

































## Appendix: Some Useful Lemmas

**Lemma A.1** (Lee, 2004a, p. 1918): *Let  $v_n$  be an  $n \times 1$  random vector of iid elements with mean zero, variance  $\sigma_v^2$ , and finite excess kurtosis  $\kappa_v$ . Let  $A_n$  be an  $n$  dimensional square matrix. Then  $E(v_n' A_n v_n) = \sigma_v^2 \text{tr}(A_n)$  and  $\text{Var}(v_n' A_n v_n) = \sigma_v^4 \kappa_v \sum_{i=1}^n a_{n,ii}^2 + \sigma_v^4 \text{tr}(A_n A_n' + A_n^2)$ , where  $\{a_{n,ii}\}$  are the diagonal elements of  $A_n$ .*

**Lemma A.2** (Lee, 2004a, p. 1918): *Suppose that the elements of the  $n \times k$  matrix  $X_n$  are uniformly bounded; and  $\lim_{n \rightarrow \infty} \frac{1}{n} X_n' X_n$  exists and is nonsingular. Then the projectors  $P_n = X_n (X_n' X_n)^{-1} X_n'$  and  $M_n = I_n - X_n (X_n' X_n)^{-1} X_n'$  are uniformly bounded in both row and column sums.*

**Lemma A.3** (Lemma A.9, Lee, 2004b): *Suppose that  $A_n$  represents a sequence of  $n \times n$  matrices that are uniformly bounded in both row and column sums. The elements of the  $n \times k$  matrix  $X_n$  are uniformly bounded; and  $\lim_{n \rightarrow \infty} \frac{1}{n} X_n' X_n$  exists and is nonsingular. Let  $M_n = I_n - X_n (X_n' X_n)^{-1} X_n'$ . Then*

- (i)  $\text{tr}(M_n A_n) = \text{tr}(A_n) + O(1)$
- (ii)  $\text{tr}(A_n' M_n A_n) = \text{tr}(A_n' A_n) + O(1)$
- (iii)  $\text{tr}[(M_n A_n)^2] = \text{tr}(A_n^2) + O(1)$ , and
- (iv)  $\text{tr}[(A_n' M_n A_n)^2] = \text{tr}[(M_n A_n' A_n)^2] = \text{tr}[A_n' A_n]^2 + O(1)$

Furthermore, if  $a_{n,ij} = O(h_n^{-1})$  for all  $i$  and  $j$ , then

- (v)  $\text{tr}^2(M_n A_n) = \text{tr}^2(A_n) + O(\frac{n}{h_n})$ , and
- (vi)  $\sum_{i=1}^n [(M_n A_n)_{ii}]^2 = \sum_{i=1}^n (a_{n,ii})^2 + O(h_n^{-1})$ ,

where  $(M_n A_n)_{ii}$  are the diagonal elements of  $M_n A_n$ , and  $a_{n,ii}$  the diagonal elements of  $A_n$ .

**Lemma A.4** (Kelejian and Prucha, 1999; Lee, 2002): *Let  $\{A_n\}$  and  $\{B_n\}$  be two sequences of  $n \times n$  matrices that are uniformly bounded in both row and column sums. Let  $C_n$  be a sequence of conformable matrices whose elements are uniformly  $O(h_n^{-1})$ . Then*

- (i) the sequence  $\{A_n B_n\}$  are uniformly bounded in both row and column sums,
- (ii) the elements of  $A_n$  are uniformly bounded and  $\text{tr}(A_n) = O(n)$ , and
- (iii) the elements of  $A_n C_n$  and  $C_n A_n$  are uniformly  $O(h_n^{-1})$ .



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**Table 1a.** Empirical Means, SDs and Sizes of the Tests, Rook Contiguity,  $\ell = 5^*$

dgp	n	Anselin's Test					Proposed Test				
		Mean	SD	10%	5%	1%	Mean	SD	10%	5%	1%
1	20	-0.2552	0.8854	0.0541	.0255	.0047	-0.0061	1.1108	.1284	.0811	.0280
	50	-0.1949	0.9508	0.0668	.0327	.0069	-0.0015	1.0363	.1158	.0624	.0182
	100	-0.1333	0.9784	0.0797	.0408	.0092	-0.0001	1.0226	.1098	.0606	.0157
	200	-0.1149	0.9971	0.0845	.0440	.0100	-0.0026	1.0204	.1085	.0577	.0148
	500	-0.0639	0.9899	0.0880	.0435	.0080	0.0133	0.9998	.1057	.0529	.0105
	1000	-0.0384	1.0064	0.0968	.0506	.0105	0.0136	1.0113	.1089	.0555	.0126
	1500	-0.0358	0.9994	0.0916	.0485	.0130	0.0073	1.0026	.1002	.0533	.0148
2	20	-0.2512	0.8399	0.0440	.0177	.0021	-0.0013	1.0224	.1115	.0650	.0178
	50	-0.1952	1.0170	0.0814	.0496	.0171	-0.0017	0.9642	.0994	.0591	.0179
	100	-0.1186	1.0746	0.0906	.0544	.0206	0.0136	0.9606	.0912	.0518	.0171
	200	-0.1126	1.0959	0.0952	.0562	.0201	-0.0003	0.9491	.0842	.0460	.0140
	500	-0.0949	1.1261	0.1093	.0626	.0196	-0.0158	0.9678	.0902	.0476	.0100
	1000	-0.0401	1.1499	0.1185	.0711	.0225	0.0112	0.9879	.0946	.0513	.0132
	1500	-0.0249	1.1613	0.1266	.0737	.0219	0.0154	0.9968	.0977	.0513	.0117
3	20	-0.2586	0.8531	0.0468	.0193	.0037	-0.0109	1.0391	.1180	.0682	.0194
	50	-0.1981	0.9962	0.0797	.0458	.0158	-0.0058	0.9873	.1052	.0608	.0191
	100	-0.1286	1.0269	0.0873	.0531	.0203	0.0046	0.9678	.0970	.0553	.0198
	200	-0.1253	1.0685	0.0944	.0574	.0199	-0.0095	0.9687	.0931	.0542	.0179
	500	-0.0641	1.1399	0.1173	.0700	.0259	0.0107	0.9870	.0995	.0528	.0168
	1000	-0.0614	1.1851	0.1250	.0787	.0307	-0.0067	0.9916	.0989	.0544	.0162
	1500	-0.0361	1.2124	0.1365	.0840	.0319	0.0043	0.9920	.1007	.0532	.0151
4	20	-0.2533	0.8763	0.0524	.0256	.0045	-0.0036	1.0883	.1286	.0782	.0274
	50	-0.2120	0.9612	0.0719	.0372	.0101	-0.0192	1.0205	.1050	.0621	.0202
	100	-0.1139	0.9962	0.0901	.0465	.0127	0.0197	1.0181	.1169	.0647	.0200
	200	-0.1203	1.0025	0.0847	.0480	.0113	-0.0078	1.0036	.1016	.0565	.0151
	500	-0.0762	1.0096	0.0910	.0465	.0121	0.0007	0.9997	.1019	.0513	.0134
	1000	-0.0639	1.0217	0.0982	.0524	.0115	-0.0120	1.0076	.1036	.0555	.0126
	1500	-0.0426	1.0124	0.0939	.0495	.0118	0.0005	0.9971	.0976	.0516	.0117

