

Online Appendix of the paper " How does sovereign bond market integration relate to fundamentals and CDS spreads?"

Appendix A.1 - Summary statistics for sovereign bond returns

Appendix A.2 - Correlations between sovereign bond returns

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Appendix A.9 - Statistics of the sovereign bond integration measures from hedged returns

Appendix A.1 - Summary statistics for sovereign bond returns

Panels A-G of Table A.1 present descriptive statistics of the returns for all-maturity government bond indices and by maturity segments (1-3, 3-5, 5-7, 7-10, and >10) for the developed markets (DMs) and Emerging markets (EMs). Bond index returns of DMs are proxied by CITI/SSS except for Canada, Germany, Japan, and Portugal, we use the Bank of America Merrill Lynch (BOA ML) and for Singapore, we use JP Morgan because of longer historical span. The emerging markets bond index returns are proxied by the JP Morgan indices. The bond indices for Malaysia, Mexico and Taiwan are from CITI/SSS. Returns are monthly percentage, denominated in USD. The period is from January 1986 or later to December 2012. For each country and maturity band, the panels present the annualized mean and standard deviation (SD) over the whole sample period, skewness, kurtosis, and first order autocorrelation. B-J is the Bera-Jarque test for normality based on excess skewness and kurtosis. Q is the Ljung-Box test for autocorrelation of order 12 for the returns and the returns squared. EN-AN and EN-AP are respectively the Engle-Ng (1993) negative size bias and positive size bias test on the returns.

Panel A- Developed markets (all-maturity)

	country code	Start Date	Annualized		Skew.	Kur.	Auto-Corr	B-J	P-value	Q(z) ₁₂	p-value	Q(z ²) ₁₂	p-value	EN-AN	p-value	EN-AP	p-value
			Mean	SD													
Australia	AUS	Jan-86	11.69%	12.61%	-0.50	1.08	-0.01	29.09	0.00	14.99	0.24	40.34	0.00	-2.32	0.01	-0.89	0.19
Austria	AUT	Sep-92	6.79%	10.76%	0.02	0.97	0.07	9.45	0.02	10.72	0.55	18.47	0.10	1.49	0.07	2.41	0.01
Belgium	BEL	Dec-90	7.67%	11.25%	-0.09	0.96	0.10	10.45	0.01	17.33	0.14	10.97	0.53	1.52	0.06	1.72	0.04
Canada	CAN	Jan-86	9.58%	8.87%	-0.44	1.89	-0.03	58.60	0.00	5.94	0.92	13.58	0.33	-0.84	0.20	0.28	0.39
Denmark	DNK	Mar-89	8.99%	11.03%	-0.05	1.38	0.04	22.65	0.00	18.20	0.11	19.18	0.08	1.25	0.11	2.50	0.01
Finland	FIN	Dec-94	7.46%	10.76%	0.15	0.66	0.08	4.74	0.07	10.18	0.60	17.07	0.15	1.73	0.04	1.29	0.10
France	FRA	Jan-86	9.55%	11.42%	0.13	0.68	0.04	7.08	0.03	11.25	0.51	14.89	0.25	1.39	0.08	2.22	0.01
Germany	DEU	Jan-86	9.97%	11.64%	0.27	0.50	0.01	6.45	0.04	9.40	0.67	11.07	0.52	0.37	0.36	1.59	0.06
Greece	GRC	Apr-00	6.41%	28.93%	0.01	10.50	0.18	702.28	0.00	49.14	0.00	109.70	0.00	-2.05	0.02	2.90	0.00
Ireland	HUN	Sep-92	7.62%	12.94%	-0.12	2.33	0.04	55.36	0.00	9.50	0.66	36.40	0.00	0.07	0.47	1.43	0.08
Italy	IRL	Jan-86	9.96%	12.57%	-0.30	0.80	0.06	13.26	0.01	8.54	0.74	11.78	0.46	0.59	0.28	1.28	0.10
Japan	JPN	Jan-86	8.48%	12.89%	0.54	2.31	0.10	84.25	0.00	20.82	0.05	14.29	0.28	0.80	0.21	3.11	0.00
Netherlands	NLD	Jan-86	8.94%	11.62%	0.06	0.54	0.05	4.04	0.11	9.71	0.64	19.66	0.07	0.92	0.18	2.09	0.02
New Zealand	NZL	Sep-92	10.18%	12.95%	-0.15	1.27	-0.03	17.17	0.00	21.85	0.04	68.12	0.00	-0.73	0.23	-0.30	0.38
Norway	NOR	Dec-94	7.83%	11.07%	0.05	0.24	-0.01	0.61	0.50	7.36	0.83	10.66	0.56	-1.11	0.13	-0.54	0.29

Panel A- Continued

	country code	Start date	Annualized		Skew.	Kur.	Auto-Corr	B-J	p-value	Q(z) ₁₂	p-value	Q(z ²) ₁₂	p-value	EN-AN	p-value	EN-AP	p-value
Portugal	PRT	Sep-93	7.66%	13.57%	0.05	1.58	-0.02	24.01	0.00	27.13	0.01	154.86	0.00	-2.18	0.02	2.96	0.00
Singapore	SGP	Sep-03	6.77%	7.23%	-0.36	1.54	-0.08	18.70	0.00	16.20	0.18	7.82	0.80	0.92	0.18	0.86	0.20
Spain	ESP	Dec-90	6.89%	12.30%	-0.31	0.96	0.03	14.20	0.01	10.69	0.56	14.37	0.28	0.33	0.37	0.77	0.22
Sweden	SWE	Dec-90	7.73%	12.13%	0.01	0.14	0.06	0.21	0.50	12.34	0.42	22.70	0.03	-1.74	0.04	-0.10	0.46
Switzerland	CHE	Jan-86	8.37%	12.68%	0.29	0.82	0.02	13.72	0.01	11.34	0.50	5.22	0.95	0.89	0.19	0.84	0.20
UK	GBR	Jan-86	9.53%	11.96%	0.00	0.87	0.10	10.33	0.01	27.53	0.01	54.93	0.00	0.37	0.36	1.84	0.03

Panel B- Emerging markets (all-maturity)

	country code	Start date	Annualized		Skew.	Kur.	Auto-Corr	B-J	p-value	Q(z) ₁₂	p-value	Q(z ²) ₁₂	p-value	EN-AN	p-value	EN-AP	p-value
Brazil	BRA	Jan-02	16.65%	20.12%	-1.01	3.41	-0.10	86.37	0.00	10.79	0.55	42.36	0.00	-4.77	0.00	0.75	0.23
Chile	CHL	Nov-02	8.62%	12.77%	-1.13	3.69	0.12	95.46	0.00	18.41	0.10	19.46	0.08	-2.33	0.01	-0.40	0.34
China	CHN	Dec-03	6.94%	3.81%	0.04	2.56	0.25	29.45	0.00	29.24	0.00	10.38	0.58	0.84	0.20	3.02	0.00
Colombia	COL	Jan-03	18.40%	16.66%	-0.40	0.95	0.02	7.60	0.03	15.69	0.21	32.56	0.00	-3.28	0.00	-1.01	0.16
Czech Rep.	CZE	Dec-00	13.86%	15.13%	-0.39	0.64	0.02	5.86	0.05	11.56	0.48	19.34	0.08	1.31	0.10	0.30	0.38
Hungary	HUN	Dec-00	12.99%	22.04%	-0.79	1.87	0.01	32.28	0.00	9.43	0.67	40.32	0.00	-1.73	0.04	0.92	0.18
India	IND	Dec-01	6.64%	10.59%	0.75	3.99	0.07	99.75	0.00	9.51	0.66	7.48	0.82	-0.24	0.40	-0.64	0.26
Indonesia	IDN	Jan-03	16.91%	21.20%	0.24	7.60	0.05	289.78	0.00	16.47	0.17	41.05	0.00	-1.58	0.06	-0.55	0.29
Korea	KOR	Dec-00	8.25%	14.08%	0.45	5.59	-0.15	193.32	0.00	23.53	0.02	83.62	0.00	-7.84	0.00	1.14	0.13
Malaysia	MYS	Dec-01	6.17%	6.87%	-0.58	2.14	-0.03	32.53	0.00	9.86	0.63	20.84	0.05	-1.26	0.10	-0.37	0.35
Mexico	MEX	Dec-01	8.13%	14.38%	-0.18	4.85	-0.07	129.87	0.00	15.69	0.21	28.17	0.01	-5.02	0.00	-1.92	0.03
Poland	POL	Sep-98	12.55%	16.98%	-0.39	1.08	0.08	12.75	0.01	11.09	0.52	13.47	0.34	-1.43	0.08	-0.54	0.29
South Africa	ZAF	Aug-00	10.49%	21.49%	-0.12	0.83	-0.07	3.47	0.11	16.81	0.16	17.98	0.12	-0.28	0.39	-0.27	0.39
Taiwan	TAI	Jun-00	4.27%	5.67%	-0.15	0.32	-0.01	0.78	0.50	7.67	0.81	5.88	0.92	-0.10	0.46	1.09	0.14
Thailand	THA	Dec-01	8.74%	9.29%	0.13	0.56	0.04	2.07	0.28	11.96	0.45	19.57	0.08	-2.41	0.01	0.06	0.48
Turkey	TUR	Apr-04	14.58%	18.81%	-0.89	3.32	0.07	62.07	0.00	5.37	0.94	9.67	0.65	-1.08	0.14	-1.43	0.08

Panel C- 1-3 Maturity

	Start date	Annualized		Skew.	Kur.	Auto-Corr	B-J	p-value	Q(z) ₁₂	p-value	Q(z ²) ₁₂	p-value	EN-AN	p-value	EN-AP	p-value
		Mean	SD													
Australia	Jan-86	10.40%	11.87%	-0.43	1.07	0.00	25.65	0.00	13.36	0.34	57.72	0.00	-3.15	0.00	-1.12	0.13
Austria	Sep-92	4.92%	10.39%	0.06	0.74	0.04	5.74	0.05	8.80	0.72	15.10	0.24	1.43	0.08	0.29	0.38
Belgium	Dec-90	5.81%	10.88%	-0.04	0.68	0.07	5.11	0.06	14.76	0.25	11.39	0.50	1.21	0.11	0.13	0.45
Canada	Jan-86	7.91%	7.59%	-0.49	2.99	-0.04	133.40	0.00	5.88	0.92	45.92	0.00	-1.16	0.12	1.77	0.04
Denmark	Mar-89	7.22%	10.83%	-0.08	0.77	0.05	7.31	0.03	15.74	0.20	15.14	0.23	0.95	0.17	0.29	0.39
Finland	Dec-94	5.07%	10.27%	0.11	0.76	0.03	5.59	0.05	10.42	0.58	15.46	0.22	1.25	0.11	-0.06	0.48
France	Jan-86	7.79%	10.91%	-0.02	0.32	0.02	1.37	0.47	7.91	0.79	13.15	0.36	1.32	0.09	0.39	0.35
Germany	Jan-86	7.24%	11.55%	0.04	0.33	0.02	1.57	0.42	5.73	0.93	17.67	0.13	-0.01	0.50	0.83	0.20
Greece	Apr-00	-2.57%	17.39%	-1.57	5.43	0.35	236.21	0.00	60.63	0.00	72.69	0.00	-5.51	0.00	-1.47	0.07
Ireland	Sep-92	7.10%	10.95%	0.29	1.35	-0.05	20.42	0.00	13.70	0.32	32.62	0.00	-0.01	0.50	-0.40	0.35
Italy	Jan-86	8.82%	11.67%	-0.26	0.99	0.05	16.86	0.00	7.93	0.79	12.04	0.44	0.24	0.41	1.22	0.11
Japan	Jan-86	6.28%	11.84%	0.51	1.80	0.06	57.78	0.00	32.85	0.00	11.26	0.51	1.34	0.09	2.64	0.00
Netherlands	Jan-86	7.50%	11.25%	-0.01	0.40	0.04	2.14	0.31	7.65	0.81	15.72	0.20	0.84	0.20	0.58	0.28
New Zealand	Sep-92	9.36%	12.93%	-0.15	1.83	-0.02	34.45	0.00	22.44	0.03	97.32	0.00	-3.25	0.00	-0.69	0.25
Norway	Dec-94	6.13%	11.12%	-0.04	0.18	0.00	0.33	0.50	10.27	0.59	10.58	0.57	-1.20	0.12	-1.11	0.13
Portugal	Sep-93	7.14%	11.63%	-0.08	2.04	-0.04	40.29	0.00	16.14	0.18	28.09	0.01	-0.48	0.32	1.47	0.07
Singapore	Sep-03	4.34%	6.21%	-0.70	3.33	-0.08	84.83	0.00	14.74	0.26	12.92	0.38	-0.76	0.22	0.03	0.49
Spain	Dec-90	5.76%	11.24%	-0.22	0.70	0.03	7.46	0.03	10.77	0.55	10.93	0.53	-0.30	0.38	-0.31	0.38
Sweden	Dec-90	5.88%	11.92%	0.02	0.28	0.05	0.85	0.50	8.79	0.72	37.61	0.00	-3.88	0.00	-1.36	0.09
Switzerland	Jan-86	6.96%	12.45%	0.15	1.04	-0.01	15.94	0.00	11.36	0.50	5.75	0.93	-0.14	0.45	0.59	0.28
UK	Jan-86	7.77%	10.36%	-0.15	1.10	0.08	17.50	0.00	16.82	0.16	46.59	0.00	-0.42	0.34	1.65	0.05
Czech Rep.	Dec-00	11.13%	14.23%	-0.30	0.47	0.01	3.39	0.13	14.18	0.29	23.70	0.02	0.84	0.20	-0.19	0.42
Hungary	Dec-00	12.63%	19.79%	-0.70	1.56	0.00	24.90	0.00	10.21	0.60	35.27	0.00	-1.11	0.13	1.04	0.15
Korea	Dec-00	7.53%	12.92%	0.17	5.18	-0.13	161.68	0.00	18.60	0.10	108.00	0.00	-8.97	0.00	0.61	0.27
Malaysia	Dec-01	6.34%	6.65%	-0.63	1.98	-0.07	22.12	0.00	12.08	0.44	17.17	0.14	-1.55	0.06	-0.58	0.28
Mexico	Dec-01	6.32%	11.26%	-0.85	3.66	0.07	72.58	0.00	15.68	0.21	20.01	0.07	-5.16	0.00	-1.99	0.02
Poland	Sep-98	11.12%	15.79%	-0.44	1.16	0.07	15.15	0.01	11.77	0.46	17.97	0.12	-2.09	0.02	-1.32	0.09
South Africa	Aug-00	8.04%	19.99%	-0.27	0.37	0.03	1.64	0.35	9.09	0.70	16.71	0.16	-0.34	0.37	-0.36	0.36
Taiwan	Jun-00	2.97%	5.79%	0.03	0.67	0.03	1.79	0.32	9.52	0.66	7.05	0.85	-0.43	0.34	0.49	0.31

