

Appendix D:

Model Robust Bayesian Designs

| <i>Table Key</i> | |
|------------------|--|
| Symbol | Definition |
| p_i | proportion of observations at design point i |
| p_c | proportion of observations at the control |
| x_i | design point i |
| E | efficiency |
| RE | restricted efficiency |

Table D1. D-optimal Three Level Bayesian Designs on ($EC_{0.05}$, EC_{100})

| Prior | $p_1=p_2$ | x_1 | x_2 | p_c | RE_{EXP} | E_{EXP} | RE_{LIN} | E_{LIN} | RE_{TRA} | E_{TRA} |
|-------------------------------------|-----------------------------|-------------------------|-------------------------|-------------------------|------------------------------|-----------------------------|------------------------------|-----------------------------|------------------------------|-----------------------------|
| $(\bar{0.3}, \bar{0.3}, \bar{0.3})$ | 0.4629 | $EC_{5.13}$ | $EC_{94.92}$ | 0.0742 | 96.11% | 87.86% | 9.11% | 8.34% | 76.67% | 77.91% |
| (0.6,0.3,0.1) | 0.4312 | $EC_{8.59}$ | $EC_{91.46}$ | 0.1376 | 99.88% | 91.32% | 6.64% | 6.09% | 69.63% | 70.75% |
| (0.8,0.15,0.05) | 0.4262 | $EC_{9.12}$ | $EC_{91.93}$ | 0.1476 | 99.98% | 91.41% | 6.38% | 5.84% | 67.22% | 68.31% |
| (0.15,0.8,0.05) | 0.5000 | $EC_{0.05}$ | EC_{100} | 0 | 25.27% | 23.10% | 100% | 91.62% | 100% | 100% |
| (0.05,0.15,0.8) | 0.4998 | $EC_{0.05}$ | EC_{100} | 0.0004 | 25.27% | 23.10% | 100% | 91.62% | 100% | 100% |

Table D2. D-optimal Three Level Bayesian Designs on (EC_{30}, EC_{70})

| <i>Prior</i> | $p_1=p_2$ | x_1 | x_2 | p_c | RE_{EXP} | E_{EXP} | RE_{LIN} | E_{LIN} | RE_{TRA} | E_{TRA} |
|-------------------------------------|-----------------------------|-------------------------|-------------------------|-------------------------|------------------------------|-----------------------------|------------------------------|-----------------------------|------------------------------|-----------------------------|
| $(0.\bar{3}, 0.\bar{3}, 0.\bar{3})$ | 0.3045 | EC_{30} | EC_{70} | 0.3910 | 99.91% | 91.37% | 99.90% | 63.73% | 100% | 84.33% |
| $(0.6, 0.3, 0.1)$ | 0.3005 | EC_{30} | EC_{70} | 0.3990 | 99.96% | 91.41% | 99.83% | 63.69% | 99.99% | 84.32% |
| $(0.8, 0.15, 0.05)$ | 0.2961 | EC_{30} | EC_{70} | 0.4078 | 99.99% | 91.44% | 99.74% | 63.63% | 99.96% | 84.29% |
| $(0.15, 0.8, 0.05)$ | 0.3135 | EC_{30} | EC_{70} | 0.3730 | 99.73% | 91.20% | 99.99% | 63.79% | 99.96% | 84.29% |
| $(0.05, 0.15, 0.8)$ | 0.3062 | EC_{30} | EC_{70} | 0.3876 | 99.88% | 91.34% | 99.92% | 63.74% | 99.94% | 84.33% |

Table D3. D-optimal Three Level Bayesian Designs on ($EC_{0.05}$, EC_{100})

| <i>Prior</i> | $p_1=p_2$ | x_1 | x_2 | p_c | RE_{EXP} | E_{EXP} | RE_{LIN} | E_{LIN} | RE_{TRA} | E_{TRA} |
|---------------------------------------|-----------------------------|-------------------------|-------------------------|-------------------------|------------------------------|-----------------------------|------------------------------|-----------------------------|------------------------------|-----------------------------|
| ($\bar{0.3}, \bar{0.3}, \bar{0.3}$) | 0.2889 | EC ₁₀ | EC ₅₀ | 0.4222 | 97.95% | 87.99% | 99.82% | 85.94% | 99.99% | 84.09% |
| (0.6,0.3,0.1) | 0.2835 | EC ₁₀ | EC ₅₀ | 0.4330 | 98.09% | 88.12% | 99.59% | 85.75% | 99.93% | 84.04% |
| (0.8,0.15,0.05) | 0.2781 | EC ₁₀ | EC ₅₀ | 0.4438 | 98.09% | 88.12% | 99.59% | 85.75% | 99.93% | 84.04% |
| (0.15,0.8,0.05) | 0.3011 | EC ₁₀ | EC ₅₀ | 0.3978 | 97.62% | 87.70% | 99.98% | 86.07% | 99.94% | 84.04% |
| (0.05,0.15,0.8) | 0.3025 | EC ₁₀ | EC ₅₀ | 0.3950 | 97.90% | 87.93% | 99.87% | 85.98% | 100% | 84.09% |