0.00	2.56	9.96	19.00	1.71	15.94	50.82
	(0.00)	(0.00)	(0.00)	(1.69)	(5.07)	(5.42)	(1.66)	(8.41)	(9.42)
CCC/C	0.00	0.00	0.00	1.31	1.31	9.15	1.96	50.98	35.29
	(0.00)	(0.00)	(0.00)	(2.29)	(3.56)	(8.78)	(3.55)	(21.86)	(18.05)

Note: Figures in parentheses are weighted standard deviations. Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®. NR--Not rated.

Table 23

Seven-Year Weighted-Average European Corporate Transition Matrix, 1981-2017 (%)

From/to	AAA	AA	A	BBB	BB	B	CCC/C	D	NR
AAA	36.98	34.01	7.13	1.55	0.48	0.00	0.00	0.00	19.86
	(17.02)	(10.95)	(4.18)	(2.13)	(1.63)	(0.00)	(0.00)	(0.00)	(11.31)
AA	0.56	35.96	34.80	5.02	0.78	0.19	0.03	0.28	22.38
	(0.65)	(8.99)	(7.25)	(2.13)	(0.81)	(0.39)	(0.17)	(0.44)	(6.33)
A	0.03	6.23	42.09	18.60	2.67	0.36	0.07	0.52	29.44
	(0.14)	(3.46)	(7.15)	(3.95)	(1.63)	(0.38)	(0.12)	(0.53)	(6.07)
BBB	0.00	0.77	11.71	36.97	6.88	1.97	0.71	1.28	39.71
	(0.00)	(3.66)	(2.17)	(6.45)	(2.44)	(0.79)	(0.84)	(1.12)	(7.28)
BB	0.00	0.08	2.01	10.46	18.98	7.82	0.85	6.82	52.98
	(0.00)	(0.85)	(3.83)	(4.70)	(8.18)	(2.57)	(0.68)	(3.99)	(10.19)
B	0.00	0.00	0.00	3.23	7.41	12.35	0.66	19.56	56.79
	(0.00)	(0.00)	(0.00)	(1.83)	(4.45)	(4.49)	(1.18)	(8.67)	(9.21)
CCC/C	0.00	0.00	0.00	0.88	2.65	2.65	0.88	46.02	46.90
	(0.00)	(0.00)	(0.00)	(2.02)	(4.35)	(4.92)	(2.92)	(23.11)	(18.93)

Note: Figures in parentheses are weighted standard deviations. Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®. NR--Not rated.

Table 24

Ten-Year Weighted-Average European Corporate Transition Matrix, 1981-2017 (%)

From/to	AAA	AA	A	BBB	BB	B	CCC/C	D	NR
AAA	23.56	34.71	11.78	2.88	0.13	0.00	0.00	0.00	26.94
	(13.82)	(8.59)	(4.72)	(2.11)	(0.84)	(0.00)	(0.00)	(0.00)	(11.35)
AA	0.37	26.11	35.69	7.42	0.91	0.22	0.00	0.40	28.88
	(0.56)	(7.50)	(6.66)	(2.99)	(0.81)	(0.35)	(0.00)	(0.48)	(5.77)
A	0.00	6.32	30.56	19.69	3.30	0.61	0.00	0.70	38.81
	(0.00)	(3.45)	(5.98)	(5.02)	(1.83)	(0.56)	(0.00)	(0.58)	(7.29)
BBB	0.00	0.98	11.86	27.76	6.56	1.61	0.98	1.92	48.33
	(0.00)	(4.33)	(2.82)	(6.34)	(2.73)	(0.89)	(0.86)	(0.92)	(7.07)
BB	0.00	0.10	2.98	7.19	12.01	6.88	0.41	8.83	61.60
	(0.00)	(0.98)	(6.59)	(3.35)	(6.21)	(2.29)	(0.70)	(4.24)	(8.99)
B	0.00	0.00	0.00	1.29	5.95	6.34	0.52	20.57	65.33
	(0.00)	(0.00)	(0.00)	(1.23)	(3.52)	(3.21)	(0.76)	(10.25)	(8.59)
CCC/C	0.00	0.00	0.00	1.52	0.00	3.03	0.00	54.55	40.91
	(0.00)	(0.00)	(0.00)	(4.54)	(0.00)	(5.43)	(0.00)	(20.52)	(20.09)

Note: Figures in parentheses are weighted standard deviations. Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®. NR--Not rated.