Panel D- 3-5 Maturity

	Start date	Annualized		Skew.	Kur.	Auto-Corr	B-J	p-value	Q(z) ₁₂	p-value	Q(z ²) ₁₂	p-value	EN-AN	p-value	EN-AP	p-value
		Mean	SD													
Australia	Jan-86	11.34%	12.24%	-0.46	0.96	-0.01	23.82	0.00	14.00	0.30	38.85	0.00	-2.70	0.00	-1.09	0.14
Austria	Sep-92	6.24%	10.57%	0.12	0.82	0.05	7.37	0.03	9.85	0.63	13.22	0.35	1.69	0.05	1.32	0.09
Belgium	Dec-90	7.08%	11.05%	-0.02	0.75	0.09	6.15	0.04	15.97	0.19	9.51	0.66	1.73	0.04	0.73	0.23
Canada	Jan-86	9.03%	8.15%	-0.42	1.97	-0.03	62.00	0.00	6.08	0.91	22.29	0.03	-0.88	0.19	1.12	0.13
Denmark	Mar-89	8.28%	11.03%	0.01	0.86	0.03	8.83	0.02	17.45	0.13	15.37	0.22	1.28	0.10	1.43	0.08
Finland	Dec-94	6.61%	10.60%	0.12	0.61	0.05	3.71	0.12	11.25	0.51	15.83	0.20	1.61	0.05	0.93	0.18
France	Jan-86	9.04%	11.08%	0.10	0.45	0.03	3.31	0.16	8.55	0.74	13.88	0.31	1.65	0.05	1.33	0.09
Germany	Jan-86	8.97%	11.75%	0.13	0.42	0.02	3.17	0.17	11.43	0.49	15.54	0.21	-0.15	0.44	1.26	0.10
Greece	Apr-00	-2.80%	19.29%	-1.71	6.47	0.19	320.77	0.00	35.87	0.00	47.42	0.00	-3.53	0.00	-0.90	0.18
Ireland	Sep-92	8.83%	12.80%	0.24	2.83	0.03	73.16	0.00	18.21	0.11	39.88	0.00	-0.13	0.45	0.92	0.18
Italy	Jan-86	8.95%	12.22%	-0.31	0.85	0.07	14.47	0.01	13.92	0.31	8.10	0.78	0.84	0.20	1.25	0.11
Japan	Jan-86	7.34%	12.24%	0.52	1.92	0.07	64.12	0.00	31.19	0.00	11.52	0.48	1.26	0.10	3.16	0.00
Netherlands	Jan-86	8.46%	11.41%	0.06	0.40	0.05	2.30	0.28	8.25	0.77	15.30	0.23	1.05	0.15	1.28	0.10
New Zealand	Sep-92	10.04%	13.09%	-0.10	1.36	-0.04	17.42	0.00	20.70	0.05	71.24	0.00	-1.44	0.08	-0.33	0.37
Norway	Dec-94	7.64%	11.15%	0.03	0.17	0.00	0.29	0.50	6.03	0.91	8.87	0.71	-0.86	0.19	-0.63	0.26
Portugal	Sep-93	7.36%	14.05%	0.18	2.03	-0.09	37.34	0.00	39.73	0.00	162.22	0.00	-2.96	0.00	2.39	0.01
Singapore	Sep-03	6.34%	6.81%	-0.61	2.64	-0.09	55.02	0.00	17.33	0.14	12.79	0.38	0.21	0.42	-0.32	0.37
Spain	Dec-90	6.82%	11.91%	-0.20	0.76	0.01	8.10	0.02	9.31	0.68	11.57	0.48	0.35	0.36	-0.08	0.47
Sweden	Dec-90	7.01%	12.05%	0.06	0.11	0.04	0.28	0.50	10.29	0.59	26.55	0.01	-2.56	0.01	-0.77	0.22
Switzerland	Jan-86	7.72%	12.50%	0.24	0.88	0.01	13.45	0.01	10.58	0.57	5.11	0.95	0.32	0.37	0.58	0.28
UK	Jan-86	8.61%	10.76%	0.03	0.94	0.10	12.01	0.01	22.63	0.03	59.49	0.00	0.26	0.40	2.05	0.02
Czech Rep.	Dec-00	12.86%	14.77%	-0.33	0.47	0.01	3.65	0.11	12.61	0.40	24.32	0.02	0.85	0.20	0.13	0.45
Hungary	Dec-00	13.14%	22.25%	-0.66	1.46	0.00	22.14	0.00	10.69	0.56	46.46	0.00	-1.75	0.04	1.04	0.15
Korea	Dec-00	8.38%	14.00%	0.20	4.77	-0.14	137.55	0.00	21.27	0.05	89.89	0.00	-7.42	0.00	0.98	0.16
Malaysia	Dec-01	7.02%	7.20%	-0.57	1.83	-0.06	18.62	0.00	11.74	0.47	14.53	0.27	-0.99	0.16	-0.95	0.17
Mexico	Dec-01	7.54%	12.15%	-0.66	3.32	0.02	56.98	0.00	13.46	0.34	20.22	0.06	-4.70	0.00	-2.00	0.02
Poland	Sep-98	11.95%	16.97%	-0.33	1.01	0.07	10.49	0.01	10.79	0.55	11.96	0.45	-1.74	0.04	-0.89	0.19
South Africa	Aug-00	14.29%	17.51%	-0.49	0.74	-0.02	5.56	0.05	14.60	0.26	14.52	0.27	-1.05	0.15	0.11	0.45
Taiwan	Jun-00	3.51%	5.73%	-0.04	0.68	0.02	1.85	0.31	9.28	0.68	9.04	0.70	-0.18	0.43	0.56	0.29

Panel E- 5-7 Maturity

	Start date	Annualized		Skew.	Kur.	Auto-Corr	B-J	p-value	Q(z) ₁₂	p-value	Q(z ²) ₁₂	p-value	EN-AN	p-value	EN-AP	p-value
		Mean	SD													
Australia	Jan-86	12.14%	12.69%	-0.50	1.09	-0.02	29.27	0.00	14.39	0.28	31.35	0.00	-2.22	0.01	-0.80	0.21
Austria	Sep-92	7.04%	10.81%	0.09	0.88	0.07	8.17	0.02	11.12	0.52	16.47	0.17	1.64	0.05	2.09	0.02
Belgium	Dec-90	7.96%	11.33%	-0.04	0.88	0.09	8.61	0.02	16.54	0.17	9.10	0.69	1.80	0.04	1.45	0.07
Canada	Jan-86	9.71%	9.87%	0.15	3.84	-0.12	200.49	0.00	11.36	0.50	34.55	0.00	-0.56	0.29	1.49	0.07
Denmark	Mar-89	9.15%	11.28%	-0.02	1.01	0.02	12.08	0.01	18.28	0.11	18.65	0.10	1.36	0.09	2.21	0.01
Finland	Dec-94	8.86%	15.29%	2.54	29.44	-0.21	7624.1	0.00	12.21	0.43	16.94	0.15	0.65	0.26	15.74	0.00
France	Jan-86	9.76%	11.43%	0.15	0.54	0.03	5.16	0.07	10.37	0.58	13.81	0.31	1.39	0.08	1.90	0.03
Germany	Jan-86	9.74%	12.08%	0.18	0.50	0.02	5.00	0.07	12.78	0.39	17.73	0.12	-0.10	0.46	1.81	0.04
Greece	Apr-00	-2.16%	20.48%	-1.72	6.93	0.15	358.70	0.00	25.31	0.01	51.38	0.00	-2.86	0.00	-0.82	0.21
Ireland	Sep-92	8.55%	12.06%	-0.37	2.62	-0.01	60.64	0.00	8.37	0.76	33.99	0.00	-1.14	0.13	-0.29	0.39
Italy	Jan-86	9.19%	12.85%	-0.29	1.06	0.06	16.86	0.00	12.80	0.38	11.30	0.50	0.69	0.25	0.80	0.21
Japan	Jan-86	8.17%	12.77%	0.49	1.77	0.09	55.17	0.00	31.15	0.00	14.79	0.25	0.83	0.20	3.69	0.00
Netherlands	Jan-86	9.16%	11.70%	0.08	0.43	0.05	2.78	0.21	9.29	0.68	19.38	0.08	0.90	0.19	1.87	0.03
New Zealand	Sep-92	10.15%	13.15%	-0.18	1.18	-0.02	13.73	0.01	17.45	0.13	67.64	0.00	-0.71	0.24	-0.53	0.30
Norway	Dec-94	7.70%	11.37%	0.09	0.33	-0.04	1.23	0.50	6.81	0.87	9.14	0.69	-1.03	0.15	-0.56	0.29
Portugal	Sep-93	7.84%	16.33%	0.36	2.68	-0.06	63.59	0.00	41.11	0.00	244.50	0.00	-3.41	0.00	2.96	0.00
Singapore	Sep-03	7.52%	7.70%	-0.36	1.51	-0.08	18.32	0.00	19.90	0.07	10.50	0.57	0.69	0.24	-0.07	0.47
Spain	Dec-90	7.33%	12.55%	-0.14	0.94	0.00	10.06	0.01	7.67	0.81	15.74	0.20	0.01	0.50	0.29	0.39
Sweden	Dec-90	7.87%	12.27%	0.06	0.08	0.05	0.23	0.50	12.14	0.43	20.68	0.06	-1.64	0.05	-0.24	0.40
Switzerland	Jan-86	8.25%	12.63%	0.31	0.89	0.02	15.91	0.00	10.62	0.56	4.45	0.97	0.54	0.29	0.72	0.24
UK	Jan-86	9.29%	11.40%	0.12	1.00	0.10	14.16	0.01	26.88	0.01	69.50	0.00	0.38	0.35	2.06	0.02
Czech Rep.	Dec-00	12.13%	15.43%	-0.46	0.43	0.01	5.30	0.05	16.08	0.19	29.06	0.00	1.34	0.09	-0.05	0.48
Hungary	Dec-00	14.02%	25.04%	-0.64	1.40	-0.01	18.52	0.00	10.35	0.59	39.94	0.00	-1.70	0.05	0.34	0.37
Korea	Dec-00	6.06%	16.36%	0.75	5.35	-0.18	118.44	0.00	18.44	0.10	48.23	0.00	-6.53	0.00	1.03	0.15
Malaysia	Dec-01	7.74%	7.70%	-0.60	2.01	0.00	22.08	0.00	12.50	0.41	14.81	0.25	-0.92	0.18	-0.31	0.38
Mexico	Dec-01	8.50%	13.38%	-0.57	2.93	-0.02	44.19	0.00	13.29	0.35	22.20	0.04	-4.52	0.00	-2.17	0.02
Poland	Sep-98	9.84%	18.70%	-0.50	0.61	0.01	6.80	0.03	9.40	0.67	18.35	0.11	-1.72	0.04	-1.49	0.07
South Africa	Aug-00	14.05%	20.94%	0.02	1.13	0.04	7.78	0.03	6.71	0.88	10.19	0.60	-0.69	0.24	0.77	0.22
Taiwan	Jun-00	4.20%	5.69%	-0.08	0.53	0.00	1.23	0.47	8.00	0.79	7.07	0.85	0.08	0.47	0.49	0.31

