

Table 1a*

Small sample performance of alternative estimators of the long-run coefficient, θ , for Experiments 1 ($\psi=1$, $\phi=0.2$, $\theta_0=1.25$, $\omega_{12}=0$)

	Estimator			t-test				
	BIAS	STDE θ	RMSE	MEANt	STDt	SIZE	POWER $_{0.95\theta_0}$	POWER $_{1.05\theta_0}$
<u>T = 50</u>								
<u>ARDL(1,0)</u>								
Asymptotic	-0.0024	0.0620	0.0696	-0.0541	1.0829	0.069	0.248	0.260
Δ -method		0.0637		-0.0543	1.0592	0.063	0.235	0.252
<u>ARDL-AIC</u>								
Asymptotic	-0.0030	0.0583	0.0906	-0.0502	1.3549	0.130	0.304	0.321
Δ -method		0.0647		-0.0497	1.2561	0.108	0.276	0.296
<u>ARDL-SC</u>								
Asymptotic	-0.0025	0.0608	0.0721	-0.0540	1.1624	0.087	0.261	0.280
Δ -method		0.0628		-0.0546	1.1236	0.077	0.246	0.270
PH (0)	-0.0081	0.0496	0.0679	-0.1459	1.3011	0.139	0.345	0.388
PH (5)	-0.0111	0.0510	0.0730	-0.1920	1.4141	0.156	0.337	0.400
PH (10)	-0.0147	0.0457	0.0738	-0.3036	1.6749	0.213	0.392	0.482
PH (20)	-0.0187	0.0376	0.0740	-0.4983	2.1263	0.325	0.470	0.598
PH (40)	-0.0215	0.0286	0.0730	-0.7727	2.8106	0.434	0.572	0.714
OLS	-0.0241	0.0526	0.0723	-0.4163	1.2328	0.134	0.252	0.432
<u>T = 100</u>								
<u>ARDL(1,0)</u>								
Asymptotic	-0.0013	0.0305	0.0337	-0.0460	1.0379	0.062	0.586	0.608
Δ -method		0.0309		-0.0461	1.0254	0.058	0.579	0.602
<u>ARDL-AIC</u>								
Asymptotic	-0.0013	0.0295	0.0346	-0.0442	1.1205	0.077	0.606	0.624
Δ -method		0.0304		-0.0443	1.0907	0.071	0.588	0.608
<u>ARDL-SC</u>								
Asymptotic	-0.0014	0.0303	0.0340	-0.0488	1.0534	0.064	0.586	0.611
Δ -method		0.0308		-0.0490	1.0391	0.061	0.578	0.604
PH (0)	-0.0041	0.0247	0.0336	-0.1486	1.2645	0.125	0.671	0.731
PH (5)	-0.0044	0.0271	0.0349	-0.1381	1.2052	0.106	0.626	0.689
PH (10)	-0.0056	0.0259	0.0359	-0.1887	1.3206	0.141	0.642	0.720
PH (20)	-0.0074	0.0231	0.0368	-0.2943	1.5814	0.204	0.667	0.786
PH (40)	-0.0095	0.0189	0.0369	-0.4882	2.0106	0.307	0.720	0.853
OLS	-0.0128	0.0258	0.0364	-0.4428	1.2208	0.133	0.573	0.791
<u>T = 250</u>								
<u>ARDL(1,0)</u>								
Asymptotic	-0.0003	0.0123	0.0132	-0.0309	1.0110	0.053	0.978	0.977
Δ -method		0.0124		-0.0308	1.0064	0.052	0.977	0.976
<u>ARDL-AIC</u>								
Asymptotic	-0.0002	0.0122	0.0134	-0.0280	1.0444	0.062	0.979	0.975
Δ -method		0.0123		-0.0278	1.0344	0.059	0.977	0.974
<u>ARDL-SC</u>								
Asymptotic	-0.0003	0.0123	0.0132	-0.0307	1.0155	0.053	0.978	0.977
Δ -method		0.0123		-0.0306	1.0105	0.052	0.977	0.976
PH (0)	-0.0014	0.0100	0.0132	-0.1316	1.2299	0.113	0.983	0.990
PH (5)	-0.0009	0.0115	0.0134	-0.0766	1.1006	0.076	0.978	0.983
PH (10)	-0.0011	0.0114	0.0137	-0.0915	1.1429	0.088	0.974	0.984
PH (20)	-0.0016	0.0109	0.0141	-0.1367	1.2406	0.117	0.970	0.984
PH (40)	-0.0024	0.0099	0.0144	-0.2320	1.4475	0.170	0.970	0.987
OLS	-0.0051	0.0104	0.0145	-0.4408	1.2120	0.136	0.967	0.995

* The ARDL-AIC and ARDL-SC represent the estimates based on the ARDL model chosen by the Akaike and Schwartz Information criteria, respectively, from the set of $\{ARDL(p,m), p = 1, \dots, 5, m = 0, \dots, 5\}$ specifications. PH(j) represents the Phillips-Hansen fully modified OLS estimates based on the Bartlett window of size j . See section 5 for a more detailed description of the estimators, tests and the summary statistics. The processes generating y and x are given by (5.1) and (5.2).

Table 1b*

Small sample performance of alternative estimators of the long-run coefficient, θ , for Experiments 1 ($\psi=1$, $\phi=0.2$, $\theta_0=1.25$, $\omega_{12}=0.5$)

