

Appendix A1: Simulation Results for Both δ and ε are Normally Distributed, $\lambda = 1$, $\sigma = 1$ and $\beta = 10, 40$

Table A1.1: When $\beta = 10$

	n	$\bar{\lambda}$	$\bar{\hat{\beta}}$	$M\hat{S}E_{\hat{\beta}}$	\bar{R}_P^2	$\hat{S}D_{R_P^2}$	$M\hat{S}E_{R_P^2}$	Length $CI(\bar{R}_P^2)$
$p=1$	10	1.0000	10.0010	1.68E-02	1.0000	6.51E-06	2.15E-10	6.136E-04
	50	1.0000	9.9985	2.15E-03	1.0000	2.12E-06	1.13E-10	2.881E-04
	100	1.0000	9.9993	8.30E-04	1.0000	1.15E-06	6.51E-11	1.922E-04
	250	1.0000	9.9991	3.38E-04	1.0000	7.47E-07	6.92E-11	1.250E-04
	1000	1.0000	9.9989	9.28E-05	1.0000	3.99E-07	7.98E-11	6.187E-05
	4000	1.0000	9.9989	2.32E-05	1.0000	1.96E-07	7.83E-11	3.113E-05
$p=2$	10	1.0000	10.0011	4.64E-03	1.0000	3.01E-06	4.80E-11	7.816E-04
	50	1.0000	9.9989	7.35E-04	1.0000	1.74E-06	7.69E-11	3.776E-04
	100	1.0000	9.9990	4.77E-04	1.0000	1.26E-06	7.94E-11	2.631E-04
	250	1.0000	9.9990	1.97E-04	1.0000	7.99E-07	8.14E-11	1.703E-04
	1000	1.0000	9.9990	4.41E-05	1.0000	3.84E-07	7.19E-11	8.712E-05
	4000	1.0000	9.9989	1.25E-05	1.0000	2.02E-07	8.08E-11	4.316E-05
$p=5$	10	1.0000	9.9988	1.43E-03	1.0000	3.86E-06	8.36E-11	7.033E-04
	50	1.0000	9.9987	3.43E-04	1.0000	1.76E-06	7.80E-11	3.730E-04
	100	1.0000	9.9987	1.76E-04	1.0000	1.35E-06	9.15E-11	2.658E-04
	250	1.0000	9.9989	7.98E-05	1.0000	8.58E-07	9.14E-11	1.695E-04
	1000	1.0000	9.9989	1.88E-05	1.0000	3.94E-07	7.77E-11	8.621E-05
	4000	1.0000	9.9989	5.76E-06	1.0000	1.95E-07	7.63E-11	4.299E-05

Table A1.2: When $\beta = 40$

	n	$\bar{\lambda}$	$\bar{\hat{\beta}}$	$M\hat{S}E_{\hat{\beta}}$	\bar{R}_P^2	$\hat{S}D_{R_P^2}$	$M\hat{S}E_{R_P^2}$	Length $CI(\bar{R}_P^2)$
$p=1$	10	1.0000	40.0031	2.68E-01	1.0000	4.10E-07	8.47E-13	1.721E-04
	50	1.0000	39.9967	3.85E-02	1.0000	1.47E-07	5.48E-13	7.742E-05
	100	1.0000	39.9992	1.41E-02	1.0000	7.75E-08	2.99E-13	5.123E-05
	250	1.0000	39.9975	8.45E-03	1.0000	7.49E-08	6.79E-13	3.353E-05
	1000	1.0000	39.9984	1.59E-03	1.0000	2.72E-08	3.71E-13	1.670E-05
	4000	1.0000	39.9989	4.15E-04	1.0000	1.47E-08	4.36E-13	8.427E-06
$p=2$	10	1.0000	40.0043	2.94E-01	1.0000	6.91E-07	2.58E-12	2.150E-04
	50	1.0000	39.9987	1.76E-02	1.0000	1.37E-07	4.76E-13	1.036E-04
	100	1.0000	39.9986	7.86E-03	1.0000	1.09E-07	5.94E-13	7.506E-05
	250	1.0000	39.9991	3.24E-03	1.0000	5.74E-08	4.18E-13	4.656E-05
	1000	1.0000	39.9990	8.01E-04	1.0000	2.92E-08	4.24E-13	2.354E-05
	4000	1.0000	39.9988	2.12E-04	1.0000	1.49E-08	4.39E-13	1.172E-05
$p=5$	10	1.0000	39.9989	2.59E-02	1.0000	2.91E-07	4.63E-13	2.003E-04
	50	1.0000	39.9987	6.39E-03	1.0000	1.33E-07	4.39E-13	9.913E-05
	100	1.0000	39.9989	3.52E-03	1.0000	9.72E-08	4.75E-13	7.287E-05
	250	1.0000	39.9989	1.17E-03	1.0000	5.82E-08	4.21E-13	4.713E-05
	1000	1.0000	39.9989	3.54E-04	1.0000	2.99E-08	4.46E-13	2.348E-05
	4000	1.0000	39.9989	8.42E-05	1.0000	1.48E-08	4.34E-13	1.174E-05

Appendix A2: Simulation Results for Both δ and ε are Normally Distributed, $\lambda = 1$, $\beta = 10$ and $\sigma = 5, 10$

