TESTS FOR PARAMETER INSTABILITY AND STRUCTURAL CHANGE WITH UNKNOWN CHANGE POINT: A CORRIGENDUM

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TESTS FOR PARAMETER INSTABILITY AND STRUCTURAL CHANGE WITH UNKNOWN CHANGE POINT: A CORRIGENDUM

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TABLE I OF ANDREWS (1993) "Tests for Parameter Instability and Structural Change with Unknown Change Point," *Econometrica*, 61, 821–856, provides asymptotic critical values for sup Wald, LM, and LR tests for parameter instability. Critical values are given for degrees of freedom $p = 1, \ldots, 20$. The critical values for $p = 8$ are not correct (except for $\pi_0 = .5$). They are too small. For the common choice of $\pi_0 = .15$, they yield null rejection rates of .162, .084, and .016 for nominal sizes .10, .05, and .01, respectively (based on simulations using 100,000 simulation repetitions). The rejection rates for other values of π_0 are quite similar.

Correct values for $p = 8$ are given in Table I below. Table I also gives critical values for other values of p in $\{1, \ldots, 20\}$ based on 100,000 simulation repetitions, which should be more accurate than the critical values given in Andrews (1993), which are based on 10,000 simulation repetitions. As in Andrews (1993), a grid of π values with $N = 3{,}600$ is used to compute the critical values.

The author thanks Richard Zeckhauser for pointing out the error in Table I of Andrews (1993).

Note added in proof: A recent paper by Estrella (2002) "Bessel Process Distributions and Structural Break Tests," unpublished manuscript, Federal Reserve Bank of New York, computes the asymptotic critical values for sup Wald, LM, and LR tests by a numerical method rather than by simulation.

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TABLE I

ASYMPTOTIC CRITICAL VALUES

		$p=1$			$p=2$			$p=3$			$p=4$			$p=5$		
π_0	λ	10%	5%	1%	10%	5%	1%	10%	5%	1%	10%	5%	1%	10%	5%	1%
.50	1.00	2.69	3.79	6.63	4.61	5.97	9.23	6.25	7.82	11.35	7.77	9.51	13.37	9.23	11.07	15.05
.49	1.08	3.39	4.60	7.63	5.48	6.99	10.35	7.29	8.93	12.77	8.90	10.75	14.75	10.45	12.38	16.61
.48	1.17	3.70	4.96	8.07	5.87	7.41	10.90	7.75	9.43	13.31	9.40	11.27	15.37	11.01	12.95	17.26
.47	1.27	3.93	5.24	8.44	6.19	7.75	11.27	8.08	9.81	13.67	9.80	11.67	15.88	11.42	13.41	17.75
.45	1.49	4.30	5.65	8.93	6.66	8.25	11.89	8.62	10.37	14.31	10.41	12.30	16.57	12.04	14.04	18.49
.40	2.25	4.99	6.40	9.81	7.47	9.13	12.91	9.54	11.35	15.39	11.38	13.37	17.61	13.17	15.19	19.63
.35	3.45	5.49	6.97	10.40	8.10	9.80	13.58	10.25	12.08	16.13	12.15	14.16	18.42	13.94	16.02	20.53
.30	5.44	5.93	7.47	10.84	8.62	10.34	14.10	10.82	12.65	16.65	12.76	14.73	18.96	14.60	16.65	21.12
.25	9.00	6.35	7.87	11.28	9.09	10.78	14.61	11.32	13.18	17.13	13.33	15.29	19.47	15.21	17.27	21.71
.20	16.00	6.73	8.28	11.71	9.54	11.26	15.09	11.81	13.66	17.65	13.82	15.84	19.96	15.76	17.78	22.21
.15	32.11	7.12	8.68	12.16	10.00	11.72	15.56	12.28	14.13	18.07	14.34	16.36	20.47	16.30	18.32	22.66
.10	81.00	7.58	9.11	12.59	10.46	12.17	16.09	12.81	14.69	18.59	14.92	16.91	20.97	16.87	18.86	23.21
.05	361.00	8.13	9.71	13.17	11.08	12.80	16.57	13.46	15.36	19.28	15.64	17.54	21.63	17.58	19.57	23.85
		$p=6$			$p=7$			$p=8$			$p=9$			$p=10$		
π_0	λ	10%	5%	1%	10%	5%	1%	10%	5%	1%	10%	5%	1%	10%	5%	1%
.50	1.00	10.65	12.62	16.80	12.02	14.06	18.52	13.31	15.47	19.94	14.65	16.84	21.49	15.99	18.29	23.02
.49	1.08	11.96	14.03	18.44	13.42	15.56	20.18	14.78	16.98	21.70	16.17	18.49	23.29	17.59	19.92	24.90
.48	1.17	12.53	14.61	19.16	14.02	16.17	20.92	15.42	17.66	22.49	16.84	19.19	24.09	18.26	20.69	25.63
.47	1.27	12.97	15.07	19.65	14.47	16.67	21.48	15.90	18.16	23.02	17.34	19.72	24.67	18.79	21.23	26.14
.45	1.49	13.62	15.77	20.42	15.16	17.36	22.19	16.67	18.94	23.78	18.10	20.52	25.47	19.57	22.00	27.06
.40	2.25	14.81	16.93	21.56	16.41	18.63	23.44	17.94	20.26	25.10	19.45	21.88	26.83	20.97	23.40	28.43
.35	3.45	15.67	17.81	22.39	17.25	19.54	24.21	18.86	21.15	26.02	20.43	22.79	27.72	21.93	24.35	29.43
.30	5.44	16.34	18.50	22.96	17.99	20.26	24.90	19.60	21.89	26.77	21.19	23.57	28.47	22.74	25.15	30.14
.25	9.00	16.97	19.12	23.60	18.66	20.91	25.58	20.30	22.60	27.36	21.90	24.28	29.13	23.45	25.88	30.79
.20	16.00	17.52	19.66	24.16	19.25	21.48	26.21	20.91	23.21	28.03	22.55	24.93	29.76	24.14	26.49	31.54
.15	32.11	18.11	20.24	24.74	19.87	22.06	26.72	21.55	23.82	28.55	23.20	25.54	30.42	24.80	27.13	32.31
.10	81.00	18.71	20.81	25.30	20.49	22.62	27.26	22.20	24.45	29.16	23.89	26.16	31.03	25.47	27.77	32.96
.05	361.00	19.45	21.53	25.98	21.28	23.41	27.94	23.02	25.20	29.89	24.71	26.95	31.85	26.33	28.64	33.58