Panel F- 7-10 Maturity

	Start date	Annualized		Skew.	Kur.	Auto-Corr	B-J	p-value	Q(z) ₁₂	p-value	Q(z ²) ₁₂	p-value	EN-	p-value	EN-	p-value
		Mean	SD										AN		AP	
Australia	Jan-86	12.64%	13.31%	-0.50	1.04	-0.02	28.07	0.00	16.15	0.18	29.11	0.00	-1.75	0.04	-0.62	0.27
Austria	Sep-92	7.63%	11.15%	-0.01	1.00	0.08	10.16	0.01	12.14	0.43	19.96	0.07	1.52	0.07	2.70	0.00
Belgium	Dec-90	8.70%	11.77%	-0.13	1.11	0.09	14.29	0.01	18.10	0.11	11.90	0.45	1.49	0.07	2.11	0.02
Canada	Jan-86	10.24%	9.47%	-0.31	1.52	-0.04	36.38	0.00	7.04	0.86	12.95	0.37	-1.11	0.13	-0.44	0.33
Denmark	Mar-89	9.93%	11.69%	-0.06	1.08	0.02	14.09	0.01	22.98	0.03	23.85	0.02	1.10	0.14	2.80	0.00
Finland	Dec-94	9.02%	11.15%	0.00	0.85	0.09	6.56	0.04	11.08	0.52	22.55	0.03	1.45	0.07	2.51	0.01
France	Jan-86	10.35%	11.96%	0.20	0.84	0.04	11.74	0.01	13.02	0.37	13.89	0.31	1.19	0.12	2.15	0.02
Germany	Jan-86	9.61%	12.13%	0.06	0.71	0.05	6.79	0.03	13.41	0.34	10.38	0.58	0.91	0.18	2.18	0.01
Greece	Apr-00	-2.30%	20.43%	-1.39	4.35	0.20	159.91	0.00	25.17	0.01	62.85	0.00	-3.74	0.00	-0.97	0.17
Ireland	Sep-92	9.51%	13.77%	-0.25	2.87	0.03	81.91	0.00	10.94	0.53	37.01	0.00	-0.36	0.36	1.46	0.07
Italy	Jan-86	9.48%	13.77%	-0.27	0.81	0.06	10.25	0.01	9.62	0.65	15.43	0.22	0.51	0.31	1.26	0.11
Japan	Jan-86	8.91%	13.53%	0.44	1.49	0.09	40.62	0.00	31.62	0.00	25.43	0.01	0.13	0.45	4.03	0.00
Netherlands	Jan-86	9.50%	12.13%	0.04	0.53	0.04	3.90	0.12	11.74	0.47	22.33	0.03	0.72	0.24	2.32	0.01
New Zealand	Sep-92	11.20%	13.62%	-0.20	0.80	-0.02	8.04	0.02	18.00	0.12	44.97	0.00	0.42	0.34	-0.14	0.44
Norway	Dec-94	8.94%	11.52%	0.07	0.39	-0.01	1.54	0.41	6.66	0.88	11.84	0.46	-0.77	0.22	-0.26	0.40
Portugal	Sep-93	8.89%	15.31%	0.11	2.18	-0.01	45.72	0.00	27.88	0.01	265.76	0.00	-3.17	0.00	2.87	0.00
Singapore	Sep-03	9.62%	8.86%	-0.27	1.08	-0.11	6.76	0.03	19.57	0.08	5.39	0.94	1.43	0.08	1.64	0.05
Spain	Dec-90	8.15%	13.32%	-0.23	1.04	0.00	14.11	0.01	10.25	0.59	16.80	0.16	0.14	0.44	0.54	0.29
Sweden	Dec-90	8.90%	12.79%	0.02	0.15	0.05	0.26	0.50	14.07	0.30	16.89	0.15	-0.83	0.20	0.46	0.32
Switzerland	Jan-86	8.72%	12.77%	0.30	0.70	0.02	11.39	0.01	11.98	0.45	5.71	0.93	1.05	0.15	0.81	0.21
UK	Jan-86	9.84%	12.13%	0.09	0.92	0.09	12.01	0.01	29.74	0.00	70.73	0.00	0.52	0.30	2.05	0.02
Czech Rep.	Dec-00	11.80%	16.18%	-0.60	0.87	0.04	9.04	0.02	14.09	0.29	16.02	0.19	1.33	0.09	0.21	0.42
Hungary	Dec-00	11.27%	27.78%	-0.58	0.99	-0.03	9.53	0.02	8.15	0.77	26.55	0.01	-1.18	0.12	0.06	0.48
Korea	Dec-00	8.59%	16.64%	0.71	5.80	-0.19	166.23	0.00	24.30	0.02	47.94	0.00	-6.00	0.00	1.32	0.09
Malaysia	Dec-01	8.29%	8.96%	-0.77	2.48	0.01	34.04	0.00	12.40	0.41	12.22	0.43	-1.01	0.16	-1.00	0.16
Mexico	na															
Poland	Sep-98	12.10%	19.73%	-0.60	0.75	0.00	9.39	0.02	9.79	0.63	17.21	0.14	-1.23	0.11	-1.30	0.10
South Africa	Aug-00	7.63%	22.03%	-0.02	1.12	-0.10	5.08	0.06	14.83	0.25	18.43	0.10	-0.28	0.39	-0.18	0.43
Taiwan	Jun-00	4.47%	5.78%	-0.06	0.30	-0.02	0.43	0.50	8.39	0.75	5.80	0.93	-0.01	0.50	0.42	0.34

Panel G - >10 Maturity

	Start date	Annualized		Skew.	Kur.	Auto-Corr	B-J	p-value	Q(z) ₁₂	p-value	Q(z ²) ₁₂	p-value	EN-AN	p-value	EN-AP	p-value
		Mean	SD													
Australia	Jan-86	13.36%	14.26%	-0.48	1.11	-0.03	28.99	0.00	16.56	0.17	34.45	0.00	-1.53	0.06	-0.15	0.44
Austria	Sep-92	9.66%	12.89%	-0.08	0.74	0.05	4.42	0.08	11.72	0.47	16.24	0.18	0.91	0.18	2.10	0.02
Belgium	Dec-90	9.22%	12.53%	-0.29	1.52	0.09	29.03	0.00	22.77	0.03	18.67	0.10	0.34	0.37	3.00	0.00
Canada	Jan-86	11.70%	10.68%	-0.24	1.35	-0.03	27.70	0.00	7.06	0.85	13.74	0.32	-1.57	0.06	-0.56	0.29
Denmark	Mar-89	10.78%	12.99%	0.07	2.35	-0.01	57.53	0.00	11.73	0.47	27.83	0.01	0.58	0.28	3.74	0.00
Finland	Dec-94	8.69%	11.63%	-0.13	1.19	0.09	10.21	0.01	13.07	0.36	12.62	0.40	1.24	0.11	2.89	0.00
France	Jan-86	11.47%	13.19%	0.12	0.74	0.04	8.24	0.02	20.89	0.05	15.65	0.21	1.14	0.13	3.01	0.00
Germany	Jan-86	10.06%	13.92%	-0.29	1.72	0.07	43.73	0.00	24.49	0.02	19.10	0.09	0.90	0.18	2.09	0.02
Greece	Apr-00	8.15%	30.14%	-0.02	8.65	0.12	477.26	0.00	34.84	0.00	101.04	0.00	-2.02	0.02	2.64	0.00
Ireland	Sep-92	9.10%	14.19%	-0.42	2.39	0.03	64.64	0.00	5.99	0.92	30.95	0.00	-0.74	0.23	1.26	0.10
Italy	Jan-86	10.95%	14.88%	-0.07	-0.01	0.13	0.19	0.50	12.71	0.39	11.16	0.52	0.91	0.18	0.03	0.49
Japan	Jan-86	9.49%	14.41%	0.40	1.65	0.10	45.16	0.00	28.60	0.00	16.56	0.17	1.42	0.08	4.05	0.00
Netherlands	Jan-86	10.32%	13.08%	0.01	0.68	0.03	6.26	0.04	12.40	0.41	19.38	0.08	0.73	0.23	2.91	0.00
New Zealand	Sep-92	12.61%	13.52%	-0.20	-0.30	0.02	2.17	0.29	15.92	0.20	10.31	0.59	0.53	0.30	0.27	0.39
Norway	Dec-94	5.98%	11.71%	0.50	0.79	-0.55	1.99	0.17	20.16	0.06	7.67	0.81	-2.81	0.00	-0.06	0.48
Portugal	Sep-93	2.41%	21.41%	-0.56	2.01	-0.01	24.58	0.00	5.94	0.92	13.45	0.34	0.44	0.33	3.31	0.00
Singapore	Sep-03	10.69%	10.41%	-0.08	0.53	-0.06	1.43	0.41	13.56	0.33	22.22	0.04	0.64	0.26	3.65	0.00
Spain	Dec-90	8.59%	14.55%	-0.39	1.75	0.03	34.45	0.00	10.61	0.56	20.31	0.06	0.20	0.42	1.52	0.06
Sweden	Dec-90	10.11%	13.82%	-0.05	0.27	0.08	0.95	0.50	16.13	0.19	14.32	0.28	-0.25	0.40	1.06	0.15
Switzerland	Jan-86	9.50%	13.50%	0.32	0.58	0.02	9.99	0.01	12.91	0.38	9.92	0.62	0.97	0.17	1.82	0.04
UK	Jan-86	10.54%	13.70%	-0.05	0.74	0.09	7.49	0.03	25.75	0.01	33.11	0.00	0.47	0.32	1.45	0.07
Czech Rep.	Dec-00	15.65%	17.08%	-0.41	0.70	0.03	6.05	0.04	11.05	0.52	8.75	0.72	1.38	0.08	1.11	0.14
Hungary	Dec-00	11.46%	29.48%	-0.53	0.74	-0.04	6.78	0.03	8.05	0.78	27.73	0.01	-1.29	0.10	0.31	0.38
Korea	Dec-00	8.72%	20.56%	0.91	6.40	-0.25	145.66	0.00	20.45	0.06	26.07	0.01	-4.44	0.00	1.57	0.06
Malaysia	Dec-01	9.94%	10.89%	-0.90	2.79	0.06	44.02	0.00	15.19	0.23	13.27	0.35	-0.88	0.19	-0.16	0.44
Mexico	Dec-01	12.63%	17.75%	-0.19	1.87	-0.08	16.21	0.01	18.64	0.10	23.47	0.02	-4.48	0.00	-2.24	0.01
Poland	Sep-98	9.45%	20.99%	-0.55	0.84	0.01	8.75	0.02	8.83	0.72	19.40	0.08	-0.65	0.26	-0.80	0.21
South Africa	Aug-00	15.24%	23.59%	0.15	1.54	0.02	17.68	0.00	11.57	0.48	13.16	0.36	-0.61	0.27	0.57	0.28
Taiwan	Jun-00	5.29%	6.35%	-0.50	1.48	0.01	12.75	0.01	7.88	0.79	9.18	0.69	0.27	0.39	0.55	0.29

Appendix A.2- Correlations between sovereign bond returns

The table presents cross-correlations among the different maturity bands for DMs and EMs

