SUPPLEMENTAL MATERIALS

Double shrinkage estimators for large sparse covariance matrices

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(Received 00 Month 201X; final version received 00 Month 201X)

Appendix C. Figures for Exponential Data

Figure C1. Relative losses (estimated loss of DS_γ divided by estimated loss of GT_γ) under different covariance models, different dimensions, and different γ 's where datasets were generated from normal distribution. Each losses was estimated by 100 independent replicates.

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Figure C2. Estimated loss of DS_γ , under different covariance models, different dimensions and different γ 's where datasets were generated from normal distribution. Each losses was estimated by 100 independent replicates.

Figure C3. Estimated loss under different estimators, FS, DS₀, and XMZ, different covariance models, and different dimensions where datasets were generated from exponential distribution. Each losses was estimated by 100 independent replicates.

Appendix D. Supplemental Tables

Table D1. Simulation Result for Normal Data, $p=50$

	SC	FS	GT_{∞}	GT_1	GT_0	DS_{∞}	DS_1	DS_0	XMZ
ZR									
ASL	0.64	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
TPR	1.00	1.00	0.04	0.17	0.26	0.06	0.18	0.30	0.26
FPR	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MCN	50.98	2.39	2.36	2.36	2.35	2.37	2.36	2.35	2.35
PDR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MA									
ASL	0.64	0.31	0.41	0.28	0.26	0.27	0.25	0.25	0.26
TPR	1.00	1.00	0.30	0.75	0.90	0.57	0.83	0.93	0.90
FPR	1.00	1.00	0.00	0.01	0.03	0.00	0.02	0.05	0.03
MCN	–	5.23	21.06	5.91	4.25	10.68	5.47	4.09	4.25
PDR	1.00	1.00	0.63	1.00	1.00	1.00	1.00	1.00	1.00
AR†									
ASL	0.65	0.35	0.57	0.40	0.36	0.35	0.34	0.34	0.36
TPR	1.00	1.00	0.02	0.08	0.15	0.16	0.15	0.20	0.15
MCN	133.12	6.95	27.04	6.81	4.91	10.42	6.43	4.93	4.91
PDR	1.00	1.00	0.65	1.00	1.00	1.00	1.00	1.00	1.00
BL									
ASL	0.70	0.71	0.73	0.75	0.79	0.84	0.83	0.83	0.79
TPR	1.00	1.00	0.89	0.90	0.94	0.91	0.95	0.98	0.94
FPR	1.00	1.00	0.45	0.37	0.59	0.51	0.66	0.86	0.59
MCN	–	153.11	80.71	157.68	455.21	102.48	122.86	95.74	455.21
PDR	1.00	1.00	0.13	0.06	0.96	0.59	0.86	1.00	1.00
CS†									
ASL	0.73	0.70	0.73	0.74	0.78	0.80	0.80	0.82	0.78
TPR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MCN	484.25	117.62	484.25	483.24	308.80	75.79	75.78	75.27	308.80
PDR	1.00	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00

ASL: average sample loss; MCN: median condition number.

† FPR is irrelevant under this model.

– The median condition number is greater than 1000.