Appendix IV: Profiles Of European Corporate Defaults In 2017

In 2017, there were 16 European corporate defaults affecting $12 billion of debt. Four were by issuers that we rated confidentially. This appendix summarizes the events leading up to, and, in some cases, following each corporate default for the 12 publicly rated issuers that defaulted in 2017. We also include details of the debt instruments outstanding at the time of default.

Avanti Communications Group PLC

- $685 million 10.00% callable notes due Oct. 1, 2019

- $125 million 10% first-lien notes due Oct. 1, 2019

- $685.41 million 12% third-lien notes due Oct. 1, 2023

- $617.66 million 10% first-lien notes due Oct. 1, 2019

- $150 million 10% first-lien notes due Oct. 1, 2019

On Jan. 27, 2017, S&P Global Ratings lowered its issuer credit rating on U.K.-based fixed satellite services provider Avanti Communications Group PLC to 'SD' from 'CC'. The downgrade followed the issuer's completion of a distressed exchange wherein it exchanged $708 million of its senior secured notes due 2019 for a combination of $497 million amended notes with a payment-in-kind (PIK) toggle feature and subordinated position maturing in 2022/2023, as well as $211 million of newly issued senior PIK toggle notes maturing in 2021/2022. S&P Global Ratings considers the transaction distressed because the issuer has been offered less than the original promise of the

notes.

On Oct. 20, 2017, we withdrew our 'SD' issuer credit rating on Avanti Communications Group PLC due to a lack of sufficient information.

Table 25

Avanti Communications Group PLC--Issuer Credit Rating

Date	To
20-Oct-2017	NR
27-Jan-2017	SD/NM
28-Dec-2016	CC/Negative
12-Jul-2016	CCC-/Negative
26-Feb-2016	B-/Watch Neg
27-Sep-2013	B-/Stable

NR--Not rated.

Toisa Ltd.

- $70 million term A first-lien senior secured bank loan due June 30, 2020

- $70 million term B first-lien senior secured bank loan due Nov. 30, 2020

- £60 million term first-lien senior secured bank loan due Oct. 21, 2020

Bermuda-based offshore and construction vessels operator Toisa Ltd. defaulted after the issuer filed for Chapter 11 in bankruptcy court on Jan. 29, 2017. We withdrew the ratings on the issuer on March 5, 2004, following the issuer's request, since it has no debt ratings outstanding and no plan to issue public debt in the future.

Table 26

Toisa Ltd.--Issuer Credit Rating

Date	To
March 5, 2004	NR
July 19, 2001	BB-/Stable

NR--Not rated.

Agrokor d.d.

- €300 million 9.875% bonds due May 1, 2019

- $300 million 8.875% notes due Feb. 1, 2020

- €325 million 9.125% notes due Feb. 1, 2020

On May 8, 2017, S&P Global Ratings lowered its issuer credit rating on Croatian retailer Agrokor d.d. to 'SD' from 'CC'. On May 1, 2017, the company missed a coupon payment on its €300 million

senior secured notes due 2019. Under a new Croatian law, Agrokor is restricted from making debt payments to lenders and bondholders. Therefore, we think it is highly unlikely that Agrokor will resume payments within the 30-day grace period.

On May 17, 2017, we affirmed our issuer credit ratings on Agrokor at 'SD'. We withdrew the ratings because the rating engagement was not renewed, and we chose not to continue ratings surveillance on an unsolicited basis.