	All	1-3	3-5	5-7	7-10	>10	All	1-3	3-5	5-7	7-10	>10	All	1-3	3-5	5-7	7-10	>10	All	1-3	3-5	5-7	7-10	>10	
Developed markets																									
<i>Australia</i>						<i>Austria</i>						<i>Belgium</i>						<i>Canada</i>							
All	1.00						1.00						1.00						1.00						
1-3	0.97	1.00					0.96	1.00					0.96	1.00					0.93	1.00					
3-5	1.00	0.99	1.00				0.99	0.99	1.00				0.99	0.99	1.00				0.98	0.97	1.00				
5-7	1.00	0.97	0.99	1.00			1.00	0.97	0.99	1.00			1.00	0.97	0.99	1.00			0.99	0.94	0.99	1.00			
7-10	0.99	0.94	0.97	0.99	1.00		0.99	0.94	0.97	0.99	1.00		0.99	0.93	0.97	0.99	1.00		0.99	0.89	0.96	0.99	1.00		
>10	0.97	0.90	0.95	0.98	0.99	1.00	0.94	0.83	0.88	0.92	0.96	1.00	0.95	0.84	0.89	0.93	0.97	1.00	0.96	0.79	0.89	0.94	0.97	1.00	
<i>Denmark</i>						<i>Finland</i>						<i>France</i>						<i>Germany</i>							
All	1.00						1.00						1.00						1.00						
1-3	0.96	1.00					0.97	1.00					0.96	1.00					0.97	1.00					
3-5	0.98	0.99	1.00				0.98	0.97	1.00				0.99	0.99	1.00				0.99	0.99	1.00				
5-7	0.99	0.96	0.99	1.00			0.96	0.92	0.94	1.00			1.00	0.96	0.99	1.00			1.00	0.97	0.99	1.00			
7-10	0.99	0.93	0.97	0.99	1.00		0.99	0.92	0.96	0.96	1.00		0.99	0.93	0.97	0.99	1.00		0.99	0.95	0.98	0.99	1.00		
>10	0.87	0.72	0.79	0.84	0.88	1.00	0.82	0.73	0.76	0.81	0.84	1.00	0.95	0.83	0.89	0.93	0.97	1.00	0.38	0.35	0.36	0.37	0.37	1.00	
<i>Greece</i>						<i>Ireland</i>						<i>Italy</i>						<i>Japan</i>							
All	1.00						1.00						1.00						1.00						
1-3	0.64	1.00					0.90	1.00					0.98	1.00					0.98	1.00					
3-5	0.66	0.97	1.00				0.95	0.89	1.00				0.96	0.95	1.00				0.99	0.99	1.00				
5-7	0.66	0.94	0.99	1.00			0.82	0.78	0.75	1.00			0.91	0.87	0.93	1.00			1.00	0.98	0.99	1.00			
7-10	0.66	0.94	0.97	0.99	1.00		0.98	0.85	0.94	0.80	1.00		0.87	0.81	0.87	0.95	1.00		0.99	0.95	0.97	0.99	1.00		
>10	0.98	0.61	0.64	0.65	0.66	1.00	0.98	0.82	0.90	0.81	0.97	1.00	0.95	0.87	0.92	0.95	0.97	1.00	0.87	0.80	0.84	0.87	0.89	1.00	
<i>Netherlands</i>						<i>New Zealand</i>						<i>Norway</i>						<i>Portugal</i>							
All	1.00						1.00						1.00						1.00						
1-3	0.97	1.00					0.94	1.00					0.96	1.00					0.95	1.00					
3-5	0.99	0.99	1.00				0.96	0.91	1.00				0.99	0.96	1.00				0.99	0.95	1.00				
5-7	1.00	0.97	0.99	1.00			0.93	0.86	0.87	1.00			0.97	0.92	0.96	1.00			0.99	0.91	0.99	1.00			
7-10	1.00	0.95	0.97	0.99	1.00		0.99	0.90	0.93	0.92	1.00		0.98	0.92	0.96	0.97	1.00		0.99	0.91	0.97	0.99	1.00		
>10	0.95	0.85	0.89	0.93	0.96	1.00	0.82	0.77	0.74	0.74	0.86	1.00	na	na	na	na	na		0.94	0.83	0.90	0.91	0.95	1.00	

Table A.2- continued

	All	1-3	3-5	5-7	7-10	>10	All	1-3	3-5	5-7	7-10	>10	All	1-3	3-5	5-7	7-10	>10	All	1-3	3-5	5-7	7-10	>10			
<i>Singapore</i>							<i>Spain</i>							<i>Sweden</i>							<i>Switzerland</i>						
All	1.00						All	1.00					All	1.00					All	1.00							
1-3	0.99	1.00					0.97	1.00					0.97	1.00				0.98	1.00								
3-5	1.00	0.99	1.00				0.99	0.99	1.00				0.99	0.99	1.00			0.99	0.99	1.00							
5-7	0.97	0.96	0.96	1.00			0.99	0.95	0.99	1.00			1.00	0.96	0.99	1.00		1.00	0.98	0.99	1.00						
7-10	0.99	0.97	0.99	0.99	1.00		0.99	0.93	0.97	0.99	1.00		0.99	0.93	0.97	0.99	1.00	1.00	0.97	0.98	0.99	1.00					
>10	0.95	0.94	0.94	0.96	0.97	1.00	0.85	0.75	0.81	0.87	0.87	1.00	0.95	0.85	0.91	0.95	0.98	1.00	0.98	0.92	0.95	0.96	0.98	1.00			
<i>UK</i>							<i>US</i>																				
All	1.00						All	1.00																			
1-3	0.92	1.00					0.87	1.00																			
3-5	0.96	0.99	1.00				0.95	0.96	1.00																		
5-7	0.98	0.96	0.99	1.00			0.98	0.91	0.98	1.00																	
7-10	0.99	0.91	0.96	0.99	1.00		0.99	0.85	0.94	0.98	1.00																
>10	0.98	0.83	0.89	0.93	0.97	1.00	0.95	0.71	0.82	0.90	0.95	1.00															
Emerging markets																											
	All	1-3	3-5	5-7	7-10	>10	All	1-3	3-5	5-7	7-10	>10	All	1-3	3-5	5-7	7-10	>10	All	1-3	3-5	5-7	7-10	>10			
<i>Czech Rep</i>							<i>Hungary</i>							<i>Korea</i>							<i>Malaysia</i>						
All	1.00						All	1.00					All	1.00					All	1.00							
1-3	0.97	1.00					0.95	1.00					0.93	1.00				0.96	1.00								
3-5	0.98	0.99	1.00				0.96	0.99	1.00				0.92	0.99	1.00			0.99	0.98	1.00							
5-7	0.99	0.96	0.98	1.00			0.95	0.98	0.99	1.00			0.94	0.98	0.97	1.00		0.99	0.95	0.98	1.00						
7-10	0.99	0.94	0.96	0.99	1.00		0.99	0.97	0.99	0.99	1.00		0.99	0.97	0.99	0.98	1.00	0.97	0.87	0.93	0.97	1.00					
>10	0.97	0.90	0.93	0.96	0.99	1.00	0.99	0.96	0.98	0.99	0.99	1.00	0.97	0.94	0.96	0.98	0.96	1.00	0.90	0.76	0.84	0.89	0.96	1.00			
<i>Mexico</i>							<i>Poland</i>							<i>South Africa</i>							<i>Taiwan</i>						
All	1.00						All	1.00					All	1.00					All	1.00							
1-3	0.96	1.00					0.99	1.00					0.99	1.00				0.99	1.00								
3-5	0.99	0.99	1.00				1.00	0.99	1.00				1.00	0.99	1.00			1.00	0.99	1.00							
5-7	0.99	0.96	0.99	1.00			0.97	0.96	0.96	1.00			0.97	0.96	0.96	1.00		0.97	0.96	0.96	1.00						
7-10	na	na	na	na	na		0.99	0.97	0.99	0.99	1.00		0.99	0.97	0.99	0.99	1.00	0.99	0.97	0.99	0.99	1.00					
>10	0.95	0.86	0.91	0.94	1.00		0.95	0.94	0.94	0.96	0.97	1.00	0.95	0.94	0.94	0.96	0.97	1.00	0.95	0.94	0.94	0.96	0.97	1.00			

Appendix A.3- Correlations between sovereign bond, diversification portfolio and world bond index

Panels A-F of Table A.3 present the cross-correlation between each bond index return j , its corresponding Diversification Portfolio (DP_j) and the World Bond Market Portfolio (W) as well as correlations between DP_j and W . Panel A displays the all-maturity government bond indices for the developed markets (DMs) and Emerging markets (EMs). Panels B-F display by maturity segments (1-3, 3-5, 5-7, 7-10, and >10). The diversification portfolios are constructed from Eq. (3) of the paper. The substitute assets are detailed in Appendix A of the paper.

Panel A- All-maturity

	AUS	AUT	BEL	CAN	DNK	FIN	FRA	DEU	GRC	HUN	IRL	JPN	NLD	NZL	NOR	PRT	SGP	ESP	SWE	CHE	GBR
$\rho(R_j, R_w)$	0.41	0.85	0.83	0.38	0.84	0.82	0.74	0.82	0.35	0.73	0.61	0.67	0.73	0.58	0.64	0.63	0.70	0.76	0.70	0.68	0.61
$\rho(R_j, DP_j)$	0.72	0.91	0.90	0.80	0.91	0.90	0.79	0.87	0.63	0.81	0.71	0.75	0.78	0.75	0.82	0.75	0.79	0.87	0.78	0.72	0.65
$\rho(DP_j, R_w)$	0.62	0.92	0.91	0.49	0.92	0.90	0.93	0.94	0.59	0.89	0.84	0.87	0.93	0.77	0.76	0.85	0.88	0.87	0.87	0.94	0.93
	BRA	CHL	CHN	COL	CZE	HUN	IND	IDN	KOR	MYS	MEX	POL	ZAF	TAI	THA	TUR					
$\rho(R_j, R_w)$	0.11	0.30	0.17	0.31	0.71	0.52	0.36	0.32	0.49	0.43	0.23	0.52	0.43	0.55	0.52	0.30					
$\rho(R_j, DP_j)$	0.72	0.63	0.29	0.63	0.85	0.82	0.54	0.70	0.73	0.68	0.68	0.74	0.71	0.69	0.60	0.70					
$\rho(DP_j, R_w)$	0.11	0.60	0.39	0.47	0.83	0.61	0.52	0.46	0.69	0.55	0.36	0.70	0.66	0.80	0.87	0.49					

Panel B- 1-3 Maturity

	AUS	AUT	BEL	CAN	DNK	FIN	FRA	DEU	GRC	HUN	IRL	JPN	NLD	NZL	NOR	PRT	SGP	ESP	SWE	CHE	GBR
$\rho(R_j, R_w)$	0.35	0.77	0.77	0.31	0.78	0.78	0.68	0.67	0.56	0.73	0.61	0.64	0.68	0.51	0.60	0.67	0.59	0.74	0.64	0.64	0.53
$\rho(R_j, DP_j)$	0.73	0.91	0.90	0.93	0.92	0.92	0.79	0.76	0.79	0.86	0.73	0.71	0.78	0.75	0.83	0.82	0.79	0.89	0.81	0.71	0.64
$\rho(DP_j, R_w)$	0.54	0.82	0.83	0.32	0.82	0.84	0.85	0.86	0.68	0.83	0.81	0.87	0.85	0.67	0.71	0.81	0.73	0.81	0.75	0.89	0.80
	CZE	HUN	KOR	MYS	MEX	POL	ZAF	TAI													
$\rho(R_j, R_w)$	0.67	0.56	0.49	0.46	0.23	0.49	0.39	0.53													
$\rho(R_j, DP_j)$	0.87	0.83	0.75	0.75	0.77	0.76	0.76	0.77													
$\rho(DP_j, R_w)$	0.76	0.65	0.62	0.64	0.27	0.66	0.59	0.66													