Table D2. Simulation Result for Normal Data, $p=50$

	ASC	FS	GT_{∞}	GT_1	GT_0	DS_{∞}	DS_1	DS_0	XMZ
ZR									
ASL	1.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
TPR	1.00	1.00	0.01	0.09	0.14	0.01	0.09	0.15	0.14
FPR	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MCN	–	2.52	2.48	2.48	2.48	2.48	2.48	2.48	2.48
PDR	0.44	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MA									
ASL	1.04	0.37	0.49	0.34	0.31	0.34	0.31	0.30	0.31
TPR	1.00	1.00	0.12	0.62	0.82	0.41	0.71	0.85	0.82
FPR	1.00	1.00	0.00	0.00	0.02	0.00	0.01	0.02	0.02
MCN	–	4.80	12.15	4.71	3.73	8.57	4.61	3.57	3.73
PDR	0.55	1.00	0.92	1.00	1.00	1.00	1.00	1.00	1.00
AR†									
ASL	1.06	0.44	0.66	0.47	0.43	0.43	0.42	0.41	0.43
TPR	1.00	1.00	0.00	0.04	0.07	0.08	0.06	0.09	0.07
MCN	–	6.38	9.60	5.83	4.35	9.71	5.47	4.26	4.35
PDR	0.45	1.00	0.80	1.00	1.00	1.00	1.00	1.00	1.00
BL									
ASL	1.42	1.31	1.47	1.48	1.45	1.46	1.45	1.45	1.45
TPR	1.00	1.00	0.90	0.91	0.95	0.92	0.96	0.98	0.95
FPR	1.00	1.00	0.45	0.45	0.62	0.52	0.70	0.90	0.62
MCN	–	301.24	91.31	134.64	989.35	129.79	268.68	175.53	–
PDR	0.49	1.00	0.00	0.02	0.34	0.49	0.71	0.97	1.00
CS†									
ASL	1.23	1.14	1.23	1.22	1.25	1.26	1.26	1.29	1.25
TPR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MCN	–	288.42	–	–	–	151.41	151.48	151.47	–
PDR	0.46	1.00	0.45	0.27	1.00	1.00	1.00	1.00	1.00

ASL: average sample loss; MCN: median condition number.

† FPR is irrelevant under this model.

– The median condition number is greater than 1000.

Table D3. Simulation Result for Normal Data, $p=100$

	SC	FS	GT_{∞}	GT_1	GT_0	DS_{∞}	DS_1	DS_0	XMZ
ZR									
ASL	2.08	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
TPR	1.00	1.00	0.01	0.04	0.09	0.01	0.04	0.10	0.09
FPR	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MCN	–	2.79	2.76	2.76	2.76	2.76	2.76	2.76	2.76
PDR	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MA									
ASL	2.06	0.44	0.53	0.41	0.37	0.45	0.39	0.37	0.37
TPR	1.00	1.00	0.02	0.44	0.68	0.19	0.53	0.72	0.68
FPR	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
MCN	–	4.82	5.31	4.37	3.72	8.64	4.19	3.62	3.72
PDR	0.00	1.00	0.94	1.00	1.00	1.00	1.00	1.00	1.00
AR†									
ASL	2.08	0.54	0.70	0.56	0.51	0.57	0.52	0.50	0.51
TPR	1.00	1.00	0.00	0.01	0.02	0.02	0.02	0.03	0.02
MCN	–	5.99	5.19	4.89	3.99	9.12	4.57	3.89	3.99
PDR	0.00	1.00	0.94	1.00	1.00	1.00	1.00	1.00	1.00
BL									
ASL	2.56	2.34	2.62	2.56	2.54	2.64	2.61	2.61	2.54
TPR	1.00	1.00	0.90	0.91	0.95	0.92	0.96	0.99	0.95
FPR	1.00	1.00	0.46	0.44	0.62	0.51	0.68	0.88	0.62
MCN	–	698.68	84.98	119.54	452.44	144.07	454.26	434.18	–
PDR	0.00	1.00	0.00	0.00	0.06	0.43	0.54	0.83	1.00
CS†									
ASL	2.44	2.37	2.44	2.44	2.58	2.85	2.86	2.93	2.59
TPR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MCN	–	676.95	–	–	–	346.56	347.31	343.26	–
PDR	0.00	1.00	0.00	0.00	0.39	0.98	0.98	0.99	1.00

ASL: average sample loss; MCN: median condition number.

† FPR is irrelevant under this model.

– The median condition number is greater than 1000.