Table A2.1: When $\sigma = 5$

	n	$\bar{\hat{\beta}}$	$M\hat{S}E_{\hat{\beta}}$	\bar{R}_p^2	$\hat{S}D_{R_p^2}$	$M\hat{S}E_{R_p^2}$	Length $CI(\bar{R}_p^2)$
$p=1$	10	9.9916	4.92E-01	0.9996	1.89E-04	1.79E-07	3.20E-03
	50	9.9808	3.99E-02	0.9998	3.85E-05	3.68E-08	1.36E-03
	100	9.9783	2.15E-02	0.9998	2.96E-05	4.36E-08	1.01E-03
	250	9.9738	1.01E-02	0.9998	2.12E-05	5.50E-08	6.34E-04
	1000	9.9730	2.98E-03	0.9998	1.01E-05	5.20E-08	3.13E-04
	4000	9.9729	1.27E-03	0.9998	4.83E-06	4.75E-08	1.55E-04
$p=2$	10	9.9774	1.95E-01	0.9997	1.60E-04	1.38E-07	3.62E-03
	50	9.9738	2.83E-02	0.9997	5.12E-05	6.65E-08	1.89E-03
	100	9.9718	1.24E-02	0.9998	3.38E-05	5.72E-08	1.41E-03
	250	9.9762	4.72E-03	0.9998	1.81E-05	4.16E-08	8.55E-04
	1000	9.9733	1.76E-03	0.9998	9.86E-06	4.79E-08	4.32E-04
	4000	9.9719	1.07E-03	0.9998	5.22E-06	5.42E-08	2.17E-04
$p=5$	10	9.9800	4.26E-02	0.9998	8.62E-05	4.07E-08	3.67E-03
	50	9.9726	1.46E-02	0.9998	4.47E-05	5.06E-08	1.90E-03
	100	9.9718	5.22E-03	0.9998	3.21E-05	5.18E-08	1.33E-03
	250	9.9736	2.11E-03	0.9998	1.98E-05	4.87E-08	8.56E-04
	1000	9.9730	1.16E-03	0.9998	1.00E-05	5.02E-08	4.34E-04
	4000	9.9727	8.56E-04	0.9998	4.94E-06	5.02E-08	2.16E-04

Table A2.2: When $\sigma = 10$

	n	$\bar{\hat{\beta}}$	$M\hat{S}E_{\hat{\beta}}$	\bar{R}_p^2	$\hat{S}D_{R_p^2}$	$M\hat{S}E_{R_p^2}$	Length $CI(\bar{R}_p^2)$
$p=1$	10	10.0143	1.20E+00	0.9991	4.53E-04	1.03E-06	6.39E-03
	50	9.9049	2.06E-01	0.9990	1.95E-04	9.70E-07	2.87E-03
	100	9.9111	8.56E-02	0.9992	1.12E-04	6.28E-07	2.02E-03
	250	9.8904	4.76E-02	0.9991	8.36E-05	8.56E-07	1.26E-03
	1000	9.8876	2.16E-02	0.9991	4.18E-05	8.76E-07	6.30E-04
	4000	9.8941	1.34E-02	0.9991	2.02E-05	7.90E-07	3.14E-04
$p=2$	10	9.9552	4.23E-01	0.9992	3.65E-04	7.13E-07	7.58E-03
	50	9.9134	1.07E-01	0.9992	1.66E-04	6.91E-07	3.77E-03
	100	9.8921	5.82E-02	0.9990	1.34E-04	9.28E-07	2.80E-03
	250	9.8933	2.82E-02	0.9991	7.80E-05	7.78E-07	1.72E-03
	1000	9.8970	1.48E-02	0.9991	3.87E-05	7.47E-07	8.70E-04
	4000	9.8954	1.20E-02	0.9991	1.94E-05	7.53E-07	4.34E-04
$p=5$	10	9.9215	1.25E-01	0.9993	3.49E-04	6.83E-07	7.28E-03
	50	9.8821	5.40E-02	0.9989	2.14E-04	1.17E-06	3.81E-03
	100	9.8841	3.23E-02	0.9990	1.37E-04	9.61E-07	2.69E-03
	250	9.8935	1.83E-02	0.9991	7.93E-05	7.76E-07	1.72E-03
	1000	9.8944	1.28E-02	0.9991	3.89E-05	7.73E-07	8.70E-04
	4000	9.8918	1.21E-02	0.9991	2.04E-05	7.99E-07	4.36E-04

Appendix A3: Robustness of $\hat{\beta}$ and R_p^2 To Non-Normality

Table A3.1: Parameters estimation, standard deviation, mean square error and length of confidence interval for $\hat{\beta}$ and R_p^2 involving $\lambda = 1, \sigma = 1, \beta = 1, p = 2, n = 10$ and varying distributions

\bar{m}_3	\bar{m}_4	$\bar{\beta}$	$M\hat{S}E_{\hat{\beta}}$	\bar{R}_p^2	$\hat{S}D_{R_p^2}$	$M\hat{S}E_{R_p^2}$	Length $CI(\bar{R}_p^2)$
0.0	3.0	1.0000	0.00E+00	1.0000	0.00E+00	0.00E+00	0.000E+00
0.0	2.2	1.0000	5.87E-07	1.0000	1.60E-05	3.26E-10	6.835E-04
0.0	12.0	1.0000	6.54E-06	0.9999	1.17E-04	2.19E-08	2.372E-03
0.5	3.0	1.0000	8.04E-07	1.0000	1.72E-05	4.34E-10	8.000E-04
0.5	11.6	1.0000	6.63E-06	0.9999	1.17E-04	2.22E-08	2.379E-03
1.0	4.5	1.0000	2.29E-06	1.0000	3.86E-05	2.52E-09	1.349E-03
1.0	12.8	1.0000	7.12E-06	0.9999	1.58E-04	3.54E-08	2.488E-03
1.5	6.7	1.0000	4.41E-06	0.9999	8.11E-05	1.03E-08	1.877E-03
1.5	13.0	1.0000	7.53E-06	0.9999	1.55E-04	3.45E-08	2.477E-03
2.0	9.3	1.0000	6.84E-06	0.9999	1.23E-04	2.43E-08	2.392E-03
2.0	14.4	1.0001	9.44E-06	0.9999	2.20E-04	6.41E-08	2.698E-03
2.5	13.3	0.9999	9.65E-06	0.9999	1.57E-04	4.24E-08	2.850E-03
2.2	16.0	1.0001	9.99E-06	0.9999	2.48E-04	8.17E-08	2.857E-03
3.0	16.0	1.0000	1.36E-05	0.9998	2.39E-04	9.34E-08	3.397E-03
2.7	16.0	1.0001	1.22E-05	0.9998	2.83E-04	1.08E-07	3.115E-03
-0.5	4.1	1.0000	6.31E-07	1.0000	1.38E-05	2.63E-10	6.923E-04
-0.5	11.9	1.0000	6.37E-06	0.9999	1.24E-04	2.37E-08	2.370E-03
-1.0	5.7	1.0000	2.07E-06	1.0000	4.16E-05	2.58E-09	1.306E-03
-1.0	11.6	1.0000	6.76E-06	0.9999	1.33E-04	2.55E-08	2.303E-03
-1.5	7.5	1.0000	4.05E-06	0.9999	8.15E-05	9.87E-09	1.815E-03
-1.5	12.1	1.0000	7.48E-06	0.9999	1.62E-04	3.64E-08	2.464E-03
-2.0	10.2	1.0000	6.47E-06	0.9999	1.18E-04	2.24E-08	2.356E-03
-2.0	14.7	1.0000	9.08E-06	0.9999	1.72E-04	4.50E-08	2.730E-03
-2.5	13.5	1.0000	1.00E-05	0.9999	1.89E-04	5.32E-08	2.810E-03
-2.2	16.7	1.0000	1.02E-05	0.9999	2.70E-04	9.37E-08	2.877E-03
-3.0	16.7	1.0000	1.25E-05	0.9998	2.20E-04	7.75E-08	3.215E-03
-2.7	16.7	1.0001	1.18E-05	0.9998	2.77E-04	1.02E-07	3.022E-03