	Estimator			t-test				
	BIAS	STDE θ	RMSE	MEANt	STDt	SIZE	POWER $_{0.95\theta_0}$	POWER $_{1.05\theta_0}$
<u>T = 50</u>								
<u>ARDL(1,2)</u>								
Asymptotic	-0.0002	0.0530	0.0649	-0.0078	1.1774	0.097	0.336	0.338
Δ -method		0.0571		-0.0069	1.1066	0.082	0.303	0.310
<u>ARDL-AIC</u>								
Asymptotic	-0.0018	0.0496	0.0708	-0.0341	1.3943	0.150	0.383	0.396
Δ -method		0.0542		-0.0382	1.2871	0.121	0.356	0.362
<u>ARDL-SC</u>								
Asymptotic	-0.0023	0.0485	0.0653	-0.0410	1.3039	0.129	0.380	0.392
Δ -method		0.0505		-0.0408	1.2581	0.119	0.367	0.378
PH (0)	-0.0042	0.0434	0.0588	-0.0910	1.2967	0.133	0.399	0.434
PH (5)	0.0035	0.0447	0.0619	0.0532	1.3745	0.150	0.435	0.395
PH (10)	0.0066	0.0400	0.0619	0.1367	1.6243	0.205	0.515	0.446
PH (20)	0.0090	0.0327	0.0614	0.2708	2.0904	0.316	0.627	0.529
PH (40)	0.0106	0.0247	0.0604	0.4501	2.7508	0.442	0.724	0.628
OLS	0.0120	0.0463	0.0593	0.2287	1.2001	0.106	0.457	0.319
<u>T = 100</u>								
<u>ARDL(1,2)</u>								
Asymptotic	-0.0011	0.0264	0.0311	-0.0315	1.0919	0.074	0.677	0.696
Δ -method		0.0274		-0.0304	1.0606	0.070	0.656	0.681
<u>ARDL-AIC</u>								
Asymptotic	-0.0019	0.0257	0.0324	-0.0533	1.1657	0.091	0.683	0.715
Δ -method		0.0266		-0.0521	1.1288	0.083	0.667	0.699
<u>ARDL-SC</u>								
Asymptotic	-0.0033	0.0254	0.0317	-0.1033	1.1591	0.092	0.671	0.735
Δ -method		0.0259		-0.1013	1.1407	0.088	0.662	0.727
PH (0)	-0.0034	0.0216	0.0304	-0.1383	1.2796	0.124	0.738	0.806
PH (5)	-0.0005	0.0238	0.0309	-0.0208	1.2166	0.105	0.732	0.740
PH (10)	0.0008	0.0226	0.0313	0.0291	1.3303	0.134	0.756	0.746
PH (20)	0.0023	0.0201	0.0317	0.1150	1.5907	0.197	0.802	0.773
PH (40)	0.0036	0.0162	0.0316	0.2375	2.0547	0.294	0.861	0.823
OLS	0.0049	0.0228	0.0303	0.1910	1.2145	0.108	0.799	0.713
<u>T = 250</u>								
<u>ARDL(1,2)</u>								
Asymptotic	-0.0001	0.0106	0.0116	-0.0279	1.0200	0.056	0.989	0.986
Δ -method		0.0108		-0.0276	1.0091	0.054	0.988	0.984
<u>ARDL-AIC</u>								
Asymptotic	-0.0004	0.0106	0.0118	-0.0463	1.0451	0.064	0.986	0.986
Δ -method		0.0107		-0.0461	1.0319	0.060	0.986	0.985
<u>ARDL-SC</u>								
Asymptotic	-0.0011	0.0105	0.0118	-0.1116	1.0405	0.062	0.987	0.989
Δ -method		0.0106		-0.1109	1.0333	0.060	0.986	0.988
PH (0)	-0.0012	0.0087	0.0116	-0.1368	1.2274	0.111	0.993	0.996
PH (5)	-0.0002	0.0100	0.0117	-0.0354	1.0941	0.077	0.991	0.988
PH (10)	0.0002	0.0099	0.0119	-0.0083	1.1335	0.082	0.990	0.987
PH (20)	0.0006	0.0094	0.0122	0.0258	1.2316	0.109	0.992	0.985
PH (40)	0.0010	0.0085	0.0124	0.0746	1.4446	0.155	0.993	0.986
OLS	0.0022	0.0091	0.0119	0.1958	1.1825	0.107	0.995	0.986

* See the footnote to Table 1a.

Table 1c*

Small sample performance of alternative estimators of the long-run coefficient, θ , for Experiments 1 ($\psi=1$, $\phi=0.2$, $\theta_0=1.25$, $\omega_{12}=-0.5$)

	Estimator			t-test				
	BIAS	STDE θ	RMSE	MEANt	STDt	SIZE	POWER $_{0.95\theta_0}$	POWER $_{1.05\theta_0}$
<u>T = 50</u>								
<u>ARDL(1,2)</u>								
Asymptotic	-0.0023	0.0524	0.0662	-0.0400	1.2018	0.099	0.347	0.346
Δ -method		0.0563		-0.0354	1.1292	0.082	0.317	0.321
<u>ARDL-AIC</u>								
Asymptotic	-0.0014	0.0492	0.0713	-0.0473	1.4301	0.152	0.390	0.401
Δ -method		0.0540		-0.0477	1.2905	0.118	0.351	0.367
<u>ARDL-SC</u>								
Asymptotic	-0.0002	0.0515	0.0668	-0.0274	1.2591	0.114	0.360	0.358
Δ -method		0.0545		-0.0255	1.1888	0.095	0.336	0.339
PH (0)	-0.0117	0.0441	0.0639	-0.2401	1.3173	0.142	0.380	0.488
PH (5)	-0.0258	0.0486	0.0787	-0.4475	1.4072	0.175	0.325	0.496
PH (10)	-0.0361	0.0456	0.0870	-0.7109	1.6621	0.246	0.355	0.579
PH (20)	-0.0471	0.0394	0.0947	-1.1657	2.1190	0.364	0.406	0.692
PH (40)	-0.0542	0.0311	0.0984	-1.7815	2.7333	0.501	0.491	0.812
OLS	-0.0606	0.0582	0.1009	-0.9327	1.1757	0.192	0.170	0.560
<u>T = 100</u>								
<u>ARDL(1,2)</u>								
Asymptotic	-0.0007	0.0260	0.0296	-0.0236	1.0836	0.068	0.685	0.696
Δ -method		0.0269		-0.0234	1.0515	0.062	0.668	0.680
<u>ARDL-AIC</u>								
Asymptotic	-0.0004	0.0249	0.0307	-0.0239	1.1768	0.097	0.710	0.716
Δ -method		0.0259		-0.0240	1.1290	0.086	0.694	0.701
<u>ARDL-SC</u>								
Asymptotic	0.0007	0.0250	0.0299	0.0174	1.1332	0.086	0.724	0.703
Δ -method		0.0257		0.0158	1.1056	0.078	0.711	0.690
PH (0)	-0.0044	0.0216	0.0292	-0.1858	1.2470	0.118	0.738	0.808
PH (5)	-0.0077	0.0248	0.0323	-0.2593	1.1730	0.098	0.655	0.781
PH (10)	-0.0115	0.0244	0.0357	-0.3974	1.2758	0.135	0.631	0.811
PH (20)	-0.0168	0.0230	0.0402	-0.6455	1.5064	0.212	0.617	0.858
PH (40)	-0.0224	0.0198	0.0442	-1.0711	1.9059	0.326	0.627	0.912
OLS	-0.0298	0.0286	0.0484	-0.9267	1.1078	0.178	0.393	0.888
<u>T = 250</u>								
<u>ARDL(1,2)</u>								
Asymptotic	-0.0000	0.0105	0.0115	-0.0050	1.0168	0.056	0.988	0.991
Δ -method		0.0106		-0.0049	1.0053	0.053	0.987	0.990
<u>ARDL-AIC</u>								
Asymptotic	0.0002	0.0103	0.0117	0.0087	1.0603	0.061	0.989	0.990
Δ -method		0.0105		0.0084	1.0446	0.058	0.988	0.988
<u>ARDL-SC</u>								
Asymptotic	0.0006	0.0101	0.0116	0.0471	1.0637	0.068	0.991	0.990
Δ -method		0.0102		0.0466	1.0539	0.065	0.990	0.989
PH (0)	-0.0013	0.0087	0.0115	-0.1378	1.2172	0.113	0.990	0.994
PH (5)	-0.0014	0.0101	0.0118	-0.1122	1.0691	0.068	0.985	0.993
PH (10)	-0.0021	0.0102	0.0124	-0.1671	1.0989	0.078	0.977	0.994
PH (20)	-0.0035	0.0101	0.0136	-0.2857	1.1879	0.108	0.968	0.995
PH (40)	-0.0056	0.0096	0.0154	-0.5046	1.3807	0.170	0.958	0.997
OLS	-0.0119	0.0115	0.0194	-0.9203	1.1137	0.180	0.906	1.000

* See the footnote to Table 1a.