Table D4. Simulation Result for Normal Data, $p=150$

	SC	FS	GT_{∞}	GT_1	GT_0	DS_{∞}	DS_1	DS_0	XMZ
ZR									
ASL	3.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04
TPR	1.00	1.00	0.00	0.00	0.02	0.00	0.00	0.02	0.02
FPR	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MCN	–	2.98	2.95	2.95	2.95	2.95	2.95	2.95	2.95
PDR	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MA									
ASL	3.10	0.47	0.54	0.44	0.41	0.50	0.43	0.40	0.41
TPR	1.00	1.00	0.01	0.35	0.58	0.09	0.42	0.62	0.58
FPR	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MCN	–	4.62	3.80	4.13	3.74	7.26	3.96	3.71	3.74
PDR	0.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
AR†									
ASL	3.07	0.59	0.70	0.60	0.56	0.66	0.58	0.55	0.56
TPR	1.00	1.00	0.00	0.01	0.01	0.02	0.01	0.01	0.01
MCN	–	5.49	3.51	4.38	4.02	8.43	4.32	3.98	4.02
PDR	0.00	1.00	0.97	1.00	1.00	0.99	1.00	1.00	1.00
BL									
ASL	3.70	3.56	3.87	3.90	4.00	4.24	4.20	4.21	4.00
TPR	1.00	1.00	0.88	0.90	0.94	0.91	0.95	0.98	0.94
FPR	1.00	1.00	0.43	0.41	0.60	0.50	0.66	0.88	0.61
MCN	–	–	68.21	107.16	322.96	167.79	353.32	660.83	–
PDR	0.00	1.00	0.00	0.00	0.00	0.40	0.44	0.77	1.00
CS†									
ASL	4.07	4.10	4.07	4.08	4.35	4.65	4.66	4.79	4.36
TPR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MCN	–	676.95	–	–	–	546.94	548.15	543.13	–
PDR	0.00	1.00	0.00	0.00	0.01	1.00	1.00	1.00	1.00

ASL: average sample loss; MCN: median condition number.

† FPR is irrelevant under this model.

– The median condition number is greater than 1000.

Table D5. Simulation Result for Normal Data, $p=200$

	SC	FS	GT_{∞}	GT_1	GT_0	DS_{∞}	DS_1	DS_0	XMZ
ZR									
ASL	4.10	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04
TPR	1.00	1.00	0.00	0.02	0.03	0.00	0.02	0.04	0.03
FPR	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MCN	–	3.03	2.98	2.98	2.98	2.98	2.98	2.98	2.98
PDR	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MA									
ASL	4.08	0.49	0.54	0.46	0.44	0.53	0.45	0.43	0.44
TPR	1.00	1.00	0.01	0.28	0.50	0.03	0.34	0.54	0.50
FPR	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MCN	–	4.60	4.27	4.22	3.92	5.48	4.16	3.87	3.92
PDR	0.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
AR†									
ASL	4.08	0.61	0.70	0.63	0.59	0.69	0.61	0.58	0.59
TPR	1.00	1.00	0.00	0.00	0.01	0.02	0.00	0.01	0.01
MCN	–	5.56	3.63	4.38	4.01	6.25	4.28	3.99	4.01
PDR	0.00	1.00	0.93	1.00	1.00	1.00	1.00	1.00	1.00
BL									
ASL	5.21	4.75	5.44	5.39	5.24	5.38	5.35	5.35	5.23
TPR	1.00	1.00	0.90	0.91	0.95	0.92	0.96	0.98	0.95
FPR	1.00	1.00	0.47	0.44	0.62	0.52	0.65	0.86	0.63
MCN	–	–	79.48	127.89	350.42	309.87	467.18	889.14	–
PDR	0.00	1.00	0.00	0.00	0.01	0.45	0.40	0.71	1.00
CS†									
ASL	4.79	4.25	4.79	4.80	4.93	5.03	5.04	5.16	4.93
TPR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MCN	–	–	–	–	–	752.20	754.16	757.71	–
PDR	0.00	1.00	0.00	0.00	0.00	0.97	0.97	0.95	1.00

ASL: average sample loss; MCN: median condition number.