\*The  $n$  spatial units are randomly placed on a lattice of  $\ell \times m$  squares.

dgp1=normal, dgp2=normal mixture( $\tau = 10, p = 0.05$ ), dgp3=lognormal, dgp4=chi-squared(df=3).

**Table 1b.** Empirical Means, SDs and Sizes of the Tests, Queen Contiguity,  $\ell = 5^*$

dgp	n	Anselin's Test					Proposed Test				
		Mean	SD	10%	5%	1%	Mean	SD	10%	5%	1%
1	20	-0.5543	0.6913	.0189	.0089	.0018	0.0120	1.1381	.1299	.0924	.0441
	50	-0.3213	0.8662	.0475	.0262	.0082	-0.0029	1.0362	.1139	.0691	.0276
	100	-0.2562	0.9330	.0628	.0349	.0107	-0.0002	1.0253	.1124	.0681	.0238
	200	-0.1735	0.9793	.0761	.0399	.0110	0.0019	1.0240	.1114	.0621	.0189
	500	-0.1092	0.9893	.0845	.0432	.0117	0.0107	1.0082	.1055	.0583	.0150
	1000	-0.0853	0.9890	.0890	.0457	.0109	0.0036	0.9989	.1060	.0555	.0145
	1500	-0.0823	0.9903	.0898	.0462	.0113	-0.0142	0.9964	.1031	.0547	.0129
2	20	-0.5627	0.6953	.0175	.0070	.0012	-0.0038	1.0550	.1248	.0820	.0307
	50	-0.3175	0.9750	.0708	.0427	.0162	-0.0009	0.9800	.1056	.0675	.0244
	100	-0.2649	1.0840	.0840	.0520	.0220	-0.0079	0.9633	.0962	.0570	.0223
	200	-0.1637	1.1503	.1025	.0643	.0262	0.0085	0.9664	.0938	.0532	.0186
	500	-0.1167	1.1792	.1176	.0719	.0243	0.0021	0.9684	.0952	.0519	.0116
	1000	-0.0838	1.2209	.1291	.0804	.0286	0.0040	0.9987	.1007	.0547	.0144
	1500	-0.0681	1.2278	.1335	.0863	.0296	0.0001	1.0026	.1031	.0554	.0138
3	20	-0.5558	0.7032	.0208	.0084	.0011	0.0066	1.0780	.1271	.0841	.0370
	50	-0.3218	0.9259	.0597	.0361	.0135	-0.0050	0.9837	.1039	.0646	.0241
	100	-0.2656	1.0171	.0732	.0452	.0174	-0.0099	0.9689	.0978	.0567	.0226
	200	-0.1799	1.1241	.0974	.0612	.0246	-0.0056	0.9968	.0968	.0600	.0222
	500	-0.1250	1.2040	.1216	.0764	.0308	-0.0102	0.9886	.1015	.0560	.0167
	1000	-0.0955	1.2372	.1330	.0859	.0337	-0.0025	0.9828	.0996	.0558	.0138
	1500	-0.0888	1.2869	.1394	.0911	.0384	-0.0133	0.9968	.1002	.0543	.0155
4	20	-0.5558	0.6889	.0178	.0080	.0013	0.0070	1.1046	.1285	.0860	.0399
	50	-0.3259	0.8918	.0545	.0303	.0103	-0.0083	1.0317	.1082	.0674	.0287
	100	-0.2621	0.9370	.0644	.0359	.0104	-0.0065	0.9956	.1054	.0629	.0217
	200	-0.1689	0.9973	.0814	.0453	.0138	0.0066	1.0125	.1077	.0636	.0195
	500	-0.1288	1.0082	.0875	.0488	.0142	-0.0091	1.0000	.1020	.0577	.0169
	1000	-0.0825	1.0190	.0963	.0509	.0130	0.0062	1.0026	.1073	.0571	.0137
	1500	-0.0558	1.0247	.1019	.0541	.0156	0.0121	1.0050	.1088	.0582	.0162

\*The  $n$  spatial units are randomly placed on a lattice of  $\ell \times m$  squares.

dgp1=normal, dgp2=normal mixture( $\tau = 10, p = 0.05$ ), dgp3=lognormal, dgp4=chi-squared(df=3).

