Supplementary Material for "Sparse principal component regression via singular value decomposition approach"

by Shuichi Kawano

Additional tables for TPR, TNR, and MCC in the Monte Carlo simulations

Table S.1: Mean (standard deviation) values of TPR, TNR, and MCC for Case 2. The bold values correspond to the largest means.

σ	n	k		SPCRsvd-LADMM	SPCRsvd-ADMM	SPCR	SPLS
1	50	1	TPR	0.990	0.965	**1**	0.870
				(0.100)	(0.128)	(0)	(0.220)
			TNR	0.311	0.502	0.011	**0.937**
				(0.199)	(0.265)	(0.053)	(0.151)
			MCC	0.271	0.411	0.011	**0.827**
				(0.147)	(0.205)	(0.052)	(0.198)
		5	TPR	0.995	**1**	0.990	**1**
				(0.050)	(0)	(0.100)	(0)
			TNR	0.2612	0.430	0.553	**0.946**
				(0.204)	(0.205)	(0.258)	(0.116)
			MCC	0.238	0.370	0.466	**0.919**
				(0.154)	(0.156)	(0.222)	(0.160)
	200	1	TPR	**1**	0.955	**1**	0.900
				(0)	(0.143)	(0)	(0.201)
			TNR	0.472	0.708	0.007	**0.968**
				(0.247)	(0.302)	(0.029)	(0.078)
			MCC	0.393	0.608	0.010	**0.881**
				(0.195)	(0.284)	(0.039)	(0.160)
		5	TPR	**1**	**1**	**1**	**1**
				(0)	(0)	(0)	(0)
			TNR	0.400	0.615	0.595	**0.901**
				(0.269)	(0.235)	(0.294)	(0.173)
			MCC	0.348	0.521	0.516	**0.863**
				(0.213)	(0.218)	(0.260)	(0.210)
2	50	1	TPR	0.985	0.940	**1**	0.860
				(0.111)	(0.178)	(0)	(0.225)
			TNR	0.181	0.381	0.006	**0.945**
				(0.176)	(0.286)	(0.044)	(0.139)
			MCC	0.175	0.301	0.005	**0.831**
				(0.125)	(0.230)	(0.040)	(0.195)
		5	TPR	0.990	**1**	0.990	**1**
				(0.050)	(0)	(0.100)	(0)
			TNR	0.160	0.258	0.433	**0.943**
				(0.168)	(0.173)	(0.258)	(0.144)
			MCC	0.161	0.242	0.368	**0.919**
				(0.136)	(0.134)	(0.207)	(0.176)
	200	1	TPR	**1**	0.870	**1**	0.890
				(0)	(0.220)	(0)	(0.208)
			TNR	0.261	0.598	0.003	**0.968**
				(0.178)	(0.316)	(0.021)	(0.074)
			MCC	0.242	0.444	0.005	**0.874**
				(0.140)	(0.234)	(0.028)	(0.161)
		5	TPR	**1**	**1**	**1**	**1**
				(0)	(0)	(0)	(0)
			TNR	0.211	0.416	0.532	**0.907**
				(0.164)	(0.219)	(0.245)	(0.157)
			MCC	0.204	0.359	0.452	**0.867**
				(0.132)	(0.169)	(0.196)	(0.201)

Table S.2: Mean (standard deviation) values of TPR, TNR, and MCC for Case 3. The bold values correspond to the largest means.

σ	n	k		SPCRsvd-LADMM	SPCRsvd-ADMM	SPCR	SPLS
1	50	1	TPR	**1**	**1**	0.990	0.580
				(0)	(0)	(0.100)	(0.297)
			TNR	0.173	0.384	0.182	**0.707**
				(0.112)	(0.204)	(0.151)	(0.308)
			MCC	0.229	**0.391**	0.220	0.334
				(0.104)	(0.172)	(0.126)	(0.211)
		5	TPR	**1**	**1**	**1**	0.985
				(0)	(0)	(0)	(0.053)
			TNR	0.185	0.421	0.20	**0.71**
				(0.144)	(0.247)	(0.134)	(0.186)
			MCC	0.228	0.424	0.243	**0.657**
				(0.138)	(0.214)	(0.129)	(0.179)
	200	1	TPR	**1**	**1**	**1**	0.826
				(0)	(0)	(0)	(0.190)
			TNR	0.246	0.607	0.200	**0.839**
				(0.119)	(0.270)	(0.121)	(0.186)
			MCC	0.286	0.578	0.252	**0.672**
				(0.111)	(0.249)	(0.107)	(0.208)
		5	TPR	**1**	**1**	**1**	0.998
				(0)	(0)	(0)	(0.016)
			TNR	0.259	0.521	0.195	**0.890**
				(0.193)	(0.278)	(0.133)	(0.111)
			MCC	0.281	0.512	0.241	**0.856**
				(0.180)	(0.251)	(0.125)	(0.128)
2	50	1	TPR	**1**	**1**	0.990	0.518
				(0)	(0)	(0.100)	(0.307)
			TNR	0.083	0.227	0.113	**0.738**
				(0.079)	(0.169)	(0.130)	(0.292)
			MCC	0.132	0.260	0.152	**0.307**
				(0.103)	(0.158)	(0.114)	(0.242)
		5	TPR	**1**	**1**	**1**	0.981
				(0)	(0)	(0)	(0.057)
			TNR	0.111	0.276	0.117	**0.615**
				(0.116)	(0.201)	(0.095)	(0.227)
			MCC	0.152	0.304	0.170	**0.568**
				(0.131)	(0.179)	(0.110)	(0.198)
	200	1	TPR	**0.990**	**0.990**	0.980	0.785
				(0.100)	(0.100)	(0.140)	(0.209)
			TNR	0.134	0.445	0.175	**0.847**
				(0.135)	(0.255)	(0.158)	(0.186)
			MCC	0.176	0.426	0.209	**0.650**
				(0.114)	(0.225)	(0.109)	(0.197)
		5	TPR	0.990	**1**	0.980	0.998
				(0.100)	(0)	(0.140)	(0.016)
			TNR	0.137	0.397	0.181	**0.870**
				(0.142)	(0.242)	(0.157)	(0.145)
			MCC	0.171	0.408	0.216	**0.836**
				(0.128)	(0.202)	(0.107)	(0.152)