Table A3.2: Parameters estimation, standard deviation, mean square error and length of confidence interval for $\hat{\beta}$ and R_p^2 involving $\lambda = 1, \sigma = 1, \beta = 1, p = 5, n = 10$ and varying distributions

\bar{m}_3	\bar{m}_4	$\bar{\beta}$	$M\hat{S}E_{\hat{\beta}}$	\bar{R}_p^2	$\hat{S}D_{R_p^2}$	$M\hat{S}E_{R_p^2}$	Length $CI(\bar{R}_p^2)$
0.0	3.0	1.0000	0.00E+00	1.0000	0.00E+00	0.00E+00	0.000E+00
0.0	2.2	1.0000	3.43E-07	1.0000	1.03E-05	1.51E-10	5.765E-04
0.0	12.0	1.0000	3.95E-06	0.9999	8.63E-05	1.29E-08	2.011E-03
0.5	3.0	1.0000	5.10E-07	1.0000	1.40E-05	2.84E-10	6.673E-04
0.5	11.6	1.0000	3.91E-06	0.9999	9.61E-05	1.50E-08	2.017E-03
1.0	4.5	1.0000	1.45E-06	1.0000	3.18E-05	1.73E-09	1.148E-03
1.0	12.8	1.0000	4.44E-06	0.9999	1.24E-04	2.23E-08	2.112E-03
1.5	6.7	1.0000	2.74E-06	0.9999	5.85E-05	6.03E-09	1.606E-03
1.5	13.0	1.0001	4.46E-06	0.9999	1.20E-04	2.12E-08	2.078E-03
2.0	9.3	1.0000	4.34E-06	0.9999	9.93E-05	1.64E-08	2.034E-03
2.0	14.4	1.0000	5.57E-06	0.9999	1.66E-04	3.81E-08	2.288E-03
2.5	13.3	1.0000	5.97E-06	0.9999	1.49E-04	3.51E-08	2.428E-03
2.2	16.0	1.0001	6.18E-06	0.9999	1.92E-04	5.00E-08	2.405E-03

Table A3.2: Continued.

\bar{m}_3	\bar{m}_4	$\bar{\beta}$	$M\hat{S}E_{\hat{\beta}}$	\bar{R}_p^2	$\hat{S}D_{R_p^2}$	$M\hat{S}E_{R_p^2}$	Length $CI(\bar{R}_p^2)$
3.0	16.0	1.0000	8.74E-06	0.9998	1.99E-04	6.52E-08	2.896E-03
2.7	16.0	1.0000	7.83E-06	0.9999	2.25E-04	7.04E-08	2.655E-03
-0.5	4.1	1.0000	3.93E-07	1.0000	1.16E-05	1.88E-10	5.932E-04
-0.5	11.9	1.0000	4.00E-06	0.9999	9.67E-05	1.49E-08	2.006E-03
-1.0	5.7	1.0000	1.29E-06	1.0000	3.47E-05	1.77E-09	1.101E-03
-1.0	11.6	1.0000	4.04E-06	0.9999	1.11E-04	1.82E-08	1.986E-03
-1.5	7.5	1.0000	2.49E-06	1.0000	6.54E-05	6.44E-09	1.537E-03
-1.5	12.1	1.0000	4.48E-06	0.9999	1.26E-04	2.31E-08	2.107E-03
-2.0	10.2	1.0000	4.27E-06	0.9999	1.00E-04	1.61E-08	2.014E-03
-2.0	14.7	1.0000	5.70E-06	0.9999	1.75E-04	4.18E-08	2.335E-03
-2.5	13.5	1.0000	5.75E-06	0.9999	1.39E-04	3.09E-08	2.377E-03
-2.2	16.7	1.0000	6.63E-06	0.9999	1.83E-04	4.75E-08	2.442E-03
-3.0	16.7	1.0000	7.84E-06	0.9999	1.90E-04	5.66E-08	2.742E-03
-2.7	16.7	1.0000	7.24E-06	0.9999	2.15E-04	6.41E-08	2.577E-03

Table A3.3: Parameters estimation, standard deviation, mean square error and length of confidence interval for $\hat{\beta}$ and R_p^2 involving $\lambda = 1, \sigma = 1, \beta = 1, p = 1, n = 100$ and varying distributions