Table 1d*

Small sample performance of alternative estimators of the long-run coefficient, θ , for Experiments 1 ($\psi=1$, $\phi=0.8$, $\theta_0=5$, $\omega_{12}=0$)

	Estimator			t-test				
	BIAS	STDE θ	RMSE	MEANt	STDt	SIZE	POWER $_{0.95\theta_0}$	POWER $_{1.05\theta_0}$
<u>T = 50</u>								
<u>ARDL(1,0)</u>								
Asymptotic	-0.0244	0.2486	0.3773	-0.1811	1.3950	0.142	0.274	0.332
Δ -method		0.3231		-0.1588	1.0951	0.072	0.161	0.245
<u>ARDL-AIC</u>								
Asymptotic	-0.0197	0.2268	0.4161	-0.2150	1.8688	0.224	0.357	0.407
Δ -method		0.3103		-0.1924	1.3541	0.128	0.227	0.298
<u>ARDL-SC</u>								
Asymptotic	-0.0235	0.2437	0.3903	-0.1969	1.5126	0.164	0.298	0.350
Δ -method		0.3199		-0.1721	1.1649	0.086	0.178	0.263
PH (0)	-1.1527	0.2280	1.3786	-5.2185	3.3720	0.852	0.769	0.910
PH (5)	-0.9850	0.3914	1.2493	-2.6525	2.0803	0.626	0.493	0.752
PH (10)	-0.9915	0.4204	1.2911	-2.5283	2.1741	0.595	0.468	0.711
PH (20)	-1.0968	0.4223	1.4192	-2.9371	2.6879	0.639	0.530	0.728
PH (40)	-1.2228	0.3604	1.5239	-4.1524	3.6499	0.723	0.646	0.791
OLS	-1.3488	0.2873	1.6072	-4.8132	3.0641	0.845	0.767	0.894
<u>T = 100</u>								
<u>ARDL(1,0)</u>								
Asymptotic	-0.0111	0.1222	0.1524	-0.0995	1.1354	0.088	0.570	0.605
Δ -method		0.1406		-0.0910	1.0035	0.055	0.505	0.542
<u>ARDL-AIC</u>								
Asymptotic	-0.0109	0.1173	0.1599	-0.1113	1.2727	0.120	0.594	0.631
Δ -method		0.1373		-0.1032	1.0982	0.078	0.519	0.557
<u>ARDL-SC</u>								
Asymptotic	-0.0112	0.1214	0.1548	-0.1061	1.1646	0.094	0.574	0.609
Δ -method		0.1399		-0.0969	1.0241	0.060	0.507	0.548
PH (0)	-0.6722	0.1317	0.8221	-4.8927	2.9266	0.862	0.676	0.964
PH (5)	-0.5162	0.2309	0.6673	-2.1405	1.5251	0.527	0.295	0.833
PH (10)	-0.4743	0.2514	0.6448	-1.7892	1.4493	0.426	0.230	0.756
PH (20)	-0.5079	0.2719	0.7115	-1.7609	1.5673	0.414	0.254	0.715
PH (40)	-0.6113	0.2761	0.8307	-2.2095	2.0303	0.522	0.352	0.751
OLS	-0.7984	0.1649	0.9748	-4.6328	2.7775	0.853	0.698	0.947
<u>T = 250</u>								
<u>ARDL(1,0)</u>								
Asymptotic	-0.0013	0.0493	0.0566	-0.0392	1.0577	0.066	0.970	0.971
Δ -method		0.0523		-0.0380	1.0056	0.053	0.962	0.963
<u>ARDL-AIC</u>								
Asymptotic	-0.0012	0.0486	0.0583	-0.0433	1.1060	0.076	0.970	0.968
Δ -method		0.0519		-0.0426	1.0420	0.062	0.962	0.959
<u>ARDL-SC</u>								
Asymptotic	-0.0013	0.0492	0.0566	-0.0402	1.0605	0.066	0.970	0.972
Δ -method		0.0523		-0.0391	1.0081	0.053	0.962	0.964
PH (0)	-0.3017	0.0593	0.3781	-4.6556	2.7008	0.852	0.611	0.999
PH (5)	-0.2115	0.1030	0.2746	-1.8674	1.2164	0.473	0.314	0.986
PH (10)	-0.1718	0.1085	0.2348	-1.4197	1.0624	0.290	0.332	0.978
PH (20)	-0.1588	0.1142	0.2327	-1.2056	1.0517	0.217	0.366	0.961
PH (40)	-0.1917	0.1265	0.2864	-1.2862	1.1938	0.260	0.349	0.944
OLS	-0.3617	0.0739	0.4534	-4.4773	2.6420	0.844	0.596	0.996

* See the footnote to Table 1a.

Table 1e*

Small sample performance of alternative estimators of the long-run coefficient, θ , for Experiments 1 ($\psi=1, \phi=0.8, \theta_0=5, \omega_{12}=0.5$)

