**TABLE S1** Hypred Mid Tier, Reverse, SD=1 ME=0, Estimated Betas

| | | Linreg | MSS | LRSOE | MiniPred | Mini+alg |
|---|---|---|---|---|---|---|
| Sensitivity | | | | | | |
| | Mean (95% CI) | 89.8% (83.1%, 94.4%) | 90.6% (84.1%, 95%) | 91.3% (85%, 95.6%) | 100% (97.1%, 100%) | 100% (97.1%, 100%) |
| Efficiency | | | | | | |
| | Mean (95% CI) | 78.9% (78.3%, 79.6%) | 78.6% (78%, 79.3%) | 78.7% (78%, 79.3%) | 84.2% (83.6%, 84.8%) | 84.4% (83.8%, 84.9%) |
| | Median (Q1, Q3) | 79% (79%, 80%) | 79% (78%, 80%) | 79% (78%, 80%) | 85.5% (81%, 90%) | 86% (81%, 90%) |
| | Min, Max | 73%, 80% | 73%, 80% | 72%, 80% | 70%, 90% | 64%, 90% |
| Rounds | | | | | | |
| | Mean (95% CI) | 1.8 (1.7, 1.9) | 1.6 (1.5, 1.7) | 1.6 (1.5, 1.7) | 5.1 (4.6, 5.7) | 5 (4.5, 5.6) |
| | Median (Q1, Q3) | 2 (1, 2) | 2 (1, 2) | 2 (1, 2) | 5 (1, 8) | 5 (1, 8) |
| | Min, Max | 1, 5 | 1, 3 | 1, 3 | 1, 11 | 1, 11 |

**TABLE S2** Hypred Mid Tier, Reverse, SD=1 ME=0.025, Estimated Betas

| | | Linreg | MSS | LRSOE | MiniPred | Mini+alg |
|---|---|---|---|---|---|---|
| Sensitivity | | | | | | |
| | Mean (95% CI) | 91.9% (85.7%, 96.1%) | 94.4% (88.7%, 97.7%) | 93.5% (87.7%, 97.2%) | 96.8% (91.9%, 99.1%) | 96% (90.8%, 98.7%) |
| Efficiency | | | | | | |
| | Mean (95% CI) | 79% (78.3%, 79.6%) | 78.6% (77.9%, 79.3%) | 78.7% (78%, 79.4%) | 84.3% (83.7%, 84.9%) | 84.7% (84.2%, 85.3%) |
| | Median (Q1, Q3) | 79% (79%, 80%) | 79% (78%, 80%) | 79% (78%, 80%) | 85% (81%, 90%) | 86% (81.2%, 90%) |
| | Min, Max | 73%, 80% | 73%, 80% | 72%, 80% | 71%, 90% | 64%, 90% |
| Rounds | | | | | | |
| | Mean (95% CI) | 1.8 (1.7, 1.9) | 1.6 (1.5, 1.7) | 1.6 (1.5, 1.7) | 5.2 (4.6, 5.7) | 4.7 (4.2, 5.3) |
| | Median (Q1, Q3) | 2 (1, 2) | 2 (1, 2) | 2 (1, 2) | 5 (1, 8) | 4 (1, 8) |
| | Min, Max | 1, 5 | 1, 3 | 1, 3 | 1, 11 | 1, 11 |

**TABLE S3** Hypred Mid Tier, Reverse, SD=1 ME=0.05, Estimated Betas

|  |  | Linreg | MSS | LRSOE | MiniPred | Mini+alg |
|---|---|---|---|---|---|---|
| Sensitivity |  |  |  |  |  |  |
|  | Mean (95% CI) | 86% (78.5%, 91.6%) | 90.9% (84.3%, 95.4%) | 90.1% (83.3%, 94.8%) | 93.4% (87.4%, 97.1%) | 95.9% (90.6%, 98.6%) |
| Efficiency |  |  |  |  |  |  |
|  | Mean (95% CI) | 79% (78.3%, 79.6%) | 78.6% (77.9%, 79.3%) | 78.7% (78%, 79.3%) | 84.1% (83.5%, 84.7%) | 84.6% (84%, 85.1%) |
|  | Median (Q1, Q3) | 79% (79%, 80%) | 79% (78%, 80%) | 79% (78%, 80%) | 85% (80%, 90%) | 86% (82%, 90%) |
|  | Min, Max | 73%, 80% | 73%, 80% | 70%, 80% | 64%, 90% | 60%, 90% |
| Rounds |  |  |  |  |  |  |
|  | Mean (95% CI) | 1.8 (1.6, 1.9) | 1.6 (1.5, 1.7) | 1.6 (1.5, 1.7) | 5.4 (4.8, 6) | 4.9 (4.3, 5.4) |
|  | Median (Q1, Q3) | 2 (1, 2) | 2 (1, 2) | 2 (1, 2) | 6 (1, 8.75) | 4 (1, 8) |
|  | Min, Max | 1, 4 | 1, 4 | 1, 3 | 1, 11 | 1, 11 |