**Table 2a.** Empirical Means, SDs and Sizes of the Tests, Rook Contiguity,  $\ell = m^*$

dgp	$n$	Anselin's Test					Proposed Test				
		Mean	SD	10%	5%	1%	Mean	SD	10%	5%	1%
1	$5^2$	-0.3575	0.8954	.0456	.0227	.0041	0.0007	1.0987	.1298	.0794	.0280
	$7^2$	-0.2155	0.9602	.0707	.0350	.0090	0.0050	1.0597	.1194	.0715	.0222
	$10^2$	-0.1358	0.9741	.0810	.0421	.0098	-0.0006	1.0206	.1100	.0625	.0171
	$15^2$	-0.1155	0.9787	.0823	.0411	.0075	-0.0030	1.0007	.1037	.0540	.0123
	$23^2$	-0.0873	0.9880	.0834	.0447	.0095	-0.0062	0.9980	.1006	.0547	.0123
	$32^2$	-0.0383	1.0032	.0958	.0498	.0104	0.0175	1.0085	.1056	.0567	.0128
	$39^2$	-0.0639	0.9955	.0895	.0460	.0100	-0.0174	0.9990	.0977	.0515	.0119
2	$5^2$	-0.3546	0.8840	.0471	.0208	.0028	0.0035	1.0106	.1127	.0675	.0189
	$7^2$	-0.2112	1.0039	.0794	.0491	.0172	0.0064	0.9615	.1001	.0611	.0174
	$10^2$	-0.1435	1.0727	.0905	.0544	.0232	-0.0074	0.9526	.0886	.0515	.0189
	$15^2$	-0.0982	1.1033	.0995	.0626	.0240	0.0124	0.9624	.0903	.0539	.0185
	$23^2$	-0.0951	1.1076	.1028	.0614	.0213	-0.0128	0.9882	.0921	.0509	.0153
	$32^2$	-0.0612	1.0895	.1082	.0597	.0187	-0.0050	0.9941	.0989	.0509	.0146
	$39^2$	-0.0318	1.0787	.1088	.0625	.0168	0.0139	0.9976	.1008	.0546	.0123
3	$5^2$	-0.3556	0.8998	.0502	.0264	.0053	0.0021	1.0398	.1150	.0730	.0249
	$7^2$	-0.2206	0.9827	.0765	.0427	.0145	-0.0003	0.9863	.1053	.0632	.0199
	$10^2$	-0.1237	1.0340	.0936	.0569	.0215	0.0115	0.9716	.0996	.0604	.0206
	$15^2$	-0.1092	1.0686	.1011	.0596	.0203	0.0030	0.9700	.0980	.0545	.0178
	$23^2$	-0.0623	1.1088	.1116	.0679	.0270	0.0172	0.9905	.1033	.0579	.0200
	$32^2$	-0.0887	1.0851	.1052	.0655	.0247	-0.0286	0.9766	.0958	.0560	.0179
	$39^2$	-0.0649	1.1092	.1099	.0687	.0270	-0.0169	1.0000	.1001	.0591	.0189
4	$5^2$	-0.3540	0.8962	.0492	.0228	.0050	0.0042	1.0770	.1260	.0785	.0270
	$7^2$	-0.2230	0.9522	.0668	.0356	.0099	-0.0031	1.0215	.1092	.0638	.0194
	$10^2$	-0.1460	0.9800	.0817	.0420	.0112	-0.0110	1.0015	.1046	.0569	.0155
	$15^2$	-0.1083	0.9990	.0884	.0462	.0128	0.0043	1.0006	.1029	.0587	.0154
	$23^2$	-0.0758	1.0009	.0912	.0490	.0113	0.0052	0.9965	.1030	.0554	.0135
	$32^2$	-0.0518	1.0085	.0951	.0499	.0104	0.0039	1.0030	.1042	.0545	.0115
	$39^2$	-0.0405	1.0063	.0951	.0483	.0135	0.0060	1.0008	.1021	.0518	.0144

\*The  $n$  spatial units are randomly placed on a lattice of  $\ell \times m$  squares.

dgp1=normal, dgp2=normal mixture( $\tau = 10, p = 0.05$ ), dgp3=lognormal, dgp4=chi-squared(df=3).

**Table 2b.** Empirical Means, SDs and Sizes of the Tests, Queen Contiguity,  $\ell = m^*$

dgp	$n$	Anselin's Test					Proposed Test				
		Mean	SD	10%	5%	1%	Mean	SD	10%	5%	1%
1	$5^2$	-0.4613	0.7557	.0277	.0136	.0034	0.0142	1.1079	.1306	.0858	.0379
	$7^2$	-0.3936	0.8373	.0398	.0201	.0055	-0.0010	1.0419	.1128	.0714	.0279
	$10^2$	-0.3157	0.9107	.0549	.0301	.0076	-0.0038	1.0216	.1124	.0672	.0237
	$15^2$	-0.1847	0.9669	.0749	.0408	.0105	0.0111	1.0134	.1121	.0643	.0198
	$23^2$	-0.1285	0.9641	.0787	.0405	.0105	-0.0026	0.9837	.1025	.0554	.0158
	$32^2$	-0.1000	0.9897	.0882	.0447	.0088	-0.0055	1.0006	.1052	.0555	.0122
	$39^2$	-0.0722	1.0030	.0930	.0462	.0089	0.0056	1.0105	.1092	.0561	.0126
2	$5^2$	-0.4941	0.7753	.0253	.0101	.0017	-0.0298	1.0220	.1180	.0708	.0240
	$7^2$	-0.3931	0.9389	.0566	.0354	.0138	0.0012	0.9892	.1044	.0686	.0269
	$10^2$	-0.3188	1.0812	.0786	.0499	.0230	-0.0062	0.9792	.0979	.0611	.0266
	$15^2$	-0.1891	1.1445	.0985	.0627	.0261	0.0051	0.9650	.0961	.0545	.0192
	$23^2$	-0.1024	1.1558	.1197	.0760	.0285	0.0200	0.9893	.1075	.0624	.0185
	$32^2$	-0.1197	1.1282	.1066	.0655	.0236	-0.0218	0.9885	.0955	.0540	.0157
	$39^2$	-0.0765	1.1091	.1097	.0642	.0221	0.0010	0.9879	.0977	.0515	.0161
3	$5^2$	-0.4730	0.7733	.0280	.0140	.0030	-0.0035	1.0339	.1231	.0754	.0283
	$7^2$	-0.3983	0.9043	.0514	.0316	.0106	-0.0049	1.0027	.1028	.0668	.0283
	$10^2$	-0.3061	1.0278	.0703	.0453	.0187	0.0059	0.9957	.1007	.0645	.0271
	$15^2$	-0.1932	1.1029	.0955	.0600	.0237	0.0036	0.9815	.1012	.0588	.0221
	$23^2$	-0.1178	1.1370	.1080	.0684	.0278	0.0059	0.9783	.1007	.0567	.0183
	$32^2$	-0.0974	1.1449	.1076	.0657	.0264	-0.0017	0.9782	.0965	.0540	.0179
	$39^2$	-0.0798	1.1433	.1126	.0722	.0292	-0.0013	0.9841	.1026	.0598	.0185
4	$5^2$	-0.4611	0.7627	.0277	.0133	.0036	0.0138	1.0841	.1292	.0827	.0336
	$7^2$	-0.3760	0.8622	.0447	.0245	.0069	0.0198	1.0380	.1158	.0747	.0300
	$10^2$	-0.3240	0.9324	.0568	.0314	.0104	-0.0125	1.0109	.1038	.0628	.0218
	$15^2$	-0.1912	0.9868	.0782	.0441	.0141	0.0046	1.0052	.1076	.0638	.0212
	$23^2$	-0.1360	1.0122	.0874	.0489	.0137	-0.0100	1.0107	.1047	.0596	.0188
	$32^2$	-0.0957	1.0006	.0924	.0477	.0133	-0.0011	0.9948	.1045	.0564	.0156
	$39^2$	-0.0650	1.0007	.0931	.0485	.0129	0.0127	0.9940	.1028	.0563	.0146

\*The  $n$  spatial units are randomly placed on a lattice of  $\ell \times m$  squares.

dgp1=normal, dgp2=normal mixture( $\tau = 10, p = 0.05$ ), dgp3=lognormal, dgp4=chi-squared(df=3).