Table S.3: Mean (standard deviation) values of TPR, TNR, and MCC for Case 4. The bold values correspond to the largest means.

σ	n	k		SPCRsvd-LADMM	SPCRsvd-ADMM	SPCR	SPLS
1	50	1	TPR	**1**	**1**	**1**	0.500
				(0)	(0)	(0)	(0)
			TNR	0.114	0.390	0.121	**0.998**
				(0.082)	(0.240)	(0.089)	(0.007)
			MCC	0.197	0.439	0.204	**0.610**
				(0.111)	(0.216)	(0.114)	(0.013)
		5	TPR	**1**	**1**	**1**	0.975
				(0)	(0)	(0)	(0.074)
			TNR	0.078	0.253	0.147	**0.723**
				(0.084)	(0.205)	(0.090)	(0.198)
			MCC	0.145	0.323	0.237	**0.702**
				(0.119)	(0.191)	(0.104)	(0.183)
	200	1	TPR	**1**	**1**	**1**	0.505
				(0)	(0)	(0)	(0.029)
			TNR	0.200	0.793	0.183	**0.990**
				(0.099)	(0.254)	(0.104)	(0.043)
			MCC	0.288	0.797	0.273	**0.603**
				(0.106)	(0.233)	(0.108)	(0.044)
		5	TPR	**1**	**1**	**1**	**1**
				(0)	(0)	(0)	(0)
			TNR	0.156	0.449	0.190	**0.909**
				(0.120)	(0.255)	(0.105)	(0.090)
			MCC	0.229	0.486	0.280	**0.900**
				(0.145)	(0.228)	(0.106)	(0.091)
2	50	1	TPR	**1**	0.999	0.999	0.499
				(0)	(0.008)	(0.008)	(0.014)
			TNR	0.048	0.220	0.065	**0.995**
				(0.055)	(0.200)	(0.060)	(0.025)
			MCC	0.102	0.270	0.132	**0.603**
				(0.102)	(0.211)	(0.102)	(0.039)
		5	TPR	**1**	0.983	0.999	0.931
				(0)	(0.111)	(0.008)	(0.122)
			TNR	0.047	0.243	0.076	**0.724**
				(0.061)	(0.211)	(0.063)	(0.203)
			MCC	0.098	0.307	0.148	**0.662**
				(0.105)	(0.168)	(0.103)	(0.183)
	200	1	TPR	**1**	**1**	**1**	0.505
				(0)	(0)	(0)	(0.028)
			TNR	0.089	0.697	0.100	**0.990**
				(0.076)	(0.258)	(0.076)	(0.044)
			MCC	0.165	0.704	0.182	**0.602**
				(0.111)	(0.229)	(0.106)	(0.043)
		5	TPR	**1**	0.998	**1**	**1**
				(0)	(0.016)	(0)	(0)
			TNR	0.078	0.393	0.110	**0.895**
				(0.077)	(0.215)	(0.078)	(0.113)
			MCC	0.143	0.450	0.195	**0.887**
				(0.119)	(0.175)	(0.105)	(0.112)

Table S.4: Mean (standard deviation) values of TPR, TNR, and MCC for Case 5. The bold values correspond to the largest means.

