

Online Resource 1. Statistical details for structural break points.

(a) All ages, EWM: No additional breaks found for 12 breaks.

Sequential test for multiple breaks at unknown breakpoints, Bai & Perron Critical Values:

	Test statistic	1% Critical value	5% Critical value	10% Critical value
F(1 0)	62.49	13.58	9.63	8.02
F(2 1)	3.56	15.03	11.14	9.56
F(3 2)	5.55	15.62	12.16	10.45
F(4 3)	5.87	16.39	12.83	11.07
F(5 4)	2.56	16.6	13.45	11.65
F(6 5)	1.29	16.9	14.05	12.07
F(7 6)	2.84	17.04	14.29	12.47
F(8 7)	5.33	17.27	14.5	12.7
F(9 8)	0.67	17.32	14.69	13.07
F(10 9)	1.88	17.61	14.88	13.34
F(11 10)	1.61	17.61	14.88	13.34

Detected number of breaks	1	1	1
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Maximum number of breaks reached with null always rejected.

Estimation of break points: T = 135, SSR = 0.53, Trimming = 0.05

#	Index	Date	95% Conf. Interval
1	33	1918	-2.7e+04 - 3.1e+04

(b) All ages, winter mortality rates: No additional breaks found for 14 breaks.

Sequential test for multiple breaks at unknown breakpoints, Bai & Perron Critical Values:

	Test statistic	1% Critical value	5% Critical value	10% Critical value
F(1 0)	77.08	13.58	9.63	8.02
F(2 1)	5.21	15.03	11.14	9.56
F(3 2)	20.65	15.62	12.16	10.45
F(4 3)	18.46	16.39	12.83	11.07
F(5 4)	7.4	16.6	13.45	11.65
F(6 5)	5.44	16.9	14.05	12.07
F(7 6)	3.71	17.04	14.29	12.47
F(8 7)	6.49	17.27	14.5	12.7
F(9 8)	1.69	17.32	14.69	13.07
F(10 9)	0.54	17.61	14.88	13.34
F(11 10)	0.85	17.61	14.88	13.34
F(12 11)	1.39	17.61	14.88	13.34
F(13 12)	1.2	17.61	14.88	13.34

Detected number of breaks	(min)	1	1	1
	(max)	4	4	4

Estimation of break points: T=134, SSR = 219.28, Trimming=0.05

#	Index	Date	95% Conf. Interval
1	33	1918	1895 - 1941

(c) All ages, non-winter mortality rates: No additional breaks found for 14 breaks.

Sequential test for multiple breaks at unknown breakpoints, Bai & Perron Critical Values:

	Test statistic	1% Critical value	5% Critical value	10% Critical value
F(1 0)	62	13.58	9.63	8.02
F(2 1)	11.14	15.03	11.14	9.56
F(3 2)	19.26	15.62	12.16	10.45
F(4 3)	21.07	16.39	12.83	11.07
F(5 4)	4.31	16.6	13.45	11.65
F(6 5)	2.72	16.9	14.05	12.07
F(7 6)	9.32	17.04	14.29	12.47
F(8 7)	1.09	17.27	14.5	12.7
F(9 8)	1.34	17.32	14.69	13.07
F(10 9)	5.89	17.61	14.88	13.34
F(11 10)	1.48	17.61	14.88	13.34
F(12 11)	0.1	17.61	14.88	13.34
F(13 12)	0.26	17.61	14.88	13.34
Detected number of breaks	(min)	1	4	4
	(max)	4	4	4

Estimation of break points: T=134, SSR = 53.97, Trimming=0.05

#	Index	Date	95% Conf. Interval
1	53	1938	1824 - 2052
2	60	1945	1818 - 2072
3	80	1965	-3.1e+03 - 7006
4	103	1988	1715 - 2261

(d) 65 years and over, EWMI: No additional breaks found for 14 breaks.