\bar{m}_3	\bar{m}_4	$\bar{\beta}$	$M\hat{S}E_{\hat{\beta}}$	\bar{R}_p^2	$\hat{S}D_{R_p^2}$	$M\hat{S}E_{R_p^2}$	Length $CI(\bar{R}_p^2)$
0.0	3.0	1.0000	0.00E+00	1.0000	0.00E+00	0.00E+00	0.000E+00
0.0	2.2	1.0000	1.43E-07	1.0000	3.57E-06	6.30E-11	1.756E-04
0.0	12.0	1.0000	1.65E-06	0.9999	3.34E-05	7.27E-09	5.894E-04
0.5	3.0	1.0000	2.01E-07	1.0000	4.51E-06	1.14E-10	2.054E-04
0.5	11.6	1.0000	1.61E-06	0.9999	3.40E-05	7.33E-09	5.893E-04
1.0	4.5	1.0000	5.56E-07	1.0000	1.02E-05	8.76E-10	3.511E-04
1.0	12.8	1.0000	1.80E-06	0.9999	3.95E-05	9.13E-09	6.193E-04
1.5	6.7	1.0000	1.11E-06	0.9999	2.05E-05	3.26E-09	4.856E-04
1.5	13.0	1.0000	1.81E-06	0.9999	4.20E-05	9.24E-09	6.159E-04
2.0	9.3	1.0000	1.67E-06	0.9999	3.35E-05	8.20E-09	6.102E-04
2.0	14.4	1.0000	2.23E-06	0.9999	5.39E-05	1.39E-08	6.768E-04
2.5	13.3	0.9999	2.42E-06	0.9999	4.53E-05	1.57E-08	7.196E-04
2.2	16.0	1.0000	2.49E-06	0.9999	6.63E-05	1.91E-08	7.252E-04
3.0	16.0	1.0000	3.33E-06	0.9998	6.02E-05	3.07E-08	8.553E-04
2.7	16.0	1.0000	2.96E-06	0.9999	7.39E-05	2.60E-08	7.902E-04
-0.5	4.1	1.0000	1.50E-07	1.0000	3.91E-06	7.11E-11	1.801E-04
-0.5	11.9	1.0000	1.60E-06	0.9999	3.22E-05	7.12E-09	5.877E-04
-1.0	5.7	1.0000	5.15E-07	1.0000	1.16E-05	7.72E-10	3.330E-04
-1.0	11.6	1.0000	1.60E-06	0.9999	3.71E-05	7.50E-09	5.861E-04
-1.5	7.5	1.0000	1.03E-06	1.0000	2.21E-05	2.88E-09	4.633E-04
-1.5	12.1	1.0000	1.81E-06	0.9999	4.20E-05	9.33E-09	6.176E-04
-2.0	10.2	1.0000	1.60E-06	0.9999	3.40E-05	7.59E-09	5.954E-04
-2.0	14.7	1.0000	2.24E-06	0.9999	5.47E-05	1.47E-08	6.879E-04
-2.5	13.5	1.0000	2.31E-06	0.9999	5.18E-05	1.57E-08	7.085E-04
-2.2	16.7	1.0000	2.51E-06	0.9999	6.54E-05	1.94E-08	7.307E-04
-3.0	16.7	1.0000	3.07E-06	0.9999	6.27E-05	2.62E-08	8.126E-04
-2.7	16.7	1.0000	2.86E-06	0.9999	7.61E-05	2.50E-08	7.747E-04

Table A3.4: Parameters estimation, standard deviation, mean square error and length of confidence interval for $\hat{\beta}$ and R_p^2 involving $\lambda = 1, \sigma = 1, \beta = 1, p = 2, n = 100$ and varying distributions

\bar{m}_3	\bar{m}_4	$\bar{\beta}$	$M\hat{S}E_{\hat{\beta}}$	\bar{R}_p^2	$\hat{S}D_{R_p^2}$	$M\hat{S}E_{R_p^2}$	Length $CI(\bar{R}_p^2)$
0.0	3.0	1.0000	0.00E+00	1.0000	0.00E+00	0.00E+00	0.000E+00
0.0	2.2	1.0000	7.25E-08	1.0000	3.79E-06	6.75E-11	2.455E-04
0.0	12.0	1.0000	8.20E-07	0.9999	3.30E-05	7.52E-09	8.223E-04
0.5	3.0	1.0000	1.01E-07	1.0000	4.78E-06	1.23E-10	2.882E-04
0.5	11.6	1.0000	8.18E-07	0.9999	3.39E-05	7.57E-09	8.212E-04
1.0	4.5	1.0000	2.93E-07	1.0000	1.07E-05	9.31E-10	4.909E-04
1.0	12.8	1.0000	9.13E-07	0.9999	3.98E-05	9.60E-09	8.670E-04
1.5	6.7	1.0000	5.48E-07	0.9999	2.09E-05	3.41E-09	6.782E-04
1.5	13.0	1.0000	9.10E-07	0.9999	4.49E-05	1.01E-08	8.657E-04
2.0	9.3	1.0000	8.77E-07	0.9999	3.39E-05	8.59E-09	8.525E-04
2.0	14.4	1.0000	1.11E-06	0.9999	5.71E-05	1.51E-08	9.484E-04
2.5	13.3	1.0000	1.20E-06	0.9999	4.74E-05	1.66E-08	1.004E-03
2.2	16.0	1.0000	1.30E-06	0.9999	6.52E-05	1.96E-08	1.012E-03
3.0	16.0	1.0000	1.73E-06	0.9998	6.14E-05	3.22E-08	1.194E-03
2.7	16.0	1.0000	1.49E-06	0.9999	7.69E-05	2.75E-08	1.104E-03
-0.5	4.1	1.0000	7.93E-08	1.0000	4.06E-06	7.63E-11	2.526E-04
-0.5	11.9	1.0000	8.26E-07	0.9999	3.50E-05	7.71E-09	8.228E-04
-1.0	5.7	1.0000	2.61E-07	1.0000	1.13E-05	7.92E-10	4.644E-04
-1.0	11.6	1.0000	8.44E-07	0.9999	4.03E-05	8.18E-09	8.212E-04
-1.5	7.5	1.0000	5.12E-07	0.9999	2.32E-05	3.04E-09	6.464E-04
-1.5	12.1	1.0000	8.82E-07	0.9999	4.14E-05	9.60E-09	8.615E-04
-2.0	10.2	1.0000	8.30E-07	0.9999	3.45E-05	8.01E-09	8.333E-04
-2.0	14.7	1.0000	1.09E-06	0.9999	5.55E-05	1.54E-08	9.616E-04
-2.5	13.5	1.0000	1.19E-06	0.9999	5.37E-05	1.65E-08	9.883E-04
-2.2	16.7	1.0000	1.28E-06	0.9999	6.86E-05	2.05E-08	1.019E-03
-3.0	16.7	1.0000	1.51E-06	0.9998	6.17E-05	2.68E-08	1.129E-03
-2.7	16.7	1.0001	1.41E-06	0.9999	7.50E-05	2.57E-08	1.082E-03

Table A3.5: Parameters estimation, standard deviation, mean square error and length of confidence interval for $\hat{\beta}$ and R_p^2 involving $\lambda = 1, \sigma = 1, \beta = 1, p = 5, n = 100$ and varying distributions

