Durbin-Watson Significance Tables

The Durbin-Watson test statistic tests the null hypothesis that the residuals from an ordinary least-squares regression are not autocorrelated against the alternative that the residuals follow an AR1 process. The Durbin-Watson statistic ranges in value from 0 to 4. A value near 2 indicates non-autocorrelation; a value toward 0 indicates positive autocorrelation; a value toward 4 indicates negative autocorrelation.

Because of the dependence of any computed Durbin-Watson value on the associated data matrix, exact critical values of the Durbin-Watson statistic are not tabulated for all possible cases. Instead, Durbin and Watson established upper and lower bounds for the critical values. Typically, tabulated bounds are used to test the hypothesis of zero autocorrelation against the alternative of *positive* first-order autocorrelation, since positive autocorrelation is seen much more frequently in practice than negative autocorrelation. To use the table, you must cross-reference the sample size against the number of regressors, excluding the constant from the count of the number of regressors.

The conventional Durbin-Watson tables are not applicable when you do not have a constant term in the regression. Instead, you must refer to an appropriate set of Durbin-Watson tables. The conventional Durbin-Watson tables are also not applicable when a lagged dependent variable appears among the regressors. Durbin has proposed alternative test procedures for this case.

Statisticians have compiled Durbin-Watson tables from some special cases, including:

- Regressions with a full set of quarterly seasonal dummies.
- Regressions with an intercept and a linear trend variable (CURVEFIT MODEL=LINEAR).
- Regressions with a full set of quarterly seasonal dummies and a linear trend variable.

In addition to obtaining the Durbin-Watson statistic for residuals from REGRESSION, you should also plot the ACF and PACF of the residuals series. The plots might suggest either that the residuals are random, or that they follow some ARMA process. If the residuals resemble an AR1 process, you can estimate an appropriate regression using the AREG procedure. If the residuals follow any ARMA process, you can estimate an appropriate regression using the ARIMA procedure.

In this appendix, we have reproduced two sets of tables. Savin and White (1977) present tables for sample sizes ranging from 6 to 200 and for 1 to 20 regressors for models in which an intercept is included. Farebrother (1980) presents tables for sample sizes ranging from 2 to 200 and for 0 to 21 regressors for models in which an intercept is not included.

Let's consider an example of how to use the tables. In Chapter 9, we look at the classic Durbin and Watson data set concerning consumption of spirits. The sample size is 69, there are 2 regressors, and there is an intercept term in the model. The Durbin-Watson test statistic value is 0.24878. We want to test the null hypothesis of zero autocorrelation in the residuals against the alternative that the residuals are positively autocorrelated at the 1% level of significance. If you examine the Savin and White tables (Table A.2 and Table A.3), you will not find a row for sample size 69, so go to the next *lowest* sample size with a tabulated row, namely *N=65*. Since there are two regressors, find the column labeled *k=2*. Cross-referencing the indicated row and column, you will find that the printed bounds are dL = 1.377 and dU = 1.500. If the observed value of the test statistic is less than the tabulated lower bound, then you should reject the null hypothesis of non-autocorrelated errors in favor of the hypothesis of positive first-order autocorrelation. Since 0.24878 is less than 1.377, we reject the null hypothesis. If the test statistic value were greater than dU, we would not reject the null hypothesis.

A third outcome is also possible. If the test statistic value lies between dL and dU, the test is inconclusive. In this context, you might err on the side of conservatism and not reject the null hypothesis.

For models with an intercept, if the observed test statistic value is greater than 2, then you want to test the null hypothesis against the alternative hypothesis of negative first-order autocorrelation. To do this, compute the quantity 4-d and compare this value with the tabulated values of dL and dU as if you were testing for positive autocorrelation.

When the regression does not contain an intercept term, refer to Farebrother‚Äôs tabulated values of the ‚Äúminimal bound‚Äù denoted dM (Table A.4 and Table A.5), instead of Savin and White‚Äôs lower bound dL. In this instance, the upper bound is

the conventional bound dU found in the Savin and White tables. To test for negative first-order autocorrelation, use Table A.6 and Table A.7.

To continue with our example, had we run a regression with no intercept term, we would cross-reference N equals 65 and k equals 2 in Farebrother‚Äôs table. The tabulated 1% minimal bound is 1.348.

Appendix A

Table A-1
Models with an intercept (from Savin and White)

Durbin-Watson Statistic: 1 Per Cent Significance Points of dL and dU

n	k'*=1 dL	dU	k'=2 dL	dU	k'=3 dL	dU	k'=4 dL	dU	k'=5 dL	dU	k'=6 dL	dU	k'=7 dL	dU	k'=8 dL	dU	k'=9 dL	dU	k'=10 dL	dU
6	0.390	1.142	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
7	0.435	1.036	0.294	1.676	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
8	0.497	1.003	0.345	1.489	0.229	2.102	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
9	0.554	0.998	0.408	1.389	0.279	1.875	0.183	2.433	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
10	0.604	1.001	0.466	1.333	0.340	1.733	0.230	2.193	0.150	2.690	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
11	0.653	1.010	0.519	1.297	0.396	1.640	0.286	2.030	0.193	2.453	0.124	2.892	-----	-----	-----	-----	-----	-----	-----	-----
12	0.697	1.023	0.569	1.274	0.449	1.575	0.339	1.913	0.244	2.280	0.164	2.665	0.105	3.053	-----	-----	-----	-----	-----	-----
13	0.738	1.038	0.616	1.261	0.499	1.526	0.391	1.826	0.294	2.150	0.211	2.490	0.140	2.838	0.090	3.182	-----	-----	-----	-----
14	0.776	1.054	0.660	1.254	0.547	1.490	0.441	1.757	0.343	2.049	0.257	2.354	0.183	2.667	0.122	2.981	0.078	3.287	-----	-----
15	0.811	1.070	0.700	1.252	0.591	1.465	0.487	1.705	0.390	1.967	0.303	2.244	0.226	2.530	0.161	2.817	0.107	3.101	0.068	3.374
16	0.844	1.086	0.738	1.253	0.633	1.447	0.532	1.664	0.437	1.901	0.349	2.153	0.269	2.416	0.200	2.681	0.142	2.944	0.094	3.201
17	0.873	1.102	0.773	1.255	0.672	1.432	0.574	1.631	0.481	1.847	0.393	2.078	0.313	2.319	0.241	2.566	0.179	2.811	0.127	3.053
18	0.902	1.118	0.805	1.259	0.708	1.422	0.614	1.604	0.522	1.803	0.435	2.015	0.355	2.238	0.282	2.467	0.216	2.697	0.160	2.925
19	0.928	1.133	0.835	1.264	0.742	1.416	0.650	1.583	0.561	1.767	0.476	1.963	0.396	2.169	0.322	2.381	0.255	2.597	0.196	2.813
20	0.952	1.147	0.862	1.270	0.774	1.410	0.684	1.567	0.598	1.736	0.515	1.918	0.436	2.110	0.362	2.308	0.294	2.510	0.232	2.174
21	0.975	1.161	0.889	1.276	0.803	1.408	0.718	1.554	0.634	1.712	0.552	1.881	0.474	2.059	0.400	2.244	0.331	2.434	0.268	2.625
22	0.997	1.174	0.915	1.284	0.832	1.407	0.748	1.543	0.666	1.691	0.587	1.849	0.510	2.015	0.437	2.188	0.368	2.367	0.304	2.548
23	1.017	1.186	0.938	1.290	0.858	1.407	0.777	1.535	0.699	1.674	0.620	1.821	0.545	1.977	0.473	2.140	0.404	2.308	0.340	2.479
24	1.037	1.199	0.959	1.298	0.881	1.407	0.805	1.527	0.728	1.659	0.652	1.797	0.578	1.944	0.507	2.097	0.439	2.255	0.375	2.417
25	1.055	1.210	0.981	1.305	0.906	1.408	0.832	1.521	0.756	1.645	0.682	1.776	0.610	1.915	0.540	2.059	0.473	2.209	0.409	2.362
26	1.072	1.222	1.000	1.311	0.928	1.410	0.855	1.517	0.782	1.635	0.711	1.759	0.640	1.889	0.572	2.026	0.505	2.168	0.441	2.313
27	1.088	1.232	1.019	1.318	0.948	1.413	0.878	1.514	0.808	1.625	0.738	1.743	0.669	1.867	0.602	1.997	0.536	2.131	0.473	2.269
28	1.104	1.244	1.036	1.325	0.969	1.414	0.901	1.512	0.832	1.618	0.764	1.729	0.696	1.847	0.630	1.970	0.566	2.098	0.504	2.229
29	1.119	1.254	1.053	1.332	0.988	1.418	0.921	1.513	0.855	1.611	0.788	1.718	0.723	1.830	0.658	1.947	0.595	2.068	0.533	2.193
30	1.134	1.264	1.070	1.339	1.006	1.421	0.941	1.510	0.877	1.606	0.812	1.707	0.748	1.814	0.684	1.925	0.622	2.041	0.562	2.160
31	1.147	1.274	1.085	1.345	1.022	1.425	0.960	1.509	0.897	1.601	0.834	1.698	0.772	1.800	0.710	1.906	0.649	2.017	0.589	2.131
32	1.160	1.283	1.100	1.351	1.039	1.428	0.978	1.509	0.917	1.597	0.856	1.690	0.794	1.788	0.734	1.889	0.674	1.995	0.615	2.104
33	1.171	1.291	1.114	1.358	1.055	1.432	0.995	1.510	0.935	1.594	0.876	1.683	0.816	1.776	0.757	1.874	0.698	1.975	0.641	2.080
34	1.184	1.298	1.128	1.364	1.070	1.436	1.012	1.511	0.954	1.591	0.896	1.677	0.837	1.766	0.779	1.860	0.722	1.957	0.665	2.057
35	1.195	1.307	1.141	1.370	1.085	1.439	1.028	1.512	0.971	1.589	0.914	1.671	0.857	1.757	0.800	1.847	0.744	1.940	0.689	2.037
36	1.205	1.315	1.153	1.376	1.098	1.442	1.043	1.513	0.987	1.587	0.932	1.666	0.877	1.749	0.821	1.836	0.766	1.925	0.711	2.018
37	1.217	1.322	1.164	1.383	1.112	1.446	1.058	1.514	1.004	1.585	0.950	1.662	0.895	1.742	0.841	1.825	0.787	1.911	0.733	2.001
38	1.227	1.330	1.176	1.388	1.124	1.449	1.072	1.515	1.019	1.584	0.966	1.658	0.913	1.735	0.860	1.816	0.807	1.899	0.754	1.985
39	1.237	1.337	1.187	1.392	1.137	1.452	1.085	1.517	1.033	1.583	0.982	1.655	0.930	1.729	0.878	1.807	0.826	1.887	0.774	1.970
40	1.246	1.344	1.197	1.398	1.149	1.456	1.098	1.518	1.047	1.583	0.997	1.652	0.946	1.724	0.895	1.799	0.844	1.876	0.749	1.956
45	1.288	1.376	1.245	1.424	1.201	1.474	1.156	1.528	1.111	1.583	1.065	1.643	1.019	1.704	0.974	1.768	0.927	1.834	0.881	1.902
50	1.324	1.403	1.285	1.445	1.245	1.491	1.206	1.537	1.164	1.587	1.123	1.639	1.081	1.692	1.039	1.748	0.997	1.805	0.955	1.864
55	1.356	1.428	1.320	1.466	1.284	1.505	1.246	1.548	1.209	1.592	1.172	1.638	1.134	1.685	1.095	1.734	1.057	1.785	1.018	1.837
60	1.382	1.449	1.351	1.484	1.317	1.520	1.283	1.559	1.248	1.598	1.214	1.639	1.179	1.682	1.144	1.726	1.108	1.771	1.072	1.817
65	1.407	1.467	1.377	1.500	1.346	1.534	1.314	1.568	1.283	1.604	1.251	1.642	1.218	1.680	1.186	1.720	1.153	1.761	1.120	1.802
70	1.429	1.485	1.400	1.514	1.372	1.546	1.343	1.577	1.313	1.611	1.283	1.645	1.253	1.680	1.223	1.716	1.192	1.754	1.162	1.792
75	1.448	1.501	1.422	1.529	1.395	1.557	1.368	1.586	1.340	1.617	1.313	1.649	1.284	1.682	1.256	1.714	1.227	1.748	1.199	1.783
80	1.465	1.514	1.440	1.541	1.416	1.568	1.390	1.595	1.364	1.624	1.338	1.653	1.312	1.683	1.285	1.714	1.259	1.745	1.232	1.777
85	1.481	1.529	1.458	1.553	1.434	1.577	1.411	1.603	1.386	1.630	1.362	1.657	1.337	1.685	1.312	1.714	1.287	1.743	1.262	1.773
90	1.496	1.541	1.474	1.563	1.452	1.587	1.429	1.611	1.406	1.636	1.383	1.661	1.360	1.687	1.336	1.714	1.312	1.741	1.288	1.769
95	1.510	1.552	1.489	1.573	1.468	1.596	1.446	1.618	1.425	1.641	1.403	1.666	1.381	1.690	1.358	1.715	1.336	1.741	1.313	1.767
100	1.522	1.562	1.502	1.582	1.482	1.604	1.461	1.625	1.441	1.647	1.421	1.670	1.400	1.693	1.378	1.717	1.357	1.741	1.335	1.765
150	1.611	1.637	1.598	1.651	1.584	1.665	1.571	1.679	1.557	1.693	1.543	1.708	1.530	1.722	1.515	1.737	1.501	1.752	1.486	1.767
200	1.664	1.684	1.653	1.693	1.643	1.704	1.633	1.715	1.623	1.725	1.613	1.735	1.603	1.746	1.592	1.757	1.582	1.768	1.571	1.779

