Chapter 8
Consistency and Performance of Sovereign Ratings Since the 1980s

This chapter compares the consistency and accuracy of sovereign ratings issued by Fitch, Moody's, and S&P from January 1987 to January 2011. Sovereign rating policies have refined considerably – and information availability has been much enhanced – since 1918, so this chapter is more exhaustive than Chap. 7. Section 8.1 reviews the literature. Section 8.2 studies rating outlooks and reviews, which did not exist in the interwar years, and shows that the three CRAs are more prone to upgrade sovereigns with a positive outlook or a positive watch than to downgrade issuers with a negative outlook or a negative watch. Focusing on the stability of sovereign ratings, Sect. 8.3 finds that rating changes by Moody's are the least frequent, but have the greatest magnitude. Section 8.4 compares the accuracy of Fitch, Moody's, and S&P sovereign ratings. It turns out that S&P ratings are slightly more accurate in the short term, whereas Moody's ratings perform better in the medium term. Section 8.5 concludes.

8.1 Review of the Literature

This chapter refers to three strands of the literature.

The first group of papers consists of those that specifically analyze rating migration rates. Focusing on corporate ratings, Nickell et al. (2000) and Moody's (2003b) emphasize the stability and cyclicality of migration rates. Hu et al. (2002), noting that the lack of historical data for sovereigns precludes the computation of migration rates, use an ordered probit model to estimate these transition matrices. Moody's (2003a) computes the first sovereign migration rates for the period 1985–2002 and concludes that sovereign ratings are more stable than corporate ratings. Moody's also finds that upgrades and downgrades by more than one notch are more numerous in the corporate area. Similar studies conducted by Fitch and S&P yield comparable results. More interestingly, Altman and Rijken (2004) analyze the main factors underlying the stability of credit ratings and find that rating agencies have a "through

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the cycle" methodology. Confirming Altman and Rijken's work, Moody's (2006) explains that its current rating system embodies a trade-off between accuracy and stability.

The second category of papers deals with the different ways to estimate rating performances. Moody's (1995) studies its own corporate ratings for 1970–1994, computing marginal and cumulative default rates. Unsurprisingly, the agency demonstrates the accuracy of its investment-grade ratings. Moody's (1997) broadens the historical scope of its study by examining the years 1920–1996; since then, the agency has updated its reports annually. KMV (1998) warns against the excessive use of default rates to assess rating quality. They argue that since there is so little homogeneity of default rates within a rating category the outliers (which artificially increase average default rates) must be dropped. Moody's (2000) refines its assessment of the quality of corporate ratings by using cumulative accuracy profiles (CAPs) and accuracy ratios (ARs), which are designed to estimate the agency's ability to assign low ratings to issuers that will default and high ratings to those that will not.[1] These various measures of rating accuracy, extended to Moody's sovereign ratings in 2003 (Moody's 2003a), have been adopted by S&P, but not by Fitch; see S&P (2011) and Fitch (2011) for the latest reports.

The third kind of study emphasizes the importance of rating outlooks and reviews. Moody's (2004) documents corporate rating transition rates during the 1995–2003 period conditional on rating Watchlist, outlook, and rating history. Rating outlooks and reviews turn out to be powerful indicators of the likely direction and timing of future rating actions. Fitch (2005) and S&P (2010a) provide comparable studies for sovereign rating outlooks and reviews, finding that they have a significant impact on their respective rating changes.

8.2 Sovereign Rating Reviews and Outlooks

Rating reviews[2] are opinions regarding the likely direction of a rating over the short term (see Fitch 2009; Moody's 2010b; S&P 2010b). Rating outlooks assess the potential direction of a rating over the short-medium term. S&P (2010b) indicates that its rating outlooks typically extend from 6 months to 2 years. For Fitch rating outlooks, the time horizon is 1–2 years (Fitch 2009). Moody's is less precise: its rating outlooks are expected to apply over "the medium term" (Moody's 2010b).

Rating reviews and rating outlooks are two types of indicators that are intended to complement ratings and to help investors anticipate the likely change in issuer credit quality. These indicators are mutually exclusive; that is, an issuer cannot be assigned an outlook and be placed on CreditWatch at the same time.

[1] Rating a defaulter too high is a Type I error; rating a nondefaulter too low is a Type II error.

[2] The terms "rating review," "CreditWatch," "Rating Watch," and "Watchlist" are used interchangeably hereafter.

Sections 8.2.1 and 8.2.2 investigate the frequency and duration of rating reviews and of rating outlooks and assess the likelihood that these indicators ultimately result in an upgrade or downgrade. Section 8.2.3 computes the probability that downgrades and upgrades are preceded by rating reviews or outlook assignments.

8.2.1 Sovereign Rating Reviews

A rating can be placed on review for possible upgrade (a.k.a. on positive watch), on review for possible downgrade (negative watch), or more rarely on review with direction uncertain.[3] The rating is removed from the Watchlist once it is upgraded, downgraded, or confirmed.

S&P, Moody's, and Fitch started placing sovereign ratings on Watchlist on 7 March 1991, 6 May 1992, and 13 November 1995, respectively. The three periods under study are 7 March 1991 to 1 January 2011, 6 May 1992 to 1 January 2011, and 19 May 2000 to 1 January 2011 for S&P, Moody's, and Fitch, respectively.[4] Tables 8.1–8.3 display summary statistics on the Fitch, Moody's, and S&P rating reviews.

First, the number of rating reviews varies across agencies: 171 ratings are placed on Watchlist by Moody's vs. 43 for Fitch and 78 for S&P. On average, a Moody's rating is put on Watchlist every 9.5 years. The frequency of S&P and Fitch rating reviews is much lower: 21 and 22.7 years, respectively.[5]

Second, in the sample periods, there is only one CreditWatch with direction uncertain, which was issued by S&P; all other rating watches are either positive watches or negative watches. The number of negative Watchlists exceeds the number of positive Watchlists in the case of Fitch and S&P. In contrast, Moody's reviews for possible upgrade are more numerous than its reviews for possible downgrade. S&P did not place any sovereign rating on CreditWatch with positive implications until July 2010, which confirms that S&P considers the Watchlist an indicator of likely downgrades. In this regard, S&P's policy differs from that of Fitch and Moody's.

A third observation is that the great majority of ratings under positive watch are eventually upgraded: from 95.1% for Moody's to 100% for Fitch. In contrast, the percentage of ratings under negative watch that are downgraded is significantly lower: 67.7, 69.7, and 72.5% for Fitch, S&P, and Moody's, respectively. Hence, one might conclude that CRAs are more reluctant to downgrade than to upgrade, or that governments under negative watch manage to reassure rating analysts about the creditworthiness of their country.

Fourth, examining the duration of CreditWatches shows that reviews for possible upgrade are resolved in a shorter period of time than are reviews for possible

[3] This is Moody's term. Fitch and S&P use the terms "evolving" and "developing" (respectively) in such cases.

[4] Fitch Rating Watches are examined only from 19 May 2000, after Fitch IBCA merged with Duff and Phelps.

[5] Author's computations.

Table 8.1 Fitch rating reviews, 19 May 2000 to 1 January 2011

Rating review direction	Rating review termination	Number	Average duration (days)	Minimum duration (days)	Maximum duration (days)	Standard deviation (days)	% of all respective reviews	% of all rating reviews
Review for possible upgrade	Upgrade	12	52	13	111	28	100.00	27.91
	Downgrade	0	NA	NA	NA	NA	0.00	0.00
	Rating confirmed	0	NA	NA	NA	NA	0.00	0.00
All reviews for possible upgrade		*12*	*52*	*13*	*111*	*28*	*100.00*	*27.91*
Review for possible downgrade	Upgrade	1	263	263	263	NA	3.23	2.33
	Downgrade	21	94	2	448	103	67.74	48.84
	Rating confirmed	9	145	33	442	136	29.03	20.93
All reviews for possible downgrade		*31*	*114*	*2*	*448*	*116*	*100.00*	*72.09*
Evolving rating watch	Upgrade	0	NA	NA	NA	NA	NA	0.00
	Downgrade	0	NA	NA	NA	NA	NA	0.00
	Rating confirmed	0	NA	NA	NA	NA	NA	0.00
All evolving rating watches		*0*	*NA*	*NA*	*NA*	*NA*	*NA*	*0.00*
All rating reviews		***43***	***97***	***2***	***448***	***103***	***100.00***	***100.00***

Sources: Author's computations based on http://www.fitchratings.com
Notes: Percentages may not total 100% due to rounding. NA not applicable

Table 8.2 Moody's rating reviews, 6 May 1992 to 1 January 2011

Rating review direction	Rating review termination	Number	Average duration (days)	Minimum duration (days)	Maximum duration (days)	Standard deviation (days)	% of all respective reviews	% of all rating reviews
Review for possible upgrade	Upgrade	97	73	11	221	42	95.10	56.73
	Downgrade	0	NA	NA	NA	NA	0.00	0.00
	Rating confirmed	5	123	82	150	26	4.90	2.92
All reviews for possible upgrade		*102*	*76*	*11*	*221*	*43*	*100.00*	*59.65*
Review for possible downgrade	Upgrade	0	NA	NA	NA	NA	0.00	0.00
	Downgrade	50	87	8	570	89	72.46	29.24
	Rating confirmed	19	93	22	160	37	27.54	11.11
All reviews for possible downgrade		*69*	*88*	*8*	*570*	*78*	*100.00*	*40.35*
Review with direction uncertain	Upgrade	0	NA	NA	NA	NA	NA	0.00
	Downgrade	0	NA	NA	NA	NA	NA	0.00
	Rating confirmed	0	NA	NA	NA	NA	NA	0.00
All reviews with direction uncertain		*0*	*NA*	*NA*	*NA*	*NA*	*NA*	*0.00*
All rating reviews		***171***	***81***	***8***	***570***	***60***	***100.00***	***100.00***

Sources: Author's computations based on http://www.moodys.com
Notes: Percentages may not total 100% due to rounding. NA denotes not applicable

Table 8.3 S&P rating reviews, 7 March 1991 to 1 January 2011

Rating review direction	Rating review termination	Number	Average duration (days)	Minimum duration (days)	Maximum duration (days)	Standard deviation (days)	% of all respective reviews	% of all rating reviews
Review for possible upgrade	Upgrade	1	7	7	7	NA	100.00	1.28
	Downgrade	0	NA	NA	NA	NA	0.00	0.00
	Rating confirmed	0	NA	NA	NA	NA	0.00	0.00
All reviews for possible upgrade		*1*	*7*	*7*	*7*	*NA*	*100.00*	*1.28*
Review for possible downgrade	Upgrade	0	NA	NA	NA	NA	0.00	0.00
	Downgrade	53	47	2	218	45	69.74	67.95
	Rating confirmed	23	97	7	345	93	30.26	29.49
All reviews for possible downgrade		*76*	*62*	*2*	*345*	*67*	*100.00*	*97.44*
Developing Creditwatch	Upgrade	1	33	33	33	NA	100.00	1.28
	Downgrade	0	NA	NA	NA	NA	0.00	0.00
	Rating confirmed	0	NA	NA	NA	NA	0.00	0.00
All developing Creditwatches		*1*	*33*	*33*	*33*	*NA*	*100.00*	*1.28*
All rating reviews		***78***	***61***	***2***	***345***	***66***	***100.00***	***100.00***

Sources: Author's computations based on http://www.standardandpoors.com
Notes: Percentages may not total 100% due to rounding. NA denotes not applicable

downgrade. Moreover, ratings under positive (negative) watch that are eventually upgraded (downgraded) are resolved in a shorter period of time than those that result in a rating confirmation. So the longer the Rating Watch, the higher the probability that the agency confirms the rating.