**Table 3a.** Empirical Means, SDs and Sizes of the Tests, Group Interaction  
 Group sizes = {2, 3, 4, 5, 6, 7} repeated  $m$  times,  $n = 27m^*$

dgp	$m$	Anselin's Test					Proposed Test				
		Mean	SD	10%	5%	1%	Mean	SD	10%	5%	1%
1	1	-0.2621	0.9313	.0650	.0363	.0079	0.0117	1.0988	.1367	.0860	.0304
	2	-0.1685	0.9739	.0775	.0406	.0111	-0.0074	1.0489	.1144	.0681	.0208
	4	-0.1239	0.9882	.0838	.0462	.0104	-0.0071	1.0247	.1054	.0623	.0167
	8	-0.0782	0.9890	.0848	.0434	.0119	-0.0046	1.0059	.1001	.0531	.0145
	19	-0.0589	0.9911	.0896	.0450	.0106	-0.0069	0.9982	.0994	.0504	.0122
	37	-0.0423	1.0038	.0914	.0482	.0115	-0.0030	1.0080	.0987	.0525	.0131
	56	-0.0346	0.9911	.0945	.0483	.0110	-0.0035	0.9936	.1001	.0514	.0118
2	1	-0.2913	1.1282	.0850	.0572	.0290	-0.0173	1.1070	.1256	.0863	.0417
	2	-0.1470	1.3015	.1137	.0779	.0441	0.0138	1.0439	.1156	.0755	.0378
	4	-0.1481	1.4938	.1413	.1040	.0616	-0.0208	1.0194	.1066	.0727	.0328
	8	-0.0429	1.6957	.1808	.1402	.0890	0.0166	1.0242	.1171	.0783	.0325
	19	-0.0365	1.7564	.2036	.1558	.0984	0.0093	1.0032	.1118	.0695	.0251
	37	-0.0546	1.8010	.2120	.1656	.0961	-0.0072	1.0036	.1059	.0625	.0204
	56	-0.0124	1.8028	.2247	.1716	.1017	0.0108	0.9943	.1076	.0612	.0185
3	1	-0.2805	1.2401	.1044	.0760	.0447	-0.0077	1.1166	.1309	.0929	.0527
	2	-0.1724	1.4587	.1284	.0968	.0605	-0.0067	1.0547	.1151	.0824	.0455
	4	-0.1291	1.7277	.1593	.1242	.0779	-0.0044	1.0288	.1105	.0793	.0392
	8	-0.0914	2.0160	.1851	.1489	.0993	-0.0040	1.0038	.1091	.0756	.0370
	19	-0.0465	2.4965	.2141	.1765	.1292	-0.0003	1.0203	.1105	.0785	.0371
	37	-0.0396	2.7348	.2372	.1988	.1404	0.0038	1.0046	.1083	.0755	.0349
	56	-0.0242	2.9737	.2439	.2060	.1510	0.0057	1.0107	.1087	.0744	.0362
4	1	-0.2711	1.0474	.0854	.0554	.0239	0.0012	1.1201	.1350	.0932	.0425
	2	-0.1546	1.1314	.1104	.0727	.0295	0.0081	1.0667	.1287	.0838	.0301
	4	-0.1074	1.1764	.1208	.0795	.0330	0.0091	1.0304	.1174	.0741	.0238
	8	-0.0686	1.2178	.1351	.0863	.0372	0.0046	1.0188	.1126	.0663	.0215
	19	-0.0537	1.2086	.1327	.0852	.0339	-0.0005	0.9870	.1008	.0591	.0156
	37	-0.0385	1.2351	.1459	.0939	.0338	0.0013	0.9980	.1090	.0588	.0139
	56	-0.0417	1.2515	.1440	.0889	.0357	-0.0091	1.0065	.1018	.0560	.0160

\*dgp1 = normal, dgp2=normal mixture( $\tau = 5, p = 0.05$ ), dgp3=lognormal, dgp4=chi-squared(df=3).

**Table 3b.** Empirical Means, SDs and Sizes of the Tests, Group Interaction  
 Group sizes = 5 repeated  $m$  times,  $n = 5m^*$

dgp	$m$	Anselin's Test					Proposed Test				
		Mean	SD	10%	5%	1%	Mean	SD	10%	5%	1%
1	5	-0.3704	0.8699	.0500	.0295	.0081	-0.0160	1.0739	.1230	.0793	.0349
	10	-0.3109	0.9189	.0587	.0314	.0078	0.0066	1.0359	.1170	.0730	.0259
	20	-0.1377	0.9812	.0834	.0461	.0124	0.0009	1.0215	.1110	.0646	.0187
	40	-0.1059	0.9870	.0898	.0440	.0111	0.0015	1.0083	.1095	.0596	.0151
	100	-0.0642	0.9994	.0944	.0471	.0120	0.0017	1.0078	.1064	.0549	.0143
	200	-0.0434	0.9993	.0959	.0503	.0115	0.0027	1.0034	.1042	.0556	.0126
	300	-0.0280	0.9970	.0961	.0514	.0116	0.0098	0.9997	.1027	.0551	.0126
2	5	-0.3483	0.8279	.0433	.0231	.0064	0.0112	1.0162	.1140	.0718	.0273
	10	-0.3046	0.8822	.0494	.0262	.0054	0.0135	0.9868	.1071	.0631	.0208
	20	-0.1457	0.9285	.0703	.0369	.0093	-0.0074	0.9653	.0974	.0530	.0157
	40	-0.1053	0.9433	.0753	.0390	.0105	0.0022	0.9630	.0962	.0515	.0142
	100	-0.0633	0.9826	.0863	.0449	.0105	0.0026	0.9906	.0980	.0522	.0129
	200	-0.0439	0.9818	.0898	.0472	.0117	0.0023	0.9858	.0980	.0512	.0130
	300	-0.0447	0.9894	.0943	.0463	.0084	-0.0070	0.9921	.1019	.0501	.0101
3	5	-0.3587	0.8002	.0412	.0211	.0069	-0.0016	0.9780	.1050	.0639	.0257
	10	-0.3190	0.8437	.0461	.0257	.0068	-0.0026	0.9406	.0944	.0569	.0198
	20	-0.1604	0.8975	.0680	.0397	.0117	-0.0227	0.9325	.0905	.0532	.0187
	40	-0.1100	0.9375	.0770	.0452	.0163	-0.0027	0.9566	.0932	.0557	.0201
	100	-0.0573	0.9655	.0875	.0505	.0170	0.0087	0.9732	.0974	.0561	.0186
	200	-0.0351	0.9880	.0940	.0563	.0187	0.0111	0.9920	.0995	.0615	.0214
	300	-0.0340	0.9811	.0926	.0520	.0151	0.0037	0.9837	.0973	.0555	.0162
4	5	-0.3509	0.8535	.0492	.0270	.0079	0.0082	1.0502	.1200	.0799	.0330
	10	-0.3094	0.9001	.0529	.0281	.0075	0.0083	1.0115	.1114	.0671	.0230
	20	-0.1476	0.9541	.0793	.0448	.0128	-0.0094	0.9929	.1038	.0631	.0191
	40	-0.1041	0.9723	.0845	.0442	.0125	0.0033	0.9931	.1044	.0569	.0168
	100	-0.0832	0.9917	.0891	.0488	.0126	-0.0174	0.9999	.1022	.0554	.0152
	200	-0.0605	1.0075	.0977	.0527	.0138	-0.0144	1.0116	.1060	.0580	.0154
	300	-0.0615	0.9836	.0880	.0452	.0106	-0.0238	0.9863	.0944	.0481	.0116