† FPR is irrelevant under this model.

– The median condition number is greater than 1000.

Table D6. Simulation Result for Exponential Data, $p=30$

	SC	FS	GT _∞	GT ₁	GT ₀	DS _∞	DS ₁	DS ₀	XMZ
ZR									
ASL	0.76	0.17	0.18	0.17	0.17	0.17	0.17	0.17	0.17
TPR	1.00	1.00	0.07	0.08	0.08	0.08	0.08	0.13	0.08
FPR	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MCN	63.19	4.55	4.57	4.43	4.43	4.49	4.43	4.43	4.43
PDR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MA									
ASL	0.86	0.40	0.51	0.39	0.34	0.37	0.34	0.32	0.34
TPR	1.00	1.00	0.09	0.48	0.75	0.54	0.68	0.83	0.75
FPR	1.00	1.00	0.00	0.01	0.03	0.09	0.04	0.06	0.03
MCN	–	7.37	4.97	3.92	3.57	7.80	4.17	3.71	3.57
PDR	1.00	1.00	0.89	1.00	1.00	1.00	1.00	1.00	1.00
AR†									
ASL	0.80	0.42	0.66	0.51	0.45	0.43	0.43	0.42	0.45
TPR	1.00	1.00	0.01	0.05	0.12	0.23	0.19	0.20	0.12
MCN	152.54	8.36	2.71	4.83	4.16	8.45	5.29	4.25	4.16
PDR	1.00	1.00	0.87	1.00	1.00	1.00	1.00	1.00	1.00
BL									
ASL	1.56	1.46	1.65	1.87	1.73	1.66	1.65	1.65	1.73
TPR	1.00	1.00	0.85	0.83	0.88	0.89	0.94	0.97	0.88
FPR	1.00	1.00	0.50	0.45	0.56	0.57	0.75	0.88	0.56
MCN	–	160.76	71.51	132.49	277.71	73.72	66.15	57.16	294.84
PDR	1.00	1.00	0.20	0.25	0.85	0.75	0.92	0.99	1.00
CS†									
ASL	1.52	1.47	1.65	1.84	1.81	1.55	1.55	1.58	1.81
TPR	1.00	1.00	0.97	0.94	0.97	1.00	1.00	1.00	0.97
MCN	578.63	122.13	578.63	561.65	205.24	42.12	42.10	41.67	205.24
PDR	1.00	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00

ASL: average sample loss; MCN: median condition number.

† FPR is irrelevant under this model.

– The median condition number is greater than 1000.

Table D7. Simulation Result for Exponential Data, $p=50$

	SC	FS	GT_{∞}	GT_1	GT_0	DS_{∞}	DS_1	DS_0	XMZ
ZR									
ASL	1.20	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
TPR	1.00	1.00	0.09	0.09	0.10	0.11	0.10	0.11	0.10
FPR	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MCN	–	5.52	5.71	5.43	5.43	5.59	5.43	5.43	5.43
PDR	0.42	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MA									
ASL	1.21	0.41	0.53	0.40	0.36	0.40	0.36	0.35	0.36
TPR	1.00	1.00	0.04	0.47	0.72	0.33	0.60	0.77	0.72
FPR	1.00	1.00	0.00	0.00	0.01	0.01	0.01	0.02	0.01
MCN	–	6.25	3.17	4.00	3.56	7.14	4.05	3.51	3.56
PDR	0.51	1.00	0.94	1.00	1.00	1.00	1.00	1.00	1.00
AR†									
ASL	1.25	0.50	0.69	0.55	0.49	0.50	0.49	0.47	0.49
TPR	1.00	1.00	0.00	0.02	0.06	0.15	0.09	0.09	0.06
MCN	–	7.79	3.04	4.31	3.78	7.77	4.50	3.86	3.78
PDR	0.53	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00
BL									
ASL	2.78	2.47	2.87	2.87	2.60	2.41	2.39	2.40	2.59
TPR	1.00	1.00	0.90	0.86	0.90	0.92	0.96	0.98	0.90
FPR	1.00	1.00	0.64	0.55	0.59	0.72	0.82	0.90	0.59
MCN	–	322.97	361.25	158.18	516.09	92.09	121.01	96.76	–
PDR	0.46	1.00	0.04	0.07	0.53	0.74	0.89	0.99	1.00
CS†									
ASL	2.89	2.63	3.17	3.57	3.46	2.54	2.54	2.59	3.46
TPR	1.00	1.00	0.97	0.93	0.95	1.00	1.00	1.00	0.95
MCN	–	–	–	–	–	93.57	94.00	92.80	–
PDR	0.55	1.00	0.51	0.37	0.98	0.98	0.97	1.00	1.00