Finally, S&P's Rating Watches are resolved within shorter periods (61 days on average) than are those of Moody's and Fitch (81 and 97 days, respectively). This is consistent with the duration of S&P's Watchlists, which never exceeds 1 year – contrary to what is observed for Fitch and Moody's.

CreditWatches provide investors with relevant informational content. A high percentage of sovereign ratings placed on review for possible upgrade (downgrade) are eventually upgraded (downgraded) within 3 months on average, which is in line with the rating policies of all three CRAs.

8.2.2 Sovereign Rating Outlooks

There are four categories of rating outlooks. A "positive outlook" means that a rating may be raised, and a "negative outlook" means that a rating may be lowered. A "stable outlook" means that a rating is not likely to change, whereas a "developing outlook" (termed "evolving" by Fitch) means that a rating contingent may be raised or lowered upon some event.

S&P, Moody's, and Fitch began issuing sovereign rating outlooks on 26 June 1989, 7 March 1997, and 21 September 2000, respectively. The three periods under study are 26 June 1989 to 1 January 2011, 7 March 1997 to 1 January 2011, and 21 September 2000 to 1 January 2011 for S&P, Moody's, and Fitch, respectively. Tables 8.4–8.6 give summary statistics on the Fitch, Moody's, and S&P outlooks.

Observe first that the number of outlooks varies across CRAs: 874 outlooks are assigned by S&P vs. 509 for Moody's and 439 for Fitch. On average, S&P assigns a new outlook every 1.8 years. The frequency of Fitch and Moody's outlooks is lower: respectively 2.2 and 2.75 years.[6]

Second, the samples include only four developing outlooks (two assigned by Moody's and two assigned by S&P). All other outlooks are positive, stable, or negative. Stable outlooks account for 50% of all outlooks assigned. The number of positive outlooks exceeds the number of negative outlooks in the case of Fitch and Moody's, yet S&P negative outlooks are more numerous than its positive outlooks. However, the distribution of positive and negative outlooks is fairly well balanced in each agency: the largest gap is observed for Moody's, whose positive outlooks outnumber negative outlooks by roughly 20%.

Third, more than 70% of Fitch and S&P positive outlooks is eventually upgraded vs. less than 35% for Moody's. It is interesting that when all positive actions are considered (i.e., when upgrades and positive watches are combined), the Moody's percentage soars to 76% – exceeding slightly Fitch's and S&P's percentages. Other positive outlooks

[6] Author's computations.

Table 8.4 Fitch rating outlooks, 21 September 2000 to 1 January 2011

Outlook direction	Outlook termination	Number	Average duration (days)	Minimum duration (days)	Maximum duration (days)	Standard deviation (days)	% of all respective outlooks	% of all outlooks
Positive outlook	Upgrade	73	374	50	1,347	276	71.57	16.63
	Downgrade	1	509	509	509	NA	0.98	0.23
	Positive watch	2	246	203	289	61	1.96	0.46
	Negative watch	0	NA	NA	NA	NA	0.00	0.00
	Positive outlook	NA	NA	NA	NA	NA	NA	NA
	Negative outlook	0	NA	NA	NA	NA	0.00	0.00
	Stable outlook	26	413	8	785	206	25.49	5.92
	Evol. outlook	0	NA	NA	NA	NA	0.00	0.00
	Rating withdrawn	0	NA	NA	NA	NA	0.00	0.00
All positive outlooks		*102*	*383*	*8*	*1,347*	*256*	*100.00*	*23.23*
Negative outlook	Upgrade	1	164	164	164	NA	1.01	0.23
	Downgrade	58	203	13	875	167	58.59	13.21
	Positive watch	0	NA	NA	NA	NA	0.00	0.00
	Negative watch	5	194	42	330	119	5.05	1.14
	Positive outlook	1	134	134	134	NA	1.01	0.23
	Negative outlook	NA	NA	NA	NA	NA	NA	NA
	Stable outlook	34	482	125	1,260	297	34.34	7.74
	Evol. outlook	0	NA	NA	NA	NA	0.00	0.00
	Rating withdrawn	0	NA	NA	NA	NA	0.00	0.00
All negative outlooks		*99*	*297*	*13*	*1,260*	*254*	*100.00*	*22.55*

Stable outlook	Upgrade	58	653	56	2,278	460	24.37	13.21
	Downgrade	13	819	231	3,045	883	5.46	2.96
	Positive watch	8	487	53	1,180	386	3.36	1.82
	Negative watch	12	517	48	3,088	832	5.04	2.73
	Positive outlook	84	624	33	1,950	464	35.29	19.13
	Negative outlook	58	568	33	2,158	466	24.37	13.21
	Stable outlook	NA	NA	NA	NA	NA	NA	NA
	Evol. outlook	0	NA	NA	NA	NA	0.00	0.00
	Rating withdrawn	5	940	458	2,045	641	2.10	1.14
All stable outlooks		*238*	*625*	*33*	*3,088*	*517*	*100.00*	*54.21*
Evolving outlook	Upgrade	0	NA	NA	NA	NA	0.00	0.00
	Downgrade	0	NA	NA	NA	NA	0.00	0.00
	Positive watch	0	NA	NA	NA	NA	0.00	0.00
	Negative watch	0	NA	NA	NA	NA	0.00	0.00
	Positive outlook	0	NA	NA	NA	NA	0.00	0.00
	Negative outlook	0	NA	NA	NA	NA	0.00	0.00
	Stable outlook	0	NA	NA	NA	NA	0.00	0.00
	Evol. outlook	NA	NA	NA	NA	NA	NA	NA
	Rating withdrawn	0	NA	NA	NA	NA	0.00	0.00
All evolving outlooks		*0*	*NA*	*NA*	*NA*	*NA*	*NA*	*0.00*
All outlooks		***439***	***495***	***8***	***3,088***	***442***	***100.00***	***100.00***

Sources: Author's computations based on http://www.fitchratings.com
Notes: Percentages may not total 100% due to rounding. NA denotes not applicable

Table 8.5 Moody's rating outlooks, 7 March 1997 to 1 January 2011

Outlook direction	Outlook termination	Number	Average duration (days)	Minimum duration (days)	Maximum duration (days)	Standard deviation (days)	% of all respective outlooks	% of all outlooks
Positive outlook	Upgrade	42	349	29	1,471	324	34.71	8.25
	Downgrade	0	NA	NA	NA	NA	0.00	0.00
	Positive watch	50	339	69	928	202	41.32	9.82
	Negative watch	0	NA	NA	NA	NA	0.00	0.00
	Positive outlook	NA	NA	NA	NA	NA	NA	NA
	Negative outlook	3	562	117	1,120	511	2.48	0.59
	Stable outlook	25	530	62	1,068	323	20.66	4.91
	Dev. outlook	1	84	84	84	NA	0.83	0.20
	Rating withdrawn	0	NA	NA	NA	NA	0.00	0.00
All positive outlooks		*121*	*385*	*29*	*1,471*	*292*	*100.00*	*23.77*
Negative outlook	Upgrade	1	415	415	415	NA	0.98	0.20
	Downgrade	35	181	8	1,333	246	34.31	6.88
	Positive watch	0	NA	NA	NA	NA	0.00	0.00
	Negative watch	27	182	15	805	182	26.47	5.30
	Positive outlook	1	580	580	580	NA	0.98	0.20
	Negative outlook	NA	NA	NA	NA	NA	NA	NA
	Stable outlook	38	486	17	1,609	340	37.25	7.47
	Dev. outlook	0	NA	NA	NA	NA	0.00	0.00
	Rating withdrawn	0	NA	NA	NA	NA	0.00	0.00
All negative outlooks		*102*	*301*	*8*	*1,609*	*306*	*100.00*	*20.04*

Stable outlook	Upgrade	52	1,002	16	3,031	739	18.31	10.22
	Downgrade	25	647	18	3,213	807	8.80	4.91
	Positive watch	37	783	127	4,769	808	13.03	7.27
	Negative watch	22	872	76	4,396	1,133	7.75	4.32
	Positive outlook	94	746	66	3,308	638	33.10	18.47
	Negative outlook	53	781	16	4,196	892	18.66	10.41
	Stable outlook	NA	NA	NA	NA	NA	NA	NA
	Dev. outlook	0	NA	NA	NA	NA	0.00	0.00
	Rating withdrawn	1	2,340	2,340	2,340	NA	0.35	0.20
All stable outlooks		*284*	*811*	*16*	*4,769*	*795*	*100.00*	*55.80*
Developing outlook	Upgrade	1	282	282	282	NA	50.00	0.20
	Downgrade	0	NA	NA	NA	NA	0.00	0.00
	Positive watch	0	NA	NA	NA	NA	0.00	0.00
	Negative watch	0	NA	NA	NA	NA	0.00	0.00
	Positive outlook	0	NA	NA	NA	NA	0.00	0.00
	Negative outlook	0	NA	NA	NA	NA	0.00	0.00
	Stable outlook	1	78	78	78	NA	50.00	0.20
	Dev. outlook	NA	NA	NA	NA	NA	NA	NA
	Rating withdrawn	0	NA	NA	NA	NA	0.00	0.00
All developing outlooks		*2*	*180*	*78*	*282*	*144*	*100.00*	*0.39*
All outlooks		***509***	***605***	***8***	***4,769***	***667***	***100.00***	***100.00***

Sources: Author's computations based on http://www.moodys.com
Note: Percentages may not total 100% due to rounding. NA denotes not applicable

Table 8.6 S&P rating outlooks, 26 June 1989 to 1 January 2011

Outlook direction	Outlook termination	Number	Average duration (days)	Minimum duration (days)	Maximum duration (days)	Standard deviation (days)	% of all respective outlooks	% of all outlooks
Positive outlook	Upgrade	146	406	21	1,395	258	70.53	16.70
	Downgrade	0	NA	NA	NA	NA	0.00	0.00
	Positive watch	0	NA	NA	NA	NA	0.00	0.00
	Negative watch	1	400	400	400	NA	0.48	0.11
	Positive outlook	NA	NA	NA	NA	NA	NA	NA
	Negative outlook	1	1,809	1,809	1,809	NA	0.48	0.11
	Stable outlook	59	425	86	2,416	367	28.50	6.75
	Dev. outlook	0	NA	NA	NA	NA	0.00	0.00
	Rating withdrawn	0	NA	NA	NA	NA	0.00	0.00
All positive outlooks		*207*	*418*	*21*	*2,416*	*307*	*100.00*	*23.68*
Negative outlook	Upgrade	1	305	305	305	NA	0.43	0.11
	Downgrade	125	166	4	1,251	209	53.65	14.30
	Positive watch	0	NA	NA	NA	NA	0.00	0.00
	Negative watch	19	248	32	853	208	8.15	2.17
	Positive outlook	5	432	153	836	287	2.15	0.57
	Negative outlook	NA	NA	NA	NA	NA	NA	NA
	Stable outlook	82	426	22	1,410	294	35.19	9.38
	Dev. outlook	0	NA	NA	NA	NA	0.00	0.00
	Rating withdrawn	1	54	54	54	NA	0.43	0.11
All negative outlooks		*233*	*292*	*4*	*1,410*	*264*	*100.00*	*26.66*