	Estimator			t-test				
	BIAS	STDE θ	RMSE	MEANt	STDt	SIZE	POWER _{0.95θ_0}	POWER _{1.05θ_0}
<u>T = 50</u>								
<u>ARDL(1,2)</u>								
Asymptotic	-0.0281	0.2138	0.3419	-0.2619	1.5128	0.180	0.329	0.406
Δ -method		0.3016		-0.2224	1.1135	0.078	0.186	0.291
<u>ARDL-AIC</u>								
Asymptotic	-0.0081	0.1946	0.3739	-0.1926	1.8997	0.249	0.414	0.445
Δ -method		0.2795		-0.1906	1.3497	0.129	0.262	0.342
<u>ARDL-SC</u>								
Asymptotic	-0.0148	0.2058	0.3535	-0.1998	1.6764	0.208	0.377	0.418
Δ -method		0.2841		-0.1915	1.2583	0.108	0.232	0.320
PH (0)	-1.0521	0.2057	1.2676	-5.2811	3.4463	0.848	0.763	0.911
PH (5)	-0.8982	0.3524	1.1512	-2.6729	2.1043	0.637	0.492	0.768
PH (10)	-0.9036	0.3773	1.1872	-2.5416	2.1803	0.598	0.466	0.731
PH (20)	-0.9967	0.3769	1.2983	-2.9728	2.7116	0.640	0.530	0.742
PH (40)	-1.1092	0.3206	1.3917	-4.2284	3.6902	0.728	0.641	0.812
OLS	-1.2234	0.2560	1.4665	-4.9168	3.1793	0.836	0.769	0.897
<u>T = 100</u>								
<u>ARDL(1,2)</u>								
Asymptotic	-0.0141	0.1060	0.1419	-0.1580	1.2264	0.108	0.654	0.704
Δ -method		0.1260		-0.1382	1.0487	0.060	0.566	0.629
<u>ARDL-AIC</u>								
Asymptotic	-0.0091	0.1028	0.1477	-0.1223	1.3249	0.134	0.675	0.706
Δ -method		0.1225		-0.1117	1.1241	0.081	0.588	0.632
<u>ARDL-SC</u>								
Asymptotic	-0.0040	0.1070	0.1429	-0.0730	1.2447	0.110	0.668	0.677
Δ -method		0.1264		-0.0697	1.0721	0.062	0.586	0.606
PH (0)	-0.6110	0.1199	0.7490	-4.8736	2.9267	0.856	0.661	0.970
PH (5)	-0.4687	0.2096	0.6048	-2.1350	1.5118	0.539	0.275	0.854
PH (10)	-0.4302	0.2279	0.5824	-1.7892	1.4352	0.431	0.216	0.780
PH (20)	-0.4613	0.2460	0.6413	-1.7713	1.5587	0.421	0.240	0.746
PH (40)	-0.5561	0.2504	0.7521	-2.2061	1.9845	0.519	0.356	0.767
OLS	-0.7222	0.1484	0.8841	-4.6446	2.8003	0.844	0.685	0.955
<u>T = 250</u>								
<u>ARDL(1,2)</u>								
Asymptotic	-0.0017	0.0426	0.0500	-0.0639	1.0739	0.070	0.987	0.980
Δ -method		0.0459		-0.0611	1.0102	0.055	0.981	0.972
<u>ARDL-AIC</u>								
Asymptotic	-0.0006	0.0423	0.0507	-0.0454	1.1042	0.077	0.987	0.978
Δ -method		0.0456		-0.0441	1.0367	0.058	0.982	0.971
<u>ARDL-SC</u>								
Asymptotic	0.0024	0.0436	0.0504	0.0180	1.0585	0.068	0.989	0.975
Δ -method		0.0468		0.0144	0.9982	0.052	0.982	0.968
PH (0)	-0.2711	0.0535	0.3438	-4.6110	2.6983	0.848	0.615	0.998
PH (5)	-0.1898	0.0928	0.2491	-1.8488	1.2062	0.467	0.364	0.993
PH (10)	-0.1541	0.0977	0.2132	-1.4035	1.0449	0.281	0.397	0.987
PH (20)	-0.1427	0.1026	0.2126	-1.1924	1.0333	0.210	0.436	0.977
PH (40)	-0.1719	0.1136	0.2610	-1.2689	1.1714	0.251	0.399	0.965
OLS	-0.3234	0.0660	0.4105	-4.4562	2.6611	0.843	0.597	0.996

* See the footnote to Table 1a.

Table 1f*

Small sample performance of alternative estimators of the long-run coefficient, θ , for Experiments 1 ($\psi=1$, $\phi=0.8$, $\theta_0=5$, $\omega_{12}=-0.5$)

	Estimator			t-test				
	BIAS	STDE θ	RMSE	MEANt	STDt	SIZE	POWER $_{0.95\theta_0}$	POWER $_{1.05\theta_0}$
<u>T = 50</u>								
<u>ARDL(1,2)</u>								
Asymptotic	-0.0351	0.2141	0.3604	-0.2843	1.5817	0.178	0.332	0.420
Δ -method		0.3018		-0.2273	1.1431	0.081	0.190	0.286
<u>ARDL-AIC</u>								
Asymptotic	-0.0267	0.1932	0.3823	-0.2711	1.9131	0.255	0.414	0.475
Δ -method		0.2766		-0.2284	1.3410	0.131	0.265	0.351
<u>ARDL-SC</u>								
Asymptotic	-0.0421	0.2047	0.3627	-0.3221	1.6632	0.207	0.354	0.452
Δ -method		0.2802		-0.2580	1.2294	0.102	0.224	0.338
PH (0)	-1.2738	0.2452	1.5167	-5.3680	3.4405	0.858	0.783	0.912
PH (5)	-1.0925	0.4220	1.3767	-2.7297	2.1095	0.635	0.523	0.754
PH (10)	-1.1009	0.4548	1.4258	-2.5958	2.2140	0.602	0.499	0.707
PH (20)	-1.2209	0.4585	1.5736	-3.0096	2.7512	0.638	0.548	0.726
PH (40)	-1.3569	0.3908	1.6906	-4.2580	3.7440	0.721	0.652	0.790
OLS	-1.4993	0.3142	1.7804	-4.8871	3.0990	0.842	0.778	0.896
<u>T = 100</u>								
<u>ARDL(1,2)</u>								
Asymptotic	-0.0085	0.1058	0.1410	-0.1100	1.2105	0.099	0.666	0.708
Δ -method		0.1265		-0.1004	1.0196	0.056	0.577	0.627
<u>ARDL-AIC</u>								
Asymptotic	-0.0100	0.0998	0.1445	-0.1264	1.3475	0.129	0.695	0.732
Δ -method		0.1192		-0.1156	1.1287	0.080	0.605	0.662
<u>ARDL-SC</u>								
Asymptotic	-0.0181	0.1018	0.1424	-0.1962	1.2682	0.117	0.667	0.739
Δ -method		0.1196		-0.1736	1.0818	0.073	0.583	0.677
PH (0)	-0.7307	0.1420	0.8912	-4.9305	2.9017	0.864	0.689	0.963
PH (5)	-0.5621	0.2485	0.7219	-2.1668	1.5095	0.541	0.303	0.826
PH (10)	-0.5180	0.2703	0.6995	-1.8204	1.4451	0.436	0.234	0.749
PH (20)	-0.5573	0.2929	0.7748	-1.8001	1.5739	0.421	0.256	0.704
PH (40)	-0.6716	0.2985	0.9076	-2.2454	2.0148	0.523	0.367	0.736
OLS	-0.8716	0.1805	1.0629	-4.6160	2.7321	0.852	0.698	0.948
<u>T = 250</u>								
<u>ARDL(1,2)</u>								
Asymptotic	-0.0005	0.0425	0.0499	-0.0255	1.0656	0.062	0.986	0.986
Δ -method		0.0458		-0.0248	0.9947	0.043	0.979	0.982
<u>ARDL-AIC</u>								
Asymptotic	-0.0013	0.0412	0.0509	-0.0422	1.1162	0.076	0.986	0.986
Δ -method		0.0445		-0.0408	1.0395	0.050	0.978	0.980
<u>ARDL-SC</u>								
Asymptotic	-0.0044	0.0413	0.0499	-0.1093	1.0978	0.074	0.984	0.990
Δ -method		0.0443		-0.1026	1.0311	0.054	0.978	0.985
PH (0)	-0.3279	0.0638	0.4120	-4.7000	2.7099	0.862	0.595	0.996
PH (5)	-0.2304	0.1105	0.3005	-1.8942	1.2198	0.478	0.285	0.985
PH (10)	-0.1874	0.1161	0.2579	-1.4430	1.0589	0.295	0.287	0.973
PH (20)	-0.1740	0.1220	0.2587	-1.2274	1.0530	0.221	0.324	0.953
PH (40)	-0.2099	0.1359	0.3180	-1.3035	1.2014	0.257	0.304	0.934
OLS	-0.3948	0.0807	0.4964	-4.4736	2.6336	0.853	0.596	0.993

* See the footnote to Table 1a.