Panel C- 3-5 Maturity

	AUS	AUT	BEL	CAN	DNK	FIN	FRA	DEU	GRC	HUN	IRL	JPN	NLD	NZL	NOR	PRT	SGP	ESP	SWE	CHE	GBR
$\rho(R_j, R_w)$	0.40	0.82	0.81	0.40	0.82	0.83	0.72	0.72	0.54	0.73	0.61	0.66	0.71	0.56	0.62	0.60	0.66	0.75	0.68	0.66	0.58
$\rho(R_j, DP_j)$	0.72	0.91	0.90	0.94	0.91	0.92	0.80	0.78	0.76	0.82	0.72	0.73	0.78	0.74	0.81	0.73	0.80	0.88	0.80	0.72	0.65
$\rho(DP_j, R_w)$	0.60	0.87	0.88	0.41	0.88	0.87	0.90	0.92	0.70	0.86	0.83	0.87	0.91	0.75	0.74	0.82	0.81	0.84	0.82	0.91	0.87
	CZE	HUN	KOR	MYS	MEX	POL	ZAF	TAI													
$\rho(R_j, R_w)$	0.67	0.56	0.49	0.46	0.27	0.49	0.39	0.53													
$\rho(R_j, DP_j)$	0.87	0.83	0.75	0.75	0.77	0.76	0.76	0.77													
$\rho(DP_j, R_w)$	0.76	0.65	0.62	0.64	0.33	0.66	0.59	0.66													

Appendix A.3 continued

Panel D- 5-7 Maturity

	AUS	AUT	BEL	CAN	DNK	FIN	FRA	DEU	GRC	HUN	IRL	JPN	NLD	NZL	NOR	PRT	SGP	ESP	SWE	CHE	GBR
$\rho(R_j, R_w)$	0.42	0.84	0.82	0.45	0.84	0.57	0.73	0.74	0.55	0.70	0.61	0.66	0.73	0.59	0.64	0.56	0.69	0.75	0.70	0.67	0.60
$\rho(R_j, DP_j)$	0.71	0.91	0.89	0.94	0.91	0.69	0.79	0.79	0.77	0.82	0.72	0.73	0.78	0.75	0.81	0.68	0.79	0.85	0.78	0.72	0.66
$\rho(DP_j, R_w)$	0.63	0.91	0.91	0.45	0.91	0.87	0.93	0.94	0.71	0.83	0.83	0.88	0.93	0.76	0.77	0.83	0.88	0.87	0.87	0.93	0.91
	CZE	HUN	KOR	MYS	MEX	POL	ZAF	TAI													
$\rho(R_j, R_w)$	0.67	0.56	0.49	0.46	0.30	0.49	na	0.53													
$\rho(R_j, DP_j)$	0.87	0.83	0.75	0.75	0.68	0.76	na	0.77													
$\rho(DP_j, R_w)$	0.76	0.65	0.62	0.64	0.39	0.66	na	0.66													

Panel E- 7-10 Maturity

	AUS	AUT	BEL	CAN	DNK	FIN	FRA	DEU	GRC	HUN	IRL	JPN	NLD	NZL	NOR	PRT	SGP	ESP	SWE	CHE	GBR
$\rho(R_j, R_w)$	0.43	0.85	0.83	0.44	0.85	0.85	0.74	0.79	0.57	0.73	0.61	0.67	0.73	0.62	0.67	0.59	0.70	0.74	0.70	0.68	0.61
$\rho(R_j, DP_j)$	0.70	0.91	0.89	0.77	0.90	0.91	0.80	0.83	0.78	0.80	0.72	0.74	0.79	0.75	0.81	0.70	0.77	0.83	0.76	0.73	0.66
$\rho(DP_j, R_w)$	0.67	0.93	0.93	0.57	0.93	0.93	0.92	0.95	0.72	0.90	0.85	0.88	0.93	0.81	0.81	0.84	0.91	0.89	0.91	0.94	0.93
	CZE	HUN	KOR	MYS	MEX	POL	ZAF	TAI													
$\rho(R_j, R_w)$	0.71	0.52	0.54	0.47	na	0.56	0.39	0.53													
$\rho(R_j, DP_j)$	0.86	0.80	0.72	0.68	na	0.76	0.70	0.67													
$\rho(DP_j, R_w)$	0.82	0.66	0.75	0.68	na	0.73	0.65	0.80													

Panel F- >10 Maturity

	AUS	AUT	BEL	CAN	DNK	FIN	FRA	DEU	GRC	HUN	IRL	JPN	NLD	NZL	NOR	PRT	SGP	ESP	SWE	CHE	GBR
$\rho(R_j, R_w)$	0.45	0.82	0.81	0.49	0.78	0.84	0.73	0.68	0.36	0.73	0.61	0.67	0.70	0.62	na	0.49	0.70	0.71	0.69	0.68	0.60
$\rho(R_j, DP_j)$	0.70	0.89	0.87	0.93	0.86	0.91	0.80	0.76	0.66	0.79	0.71	0.73	0.78	0.73	na	0.63	0.75	0.80	0.73	0.72	0.67
$\rho(DP_j, R_w)$	0.68	0.93	0.92	0.50	0.92	0.91	0.92	0.91	0.59	0.91	0.86	0.90	0.90	0.84	na	0.78	0.93	0.89	0.94	0.94	0.93
	CZE	HUN	KOR	MYS	MEX	POL	ZAF	TAI													
$\rho(R_j, R_w)$	0.72	0.51	na	0.45	0.29	0.55	0.40	0.52													
$\rho(R_j, DP_j)$	0.82	0.79	na	0.65	0.52	0.73	0.59	0.56													
$\rho(DP_j, R_w)$	0.87	0.67	na	0.73	na	0.74	0.63	0.92													

Appendix A.4 - Summary statistics of the sovereign bond integration measures by maturity segment

Panels A-E reports start date, mean, standard deviation (SD), trend coefficient and its t-stat for the integration measures of the bond indices by maturity segment 1-3, 3-5, 5-7, 7-10, and >10. The integration measures are estimated from the E-L model of Section I. The standard errors for the trend tests of the individual regressions are heteroskedasticity and autocorrelation consistent and are obtained from the Newey-West (1987) correction with six lags. For the trend tests by region, we run panel regressions with country fixed effects and a trend. The standard errors are clustered by country and time. We report the trend coefficient and t-

	Start date	Mean	SD	Trend (×1200)	t-stat	Mean	SD	Trend (×1200)	t-stat	Mean	SD	Trend (×1200)	t-stat
		<i>Panel A- Maturity 1-3</i>				<i>Panel B- Maturity 3-5</i>				<i>Panel C- Maturity 5-7</i>			
Australia	Jan-86	0.45	0.24	1.96	5.29	0.48	0.20	1.53	5.03	0.51	0.17	1.77	9.09
Austria	Sep-92	0.87	0.06	0.73	11.22	0.87	0.05	0.56	8.12	0.87	0.04	0.30	4.89
Belgium	Dec-90	0.84	0.04	0.08	1.73	0.83	0.05	0.06	1.06	0.82	0.05	0.06	1.06
Canada	Jan-86	0.51	0.35	3.74	10.67	0.59	0.31	3.30	11.04	0.63	0.32	3.41	12.09
Denmark	Mar-89	0.87	0.04	0.47	9.10	0.86	0.03	0.10	3.11	0.86	0.03	0.09	3.19
Finland	Dec-94	0.87	0.03	0.22	3.47	0.89	0.02	0.07	2.33	0.78	0.18	3.26	15.24
France	Jan-86	0.67	0.22	2.79	20.12	0.68	0.21	2.59	21.64	0.68	0.21	2.58	22.21
Germany	Jan-86	0.66	0.24	3.00	21.20	0.69	0.22	2.78	23.84	0.70	0.21	2.71	23.80
Greece	Apr-00	0.76	0.12	0.12	0.43	0.73	0.08	-0.42	-1.26	0.75	0.07	-0.76	-2.37
Ireland	Sep-92	0.80	0.06	0.26	1.62	0.80	0.10	0.55	3.62	0.70	0.09	1.12	5.91
Italy	Jan-86	0.56	0.30	3.34	14.03	0.58	0.20	1.65	7.52	0.58	0.28	3.40	9.83
Japan	Jan-86	0.54	0.09	0.07	1.16	0.57	0.09	0.18	4.37	0.60	0.17	1.27	4.94
Netherlands	Jan-86	0.67	0.23	2.90	21.76	0.67	0.22	2.83	23.44	0.68	0.22	2.72	22.59
New Zealand	Sep-92	0.50	0.18	2.21	5.78	0.51	0.16	2.01	5.74	0.52	0.18	1.78	3.96
Norway	Dec-94	0.74	0.05	0.40	4.39	0.70	0.11	1.44	4.87	0.71	0.09	0.91	3.86
Portugal	Sep-93	0.75	0.12	0.77	2.11	0.72	0.16	-0.33	-0.53	0.67	0.19	-0.37	-0.48
Singapore	Sep-03	0.64	0.10	2.05	7.53	0.68	0.02	0.39	4.45	0.67	0.08	0.58	2.45
Spain	Dec-90	0.83	0.08	1.32	15.47	0.80	0.07	0.85	6.52	0.77	0.09	0.91	5.85
Sweden	Dec-90	0.67	0.12	1.85	9.58	0.66	0.12	1.77	10.43	0.64	0.11	1.65	9.48
Switzerland	Jan-86	0.62	0.22	2.63	15.88	0.63	0.21	2.59	16.08	0.62	0.20	2.39	17.23
UK	Jan-86	0.49	0.13	0.67	3.18	0.53	0.16	1.88	15.35	0.55	0.18	2.17	20.19
Czech Rep.	Dec-00	0.77	0.08	0.96	2.60	0.75	0.07	0.75	3.11	0.72	0.07	0.60	1.75
Hungary	Dec-00	0.65	0.17	3.14	4.92	0.62	0.12	0.75	2.22	0.62	0.14	0.63	1.52
Korea	Dec-00	0.55	0.08	0.49	2.19	0.53	0.06	0.11	0.57	0.53	0.30	3.88	1.42
Malaysia	Dec-01	0.49	0.23	7.54	6.01	0.52	0.16	0.96	1.31	0.48	0.17	0.93	1.14
Mexico	Dec-01	0.47	0.28	3.95	2.81	0.51	0.27	4.76	3.49	0.46	0.09	0.22	0.60
Poland	Sep-98	0.58	0.18	3.27	6.34	0.57	0.19	2.95	4.84	0.61	0.22	3.72	3.63
South Africa	Aug-00	0.60	0.15	-0.79	-1.06	0.56	0.04	0.31	2.10	na	na	na	na
Taiwan	Jun-00	0.66	0.08	1.50	3.16	0.63	0.07	-0.49	-1.14	0.55	0.11	3.06	4.38