\*dgp1 = normal, dgp2=normal mixture( $\tau = 5, p = 0.05$ ), dgp3=lognormal, dgp4=chi-squared(df=3).



**Table 4a.** Empirical Means, SDs and Sizes of the Tests, Group Interaction  
 Number of groups  $l \propto n^{.75}$ , Group sizes  $m \sim U(.5n^{.25}, 1.5n^{.25})^*$

dgp	n	Anselin's Test					Proposed Test				
		Mean	SD	10%	5%	1%	Mean	SD	10%	5%	1%
1	20	-0.1115	0.9529	.0758	.0308	.0018	-0.0015	1.1489	.1405	.0809	.0150
	50	-0.0878	0.9946	.0865	.0369	.0056	0.0057	1.0608	.1169	.0608	.0115
	100	-0.0758	0.9849	.0879	.0429	.0078	0.0074	1.0176	.1102	.0551	.0120
	200	-0.0880	0.9975	.0870	.0449	.0090	-0.0166	1.0148	.1029	.0547	.0127
	500	-0.0669	0.9990	.0958	.0489	.0109	-0.0050	1.0071	.1079	.0581	.0135
	1000	-0.0597	0.9954	.0890	.0440	.0116	-0.0114	0.9998	.0983	.0493	.0136
	1500	-0.0379	0.9968	.0941	.0489	.0106	0.0024	0.9999	.1016	.0544	.0122
2	20	-0.1230	1.3587	.1569	.1167	.0582	-0.0150	1.1944	.1859	.1121	.0108
	50	-0.1199	1.9904	.2418	.2051	.1472	-0.0074	1.0853	.1799	.0704	.0048
	100	-0.1266	2.3663	.2421	.2097	.1591	-0.0166	1.0398	.1502	.0923	.0182
	200	-0.0613	2.1549	.2092	.1708	.1201	0.0037	1.0275	.1119	.0836	.0373
	500	-0.0680	1.7972	.1954	.1519	.0918	-0.0023	0.9985	.0988	.0608	.0242
	1000	-0.0728	1.4726	.1750	.1195	.0571	-0.0156	0.9886	.0972	.0535	.0145
	1500	-0.0415	1.4200	.1697	.1145	.0541	-0.0011	1.0026	.1008	.0573	.0178
3	20	-0.1327	1.3252	.1606	.1144	.0381	-0.0249	1.2033	.1839	.1038	.0108
	50	-0.0631	1.7203	.2239	.1778	.1064	0.0235	1.0846	.1698	.0775	.0068
	100	-0.0699	2.0036	.2207	.1838	.1239	0.0064	1.0500	.1504	.0921	.0155
	200	-0.0738	1.8680	.1814	.1438	.0851	-0.0016	1.0179	.1084	.0728	.0360
	500	-0.0586	1.7801	.1731	.1337	.0779	0.0004	1.0056	.1006	.0604	.0242
	1000	-0.0394	1.5745	.1695	.1234	.0676	0.0027	0.9955	.1065	.0622	.0236
	1500	-0.0426	1.5613	.1634	.1148	.0640	-0.0037	1.0063	.0998	.0612	.0243
4	20	-0.0963	1.0741	.1133	.0591	.0080	0.0129	1.1744	.1616	.0930	.0164
	50	-0.0785	1.1981	.1376	.0853	.0274	0.0034	1.0719	.1356	.0720	.0160
	100	-0.0668	1.2344	.1416	.0914	.0341	-0.0021	1.0357	.1203	.0662	.0154
	200	-0.0559	1.1970	.1345	.0836	.0325	0.0262	1.0172	.1165	.0669	.0191
	500	-0.0490	1.1242	.1209	.0706	.0271	0.0064	1.0014	.1069	.0584	.0184
	1000	-0.0466	1.0585	.1111	.0604	.0161	0.0021	0.9986	.1065	.0561	.0139
	1500	-0.0321	1.0356	.1056	.0596	.0149	0.0078	0.9860	.1022	.0551	.0133

\*dgp1 = normal, dgp2=normal mixture ( $\tau = 10, p = 0.05$ ), dgp3=lognormal, dgp4=chi-squared(df=3).