Table 2a*

Small sample performance of alternative estimators of the long-run coefficient, θ , for Experiments 2 ($\psi=0.95$, $\phi=0.2$, $\theta_0=1.25$, $\omega_{12}=0$)

	Estimator			t-test				
	BIAS	STDE θ	RMSE	MEANt	STDt	SIZE	POWER $_{0.95\theta_0}$	POWER $_{1.05\theta_0}$
<u>T = 50</u>								
<u>ARDL(1,0)</u>								
Asymptotic	-0.0036	0.0731	0.0793	-0.0692	1.0714	0.066	0.174	0.203
Δ -method		0.0755		-0.0701	1.0431	0.057	0.159	0.193
<u>ARDL-AIC</u>								
Asymptotic	-0.0036	0.0684	0.0920	-0.0679	1.3686	0.134	0.244	0.259
Δ -method		0.0742		-0.0689	1.2429	0.102	0.209	0.235
<u>ARDL-SC</u>								
Asymptotic	-0.0040	0.0716	0.0826	-0.0736	1.1721	0.087	0.194	0.222
Δ -method		0.0744		-0.0749	1.1178	0.073	0.176	0.211
PH (0)	-0.0113	0.0584	0.0782	-0.1813	1.2873	0.130	0.257	0.320
PH (5)	-0.0171	0.0602	0.0848	-0.2683	1.3992	0.162	0.261	0.347
PH (10)	-0.0229	0.0540	0.0868	-0.4303	1.6533	0.225	0.312	0.435
PH (20)	-0.0288	0.0446	0.0871	-0.6968	2.0671	0.317	0.383	0.561
PH (40)	-0.0319	0.0343	0.0860	-1.0271	2.6683	0.432	0.478	0.671
OLS	-0.0340	0.0620	0.0846	-0.5221	1.1981	0.137	0.166	0.377
<u>T = 100</u>								
<u>ARDL(1,0)</u>								
Asymptotic	-0.0020	0.0426	0.0462	-0.0614	1.0669	0.067	0.351	0.383
Δ -method		0.0435		-0.0615	1.0479	0.065	0.337	0.372
<u>ARDL-AIC</u>								
Asymptotic	-0.0020	0.0413	0.0488	-0.0601	1.1881	0.096	0.378	0.414
Δ -method		0.0431		-0.0591	1.1332	0.086	0.357	0.394
<u>ARDL-SC</u>								
Asymptotic	-0.0023	0.0423	0.0468	-0.0675	1.0893	0.073	0.354	0.393
Δ -method		0.0433		-0.0671	1.0664	0.071	0.340	0.383
PH (0)	-0.0072	0.0345	0.0462	-0.2024	1.2900	0.134	0.438	0.551
PH (5)	-0.0092	0.0379	0.0488	-0.2269	1.2595	0.123	0.382	0.505
PH (10)	-0.0125	0.0362	0.0505	-0.3324	1.3766	0.156	0.401	0.562
PH (20)	-0.0165	0.0327	0.0515	-0.5196	1.6101	0.224	0.429	0.640
PH (40)	-0.0202	0.0272	0.0520	-0.8056	2.0194	0.316	0.490	0.748
OLS	-0.0233	0.0361	0.0514	-0.6222	1.2181	0.155	0.305	0.651
<u>T = 250</u>								
<u>ARDL(1,0)</u>								
Asymptotic	-0.0011	0.0228	0.0237	-0.0540	1.0222	0.058	0.766	0.789
Δ -method		0.0231		-0.0537	1.0099	0.055	0.760	0.780
<u>ARDL-AIC</u>								
Asymptotic	-0.0009	0.0225	0.0245	-0.0485	1.0733	0.074	0.771	0.782
Δ -method		0.0231		-0.0472	1.0451	0.067	0.759	0.768
<u>ARDL-SC</u>								
Asymptotic	-0.0011	0.0227	0.0239	-0.0557	1.0324	0.060	0.766	0.786
Δ -method		0.0230		-0.0553	1.0193	0.057	0.760	0.778
PH (0)	-0.0047	0.0185	0.0240	-0.2455	1.2413	0.124	0.819	0.909
PH (5)	-0.0044	0.0213	0.0248	-0.1981	1.1302	0.088	0.752	0.847
PH (10)	-0.0060	0.0212	0.0255	-0.2749	1.1668	0.100	0.734	0.859
PH (20)	-0.0087	0.0205	0.0266	-0.4253	1.2492	0.133	0.717	0.890
PH (40)	-0.0119	0.0190	0.0279	-0.6460	1.3971	0.187	0.711	0.920
OLS	-0.0161	0.0192	0.0288	-0.8167	1.1920	0.176	0.666	0.955

* See the footnote to Table 1a.

Table 2b*

Small sample performance of alternative estimators of the long-run coefficient, θ , for Experiments 2 ($\psi=0.95$, $\phi=0.2$, $\theta_0=1.275$, $\omega_{12}=0.5$)