On April 2, 2017, a spokesperson for Agrokor said that the company reached an agreement with its group of bank creditors to freeze debt payments. Consequently, on April 5, 2017, we lowered our long- and short-term issuer credit ratings on Agrokor to 'CC/C' from 'B-/B' and assigned a negative outlook.

Table 27

Agrokor d.d. --Issuer Credit Rating

Date	To
May 17, 2017	NR
May 8, 2017	SD/NM
April 5, 2017	CC/Negative
March 3, 2017	B-/Negative
April 30, 2013	B/Stable
April 18, 2012	B/Positive
May 31, 2011	B/Stable
April 7, 2011	B/Watch Neg
Nov. 11, 2010	B/Stable
Feb. 21, 2008	B/Negative
Nov. 12, 2007	B/Watch Neg
Oct. 13, 2006	B/Positive
Oct. 4, 2005	B/Negative
March 17, 2005	B+/Negative
March 30, 2000	B+/Stable

NR--Not rated. Selective default.

CGG

- $400 million 7.75% callable notes due May 15, 2017

- $650 million 6.50% bonds due June 1, 2021

- $325 million revolving credit facility (RCF) bank loan due July 15, 2018

- €400 million 5.875% notes due May 15, 2020

- $500 million 6.875% callable bonds due Jan. 15, 2022

- $165 million RCF bank loan due July 15, 2018

- $100 million RCF bank loan due July 1, 2018

- $100 million term loan facility bank loan due July 1, 2018

- $350 million floating-rate bank loan due 2021

- €$360 million 1.25% convertible bond due Jan. 1, 2019

- €$360.111 million 1.75% convertible bond due Jan. 1, 2020

- $342.1225 million first-lien guaranteed term loan due May 15, 2019

- $100 million first-lien guaranteed revolver bank due Dec. 16, 2019

- $150 million first-lien guaranteed term loan due Dec. 16, 2019

On May 18, 2017, S&P Global Ratings lowered its issuer credit rating on French geoscience company CGG to 'D' from 'CCC-'. The downgrade followed the interest payment on CGG's senior unsecured note (due 2020), which was due on May 15, 2017, being put on hold.

On Jan. 10, 2017, we lowered our long-term issuer credit rating on CGG to 'CCC-' from 'CCC+' with a negative outlook following the company's announcement that it intended to achieve a financial restructuring to reduce its current debt levels.

Table 28

CGG --Issuer Credit Rating

Date	To
May 18, 2017	D
Jan. 10, 2017	CCC-/Negative
Nov. 16, 2015	CCC+/Negative
Aug. 7, 2015	B-/Stable
Jan. 22, 2015	B/Negative
Aug. 8, 2014	B+/Negative
April 7, 2014	B+/Stable
Nov. 29, 2012	BB-/Stable
Sept. 25, 2012	BB-/Watch Neg
March 30, 2012	BB-/Stable
Dec. 2, 2010	BB-/Negative
May 11, 2010	BB-/Stable
June 1, 2009	BB/Negative
Dec. 13, 2007	BB/Stable
Jan. 11, 2007	BB-/Positive
Sept. 5, 2006	BB-/Watch Neg
Dec. 12, 2005	BB-/Stable
Aug. 30, 2005	BB-/Watch Neg
April 15, 2005	BB-/Stable
Nov. 23, 2004	BB/Negative
Sept. 2, 2004	BB/Watch Neg
Feb. 21, 2003	BB/Negative
Dec. 23, 2002	BB/Watch Neg

Table 28

CGG --Issuer Credit Rating (cont.)