\bar{m}_3	\bar{m}_4	$\bar{\beta}$	$M\hat{S}E_{\hat{\beta}}$	\bar{R}_p^2	$\hat{S}D_{R_p^2}$	$M\hat{S}E_{R_p^2}$	Length $CI(\bar{R}_p^2)$
0.0	3.0	1.0000	0.00E+00	1.0000	0.00E+00	0.00E+00	0.000E+00
0.0	2.2	1.0000	3.43E-08	1.0000	4.38E-06	9.06E-11	2.429E-04
0.0	12.0	1.0000	3.98E-07	0.9999	3.72E-05	9.94E-09	8.119E-04
0.5	3.0	1.0000	4.89E-08	1.0000	5.37E-06	1.62E-10	2.844E-04
0.5	11.6	1.0000	4.10E-07	0.9999	4.08E-05	1.03E-08	8.124E-04
1.0	4.5	1.0000	1.39E-07	1.0000	1.22E-05	1.22E-09	4.832E-04
1.0	12.8	1.0000	4.47E-07	0.9999	4.50E-05	1.27E-08	8.569E-04
1.5	6.7	1.0000	2.69E-07	0.9999	2.44E-05	4.60E-09	6.709E-04
1.5	13.0	1.0000	4.52E-07	0.9999	4.90E-05	1.29E-08	8.507E-04
2.0	9.3	1.0000	4.30E-07	0.9999	3.89E-05	1.15E-08	8.429E-04
2.0	14.4	1.0000	5.52E-07	0.9999	6.51E-05	2.00E-08	9.381E-04
2.5	13.3	1.0000	6.00E-07	0.9999	5.43E-05	2.21E-08	9.931E-04
2.2	16.0	1.0001	6.27E-07	0.9999	7.68E-05	2.62E-08	9.968E-04
3.0	16.0	1.0000	8.46E-07	0.9998	7.22E-05	4.32E-08	1.180E-03
2.7	16.0	1.0000	7.72E-07	0.9998	8.96E-05	3.77E-08	1.097E-03

Table A3.5: Continued.

\bar{m}_3	\bar{m}_4	$\bar{\beta}$	$M\hat{S}E_{\hat{\beta}}$	\bar{R}_p^2	$\hat{S}D_{R_p^2}$	$M\hat{S}E_{R_p^2}$	Length $CI(\bar{R}_p^2)$
-0.5	4.1	1.0000	3.89E-08	1.0000	4.62E-06	1.00E-10	2.487E-04
-0.5	11.9	1.0000	4.01E-07	0.9999	3.94E-05	1.01E-08	8.114E-04
-1.0	5.7	1.0000	1.28E-07	1.0000	1.34E-05	1.06E-09	4.578E-04
-1.0	11.6	1.0000	4.03E-07	0.9999	4.54E-05	1.08E-08	8.117E-04
-1.5	7.5	1.0000	2.55E-07	0.9999	2.75E-05	4.18E-09	6.422E-04
-1.5	12.1	1.0000	4.56E-07	0.9999	5.09E-05	1.32E-08	8.512E-04
-2.0	10.2	1.0000	4.01E-07	0.9999	3.89E-05	1.05E-08	8.203E-04
-2.0	14.7	1.0000	5.71E-07	0.9999	6.59E-05	2.11E-08	9.527E-04
-2.5	13.5	1.0000	6.00E-07	0.9999	6.07E-05	2.19E-08	9.770E-04
-2.2	16.7	1.0001	6.44E-07	0.9999	8.04E-05	2.81E-08	1.013E-03
-3.0	16.7	1.0000	7.90E-07	0.9998	7.99E-05	3.82E-08	1.124E-03
-2.7	16.7	1.0001	7.48E-07	0.9998	9.04E-05	3.54E-08	1.072E-03

Table A3.6: Parameters estimation, standard deviation, mean square error and length of confidence interval for $\hat{\beta}$ and R_p^2 involving $\lambda = 1, \sigma = 1, \beta = 1, p = 1, n = 1000$ and varying distributions

\bar{m}_3	\bar{m}_4	$\bar{\beta}$	$M\hat{S}E_{\hat{\beta}}$	\bar{R}_p^2	$\hat{S}D_{R_p^2}$	$M\hat{S}E_{R_p^2}$	Length $CI(\bar{R}_p^2)$
0.0	3.0	1.0000	0.00E+00	1.0000	0.00E+00	0.00E+00	0.000E+00
0.0	2.2	1.0000	1.53E-08	1.0000	1.29E-06	6.32E-11	5.815E-05
0.0	12.0	1.0000	1.72E-07	0.9999	1.13E-05	7.57E-09	1.931E-04
0.5	3.0	1.0000	2.14E-08	1.0000	1.61E-06	1.18E-10	6.810E-05
0.5	11.6	1.0000	1.71E-07	0.9999	1.15E-05	7.55E-09	1.929E-04
1.0	4.5	1.0000	6.14E-08	1.0000	3.62E-06	9.47E-10	1.149E-04
1.0	12.8	1.0000	2.00E-07	0.9999	1.37E-05	9.47E-09	2.039E-04
1.5	6.7	1.0000	1.18E-07	0.9999	7.11E-06	3.51E-09	1.594E-04
1.5	13.0	1.0000	2.01E-07	0.9999	1.48E-05	9.43E-09	2.035E-04
2.0	9.3	1.0000	1.90E-07	0.9999	1.15E-05	8.69E-09	2.000E-04
2.0	14.4	1.0000	2.36E-07	0.9999	1.87E-05	1.37E-08	2.233E-04
2.5	13.3	1.0000	2.62E-07	0.9999	1.57E-05	1.67E-08	2.353E-04
2.2	16.0	1.0000	2.69E-07	0.9999	2.28E-05	1.84E-08	2.401E-04
3.0	16.0	1.0000	3.73E-07	0.9998	2.14E-05	3.31E-08	2.795E-04
2.7	16.0	1.0000	3.28E-07	0.9998	2.63E-05	2.59E-08	2.616E-04
-0.5	4.1	1.0000	1.68E-08	1.0000	1.38E-06	7.00E-11	5.963E-05
-0.5	11.9	1.0000	1.77E-07	0.9999	1.15E-05	7.49E-09	1.925E-04
-1.0	5.7	1.0000	5.53E-08	1.0000	3.98E-06	7.78E-10	1.092E-04
-1.0	11.6	1.0000	1.80E-07	0.9999	1.35E-05	7.74E-09	1.937E-04
-1.5	7.5	1.0000	1.06E-07	0.9999	7.90E-06	2.97E-09	1.526E-04
-1.5	12.1	1.0000	1.94E-07	0.9999	1.47E-05	9.42E-09	2.034E-04
-2.0	10.2	1.0000	1.76E-07	0.9999	1.19E-05	8.01E-09	1.957E-04
-2.0	14.7	1.0000	2.42E-07	0.9999	1.93E-05	1.47E-08	2.271E-04
-2.5	13.5	1.0000	2.53E-07	0.9999	1.79E-05	1.60E-08	2.327E-04
-2.2	16.7	1.0000	2.83E-07	0.9999	2.29E-05	1.90E-08	2.419E-04
-3.0	16.7	1.0000	3.35E-07	0.9998	2.16E-05	2.73E-08	2.659E-04
-2.7	16.7	1.0001	3.06E-07	0.9998	2.64E-05	2.39E-08	2.562E-04