Appendix A.4 continued

	Start date	Mean	SD	Trend (×1200)	t-stat	Mean	SD	Trend (×1200)	t-stat	Pool	DM & EM	DM	DM ex. Euro	Eurozone	Euro Core	Euro Periph	EM	
	<i>Panel D-Maturity 7-10</i>					<i>Panel E-Maturity >10</i>					<i>Maturity 1-3</i>							
Australia	Jan-86	0.48	0.22	2.17	9.12	0.50	0.21	2.13	9.46	Mean	0.66	0.68	0.60	0.75	0.76	0.74	0.60	
Austria	Sep-92	0.85	0.04	0.17	3.14	0.84	0.06	0.23	2.87	SD	0.13	0.14	0.13	0.10	0.10	0.10	0.10	
Belgium	Dec-90	0.81	0.05	0.13	1.92	0.79	0.06	0.38	2.62	Trend	1.93	1.91	1.72	2.12	2.23	1.92	2.37	
Canada	Jan-86	0.61	0.25	2.57	9.38	0.68	0.23	2.11	8.36	t-stat	6.44	6.12	3.67	5.71	5.50	2.60	3.81	
Denmark	Mar-89	0.85	0.05	0.20	2.41	0.79	0.08	0.33	2.23					<i>Maturity 3-5</i>				
Finland	Dec-94	0.86	0.05	0.30	3.94	0.85	0.03	0.03	0.98	Mean	0.66	0.69	0.62	0.75	0.77	0.73	0.59	
France	Jan-86	0.69	0.13	0.93	6.26	0.66	0.19	2.09	11.31	SD	0.12	0.12	0.11	0.09	0.10	0.09	0.08	
Germany	Jan-86	0.75	0.18	1.82	6.25	0.69	0.17	1.88	12.83	Trend	1.72	1.73	1.76	1.71	2.10	0.96	1.44	
Greece	Apr-00	0.78	0.10	-0.91	-1.66	0.59	0.19	-0.71	-1.14	t-stat	6.81	6.63	4.58	4.84	5.32	2.50	2.53	
Ireland	Sep-92	0.74	0.10	0.20	0.61	0.72	0.08	0.35	2.12					<i>Maturity 5-7</i>				
Italy	Jan-86	0.59	0.28	3.31	7.16	0.62	0.24	3.60	8.37	Mean	0.65	0.68	0.63	0.73	0.76	0.69	0.57	
Japan	Jan-86	0.58	0.11	0.12	1.07	0.60	0.16	0.17	4.52	SD	0.11	0.10	0.10	0.08	0.08	0.08	0.09	
Netherlands	Jan-86	0.67	0.22	2.69	19.84	0.63	0.23	2.70	15.92	Trend	2.01	2.01	1.97	2.07	2.25	1.64	1.80	
New Zealand	Sep-92	0.54	0.14	1.55	5.00	0.50	0.09	0.64	3.54	t-stat	8.84	8.68	6.27	6.17	6.65	2.14	2.67	
Norway	Dec-94	0.69	0.08	0.29	1.43	na	na	na	na					<i>Maturity 7-10</i>				
Portugal	Sep-93	0.67	0.17	0.43	0.81	0.58	0.21	0.07	0.19	Mean	0.65	0.68	0.62	0.74	0.77	0.70	0.56	
Singapore	Sep-03	0.69	0.09	-0.37	-0.77	0.62	0.11	-0.12	-0.43	SD	0.12	0.11	0.10	0.08	0.08	0.07	0.12	
Spain	Dec-90	0.74	0.09	0.97	5.47	0.72	0.11	1.50	5.89	Trend	1.51	1.52	1.66	1.36	1.38	1.33	0.78	
Sweden	Dec-90	0.61	0.11	1.50	6.59	0.62	0.18	2.69	8.28	t-stat	5.89	5.85	4.50	3.83	3.39	1.88	2.86	
Switzerland	Jan-86	0.62	0.19	2.33	17.45	0.61	0.12	1.31	11.79					<i>Maturity >10</i>				
UK	Jan-86	0.54	0.20	2.47	23.77	0.56	0.17	2.06	22.24	Mean	0.62	0.66	0.61	0.70	0.74	0.65	0.50	
Czech Rep.	Dec-00	0.76	0.06	0.47	1.42	0.72	0.08	-0.08	-0.49	SD	0.14	0.10	0.09	0.09	0.09	0.07	0.18	
Hungary	Dec-00	0.67	0.11	-0.08	-0.28	0.64	0.10	-0.07	-0.18	Trend	1.67	1.72	1.70	1.73	1.80	1.53	0.31	
Korea	Dec-00	0.47	0.26	1.04	0.62	na	na	na	na	t-stat	9.49	9.72	9.02	5.59	5.60	2.09	1.33	
Malaysia	Dec-01	0.45	0.13	0.95	0.99	0.40	0.16	0.20	0.24									
Mexico	Dec-01	na	na	na	na	0.62	0.15	-0.14	-0.60									
Poland	Sep-98	0.63	0.15	1.05	1.55	0.55	0.15	1.49	2.38									
South Africa	Aug-00	0.47	0.10	0.56	1.46	0.25	0.11	0.35	1.75									
Taiwan	Jun-00	0.51	0.09	1.22	3.95	0.31	0.11	0.02	0.02									

Appendix A.5 - Definition of the variables used in the robustness regressions

Variable	Name	Description
<u>Real macroeconomic variables</u>		
Industrial Production growth	ΔIP	measured as the difference in logs of the industrial production index (seasonally adjusted) at time t and $t-12$, t in months. Frequency: Monthly. Source: OECD and IFS through Datastream.
IP volatility	$\sigma(IP)$	measured by fitting a GARCH(1,1) to the shocks to monthly IP growth rates. IP shocks are estimated from an ARIMA(p,q).
Change in unemployment rate	$\Delta UNEMPL$	measured as the difference in logs of the unemployment rate (seasonally adjusted) at time t and $t-12$, t in months. Frequency: Monthly. Source: OECD and IFS through Datastream.
Unemployment volatility	$\sigma(UNEMPL)$	measured by fitting a GARCH(1,1) to the shocks to monthly unemployment growth rates. Unemployment shocks are estimated from an ARIMA(p,q). Frequency: Monthly. Source: OECD and IFS through Datastream.
<u>Used as additional controls</u>		
FX volatility	$\sigma(FX)$	Realized foreign exchange rate (FX) volatility measured by cumulating daily squared changes in foreign exchange rate expressed as US dollar unit per foreign currency. We then take a 12-month moving average of the monthly FX volatility measures. Frequency: Monthly
Duration	DUR	Duration is the equally-weighted average of individual bonds durations. Frequency: Monthly. Source: Bloomberg
Public Debt/GDP	PD/GDP	Total public debt divided by Gross Domestic Product (GDP). Frequency: Annual. Source: World Bank Development Indicators (WDI).
Fiscal Space	FS	Inverse of tax-years it would take to repay the public debt following Aizenman et al. (2013). The denominator, Tax base, is tax revenue/GDP. Public Debt is public debt/GDP. Frequency: Annual. Source: WDI.
<u>Global investor sentiment (alternative variable)</u>		
$SENT$	$SENT$	$SENT$ is the first principal component of 6 proxies (trading volume; the dividend premium; the closed-end fund discount; the number and first-day returns on IPOs; and the equity share in new issues) as used in Baker and Wurgler (2007). Data available at http://www.stern.nyu.edu/~jwurgler . Data is from 01/1986-12/2010. Frequency: Monthly.
<u>Political ratings subcomponents</u>		
Quality of institutions	QIS	The sum of ICRG political risk sub-components: Law and Order, Bureaucratic Quality, and Corruption. The index has 16 points. It is scaled to range from 0 (weak institutions) to 1 (strong institutions). Frequency: Monthly. Source: International Country Risk Guide (ICRG).
Conflict	$CONFLICT$	The sum of ICRG political risk sub-components: Internal Conflicts, External Conflicts, Religious Tensions, and Ethnic Tensions. The index has 36 points. It is scaled to range from 0 (no conflicts) to 1 (intense conflicts). Frequency: Monthly. Source: International Country Risk Guide (ICRG).
Democratic Tendencies	$DEMTEN$	The sum of ICRG political risk sub-components: Military in Politics and Democratic Accountability. The index has 12 points. It is scaled to range from 0 (weak democracy) to 1 (strong democracy). Frequency: Monthly. Source: International Country Risk Guide (ICRG).
Government Actions	$GOVACT$	The sum of ICRG political risk sub-components: Government Stability, Socioeconomic Conditions, and Investment Profile. The index has 36 points. It is scaled to range from 0 (weak government actions) to 1 (strong government actions). Frequency: Monthly. Source: International Country Risk Guide (ICRG).
<u>Variables in interaction with illiquidity</u>		
Business Cycle Dummy	$Dummy BC$	Business Cycle Peak and Trough dates. Frequency: Monthly. Source: Economic Cycle Research Institute (ECRI). Completed with data from Hsieh, et al., 2010. A Chronology of International Business Cycles Through Nonparametric Decoding. Federal Reserve Bank of Kansas City RWP 11-13

Appendix A.6 - Summary statistics and cross-correlations of the variables used in the panel regressions

Panel A - Descriptive statistics by country

	RATING	CDS-5 year (bps)	POL	QIS	CONF LICT	GOV- ACT	DEM- TEN	π (% p.a)	$\sigma(\pi)$ (% p.a)	ΔIP (% p.a)	$\sigma(IP)$ (% p.a)	$\Delta UNEMPL$ (% p.a)	$\sigma(UNEMPL)$ (% p.a)	ILIQ (E-W) (bps)	ILIQ (V-W) (bps)
Developed markets															
Australia	20.05	30.59	0.84	0.92	0.89	1.00	0.69	3.33	1.51	2.23	4.01	-1.65	9.00	16.33	2.55
Austria	20.94	40.93	0.87	0.92	0.93	0.96	0.74	2.16	1.05	3.30	6.02	1.14	11.86	12.38	2.62
Belgium	19.94	52.91	0.81	0.86	0.87	0.97	0.68	2.13	0.94	2.33	7.01	-0.36	3.25	10.87	1.41
Canada	20.64	25.10	0.85	0.97	0.89	1.00	0.71	2.44	1.19	1.35	3.19	-1.06	7.88	4.17	0.61
Denmark	20.27	29.97	0.86	0.99	0.91	1.00	0.71	2.44	1.09	1.04	10.40	-2.26	24.55	10.29	2.41
Finland	20.25	18.23	0.90	1.00	0.98	1.00	0.74	2.37	1.10	2.48	7.59	2.55	4.24	12.09	1.31
France	20.96	40.09	0.79	0.82	0.82	0.92	0.69	1.97	0.81	0.39	3.95	-0.30	2.89	8.33	1.23
Germany	21.00	23.98	0.84	0.90	0.91	0.96	0.69	1.83	1.14	1.65	4.84	-0.12	2.58	5.67	0.94
Greece	13.24	700.93	0.72	0.67	0.83	0.81	0.59	7.63	2.94	-0.09	8.29	10.49	6.05	41.80	6.64
Ireland	19.11	177.53	0.84	0.84	0.91	0.99	0.72	2.54	1.30	6.88	13.79	4.94	8.26	19.93	2.11
Italy	18.11	91.82	0.77	0.68	0.89	0.90	0.65	3.38	0.62	0.34	4.37	3.60	9.06	10.66	1.10
Japan	19.89	36.13	0.83	0.83	0.93	0.92	0.69	0.45	1.15	0.64	6.28	1.72	10.28	10.99	1.01
Netherlands	21.00	30.40	0.87	0.97	0.93	1.00	0.73	1.94		1.43	7.64	-4.61	6.50	19.04	2.09
New Zealand	19.46	38.24	0.86	0.97	0.93	0.99	0.70	3.16	1.83	0.77	1.70	1.94	4.25	13.82	4.62
Norway	21.00	14.07	0.87	0.95	0.94	1.00	0.72	2.79	1.46	1.47	11.29	1.28	25.80	8.74	2.62
Portugal	17.46	201.35	0.80	0.77	0.92	0.90	0.66	4.88	1.32	0.94	7.67	6.94	6.75	180.72	3.72
Singapore	20.89	26.84	0.83	0.84	0.91	0.68	0.78	1.94	1.33	7.31	19.53	-4.11	13.35	8.67	2.67
Spain	19.40	93.54	0.72	0.75	0.82	0.89	0.68	3.80	1.33	0.49	5.45	0.78	3.00	8.08	1.68
Sweden	20.60	20.95	0.87	0.98	0.95	0.98	0.70	2.65	1.65	1.76	6.06	2.81	14.76	9.39	2.69
Switzerland	21.00	56.65	0.89	0.92	0.94	1.00	0.79	1.47	1.10	2.64	7.64	4.76	4.71	13.73	3.65
UK	21.00	47.27	0.82	0.89	0.83	0.99	0.73	2.93		0.40	3.18	-3.05	5.16	15.28	1.17

Panel A of Appendix A.6 - Continued

	<i>CDS-5</i>														
	<i>year</i>														
<i>RATING</i>	<i>(bps)</i>	<i>POL</i>	<i>QIS</i>	<i>CONF</i>	<i>GOV-</i>	<i>DEM-</i>	π	$\sigma(\pi)$	ΔIP	$\sigma(IP)$	$\Delta UNEMPL$	$\sigma(UNEMPL)$	<i>ILIQ (E-W)</i>	<i>ILIQ (V-W)</i>	
				<i>LICT</i>	<i>ACT</i>	<i>TEN</i>	<i>(% p.a)</i>	<i>(% p.a)</i>	<i>(% p.a)</i>	<i>(% p.a)</i>	<i>(% p.a)</i>	<i>(% p.a)</i>	<i>(bps)</i>	<i>(bps)</i>	
Emerging markets															
Brazil	9.89	472.67	0.67	0.42	0.83	0.72	0.59	6.1	1.18	2.15	7.23	-3.54	15.45	29.74	16.35
Chile	15.89	81.30	0.78	0.75	0.86	0.70	0.73	3.41	1.35	2.42	9.11	0.23	9.21	12.19	3.56
China	14.98	170.47	0.66	0.52	0.81	0.32	0.69	0.13	2.37	-0.08	10.07	-0.43	1.08	30.55	1.97
Colombia	10.85	315.78	0.55	0.38	0.66	0.48	0.54	7.06	1.29	1.73	8.95	-3.33	15.84	13.91	1.25
Czech Rep.	15.62	52.91	0.79	0.69	0.88	0.94	0.69	3.38		3.07	10.08	6.40	12.91	21.01	5.77
Hungary	13.46	129.63	0.79	0.71	0.86	0.99	0.69	7.02	3.51	5.39	9.00	0.68	9.76	23.87	6.27
India	10.98	120.09	0.52	0.59	0.58	0.82	0.51	6.64	2.75	6.19	5.37	1.45	1.72	20.27	3.95
Indonesia	7.65	267.90	0.54	0.43	0.59	0.53	0.54	10.39	3.83	3.20	14.50	1.44	1.97	32.33	9.02
Korea	14.87	90.19	0.77	0.66	0.84	0.87	0.70	3.25	1.47	6.63	7.99	-4.12	17.63	17.89	3.83
Malaysia	14.48	86.44	0.73	0.60	0.80	0.71	0.73	2.40	1.19	3.69	16.14	-3.05	21.41	16.58	1.97
Mexico	12.13	149.36	0.71	0.48	0.79	0.81	0.69	6.86	1.46	2.26	3.79	0.25	25.67	17.44	4.47
Poland	14.02	83.74	0.78	0.64	0.89	1.00	0.68	4.76	1.53	5.70	8.18	-0.62	5.03	23.92	5.05
South Africa	12.87	142.21	0.68	0.45	0.79	0.79	0.64	5.84	1.62	-4.62	18.40	0.12	2.74	12.01	4.75
Taiwan	18.64	61.90	0.78	0.65	0.85	0.76	0.78	1.04	2.92	4.42	8.56	2.96	9.16	12.23	1.33
Thailand	13.29	94.71	0.65	0.46	0.74	0.65	0.64	2.96	1.69	6.24	14.03	-14.66	51.88	31.30	8.79
Turkey	8.20	382.36	0.59	0.53	0.62	0.54	0.60	24.69		4.00	14.37	-1.73	8.04	15.96	3.36