**Table 4b.** Empirical Means, SDs and Sizes of the Tests, Group Interaction  
 Number of groups  $\ell \propto n^{.5}$ , Group sizes  $m \sim U(.5n^{.5}, 1.5n^{.5})^*$

dgp	n	Anselin's Test					Proposed Test				
		Mean	SD	10%	5%	1%	Mean	SD	10%	5%	1%
1	20	-0.3578	0.8713	.0550	.0310	.0084	-0.0099	1.1168	.1317	.0879	.0413
	50	-0.2694	0.9177	.0661	.0371	.0107	0.0036	1.0348	.1204	.0764	.0289
	100	-0.2032	0.9620	.0748	.0433	.0152	0.0055	1.0271	.1136	.0701	.0256
	200	-0.1568	0.9785	.0812	.0473	.0163	0.0173	1.0196	.1135	.0672	.0266
	500	-0.1378	0.9859	.0875	.0481	.0150	0.0117	1.0126	.1129	.0672	.0211
	1000	-0.1186	0.9792	.0865	.0478	.0130	0.0037	0.9962	.1078	.0628	.0190
	1500	-0.1019	0.9933	.0904	.0500	.0156	0.0121	1.0077	.1093	.0627	.0201
2	20	-0.3479	0.8240	.0424	.0200	.0055	0.0034	1.0231	.1178	.0719	.0261
	50	-0.2721	0.8545	.0498	.0254	.0075	0.0004	0.9174	.0889	.0515	.0173
	100	-0.1958	0.9479	.0668	.0382	.0124	0.0126	0.9334	.0915	.0511	.0165
	200	-0.1763	0.9917	.0787	.0448	.0145	-0.0037	0.9428	.0930	.0506	.0157
	500	-0.1511	0.9917	.0810	.0437	.0145	-0.0017	0.9696	.0979	.0539	.0167
	1000	-0.1151	0.9934	.0866	.0485	.0152	0.0070	0.9778	.1001	.0575	.0183
	1500	-0.1457	0.9949	.0836	.0465	.0131	-0.0314	0.9803	.0967	.0524	.0157
3	20	-0.3483	0.8186	.0439	.0236	.0063	0.0023	1.0172	.1128	.0724	.0290
	50	-0.2629	0.9016	.0610	.0366	.0131	0.0107	0.9834	.1014	.0651	.0262
	100	-0.2082	0.9444	.0704	.0411	.0164	0.0000	0.9567	.0976	.0582	.0223
	200	-0.1681	0.9967	.0850	.0517	.0208	0.0058	0.9731	.1023	.0628	.0245
	500	-0.1287	1.0011	.0876	.0507	.0201	0.0199	0.9817	.1047	.0612	.0226
	1000	-0.1309	0.9993	.0847	.0513	.0168	-0.0078	0.9782	.0989	.0581	.0184
	1500	-0.1311	1.0038	.0856	.0510	.0170	-0.0166	0.9800	.0962	.0563	.0188
4	20	-0.3674	0.8465	.0482	.0255	.0071	-0.0217	1.0735	.1225	.0846	.0346
	50	-0.2822	0.9108	.0640	.0376	.0115	-0.0106	1.0170	.1125	.0701	.0281
	100	-0.2022	0.9465	.0724	.0438	.0151	0.0066	0.9992	.1065	.0651	.0246
	200	-0.1703	0.9743	.0811	.0460	.0168	0.0034	1.0039	.1055	.0659	.0250
	500	-0.1631	0.9825	.0826	.0462	.0157	-0.0142	1.0038	.1062	.0632	.0210
	1000	-0.1172	0.9857	.0842	.0484	.0156	0.0050	0.9993	.1060	.0607	.0198
	1500	-0.0974	0.9891	.0898	.0510	.0139	0.0166	1.0004	.1096	.0619	.0188

\*dgp1 = normal, dgp2=normal mixture ( $\tau = 10, p = 0.05$ ), dgp3=lognormal, dgp4=chi-squared(df=3).

**Table 4c.** Empirical Means, SDs and Sizes of the Tests, Group Interaction  
 Number of groups  $\ell \propto n^{.25}$ , Group sizes  $m \sim U(.5n^{.75}, 1.5n^{.75})^*$

dgp	n	Anselin's Test					Proposed Test				
		Mean	SD	10%	5%	1%	Mean	SD	10%	5%	1%
1	20	-0.5368	0.6713	.0295	.0173	.0058	-0.0091	1.1024	.1142	.0842	.0488
	50	-0.3820	0.8296	.0505	.0306	.0114	0.0042	1.0276	.1109	.0759	.0380
	100	-0.4075	0.8141	.0462	.0298	.0123	0.0111	1.0254	.1064	.0740	.0382
	200	-0.3466	0.8753	.0554	.0361	.0151	0.0078	1.0199	.1081	.0716	.0361
	500	-0.3329	0.8852	.0592	.0355	.0141	-0.0143	0.9965	.1037	.0707	.0315
	1000	-0.2914	0.8988	.0602	.0363	.0141	-0.0042	0.9858	.1027	.0665	.0291
	1500	-0.3082	0.9051	.0612	.0363	.0136	-0.0214	0.9927	.1063	.0676	.0278
2	20	-0.5235	0.6229	.0206	.0105	.0039	0.0120	1.0058	.1079	.0764	.0386
	50	-0.3844	0.7241	.0299	.0164	.0052	0.0011	0.8787	.0893	.0539	.0204
	100	-0.4101	0.7467	.0385	.0210	.0063	0.0076	0.9108	.0955	.0624	.0271
	200	-0.3544	0.8200	.0457	.0260	.0100	-0.0014	0.9371	.0948	.0606	.0248
	500	-0.3084	0.9144	.0640	.0395	.0147	0.0122	0.9700	.1024	.0679	.0270
	1000	-0.2966	0.9014	.0621	.0355	.0142	-0.0097	0.9804	.1039	.0668	.0273
	1500	-0.2822	0.9016	.0615	.0382	.0142	0.0071	0.9865	.1040	.0659	.0285
3	20	-0.5355	0.6213	.0206	.0126	.0029	-0.0071	1.0021	.1062	.0743	.0396
	50	-0.3955	0.7724	.0420	.0227	.0088	-0.0126	0.9426	.0964	.0655	.0276
	100	-0.4280	0.7598	.0363	.0225	.0079	-0.0141	0.9385	.0946	.0610	.0288
	200	-0.3584	0.8277	.0470	.0282	.0104	-0.0059	0.9522	.0978	.0632	.0273
	500	-0.3212	0.9021	.0585	.0368	.0152	-0.0009	0.9611	.0960	.0628	.0277
	1000	-0.2884	0.9036	.0598	.0390	.0151	-0.0009	0.9810	.1039	.0639	.0294
	1500	-0.2980	0.8884	.0599	.0338	.0136	-0.0103	0.9714	.0992	.0650	.0254
4	20	-0.5366	0.6529	.0246	.0153	.0048	-0.0089	1.0653	.1153	.0810	.0445
	50	-0.3940	0.8274	.0489	.0318	.0110	-0.0104	1.0208	.1062	.0758	.0366
	100	-0.4217	0.8103	.0437	.0270	.0110	-0.0066	1.0161	.1037	.0749	.0357
	200	-0.3442	0.8638	.0537	.0334	.0133	0.0106	1.0043	.1086	.0706	.0333
	500	-0.3290	0.8876	.0581	.0362	.0142	-0.0098	0.9927	.1041	.0684	.0311
	1000	-0.2892	0.9227	.0636	.0393	.0157	-0.0017	1.0111	.1097	.0697	.0312
	1500	-0.3012	0.9028	.0603	.0369	.0142	-0.0137	0.9900	.1041	.0651	.0299

\*dgp1 = normal, dgp2=normal mixture ( $\tau = 10, p = 0.05$ ), dgp3=lognormal, dgp4=chi-squared (df=3).