ASL: average sample loss; MCN: median condition number.

† FPR is irrelevant under this model.

– The median condition number is greater than 1000.

Table D8. Simulation Result for Exponential Data, $p=100$

	SC	FS	GT_{∞}	GT_1	GT_0	DS_{∞}	DS_1	DS_0	XMZ
ZR									
ASL	2.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
TPR	1.00	1.00	0.03	0.03	0.03	0.03	0.03	0.03	0.03
FPR	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MCN	–	6.90	7.27	6.92	6.90	7.08	6.91	6.90	6.90
PDR	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MA									
ASL	2.31	0.47	0.54	0.44	0.40	0.49	0.42	0.39	0.40
TPR	1.00	1.00	0.02	0.35	0.60	0.11	0.44	0.66	0.60
FPR	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
MCN	–	5.90	4.59	4.07	3.60	6.58	4.02	3.58	3.60
PDR	0.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00
AR†									
ASL	2.28	0.58	0.70	0.60	0.55	0.61	0.56	0.54	0.55
TPR	1.00	1.00	0.00	0.01	0.02	0.15	0.03	0.03	0.02
MCN	–	7.03	2.86	3.97	3.65	7.21	4.08	3.64	3.65
PDR	0.00	1.00	0.96	1.00	1.00	1.00	1.00	1.00	1.00
BL									
ASL	5.68	5.23	6.03	6.27	5.63	5.53	5.52	5.52	5.62
TPR	1.00	1.00	0.88	0.84	0.89	0.92	0.96	0.98	0.89
FPR	1.00	1.00	0.59	0.48	0.57	0.67	0.80	0.91	0.57
MCN	–	689.36	412.19	104.02	336.95	147.63	210.55	214.50	–
PDR	0.00	1.00	0.00	0.04	0.18	0.59	0.74	0.94	1.00
CS†									
ASL	4.74	4.56	4.93	6.28	6.00	5.24	5.25	5.35	6.01
TPR	1.00	1.00	0.99	0.93	0.97	1.00	1.00	1.00	0.97
MCN	–	623.15	–	–	–	196.22	196.10	191.72	–
PDR	0.00	1.00	0.01	0.04	0.33	0.96	0.96	0.98	1.00

ASL: average sample loss; MCN: median condition number.

† FPR is irrelevant under this model.

– The median condition number is greater than 1000.