σ	n	k		SPCRsvd-LADMM	SPCRsvd-ADMM	SPCR	SPLS
1	50	1	TPR	**1**	**1**	**1**	0.343
				(0)	(0)	(0)	(0.296)
			TNR	0.157	0.333	0.187	**0.787**
				(0.089)	(0.157)	(0.107)	(0.314)
			MCC	0.232	**0.370**	0.253	0.195
				(0.086)	(0.132)	(0.105)	(0.210)
		5	TPR	**1**	**1**	**1**	0.918
				(0)	(0)	(0)	(0.105)
			TNR	0.142	0.272	0.194	**0.652**
				(0.114)	(0.194)	(0.113)	(0.204)
			MCC	0.204	0.309	0.258	**0.558**
				(0.122)	(0.181)	(0.109)	(0.178)
	200	1	TPR	**1**	0.990	0.990	0.635
				(0)	(0.100)	(0.100)	(0.258)
			TNR	0.227	0.670	0.209	**0.751**
				(0.097)	(0.223)	(0.135)	(0.286)
			MCC	0.291	**0.640**	0.263	0.446
				(0.090)	(0.211)	(0.107)	(0.181)
		5	TPR	**1**	0.998	**1**	**1**
				(0)	(0.020)	(0)	(0)
			TNR	0.214	0.421	0.213	**0.848**
				(0.151)	(0.241)	(0.117)	(0.122)
			MCC	0.267	0.430	0.275	**0.818**
				(0.143)	(0.216)	(0.109)	(0.127)
2	50	1	TPR	**0.999**	**0.999**	0.988	0.338
				(0.010)	(0.010)	(0.100)	(0.299)
			TNR	0.079	0.229	0.128	**0.792**
				(0.065)	(0.169)	(0.123)	(0.297)
			MCC	0.142	**0.276**	0.182	0.198
				(0.092)	(0.161)	(0.104)	(0.195)
		5	TPR	**1**	0.998	0.998	0.879
				(0)	(0.014)	(0.014)	(0.171)
			TNR	0.079	0.195	0.126	**0.630**
				(0.081)	(0.131)	(0.083)	(0.236)
			MCC	0.135	0.253	0.193	**0.504**
				(0.107)	(0.125)	(0.097)	(0.202)
	200	1	TPR	**1**	**1**	0.990	0.569
				(0)	(0)	(0.100)	(0.268)
			TNR	0.119	0.555	0.170	**0.797**
				(0.072)	(0.192)	(0.122)	(0.279)
			MCC	0.193	**0.548**	0.230	0.442
				(0.083)	(0.160)	(0.095)	(0.183)
		5	TPR	**1**	0.999	**1**	0.999
				(0)	(0.010)	(0)	(0.010)
			TNR	0.104	0.338	0.169	**0.809**
				(0.093)	(0.196)	(0.091)	(0.155)
			MCC	0.164	0.376	0.239	**0.782**
				(0.113)	(0.162)	(0.094)	(0.160)

Table S.5: Mean (standard deviation) values of TPR, TNR, and MCC for Case 6. The bold values correspond to the largest means.

σ	n	k		SPCRsvd-LADMM	SPCRsvd-ADMM	SPCR	SPLS
1	50	1	TPR	0.995	0.995	**1**	0.875
				(0.050)	(0.050)	(0)	(0.217)
			TNR	0.567	0.762	0.360	**0.949**
				(0.120)	(0.083)	(0.0833)	(0.122)
			MCC	0.167	0.277	0.106	**0.770**
				(0.063)	(0.147)	(0.021)	(0.276)
		2	TPR	0.990	**1**	**1**	1
				(0.100)	(0)	(0)	(0)
			TNR	0.569	0.729	0.795	**1**
				(0.097)	(0.169)	(0.153)	(0)
			MCC	0.160	0.299	0.308	**1**
				(0.031)	(0.219)	(0.100)	(0)
	200	1	TPR	**1**	**1**	**1**	0.900
				(0)	(0)	(0)	(0.201)
			TNR	0.652	0.693	0.025	**0.978**
				(0.060)	(0.117)	(0.016)	(0.054)
			MCC	0.192	0.273	0.021	**0.829**
				(0.023)	(0.232)	(0.009)	(0.232)
		2	TPR	**1**	0.985	**1**	**1**
				(0)	(0.085)	(0)	(0)
			TNR	0.657	0.730	0.885	**1**
				(0.065)	(0.080)	(0.075)	(0)
			MCC	0.194	0.238	0.418	**1**
				(0.025)	(0.101)	(0.144)	(0)
2	50	1	TPR	0.995	0.995	**1**	0.875
				(0.050)	(0.050)	(0)	(0.217)
			TNR	0.494	0.647	0.280	**0.951**
				(0.103)	(0.055)	(0.081)	(0.123)
			MCC	0.144	0.190	0.088	**0.775**
				(0.061)	(0.036)	(0.019)	(0.266)
		2	TPR	0.995	0.995	**1**	**1**
				(0.050)	(0.050)	(0)	(0)
			TNR	0.466	0.555	0.694	**1**
				(0.107)	(0.135)	(0.164)	(0)
			MCC	0.137	0.161	0.225	**1**
				(0.061)	(0.044)	(0.064)	(0)
	200	1	TPR	**1**	0.990	**1**	0.890
				(0)	(0.070)	(0)	(0.208)
			TNR	0.386	0.591	0.012	**0.975**
				(0.056)	(0.142)	(0.011)	(0.058)
			MCC	0.111	0.184	0.013	**0.807**
				(0.013)	(0.089)	(0.009)	(0.242)
		2	TPR	**1**	**1**	**1**	**1**
				(0)	(0)	(0)	(0)
			TNR	0.390	0.725	0.845	**1**
				(0.048)	(0.114)	(0.068)	(0)
			MCC	0.112	0.240	0.335	**1**
				(0.011)	(0.069)	(0.084)	(0)