*k' is the number of regressors excluding the intercept

n	k'*=11 dL	dU	k'=12 dL	dU	k'=13 dL	dU	k'=14 dL	dU	k'=15 dL	dU	k'=16 dL	dU	k'=17 dL	dU	k'=18 dL	dU	k'=19 dL	dU	k'=20 dL	dU
16	0.060	3.446	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
17	0.084	3.286	0.053	3.506	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
18	0.113	3.146	0.075	3.358	0.047	3.557	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
19	0.145	3.023	0.102	3.227	0.067	3.420	0.043	3.601	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
20	0.178	2.914	0.131	3.109	0.092	3.297	0.061	3.474	0.038	3.639	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
21	0.212	2.817	0.162	3.004	0.119	3.185	0.084	3.358	0.055	3.521	0.035	3.671	-----	-----	-----	-----	-----	-----	-----	-----
22	0.246	2.729	0.194	2.909	0.148	3.084	0.109	3.252	0.077	3.412	0.050	3.562	0.032	3.700	-----	-----	-----	-----	-----	-----
23	0.281	2.651	0.227	2.822	0.178	2.991	0.136	3.155	0.100	3.311	0.070	3.459	0.046	3.597	0.029	3.725	-----	-----	-----	-----
24	0.315	2.580	0.260	2.744	0.209	2.906	0.165	3.065	0.125	3.218	0.092	3.363	0.065	3.501	0.043	3.629	0.027	3.747	-----	-----
25	0.348	2.517	0.292	2.674	0.240	2.829	0.194	2.982	0.152	3.131	0.116	3.274	0.085	3.410	0.060	3.538	0.039	3.657	0.025	3.766
26	0.381	2.460	0.324	2.610	0.272	2.758	0.224	2.906	0.180	3.050	0.141	3.191	0.107	3.325	0.079	3.452	0.055	3.572	0.036	3.682
27	0.413	2.409	0.356	2.552	0.303	2.694	0.253	2.836	0.208	2.976	0.167	3.113	0.131	3.245	0.100	3.371	0.073	3.490	0.051	3.602
28	0.444	2.363	0.387	2.499	0.333	2.635	0.283	2.772	0.237	2.907	0.194	3.040	0.156	3.169	0.122	3.294	0.093	3.412	0.068	3.524
29	0.474	2.321	0.417	2.451	0.363	2.582	0.313	2.713	0.266	2.843	0.222	2.972	0.182	3.098	0.146	3.220	0.114	3.338	0.087	3.450
30	0.503	2.283	0.447	2.407	0.393	2.533	0.342	2.659	0.294	2.785	0.249	2.909	0.208	3.032	0.171	3.152	0.137	3.267	0.107	3.379
31	0.531	2.248	0.475	2.367	0.422	2.487	0.371	2.609	0.322	2.730	0.277	2.851	0.234	2.970	0.193	3.087	0.160	3.201	0.128	3.311
32	0.558	2.216	0.503	2.330	0.450	2.446	0.399	2.563	0.350	2.680	0.304	2.797	0.261	2.912	0.221	3.026	0.184	3.137	0.151	3.246
33	0.585	2.187	0.530	2.296	0.477	2.408	0.426	2.520	0.377	2.633	0.331	2.746	0.287	2.858	0.246	2.969	0.209	3.078	0.174	3.184
34	0.610	2.160	0.556	2.266	0.503	2.373	0.452	2.481	0.404	2.590	0.357	2.699	0.313	2.808	0.272	2.915	0.233	3.022	0.197	3.126
35	0.634	2.136	0.581	2.237	0.529	2.340	0.478	2.444	0.430	2.550	0.383	2.655	0.339	2.761	0.297	2.865	0.257	2.969	0.221	3.071
36	0.658	2.113	0.605	2.210	0.554	2.310	0.504	2.410	0.455	2.512	0.409	2.614	0.364	2.717	0.322	2.818	0.282	2.919	0.244	3.019
37	0.680	2.092	0.628	2.186	0.578	2.282	0.528	2.379	0.480	2.477	0.434	2.576	0.389	2.675	0.347	2.774	0.306	2.872	0.268	2.969
38	0.702	2.073	0.651	2.164	0.601	2.256	0.552	2.350	0.504	2.445	0.458	2.540	0.414	2.637	0.371	2.733	0.330	2.828	0.291	2.923
39	0.723	2.055	0.673	2.143	0.623	2.232	0.575	2.323	0.528	2.414	0.482	2.507	0.438	2.600	0.395	2.694	0.354	2.787	0.315	2.879
40	0.744	2.039	0.694	2.123	0.645	2.210	0.597	2.297	0.551	2.386	0.505	2.476	0.461	2.566	0.418	2.657	0.377	2.748	0.338	2.838
45	0.835	1.972	0.790	2.044	0.744	2.118	0.700	2.193	0.655	2.269	0.612	2.346	0.570	2.424	0.528	2.503	0.488	2.582	0.448	2.661
50	0.913	1.925	0.871	1.987	0.829	2.051	0.787	2.116	0.746	2.182	0.705	2.250	0.665	2.318	0.625	2.387	0.586	2.456	0.548	2.526
55	0.979	1.891	0.940	1.945	0.902	2.002	0.863	2.059	0.825	2.117	0.786	2.176	0.748	2.237	0.711	2.298	0.674	2.359	0.637	2.421
60	1.037	1.865	1.001	1.914	0.965	1.964	0.929	2.015	0.893	2.067	0.857	2.120	0.822	2.173	0.786	2.227	0.751	2.283	0.716	2.338
65	1.087	1.845	1.053	1.889	1.020	1.934	0.986	1.980	0.953	2.027	0.919	2.075	0.886	2.123	0.852	2.172	0.819	2.221	0.789	2.272
70	1.131	1.831	1.099	1.870	1.068	1.911	1.037	1.953	1.005	1.995	0.974	2.038	0.943	2.082	0.911	2.127	0.880	2.172	0.849	2.217
75	1.170	1.819	1.141	1.856	1.111	1.893	1.082	1.931	1.052	1.970	1.023	2.009	0.993	2.049	0.964	2.090	0.934	2.131	0.905	2.172
80	1.205	1.810	1.177	1.844	1.150	1.878	1.122	1.913	1.094	1.949	1.066	1.984	1.039	2.022	1.011	2.059	0.983	2.097	0.955	2.135
85	1.236	1.803	1.210	1.834	1.184	1.866	1.158	1.898	1.132	1.931	1.106	1.965	1.080	1.999	1.053	2.033	1.027	2.068	1.000	2.104
90	1.264	1.798	1.240	1.827	1.215	1.856	1.191	1.886	1.166	1.917	1.141	1.948	1.116	1.979	1.091	2.012	1.066	2.044	1.041	2.077
95	1.290	1.793	1.267	1.821	1.244	1.848	1.221	1.876	1.197	1.905	1.174	1.943	1.150	1.963	1.126	1.993	1.102	2.023	1.079	2.054
100	1.314	1.790	1.292	1.816	1.270	1.841	1.248	1.868	1.225	1.895	1.203	1.922	1.181	1.949	1.158	1.977	1.136	2.006	1.113	2.034
150	1.473	1.783	1.458	1.799	1.444	1.814	1.429	1.830	1.414	1.847	1.400	1.863	1.385	1.880	1.370	1.897	1.355	1.913	1.340	1.931
200	1.561	1.791	1.550	1.801	1.539	1.813	1.528	1.824	1.518	1.836	1.507	1.847	1.495	1.860	1.484	1.871	1.474	1.883	1.462	1.896