**Table 5a.** Empirical Powers of the Proposed Test, Rook or Queen Contiguity

$\sigma_v$	$n = 25$				$n = 100$				$n = 225$			
	dgp1	dgp2	dgp3	dgp4	dgp1	dgp2	dgp3	dgp4	dgp1	dgp2	dgp3	dgp4
Rook Contiguity, $\ell = 5$												
0.00	0.129	0.112	0.115	0.119	0.107	0.087	0.098	0.113	0.107	0.082	0.097	0.110
0.25	0.144	0.149	0.136	0.138	0.132	0.124	0.136	0.126	0.143	0.135	0.141	0.140
0.50	0.183	0.253	0.223	0.189	0.239	0.258	0.248	0.228	0.297	0.299	0.308	0.296
0.75	0.249	0.379	0.321	0.261	0.403	0.444	0.452	0.413	0.590	0.580	0.609	0.581
1.00	0.333	0.477	0.446	0.350	0.620	0.637	0.646	0.615	0.849	0.795	0.825	0.849
1.25	0.420	0.564	0.535	0.443	0.795	0.776	0.801	0.791	0.964	0.924	0.928	0.962
1.50	0.513	0.635	0.609	0.527	0.898	0.871	0.886	0.898	0.995	0.976	0.972	0.993
1.75	0.604	0.682	0.679	0.604	0.958	0.926	0.940	0.955	1.000	0.993	0.988	0.999
2.00	0.664	0.723	0.723	0.667	0.981	0.957	0.963	0.978	1.000	0.999	0.994	1.000
Rook Contiguity, $\ell = \sqrt{n}$												
0.00	0.131	0.127	0.123	0.125	0.108	0.088	0.100	0.110	0.105	0.084	0.094	0.108
0.25	0.137	0.161	0.150	0.139	0.135	0.121	0.133	0.133	0.140	0.133	0.134	0.146
0.50	0.181	0.266	0.226	0.187	0.231	0.257	0.254	0.225	0.297	0.291	0.308	0.295
0.75	0.253	0.398	0.334	0.265	0.401	0.434	0.459	0.398	0.570	0.551	0.586	0.565
1.00	0.346	0.487	0.438	0.340	0.609	0.621	0.653	0.611	0.832	0.795	0.814	0.830
1.25	0.441	0.568	0.538	0.444	0.791	0.764	0.795	0.777	0.962	0.922	0.926	0.956
1.50	0.516	0.623	0.618	0.537	0.896	0.865	0.881	0.892	0.992	0.973	0.968	0.990
1.75	0.610	0.690	0.676	0.608	0.954	0.921	0.927	0.952	0.999	0.994	0.986	0.999
2.00	0.665	0.725	0.719	0.670	0.983	0.954	0.958	0.979	1.000	0.998	0.992	1.000
Queen Contiguity, $\ell = 5$												
0.00	0.125	0.125	0.126	0.121	0.105	0.097	0.100	0.110	0.107	0.098	0.100	0.107
0.25	0.126	0.158	0.143	0.135	0.125	0.121	0.125	0.124	0.138	0.124	0.128	0.140
0.50	0.162	0.232	0.193	0.167	0.201	0.213	0.212	0.199	0.255	0.244	0.255	0.246
0.75	0.202	0.311	0.268	0.210	0.317	0.345	0.356	0.331	0.460	0.439	0.470	0.452
1.00	0.273	0.400	0.350	0.278	0.479	0.505	0.528	0.486	0.689	0.650	0.688	0.699
1.25	0.330	0.467	0.424	0.351	0.633	0.633	0.667	0.635	0.863	0.815	0.832	0.855
1.50	0.401	0.522	0.490	0.412	0.763	0.742	0.777	0.761	0.951	0.910	0.912	0.949
1.75	0.457	0.577	0.548	0.478	0.852	0.829	0.852	0.847	0.986	0.960	0.956	0.984
2.00	0.521	0.613	0.613	0.533	0.914	0.880	0.891	0.911	0.996	0.983	0.977	0.995
Queen Contiguity, $\ell = \sqrt{n}$												
0.00	0.121	0.126	0.120	0.125	0.113	0.095	0.100	0.105	0.113	0.090	0.103	0.107
0.25	0.132	0.152	0.141	0.137	0.134	0.123	0.134	0.127	0.139	0.120	0.126	0.128
0.50	0.166	0.234	0.209	0.166	0.201	0.219	0.213	0.191	0.249	0.224	0.243	0.239
0.75	0.208	0.318	0.283	0.214	0.305	0.343	0.352	0.311	0.432	0.407	0.436	0.427
1.00	0.273	0.411	0.357	0.282	0.474	0.499	0.510	0.465	0.665	0.618	0.652	0.657
1.25	0.342	0.473	0.447	0.350	0.606	0.621	0.645	0.607	0.839	0.788	0.808	0.835
1.50	0.414	0.535	0.512	0.422	0.743	0.731	0.752	0.740	0.938	0.892	0.900	0.932
1.75	0.474	0.590	0.560	0.496	0.838	0.808	0.833	0.834	0.978	0.949	0.948	0.976
2.00	0.531	0.623	0.609	0.552	0.900	0.869	0.884	0.895	0.994	0.977	0.971	0.990

\*dgp1 = normal, dgp2=normal mixture ( $\tau = 10, p = 0.05$ ), dgp3=lognormal, dgp4=chi-squared (df=3).