Date	To
Dec. 6, 2002	BB/Negative
Nov. 6, 2000	BB/Stable

Frigoglass SAIC

- €250 million 8.25% notes due May 15, 2018

On May 23, 2017, S&P Global Ratings lowered its long-term issuer credit rating on Greek ice-cold merchandiser Frigoglass SAIC to 'SD' from 'CC' following a missed a coupon payment on its €250 million senior unsecured notes due 2018 on May 15, 2017. We did not expect Frigoglass to be able to make a payment in the relevant grace period of 30 days from the missed payment date. The company intended to apply to the High Court of Justice of England and Wales to sanction a scheme of arrangement to implement the restructuring.

Earlier, on March 21, 2017, we lowered our issuer credit rating on Frigoglass to 'CC' from 'CCC+' and assigned a negative outlook following the company's announcement that it would offer noteholders the option to exchange their senior notes with new first-lien notes as part of a broad capital restructuring.

Table 29

Frigoglass SAIC --Issuer Credit Rating

Date	To
May 23, 2017	SD/N.M.
March 21, 2017	CC/Negative
April 14, 2016	CCC+/Negative
Feb. 29, 2016	CCC/Watch Dev
June 4, 2014	B+/Stable
Dec. 5, 2013	BB-/Negative
May 7, 2013	BB-/Stable

N.M.--Not meaningful.

Novartex

- €500 million bonds due Oct. 20, 2019

- €780 million bank loan due Oct. 29, 2020

On June 6, 2017, S&P Global Ratings lowered its long-term issuer credit rating on Novartex S.A.S., the parent company of France-based mass-market apparel and footwear retailer Vivarte Group, to 'SD' from 'CC' following Novartex's agreement with its creditors on the terms of its distressed exchange offer, which we consider tantamount to a selective default.

On July 6, 2017, we raised our long-term issuer credit rating on Novartex S.A.S. after completion of its distressed exchange offer, converting €780 million of debt to equity. The outlook is stable, reflecting our view that the cash-preserving features of the new capital structure and strengthening earnings and working capital control will prevent default in the next 12 months. However, the ability to cover any operating setbacks will depend on Vivarte's execution of the asset sales as planned.

Table 30

Novartex --Issuer Credit Rating

Date	To
July 6, 2017	CCC/Stable
June 6, 2017	SD/N.M.
Jan. 25, 2017	CC/Negative
July 29, 2016	CCC/Negative
Jan. 20, 2015	CCC+/Stable

N.M.--Not meaningful. SD--Selective default.

Norske Skogindustrier ASA

- $200 million 7.125% bonds due Oct. 15, 2033

- €114 million 7.00% notes due Dec. 30, 2016

- €78.95 million 2% notes due Dec. 30, 2115

- €114.212 million 7% bonds due Dec. 30, 2026

On July 18, 2017, S&P Global Ratings lowered its long- and short-term issuer credit ratings on Norwegian paper producer Norske Skogindustrier ASA to 'SD' from 'CC/C'.

The downgrade followed Norske Skog's announcement that it had entered a standstill agreement with the holders of its senior secured notes in order to suspend coupon payments beyond the 30-day contractual grace period under the existing senior secured notes' indenture, which had expired on July 14.

On Nov. 29, 2017, we revised our long- and short-term issuer credit ratings on Norske Skogindustrier ASA and its core rated subsidiaries to 'D' from 'SD', since the issuer has now defaulted on all of its notes. The company has not paid the cash coupon due on its unsecured notes due in 2033 before the expiry of the contractual grace period on Nov. 15, 2017. The issuer decided not to make this payment, given its ongoing restructuring negotiations with creditors.

Table 31

Norske Skogindustrier ASA --Issuer Credit Rating

Date	To
Nov. 29, 2017	D
July 18, 2017	SD/NM
June 6, 2017	CC/Watch Neg
March 27, 2017	CCC+/Negative

Table 31

Norske Skogindustrier ASA --Issuer Credit Rating (cont.)