*k' is the number of regressors excluding the intercept

Appendix A

Table A-2
Models with an intercept (from Savin and White)

Durbin-Watson Statistic: 5 Per Cent Significance Points of dL and dU

n	k'=1 dL	dU	k'=2 dL	dU	k'=3 dL	dU	k'=4 dL	dU	k'=5 dL	dU	k'=6 dL	dU	k'=7 dL	dU	k'=8 dL	dU	k'=9 dL	dU	k'=10 dL	dU
6	0.610	1.400	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
7	0.700	1.356	0.467	1.896	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
8	0.763	1.332	0.559	1.777	0.367	2.287	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
9	0.824	1.320	0.629	1.699	0.455	2.128	0.296	2.588	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
10	0.879	1.320	0.697	1.641	0.525	2.016	0.376	2.414	0.243	2.822	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
11	0.927	1.324	0.758	1.604	0.595	1.928	0.444	2.283	0.315	2.645	0.203	3.004	-----	-----	-----	-----	-----	-----	-----	-----
12	0.971	1.331	0.812	1.579	0.658	1.864	0.512	2.177	0.380	2.506	0.268	2.832	0.171	3.149	-----	-----	-----	-----	-----	-----
13	1.010	1.340	0.861	1.562	0.715	1.816	0.574	2.094	0.444	2.390	0.328	2.692	0.230	2.985	0.147	3.266	-----	-----	-----	-----
14	1.045	1.350	0.905	1.551	0.767	1.779	0.632	2.030	0.505	2.296	0.389	2.572	0.286	2.848	0.200	3.111	0.127	3.360	-----	-----
15	1.077	1.361	0.946	1.543	0.814	1.750	0.685	1.977	0.562	2.220	0.447	2.471	0.343	2.727	0.251	2.979	0.175	3.216	0.111	3.438
16	1.106	1.371	0.982	1.539	0.857	1.728	0.734	1.935	0.615	2.157	0.502	2.388	0.398	2.624	0.304	2.860	0.222	3.090	0.155	3.304
17	1.133	1.381	1.015	1.536	0.897	1.710	0.779	1.900	0.664	2.104	0.554	2.318	0.451	2.537	0.356	2.757	0.272	2.975	0.198	3.184
18	1.158	1.391	1.046	1.535	0.933	1.696	0.820	1.872	0.710	2.060	0.603	2.258	0.502	2.461	0.407	2.668	0.321	2.873	0.244	3.073
19	1.180	1.401	1.074	1.536	0.967	1.685	0.859	1.848	0.752	2.023	0.649	2.206	0.549	2.396	0.456	2.589	0.369	2.783	0.290	2.974
20	1.201	1.411	1.100	1.537	0.998	1.676	0.894	1.828	0.792	1.991	0.691	2.162	0.595	2.339	0.502	2.521	0.416	2.704	0.336	2.885
21	1.221	1.420	1.125	1.538	1.026	1.669	0.927	1.812	0.829	1.964	0.731	2.124	0.637	2.290	0.546	2.461	0.461	2.633	0.380	2.806
22	1.239	1.429	1.147	1.541	1.053	1.664	0.958	1.797	0.863	1.940	0.769	2.090	0.677	2.246	0.588	2.407	0.504	2.571	0.424	2.735
23	1.257	1.437	1.168	1.543	1.078	1.660	0.986	1.785	0.895	1.920	0.804	2.061	0.715	2.208	0.628	2.360	0.545	2.514	0.465	2.670
24	1.273	1.446	1.188	1.546	1.101	1.656	1.013	1.775	0.925	1.902	0.837	2.035	0.750	2.174	0.666	2.318	0.584	2.464	0.506	2.613
25	1.288	1.454	1.206	1.550	1.123	1.654	1.038	1.767	0.953	1.886	0.868	2.013	0.784	2.144	0.702	2.280	0.621	2.419	0.544	2.560
26	1.302	1.461	1.224	1.553	1.143	1.652	1.062	1.759	0.979	1.873	0.897	1.992	0.816	2.117	0.735	2.246	0.657	2.379	0.581	2.513
27	1.316	1.469	1.240	1.556	1.162	1.651	1.084	1.753	1.004	1.861	0.925	1.974	0.845	2.093	0.767	2.216	0.691	2.342	0.616	2.470
28	1.328	1.476	1.255	1.560	1.181	1.650	1.104	1.747	1.028	1.850	0.951	1.959	0.874	2.071	0.798	2.188	0.723	2.309	0.649	2.431
29	1.341	1.483	1.270	1.563	1.198	1.650	1.124	1.743	1.050	1.841	0.975	1.944	0.900	2.052	0.826	2.164	0.753	2.278	0.681	2.396
30	1.352	1.489	1.284	1.567	1.214	1.650	1.143	1.739	1.071	1.833	0.998	1.931	0.926	2.034	0.854	2.141	0.782	2.251	0.712	2.363
31	1.363	1.496	1.297	1.570	1.229	1.650	1.160	1.735	1.090	1.825	1.020	1.920	0.950	2.018	0.879	2.120	0.810	2.226	0.741	2.333
32	1.373	1.502	1.309	1.574	1.244	1.650	1.177	1.732	1.109	1.819	1.041	1.909	0.972	2.004	0.904	2.102	0.836	2.203	0.769	2.306
33	1.383	1.508	1.321	1.577	1.258	1.651	1.193	1.730	1.127	1.813	1.061	1.900	0.994	1.991	0.927	2.085	0.861	2.181	0.796	2.281
34	1.393	1.514	1.333	1.580	1.271	1.652	1.208	1.728	1.144	1.808	1.079	1.891	1.015	1.978	0.950	2.069	0.885	2.162	0.821	2.257
35	1.402	1.519	1.343	1.584	1.283	1.653	1.222	1.726	1.160	1.803	1.097	1.884	1.034	1.967	0.971	2.054	0.908	2.144	0.845	2.236
36	1.411	1.525	1.354	1.587	1.295	1.654	1.236	1.724	1.175	1.799	1.114	1.876	1.053	1.957	0.991	2.041	0.930	2.127	0.868	2.216
37	1.419	1.530	1.364	1.590	1.307	1.655	1.249	1.723	1.190	1.795	1.131	1.870	1.071	1.948	1.011	2.029	0.951	2.112	0.891	2.197
38	1.427	1.535	1.373	1.594	1.318	1.656	1.261	1.722	1.204	1.792	1.146	1.864	1.088	1.939	1.029	2.017	0.970	2.098	0.912	2.180
39	1.435	1.540	1.382	1.597	1.328	1.658	1.273	1.722	1.218	1.789	1.161	1.859	1.104	1.932	1.047	2.007	0.990	2.085	0.932	2.164
40	1.442	1.544	1.391	1.600	1.338	1.659	1.285	1.721	1.230	1.786	1.175	1.854	1.120	1.924	1.064	1.997	1.008	2.072	0.952	2.149
45	1.475	1.566	1.430	1.615	1.383	1.666	1.336	1.720	1.287	1.776	1.238	1.835	1.189	1.895	1.139	1.958	1.089	2.022	1.038	2.088
50	1.503	1.585	1.462	1.628	1.421	1.674	1.378	1.721	1.335	1.771	1.291	1.822	1.246	1.875	1.201	1.930	1.156	1.986	1.110	2.044
55	1.528	1.601	1.490	1.641	1.452	1.681	1.414	1.724	1.374	1.768	1.334	1.814	1.294	1.861	1.253	1.909	1.212	1.959	1.170	2.010
60	1.549	1.616	1.514	1.652	1.480	1.689	1.444	1.727	1.408	1.767	1.372	1.808	1.335	1.850	1.298	1.894	1.260	1.939	1.222	1.984
65	1.567	1.629	1.536	1.662	1.503	1.696	1.471	1.731	1.438	1.767	1.404	1.805	1.370	1.843	1.336	1.882	1.301	1.923	1.266	1.964
70	1.583	1.641	1.554	1.672	1.525	1.703	1.494	1.735	1.464	1.768	1.433	1.802	1.401	1.838	1.369	1.874	1.337	1.910	1.305	1.948
75	1.598	1.652	1.571	1.680	1.543	1.709	1.515	1.739	1.487	1.770	1.458	1.801	1.428	1.834	1.399	1.867	1.369	1.901	1.339	1.935
80	1.611	1.662	1.586	1.688	1.560	1.715	1.534	1.743	1.507	1.772	1.480	1.801	1.453	1.831	1.425	1.861	1.397	1.893	1.369	1.925
85	1.624	1.671	1.600	1.696	1.575	1.721	1.550	1.747	1.525	1.774	1.500	1.801	1.474	1.829	1.448	1.857	1.422	1.886	1.396	1.916
90	1.635	1.679	1.612	1.703	1.589	1.726	1.566	1.751	1.542	1.776	1.518	1.801	1.494	1.827	1.469	1.854	1.445	1.881	1.420	1.909
95	1.645	1.687	1.623	1.709	1.602	1.732	1.579	1.755	1.557	1.778	1.535	1.802	1.512	1.827	1.489	1.852	1.465	1.877	1.442	1.903
100	1.654	1.694	1.634	1.715	1.613	1.736	1.592	1.758	1.571	1.780	1.550	1.803	1.528	1.826	1.506	1.850	1.484	1.874	1.462	1.898
150	1.720	1.747	1.706	1.760	1.693	1.774	1.679	1.788	1.665	1.802	1.651	1.817	1.637	1.832	1.622	1.846	1.608	1.862	1.593	1.877
200	1.758	1.779	1.748	1.789	1.738	1.799	1.728	1.809	1.718	1.820	1.707	1.831	1.697	1.841	1.686	1.852	1.675	1.863	1.665	1.874