**Table 5b.** Empirical Power of the Proposed Test, Group Interaction

$\sigma_v$	$n = 25$				$n = 100$				$n = 225$			
	dgp1	dgp2	dgp3	dgp4	dgp1	dgp2	dgp3	dgp4	dgp1	dgp2	dgp3	dgp4
	Group Size = {2 3 5 7 8} for Panel 1;								Group Size = 5 for Panel 2			
0.00	0.138	0.123	0.128	0.140	0.116	0.116	0.113	0.114	0.103	0.116	0.115	0.113
0.25	0.159	0.173	0.163	0.155	0.148	0.137	0.137	0.148	0.165	0.143	0.145	0.157
0.50	0.209	0.306	0.250	0.216	0.271	0.227	0.246	0.250	0.387	0.217	0.265	0.332
0.75	0.305	0.435	0.371	0.300	0.508	0.377	0.442	0.455	0.738	0.400	0.504	0.653
1.00	0.420	0.534	0.500	0.424	0.750	0.539	0.625	0.694	0.950	0.631	0.728	0.902
1.25	0.529	0.617	0.603	0.532	0.902	0.691	0.778	0.864	0.994	0.832	0.864	0.983
1.50	0.641	0.674	0.685	0.637	0.967	0.808	0.863	0.944	1.000	0.939	0.932	0.998
1.75	0.713	0.728	0.742	0.717	0.990	0.891	0.914	0.979	1.000	0.983	0.964	1.000
2.00	0.780	0.776	0.788	0.777	0.997	0.939	0.941	0.992	1.000	0.996	0.980	1.000
0.00	0.127	0.096	0.100	0.115	0.115	0.078	0.089	0.111	0.106	0.075	0.094	0.110
0.25	0.138	0.146	0.133	0.141	0.146	0.130	0.141	0.140	0.163	0.138	0.152	0.158
0.50	0.193	0.269	0.243	0.196	0.268	0.317	0.315	0.270	0.365	0.409	0.398	0.366
0.75	0.261	0.404	0.353	0.275	0.475	0.564	0.557	0.487	0.686	0.734	0.723	0.691
1.00	0.355	0.517	0.459	0.368	0.699	0.736	0.750	0.700	0.920	0.902	0.907	0.921
1.25	0.453	0.589	0.562	0.470	0.857	0.857	0.868	0.858	0.988	0.969	0.970	0.983
1.50	0.533	0.651	0.632	0.546	0.937	0.923	0.926	0.937	0.998	0.993	0.990	0.998
1.75	0.610	0.696	0.688	0.631	0.975	0.959	0.961	0.974	1.000	0.999	0.996	0.999
2.00	0.674	0.745	0.734	0.679	0.990	0.980	0.977	0.987	1.000	0.999	0.998	1.000
	Group sizes $\sim U(.5n^0, 1.5n^0)^*$ , $\delta = .25, .5$ and $.75$ , respectively, for Panels 3, 4 and 5 below											
0.00	0.126	0.195	0.182	0.147	0.111	0.162	0.155	0.122	0.112	0.120	0.121	0.111
0.25	0.152	0.231	0.206	0.170	0.147	0.187	0.173	0.152	0.159	0.145	0.140	0.159
0.50	0.203	0.331	0.286	0.213	0.285	0.267	0.284	0.249	0.394	0.234	0.280	0.340
0.75	0.268	0.428	0.380	0.285	0.522	0.402	0.461	0.469	0.749	0.444	0.533	0.666
1.00	0.353	0.516	0.463	0.390	0.762	0.548	0.645	0.695	0.948	0.683	0.758	0.909
1.25	0.458	0.572	0.540	0.468	0.913	0.687	0.778	0.868	0.995	0.861	0.881	0.988
1.50	0.542	0.622	0.604	0.542	0.972	0.807	0.861	0.948	1.000	0.953	0.944	0.999
1.75	0.610	0.655	0.661	0.613	0.991	0.881	0.913	0.984	1.000	0.988	0.965	1.000
2.00	0.669	0.691	0.708	0.671	0.998	0.934	0.942	0.993	1.000	0.996	0.980	1.000
0.00	0.135	0.117	0.115	0.123	0.117	0.095	0.101	0.105	0.112	0.092	0.103	0.108
0.25	0.145	0.166	0.146	0.145	0.138	0.134	0.136	0.135	0.142	0.139	0.140	0.143
0.50	0.198	0.295	0.246	0.202	0.236	0.267	0.258	0.236	0.274	0.286	0.281	0.269
0.75	0.278	0.430	0.382	0.294	0.386	0.437	0.441	0.388	0.479	0.512	0.518	0.484
1.00	0.390	0.536	0.497	0.398	0.578	0.609	0.617	0.578	0.714	0.712	0.729	0.703
1.25	0.495	0.623	0.598	0.512	0.734	0.728	0.756	0.742	0.863	0.851	0.860	0.862
1.50	0.579	0.683	0.676	0.594	0.845	0.824	0.846	0.849	0.944	0.928	0.935	0.943
1.75	0.664	0.724	0.732	0.668	0.922	0.890	0.902	0.914	0.979	0.966	0.964	0.978
2.00	0.722	0.770	0.771	0.729	0.956	0.928	0.937	0.953	0.992	0.983	0.984	0.993
0.00	0.111	0.096	0.100	0.107	0.108	0.090	0.097	0.107	0.113	0.097	0.094	0.102
0.25	0.127	0.130	0.126	0.124	0.115	0.114	0.113	0.127	0.123	0.118	0.124	0.123
0.50	0.148	0.198	0.175	0.154	0.162	0.186	0.178	0.171	0.176	0.192	0.186	0.181
0.75	0.185	0.270	0.251	0.208	0.223	0.270	0.261	0.235	0.272	0.290	0.286	0.271
1.00	0.242	0.353	0.314	0.263	0.315	0.355	0.356	0.311	0.384	0.397	0.409	0.383
1.25	0.297	0.414	0.375	0.310	0.400	0.443	0.441	0.403	0.503	0.504	0.519	0.488
1.50	0.348	0.458	0.424	0.370	0.480	0.529	0.524	0.479	0.588	0.605	0.608	0.598
1.75	0.401	0.490	0.472	0.416	0.542	0.598	0.588	0.548	0.671	0.683	0.694	0.671
2.00	0.454	0.540	0.518	0.469	0.614	0.646	0.651	0.619	0.743	0.745	0.764	0.749

\*dgp1 = normal, dgp2=normal mixture ( $\tau = 10, p = 0.05$ ), dgp3=lognormal, dgp4=chi-squared (df=3).