Sequential test for multiple breaks at unknown breakpoints, Bai & Perron Critical Values:

	Test statistic	1% Critical value	5% Critical value	10% Critical value
F(1 0)	39.46	13.58	9.63	8.02
F(2 1)	7.99	15.03	11.14	9.56
F(3 2)	11.03	15.62	12.16	10.45
F(4 3)	2.2	16.39	12.83	11.07
F(5 4)	2.87	16.6	13.45	11.65
F(6 5)	12.8	16.9	14.05	12.07
F(7 6)	1.8	17.04	14.29	12.47
F(8 7)	1.91	17.27	14.5	12.7
F(9 8)	2.23	17.32	14.69	13.07
F(10 9)	1.99	17.61	14.88	13.34
F(11 10)	2.32	17.61	14.88	13.34
Detected number of breaks	(min)	1	1	1
	(max)	1	1	6

Null hypothesis rejected more than once after non-rejection. The detected number of breaks indicates the minimum and maximum number of breaks for which the null hypothesis is rejected.

Estimation of break points: T=135, SSR = 0.85, Trimming=0.05

#	Index	Date	95% Conf. Interval
1	33	1918	-2.9e+04 - 3.3e+04

(e) 65 years and over, winter mortality rates: No additional breaks found for 17 breaks.

Sequential test for multiple breaks at unknown breakpoints, Bai & Perron Critical Values:

	Test statistic	1% Critical value	5% Critical value	10% Critical value
F(1 0)	77.27	13.58	9.63	8.02
F(2 1)	64.2	15.03	11.14	9.56
F(3 2)	16.73	15.62	12.16	10.45
F(4 3)	14.14	16.39	12.83	11.07
F(5 4)	7.71	16.6	13.45	11.65
F(6 5)	8.14	16.9	14.05	12.07
F(7 6)	5.24	17.04	14.29	12.47
F(8 7)	4.06	17.27	14.5	12.7
F(9 8)	4.71	17.32	14.69	13.07
F(10 9)	1.07	17.61	14.88	13.34
F(11 10)	0.29	17.61	14.88	13.34
F(12 11)	0	17.61	14.88	13.34
F(13 12)	0.04	17.61	14.88	13.34
F(14 13)	0.11	17.61	14.88	13.34
F(15 14)	1.88	17.61	14.88	13.34
F(16 15)	0.02	17.61	14.88	13.34

Detected number of breaks	3	4	4
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The detected number of breaks indicates the highest number of breaks for which the null hypothesis is rejected.

Estimation of break points: T=135, SSR = 5376.95, Trimming=0.05

#	Index	Date	95% Conf. Interval
1	15	1900	1895 - 1905
2	32	1917	1916 - 1918
3	75	1960	1874 - 2046
4	104	1989	1974 - 2004

(f) 65 years and over, non-winter mortality rates: No additional breaks found for 13 breaks.

Sequential test for multiple breaks at unknown breakpoints, Bai & Perron Critical Values:

	Test statistic	1% Critical value	5% Critical value	10% Critical value
F(1 0)	93.29	13.58	9.63	8.02
F(2 1)	25.07	15.03	11.14	9.56
F(3 2)	18.49	15.62	12.16	10.45
F(4 3)	22.19	16.39	12.83	11.07
F(5 4)	11.34	16.6	13.45	11.65
F(6 5)	17.66	16.9	14.05	12.07
F(7 6)	2.62	17.04	14.29	12.47
F(8 7)	2.67	17.27	14.5	12.7
F(9 8)	3.54	17.32	14.69	13.07
F(10 9)	1.04	17.61	14.88	13.34
F(11 10)	2.32	17.61	14.88	13.34
F(12 11)	1.27	17.61	14.88	13.34
Detected number of breaks	(min)	4	4	4
	(max)	6	6	6

Null hypothesis rejected more than once after non-rejection. The detected number of breaks indicates the minimum and maximum number of breaks for which the null hypothesis is rejected.

Estimation of break points: T=135, SSR = 2271.05, Trimming=0.05

#	Index	Date	95% Conf. Interval
1	11	1896	1888 - 1904
2	28	1913	1881 - 1945
3	48	1933	1881 - 1985
4	104	1989	1968 - 2010