Stable outlook	Upgrade	93	628	80	2,454	486	21.53	10.64
	Downgrade	26	659	61	4,259	846	6.02	2.97
	Positive watch	1	66	66	66	NA	0.23	0.11
	Negative watch	38	480	64	1,514	410	8.80	4.35
	Positive outlook	143	709	51	4,207	616	33.10	16.36
	Negative outlook	130	798	13	7,269	1,022	30.09	14.87
	Stable outlook	NA	NA	NA	NA	NA	NA	NA
	Dev. outlook	0	NA	NA	NA	NA	0.00	0.00
	Rating withdrawn	1	1,520	1,520	1,520	NA	0.23	0.11
All stable outlooks		*432*	*696*	*13*	*7,269*	*745*	*100.00*	*49.43*
Developing outlook	Upgrade	2	142	35	248	NA	100.00	0.23
	Downgrade	0	NA	NA	NA	NA	0.00	0.00
	Positive watch	0	NA	NA	NA	NA	0.00	0.00
	Negative watch	0	NA	NA	NA	NA	0.00	0.00
	Positive outlook	0	NA	NA	NA	NA	0.00	0.00
	Negative outlook	0	NA	NA	NA	NA	0.00	0.00
	Stable outlook	0	NA	NA	NA	NA	0.00	0.00
	Dev. outlook	NA	NA	NA	NA	NA	NA	NA
	Rating withdrawn	0	NA	NA	NA	NA	0.00	0.00
All developing outlooks		*2*	*142*	*35*	*248*	*NA*	*100.00*	*0.23*
All outlooks		***874***	***521***	***4***	***7,269***	***589***	***100.00***	***100.00***

Sources: Author's computations based on http://www.standardandpoors.com
Notes: Percentages may not total 100% due to rounding. NA denotes not applicable

are generally changed to stable. Less than 0.5% of positive outlooks leads to a negative action (i.e., to a downgrade, a negative watch, or a negative outlook).

Fourth, the percentage of negative outlooks that are eventually downgraded (or lead to a negative action) is significantly lower: 34.3% (60.8%), 53.6% (61.8%), and 58.6% (63.6%) for Moody's, S&P, and Fitch, respectively. Other negative outlooks are generally changed to stable. The proportion of negative outlooks that result in a positive action is slightly above 2%. As before, one may well presume that CRAs are more reluctant to downgrade than to upgrade.

Fifth, stable outlooks that finish with a positive action outnumber those that finish with a negative action: 63 vs. 34.9% for Fitch, 64.4 vs. 35.2% for Moody's, and 54.9 vs. 44.9% for S&P. These findings could mean that there is an upward bias in the rating policies of Fitch and Moody's and, to a lesser extent, S&P.

Sixth, examining the duration of outlooks shows that negative outlooks are resolved in shorter periods of time than positive outlooks: 297 vs. 383 days for Fitch, 301 vs. 385 days for Moody's, and 292 vs. 418 days for S&P. Naturally enough, outlooks that move in the expected direction (i.e., positive outlooks that result in a positive action and negative outlooks that result in a negative action) are resolved more quickly than are outlooks that move in the unexpected direction. These gaps are even larger for (a) negative outlooks assigned by the three CRAs and (b) all of the Moody's outlooks.

Seventh, resolving stable outlooks takes much more time than resolving positive and negative outlooks: 625, 696, and 811 days for Fitch, S&P, and Moody's, respectively. These longer periods are not surprising given that negative and positive outlooks are intended to be temporary signals.

Positive and negative outlooks are, on average, resolved within 10–14 months; this is consistent with the agencies' rating policy. The proportion of positive (negative) outlooks that are eventually upgraded (downgraded) is much higher for Fitch and S&P than for Moody's, which is more prone to place on review for possible upgrade (downgrade) a rating that is assigned a positive (negative) outlook. These findings highlight the importance of Watchlist signals in Moody's rating policy.

8.2.3 Outlook/Watchlist Status Prior to Rating Change Announcements

This section answers the following question: What is the current status of sovereign ratings when they are upgraded or downgraded?

The three periods under study are 7 March 1991 to 1 January 2011, 7 March 1997 to 1 January 2011, and 21 September 2000 to 1 January 2011 for S&P, Moody's, and Fitch, respectively.[7] Tables 8.7–8.9 provide information about the current status of Fitch, Moody's, and S&P ratings at the time of their upgrade or downgrade.

[7] The starting date of each period corresponds to the first day on which the respective agencies assigned both rating watches and outlooks to sovereign issuers.

Table 8.7 Current rating status at the time of Fitch rating changes, 21 September 2000 to 1 January 2011

Rating change	Current status at time of the rating change	Investment-grade ratings (%)	Speculative-grade ratings (%)	All ratings (%)
Downgrade	Positive watch	0.00	0.00	0.00
	Negative watch	13.16	29.09	22.58
	Evolving watch	0.00	0.00	0.00
	Positive outlook	0.00	1.82	1.08
	Negative outlook	78.95	50.91	62.37
	Stable outlook	7.89	18.18	13.98
	Evolving outlook	0.00	0.00	0.00
	Total	*100.00*	*100.00*	*100.00*
Upgrade	Positive watch	10.00	5.41	7.64
	Negative watch	0.00	1.35	0.69
	Evolving watch	0.00	0.00	0.00
	Positive outlook	50.00	51.35	50.69
	Negative outlook	0.00	1.35	0.69
	Stable outlook	40.00	40.54	40.28
	Evolving outlook	0.00	0.00	0.00
	Total	*100.00*	*100.00*	*100.00*

Sources: Author's computations based on http://www.fitchratings.com
Note: Percentages may not total 100% due to rounding

Table 8.8 Current rating status at the time of Moody's rating changes, 7 March 1997 to 1 January 2011

Rating change	Current status at time of the rating change	Investment-grade ratings (%)	Speculative-grade ratings (%)	All ratings (%)
Downgrade	Positive watch	0.00	0.00	0.00
	Negative watch	51.43	29.51	37.50
	Uncertain watch	0.00	0.00	0.00
	Positive outlook	0.00	0.00	0.00
	Negative outlook	34.29	37.70	36.46
	Stable outlook	14.29	32.79	26.04
	Developing outlook	0.00	0.00	0.00
	Total	*100.00*	*100.00*	*100.00*
Upgrade	Positive watch	49.47	38.46	44.51
	Negative watch	0.00	0.00	0.00
	Uncertain watch	0.00	0.00	0.00
	Positive outlook	23.16	25.64	24.28
	Negative outlook	0.00	1.28	0.58
	Stable outlook	27.37	33.33	30.06
	Developing outlook	0.00	1.28	0.58
	Total	*100.00*	*100.00*	*100.00*

Sources: Author's computations based on http://www.moodys.com
Note: Percentages may not total 100% due to rounding

Table 8.9 Current rating status at the time of S&P rating changes, 7 March 1991 to 1 January 2011

Rating change	Current status at time of the rating change	Investment-grade ratings (%)	Speculative-grade ratings (%)	All ratings (%)
Downgrade	Positive watch	0.00	0.00	0.00
	Negative watch	24.05	28.10	26.50
	Developing watch	0.00	0.00	0.00
	Positive outlook	0.00	0.00	0.00
	Negative outlook	64.56	57.85	60.50
	Stable outlook	11.39	14.05	13.00
	Developing outlook	0.00	0.00	0.00
	Total	*100.00*	*100.00*	*100.00*
Upgrade	Positive watch	0.00	0.83	0.41
	Negative watch	0.00	0.00	0.00
	Developing watch	0.00	0.83	0.41
	Positive outlook	64.75	54.55	59.67
	Negative outlook	0.00	0.83	0.41
	Stable outlook	35.25	41.32	38.27
	Developing outlook	0.00	1.65	0.82
	Total	*100.00*	*100.00*	*100.00*

Sources: Author's computations based on http://www.standardandpoors.com
Note: Percentages may not total 100% due to rounding

First, the percentage of downgrades that are preceded by a negative watch or a negative outlook outnumbers that of upgrades that are preceded by a positive watch or a positive outlook: 84.9 vs. 58.3% for Fitch, 74 vs. 68.8% for Moody's, and 87 vs. 60.1% for S&P. This gap is the reason for the higher proportion of upgrades that are preceded by a stable outlook. These findings indicate that rating agencies are more reluctant to downgrade than to upgrade a country that has a stable outlook.

A second observation is that these results are even more striking when speculative-grade ratings are considered: 33.3, 40.5, and 41.3% of the speculative-grade ratings upgraded by Moody's, Fitch, and S&P (respectively) are preceded by a stable outlook. These percentages support the view that speculative-grade rating outlooks convey less relevant information than do investment-grade rating outlooks. This assumption is confirmed by the exclusive occurrence of speculative-grade ratings among those rating watches and outlooks that lead to an unexpected rating change (i.e., positive watches and positive outlooks that result in a downgrade and negative watches and negative outlooks that result in an upgrade).

Third, the most frequent status at the time of Moody's upgrades (downgrades) is being on the positive (negative) Watchlist. This contrasts with Fitch and S&P, where the most common rating status at time of upgrades (downgrades) is the positive (negative) outlook. As a result, Moody's outlooks provide less information about likely rating changes than do Fitch and S&P outlooks.

In conclusion, Watchlist signals are the most reliable indicators of rating changes; the positive and negative outlooks assigned by Fitch and S&P also have predictive power concerning likely rating changes. Next, there is an upward bias to the rating policies of all three CRAs, as indicated by the greater probability of positive outlooks and positive watches resulting in an upgrade than the probability of negative outlooks and negative watches resulting in a downgrade. Finally, it is worth considering a suggestion to improve the consistency of rating actions: all upgrades (downgrades) could be preceded by a positive (negative) outlook or a positive (negative) watch.[8] This procedure would reduce to zero the probability that a rating with a stable outlook is upgraded or downgraded, thereby enhancing the predictive power of outlooks and Watchlist signals.

8.3 Stability of Sovereign Ratings

Rating changes are decisive actions that reflect the strengthening or the worsening of the sovereign issuer's financial position. This section investigates the stability of sovereign ratings issued by the three main CRAs. Section 8.3.1 studies the frequency and magnitude of rating changes. Section 8.3.2 provides an exhaustive analysis of migration rates. Section 8.3.3 presents an original comparison of Fitch, Moody's, and S&P rating reversals.

8.3.1 Frequency and Magnitude of Rating Changes

Table 8.10 displays the distribution of Fitch, Moody's, and S&P upgrades and downgrades.

The S&P rating changes outnumber those of Fitch and Moody's: 471 vs. 242 and 347, respectively. On average, an S&P rating is modified every 3.7 vs. 3.8 years for a Fitch rating and 5.2 years for a Moody's rating.[9] The number of upgrade announcements far exceeds the number of downgrade announcements: 147 upgrades vs. 95 downgrades for Fitch, 211 vs. 136 for Moody's, and 260 vs. 211 for S&P. This finding is in line with the results in Sect. 8.1 showing that positive outlooks and watches outnumber negative outlooks and watches.