	Estimator			t-test				
	BIAS	STDE θ	RMSE	MEANt	STDt	SIZE	POWER $_{0.95\theta_0}$	POWER $_{1.05\theta_0}$
<u>T = 50</u>								
<u>ARDL(1,2)</u>								
Asymptotic	0.0004	0.0625	0.0742	-0.0157	1.1673	0.092	0.254	0.268
Δ -method		0.0681		-0.0154	1.0823	0.071	0.224	0.237
<u>ARDL-AIC</u>								
Asymptotic	-0.0012	0.0581	0.0817	-0.0505	1.4144	0.160	0.323	0.333
Δ -method		0.0642		-0.0568	1.2877	0.129	0.283	0.302
<u>ARDL-SC</u>								
Asymptotic	-0.0022	0.0571	0.0736	-0.0600	1.2948	0.126	0.304	0.328
Δ -method		0.0597		-0.0594	1.2432	0.115	0.289	0.302
PH (0)	-0.0055	0.0512	0.0677	-0.1250	1.2723	0.122	0.314	0.366
PH (5)	0.0051	0.0526	0.0721	0.0650	1.3665	0.149	0.361	0.336
PH (10)	0.0091	0.0470	0.0720	0.1691	1.6128	0.198	0.448	0.374
PH (20)	0.0123	0.0387	0.0704	0.3148	2.0131	0.303	0.562	0.447
PH (40)	0.0140	0.0296	0.0690	0.4917	2.6267	0.416	0.671	0.554
OLS	0.0149	0.0543	0.0773	0.2431	1.1708	0.100	0.368	0.250
<u>T = 100</u>								
<u>ARDL(1,2)</u>								
Asymptotic	-0.0008	0.0366	0.0420	-0.0203	1.1131	0.080	0.461	0.469
Δ -method		0.0385		-0.0192	1.0631	0.068	0.437	0.443
<u>ARDL-AIC</u>								
Asymptotic	-0.0023	0.0357	0.0442	-0.0595	1.2069	0.106	0.473	0.505
Δ -method		0.0376		0.0593	1.1466	0.090	0.446	0.476
<u>ARDL-SC</u>								
Asymptotic	-0.0047	0.0351	0.0424	-0.1170	1.1797	0.100	0.458	0.536
Δ -method		0.0361		-0.1141	1.1521	0.094	0.448	0.520
PH (0)	-0.0053	0.0299	0.0403	-0.1705	1.2837	0.130	0.540	0.634
PH (5)	0.0005	0.0330	0.0417	0.0113	1.2449	0.117	0.539	0.528
PH (10)	0.0028	0.0314	0.0422	0.0885	1.3590	0.150	0.580	0.541
PH (20)	0.0053	0.0281	0.0423	0.2002	1.5732	0.197	0.658	0.582
PH (40)	0.0068	0.0233	0.0416	0.3326	1.9610	0.285	0.745	0.648
OLS	0.0085	0.0313	0.0401	0.2608	1.2037	0.112	0.640	0.482
<u>T = 250</u>								
<u>ARDL(1,2)</u>								
Asymptotic	-0.0005	0.0198	0.0209	-0.0283	1.0388	0.058	0.867	0.876
Δ -method		0.0204		-0.0273	1.0087	0.052	0.857	0.862
<u>ARDL-AIC</u>								
Asymptotic	-0.0012	0.0197	0.0216	-0.0634	1.0823	0.067	0.858	0.877
Δ -method		0.0204		-0.0629	1.0452	0.058	0.846	0.862
<u>ARDL-SC</u>								
Asymptotic	-0.0037	0.0196	0.0216	-0.1904	1.0619	0.068	0.834	0.908
Δ -method		0.0199		-0.1882	1.0427	0.064	0.826	0.902
PH (0)	-0.0038	0.0162	0.0207	-0.2309	1.2317	0.116	0.903	0.952
PH (5)	-0.0001	0.0186	0.0211	-0.0095	1.1180	0.078	0.889	0.890
PH (10)	0.0012	0.0184	0.0215	0.0587	1.1619	0.092	0.900	0.874
PH (20)	0.0027	0.0177	0.0218	0.1445	1.2417	0.109	0.915	0.874
PH (40)	0.0041	0.0164	0.0218	0.2516	1.3865	0.153	0.932	0.877
OLS	0.0059	0.0167	0.0210	0.3436	1.1777	0.108	0.956	0.878

* See the footnote to Table 1a.

Table 2c*

Small sample performance of alternative estimators of the long-run coefficient, θ , for Experiments 2 ($\psi=0.95$, $\phi=0.2$, $\theta_0=1.225$, $\omega_{12}=-0.5$)

	Estimator			t-test				
	BIAS	STDE θ	RMSE	MEANt	STDt	SIZE	POWER $_{0.95\theta_0}$	POWER $_{1.05\theta_0}$
<u>T = 50</u>								
<u>ARDL(1,2)</u>								
Asymptotic	-0.0019	0.0618	0.0750	-0.0370	1.2059	0.106	0.261	0.269
Δ -method		0.0672		-0.0349	1.1190	0.080	0.231	0.235
<u>ARDL-AIC</u>								
Asymptotic	-0.0012	0.0582	0.0827	-0.0584	1.4449	0.161	0.296	0.319
Δ -method		0.0650		-0.0583	1.2759	0.124	0.260	0.279
<u>ARDL-SC</u>								
Asymptotic	-0.0002	0.0610	0.0759	-0.0351	1.2519	0.110	0.270	0.279
Δ -method		0.0652		-0.0349	1.1725	0.092	0.247	0.252
PH (0)	-0.0148	0.0518	0.0711	-0.2694	1.2999	0.137	0.272	0.382
PH (5)	-0.0364	0.0569	0.0884	-0.5929	1.3653	0.175	0.232	0.435
PH (10)	-0.0516	0.0534	0.0998	-0.9550	1.6038	0.277	0.257	0.545
PH (20)	-0.0666	0.0461	0.1090	-1.5177	1.9610	0.395	0.316	0.693
PH (40)	-0.0752	0.0364	0.1133	-2.2398	2.5062	0.530	0.422	0.810
OLS	-0.0804	0.0678	0.1159	-1.1235	1.0804	0.219	0.099	0.542
<u>T = 100</u>								
<u>ARDL(1,2)</u>								
Asymptotic	-0.0015	0.0362	0.0414	-0.0395	1.1251	0.083	0.441	0.471
Δ -method		0.0380		-0.0372	1.0760	0.077	0.409	0.438
<u>ARDL-AIC</u>								
Asymptotic	-0.0015	0.0346	0.0435	-0.0550	1.2584	0.107	0.477	0.507
Δ -method		0.0368		-0.0506	1.2771	0.096	0.437	0.472
<u>ARDL-SC</u>								
Asymptotic	0.0013	0.0349	0.0418	0.0222	1.1740	0.089	0.492	0.476
Δ -method		0.0363		0.0201	1.1307	0.081	0.464	0.451
PH (0)	-0.0083	0.0301	0.0408	-0.2577	1.2815	0.133	0.492	0.636
PH (5)	-0.0175	0.0345	0.0476	-0.4592	1.2230	0.132	0.370	0.632
PH (10)	-0.0262	0.0339	0.0541	-0.7225	1.3310	0.189	0.342	0.696
PH (20)	-0.0369	0.0319	0.0617	-1.1483	1.5398	0.291	0.329	0.787
PH (40)	-0.0460	0.0276	0.0675	-1.7668	1.9121	0.437	0.352	0.876
OLS	-0.0539	0.0393	0.0725	-1.3037	1.0515	0.270	0.128	0.836
<u>T = 250</u>								
<u>ARDL(1,2)</u>								
Asymptotic	-0.0007	0.0195	0.0208	-0.0336	1.0493	0.060	0.849	0.868
Δ -method		0.0201		-0.0325	1.0186	0.050	0.837	0.852
<u>ARDL-AIC</u>								
Asymptotic	-0.0001	0.0191	0.0214	-0.0097	1.1059	0.073	0.854	0.864
Δ -method		0.0198		-0.0090	1.0653	0.063	0.839	0.847
<u>ARDL-SC</u>								
Asymptotic	0.0013	0.0187	0.0209	0.0635	1.0954	0.073	0.877	0.856
Δ -method		0.0191		0.0621	1.0701	0.067	0.868	0.847
PH (0)	-0.0049	0.0161	0.0209	-0.2901	1.2275	0.114	0.869	0.951
PH (5)	-0.0078	0.0190	0.0228	-0.3886	1.0971	0.094	0.768	0.934
PH (10)	-0.0122	0.0193	0.0257	-0.6034	1.1300	0.128	0.712	0.949
PH (20)	-0.0190	0.0193	0.0308	-0.9650	1.2181	0.212	0.622	0.967
PH (40)	-0.0267	0.0186	0.0368	-1.4660	1.3850	0.326	0.540	0.982
OLS	-0.0372	0.0210	0.0444	-1.7193	0.9970	0.394	0.312	0.998

* See the footnote to Table 1a.