Table A3.7: Parameters estimation, standard deviation, mean square error and length of confidence interval for $\hat{\beta}$ and R_p^2 involving $\lambda = 1, \sigma = 1, \beta = 1, p = 2, n = 1000$ and varying distributions

\bar{m}_3	\bar{m}_4	$\bar{\beta}$	$M\hat{S}E_{\hat{\beta}}$	\bar{R}_p^2	$\hat{S}D_{R_p^2}$	$M\hat{S}E_{R_p^2}$	Length $CI(\bar{R}_p^2)$
0.0	3.0	1.0000	0.00E+00	1.0000	0.00E+00	0.00E+00	0.000E+00
0.0	2.2	1.0000	7.83E-09	1.0000	1.22E-06	5.74E-11	7.968E-05
0.0	12.0	1.0000	8.33E-08	0.9999	1.07E-05	6.85E-09	2.643E-04
0.5	3.0	1.0000	1.07E-08	1.0000	1.56E-06	1.08E-10	9.351E-05
0.5	11.6	1.0000	8.37E-08	0.9999	1.10E-05	6.89E-09	2.645E-04
1.0	4.5	1.0000	3.01E-08	1.0000	3.40E-06	8.63E-10	1.577E-04
1.0	12.8	1.0000	9.28E-08	0.9999	1.29E-05	8.62E-09	2.797E-04
1.5	6.7	1.0000	5.66E-08	0.9999	6.76E-06	3.19E-09	2.184E-04
1.5	13.0	1.0000	9.27E-08	0.9999	1.41E-05	8.63E-09	2.793E-04
2.0	9.3	1.0000	9.00E-08	0.9999	1.09E-05	7.94E-09	2.744E-04
2.0	14.4	1.0000	1.13E-07	0.9999	1.83E-05	1.26E-08	3.068E-04
2.5	13.3	1.0000	1.24E-07	0.9999	1.50E-05	1.53E-08	3.231E-04
2.2	16.0	1.0001	1.31E-07	0.9999	2.19E-05	1.68E-08	3.291E-04
3.0	16.0	1.0000	1.74E-07	0.9998	2.07E-05	3.04E-08	3.839E-04
2.7	16.0	1.0000	1.60E-07	0.9998	2.49E-05	2.35E-08	3.586E-04
-0.5	4.1	1.0000	8.17E-09	1.0000	1.31E-06	6.40E-11	8.185E-05
-0.5	11.9	1.0000	8.52E-08	0.9999	1.08E-05	6.85E-09	2.643E-04
-1.0	5.7	1.0000	2.73E-08	1.0000	3.79E-06	7.10E-10	1.498E-04
-1.0	11.6	1.0000	8.79E-08	0.9999	1.27E-05	7.01E-09	2.652E-04
-1.5	7.5	1.0000	5.30E-08	0.9999	7.58E-06	2.70E-09	2.091E-04
-1.5	12.1	1.0000	9.53E-08	0.9999	1.41E-05	8.59E-09	2.790E-04
-2.0	10.2	1.0000	8.69E-08	0.9999	1.14E-05	7.33E-09	2.687E-04
-2.0	14.7	1.0000	1.14E-07	0.9999	1.82E-05	1.34E-08	3.119E-04
-2.5	13.5	1.0000	1.24E-07	0.9999	1.71E-05	1.46E-08	3.191E-04
-2.2	16.7	1.0000	1.34E-07	0.9999	2.22E-05	1.73E-08	3.318E-04
-3.0	16.7	1.0000	1.63E-07	0.9998	2.09E-05	2.50E-08	3.650E-04
-2.7	16.7	1.0001	1.54E-07	0.9999	2.48E-05	2.17E-08	3.508E-04

Table A3.8: Parameters estimation, standard deviation, mean square error and length of confidence interval for $\hat{\beta}$ and R_p^2 involving $\lambda = 1, \sigma = 1, \beta = 1, p = 5, n = 1000$ and varying distributions.

\bar{m}_3	\bar{m}_4	$\bar{\beta}$	$M\hat{S}E_{\hat{\beta}}$	\bar{R}_p^2	$\hat{S}D_{R_p^2}$	$M\hat{S}E_{R_p^2}$	Length $CI(\bar{R}_p^2)$
0.0	3.0	1.0000	0.00E+00	1.0000	0.00E+00	0.00E+00	0.000E+00
0.0	2.2	1.0000	3.12E-09	1.0000	1.26E-06	6.18E-11	7.947E-05
0.0	12.0	1.0000	3.50E-08	0.9999	1.11E-05	7.41E-09	2.639E-04
0.5	3.0	1.0000	4.34E-09	1.0000	1.61E-06	1.16E-10	9.311E-05
0.5	11.6	1.0000	3.59E-08	0.9999	1.17E-05	7.42E-09	2.638E-04
1.0	4.5	1.0000	1.22E-08	1.0000	3.54E-06	9.29E-10	1.572E-04
1.0	12.8	1.0000	3.78E-08	0.9999	1.36E-05	9.28E-09	2.788E-04
1.5	6.7	1.0000	2.38E-08	0.9999	6.93E-06	3.42E-09	2.176E-04
1.5	13.0	1.0000	3.97E-08	0.9999	1.45E-05	9.27E-09	2.784E-04
2.0	9.3	1.0000	3.78E-08	0.9999	1.13E-05	8.52E-09	2.734E-04
2.0	14.4	1.0000	4.85E-08	0.9999	1.88E-05	1.36E-08	3.058E-04
2.5	13.3	1.0000	5.29E-08	0.9999	1.58E-05	1.65E-08	3.223E-04
2.2	16.0	1.0001	5.89E-08	0.9999	2.27E-05	1.81E-08	3.282E-04
3.0	16.0	1.0000	7.51E-08	0.9998	2.15E-05	3.27E-08	3.829E-04
2.7	16.0	1.0000	6.80E-08	0.9998	2.53E-05	2.53E-08	3.576E-04