The most massive wave of upgrades is observed for Moody's in 2002. This record high, which is related to the agency's revised country ceiling policy (described in Chap. 3), paved the way for a series of upgrades by Fitch and S&P during 2003–2004. The number of downgrades peaks in 2008, when S&P negative rating changes greatly exceed those of its competitors.

[8] Obviously, this would *not* mean that all positive (negative) outlooks and watches would automatically result in an upgrade (a downgrade).

[9] Author's computations.

Table 8.10 Distribution of Fitch, Moody's, and S&P rating changes, 1 January 1987 to 1 January 2011

	Fitch UP	Moody's UP	S&P UP	Fitch DN	Moody's DN	S&P DN	Fitch UP-to-DN ratio	Moody's UP-to-DN ratio	S&P UP-to-DN ratio
1987	NA	0	0	NA	4	0	NA	0.00	NA
1988	NA	0	0	NA	0	0	NA	NA	NA
1989	NA	0	1	NA	5	2	NA	0.00	0.50
1990	NA	3	0	NA	3	2	NA	1.00	0.00
1991	NA	1	6	NA	4	3	NA	0.25	2.00
1992	NA	1	0	NA	2	2	NA	0.50	0.00
1993	NA	2	4	NA	2	3	NA	1.00	1.33
1994	NA	6	4	NA	6	4	NA	1.00	1.00
1995	NA	6	11	NA	3	1	NA	2.00	11.00
1996	NA	9	8	NA	1	2	NA	9.00	4.00
1997	NA	13	7	NA	10	9	NA	1.30	0.78
1998	NA	6	5	NA	23	24	NA	0.26	0.21
1999	NA	8	12	NA	4	11	NA	2.00	1.09
2000	NA	11	13	NA	4	6	NA	2.75	2.17
2001	12	9	17	17	7	18	0.71	1.29	0.94
2002	16	27	16	10	6	14	1.60	4.50	1.14
2003	23	19	21	9	8	12	2.56	2.38	1.75
2004	24	7	29	2	3	10	12.00	2.33	2.90
2005	19	12	24	8	4	7	2.38	3.00	3.43
2006	13	20	21	2	1	7	6.50	20.00	3.00
2007	12	17	25	3	1	5	4.00	17.00	5.00
2008	10	8	11	17	9	29	0.59	0.89	0.38
2009	3	11	3	18	17	25	0.17	0.65	0.12
2010	15	15	22	9	9	15	1.67	1.67	1.47

Sources: Author's computations

Notes: "UP" and "DN" denote "upgrades" and "downgrades," respectively. NA denotes not applicable. The counting of Fitch rating changes starts on 1 January 2001, i.e., the first civil year after Fitch IBCA merged with Duff and Phelps

Not surprisingly, the upgrade-to-downgrade ratios are correlated to business cycles. In times of sovereign debt crisis, currency crisis, or economic recession (e.g., 1992, 1997–1998, 2001, and 2008–2009), these ratios are lower than unity; however, they soar during boom periods (e.g., 1995–1996, 2004–2007). These findings support the view that sovereign ratings have procyclical effects (see Ferri et al. 1999; Reisen and von Maltzan 1999).

Any examination of the *frequency* of rating changes must be complemented with one of the *magnitude* of rating changes – that is, taking into account the "upward notches" and "downward notches" in lieu of rating change events. Table 8.11 reveals that multi-notch upgrades and downgrades do exist, but account for a small portion of all rating changes.

The magnitude of rating changes is summarized in Table 8.12. One-notch rating changes account for the vast majority of all rating changes: 85.4, 83.1, and 72.6% for S&P, Fitch, and Moody's, respectively. The percentage of two-notch rating changes is quite low, except for Moody's: 7.9 and 9.5% for S&P and Fitch (respectively) vs. 21.6% for Moody's. Three-notch rating changes account for 2.3, 3.7, and 4.9% of all changes for S&P, Fitch, and Moody's, respectively. More-than-three-notch rating changes are less frequent at Moody's (0.9%) than at Fitch and S&P (3.7 and 4.5%). Overall, then, the average upgrades and downgrades for the three agencies turn out to be quite similar (see the last two lines of Table 8.12), as the numerous two-notch rating changes by Moody's are counterbalanced by the more-than-three-notch rating changes by Fitch and S&P.

These results must actually be interpreted in light of the occurrence of several multi-notch rating changes stemming from the downgrade to (and removal from) the default category. When defaulting sovereigns are dropped from the three samples,[10] the proportion of more-than-two-notch rating changes decreases dramatically for Fitch and S&P. The proportion of one-notch rating changes then reaches 91.4 and 93.5% for Fitch and S&P vs. 74.9% for Moody's. These results show that multi-notch upgrades and downgrades are much more common for Moody's than for Fitch and S&P. This discrepancy in rating practices is even more striking when migration rates are examined.

8.3.2 Rating Migration Matrices

Table 8.13 displays the annual frequency of rating changes. Note that the ratings assigned by Moody's are more stable than those assigned by Fitch and S&P. Also the proportion of one-notch rating changes reaches 17.9 and 17.8% for

[10]Defaulting countries are Argentina, the Dominican Republic, Ecuador, Indonesia, Jamaica, Russia, Ukraine, Uruguay, and Venezuela for the three agencies, plus: Moldova and the Seychelles for Fitch; Belize, Moldova, Pakistan, and Paraguay for Moody's; and Belize, Grenada, Pakistan, Paraguay, and the Seychelles for S&P.

Table 8.11 Distribution of Fitch, Moody's, and S&P rating changes in notches, 1 January 1987 to 1 January 2011

	Fitch UP	Moody's UP	S&P UP	Fitch DN	Moody's DN	S&P DN	Fitch UP-to-DN ratio	Moody's UP-to-DN ratio	S&P UP-to-DN ratio
1987	NA	0	0	NA	7	0	NA	0.00	NA
1988	NA	0	0	NA	0	0	NA	NA	NA
1989	NA	0	1	NA	5	3	NA	0.00	0.33
1990	NA	3	0	NA	5	2	NA	0.60	0.00
1991	NA	2	7	NA	6	3	NA	0.33	2.33
1992	NA	2	0	NA	3	2	NA	0.67	0.00
1993	NA	2	4	NA	2	4	NA	1.00	1.00
1994	NA	7	4	NA	8	6	NA	0.88	0.67
1995	NA	6	13	NA	3	1	NA	2.00	13.00
1996	NA	11	9	NA	1	2	NA	11.00	4.50
1997	NA	14	7	NA	14	16	NA	1.00	0.44
1998	NA	7	7	NA	34	32	NA	0.21	0.22
1999	NA	10	20	NA	6	15	NA	1.67	1.33
2000	NA	12	25	NA	4	9	NA	3.00	2.78
2001	12	13	17	25	8	20	0.48	1.63	0.85
2002	17	49	19	14	11	18	1.21	4.45	1.06
2003	36	30	26	13	12	20	2.77	2.50	1.30
2004	26	8	33	3	4	18	8.67	2.00	1.83
2005	25	15	42	12	7	13	2.08	2.14	3.23
2006	13	23	22	2	1	7	6.50	23.00	3.14
2007	13	18	31	4	1	5	3.25	18.00	6.20
2008	10	9	11	24	15	38	0.42	0.60	0.29
2009	7	11	6	22	22	26	0.32	0.50	0.23
2010	27	17	26	15	18	21	1.80	0.94	1.24

Sources: Author's computations

Notes: UP and DN denote upgrades and downgrades, respectively. NA denotes not applicable. The counting of Fitch rating changes starts on 1 January 2001, i.e., the first civil year after Fitch IBCA merged with Duff and Phelps

Table 8.12 Magnitude of Fitch, Moody's, and S&P rating changes, 1 January 1987 to 1 January 2011

	All ratings			Nondefaulting ratings only		
	Fitch	Moody's	S&P	Fitch	Moody's	S&P
UP by more than three notches (%)	2.48	0.00	3.18	0.00	0.00	0.00
UP by three notches (%)	0.00	2.31	0.21	0.00	2.35	0.31
UP by two notches (%)	4.55	12.10	1.91	3.45	11.76	1.86
UP by one notch (%)	53.72	46.40	49.89	62.07	53.73	59.13
DN by more than three notches (%)	1.24	0.86	1.27	0.00	0.78	0.31
DN by three notches (%)	3.72	2.59	2.12	1.72	1.96	0.93
DN by two notches (%)	4.96	9.51	5.94	3.45	8.24	3.10
DN by one notch (%)	29.34	26.22	35.46	29.31	21.18	34.37
All rating changes (%)	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*
Average UP (notches)	1.27	1.27	1.27	1.05	1.24	1.04
Average DN (notches)	1.41	1.45	1.33	1.20	1.46	1.15

Sources: Author's computations
Notes: UP and DN denote upgrades and downgrades, respectively. The period under consideration for Fitch rating changes is 1 January 2001 to 1 January 2011

Table 8.13 Average annual frequency of Fitch, Moody's, and S&P rating changes, 1 January 1987 to 1 January 2011

	Fitch	Moody's	S&P
No rating change (%)	77.58	82.34	77.69
UP by more than three notches (%)	0.33	0.00	0.48
UP by three notches (%)	0.00	0.58	0.12
UP by two notches (%)	1.55	2.25	1.19
UP by one notch (%)	13.54	9.06	12.55
DN by more than three notches (%)	0.67	0.69	0.83
DN by three notches (%)	0.55	0.52	0.48
DN by two notches (%)	1.55	1.38	1.31
DN by one notch (%)	4.22	3.17	5.35
Total (%)	*100.00*	*100.00*	*100.00*

Sources: Author's computations
Notes: UP and DN denote upgrades and downgrades, respectively. The period under consideration for Fitch rating changes is 1 January 2001 to 1 January 2011

S&P and Fitch (respectively) vs. 12.2% for Moody's. These two findings confirm that Moody's rating changes are less frequent, but are of greater magnitude. This idiosyncratic rating policy can be checked through analysis of rating migration matrices.

Rating migration matrices provide a picture of changes in credit quality over time for the different rating categories. Tables 8.14–8.16 show average annual rating migration rates for Fitch, Moody's, and S&P, respectively.