Table 2d*

Small sample performance of alternative estimators of the long-run coefficient, θ , for Experiments 2 ($\psi=0.95$, $\phi=0.8$, $\theta_0=5$, $\omega_{12}=0$)

	Estimator			t-test				
	BIAS	STDE θ	RMSE	MEANt	STDt	SIZE	POWER $_{0.95\theta_0}$	POWER $_{1.05\theta_0}$
<u>T = 50</u>								
<u>ARDL(1,0)</u>								
Asymptotic	-0.0391	0.2926	0.4506	-0.2390	1.4578	0.170	0.231	0.298
Δ -method		0.4045		-0.2060	1.0980	0.079	0.103	0.191
<u>ARDL-AIC</u>								
Asymptotic	-0.0292	0.2660	0.5249	-0.3043	2.0791	0.272	0.330	0.380
Δ -method		0.3912		-0.2686	1.4295	0.135	0.166	0.250
<u>ARDL-SC</u>								
Asymptotic	-0.0367	0.2858	0.4674	-0.2555	1.6332	0.192	0.258	0.318
Δ -method		0.3983		-0.2213	1.2068	0.092	0.124	0.206
PH (0)	-1.5582	0.2452	1.6902	-6.5953	2.8986	0.964	0.916	0.985
PH (5)	-1.3809	0.4144	1.5486	-3.5302	1.9340	0.800	0.676	0.902
PH (10)	-1.4236	0.4447	1.6114	-3.4380	2.0248	0.772	0.652	0.870
PH (20)	-1.5846	0.4482	1.7724	-3.9655	2.4947	0.814	0.720	0.885
PH (40)	-1.7278	0.3754	1.8918	-5.4744	3.3989	0.884	0.821	0.932
OLS	-1.8212	0.3100	1.9642	-6.0577	2.5381	0.959	0.919	0.982
<u>T = 100</u>								
<u>ARDL(1,0)</u>								
Asymptotic	-0.0210	0.1702	0.2236	-0.1549	1.2596	0.127	0.360	0.417
Δ -method		0.2107		-0.1342	1.0399	0.064	0.236	0.315
<u>ARDL-AIC</u>								
Asymptotic	-0.0212	0.1635	0.2412	-0.1867	1.4637	0.161	0.387	0.447
Δ -method		0.2081		-0.1614	1.1624	0.086	0.255	0.339
<u>ARDL-SC</u>								
Asymptotic	-0.0219	0.1690	0.2275	-0.1638	1.2994	0.134	0.365	0.423
Δ -method		0.2098		-0.1415	1.0656	0.068	0.238	0.322
PH (0)	-1.1700	0.1639	1.2604	-7.0799	2.4658	0.995	0.934	1.000
PH (5)	-0.9500	0.2858	1.0559	-3.3069	1.4489	0.828	0.578	0.970
PH (10)	-0.9250	0.3141	1.0505	-2.9285	1.4216	0.740	0.483	0.932
PH (20)	-1.0329	0.3460	1.1757	-3.0017	1.5508	0.736	0.508	0.919
PH (40)	-1.2137	0.3481	1.3450	-3.7006	2.0755	0.834	0.647	0.943
OLS	-1.3839	0.2048	1.4847	-6.6914	2.2415	0.995	0.949	1.000
<u>T = 250</u>								
<u>ARDL(1,0)</u>								
Asymptotic	-0.0064	0.0912	0.1077	-0.0874	1.1433	0.089	0.752	0.766
Δ -method		0.1044		-0.0791	1.0031	0.050	0.672	0.700
<u>ARDL-AIC</u>								
Asymptotic	-0.0067	0.0899	0.1115	-0.0979	1.2183	0.105	0.750	0.768
Δ -method		0.1044		-0.0884	1.0501	0.057	0.662	0.695
<u>ARDL-SC</u>								
Asymptotic	-0.0068	0.0911	0.1085	-0.0909	1.1532	0.091	0.748	0.768
Δ -method		0.1043		-0.0821	1.0104	0.052	0.672	0.700
PH (0)	-0.8446	0.0960	0.8871	-8.6581	2.0763	1.000	0.969	1.000
PH (5)	-0.6267	0.1690	0.6724	-3.6456	1.1470	0.947	0.530	1.000
PH (10)	-0.5634	0.1843	0.6174	-2.9944	1.0978	0.830	0.357	0.998
PH (20)	-0.6039	0.2076	0.6722	-2.8414	1.1335	0.774	0.356	0.994
PH (40)	-0.7512	0.2369	0.8249	-3.1554	1.2912	0.833	0.476	0.995
OLS	-1.0106	0.1190	1.0583	-8.3585	1.8843	1.000	0.987	1.000

* See the footnote to Table 1a.

Table 2e*

Small sample performance of alternative estimators of the long-run coefficient, θ , for Experiments 2 ($\psi=0.95$, $\phi=0.8$, $\theta_0=5.1$, $\omega_{12}=0.5$)