Table A3.8: Continued.

\bar{m}_3	\bar{m}_4	$\bar{\beta}$	$M\hat{S}E_{\hat{\beta}}$	\bar{R}_P^2	$\hat{S}D_{R_P^2}$	$M\hat{S}E_{R_P^2}$	Length $CI(\bar{R}_P^2)$
-0.5	4.1	1.0000	3.33E-09	1.0000	1.37E-06	6.86E-11	8.152E-05
-0.5	11.9	1.0000	3.55E-08	0.9999	1.15E-05	7.41E-09	2.637E-04
-1.0	5.7	1.0000	1.17E-08	1.0000	3.91E-06	7.65E-10	1.494E-04
-1.0	11.6	1.0000	3.50E-08	0.9999	1.32E-05	7.58E-09	2.648E-04
-1.5	7.5	1.0000	2.18E-08	0.9999	7.85E-06	2.93E-09	2.088E-04
-1.5	12.1	1.0000	3.96E-08	0.9999	1.47E-05	9.29E-09	2.786E-04
-2.0	10.2	1.0000	3.66E-08	0.9999	1.18E-05	7.85E-09	2.676E-04
-2.0	14.7	1.0000	5.02E-08	0.9999	1.91E-05	1.45E-08	3.110E-04
-2.5	13.5	1.0000	5.20E-08	0.9999	1.76E-05	1.57E-08	3.180E-04
-2.2	16.7	1.0001	5.98E-08	0.9999	2.30E-05	1.87E-08	3.312E-04
-3.0	16.7	1.0000	6.66E-08	0.9998	2.15E-05	2.68E-08	3.638E-04
-2.7	16.7	1.0001	6.57E-08	0.9998	2.56E-05	2.34E-08	3.502E-04

Appendix A4: Robustness of $\hat{\beta}$ and R_p^2 To $\lambda \neq 1$ When $\beta = 10$ and $\sigma = 1$

Table A4.1: When $\lambda = 1.5$

	n	$\bar{\hat{\beta}}$	$M\hat{S}E_{\hat{\beta}}$	\bar{R}_p^2	$\hat{S}D_{R_p^2}$	$M\hat{S}E_{R_p^2}$	Length $CI(\bar{R}_p^2)$
$p=1$	10	1.00E+01	1.03E-02	1.00E+00	4.08E-06	8.29E-11	5.71E-04
	50	1.00E+01	1.77E-03	1.00E+00	1.73E-06	7.65E-11	2.62E-04
	100	1.00E+01	6.55E-04	1.00E+00	9.15E-07	4.21E-11	2.00E-04
	250	1.00E+01	3.21E-04	1.00E+00	7.11E-07	6.29E-11	1.23E-04
	1000	1.00E+01	8.64E-05	1.00E+00	3.80E-07	7.23E-11	6.02E-05
	4000	1.00E+01	2.36E-05	1.00E+00	1.91E-07	7.51E-11	3.01E-05
$p=2$	10	1.00E+01	8.46E-03	1.00E+00	4.26E-06	9.73E-11	8.04E-04
	50	1.00E+01	9.00E-04	1.00E+00	1.76E-06	7.81E-11	3.68E-04
	100	1.00E+01	4.17E-04	1.00E+00	1.19E-06	7.16E-11	2.59E-04
	250	1.00E+01	1.95E-04	1.00E+00	7.83E-07	7.46E-11	1.63E-04
	1000	1.00E+01	3.94E-05	1.00E+00	3.54E-07	6.24E-11	8.49E-05
	4000	1.00E+01	1.26E-05	1.00E+00	1.97E-07	7.59E-11	4.22E-05
$p=5$	10	1.00E+01	1.57E-03	1.00E+00	4.14E-06	9.32E-11	6.96E-04
	50	1.00E+01	3.50E-04	1.00E+00	1.82E-06	8.41E-11	3.55E-04
	100	1.00E+01	1.67E-04	1.00E+00	1.23E-06	7.82E-11	2.54E-04
	250	1.00E+01	6.51E-05	1.00E+00	7.24E-07	6.48E-11	1.68E-04
	1000	1.00E+01	1.74E-05	1.00E+00	3.79E-07	7.19E-11	8.41E-05
	4000	1.00E+01	6.12E-06	1.00E+00	1.94E-07	7.43E-11	4.22E-05