Not surprisingly, the entire AAA and AA rating categories are much more stable than lower categories for the three CRAs. The stability of the AAA-rated sovereigns is impressive. Iceland was the only AAA-rated country to be massively downgraded

Table 8.14 Average 1-year rating migration rates for Fitch, 1 January 2001 to 1 January 2011

	AAA	AA+	AA	AA−	A+	A	A−	BBB+	BBB	BBB−	BB+	BB	BB−	B+	B	B−	CCC+	CCC	CCC−	CC	C	D	WR
AAA	**98.6**	0.7	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AA+	13.5	**83.8**	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AA	0.0	11.7	**83.3**	1.7	1.7	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AA−	0.0	0.0	14.3	**80.0**	2.9	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
A+	0.0	0.0	0.0	13.9	**80.6**	2.8	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
A	0.0	0.0	0.0	0.0	18.0	**76.0**	2.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
A−	0.0	0.0	0.0	0.0	0.0	18.4	**75.5**	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BBB+	0.0	0.0	0.0	0.0	0.0	5.3	13.2	**63.2**	13.2	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BBB	0.0	0.0	0.0	0.0	0.0	0.0	6.3	12.5	**75.0**	4.2	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BBB−	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.4	**72.2**	5.6	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BB+	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.2	**75.8**	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	22.0	**68.3**	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0
BB−	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	11.8	**70.6**	8.8	4.4	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B+	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	19.2	**67.3**	5.8	1.9	0.0	0.0	0.0	0.0	0.0	0.0	3.8
B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	17.5	**71.9**	5.3	1.8	1.8	0.0	0.0	0.0	0.0	0.0
B−	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	19.1	**63.8**	0.0	4.3	2.1	2.1	0.0	0.0	6.4
CCC+	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.0	**40.0**	20.0	0.0	0.0	0.0	0.0	0.0
CCC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.9	0.0	**28.6**	0.0	0.0	0.0	14.3	14.3
CCC−	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**75.0**	0.0	0.0	0.0	25.0
CC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**	0.0	100.0	0.0
C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**	0.0	0.0
D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.1	9.1	0.0	9.1	0.0	0.0	0.0	**72.7**	0.0

Sources: Author's computations based on http://www.fitchratings.com
Note: WR denotes Withdrawn Rating

Table 8.15 Average 1-year rating migration rates for Moody's, 1 January 1987 to 1 January 2011

	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	WR
Aaa	**97.1**	2.3	0.3	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aa1	7.8	**83.3**	5.9	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
Aa2	3.4	8.0	**86.4**	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aa3	1.3	0.0	14.1	**83.3**	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
A1	0.0	0.0	0.0	14.3	**80.5**	3.9	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
A2	0.0	0.0	0.0	1.8	12.5	**76.8**	4.5	1.8	0.0	0.9	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
A3	0.0	0.0	0.0	0.0	3.4	12.6	**80.5**	2.3	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Baa1	0.0	0.0	0.0	0.0	3.4	5.7	9.1	**77.3**	0.0	3.4	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Baa2	0.0	0.0	0.0	0.0	0.0	1.3	3.9	11.8	**80.3**	1.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Baa3	0.0	0.0	0.0	0.0	0.0	0.0	0.9	3.4	8.6	**81.0**	1.7	1.7	0.9	0.0	0.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0
Ba1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	1.7	12.8	**81.2**	1.7	0.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ba2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	14.8	**71.6**	2.5	2.5	3.7	1.2	0.0	0.0	0.0	0.0	0.0	0.0
Ba3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4	13.2	**69.1**	8.8	2.9	1.5	0.0	0.0	0.0	0.0	0.0	0.0
B1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	6.1	**79.6**	6.1	3.1	1.0	0.0	0.0	1.0	0.0	0.0
B2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	10.2	**75.5**	6.1	3.1	0.0	1.0	0.0	0.0	2.0
B3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	6.0	16.0	**68.0**	6.0	2.0	0.0	0.0	0.0	0.0
Caa1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4	13.3	**75.6**	2.2	0.0	2.2	0.0	2.2
Caa2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.7	**66.7**	0.0	16.7	0.0	0.0
Caa3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.3	0.0	**66.7**	0.0	0.0	0.0
Ca	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	25.0	**25.0**	0.0	0.0
C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**	0.0

Sources: Author's computations based on http://www.moodys.com
Note: WR denotes Withdrawn Rating

Table 8.16 Average 1-year rating migration rates for S&P, 1 January 1987 to 1 January 2011

	AAA	AA+	AA	AA−	A+	A	A−	BBB+	BBB	BBB−	BB+	BB	BB−	B+	B	B−	CCC+	CCC	CCC−	CC	D	WR
AAA	**98.5**	1.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AA+	8.3	**87.0**	3.7	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AA	0.0	9.5	**83.2**	6.3	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AA−	0.0	0.0	15.8	**73.7**	8.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
A+	0.0	0.0	0.0	16.1	**67.7**	12.9	1.6	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
A	0.0	0.0	0.0	0.8	11.7	**82.5**	1.7	1.7	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
A−	0.0	0.0	0.0	0.0	1.1	16.3	**78.3**	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BBB+	0.0	0.0	0.0	0.0	0.0	1.8	21.4	**60.7**	12.5	1.8	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BBB	0.0	0.0	0.0	0.0	0.0	0.0	3.8	21.8	**62.8**	7.7	2.6	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BBB−	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	16.7	**76.5**	3.9	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
BB+	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	16.5	**71.4**	8.8	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0
BB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	16.2	**74.3**	6.7	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BB−	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	14.9	**69.1**	7.4	2.1	1.1	0.0	1.1	1.1	0.0	2.1	0.0
B+	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	2.8	13.8	**65.1**	12.8	2.8	0.9	0.0	0.0	0.9	0.0	0.0
B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.2	**68.7**	3.0	2.0	2.0	0.0	0.0	1.0	2.0
B−	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	20.4	**64.8**	1.9	1.9	1.9	0.0	3.7	0.0
CCC+	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.7	7.7	38.5	**46.2**	0.0	0.0	0.0	0.0	0.0
CCC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.0	20.0	**20.0**	0.0	20.0	0.0	0.0
CCC−	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**	0.0	100.0	0.0
CC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	50.0	0.0	0.0	0.0	**0.0**	0.0	0.0
SD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	40.0	10.0	0.0	0.0	0.0	**30.0**	10.0

Sources: Author's computations based on http://www.standardandpoors.com
Note: WR denotes Withdrawn Rating

within a single year (one one-notch downgrade and two three-notch downgrades by Moody's in 2008). During the sample period, Iceland was never so highly rated by Fitch and S&P, as it was previously downgraded by both CRAs. Few AA-rated countries experience a more-than-three-notch worsening of their credit rating: only South Korea in 1998 (S&P) and Ireland in 2010 (Fitch and Moody's). Other investment-grade rating categories are less stable in part because they gather sovereign issuers with various economic profiles. Emerging countries in Eastern Europe, Asia, and the Middle East were upgraded from the BBB–A categories to the A–AA categories in the 2000s, whereas Eastern Asian countries in 1997–1998 as well as peripheral European countries (e.g., Baltic countries, Greece, Iceland, Ireland, and Portugal) in 2007–2010 followed the opposite course.

The higher proportion of rating changes among speculative-grade countries reflects the greater sensitivity of low-rated than investment-grade countries to business cycles. It is also consistent with Sect. 8.1, which shows that speculative-grade issuers with a stable outlook are more likely to be upgraded or downgraded than are investment-grade issuers with a stable outlook.

It is worth remarking that all defaulting issuers were rated in the speculative-grade category as of 1 January of the default year, which explains the higher proportion of multi-notch rating changes in the bottom part of Tables 8.14–8.16. Multi-notch downgrades hit countries that subsequently defaulted, whereas multi-notch upgrades involved sovereign issuers that recovered from default.

Migration rates covering more than 1 year are regularly published by rating agencies, but they can be deceptive because some ratings are upgraded and then downgraded (or vice versa) within 2–3 years, thereby biasing the percentages of rating changes downward. Actually, using migration rates underscore the relevance of examining rating reversals to measure rating consistency and stability over time.

8.3.3 Rating Reversals

Rating reversals are defined as the cases of CRAs assigning both upward and downward rating changes within a 12-month period. Tables 8.17–8.19 exhibit the list of rating reversals for Fitch, Moody's, and S&P, respectively.

The number of rating reversals varies across CRAs: it ranges from five for Moody's to nine for Fitch and 24 for S&P. This suggests that the frequency of rating reversals is positively correlated with the frequency of rating changes, as Moody's ratings are more stable and less likely to be reversed than Fitch and S&P ratings.

Twenty of the 38 rating reversals stem from the downgrade to (and then removal from) the default category; these reversals are italicized in the three tables. If these specific rating reversals are dropped, then all the remaining observations (except Kazakhstan and Estonia) concern speculative-grade issuers. This fact is consistent with previous results showing that speculative-grade ratings are more volatile than investment-grade ones. Of more relevance is that issuers whose ratings were reversed are countries that defaulted shortly before or after the reversal.

Table 8.17 Fitch rating reversals, 1 January 2001 to 1 January 2011

Country	Date	Rating action
Argentina	*14 January 2005*	*Downgrade to D from DDD*
	3 June 2005	*Upgrade to DDD from D*
Dominican Republic	*5 May 2005*	*Downgrade to DDD from C*
	19 July 2005	*Upgrade to B– from DDD*
Ecuador	*15 December 2008*	*Downgrade to RD from CCC*
	4 September 2009	*Upgrade to CCC from RD*
Jamaica	*3 February 2010*	*Downgrade to RD from CCC*
	3 February 2010	*Upgrade to CCC from RD*
Moldova	*28 June 2002*	*Downgrade to DD from CC*
	4 February 2003	*Upgrade to B– from DD*
Turkey	25 March 2003	Downgrade to B– from B
	25 September 2003	Upgrade to B from B–
Ukraine	12 November 2009	Downgrade to B– from B
	6 July 2010	Upgrade to B from B–
Uruguay	*16 May 2003*	*Downgrade to DDD from C*
	17 June 2003	*Upgrade to B– from DDD*
Venezuela	10 January 2003	Downgrade to CCC+ from B
	23 June 2003	Upgrade to B– from CCC+

Sources: Author's classification based on http://www.fitchratings.com

Table 8.18 Moody's rating reversals, 1 January 1987 to 1 January 2011

Country	Date	Rating action
Ecuador	20 March 2008	Upgrade to B3 from Caa2
	14 November 2008	Downgrade to Caa1 from B3
Ecuador	*16 December 2008*	*Downgrade to Ca from Caa1*
	24 September 2009	*Upgrade to Caa3 from Ca*
Jamaica	*18 November 2009*	*Downgrade to Caa1 from B2*
	2 March 2010	*Upgrade to B3 from Caa1*
Moldova	*11 July 2002*	*Downgrade to Ca from Caa1*
	6 May 2003	*Upgrade to Caa1 from Ca*
Peru	19 September 2000	Downgrade to B1 from Ba3
	5 October 2000	Upgrade to Ba3 from B1

Sources: Author's classification based on http://www.moodys.com

The frequency of rating reversals would be even lower if agencies assigned more conservative and stable ratings to serial defaulters. For instance, it would have been more prudent to maintain Ecuador's rating in the CCC category than to change it eight times, as S&P did between 2000 (the year of Ecuador's recovery from its 1999 default) and 2008 (the year of its subsequent default).