Panel A of Appendix A.6 - Continued

	<i>ILIQ13</i>	<i>ILIQ35</i>	<i>ILIQ57</i>	<i>ILIQ710</i>	<i>ILIQ>10</i>	<i>DUR</i>	ΔFX (% p.a)	$\sigma(FX)$ (% p.a)	<i>Local Stock</i> <i>Market</i> <i>Return</i>	<i>PD/GDP</i>	<i>FS</i>
Developed markets											
Australia	6.66	10.21	14.17	22.59	25.16	7.33	2.18	10.36	10.83	0.20	0.70
Austria	9.67	10.83	12.19	12.55	14.94	4.61	1.82	10.20	6.73	0.64	3.37
Belgium	7.69	9.39	9.49	9.82	9.14	4.66	2.46	9.55	9.19	1.12	3.99
Canada	3.40	3.94	4.57	4.91	4.58	5.25	1.51	6.62	9.19	0.82	6.16
Denmark	6.17	9.06	10.22	14.68	14.16	4.60	1.30	10.15	10.18	0.52	1.51
Finland	9.23	12.73	13.82	11.40	18.14	4.07	1.67	9.53	8.70	0.40	2.06
France	6.22	7.14	7.13	6.82	10.54	5.35	2.13	9.92	9.39	0.57	3.04
Germany	4.13	4.60	5.24	5.93	9.22	4.65	2.49	10.08	6.31	0.62	5.93
Greece	19.41	18.84	17.14	18.92	58.11	4.29	-1.60	10.85	7.20	0.99	5.39
Ireland	19.07	17.27	28.21	45.17	17.48	4.74	1.70	9.93	9.30	0.68	2.09
Italy	7.89	8.93	10.52	12.50	15.78	4.37	1.11	9.83	5.33	1.09	4.89
Japan	5.19	7.18	8.99	10.24	21.36	5.94	3.75	10.39	0.87	1.34	21.08
Netherlands	6.63	7.37	8.32	9.20	10.58	4.77	2.49	10.06	8.17	0.59	2.61
New Zealand	6.47	10.61	14.67	22.27	23.99	4.03	2.05	10.38	8.29	0.40	0.89
Norway		14.18	5.02	14.04	3.99	4.44	1.80	10.62	11.50	0.41	1.66
Portugal	11.44	21.26	28.29	14.63	56.68	4.21	0.71	9.39	4.74	0.64	3.21
Singapore	7.85	9.36	9.12	9.86	14.26	4.05	2.24	4.81	9.00	0.85	6.12
Spain	6.93	8.71	8.31	8.35	11.28	4.50	1.33	9.41	8.25	0.53	4.35
Sweden	4.84	7.59	9.11	11.15	17.13	4.66	1.18	11.62	11.97	0.55	2.39
Switzerland	12.54	13.59	11.94	10.40	19.24	9.65	3.73	11.34	8.57	0.52	5.87
UK	5.88	6.19	6.24	5.63	10.18	6.27	0.91	9.19	9.69	0.46	1.88

Panel A of Appendix A.6 - Continued

	<i>ILIQ13</i>	<i>ILIQ35</i>	<i>ILIQ57</i>	<i>ILIQ710</i>	<i>ILIQ>10</i>	<i>DUR</i>	ΔFX (% p.a)	$\sigma(FX)$ (% p.a)	<i>Local Stock</i> <i>Market</i> <i>Return</i>	<i>PD/GDP</i>	<i>FS</i>
Emerging markets											
Brazil	8.11	8.84	9.18			2.21	-2.13	13.54	14.93	0.69	4.43
Chile	7.48	14.38	27.92	42.42	47.01	2.34	-0.19	8.87	10.53	0.10	0.55
China	16.57	19.60	25.47	62.14	52.14	7.56	1.83	1.23	11.48	0.19	2.08
Colombia	10.14	14.55	16.38	23.28	67.23	2.45	-2.67	12.69	15.67	0.36	3.30
Czech Rep.	14.61	19.13	38.16	39.89	115.22	3.29	3.38	12.68	10.93	0.28	1.83
Hungary	21.41	27.96	33.27	46.05	124.19	2.27	-0.55	13.46	6.99	0.66	2.97
India	6.55	7.34	16.99	31.50	29.16		-2.42	4.93	13.79	0.75	8.05
Indonesia	22.28	33.09	37.09	39.77	45.32	4.06	-4.72	15.51	11.22	0.47	3.70
Korea	16.52	24.43	25.26	23.30	36.49	2.92	-0.08	13.14	11.03	0.25	1.63
Malaysia	12.51	14.90	21.86	28.69	30.23	3.73	-0.96	5.36	5.09	0.44	2.88
Mexico	10.70	18.95	21.15	27.36	31.68	3.21	-2.68	9.85	16.00	0.42	4.92
Poland	19.89	21.62	21.94	43.56	187.49	3.04	0.87	12.85	5.97	0.46	2.80
South Africa	6.68	7.82	11.10	14.54	17.98	5.06	-2.47	15.21	14.69	0.36	1.36
Taiwan	11.97	11.70	15.56	18.47	11.05	4.93	-0.18	4.34	2.82	0.33	
Thailand	17.99	23.17	27.88	34.54	50.81	5.04	-0.22	8.10	7.18	0.48	2.69
Turkey	19.45	16.63		13.53		2.07	-15.60	16.12	25.92	0.52	2.18

Panel B - Cross-correlations of regression variables

	<i>II</i>	<i>RATING</i>	5-year <i>CDS</i> (bps)	<i>POL</i>	π (% p.a)	$\sigma(\pi)$ (% p.a)	ΔIP (% p.a)	$\sigma(IP)$ (% p.a)	$\Delta UNEMPL$ (% p.a)	$\sigma(UNEMPL)$ (% p.a)	<i>ILIQ</i> (E-W) (bps)	<i>ILIQ</i> (V-W) (bps)	<i>ILIQ13</i>	<i>ILIQ35</i>	<i>ILIQ57</i>	<i>ILIQ710</i>	<i>ILIQ>10</i>
<i>II</i>	1.00																
<i>RATING</i>	0.64	1.00															
5-year <i>CDS</i> (bps)	-0.28	-0.67	1.00														
<i>POL</i>	0.69	0.88	-0.57	1.00													
π (% p.a)	-0.26	-0.70	0.59	-0.59	1.00												
$\sigma(\pi)$ (% p.a)	-0.44	-0.54	0.38	-0.47	0.54	1.00											
ΔIP (% p.a)	-0.82	-0.16	-0.87	-0.85	0.91	0.19	1.00										
$\sigma(IP)$ (% p.a)	-0.17	-0.36	0.18	-0.30	0.25	0.19	0.25	1.00									
$\Delta UNEMPL$ (% p.a)	0.37	0.12	0.23	0.30	0.85	0.18	-0.26	-0.21	1.00								
$\sigma(UNEMPL)$ (% p.a)	-0.11	-0.13	-0.55	-0.59	-0.54	-0.15	0.34	0.26	-0.56	1.00							
<i>ILIQ</i> (E-W) (bps)	-0.24	-0.16	0.30	-0.92	0.17	0.11	-0.49	0.33	0.27	-0.27	1.00						
<i>ILIQ</i> (V-W) (bps)	-0.33	-0.62	0.55	-0.48	0.30	0.35	0.15	0.23	-0.14	0.26	0.21	1.00					
<i>ILIQ13</i>	-0.28	-0.59	0.47	-0.38	0.43	0.58	0.46	0.46	0.78	0.15	0.23	0.39	1.00				
<i>ILIQ35</i>	-0.32	-0.58	0.34	-0.36	0.33	0.58	0.42	0.37	0.37	0.22	0.37	0.43	0.90	1.00			
<i>ILIQ57</i>	-0.35	-0.60	0.23	-0.38	0.46	0.56	0.41	0.35	0.19	0.14	0.39	0.37	0.80	0.87	1.00		
<i>ILIQ710</i>	-0.54	-0.56	0.28	-0.40	0.71	0.52	0.36	0.29	-0.15	0.97	0.16	0.54	0.66	0.70	0.83	1.00	
<i>ILIQ>10</i>	-0.16	-0.53	0.26	-0.24	0.40	0.36	0.29	0.12	0.74	0.22	0.24	0.52	0.64	0.62	0.63	0.64	1.00

Bolded correlations are significant at 10% or less.

Panel C- Descriptive statistics of the cross-section of the full sample

	<i>II</i>	<i>RATING</i>	5-year CDS (bps)	<i>POL</i>	π (% p.a)	$\sigma(\pi)$ (% p.a)	ΔIP (% p.a)	$\sigma(IP)$ (% p.a)	$\Delta UNEMPL$ (% p.a)	$\sigma(UNEMPL)$ (% p.a)	<i>ILIQ</i> (E-W) (bps)	<i>ILIQ</i> (V-W) (bps)	<i>ILIQ13</i>	<i>ILIQ35</i>	<i>ILIQ57</i>	<i>ILIQ710</i>	<i>ILIQ>10</i>
Average	0.57	16.87	121.6	0.77	4.17	1.61	2.49	8.53	0.20	10.64	20.87	3.53	10.84	13.60	16.44	21.39	35.20
Std. Dev	0.17	4.14	143.6	0.10	4.12	0.76	2.43	4.29	4.15	9.72	28.26	3.01	5.53	6.84	9.42	14.40	38.43
1st quartile	0.46	13.42	34.74	0.71	2.16	1.15	0.90	5.43	-1.87	4.24	10.81	1.39	6.59	8.49	9.12	10.32	12.00
2nd quartile	0.57	18.64	81.30	0.79	2.96	1.33	2.23	7.67	0.23	8.26	13.91	2.62	8.67	11.70	13.99	14.66	19.24
3rd quartile	0.69	20.61	144.0	0.84	5.12	1.66	3.77	10.16	2.09	13.70	20.45	4.51	15.56	18.87	23.60	30.09	46.58
3rd-1st	0.22	7.19	109.3	0.13	2.96	0.51	2.87	4.73	3.96	9.46	9.64	3.11	8.97	10.38	14.48	19.78	34.59