*k' is the number of regressors excluding the intercept

n	k'*=11 dL	dU	k'=12 dL	dU	k'=13 dL	dU	k'=14 dL	dU	k'=15 dL	dU	k'=16 dL	dU	k'=17 dL	dU	k'=18 dL	dU	k'=19 dL	dU	k'=20 dL	dU
16	0.098	3.503	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
17	0.138	3.378	0.087	3.557	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
18	0.177	3.265	0.123	3.441	0.078	3.603	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
19	0.220	3.159	0.160	3.335	0.111	3.496	0.070	3.642	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
20	0.263	3.063	0.200	3.234	0.145	3.395	0.100	3.542	0.063	3.676	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
21	0.307	2.976	0.240	3.141	0.182	3.300	0.132	3.448	0.091	3.583	0.058	3.705	-----	-----	-----	-----	-----	-----	-----	-----
22	0.349	2.897	0.281	3.057	0.220	3.211	0.166	3.358	0.120	3.495	0.083	3.619	0.052	3.731	-----	-----	-----	-----	-----	-----
23	0.391	2.826	0.322	2.979	0.259	3.128	0.202	3.272	0.153	3.409	0.110	3.535	0.076	3.650	0.048	3.753	-----	-----	-----	-----
24	0.431	2.761	0.362	2.908	0.297	3.053	0.239	3.193	0.186	3.327	0.141	3.454	0.101	3.572	0.070	3.678	0.044	3.773	-----	-----
25	0.470	2.702	0.400	2.844	0.335	2.983	0.275	3.119	0.221	3.251	0.172	3.376	0.130	3.494	0.094	3.604	0.065	3.702	0.041	3.790
26	0.508	2.649	0.438	2.784	0.373	2.919	0.312	3.051	0.256	3.179	0.205	3.303	0.160	3.420	0.120	3.531	0.087	3.632	0.060	3.724
27	0.544	2.600	0.475	2.730	0.409	2.859	0.348	2.987	0.291	3.112	0.238	3.233	0.191	3.349	0.149	3.460	0.112	3.563	0.081	3.658
28	0.578	2.555	0.510	2.680	0.445	2.805	0.383	2.928	0.325	3.050	0.271	3.168	0.222	3.283	0.178	3.392	0.138	3.495	0.104	3.592
29	0.612	2.515	0.544	2.634	0.479	2.755	0.418	2.874	0.359	2.992	0.305	3.107	0.254	3.219	0.208	3.327	0.166	3.431	0.129	3.528
30	0.643	2.477	0.577	2.592	0.512	2.708	0.451	2.823	0.392	2.937	0.337	3.050	0.286	3.160	0.238	3.266	0.195	3.368	0.156	3.465
31	0.674	2.443	0.608	2.553	0.545	2.665	0.484	2.776	0.425	2.887	0.370	2.996	0.317	3.103	0.269	3.208	0.224	3.309	0.183	3.406
32	0.703	2.411	0.638	2.517	0.576	2.625	0.515	2.733	0.457	2.840	0.401	2.946	0.349	3.050	0.299	3.153	0.253	3.252	0.211	3.348
33	0.731	2.382	0.668	2.484	0.606	2.588	0.546	2.692	0.488	2.796	0.432	2.899	0.379	3.000	0.329	3.100	0.283	3.198	0.239	3.293
34	0.758	2.355	0.695	2.454	0.634	2.554	0.575	2.654	0.518	2.754	0.462	2.854	0.409	2.954	0.359	3.051	0.312	3.147	0.267	3.240
35	0.783	2.330	0.722	2.425	0.662	2.521	0.604	2.619	0.547	2.716	0.492	2.813	0.439	2.910	0.388	3.005	0.340	3.099	0.295	3.190
36	0.808	2.306	0.748	2.398	0.689	2.492	0.631	2.586	0.575	2.680	0.520	2.774	0.467	2.868	0.417	2.961	0.369	3.053	0.323	3.142
37	0.831	2.285	0.772	2.374	0.714	2.464	0.657	2.555	0.602	2.646	0.548	2.738	0.495	2.829	0.445	2.920	0.397	3.009	0.351	3.097
38	0.854	2.265	0.796	2.351	0.739	2.438	0.683	2.526	0.628	2.614	0.575	2.703	0.522	2.792	0.472	2.880	0.424	2.968	0.378	3.054
39	0.875	2.246	0.819	2.329	0.763	2.413	0.707	2.499	0.653	2.585	0.600	2.671	0.549	2.757	0.499	2.843	0.451	2.929	0.404	3.013
40	0.896	2.228	0.840	2.309	0.785	2.391	0.731	2.473	0.678	2.557	0.626	2.641	0.575	2.724	0.525	2.808	0.477	2.829	0.430	2.974
45	0.988	2.156	0.938	2.225	0.887	2.296	0.838	2.367	0.788	2.439	0.740	2.512	0.692	2.586	0.644	2.659	0.598	2.733	0.553	2.807
50	1.064	2.103	1.019	2.163	0.973	2.225	0.927	2.287	0.882	2.350	0.836	2.414	0.792	2.479	0.747	2.544	0.703	2.610	0.660	2.675
55	1.129	2.062	1.087	2.116	1.045	2.170	1.003	2.225	0.961	2.281	0.919	2.338	0.877	2.396	0.836	2.454	0.795	2.512	0.754	2.571
60	1.184	2.031	1.145	2.079	1.106	2.127	1.068	2.177	1.029	2.227	0.990	2.278	0.951	2.330	0.913	2.382	0.874	2.434	0.836	2.487
65	1.231	2.006	1.195	2.049	1.160	2.093	1.124	2.138	1.088	2.183	1.052	2.229	1.016	2.276	0.980	2.323	0.944	2.371	0.908	2.419
70	1.272	1.987	1.239	2.026	1.206	2.066	1.172	2.106	1.139	2.148	1.105	2.189	1.072	2.232	1.038	2.275	1.005	2.318	0.971	2.362
75	1.308	1.970	1.277	2.006	1.247	2.043	1.215	2.080	1.184	2.118	1.153	2.156	1.121	2.195	1.090	2.235	1.058	2.275	1.027	2.315
80	1.340	1.957	1.311	1.991	1.283	2.024	1.253	2.059	1.224	2.093	1.195	2.129	1.165	2.165	1.136	2.201	1.106	2.238	1.076	2.275
85	1.369	1.946	1.342	1.977	1.315	2.009	1.287	2.040	1.260	2.073	1.232	2.105	1.205	2.139	1.177	2.172	1.149	2.206	1.121	2.241
90	1.395	1.937	1.369	1.966	1.344	1.995	1.318	2.025	1.292	2.055	1.266	2.085	1.240	2.116	1.213	2.148	1.187	2.179	1.160	2.211
95	1.418	1.930	1.394	1.956	1.370	1.984	1.345	2.012	1.321	2.040	1.296	2.068	1.271	2.097	1.247	2.126	1.222	2.156	1.197	2.186
100	1.439	1.923	1.416	1.948	1.393	1.974	1.371	2.000	1.347	2.026	1.324	2.053	1.301	2.080	1.277	2.108	1.253	2.135	1.229	2.164
150	1.579	1.892	1.564	1.908	1.550	1.924	1.535	1.940	1.519	1.956	1.504	1.972	1.489	1.989	1.474	2.006	1.458	2.023	1.443	2.040
200	1.654	1.885	1.643	1.896	1.632	1.908	1.621	1.919	1.610	1.931	1.599	1.943	1.588	1.955	1.576	1.967	1.565	1.979	1.554	1.991