This section has established that about 80% of sovereign ratings remain unchanged within the 1-year horizon. The stability is even greater for investment-grade issuers. Moody's ratings turn out to be more stable than Fitch and S&P ratings, but its rating changes have a larger magnitude. This fact is evidenced by the higher proportion of two-notch upgrades and downgrades by Moody's. More-than-three-notch rating

Table 8.19 S&P rating reversals, 1 January 1987 to 1 January 2011

Country	Date	Rating action
Belize	*7 December 2006*	*Downgrade to SD from CC*
	20 February 2007	*Upgrade to B from SD*
Dominican Republic	*1 February 2005*	*Downgrade to SD from CC*
	29 June 2005	*Upgrade to B from SD*
Ecuador	28 August 2000	Upgrade to B– from SD
	2 April 2001	Downgrade to CCC+ from B–
Ecuador	24 January 2005	Upgrade to B– from CCC+
	20 June 2005	Downgrade to CCC+ from B–
Ecuador	19 January 2007	Downgrade to CCC from CCC+
	20 November 2007	Upgrade to B– from CCC
Ecuador	20 November 2007	Upgrade to B– from CCC
	14 November 2008	Downgrade to CCC– from B–
Ecuador	*15 December 2008*	*Downgrade to SD from CCC–*
	15 June 2009	*Upgrade to CCC+ from SD*
Estonia	10 August 2009	Downgrade to A– from A
	10 June 2010	Upgrade to A from A–
Grenada	*30 December 2004*	*Downgrade to SD from B–*
	18 November 2005	*Upgrade to B– from SD*
Grenada	2 April 2007	Downgrade to CCC+ from B–
	1 August 2007	Upgrade to B– from CCC+
Indonesia	*30 March 1999*	*Downgrade to SD from CCC+*
	31 March 1999	*Upgrade to CCC+ from SD*
Indonesia	*17 April 2000*	*Downgrade to SD from CCC+*
	2 October 2000	*Upgrade to B– from SD*
Indonesia	*23 April 2002*	*Downgrade to SD from CCC*
	5 September 2002	*Upgrade to CCC+ from SD*
Jamaica	*14 January 2010*	*Downgrade to SD from CCC*
	24 February 2010	*Upgrade to B– from SD*
Kazakhstan	2 November 2006	Upgrade to BBB from BBB–
	8 October 2007	Downgrade to BBB– from BBB
Lebanon	31 January 2008	Downgrade to CCC+ from B–
	5 August 2008	Upgrade to B– from CCC+
Pakistan	*29 January 1999*	*Downgrade to SD from CC*
	21 December 1999	*Upgrade to B– from SD*
Pakistan	14 November 2008	Downgrade to CCC from CCC+
	19 December 2008	Upgrade to CCC+ from CCC
South Korea	22 December 1997	Downgrade to B+ from BBB–
	18 February 1998	Upgrade to BB+ from B+
Turkey	25 April 2000	Upgrade to B+ from B
	23 February 2001	Downgrade to B from B+
Uruguay	*16 May 2003*	*Downgrade to SD from CC*
	2 June 2003	*Upgrade to B– from SD*
Venezuela	13 December 2002	Downgrade to CCC+ from B–
	30 July 2003	Upgrade to B– from CCC+
Venezuela	25 August 2004	Upgrade to B from B–
	18 January 2005	Downgrade to SD from B
Venezuela	*18 January 2005*	*Downgrade to SD from B*
	3 March 2005	*Upgrade to B from SD*

Sources: Author's classification based on http://www.standardandpoors.com

change announcements, which involve countries that are about to default or have recovered from default, cast doubt on consistency of the ratings. First, such announcements reflect an inability of CRAs to anticipate currency and debt crises (from the Asian crisis in 1997–1998 to the Greek debt crisis in 2010), which have resulted in multi-notch downgrades. Second, they reveal the inadequacy of rating scales at the bottom of the speculative grade category. Are the CCC+, CCC, CCC−, CC, and C rating categories used by Fitch and S&P actually relevant?[11] They contribute to inflating artificially the magnitude of rating changes for defaulting issuers. From this standpoint, the rating scale implemented by Moody's has led to the appreciable greater stability of its ratings.

8.4 Accuracy of Sovereign Ratings

Although consistency and stability are valuable measures of ratings performance, they must be complemented by assessment of the *accuracy* of ratings. This objective may be pursued in three ways: examination of ratings prior to default (Sect. 8.4.1); computation of cumulative default rates (Sect. 8.4.2); and computation of ARs (Sect. 8.4.3).

As in Chap. 7, these measurements aim to compare the accuracy of ratings assigned by the different credit raters. Hence, this section examines a unique sample composed of 747 annual observations for 84 sovereign issuers rated simultaneously by Fitch, Moody's, and S&P from 1 January 2001 to 1 January 2011. An unexpected difficulty arises because rating agencies do not entirely agree on which countries defaulted during this period. For example, S&P considers Venezuela to be a country that defaulted in 2005, but Fitch and Moody's do not. This problem is overcome by selecting all default events listed in the sovereign transition and default studies released by the three agencies (Fitch 2011; Moody's 2010a; S&P 2011). This results in seven sovereign defaults between 1 January 2001 and 1 January 2011: Argentina (2001), Indonesia (2002), Uruguay (2003), the Dominican Republic (2005), Venezuela (2005), Ecuador (2008), and Jamaica (2010).[12]

8.4.1 Ratings Prior to Default

Table 8.20 reports the ratings assigned by Fitch, Moody's, and S&P to these seven countries at various times prior to their default date.[13]

[11] The C rating category is not used by S&P.

[12] Five other countries that defaulted during this period are dropped from the sample because they were not assigned a rating by all three agencies: Moldova (2002), Paraguay (2003), Grenada (2004), Belize (2006), and Seychelles (2008).

[13] The ratings at time of default are not provided because the dates of defaults differ across agencies.

Table 8.20 Fitch, Moody's, and S&P ratings at various times prior to default

	Date of default	Fitch				Moody's				S&P			
		M	M–3	M–6	M–12	M	M–3	M–6	M–12	M	M–3	M–6	M–12
ARG	Nov 2001	CCC–	B–	B+	BB	Caa3	Caa1	B2	B1	CC	B–	B+	BB
IDN	Apr 2002	B–	B–	B–	B–	B3	B3	B3	B3	CCC	CCC	CCC+	B–
URY	May 2003	C	B–	B	BB+	B3	B3	B3	Baa3	CC	B–	B	BB+
VEN	Jan 2005	B+	B+	B–	B–	B2	B2	Caa1	Caa1	B	B	CCC+	CCC+
DOM	Apr 2005	CCC+	CCC+	CCC+	CCC+	B3	B3	B3	B3	SD	CC	CC	CC
ECU	Dec 2008	CCC	CCC	CCC	CCC	Caa1	B3	B3	Caa2	CCC–	B–	B–	B–
JAM	Jan 2010	CCC	B	B	B	Caa1	B2	B2	B1	CCC	CCC+	B–	B

Notes: M, M–3, M–6, and M–12 refer to the ratings at the beginning of the month of the default, and of the third, the sixth, and the twelfth month preceding the default, respectively. S&P downgraded the Dominican Republic to SD as early as February 2005. ARG, IDN, URY, VEN, DOM, ECU, JAM refer to Argentina, Indonesia, Uruguay, Venezuela, Dominican Republic, Ecuador, and Jamaica, respectively

Sources: http://www.fitchratings.com, http://www.moodys.com, and http://www.standardandpoors.com

S&P ratings are systematically the lowest at the beginning of the month M of the default, which supports the view that their ratings are adjusted more severely in the event of a default. At the other moments in time (M–3, M–6, and M–12), a default-by-default analysis is required. S&P issued the lowest ratings to Indonesia, Jamaica, and the Dominican Republic during the 12 months preceding their respective defaults. Fitch had the most conservative approach regarding Ecuador. Although the case of Venezuela is specific because Fitch and Moody's did not view this country as defaulting, it is worth noting that all three CRAs upgraded the country prior to the default event. This suggests how untimely positive rating actions may be for countries rated at the bottom of the speculative-grade category. Moody's assigned the most accurate ratings to Argentina, downgrading the country (to B1 from Ba3) on 6 October 1999 – far in advance of its competitors. S&P and Fitch did not downgrade Argentina until 14 November 2000 and 20 March 2001, respectively. Even after this first downgrade, S&P and Fitch ratings were higher than Moody's (BB− and BB− vs. B1). The story is quite the opposite for Uruguay, as Moody's was the last agency to downgrade the country to the speculative-grade category (on 3 May 2002 vs. 14 February 2002 and 13 March 2002 for S&P and Fitch, respectively). Moody's poor performance with regard to Uruguay's rating results from overoptimism about the country's economic resilience at a time when Argentina's economy was collapsing (Moody's 2001).

If all defaulting countries and times are considered, then S&P ratings turn out to be slightly more accurate. That being said, this result may be skewed because Fitch, Moody's, and S&P rating scales are only roughly equivalent. Moreover, Moody's ratings reflect both a probability of default and an expected recovery in the event of default, which contributes to enhancing the rating of several countries (e.g., the Dominican Republic, Indonesia, Uruguay), thus penalizing Moody's performance. Hence, other measures are needed to assess ratings accuracy; these include both average cumulative default rates and ARs.

8.4.2 Average Cumulative Default Rates

Tables 8.21–8.23 present the average cumulative default rates of cohorts of Fitch-, Moody's-, and S&P-rated countries formed at the beginning of each year from 1 January 2001 to 1 January 2011. The tables show 1- to 5-year average cumulative default rates, from which many relevant conclusions can be drawn.

First, for the sample under examination, no country rated in the BBB/Baa2 category or above by Fitch, Moody's, and S&P defaulted between 1 January 2001 and 1 January 2011. The highest rating assigned to a sovereign issuer that subsequently defaulted (i.e., Uruguay) is the same for the three agencies: BBB−/Baa3. This default affects the 2-year default rates and beyond. That the highest default rates are observed for S&P is a consequence of this agency having the smallest number of countries rated BBB−. For the opposite reason, the lowest default rates are observed for Moody's.

Table 8.21 Fitch average cumulative default rates, 1 January 2001 to 1 January 2011

In %	Year 1	Year 2	Year 3	Year 4	Year 5
AAA	0.00	0.00	0.00	0.00	0.00
AA+	0.00	0.00	0.00	0.00	0.00
AA	0.00	0.00	0.00	0.00	0.00
AA−	0.00	0.00	0.00	0.00	0.00
A+	0.00	0.00	0.00	0.00	0.00
A	0.00	0.00	0.00	0.00	0.00
A−	0.00	0.00	0.00	0.00	0.00
BBB+	0.00	0.00	0.00	0.00	0.00
BBB	0.00	0.00	0.00	0.00	0.00
BBB−	0.00	2.50	5.65	5.65	5.65
BB+	0.00	0.00	0.00	0.00	0.00
BB	2.78	2.78	2.78	2.78	2.78
BB−	0.00	0.00	0.00	4.17	9.21
B+	4.00	4.00	8.80	13.87	13.87
B	3.23	10.39	14.29	14.29	14.29
B−	4.17	17.23	21.37	25.74	25.74
CCC+	33.33	33.33	33.33	33.33	55.56
CCC	66.67	66.67	66.67	66.67	66.67
CCC−	NR	NR	NR	NR	NR
CC	NR	NR	NR	NR	NR
C	NR	NR	NR	NR	NR

Sources: Author's computations based on http://www.fitchratings.com
Note: NR denotes that no issuer was assigned the corresponding rating at the beginning of a year

Table 8.22 Moody's average cumulative default rates, 1 January 2001 to 1 January 2011