TABLE I—*Continued*

		$p = 11$			$p = 12$			$p = 13$			$p = 14$			$p = 15$		
π_0	λ	10%	5%	1%	10%	5%	1%	10%	5%	1%	10%	5%	1%	10%	5%	1%
.50	1.00	17.24	19.62	24.55	18.52	20.96	25.92	19.76	22.29	27.36	20.98	23.55	29.07	22.24	24.89	30.47
.49	1.08	18.91	21.40	26.48	20.24	22.76	27.93	21.55	24.14	29.46	22.83	25.52	31.14	24.13	26.89	32.57
.48	1.17	19.61	22.13	27.23	20.99	23.54	28.72	22.31	24.94	30.26	23.60	26.32	31.92	24.94	27.71	33.35
.47	1.27	20.18	22.71	27.84	21.55	24.11	29.33	22.87	25.55	31.04	24.20	26.95	32.57	25.55	28.38	34.07
.45	1.49	21.02	23.58	28.76	22.38	24.98	30.39	23.77	26.47	32.07	25.14	27.84	33.57	26.50	29.28	35.12
.40	2.25	22.42	24.96	30.28	23.85	26.46	31.82	25.27	27.97	33.41	26.68	29.44	35.14	28.09	30.86	36.88
.35	3.45	23.43	26.00	31.24	24.90	27.52	32.87	26.38	29.00	34.43	27.78	30.57	36.31	29.22	32.00	37.87
.30	5.44	24.23	26.79	31.99	25.76	28.36	33.62	27.23	29.87	35.24	28.69	31.39	37.16	30.12	32.90	38.69
.25	9.00	24.97	27.52	32.71	26.48	29.06	34.33	27.98	30.64	35.96	29.50	32.15	37.80	30.93	33.68	39.30
.20	16.00	25.68	28.13	33.33	27.22	29.75	34.97	28.72	31.36	36.71	30.26	32.88	38.42	31.71	34.37	40.02
.15	32.11	26.38	28.81	33.96	27.90	30.43	35.67	29.45	32.04	37.29	30.98	33.56	38.96	32.47	35.10	40.68
.10	81.00	27.05	29.51	34.62	28.63	31.12	36.39	30.17	32.76	37.98	31.71	34.31	39.76	33.22	35.86	41.45
.05	361.00	27.92	30.33	35.36	29.55	31.95	37.12	31.11	33.63	38.78	32.66	35.16	40.65	34.15	36.77	42.34
		$p = 16$			$p = 17$			$p = 18$			$p = 19$			$p = 20$		
π_0	λ	10%	5%	1%	10%	5%	1%	10%	5%	1%	10%	5%	1%	10%	5%	1%
.50	1.00	23.48	26.21	31.88	24.72	27.50	33.19	25.92	28.80	34.51	27.12	30.07	35.89	28.34	31.39	37.22
.49	1.08	25.40	28.21	33.96	26.72	29.60	35.46	27.98	30.91	36.78	29.22	32.25	38.15	30.47	33.55	39.51
.48	1.17	26.25	29.07	34.91	27.59	30.47	36.25	28.86	31.82	37.71	30.09	33.14	39.11	31.38	34.52	40.58
.47	1.27	26.86	29.72	35.59	28.25	31.10	36.95	29.51	32.43	38.40	30.77	33.81	39.83	32.09	35.20	41.31
.45	1.49	27.82	30.62	36.61	29.20	32.11	37.91	30.52	33.49	39.15	31.84	34.83	40.91	33.16	36.22	42.46
.40	2.25	29.43	32.30	38.29	30.84	33.78	39.67	32.23	35.20	41.18	33.58	36.63	42.67	34.90	38.05	44.11
.35	3.45	30.60	33.45	39.37	32.00	34.94	40.82	33.43	36.38	42.32	34.78	37.80	43.75	36.15	39.21	45.26
.30	5.44	31.52	34.34	40.19	32.94	35.81	41.62	34.39	37.31	43.22	35.78	38.72	44.73	37.18	40.18	46.21
.25	9.00	32.36	35.15	40.87	33.78	36.63	42.38	35.26	38.15	44.02	36.70	39.60	45.56	38.08	41.06	47.05
.20	16.00	33.16	35.92	41.54	34.58	37.42	43.13	36.07	38.91	44.79	37.48	40.37	46.36	38.89	41.85	47.81
.15	32.11	33.92	36.64	42.27	35.39	38.21	43.90	36.87	39.65	45.50	38.27	41.14	47.03	39.72	42.68	48.59
.10	81.00	34.71	37.43	43.12	36.21	39.00	44.68	37.68	40.45	46.24	39.12	41.90	47.81	40.55	43.47	49.48
.05	361.00	35.68	38.35	43.98	37.23	39.94	45.53	38.69	41.46	47.06	40.16	42.96	48.78	41.65	44.46	50.47