Table A4.2: When $\lambda = 10$

	n	$\bar{\hat{\beta}}$	$M\hat{S}E_{\hat{\beta}}$	\bar{R}_p^2	$\hat{S}D_{R_p^2}$	$M\hat{S}E_{R_p^2}$	Length $CI(\bar{R}_p^2)$
$p=1$	10	1.00E+01	9.73E-03	1.00E+00	4.01E-06	7.87E-11	4.81E-04
	50	1.00E+01	1.47E-03	1.00E+00	1.41E-06	4.93E-11	2.05E-04
	100	1.00E+01	3.99E-04	1.00E+00	5.50E-07	1.52E-11	1.48E-04
	250	1.00E+01	1.87E-04	1.00E+00	3.95E-07	1.99E-11	9.34E-05
	1000	1.00E+01	5.59E-05	1.00E+00	2.25E-07	2.56E-11	4.72E-05
	4000	1.00E+01	1.86E-05	1.00E+00	1.15E-07	2.64E-11	2.35E-05
$p=2$	10	1.00E+01	4.45E-03	1.00E+00	2.22E-06	2.58E-11	6.43E-04
	50	1.00E+01	6.96E-04	1.00E+00	1.25E-06	3.93E-11	2.87E-04
	100	1.00E+01	2.71E-04	1.00E+00	7.82E-07	3.14E-11	2.07E-04
	250	1.00E+01	9.59E-05	1.00E+00	4.58E-07	2.66E-11	1.31E-04
	1000	1.00E+01	3.23E-05	1.00E+00	2.31E-07	2.65E-11	6.61E-05
	4000	1.00E+01	1.29E-05	1.00E+00	1.16E-07	2.72E-11	3.28E-05
$p=5$	10	1.00E+01	9.73E-04	1.00E+00	2.25E-06	2.82E-11	5.41E-04
	50	1.00E+01	1.96E-04	1.00E+00	9.10E-07	2.17E-11	2.80E-04
	100	1.00E+01	9.17E-05	1.00E+00	6.52E-07	2.16E-11	1.97E-04
	250	1.00E+01	5.28E-05	1.00E+00	4.49E-07	2.46E-11	1.30E-04
	1000	1.00E+01	1.48E-05	1.00E+00	2.26E-07	2.57E-11	6.55E-05
	4000	1.00E+01	8.54E-06	1.00E+00	1.13E-07	2.60E-11	3.28E-05

Table A4.3: When $\lambda = 30$

	n	$\bar{\hat{\beta}}$	$M\hat{S}E_{\hat{\beta}}$	\bar{R}_p^2	$\hat{S}D_{R_p^2}$	$M\hat{S}E_{R_p^2}$	Length $CI(\bar{R}_p^2)$
$p=1$	10	1.00E+01	1.98E-03	1.00E+00	8.00E-07	3.17E-12	3.26E-04
	50	1.00E+01	6.65E-04	1.00E+00	6.36E-07	1.01E-11	1.42E-04
	100	1.00E+01	2.14E-04	1.00E+00	2.83E-07	3.96E-12	9.80E-05
	250	1.00E+01	1.00E-04	1.00E+00	2.06E-07	5.34E-12	6.24E-05
	1000	1.00E+01	3.14E-05	1.00E+00	1.04E-07	5.38E-12	3.14E-05
	4000	1.00E+01	1.31E-05	1.00E+00	5.01E-08	5.08E-12	1.56E-05
$p=2$	10	1.00E+01	9.73E-04	1.00E+00	1.30E-06	9.23E-12	4.01E-04
	50	1.00E+01	1.80E-04	1.00E+00	3.96E-07	3.86E-12	1.95E-04
	100	1.00E+01	1.11E-04	1.00E+00	3.22E-07	5.33E-12	1.39E-04
	250	1.00E+01	5.52E-05	1.00E+00	2.07E-07	5.42E-12	8.75E-05
	1000	1.00E+01	2.00E-05	1.00E+00	1.01E-07	5.18E-12	4.34E-05
	4000	1.00E+01	1.07E-05	1.00E+00	5.04E-08	5.19E-12	2.17E-05
$p=5$	10	1.00E+01	4.53E-04	1.00E+00	7.86E-07	3.50E-12	3.56E-04
	50	1.00E+01	1.04E-04	1.00E+00	4.21E-07	4.47E-12	1.82E-04
	100	1.00E+01	6.26E-05	1.00E+00	3.22E-07	5.19E-12	1.32E-04
	250	1.00E+01	2.23E-05	1.00E+00	1.88E-07	4.38E-12	8.45E-05
	1000	1.00E+01	1.27E-05	1.00E+00	1.04E-07	5.32E-12	4.34E-05
	4000	1.00E+01	8.98E-06	1.00E+00	5.05E-08	5.08E-12	2.16E-05

Table A4.4: When $\lambda = 100$

	n	$\bar{\hat{\beta}}$	$M\hat{S}E_{\hat{\beta}}$	\bar{R}_p^2	$\hat{S}D_{R_p^2}$	$M\hat{S}E_{R_p^2}$	Length $CI(\bar{R}_p^2)$
$p=1$	10	1.00E+01	9.92E-28	1.00E+00	8.02E-17	6.43E-33	0.00E+00
	50	1.00E+01	2.77E-27	1.00E+00	4.53E-17	2.05E-33	0.00E+00
	100	1.00E+01	6.10E-27	1.00E+00	1.14E-16	1.30E-32	0.00E+00
	250	1.00E+01	1.39E-26	1.00E+00	5.88E-17	3.46E-33	0.00E+00
	1000	1.00E+01	4.66E-26	1.00E+00	9.29E-17	8.63E-33	0.00E+00
	4000	1.00E+01	1.82E-25	1.00E+00	1.24E-16	1.53E-32	0.00E+00
$p=2$	10	1.00E+01	2.54E-27	1.00E+00	7.97E-17	6.35E-33	0.00E+00
	50	1.00E+01	2.35E-27	1.00E+00	1.16E-16	1.34E-32	0.00E+00
	100	1.00E+01	5.16E-27	1.00E+00	1.28E-16	1.63E-32	0.00E+00
	250	1.00E+01	5.83E-27	1.00E+00	9.55E-17	9.11E-33	0.00E+00
	1000	1.00E+01	2.19E-26	1.00E+00	9.93E-17	9.85E-33	0.00E+00
	4000	1.00E+01	9.86E-26	1.00E+00	2.06E-16	4.26E-32	0.00E+00
$p=5$	10	1.00E+01	8.99E-28	1.00E+00	1.19E-16	1.43E-32	0.00E+00
	50	1.00E+01	1.68E-27	1.00E+00	5.97E-17	3.56E-33	0.00E+00
	100	1.00E+01	1.86E-27	1.00E+00	7.69E-17	5.91E-33	0.00E+00
	250	1.00E+01	2.89E-27	1.00E+00	1.16E-16	1.35E-32	0.00E+00
	1000	1.00E+01	1.15E-26	1.00E+00	1.30E-16	1.69E-32	0.00E+00
	4000	1.00E+01	4.25E-26	1.00E+00	1.85E-16	3.43E-32	0.00E+00

Appendix B1: JPEG Codec Images with Compression Factor 10 to 100 for Four Selected Image