In %	Year 1	Year 2	Year 3	Year 4	Year 5
Aaa	0.00	0.00	0.00	0.00	0.00
Aa1	0.00	0.00	0.00	0.00	0.00
Aa2	0.00	0.00	0.00	0.00	0.00
Aa3	0.00	0.00	0.00	0.00	0.00
A1	0.00	0.00	0.00	0.00	0.00
A2	0.00	0.00	0.00	0.00	0.00
A3	0.00	0.00	0.00	0.00	0.00
Baa1	0.00	0.00	0.00	0.00	0.00
Baa2	0.00	0.00	0.00	0.00	0.00
Baa3	0.00	2.08	4.36	4.36	4.36
Ba1	0.00	0.00	0.00	0.00	0.00
Ba2	0.00	0.00	0.00	0.00	0.00
Ba3	0.00	0.00	0.00	0.00	0.00
B1	2.00	4.08	6.48	9.32	9.32
B2	3.57	7.76	7.76	12.62	17.47
B3	11.11	14.53	18.25	18.25	18.25
Caa1	12.50	37.50	46.43	54.08	54.08
Caa2	33.33	33.33	33.33	33.33	66.67
Caa3	0.00	0.00	0.00	0.00	0.00

Sources: Author's computations based on http://www.moodys.com
Note: NR denotes that no issuer was assigned the corresponding rating at the beginning of a year

Table 8.23 S&P average cumulative default rates, 1 January 2001 to 1 January 2011

In %	Year 1	Year 2	Year 3	Year 4	Year 5
AAA	0.00	0.00	0.00	0.00	0.00
AA+	0.00	0.00	0.00	0.00	0.00
AA	0.00	0.00	0.00	0.00	0.00
AA–	0.00	0.00	0.00	0.00	0.00
A+	0.00	0.00	0.00	0.00	0.00
A	0.00	0.00	0.00	0.00	0.00
A–	0.00	0.00	0.00	0.00	0.00
BBB+	0.00	0.00	0.00	0.00	0.00
BBB	0.00	0.00	0.00	0.00	0.00
BBB–	0.00	2.94	6.41	6.41	6.41
BB+	0.00	0.00	0.00	0.00	0.00
BB	0.00	0.00	0.00	0.00	0.00
BB–	2.63	2.63	2.63	2.63	2.63
B+	0.00	0.00	0.00	0.00	0.00
B	3.57	7.28	11.31	19.76	24.48
B–	7.41	14.81	14.81	14.81	14.81
CCC+	0.00	14.29	38.78	47.52	56.27
CCC	66.67	83.33	83.33	83.33	83.33
CCC–	NR	NR	NR	NR	NR
CC	100.00	100.00	100.00	100.00	100.00

Sources: Author's computations based on http://www.standardandpoors.com

Note: NR denotes that no issuer was assigned the corresponding rating at the beginning of a year

Second, there were no defaults within the entire Moody's Ba rating category. The same cannot be said for Fitch and S&P, whose BB and BB– categories (respectively) include default events. As a result, Moody's outperforms its competitors with respect to the top speculative-grade rating categories.

Third, the default rates for the B+/B1 category are not homogeneous across rating agencies: they range from 0% for S&P over all time horizons to 13.87% for Fitch over the 4- and 5-year horizons. The S&P B+ default rates are troublesome in that they ought to be higher than its BB– default rates. In fact, examining the B–B–/B2–B3 categories reveals that Fitch and Moody's default rates do increase as the credit quality declines. However, this path is observed for S&P only over the 1-, 2-, and 3-year horizons.

Fourth, all the CCC/Caa rating categories (and below) exhibit the highest default rates. Yet some categories contain no issuer (e.g., the S&P CCC– and the Fitch CCC–, CC, and C categories) or, more embarrassingly, a single issuer that did not default (e.g., the Moody's Caa3 category). These results highlight the need for all three CRAs to reduce the number of low speculative-grade rating categories.

This analysis of average cumulative default rates shows the performance of Fitch, Moody's, and S&P to be similar in that their investment-grade rating categories are safe (except for BBB–/Baa3). However, the absence of defaults in the entire Ba rating category gives Moody's the most accurate ratings.

8.4.3 *Cumulative Accuracy Profiles and Accuracy Ratios*

The last measurement of rating accuracy consists of tracing CAP curves and computing ARs. Both CAPs and ARs are designed to establish whether CRAs manage to assign low ratings to issuers that default and high ratings to issuers that do not.

A CAP curve is used to facilitate a visual and qualitative assessment of ratings performance. It is constructed by sorting the sovereign issuers from lowest to highest rating and then plotting, for each rating category, the percentage of defaults accounted for by sovereigns with the same or a lower rating against the percentage of all sovereigns with the same or a lower rating. The further the CAP curve bows toward the upper left corner, the greater the fraction of all defaults that are accounted for by the lowest rating categories (see Moody's 2000 for an exhaustive explanation).

Figures 8.1–8.3 depict the 1-, 3-, and 5-year CAP curves for the sample covering all the countries rated simultaneously by Fitch, Moody's, and S&P from 1 January 2001 through 1 January 2011. For the three time horizons, examining CAP curves does not reveal which agency's ratings are the most powerful predictor of default because the curves cross one another. For this reason, computing ARs is necessary in order to compare the ratings performance of Fitch, Moody's, and S&P.

The AR compresses the information depicted in the CAP curve into a single summary statistic: it is the ratio of the area between the CAP curve and the 45° line to the total area above the 45° line. ARs range between −1 and 1, where 1 represents

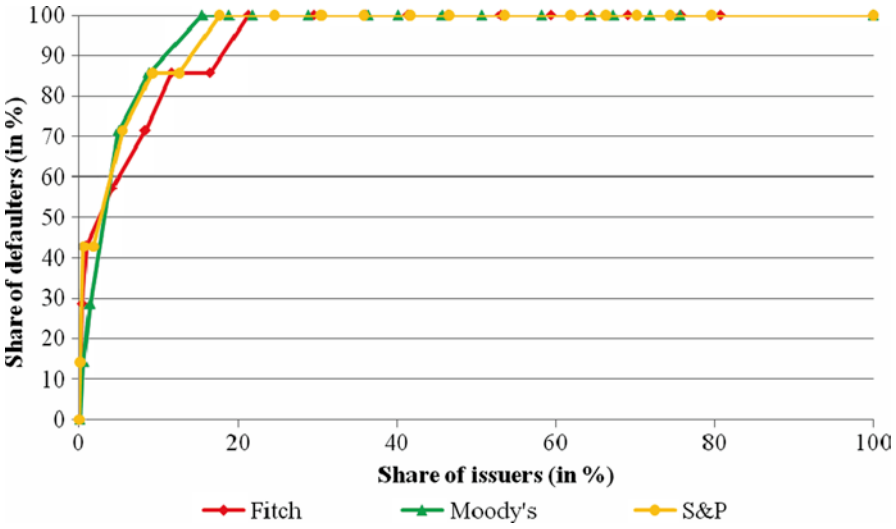

Fig. 8.1 One-year cumulative accuracy profiles (CAPs), 1 January 2001 to 1 January 2011. *Sources*: Author's computations

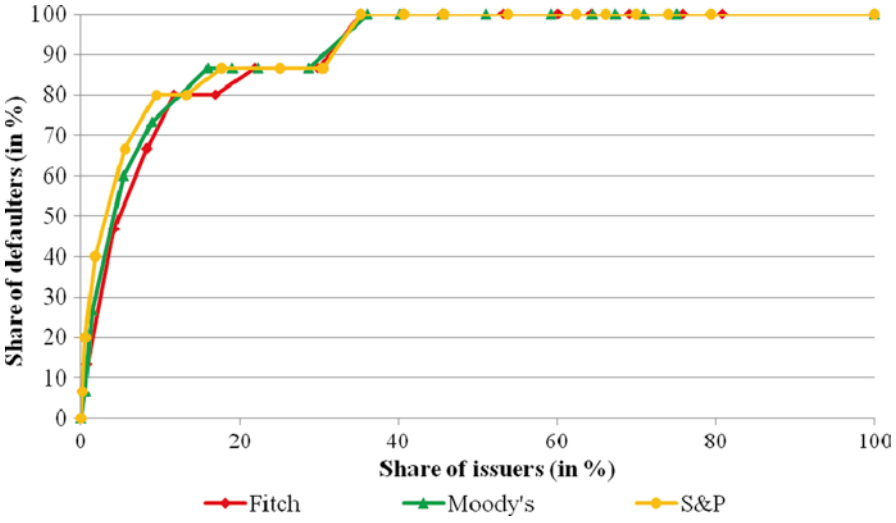

Fig. 8.2 Three-year CAPs, 1 January 2001 to 1 January 2011. *Sources*: Author's computations

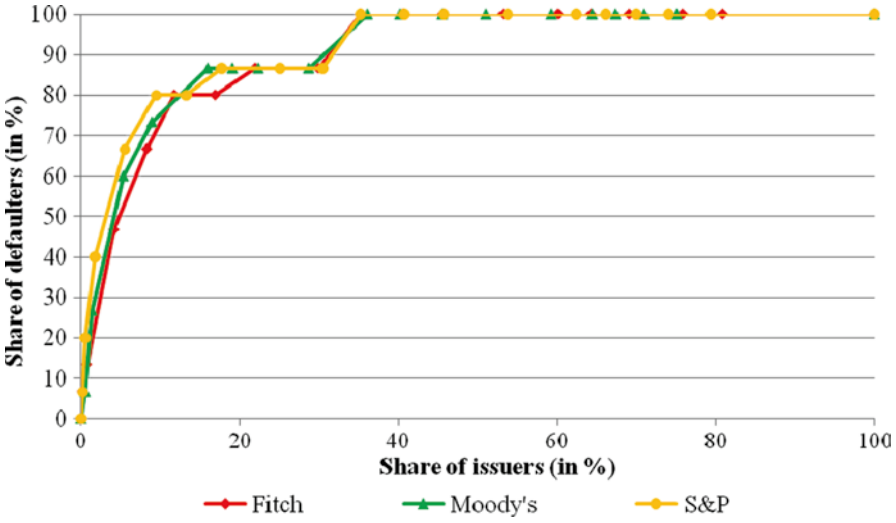

Fig. 8.3 Five-year CAPs, 1 January 2001 to 1 January 2011. *Sources*: Author's computations

Table 8.24 Accuracy ratios, 1 January 2001 to 1 January 2011

	One-year accuracy ratio	Three-year accuracy ratio	Five-year accuracy ratio
Fitch	0.890	0.819	0.817
Moody's	0.915	0.835	0.852
S&P	0.914	0.847	0.852

Sources: Author's computations

maximum accuracy (i.e., all defaulters are assigned the lowest rating) and −1 represents worst performance (i.e., all defaulters are assigned the highest rating). The formula is as follows:

$$\mathrm{AR} = 2\left[\left[\sum_{R_i = R_1, \ldots, R_{\max}} \frac{(D_{R_i} + D_{R_{i-1}})(N_{R_i} - N_{R_{i-1}})}{2DN}\right] - 0.5\right],$$

where
D = total number of defaults;
N = total number of issuers;
R_i = rating of a given agency;
D_{R_i} = total number of defaults rated R_i and less;
N_{R_i} = total number of issuers rated R_i and less;
$D_0 = 0$; and
$N_0 = 0$.