*K' is the number of regressors excluding the intercept

Appendix A

Table A-3

Models with no intercept (from Farebrother): Positive serial correlation

Durbin-Watson One Per Cent Minimal Bound

N	K=0	K=1	K=2	K=3	K=4	K=5	K=6	K=7	K=8	K=9	K=10	K=11	K=12	K=13	K=14	K=15	K=16	K=17	K=18	K=19	K=20	K=21
2	0.001	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
3	0.034	0.000	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
4	0.127	0.022	0.000	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
5	0.233	0.089	0.014	0.000	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
6	0.322	0.175	0.065	0.010	0.000	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
7	0.398	0.253	0.135	0.049	0.008	0.000	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
8	0.469	0.324	0.202	0.106	0.038	0.006	0.000	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
9	0.534	0.394	0.268	0.164	0.086	0.031	0.005	0.000	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
10	0.591	0.457	0.333	0.223	0.136	0.070	0.025	0.004	0.000	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
11	0.643	0.515	0.394	0.284	0.189	0.114	0.059	0.021	0.003	0.000	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
12	0.691	0.568	0.451	0.341	0.244	0.161	0.097	0.050	0.018	0.003	0.000	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
13	0.733	0.617	0.503	0.396	0.298	0.212	0.139	0.083	0.043	0.015	0.002	0.000	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
14	0.773	0.662	0.552	0.448	0.350	0.262	0.185	0.121	0.072	0.037	0.013	0.002	0.000	-----	-----	-----	-----	-----	-----	-----	-----	-----
15	0.809	0.703	0.598	0.496	0.400	0.311	0.232	0.163	0.107	0.063	0.032	0.011	0.002	0.000	-----	-----	-----	-----	-----	-----	-----	-----
16	0.842	0.741	0.640	0.541	0.447	0.358	0.278	0.206	0.145	0.094	0.056	0.028	0.010	0.002	0.000	-----	-----	-----	-----	-----	-----	-----
17	0.873	0.776	0.679	0.583	0.491	0.404	0.323	0.249	0.184	0.129	0.084	0.050	0.025	0.009	0.001	0.000	-----	-----	-----	-----	-----	-----
18	0.901	0.808	0.715	0.623	0.533	0.447	0.366	0.292	0.225	0.166	0.116	0.075	0.044	0.023	0.008	0.001	0.000	-----	-----	-----	-----	-----
19	0.928	0.839	0.749	0.660	0.572	0.488	0.408	0.333	0.265	0.204	0.150	0.105	0.068	0.040	0.020	0.007	0.001	0.000	-----	-----	-----	-----
20	0.952	0.867	0.780	0.694	0.609	0.527	0.448	0.374	0.304	0.241	0.185	0.136	0.095	0.062	0.036	0.018	0.006	0.001	0.000	-----	-----	-----
21	0.976	0.893	0.810	0.727	0.644	0.564	0.486	0.413	0.343	0.279	0.221	0.169	0.124	0.087	0.056	0.033	0.017	0.006	0.001	0.000	-----	-----
22	0.997	0.918	0.838	0.757	0.677	0.599	0.523	0.450	0.381	0.316	0.257	0.203	0.155	0.114	0.079	0.051	0.030	0.015	0.005	0.001	0.000	-----
23	1.018	0.942	0.864	0.786	0.709	0.632	0.558	0.486	0.417	0.352	0.292	0.237	0.187	0.143	0.104	0.073	0.047	0.027	0.014	0.005	0.001	0.000
24	1.037	0.964	0.889	0.813	0.738	0.664	0.591	0.520	0.452	0.387	0.327	0.270	0.219	0.172	0.131	0.096	0.067	0.043	0.025	0.013	0.004	0.001
25	1.056	0.984	0.912	0.839	0.766	0.693	0.622	0.553	0.486	0.421	0.361	0.304	0.251	0.203	0.160	0.122	0.089	0.062	0.040	0.023	0.012	0.004
26	1.073	1.004	0.934	0.863	0.792	0.722	0.652	0.584	0.518	0.454	0.394	0.336	0.283	0.233	0.189	0.148	0.113	0.083	0.057	0.037	0.022	0.011
27	1.089	1.023	0.955	0.886	0.817	0.749	0.681	0.614	0.549	0.486	0.426	0.368	0.314	0.264	0.218	0.176	0.138	0.105	0.077	0.053	0.034	0.020
28	1.105	1.040	0.974	0.908	0.841	0.774	0.708	0.643	0.579	0.517	0.457	0.400	0.345	0.294	0.247	0.204	0.164	0.129	0.098	0.071	0.050	0.032
29	1.120	1.057	0.993	0.929	0.864	0.798	0.734	0.670	0.607	0.546	0.487	0.430	0.376	0.324	0.276	0.232	0.191	0.154	0.120	0.091	0.067	0.046
30	1.134	1.073	1.011	0.948	0.885	0.822	0.759	0.696	0.635	0.574	0.516	0.460	0.405	0.354	0.305	0.260	0.217	0.179	0.144	0.113	0.086	0.062
31	1.147	1.088	1.028	0.967	0.905	0.844	0.782	0.721	0.661	0.602	0.544	0.488	0.434	0.383	0.334	0.288	0.244	0.205	0.168	0.135	0.106	0.080
32	1.160	1.103	1.044	0.985	0.925	0.865	0.805	0.745	0.686	0.628	0.571	0.516	0.462	0.411	0.362	0.315	0.271	0.230	0.193	0.158	0.127	0.100
33	1.173	1.117	1.060	1.002	0.944	0.885	0.826	0.768	0.710	0.653	0.597	0.542	0.489	0.438	0.389	0.342	0.298	0.256	0.218	0.182	0.149	0.120
34	1.185	1.130	1.075	1.018	0.961	0.904	0.847	0.790	0.733	0.677	0.622	0.568	0.516	0.465	0.416	0.369	0.324	0.282	0.243	0.206	0.172	0.141
35	1.196	1.143	1.089	1.034	0.978	0.923	0.867	0.811	0.755	0.700	0.646	0.593	0.541	0.491	0.442	0.395	0.350	0.308	0.268	0.230	0.195	0.163
36	1.207	1.155	1.102	1.049	0.995	0.940	0.886	0.831	0.777	0.723	0.669	0.617	0.566	0.516	0.467	0.421	0.376	0.333	0.292	0.254	0.218	0.185
37	1.217	1.167	1.116	1.063	1.010	0.957	0.904	0.850	0.797	0.744	0.692	0.640	0.590	0.540	0.492	0.446	0.401	0.358	0.317	0.278	0.241	0.207
38	1.228	1.178	1.128	1.077	1.026	0.974	0.921	0.869	0.817	0.765	0.713	0.663	0.613	0.564	0.516	0.470	0.425	0.382	0.341	0.302	0.265	0.230
39	1.237	1.189	1.140	1.090	1.040	0.989	0.938	0.887	0.836	0.785	0.734	0.684	0.635	0.587	0.540	0.494	0.449	0.406	0.365	0.325	0.288	0.252
40	1.247	1.200	1.152	1.103	1.054	1.004	0.954	0.904	0.854	0.804	0.754	0.705	0.657	0.609	0.562	0.517	0.473	0.430	0.388	0.349	0.311	0.275
45	1.289	1.247	1.204	1.160	1.116	1.071	1.026	0.981	0.936	0.890	0.845	0.800	0.755	0.710	0.666	0.623	0.581	0.539	0.499	0.459	0.421	0.384
50	1.325	1.287	1.248	1.208	1.168	1.128	1.087	1.046	1.004	0.963	0.921	0.880	0.838	0.797	0.756	0.715	0.675	0.636	0.597	0.559	0.521	0.485
55	1.356	1.321	1.286	1.250	1.213	1.176	1.139	1.101	1.063	1.025	0.987	0.948	0.910	0.872	0.833	0.796	0.758	0.721	0.684	0.647	0.611	0.576
60	1.383	1.351	1.319	1.285	1.252	1.218	1.183	1.149	1.114	1.078	1.043	1.008	0.972	0.936	0.901	0.865	0.830	0.795	0.760	0.725	0.691	0.657
65	1.408	1.378	1.348	1.317	1.286	1.254	1.222	1.190	1.158	1.125	1.092	1.059	1.026	0.993	0.960	0.927	0.894	0.861	0.828	0.795	0.762	0.730
70	1.429	1.401	1.373	1.345	1.316	1.286	1.257	1.227	1.197	1.166	1.136	1.105	1.074	1.043	1.012	0.981	0.950	0.919	0.888	0.857	0.826	0.795
75	1.448	1.423	1.396	1.369	1.342	1.315	1.287	1.260	1.231	1.203	1.174	1.146	1.117	1.088	1.058	1.029	1.000	0.971	0.941	0.912	0.883	0.854
80	1.466	1.442	1.417	1.392	1.367	1.341	1.315	1.289	1.262	1.236	1.209	1.182	1.155	1.127	1.100	1.072	1.045	1.017	0.989	0.962	0.934	0.907
85	1.482	1.459	1.436	1.412	1.388	1.364	1.340	1.315	1.290	1.265	1.240	1.214	1.189	1.163	1.137	1.111	1.085	1.059	1.033	1.006	0.980	0.954
90	1.497	1.475	1.453	1.431	1.408	1.385	1.362	1.339	1.315	1.292	1.268	1.244	1.220	1.195	1.171	1.146	1.121	1.097	1.072	1.047	1.022	0.997
95	1.510	1.490	1.469	1.448	1.426	1.405	1.383	1.361	1.338	1.316	1.293	1.271	1.248	1.225	1.201	1.178	1.155	1.131	1.108	1.084	1.060	1.037
100	1.523	1.503	1.483	1.463	1.443	1.422	1.402	1.381	1.359	1.338	1.317	1.295	1.273	1.251	1.229	1.207	1.185	1.162	1.140	1.118	1.095	1.072
150	1.611	1.598	1.585	1.571	1.558	1.544	1.530	1.516	1.502	1.488	1.474	1.460	1.445	1.431	1.416	1.402	1.387	1.372	1.357	1.342	1.327	1.312
200	1.664	1.654	1.644	1.634	1.624	1.613	1.603	1.593	1.582	1.572	1.561	1.551	1.540	1.529	1.519	1.508	1.497	1.486	1.475	1.434	1.453	1.442