	Estimator			t-test				
	BIAS	STDE θ	RMSE	MEANt	STDt	SIZE	POWER _{0.95θ_0}	POWER _{1.05θ_0}
<u>T = 50</u>								
<u>ARDL(1,2)</u>								
Asymptotic	-0.0347	0.2512	0.4217	-0.3359	1.6517	0.211	0.278	0.384
Δ -method		0.3787		-0.2811	1.1552	0.095	0.098	0.238
<u>ARDL-AIC</u>								
Asymptotic	-0.0051	0.2281	0.4675	-0.2470	2.1417	0.288	0.383	0.432
Δ -method		0.3493		-0.2415	1.4409	0.147	0.186	0.288
<u>ARDL-SC</u>								
Asymptotic	-0.0106	0.2418	0.4468	-0.2442	1.8404	0.246	0.383	0.432
Δ -method		0.3563		-0.2365	1.3067	0.123	0.186	0.288
PH (0)	-1.4516	0.2276	1.5702	-6.6194	2.8536	0.961	0.912	0.984
PH (5)	-1.2795	0.3854	1.4311	-3.5156	1.9012	0.808	0.674	0.903
PH (10)	-1.3147	0.4149	1.4846	-3.3987	1.9703	0.778	0.636	0.879
PH (20)	-1.4631	0.4194	1.6337	-3.8890	2.3792	0.811	0.709	0.887
PH (40)	-1.5993	0.3495	1.7491	-5.4509	3.4065	0.882	0.882	0.932
OLS	-1.6889	0.2839	1.8169	-6.1446	2.5556	0.961	0.918	0.982
<u>T = 100</u>								
<u>ARDL(1,2)</u>								
Asymptotic	-0.0214	0.1463	0.2065	-0.2057	1.3667	0.150	0.449	0.520
Δ -method		0.1895		-0.1757	1.0785	0.073	0.293	0.396
<u>ARDL-AIC</u>								
Asymptotic	-0.0150	0.1415	0.2171	-0.1717	1.5137	0.184	0.489	0.527
Δ -method		0.1835		-0.1510	1.1863	0.096	0.338	0.402
<u>ARDL-SC</u>								
Asymptotic	-0.0015	0.1479	0.2091	-0.0749	1.3948	0.153	0.482	0.474
Δ -method		0.1897		-0.0761	1.1116	0.076	0.333	0.360
PH (0)	-1.0788	0.1520	1.1596	-7.0322	2.3953	0.992	0.928	1.000
PH (5)	-0.8709	0.2645	0.9634	-3.2714	1.3942	0.840	0.544	0.976
PH (10)	-0.8456	0.2903	0.9552	-2.8961	1.3742	0.742	0.449	0.947
PH (20)	-0.9440	0.3195	1.0700	-2.9732	1.5166	0.736	0.479	0.928
PH (40)	-1.1117	0.3220	1.2283	-3.6630	2.0495	0.839	0.621	0.948
OLS	-1.2707	0.1878	1.3611	-6.6920	2.2028	0.992	0.944	1.000
<u>T = 250</u>								
<u>ARDL(1,2)</u>								
Asymptotic	-0.0066	0.0791	0.0979	-0.1153	1.1951	0.100	0.848	0.856
Δ -method		0.0936		-0.1023	1.0171	0.055	0.768	0.706
<u>ARDL-AIC</u>								
Asymptotic	-0.0027	0.0786	0.0998	-0.0710	1.2348	0.108	0.855	0.846
Δ -method		0.0931		-0.0650	1.0473	0.062	0.777	0.782
<u>ARDL-SC</u>								
Asymptotic	0.0062	0.0811	0.0993	0.0393	1.1815	0.092	0.864	0.816
Δ -method		0.0954		0.0293	1.0093	0.048	0.791	0.742
PH (0)	-0.7882	0.0888	0.8296	-8.7240	2.1281	1.000	0.958	1.000
PH (5)	-0.5854	0.1559	0.6298	-3.6848	1.1671	0.948	0.490	1.000
PH (10)	-0.5265	0.1698	0.5792	-3.0319	1.1145	0.840	0.320	0.999
PH (20)	-0.5642	0.1909	0.6310	-2.8796	1.1539	0.782	0.321	0.998
PH (40)	-0.7001	0.2178	0.7715	-3.1977	1.3422	0.838	0.456	0.997
OLS	-0.9379	0.1090	0.9843	-8.4561	1.9852	1.000	0.981	1.000

* See the footnote to Table 1a.

Table 2f*

Small sample performance of alternative estimators of the long-run coefficient, θ , for Experiments 2 ($\psi=0.95$, $\phi=0.8$, $\theta_0=4.9$, $\omega_{12}=-0.5$)

	Estimator			t-test				
	BIAS	STDE θ	RMSE	MEANt	STDt	SIZE	POWER $_{0.95\theta_0}$	POWER $_{1.05\theta_0}$
<u>T = 50</u>								
<u>ARDL(1,2)</u>								
Asymptotic	-0.0493	0.2500	0.4474	-0.3777	1.7332	0.224	0.286	0.376
Δ -method		0.3782		-0.2953	1.1762	0.094	0.116	0.227
<u>ARDL-AIC</u>								
Asymptotic	-0.0350	0.2284	0.4825	-0.3603	2.0905	0.295	0.354	0.441
Δ -method		0.3532		-0.2972	1.3778	0.141	0.169	0.287
<u>ARDL-SC</u>								
Asymptotic	-0.0585	0.2404	0.4544	-0.4282	1.8312	0.250	0.296	0.407
Δ -method		0.3514		-0.3380	1.2691	0.124	0.141	0.272
PH (0)	-1.6651	0.2566	1.8006	-6.7028	2.8827	0.966	0.921	0.985
PH (5)	-1.4799	0.4340	1.6516	-3.5841	1.8909	0.820	0.704	0.901
PH (10)	-1.5274	0.4672	1.7220	-3.4854	2.0015	0.786	0.674	0.875
PH (20)	-1.7046	0.4729	1.9012	-4.0093	2.4821	0.821	0.734	0.891
PH (40)	-1.8600	0.3960	2.0326	-5.5315	3.4069	0.988	0.831	0.929
OLS	-1.9570	0.3308	2.1081	-6.0698	2.5053	0.962	0.921	0.982
<u>T = 100</u>								
<u>ARDL(1,2)</u>								
Asymptotic	-0.0219	0.1461	0.2117	-0.2430	1.3749	0.146	0.415	0.512
Δ -method		0.1906		-0.1651	1.0636	0.070	0.268	0.371
<u>ARDL-AIC</u>								
Asymptotic	-0.0220	0.1382	0.2304	-0.2201	1.5408	0.182	0.452	0.538
Δ -method		0.1805		-0.1874	1.1814	0.102	0.313	0.421
<u>ARDL-SC</u>								
Asymptotic	-0.0384	0.1408	0.2130	-0.3157	1.4223	0.168	0.407	0.558
Δ -method		0.1794		-0.2591	1.1240	0.087	0.282	0.435
PH (0)	-1.2356	0.1719	1.3285	-7.1190	2.4378	0.995	0.949	1.000
PH (5)	-1.0023	0.2993	1.1101	-3.3257	1.4319	0.884	0.596	0.971
PH (10)	-0.9764	0.3292	1.1044	-3.9438	1.4008	0.758	0.504	0.939
PH (20)	-1.0922	0.3640	1.2390	-3.0092	1.5276	0.748	0.532	0.926
PH (40)	-1.2862	0.3688	1.4217	-3.6903	2.0508	0.837	0.664	0.946
OLS	-1.4700	0.2186	1.5749	-6.6466	2.1779	0.994	0.960	1.000
<u>T = 250</u>								
<u>ARDL(1,2)</u>								
Asymptotic	-0.0044	0.0787	0.0960	-0.0793	1.1828	0.099	0.826	0.836
Δ -method		0.0931		-0.0716	1.0039	0.052	0.755	0.760
<u>ARDL-AIC</u>								
Asymptotic	-0.0062	0.0762	0.0989	-0.1044	1.2607	0.117	0.826	0.841
Δ -method		0.0904		-0.0961	1.0659	0.066	0.755	0.778
<u>ARDL-SC</u>								
Asymptotic	-0.0166	0.0762	0.0975	-0.2383	1.2240	0.114	0.804	0.876
Δ -method		0.0890		-0.2096	1.0519	0.068	0.741	0.810
PH (0)	-0.8992	0.1010	0.9423	-8.7563	2.0063	1.000	0.985	1.000
PH (5)	-0.6670	0.1773	0.7131	-3.6962	1.1096	0.962	0.576	1.000
PH (10)	-0.5992	0.1932	0.6540	-3.0365	1.0655	0.856	0.379	0.999
PH (20)	-0.6431	0.2184	0.7136	-2.8767	1.1152	0.797	0.371	0.996
PH (40)	-0.8017	0.2509	0.8782	-3.1827	1.2957	0.846	0.514	0.995
OLS	-1.0815	0.1272	1.1306	-8.3635	1.8121	1.000	0.994	1.000

* See the footnote to Table 1a.