Table 8.24 presents the 1-, 3-, and 5-year ARs for the three agencies. ARs during the period of study are much higher than those observed for the interwar years (see Flandreau et al. 2010). This gap is likely due not only to the greater efficiency of modern credit ratings but also, and even more probably, to the massive and unprecedented wave of sovereign defaults during the 1930s.

Three-year ARs are lower than 1-year ARs, but surprisingly they turn out to be lower than 5-year ARs, too. These unexpected results reflect two circumstances: (a) the investment-grade ratings assigned to Uruguay 4 and 5 years (i.e., in 2000 and 1999) prior to its default in May 2003 are not included in the sample; and (b) the low ratings assigned to defaulting countries 4 and 5 years prior to their bankruptcy enhance the 5-year ARs of Moody's and S&P.

Fitch ARs are the lowest for the three time horizons. At the 1-year horizon, Fitch is in third position mainly because it assigned, at the beginning of a year, the highest rating (of all three CRAs) to a country that defaulted later that year. On 1 January 2001, Argentina – which became insolvent in November 2001 – was rated BB by Fitch vs. BB− and B1 by S&P and Moody's, respectively. At each time horizon, Fitch is penalized because it has the highest proportion of defaulting countries among the whole BB rating category.

The ARs for Moody's and S&P are very close, except at the 3-year horizon. An in-depth analysis of Moody's and S&P ARs and CAPs is needed to compare the performance of these two agencies. As shown in Figs. 8.1–8.3, S&P ratings provide a better rank ordering of sovereign risk among the higher-risk portion of the rating scale (i.e., the whole B rating category and below). In contrast, Moody's ratings are

more accurate when ranking countries within the whole Ba rating category. In other words, S&P ratings are more subject to Type I errors (rating a defaulter too high), whereas Moody's ratings are more subject to Type II errors (rating a nondefaulter too low). At the 1- and 5-year horizons, effects of the Type I errors by S&P nearly balance those of the Type II errors by Moody's. Yet at the 3-year horizon, effects of Moody's Type II errors are greater than those of S&P Type I errors, which propels S&P to the top position.

A different sample can be used to compare directly the performance of Moody's and S&P. This sample includes all countries rated simultaneously by the two agencies between 1 January 1987 and 1 January 2011, and it yields 1,492 annual observations for 98 countries. The defaulting countries account for all default events listed in the sovereign transition and default studies released by the two agencies (Moody's 2010a; S&P 2011): Pakistan (1999), Russia (1999), Indonesia (1999, 2000, and 2002), Argentina (2001), Paraguay (2003), Uruguay (2003), the Dominican Republic (2005), Venezuela (2005), Belize (2006), Ecuador (2008), and Jamaica (2010).[14]

Figures 8.4–8.6 depict the 1-, 3-, and 5-year CAP curves. At the three time horizons, S&P ratings are more accurate across the B rating category and below, whereas Moody's ratings provide the better rank ordering across the Ba rating

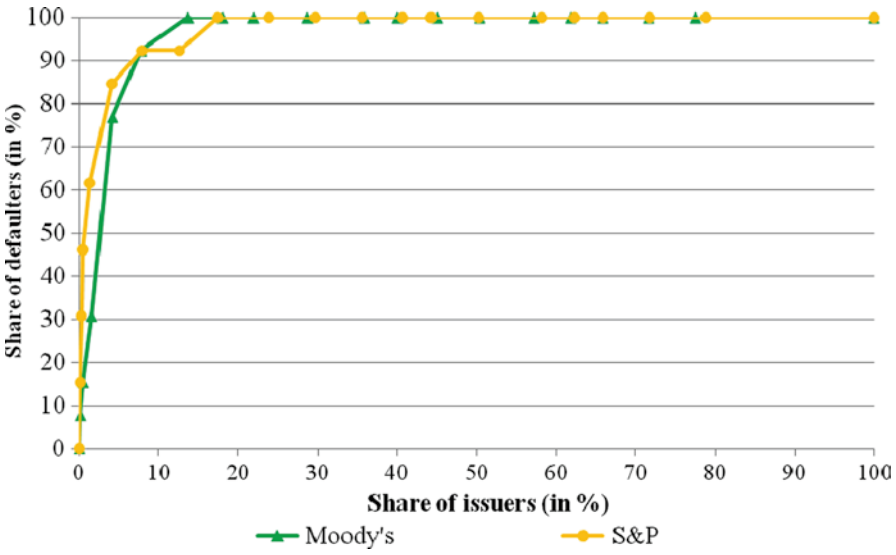

Fig. 8.4 One-year CAPs, 1 January 1987 to 1 January 2011. *Sources*: Author's computations

[14]Three other countries that defaulted during this period are dropped from the sample because they were not assigned a rating by both agencies: Moldova (2002), Grenada (2004), and Seychelles (2008).

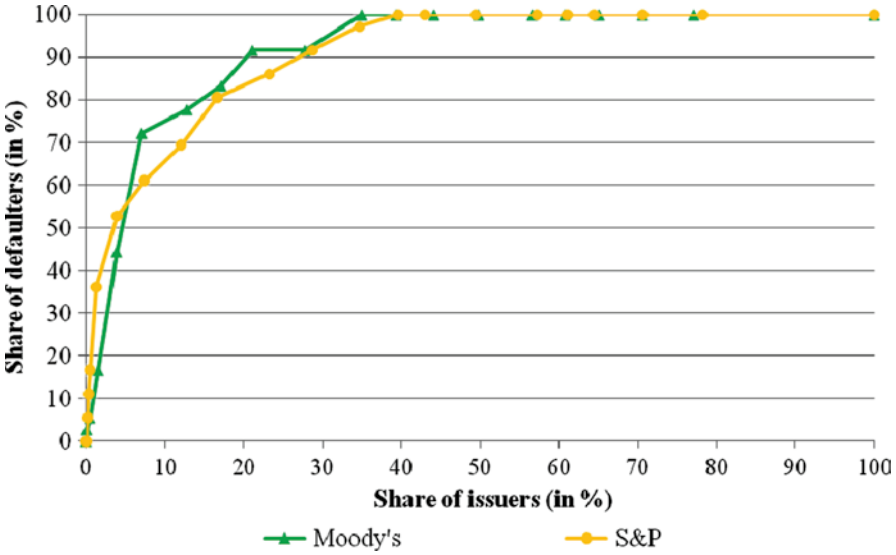

Fig. 8.5 Three-year CAPs, 1 January 1987 to 1 January 2011. *Sources*: Author's computations

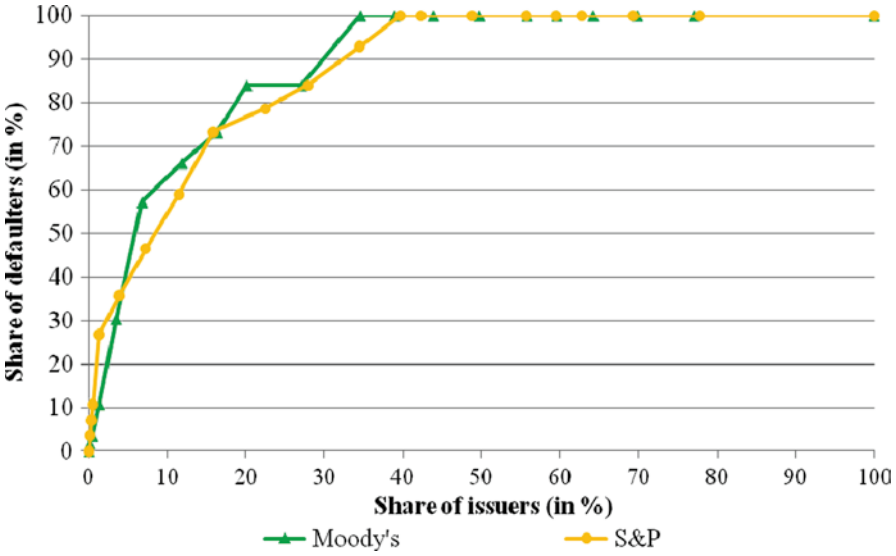

Fig. 8.6 Five-year CAPs, 1 January 1987 to 1 January 2011. *Sources*: Author's computations

Table 8.25 Accuracy ratios, 1 January 1987 to 1 January 2011

	One-year accuracy ratio	Three-year accuracy ratio	Five-year accuracy ratio
Moody's	0.935	0.840	0.787
S&P	0.950	0.823	0.761

Sources: Author's computations

category and above. But such comparison of CAP curves does not establish which agency's ratings are the best predictor of default because, as mentioned previously, the curves cross each other. Therefore, computing ARs is the best way to measure the ratings performance of Moody's and S&P.

Table 8.25 summarizes the ARs for these two agencies. The S&P ARs are better at the 1-year horizon, but the Moody's ratings outperform in the longer term. There are two reasons why S&P exhibits lower performance than Moody's at the 3- and 5-year horizons. First, S&P assigned the higher rating to a country that subsequently defaulted: Indonesia was rated BBB by S&P (vs. Baa3 by Moody's) from 3 to 5 years prior to its 1999 and 2000 defaults. Second, defaulting sovereign issuers that were rated within the BB category by S&P prior to their bankruptcy outnumber those rated within the Ba rating category by Moody's. Symmetrically, the lower performance of Moody's at the 1-year horizon originates in the higher proportion of nondefaulting countries among the higher-risk portion of the rating scale (i.e., the B3, Caa1, Caa2, and Caa3 categories).

These findings are particularly relevant to guiding investment decisions. The S&P ratings are more suitable for short-term strategies, whereas the Moody's ratings provide the most valuable information in the medium term. For investment-grade bondholders, the ratings of the two agencies are roughly equivalent. For speculative-grade bondholders, the analysis must be qualified. S&P ratings are less reliable for upper speculative-grade bond investors (Type I errors), whereas Moody's ratings are less accurate for lower speculative-grade bond investors (Type II errors).

8.5 Conclusions

This chapter sheds new light on the consistency and accuracy of sovereign ratings assigned by Fitch, Moody's, and S&P ratings since 1987.

First of all, Moody's ratings are generally more stable than Fitch and S&P ratings. However, Moody's adjusts its ratings more severely through multi-notch upgrades and downgrades. The three CRAs make consistent use of rating outlooks and reviews, and most of their upgrades (downgrades) are preceded by a positive (negative) outlook or review.

Second, the expected hierarchy of cumulative default rates (i.e., higher default rates observed for lower rating categories) as well as high ARs support the view that Fitch, Moody's, and S&P manage to discriminate between defaulters and nondefaulters. The examination of ARs at different time horizons reveals that S&P is the most accurate agency in the short term and that Moody's is the most accurate in the medium term. Fitch's comparatively poor performance is linked to its delay in

downgrading some sovereign issuers that experienced severe financial difficulties (e.g., Argentina in 2001). It is reasonable to assume that as relatively new player in the sovereign rating business Fitch lagged behind its competitors when it came to adjusting ratings.

Finally, upgrades tend to soar in times of low risk aversion (e.g., 1995–1996 and 2004–2007), whereas downgrades are more numerous in times of high risk aversion (e.g., 1992, 1997–1998, 2001, 2008–2009). These findings suggest that sovereign ratings have procyclical effects on sovereign bond markets, a hypothesis that is tested in Chap. 8.

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