Table A-4

Models with no intercept (from Farebrother): Positive serial correlation

Durbin-Watson Five Per Cent Minimal Bound

N	K=0	K=1	K=2	K=3	K=4	K=5	K=6	K=7	K=8	K=9	K=10	K=11	K=12	K=13	K=14	K=15	K=16	K=17	K=18	K=19	K=20	K=21
2	0.012	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
3	0.168	0.006	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
4	0.355	0.105	0.004	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
5	0.478	0.248	0.070	0.002	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
6	0.584	0.358	0.180	0.050	0.002	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
7	0.677	0.462	0.275	0.136	0.037	0.001	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
8	0.754	0.556	0.371	0.217	0.106	0.029	0.001	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
9	0.820	0.635	0.460	0.303	0.175	0.085	0.023	0.001	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
10	0.877	0.706	0.539	0.385	0.251	0.143	0.069	0.019	0.001	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
11	0.927	0.768	0.610	0.460	0.326	0.211	0.120	0.058	0.016	0.001	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
12	0.972	0.823	0.674	0.530	0.397	0.279	0.180	0.101	0.049	0.013	0.001	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
13	1.012	0.872	0.731	0.593	0.464	0.345	0.241	0.154	0.087	0.042	0.011	0.001	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
14	1.047	0.916	0.783	0.651	0.525	0.408	0.302	0.210	0.134	0.075	0.036	0.010	0.001	-----	-----	-----	-----	-----	-----	-----	-----	-----
15	1.079	0.955	0.829	0.704	0.583	0.467	0.361	0.266	0.185	0.118	0.066	0.031	0.008	0.001	-----	-----	-----	-----	-----	-----	-----	-----
16	1.109	0.992	0.872	0.752	0.635	0.523	0.418	0.322	0.237	0.164	0.104	0.058	0.028	0.007	0.000	-----	-----	-----	-----	-----	-----	-----
17	1.136	1.024	0.911	0.797	0.684	0.575	0.472	0.376	0.288	0.211	0.146	0.093	0.052	0.025	0.007	0.000	-----	-----	-----	-----	-----	-----
18	1.160	1.055	0.946	0.837	0.729	0.624	0.523	0.427	0.339	0.260	0.190	0.131	0.083	0.046	0.022	0.006	0.000	-----	-----	-----	-----	-----
19	1.183	1.082	0.979	0.875	0.771	0.669	0.570	0.476	0.388	0.307	0.235	0.171	0.118	0.075	0.041	0.020	0.005	0.000	-----	-----	-----	-----
20	1.204	1.108	1.010	0.910	0.810	0.711	0.615	0.523	0.436	0.354	0.280	0.213	0.156	0.107	0.067	0.037	0.018	0.005	0.000	-----	-----	-----
21	1.224	1.132	1.038	0.942	0.846	0.751	0.657	0.567	0.481	0.400	0.324	0.256	0.195	0.142	0.097	0.061	0.034	0.016	0.004	0.000	-----	-----
22	1.242	1.154	1.064	0.972	0.879	0.787	0.697	0.609	0.524	0.443	0.368	0.298	0.235	0.178	0.130	0.089	0.056	0.031	0.015	0.004	0.000	-----
23	1.259	1.175	1.088	1.000	0.911	0.822	0.734	0.648	0.565	0.485	0.410	0.339	0.274	0.216	0.164	0.119	0.081	0.051	0.028	0.014	0.004	0.000
24	1.275	1.194	1.111	1.026	0.940	0.854	0.769	0.685	0.604	0.525	0.450	0.380	0.314	0.254	0.199	0.151	0.110	0.075	0.047	0.026	0.012	0.003
25	1.290	1.212	1.132	1.050	0.967	0.884	0.802	0.720	0.641	0.563	0.489	0.419	0.353	0.291	0.235	0.184	0.140	0.101	0.069	0.044	0.024	0.011
26	1.304	1.229	1.152	1.073	0.993	0.913	0.833	0.753	0.676	0.600	0.527	0.457	0.390	0.328	0.271	0.218	0.171	0.130	0.094	0.064	0.040	0.022
27	1.318	1.245	1.171	1.094	1.017	0.940	0.862	0.785	0.709	0.635	0.563	0.493	0.427	0.365	0.306	0.252	0.203	0.159	0.120	0.087	0.060	0.037
28	1.330	1.260	1.188	1.115	1.040	0.965	0.889	0.815	0.741	0.668	0.597	0.529	0.463	0.400	0.341	0.286	0.236	0.190	0.148	0.112	0.081	0.055
29	1.342	1.275	1.205	1.134	1.062	0.989	0.916	0.843	0.770	0.699	0.630	0.562	0.497	0.435	0.376	0.320	0.268	0.221	0.177	0.139	0.105	0.076
30	1.354	1.288	1.221	1.152	1.082	1.011	0.940	0.869	0.799	0.729	0.661	0.595	0.530	0.468	0.409	0.353	0.301	0.252	0.207	0.166	0.130	0.098
31	1.365	1.301	1.236	1.169	1.101	1.033	0.964	0.895	0.826	0.758	0.691	0.626	0.562	0.501	0.442	0.386	0.333	0.283	0.237	0.195	0.156	0.122
32	1.375	1.313	1.250	1.185	1.120	1.053	0.986	0.919	0.852	0.785	0.720	0.653	0.593	0.532	0.474	0.418	0.364	0.314	0.267	0.223	0.183	0.147
33	1.385	1.325	1.264	1.201	1.137	1.072	1.007	0.942	0.876	0.811	0.747	0.684	0.623	0.563	0.504	0.449	0.395	0.344	0.297	0.252	0.211	0.173
34	1.394	1.336	1.277	1.216	1.153	1.091	1.027	0.963	0.900	0.836	0.774	0.712	0.651	0.592	0.534	0.479	0.425	0.374	0.326	0.280	0.238	0.199
35	1.403	1.347	1.289	1.230	1.169	1.108	1.046	0.984	0.922	0.860	0.799	0.738	0.678	0.620	0.563	0.508	0.455	0.404	0.355	0.309	0.266	0.225
36	1.412	1.357	1.301	1.243	1.184	1.125	1.064	1.004	0.943	0.883	0.823	0.763	0.705	0.647	0.591	0.536	0.483	0.432	0.384	0.337	0.293	0.252
37	1.420	1.367	1.312	1.256	1.199	1.141	1.082	1.023	0.964	0.905	0.846	0.787	0.730	0.673	0.618	0.564	0.511	0.460	0.412	0.365	0.321	0.279
38	1.428	1.376	1.323	1.268	1.212	1.156	1.099	1.041	0.983	0.925	0.868	0.811	0.754	0.698	0.644	0.590	0.538	0.488	0.439	0.392	0.347	0.305
39	1.436	1.385	1.333	1.280	1.225	1.170	1.114	1.058	1.002	0.945	0.889	0.833	0.778	0.723	0.669	0.616	0.564	0.514	0.466	0.419	0.374	0.331
40	1.443	1.394	1.343	1.291	1.238	1.184	1.130	1.075	1.020	0.965	0.909	0.854	0.800	0.746	0.693	0.641	0.590	0.540	0.492	0.445	0.400	0.357
45	1.476	1.432	1.387	1.341	1.294	1.246	1.197	1.148	1.099	1.049	1.000	0.950	0.900	0.851	0.802	0.753	0.706	0.658	0.612	0.567	0.523	0.480
50	1.504	1.464	1.424	1.382	1.340	1.297	1.253	1.209	1.164	1.120	1.075	1.029	0.984	0.939	0.894	0.849	0.804	0.760	0.717	0.674	0.631	0.590
55	1.528	1.492	1.455	1.417	1.379	1.340	1.300	1.260	1.219	1.179	1.138	1.096	1.055	1.013	0.972	0.930	0.889	0.848	0.807	0.766	0.726	0.687
60	1.549	1.516	1.482	1.447	1.412	1.376	1.340	1.303	1.266	1.229	1.191	1.153	1.115	1.077	1.038	1.000	0.962	0.923	0.885	0.847	0.810	0.772
65	1.568	1.537	1.505	1.474	1.441	1.408	1.375	1.341	1.307	1.272	1.238	1.202	1.167	1.132	1.096	1.061	1.025	0.989	0.953	0.918	0.882	0.847
70	1.584	1.555	1.526	1.497	1.467	1.436	1.405	1.374	1.342	1.310	1.278	1.245	1.213	1.180	1.147	1.113	1.080	1.047	1.013	0.980	0.947	0.914
75	1.599	1.572	1.545	1.517	1.489	1.461	1.432	1.403	1.373	1.344	1.313	1.283	1.253	1.222	1.191	1.160	1.129	1.098	1.066	1.035	1.004	0.972
80	1.612	1.587	1.561	1.536	1.509	1.483	1.456	1.429	1.401	1.373	1.345	1.317	1.288	1.259	1.230	1.201	1.172	1.143	1.113	1.084	1.054	1.025
85	1.624	1.600	1.576	1.552	1.527	1.502	1.477	1.452	1.426	1.400	1.373	1.347	1.320	1.293	1.266	1.238	1.211	1.183	1.155	1.128	1.100	1.072
90	1.635	1.613	1.590	1.567	1.544	1.520	1.497	1.472	1.448	1.423	1.399	1.373	1.348	1.323	1.297	1.271	1.245	1.219	1.193	1.167	1.141	1.114
95	1.645	1.624	1.603	1.581	1.559	1.537	1.514	1.491	1.468	1.445	1.422	1.398	1.374	1.350	1.326	1.301	1.277	1.252	1.227	1.202	1.177	1.152
100	1.654	1.634	1.614	1.593	1.573	1.551	1.530	1.508	1.487	1.465	1.442	1.420	1.397	1.374	1.352	1.328	1.305	1.282	1.258	1.235	1.211	1.187
150	1.720	1.706	1.693	1.679	1.666	1.652	1.638	1.624	1.609	1.595	1.580	1.566	1.551	1.536	1.521	1.506	1.491	1.476	1.461	1.445	1.430	1.414
200	1.759	1.748	1.738	1.728	1.718	1.708	1.697	1.687	1.676	1.666	1.655	1.644	1.633	1.622	1.611	1.600	1.589	1.578	1.567	1.556	1.544	1.533

Appendix A

Table A-5
Models with no intercept (from Farebrother): Negative serial correlation