Table D9. Simulation Result for Exponential Data, $p=150$

	SC	FS	GT_{∞}	GT_1	GT_0	DS_{∞}	DS_1	DS_0	XMZ
ZR									
ASL	3.20	0.16	0.16	0.16	0.16	0.17	0.16	0.16	0.16
TPR	1.00	1.00	0.06	0.06	0.06	0.31	0.06	0.06	0.06
FPR	1.00	1.00	0.00	0.00	0.00	0.26	0.00	0.00	0.00
MCN	–	7.46	7.81	7.41	7.41	7.75	7.41	7.41	7.41
PDR	0.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
MA									
ASL	3.28	0.49	0.54	0.47	0.44	0.52	0.45	0.43	0.44
TPR	1.00	1.00	0.01	0.27	0.49	0.05	0.33	0.54	0.49
FPR	1.00	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
MCN	–	5.52	4.19	4.01	3.72	4.89	3.97	3.70	3.72
PDR	0.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
AR†									
ASL	3.28	0.61	0.70	0.63	0.59	0.68	0.61	0.58	0.59
TPR	1.00	1.00	0.00	0.00	0.01	0.06	0.01	0.01	0.01
MCN	–	6.92	3.11	4.10	3.85	4.67	4.08	3.87	3.85
PDR	0.00	1.00	0.96	1.00	1.00	0.99	1.00	1.00	1.00
BL									
ASL	9.68	8.30	10.05	10.94	9.19	7.98	7.96	7.95	9.19
TPR	1.00	1.00	0.89	0.83	0.88	0.93	0.96	0.98	0.88
FPR	1.00	1.00	0.64	0.49	0.55	0.72	0.82	0.91	0.55
MCN	–	–	755.07	119.13	348.39	234.09	323.13	328.55	–
PDR	0.00	1.00	0.00	0.03	0.10	0.61	0.73	0.89	1.00
CS†									
ASL	8.59	8.02	9.50	9.96	9.83	7.73	7.74	7.87	9.85
TPR	1.00	1.00	0.97	0.93	0.95	1.00	1.00	1.00	0.96
MCN	–	968.85	–	–	–	332.65	332.89	329.63	–
PDR	0.00	1.00	0.03	0.03	0.04	0.99	0.99	0.99	1.00

ASL: average sample loss; MCN: median condition number.

† FPR is irrelevant under this model.

– The median condition number is greater than 1000.

Table D10. Simulation Result for Exponential Data, $p=200$

	SC	FS	GT_{∞}	GT_1	GT_0	DS_{∞}	DS_1	DS_0	XMZ
ZR									
ASL	4.19	0.16	0.17	0.16	0.16	0.20	0.16	0.16	0.16
TPR	1.00	1.00	0.10	0.10	0.10	0.91	0.10	0.10	0.10
FPR	1.00	1.00	0.00	0.00	0.00	0.85	0.00	0.00	0.00
MCN	–	8.49	9.42	8.53	8.49	8.99	8.53	8.46	8.49
PDR	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MA									
ASL	4.32	0.64	0.71	0.65	0.61	0.69	0.63	0.60	0.61
TPR	1.00	1.00	0.00	0.23	0.44	0.02	0.28	0.48	0.44
FPR	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MCN	–	5.56	3.53	3.91	3.72	4.71	3.85	3.66	3.72
PDR	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AR†									
ASL	3.28	0.61	0.70	0.63	0.59	0.68	0.61	0.58	0.59
TPR	1.00	1.00	0.00	0.00	0.01	0.07	0.00	0.01	0.01
MCN	–	6.85	3.99	4.18	4.00	4.88	4.20	3.97	4.00
PDR	0.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00
BL									
ASL	12.49	11.68	13.15	14.73	12.74	12.02	11.97	11.96	12.71
TPR	1.00	1.00	0.88	0.83	0.87	0.92	0.95	0.98	0.88
FPR	1.00	1.00	0.61	0.45	0.56	0.70	0.81	0.93	0.56
MCN	–	–	361.23	95.36	267.97	282.41	376.39	506.03	–
PDR	0.00	1.00	0.00	0.01	0.08	0.61	0.59	0.88	1.00
CS†									
ASL	9.91	9.33	10.61	11.92	11.56	10.32	10.33	10.49	11.60
TPR	1.00	1.00	0.98	0.95	0.98	1.00	1.00	1.00	0.98
MCN	–	–	–	–	–	438.86	446.13	445.08	–
PDR	0.00	1.00	0.02	0.01	0.00	0.98	0.98	0.95	1.00

ASL: average sample loss; MCN: median condition number.

† FPR is irrelevant under this model.

– The median condition number is greater than 1000.