Date	To
July 21, 2016	CCC+/Stable
April 29, 2016	CCC-/Watch Dev
April 13, 2016	SD/NM
Nov. 17, 2015	CC/Watch Neg
Sept. 25, 2015	CCC/Negative
March 6, 2015	CCC+/Negative
Feb. 27, 2015	SD/NM
Jan. 22, 2015	CC/Watch Neg
Feb. 6, 2014	CCC+/Negative
Aug. 2, 2013	CCC/Negative
May 6, 2013	CCC+/Negative
Feb. 15, 2013	CCC+/Stable
Feb. 12, 2013	SD/N.M.
Nov. 21, 2012	CCC+/Watch Neg
March 9, 2012	B-/Stable
Nov. 10, 2011	B-/Negative
Sept. 20, 2011	B-/Watch Neg
June 16, 2011	B-/Stable
Aug. 12, 2010	B-/Negative
Feb. 17, 2010	B/Negative
May 19, 2009	B+/Negative
Sept. 23, 2008	BB-/Negative
April 21, 2008	BB-/Watch Neg
Jan. 28, 2008	BB/Negative
Oct. 22, 2007	BB+/Negative
Nov. 14, 2006	BB+/Stable
Oct. 20, 2006	BBB-/Watch Neg
March 21, 2006	BBB-/Negative
April 8, 2004	BBB-/Stable
March 18, 2004	BBB/Watch Neg
March 25, 2003	BBB/Negative
Feb. 5, 2003	BBB/Watch Neg
Oct. 12, 2001	BBB/Stable

N.M.--Not meaningful. SD--Selective default.

Pinnacle Holdco S.a.r.l.

- $135 million second-lien term bank loan due July 30,2020

- $345 million first-lien term bank loan due July 30, 2019

- $36 million revolver bank loan due July 30, 2018

On Oct. 18, 2017, S&P Global Ratings lowered its issuer credit rating on Luxembourg-based Pinnacle Holdco S.a.r.l. to 'D' from 'CCC' after the company did not make the interest and principal payments on its first-lien term loan due 2019 and its second-lien term loan due 2020 as of Sept. 29, 2017. Furthermore, we did not expect that Pinnacle would make the required interest and principal payments on its first- and second-lien term loans on Dec. 31, 2017.

On Oct. 20, 2017, we raised our issuer credit rating on Pinnacle Holdco S.a.r.l. to 'CCC' from 'D'. The upgrade followed the Oct. 16, 2017, announcement of Pinnacle's agreement to be acquired by Emerson Electric Co. for $510 million. The acquisition will expand Emerson's core O&G software platform by adding seismic imaging and modeling software capabilities for the E&P market.

On Jan. 4, 2018, we withdrew our 'CCC' issuer credit rating on Pinnacle Holdco S.a.r.l. due to the closing of its acquisition by Emerson Electric Co.

Table 32

Pinnacle Holdco S.a.r.l. --Issuer Credit Rating

Date	To
Jan. 4, 2018	NR
Oct. 20, 2017	CCC/Watch Pos
Oct. 18, 2017	D
June 27, 2017	CCC/Negative
Dec. 14, 2016	CCC+/Negative
May 6, 2016	B-/Negative
Aug. 31, 2015	B/Negative
Aug. 7, 2012	B/Stable

NR--Not rated.

Pacific Drilling S.A.

- $750 million 5.375% first-lien notes due June 1, 2020

- $750 million first-lien guaranteed senior secured bank loan due June 3, 2018

- $475 million first-lien guaranteed senior secured bank loan due June 3, 2018

- $500 million 7.25% senior secured notes due Dec. 1, 2017

On Jan. 31, 2017, S&P Global Ratings affirmed its ratings on Luxembourg-based oil and gas drilling company Pacific Drilling S.A., including the 'CCC-' issuer credit rating. We subsequently withdrew all ratings on the company.

Table 33

Pacific Drilling S.A. --Issuer Credit Rating

Date	To
Jan. 31, 2017	NR
Nov. 9, 2016	CCC-/Negative
June 14, 2016	CCC+/Negative
Nov. 13, 2015	B-/Negative
July 10, 2015	B/Negative
Nov. 12, 2012	B/Stable

NR--Not rated.