Durbin-Watson Ninety Five Per Cent Minimal Bound

N	K=0	K=1	K=2	K=3	K=4	K=5	K=6	K=7	K=8	K=9	K=10	K=11	K=12	K=13	K=14	K=15	K=16	K=17	K=18	K=19	K=20	K=21
2	1.988	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
3	2.761	0.994	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
4	2.871	1.836	0.582	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
5	2.857	2.178	1.267	0.380	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
6	2.844	2.320	1.655	0.917	0.266	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
7	2.828	2.398	1.871	1.283	0.690	0.197	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
8	2.805	2.453	2.008	1.521	1.017	0.537	0.151	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
9	2.783	2.483	2.110	1.687	1.251	0.823	0.429	0.120	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
10	2.762	2.501	2.181	1.816	1.427	1.044	0.678	0.350	0.097	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
11	2.742	2.511	2.231	1.913	1.569	1.218	0.881	0.567	0.291	0.080	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
12	2.723	2.516	2.268	1.987	1.682	1.364	1.049	0.752	0.481	0.245	0.068	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
13	2.705	2.518	2.296	2.044	1.771	1.484	1.193	0.911	0.649	0.413	0.210	0.058	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
14	2.688	2.517	2.316	2.090	1.843	1.582	1.316	1.051	0.797	0.565	0.358	0.181	0.050	-----	-----	-----	-----	-----	-----	-----	-----	-----
15	2.672	2.515	2.332	2.126	1.902	1.664	1.419	1.172	0.931	0.703	0.497	0.314	0.158	0.043	-----	-----	-----	-----	-----	-----	-----	-----
16	2.657	2.512	2.344	2.155	1.950	1.732	1.506	1.276	1.049	0.829	0.624	0.439	0.277	0.139	0.038	-----	-----	-----	-----	-----	-----	-----
17	2.644	2.508	2.353	2.179	1.990	1.789	1.580	1.367	1.153	0.944	0.743	0.557	0.391	0.246	0.124	0.034	-----	-----	-----	-----	-----	-----
18	2.631	2.504	2.359	2.199	2.024	1.838	1.644	1.445	1.244	1.045	0.852	0.669	0.501	0.351	0.220	0.110	0.030	-----	-----	-----	-----	-----
19	2.618	2.499	2.364	2.215	2.053	1.880	1.699	1.513	1.324	1.136	0.951	0.773	0.605	0.452	0.316	0.198	0.099	0.027	-----	-----	-----	-----
20	2.607	2.494	2.368	2.228	2.077	1.916	1.747	1.573	1.395	1.216	1.040	0.868	0.704	0.550	0.410	0.286	0.179	0.090	0.025	-----	-----	-----
21	2.596	2.489	2.370	2.239	2.098	1.947	1.789	1.625	1.457	1.289	1.120	0.955	0.796	0.644	0.502	0.373	0.260	0.162	0.081	0.022	-----	-----
22	2.585	2.484	2.372	2.249	2.116	1.974	1.825	1.671	1.513	1.353	1.193	1.034	0.880	0.731	0.591	0.460	0.341	0.238	0.148	0.074	0.020	-----
23	2.575	2.479	2.373	2.257	2.131	1.998	1.858	1.712	1.563	1.411	1.258	1.107	0.957	0.813	0.674	0.544	0.422	0.313	0.218	0.136	0.068	0.019
24	2.566	2.474	2.373	2.263	2.145	2.019	1.886	1.749	1.607	1.463	1.318	1.172	1.029	0.888	0.753	0.623	0.502	0.389	0.289	0.201	0.125	0.062
25	2.557	2.470	2.373	2.269	2.156	2.037	1.912	1.782	1.647	1.510	1.371	1.232	1.094	0.958	0.826	0.699	0.578	0.465	0.360	0.267	0.185	0.115
26	1.073	1.004	0.934	0.863	0.792	0.722	0.652	0.584	0.518	0.454	0.394	0.336	0.283	0.233	0.189	0.148	0.113	0.083	0.057	0.037	0.022	0.011
27	1.089	1.023	0.955	0.886	0.817	0.749	0.681	0.614	0.549	0.486	0.426	0.368	0.314	0.264	0.218	0.176	0.138	0.105	0.077	0.053	0.034	0.020
28	1.105	1.040	0.974	0.908	0.841	0.774	0.708	0.643	0.579	0.517	0.457	0.400	0.345	0.294	0.247	0.204	0.164	0.129	0.098	0.071	0.050	0.032
29	1.120	1.057	0.993	0.929	0.864	0.798	0.734	0.670	0.607	0.546	0.487	0.430	0.376	0.324	0.276	0.232	0.191	0.154	0.120	0.091	0.067	0.046
30	1.134	1.073	1.011	0.948	0.885	0.822	0.759	0.696	0.635	0.574	0.516	0.460	0.405	0.354	0.305	0.260	0.217	0.179	0.144	0.113	0.086	0.062
31	1.147	1.088	1.028	0.967	0.905	0.844	0.782	0.721	0.661	0.602	0.544	0.488	0.434	0.383	0.334	0.288	0.244	0.205	0.168	0.135	0.106	0.080
32	1.160	1.103	1.044	0.985	0.925	0.865	0.805	0.745	0.686	0.628	0.571	0.516	0.462	0.411	0.362	0.315	0.271	0.230	0.193	0.158	0.127	0.100
33	1.173	1.117	1.060	1.002	0.944	0.885	0.826	0.768	0.710	0.653	0.597	0.542	0.489	0.438	0.389	0.342	0.298	0.256	0.218	0.182	0.149	0.120
34	1.185	1.130	1.075	1.018	0.961	0.904	0.847	0.790	0.733	0.677	0.622	0.568	0.516	0.465	0.416	0.369	0.324	0.282	0.243	0.206	0.172	0.141
35	1.196	1.143	1.089	1.034	0.978	0.923	0.867	0.811	0.755	0.700	0.646	0.593	0.541	0.491	0.442	0.395	0.350	0.308	0.268	0.230	0.195	0.163
36	1.207	1.155	1.102	1.049	0.995	0.940	0.886	0.831	0.777	0.723	0.669	0.617	0.566	0.516	0.467	0.421	0.376	0.333	0.292	0.254	0.218	0.185
37	1.217	1.167	1.116	1.063	1.010	0.957	0.904	0.850	0.797	0.744	0.692	0.640	0.590	0.540	0.492	0.446	0.401	0.358	0.317	0.278	0.241	0.207
38	1.228	1.178	1.128	1.077	1.026	0.974	0.921	0.869	0.817	0.765	0.713	0.663	0.613	0.564	0.516	0.470	0.425	0.382	0.341	0.302	0.265	0.230
39	1.237	1.189	1.140	1.090	1.040	0.989	0.938	0.887	0.836	0.785	0.734	0.684	0.635	0.587	0.540	0.494	0.449	0.406	0.365	0.325	0.288	0.252
40	1.247	1.200	1.152	1.103	1.054	1.004	0.954	0.904	0.854	0.804	0.754	0.705	0.657	0.609	0.562	0.517	0.473	0.430	0.388	0.349	0.311	0.275
45	1.289	1.247	1.204	1.160	1.116	1.071	1.026	0.981	0.936	0.890	0.845	0.800	0.755	0.710	0.666	0.623	0.581	0.539	0.499	0.459	0.421	0.384
50	1.325	1.287	1.248	1.208	1.168	1.128	1.087	1.046	1.004	0.963	0.921	0.880	0.838	0.797	0.756	0.715	0.675	0.636	0.597	0.559	0.521	0.485
55	1.356	1.321	1.286	1.250	1.213	1.176	1.139	1.101	1.063	1.025	0.987	0.948	0.910	0.872	0.833	0.796	0.758	0.721	0.684	0.647	0.611	0.576
60	1.383	1.351	1.319	1.285	1.252	1.218	1.183	1.149	1.114	1.078	1.043	1.008	0.972	0.936	0.901	0.865	0.830	0.795	0.760	0.725	0.691	0.657
65	1.408	1.378	1.348	1.317	1.286	1.254	1.222	1.190	1.158	1.125	1.092	1.059	1.026	0.993	0.960	0.927	0.894	0.861	0.828	0.795	0.762	0.730
70	1.429	1.401	1.373	1.345	1.316	1.286	1.257	1.227	1.197	1.166	1.136	1.105	1.074	1.043	1.012	0.981	0.950	0.919	0.888	0.857	0.826	0.795
75	1.448	1.423	1.396	1.369	1.342	1.315	1.287	1.260	1.231	1.203	1.174	1.146	1.117	1.088	1.058	1.029	1.000	0.971	0.941	0.912	0.883	0.854
80	1.466	1.442	1.417	1.392	1.367	1.341	1.315	1.289	1.262	1.236	1.209	1.182	1.155	1.127	1.100	1.072	1.045	1.017	0.989	0.962	0.934	0.907
85	1.482	1.459	1.436	1.412	1.388	1.364	1.340	1.315	1.290	1.265	1.240	1.214	1.189	1.163	1.137	1.111	1.085	1.059	1.033	1.006	0.980	0.954
90	1.497	1.475	1.453	1.431	1.408	1.385	1.362	1.339	1.315	1.292	1.268	1.244	1.220	1.195	1.171	1.146	1.121	1.097	1.072	1.047	1.022	0.997
95	1.510	1.490	1.469	1.448	1.426	1.405	1.383	1.361	1.338	1.316	1.293	1.271	1.248	1.225	1.201	1.178	1.155	1.131	1.108	1.084	1.060	1.037
100	1.523	1.503	1.483	1.463	1.443	1.422	1.402	1.381	1.359	1.338	1.317	1.295	1.273	1.251	1.229	1.207	1.185	1.162	1.140	1.118	1.095	1.072
150	1.611	1.598	1.585	1.571	1.558	1.544	1.530	1.516	1.502	1.488	1.474	1.460	1.445	1.431	1.416	1.402	1.387	1.372	1.357	1.342	1.327	1.312
200	1.664	1.654	1.644	1.634	1.624	1.613	1.603	1.593	1.582	1.572	1.561	1.551	1.540	1.529	1.519	1.508	1.497	1.486	1.475	1.464	1.453	1.442

Table A-6
Models with no intercept (from Farebrother): Negative serial correlation