D- Descriptive statistics of the cross-section of the DM sample

	<i>II</i>	<i>RATING</i>	5-year CDS (bps)	<i>POL</i>	π (% p.a)	$\sigma(\pi)$ (% p.a)	ΔIP (% p.a)	$\sigma(IP)$ (% p.a)	$\Delta UNEMPL$ (% p.a)	$\sigma(UNEMPL)$ (% p.a)	<i>ILIQ</i> (E-W) (bps)	<i>ILIQ</i> (V-W) (bps)	<i>ILIQ13</i>	<i>ILIQ35</i>	<i>ILIQ57</i>	<i>ILIQ710</i>	<i>ILIQ>10</i>
Average	0.67	19.82	85.6	0.83	2.77	1.31	1.89	7.14	1.21	8.77	21.00	2.33	8.37	10.43	11.56	13.38	18.38
Std. Dev	0.11	1.80	149.4	0.05	1.44	0.48	1.94	4.05	3.67	6.45	37.40	1.43	4.35	4.51	6.47	8.76	14.13
1st quartile	0.57	19.45	26.40	0.81	1.96	1.10	0.60	4.28	-1.21	4.24	8.72	1.22	6.03	7.32	8.02	8.99	10.45
2nd quartile	0.67	20.27	38.24	0.84	2.44	1.19	1.43	6.28	1.14	6.75	10.99	2.11	6.79	9.36	9.49	11.15	14.94
3rd quartile	0.78	20.97	65.4	0.87	3.20	1.43	2.37	7.82	3.00	10.67	15.54	2.68	9.45	12.94	13.91	14.65	19.77
3rd-1st	0.20	1.52	39.0	0.06	1.24	0.33	1.76	3.54	4.21	6.43	6.82	1.46	3.42	5.62	5.89	5.66	9.32

Panel E- Descriptive statistics of the cross-section of the EM sample

	<i>II</i>	<i>RATING</i>	5-year CDS (bps)	<i>POL</i>	π (% p.a)	$\sigma(\pi)$ (% p.a)	ΔIP (% p.a)	$\sigma(IP)$ (% p.a)	$\Delta UNEMPL$ (% p.a)	$\sigma(UNEMPL)$ (% p.a)	<i>ILIQ</i> (E-W) (bps)	<i>ILIQ</i> (V-W) (bps)	<i>ILIQ13</i>	<i>ILIQ35</i>	<i>ILIQ57</i>	<i>ILIQ710</i>	<i>ILIQ>10</i>
Average	0.45	12.99	168.9	0.69	5.99	2.01	3.27	10.36	-1.12	13.09	20.70	5.11	13.93	17.76	23.28	32.60	60.43
Std. Dev	0.15	2.93	124.5	0.09	5.63	0.90	2.83	4.01	4.49	12.65	7.17	3.78	5.39	7.25	8.72	13.32	49.11
1st quartile	0.38	10.91	85.09	0.62	3.10	1.35	2.20	8.08	-3.19	3.88	14.94	2.67	9.12	13.04	16.53	23.28	30.23
2nd quartile	0.44	13.37	124.9	0.69	5.30	1.58	3.44	9.06	-0.15	9.48	19.08	4.21	13.56	17.79	21.94	31.50	46.16
3rd quartile	0.52	14.93	219.2	0.78	6.94	2.75	5.55	14.20	1.06	16.73	26.83	6.02	18.72	22.39	27.91	41.78	67.23
3rd-1st	0.15	4.02	134.1	0.16	3.84	1.40	3.35	6.12	4.25	12.85	11.89	3.35	9.60	9.35	11.37	18.50	37.00

Appendix A.7- Univariate Regressions

The table reports the estimated coefficients from univariate panel regressions of the all-maturity bond integration indices on variables $V_{i,t}$ which include credit quality, political risk, inflation (level and risk), rela macro variables, illiquidity, global investor sentiment and other local factors such as Public debt to GDP and fiscal space, bond characteristics such as duration, or global variables such as VIX and SENT. The estimated models are based on the general equation below,

$$I_{i,t} = \alpha + \beta_1 V_{i,t-1} + \theta \times Trend + \varepsilon_{i,t}$$

The trend and constant from univariate regressions are not reported but we report the trend coefficient and its p-value from a pooled regression with only a constant and a trend. The adjusted R^2 of this regression is a benchmark for the univariate regressions adjusted R^2 . We run unbalanced regression as not all the explanatory variables are available for all the cross-sectional units. All explanatory variables are lagged. P-values in parentheses are clustered by country and time. The sample period is from 01/1986 or later to 12/2012. Definition of the variables and data source are in Appendix B of the paper and online Appendix A.5. Numbers in bold represent significance at least at the 10% level.

	coefficient / p-values	Adjusted R^2 / # observ.
<i>RATING</i>	0.04 (0.00)	31.7% 7122
<i>POL</i>	1.31 (0.00)	32.3% 7377
$\pi (\times 10^2)$	-0.98 (0.00)	8.4% 6579
$\sigma(\pi) (\times 10^2)$	-28.53 (0.00)	9.7% 6535
$\Delta IP (\times 10^2)$	-0.39 (0.01)	5.9% 7413
$\sigma(IP) (\times 10^2)$	-0.81 (0.32)	5.3% 6445
$\Delta UNEMPL (\times 10^2)$	0.10 (0.05)	4.6% 6601
$\sigma(UNEMPL) (\times 10^2)$	-1.61 (0.08)	7.0% 7016
<i>ILIQ</i> ($\times 10^4$)	-2.08 (0.03)	3.8% 6848
<i>PD/GDP</i>	0.10 (0.13)	6.9% 5403
<i>FS</i>	0.00 (0.77)	1.9% 7043
<i>VIX</i> ($\times 10^2$)	0.41 (0.00)	4.8% 6562
<i>SENT</i> ($\times 10^2$)	0.02 (0.06)	6.5% 5475
<i>DUR</i> ($\times 10^2$)	0.44 (0.69)	2.9% 6780
<i>Trend</i> ($\times 1200$)	0.72 (0.01)	4.6% 7413

Appendix A.8 - Additional robustness tests discussed in the paper

The table reports the estimated coefficients from panel regressions of the bond integration indices on proxies for credit quality, political risk (and its four subcomponents,) inflation, illiquidity, global investor sentiment and other global (Z_t) and local ($X_{i,t}$) factors. The estimated models are based on the general equation below,

$$I_{i,t} = \alpha + \beta_1(Credit)_{i,t-1} + \beta_2(Political)_{i,t-1} + \beta_3(Inflation)_{i,t-1} + \beta_4(Illiquidity)_{i,t-1} + \beta_5(Global\ sentiment)_{i,t-1} + X'_{i,t-1}\gamma + c_i + Z'_{t-1}\delta + \theta \times Trend + \varepsilon_{i,t}$$

We run unbalanced regression as not all the explanatory variables are available for all the cross-sectional units. All explanatory variables are lagged. P-values in parentheses are clustered by country and time. The sample period is from 01/1986 or later to 12/2012. Definition of the variables and data source are in Appendix B and the online Appendix A.5. Numbers in bold represent significance at least at the 10% level.

Panel A						Panel B - Currency effects							
A1		A2		A3		A4		B1 - Model 6 (a), (b) and (e) with FX controls			B2 - Model 6 (a), (b)and (e) & integration indices from hedged returns		
		DM&EM						DM&EM	DM	EM	DM&EM	DM	EM
<i>QIS</i>	-0.11 $\Delta IP (\times 10^2)$	0.07		<i>ILIQ</i> ($\times 10^4$)	0.60 <i>RATING</i>	0.02	0.02	0.01	0.03	0.02	0.02	0.02	0.02
	(0.38)	(0.09)		(0.72)		(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
<i>CONFLICT</i>	0.30 $\sigma(IP) (\times 10^2)$	-0.10		<i>D_{BC}</i> ($\times 10^2$)	-0.33 <i>POL</i>	0.70	0.68	0.72	0.62	1.11		0.17	
	(0.22)	(0.49)		(0.87)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.12)	
<i>GOVACT</i>	0.28 $\Delta UNEMPL (\times 10^2)$		0.03	<i>D_{BC} × ILIQ</i>	-6.97 $\pi (\times 10^2)$	-0.12	-0.14	-0.18	-0.33	-0.34	-0.25		
	(0.10)		(0.11)	(0.00)		(0.01)	(0.00)	(0.06)	(0.00)	(0.00)	(0.00)		
<i>DEMTEN</i>	0.46 $\sigma(UNEMPL)(\times 10^2)$		-0.53		$\sigma(\pi) (\times 10^2)$	-2.63	-19.99	-6.77	-0.88	41.37	-3.12		
	(0.00)		(0.00)			(0.10)	(0.00)	(0.00)	(0.56)	(0.21)	(0.13)		
					<i>ILIQ</i> ($\times 10^4$)	-1.94	-1.50	-7.76	-1.29	-1.86	-13.34		
						(0.00)	(0.01)	(0.08)	(0.05)	(0.00)	(0.00)		
					<i>FX</i>	-0.06	0.13	-0.28	-0.18	-0.09	-0.39		
						(0.51)	(0.12)	(0.14)	(0.29)	(0.59)	(0.06)		
					$\sigma(FX)$	5.46	4.53	5.30	2.55	0.85	2.87		
						(0.00)	(0.00)	(0.00)	(0.00)	(0.35)	(0.00)		
					<i>VIX</i> ($\times 10^2$)	0.06	-0.08	0.36	0.18	0.21	0.12		
						(0.15)	(0.06)	(0.00)	(0.05)	(0.01)	(0.29)		
					<i>Trend</i> ($\times 1200$)	1.15	1.25	1.67	1.23	1.11	1.53		
						(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		
FE	T	T	T	T	FE	C	C	C	C	C	C		
# obser.	7377	7413	6445	5838	# obser.	5159	3563	1596	4614	2615	1999		
Adjusted R ²	44.1%	35.7%	36.0%	41.0%	Adjusted R ²	67.1%	62.2%	48.3%	65.9%	59.0%	31.0%		

Appendix A.9 - Statistics of the sovereign bond integration measures from hedged returns

The table reports start date, mean and standard deviation for the integration measures of the all-maturity bond indices constructed from unhedged returns and from hedged returns for Developed markets (Panel A) and Emerging markets (Panel B) estimated from the E-L model of Section I. Hedged bond returns are computed assuming full currency hedging is undertaken from the perspective of a US investor (by selling the foreign currency forward). The forward rates are available from Datastream starting in 01/1997 or later for our sample of DMs and EMs.

Panel A- Developed Markets

Panel B- Emerging Markets

	Start date	Unhedged		Hedged			Start date	Unhedged		Hedged	
		Mean	SD	Mean	SD			Mean	SD	Mean	SD
Australia	Jan-86	0.49	0.18	0.52	0.03	Brazil	Jan-02	0.44	0.25	0.21	0.23
Austria	Sep-92	0.85	0.03	0.62	0.21	Chile	Nov-02	0.42	0.19	0.12	0.18
Belgium	Dec-90	0.82	0.03	0.51	0.18	China	Dec-03	0.14	0.20	0.15	0.19
Canada	Jan-86	0.65	0.29	0.87	0.09	Colombia	Jan-03	0.47	0.22	0.17	0.18
Denmark	Mar-89	0.83	0.03	0.76	0.07	Czech Rep.	Dec-00	0.77	0.05	0.22	0.17
Finland	Dec-94	0.84	0.09	0.76	0.09	Hungary	Dec-00	0.63	0.15	0.24	0.26
France	Jan-86	0.67	0.21	0.67	0.14	India	Dec-01	0.28	0.22	0.12	0.17
Germany	Jan-86	0.79	0.06	0.71	0.13	Indonesia	Jan-03	0.30	0.27	0.13	0.20
Greece	Apr-00	0.65	0.13			Korea	Dec-00	0.53	0.08	0.13	0.13
Ireland	Sep-92	0.69	0.14	0.47	0.24	Malaysia	Dec-01	0.43	0.30	0.14	0.19
Italy	Jan-86	0.53	0.27	0.43	0.27	Mexico	Dec-01	0.42	0.29	0.26	0.19
Japan	Jan-86	0.57	0.11	0.20	0.17	Poland	Sep-98	0.54	0.15	0.17	0.16
Netherlands	Jan-86	0.67	0.22	0.42	0.27	South Africa	Aug-00	0.49	0.17	0.14	0.17
New Zealand	Sep-92	0.51	0.16	0.46	0.11	Taiwan	Jun-00	0.52	0.07	0.12	0.19
Norway	Dec-94	0.68	0.07	0.51	0.11	Thailand	Dec-01	0.33	0.12	0.11	0.09
Portugal	Sep-93	0.69	0.19	0.37	0.27	Turkey	Apr-04	0.45	0.20	0.13	0.19
Singapore	Sep-03	0.65	0.07								
Spain	Dec-90	0.77	0.08	0.44	0.26						
Sweden	Dec-90	0.62	0.11	0.62	0.10						
Switzerland	Jan-86	0.57	0.11	0.48	0.16						
UK	Jan-86	0.50	0.06	0.61	0.12						
<i>Averages across regions</i>											
DM	21	0.67	0.11	0.55	0.16	EM	17	0.45	0.15	0.16	0.05