Sterling Mid-Holdings Ltd.

- $745 million 12.00% PIK toggle notes due June 16, 2020

- $55 million 10.50% notes due June 15, 2020

On Nov. 27, 2017, S&P Global Ratings lowered its issuer credit rating on Jersey-based finance company Sterling Mid-Holdings Ltd. to 'SD' from 'CC'. The downgrade followed the announcement of the expiration of the issuer's revised cash tender offer for any and all of DFC Finance Corp's (subsidiary of Sterling Mid-Holdings Ltd.) 10.5%/12.0% senior secured PIK toggle notes due 2020 and 10.5% senior secured notes due 2020 at 70% of par.

On Dec. 1, 2017, we raised our long-term issuer credit rating on Sterling Mid-Holdings Ltd. to 'CCC' from 'SD'. The rating reflected Sterling's ongoing weak operating performance, its unsustainable financial leverage, its exposure to adverse regulatory reforms, and its reliance on Lone Star Funds--a private equity firm--through equity injections and debt buybacks.

Table 34

Sterling Mid-Holdings Ltd.--Issuer Credit Rating

Date	To
Dec. 1, 2017	CCC/Negative
Nov. 27, 2017	SD/N.M.
Oct. 31, 2017	CC/Negative
Aug. 23, 2016	CCC+/Negative
Aug. 18, 2016	SD/N.M.
June 29, 2016	CC/Watch Neg
May 27, 2016	CCC/Negative
Nov. 18, 2015	B-/Negative
Dec. 11, 2014	B-/Stable
June 6, 2014	B/Negative

N.M.--Not meaningful. SD--Selective default.

Bibby Offshore Holdings Ltd.

-   €175 million 7.50% notes due July 15, 2021

-   €20 million variable-rate super senior RCF bank loan due July 19, 2019

On Dec. 6, 2017, S&P Global Ratings lowered its long-term issuer credit rating on U.K.-based subsea service provider Bibby Offshore Holdings Ltd. to 'SD' from 'CC'. We lowered the ratings following Bibby Offshore's announcement that it had reached an agreement with 80% of noteholders relating to its recapitalization, which we view as a distressed exchange. The company is now seeking the approval of the remaining 20%.

We subsequently withdrew all the ratings at Bibby Offshore's request.

Table 35

Bibby Offshore Holdings Ltd. --Issuer Credit Rating

Date	To
Dec. 6, 2017	NR
Dec. 6, 2017	SD/NM
Aug. 30, 2017	CC/Negative
June 26, 2017	CCC-/Negative
Dec. 14, 2016	CCC+/Negative
June 28, 2016	B/Negative
April 7, 2016	B+/Watch Neg
July 4, 2014	B+/Stable

NR--Not rated.

Elli Investments Ltd.

-   €350 million 8.75% notes due June 15, 2019

-   €175 million 12.25% notes due June 15, 2020

On Dec. 18, 2017, S&P Global Ratings lowered its long-term issuer credit rating on U.K.-based health and social care provider Elli Investments Ltd. to 'SD' from 'CC'. The downgrade followed Elli's missed payment of coupons due on Dec. 15 on two outstanding senior note issues.

Table 36

Elli Investments Ltd. --Issuer Credit Rating

Date	To
Dec. 18, 2017	SD/N.M.
Oct. 25, 2017	CC/Negative
Nov. 2, 2015	CCC-/Negative
April 2, 2015	CCC+/Stable

Table 36

Elli Investments Ltd. --Issuer Credit Rating (cont.)

Date	To
Aug. 3, 2012	B-/Stable

N.M.--Not meaningful. SD--Selective default.

Related Research

- 2017 Annual Global Corporate Default Study And Rating Transitions, April 5, 2018

This report does not constitute a rating action.