Durbin-Watson Ninety Nine Per Cent Minimal Bound

N	K=0	K=1	K=2	K=3	K=4	K=5	K=6	K=7	K=8	K=9	K=10	K=11	K=12	K=13	K=14	K=15	K=16	K=17	K=18	K=19	K=20	K=21
2	1.999	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
3	2.951	0.999	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
4	3.221	1.967	0.586	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
5	3.261	2.462	1.359	0.382	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
6	3.235	2.682	1.878	0.983	0.268	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
7	3.198	2.776	2.177	1.459	0.740	0.198	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
8	3.166	2.817	2.347	1.776	1.158	0.576	0.153	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
9	3.133	2.837	2.448	1.983	1.465	0.937	0.460	0.121	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
10	3.101	2.847	2.514	2.121	1.684	1.224	0.773	0.375	0.098	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
11	3.071	2.847	2.560	2.220	1.842	1.441	1.035	0.647	0.312	0.081	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
12	3.043	2.843	2.592	2.294	1.961	1.607	1.244	0.885	0.549	0.263	0.069	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
13	3.017	2.836	2.612	2.349	2.054	1.737	1.410	1.082	0.764	0.471	0.225	0.059	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
14	2.992	2.828	2.626	2.391	2.127	1.842	1.544	1.244	0.948	0.666	0.409	0.195	0.051	-----	-----	-----	-----	-----	-----	-----	-----	-----
15	2.969	2.818	2.635	2.423	2.185	1.928	1.656	1.379	1.104	0.837	0.585	0.358	0.170	0.044	-----	-----	-----	-----	-----	-----	-----	-----
16	2.948	2.808	2.640	2.447	2.231	1.997	1.749	1.494	1.237	0.985	0.743	0.517	0.316	0.150	0.039	-----	-----	-----	-----	-----	-----	-----
17	2.927	2.797	2.643	2.466	2.269	2.055	1.827	1.591	1.351	1.114	0.883	0.664	0.461	0.281	0.133	0.035	-----	-----	-----	-----	-----	-----
18	2.908	2.787	2.644	2.480	2.299	2.102	1.893	1.675	1.451	1.227	1.007	0.796	0.597	0.413	0.251	0.119	0.031	-----	-----	-----	-----	-----
19	2.890	2.776	2.643	2.492	2.324	2.142	1.948	1.746	1.538	1.327	1.118	0.915	0.721	0.539	0.372	0.226	0.107	0.028	-----	-----	-----	-----
20	2.874	2.766	2.641	2.500	2.344	2.176	1.996	1.807	1.613	1.415	1.217	1.022	0.834	0.656	0.489	0.337	0.204	0.096	0.025	-----	-----	-----
21	2.858	2.756	2.638	2.506	2.361	2.204	2.036	1.861	1.678	1.492	1.305	1.119	0.937	0.763	0.598	0.446	0.307	0.185	0.087	0.023	-----	-----
22	2.842	2.746	2.635	2.511	2.375	2.228	2.071	1.907	1.736	1.561	1.384	1.207	1.032	0.862	0.700	0.548	0.408	0.280	0.169	0.080	0.021	-----
23	2.828	2.736	2.631	2.515	2.387	2.249	2.102	1.947	1.786	1.621	1.454	1.285	1.118	0.954	0.796	0.645	0.504	0.374	0.257	0.155	0.073	0.019
24	2.814	2.727	2.627	2.517	2.396	2.267	2.128	1.983	1.831	1.675	1.516	1.356	1.196	1.038	0.884	0.736	0.596	0.465	0.345	0.237	0.143	0.067
25	2.801	2.717	2.623	2.518	2.404	2.282	2.151	2.014	1.871	1.723	1.572	1.420	1.267	1.115	0.966	0.821	0.683	0.552	0.430	0.319	0.218	0.132
26	2.789	2.709	2.618	2.519	2.411	2.295	2.171	2.042	1.906	1.766	1.623	1.478	1.331	1.186	1.042	0.901	0.765	0.635	0.512	0.399	0.295	0.202
27	2.777	2.700	2.614	2.519	2.416	2.306	2.189	2.066	1.938	1.805	1.669	1.530	1.390	1.250	1.111	0.975	0.842	0.714	0.592	0.477	0.371	0.274
28	2.766	2.692	2.609	2.519	2.421	2.316	2.205	2.088	1.966	1.839	1.710	1.577	1.444	1.309	1.176	1.043	0.914	0.788	0.667	0.553	0.445	0.346
29	2.755	2.684	2.604	2.518	2.425	2.325	2.219	2.107	1.991	1.871	1.747	1.621	1.493	1.364	1.235	1.107	0.981	0.858	0.739	0.625	0.517	0.416
30	2.745	2.676	2.600	2.517	2.428	2.332	2.231	2.125	2.014	1.899	1.781	1.660	1.537	1.414	1.290	1.166	1.044	0.924	0.807	0.695	0.587	0.485
31	2.735	2.668	2.595	2.515	2.430	2.339	2.242	2.140	2.035	1.925	1.812	1.696	1.579	1.460	1.340	1.221	1.102	0.986	0.872	0.761	0.654	0.552
32	2.725	2.661	2.590	2.514	2.432	2.344	2.252	2.155	2.053	1.948	1.840	1.729	1.616	1.502	1.387	1.272	1.157	1.043	0.932	0.823	0.718	0.617
33	2.716	2.654	2.586	2.512	2.433	2.349	2.260	2.167	2.070	1.970	1.866	1.759	1.651	1.541	1.430	1.319	1.208	1.097	0.989	0.882	0.779	0.678
34	2.707	2.647	2.581	2.510	2.434	2.353	2.268	2.179	2.086	1.989	1.889	1.787	1.683	1.577	1.470	1.363	1.255	1.148	1.042	0.938	0.836	0.737
35	2.699	2.640	2.576	2.508	2.435	2.357	2.275	2.189	2.100	2.007	1.911	1.813	1.713	1.611	1.507	1.404	1.299	1.196	1.093	0.991	0.891	0.794
36	2.690	2.634	2.572	2.506	2.435	2.360	2.281	2.199	2.113	2.023	1.931	1.837	1.740	1.642	1.542	1.442	1.341	1.240	1.140	1.041	0.943	0.847
37	2.683	2.627	2.567	2.503	2.435	2.363	2.287	2.207	2.124	2.038	1.950	1.859	1.765	1.670	1.574	1.477	1.379	1.282	1.184	1.088	0.992	0.898
38	2.675	2.621	2.563	2.501	2.435	2.365	2.292	2.215	2.135	2.052	1.967	1.879	1.789	1.697	1.604	1.510	1.416	1.321	1.226	1.132	1.039	0.947
39	2.667	2.615	2.559	2.499	2.435	2.367	2.296	2.222	2.145	2.065	1.982	1.898	1.811	1.722	1.632	1.541	1.450	1.358	1.266	1.174	1.083	0.993
40	2.660	2.609	2.555	2.496	2.434	2.369	2.300	2.229	2.154	2.077	1.997	1.915	1.831	1.746	1.659	1.570	1.482	1.392	1.303	1.213	1.124	1.036
45	2.628	2.583	2.535	2.484	2.430	2.374	2.315	2.253	2.190	2.124	2.056	1.986	1.914	1.841	1.767	1.691	1.614	1.537	1.459	1.381	1.302	1.224
50	2.600	2.559	2.516	2.471	2.424	2.374	2.323	2.269	2.214	2.157	2.098	2.037	1.975	1.911	1.847	1.781	1.714	1.646	1.578	1.509	1.439	1.370
55	2.575	2.538	2.500	2.459	2.417	2.373	2.327	2.280	2.231	2.180	2.128	2.075	2.020	1.964	1.907	1.849	1.790	1.730	1.669	1.608	1.546	1.484
60	2.553	2.519	2.484	2.448	2.409	2.370	2.329	2.286	2.242	2.197	2.151	2.103	2.054	2.004	1.954	1.902	1.849	1.796	1.742	1.687	1.631	1.576
65	2.534	2.503	2.470	2.437	2.402	2.366	2.329	2.290	2.250	2.210	2.168	2.125	2.081	2.036	1.990	1.944	1.896	1.848	1.799	1.750	1.700	1.650
70	2.516	2.487	2.458	2.427	2.395	2.361	2.327	2.292	2.256	2.219	2.181	2.142	2.102	2.061	2.020	1.977	1.934	1.891	1.846	1.802	1.756	1.710
75	2.500	2.473	2.446	2.417	2.387	2.357	2.325	2.293	2.260	2.226	2.191	2.155	2.118	2.081	2.043	2.005	1.965	1.926	1.885	1.844	1.802	1.760
80	2.486	2.461	2.436	2.408	2.380	2.352	2.323	2.293	2.262	2.231	2.198	2.165	2.132	2.098	2.063	2.027	1.991	1.954	1.917	1.879	1.841	1.803
85	2.473	2.449	2.425	2.399	2.374	2.347	2.320	2.292	2.263	2.234	2.204	2.174	2.143	2.111	2.079	2.046	2.012	1.979	1.944	1.909	1.874	1.838
90	2.460	2.438	2.415	2.391	2.367	2.342	2.317	2.291	2.264	2.237	2.209	2.181	2.152	2.122	2.092	2.061	2.030	1.999	1.967	1.935	1.902	1.869
95	2.449	2.428	2.406	2.384	2.361	2.338	2.314	2.289	2.264	2.239	2.212	2.186	2.159	2.131	2.103	2.075	2.046	2.016	1.986	1.956	1.926	1.895
100	2.438	2.418	2.398	2.377	2.355	2.333	2.310	2.287	2.264	2.240	2.215	2.190	2.165	2.139	2.113	2.086	2.059	2.031	2.003	1.975	1.946	1.917
150	2.363	2.349	2.336	2.322	2.308	2.294	2.279	2.265	2.250	2.235	2.220	2.204	2.188	2.173	2.156	2.140	2.124	2.107	2.090	2.073	2.056	2.039
200	2.317	2.307	2.296	2.286	2.276	2.265	2.255	2.244	2.233	2.222	2.211	2.200	2.189	2.177	2.166	2.154	2.142	2.131	2.119	2.106	2.094	2.082