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Electronic Companion – “Learning Preferences Under
Noise and Loss Aversion: An Optimization
Approach” by Dimitris Bertsimas and Allison
O’Hair, *Operations Research*

Additional Numerical Results

Tables EC.1, EC.2 and EC.3 present the full numerical results from the empirical evidence section. Each row corresponds to a different optimization approach (the traditional analytic center approach (AC), the self-correcting analytic center approach (ACSC), the robust approach (Robust), and the *CVaR* approach (*CVaR*), and to different parameter values (γ and α). Each column corresponds to a different value of σ , the standard deviation of the noise added to the responses. For $\sigma = 0$, there is no random noise added to the responses, so only one value is computed per user and *CVaR*(5%) and *CVaR*(20%) are not computed due to the small amount of data. For $\sigma > 0$, 200 runs are computed for each method, combination of parameters, and for each user. The bold entries highlight some of the best results and some of the interesting trends in the data.

Method	$\sigma = 0$	$\sigma = 0.1$	$\sigma = 0.2$	$\sigma = 0.3$	$\sigma = 0.4$	$\sigma = 0.5$
AC	24.4	31.8 ± 9.2	35.7 ± 10.7	39.1 ± 12.0	41.7 ± 12.9	43.5 ± 13.6
ACSC, $\gamma = 0.10$	30.0	33.7 ± 10.5	36.2 ± 11.3	38.6 ± 12.6	41.9 ± 13.4	43.5 ± 13.7
<i>CVaR</i> , $\alpha = 0.05, \gamma = 0.1$	34.4	36.0 ± 8.6	37.5 ± 9.0	39.4 ± 9.4	41.3 ± 9.4	41.9 ± 9.7
Robust, $\gamma = 0.10$	56.1	54.0 ± 5.5	54.1 ± 5.7	54.1 ± 5.8	54.2 ± 5.7	54.4 ± 5.8

Table EC.1 Average true rank of the solution to the optimization problem and the standard deviation of the values for different values of σ . This value is averaged with respect to 10 different users, and 200 runs of the adaptive questionnaire per user when $\sigma > 0$.

Method	$\sigma = 0.1$	$\sigma = 0.2$	$\sigma = 0.3$	$\sigma = 0.4$	$\sigma = 0.5$
AC	52.6	59.3	65.9	70.1	73.9
ACSC, $\gamma = 0.10$	58.5	61.7	67.5	70.1	73.1
<i>CVaR</i> , $\alpha = 0.05, \gamma = 0.10$	55.9	57.6	60.4	61.9	63.3
Robust, $\gamma = 0.10$	63.3	63.7	63.5	63.0	64.1

Table EC.2 *CVaR* at $\alpha = 5\%$ of the true rank of the solution to the optimization problem for different values of σ . This value is computed with respect to 10 different true utility vectors, and 200 different runs of the adaptive questionnaire per user when $\sigma > 0$.

Method	$\sigma = 0.1$	$\sigma = 0.2$	$\sigma = 0.3$	$\sigma = 0.4$	$\sigma = 0.5$
AC	45.6	51.7	56.8	60.4	63.5
ACSC, $\gamma = 0.10$	49.0	53.1	57.5	61.5	63.1
<i>CVaR</i> , $\alpha = 0.05, \gamma = 0.10$	48.4	50.6	52.9	54.9	55.7
Robust, $\gamma = 0.10$	60.0	60.1	59.8	59.8	60.2

Table EC.3 *CVaR* at $\alpha = 20\%$ of the true rank of the solution to the optimization problem for different values of σ . This value is computed with respect to 10 different true utility vectors, and 200 different runs of the adaptive questionnaire per user when $\sigma > 0$.