**TABLE S4** Hypred Mid Tier, Reverse, SD=1 ME=0.075, Estimated Betas

|  |  | Linreg | MSS | LRSOE | MiniPred | Mini+alg |
|---|---|---|---|---|---|---|
| Sensitivity |  |  |  |  |  |  |
|  | Mean (95% CI) | 78.9% (70.6%, 85.7%) | 82.1% (74.2%, 88.4%) | 81.3% (73.3%, 87.8%) | 89.4% (82.6%, 94.3%) | 88.6% (81.6%, 93.6%) |
| Efficiency |  |  |  |  |  |  |
|  | Mean (95% CI) | 79% (78.4%, 79.7%) | 78.7% (78%, 79.4%) | 78.7% (78.1%, 79.4%) | 84.2% (83.6%, 84.8%) | 84.5% (83.9%, 85.1%) |
|  | Median (Q1, Q3) | 79% (79%, 80%) | 79% (78%, 80%) | 79% (78%, 80%) | 85% (81%, 90%) | 86% (82%, 90%) |
|  | Min, Max | 73%, 80% | 72%, 80% | 70%, 80% | 64%, 90% | 60%, 90% |
| Rounds |  |  |  |  |  |  |
|  | Mean (95% CI) | 1.7 (1.6, 1.9) | 1.6 (1.5, 1.7) | 1.6 (1.5, 1.7) | 5.2 (4.7, 5.8) | 4.9 (4.3, 5.5) |
|  | Median (Q1, Q3) | 2 (1, 2) | 2 (1, 2) | 2 (1, 2) | 5 (1, 8) | 4 (1, 8) |
|  | Min, Max | 1, 5 | 1, 4 | 1, 3 | 1, 11 | 1, 11 |

**TABLE S5** Hypred Mid Tier, Reverse, SD=1 ME=0.1, Estimated Betas

|  | Linreg | MSS | LRSOE | MiniPred | Mini+alg |
|---|---|---|---|---|---|
| Sensitivity |  |  |  |  |  |
| Mean (95% CI) | 72.7% (63.9%, 80.4%) | 75.2% (66.5%, 82.6%) | 74.4% (65.6%, 81.9%) | 85.1% (77.5%, 90.9%) | 86% (78.5%, 91.6%) |
| Efficiency |  |  |  |  |  |
| Mean (95% CI) | 79.1% (78.4%, 79.7%) | 78.7% (78.1%, 79.4%) | 78.8% (78.1%, 79.4%) | 84% (83.5%, 84.6%) | 84.3% (83.8%, 84.9%) |
| Median (Q1, Q3) | 79% (79%, 80%) | 79% (78%, 80%) | 79% (78%, 80%) | 85% (81%, 90%) | 86% (81.2%, 90%) |
| Min, Max | 72%, 80% | 69%, 80% | 70%, 80% | 60%, 90% | 60%, 90% |
| Rounds |  |  |  |  |  |
| Mean (95% CI) | 1.7 (1.6, 1.9) | 1.6 (1.5, 1.7) | 1.6 (1.5, 1.7) | 5.3 (4.7, 5.9) | 5 (4.4, 5.6) |
| Median (Q1, Q3) | 2 (1, 2) | 2 (1, 2) | 2 (1, 2) | 5 (1, 9) | 4.5 (1, 8) |
| Min, Max | 1, 5 | 1, 4 | 1, 3 | 1, 11 | 1, 11 |

**TABLE S6** Hypred Mid Tier, Reverse, SD=1 ME=0.125, Estimated Betas

|  | Linreg | MSS | LRSOE | MiniPred | Mini+alg |
|---|---|---|---|---|---|
| Sensitivity |  |  |  |  |  |
| Mean (95% CI) | 69.1% (60.1%, 77.1%) | 71.5% (62.7%, 79.3%) | 70.7% (61.9%, 78.6%) | 80.5% (72.4%, 87.1%) | 82.1% (74.2%, 88.4%) |
| Efficiency |  |  |  |  |  |
| Mean (95% CI) | 79.1% (78.4%, 79.7%) | 78.7% (78.1%, 79.4%) | 78.8% (78.1%, 79.4%) | 84.1% (83.5%, 84.7%) | 84.3% (83.7%, 84.9%) |
| Median (Q1, Q3) | 79% (79%, 80%) | 79% (78%, 80%) | 79% (78%, 80%) | 85.5% (80.3%, 90%) | 86% (81.2%, 90%) |
| Min, Max | 71%, 80% | 69%, 80% | 70%, 80% | 60%, 90% | 60%, 90% |
| Rounds |  |  |  |  |  |
| Mean (95% CI) | 1.7 (1.6, 1.9) | 1.6 (1.5, 1.7) | 1.6 (1.5, 1.7) | 5.3 (4.7, 5.9) | 5 (4.4, 5.7) |
| Median (Q1, Q3) | 2 (1, 2) | 2 (1, 2) | 2 (1, 2) | 5 (1, 9) | 4 (1, 8.75) |
| Min, Max | 1, 5 | 1, 5 | 1, 4 | 1, 11 | 1, 11 |

**TABLE S7** Hypred Mid Tier, Reverse, SD=1 ME=0.15, Estimated Betas

|  | | Linreg | MSS | LRSOE | MiniPred | Mini+alg |
|---|---|---|---|---|---|---|
| Sensitivity | | | | | | |
| | Mean (95% CI) | 64% (54.9%, 72.4%) | 66.4% (57.4%, 74.6%) | 65.6% (56.6%, 73.9%) | 76.8% (68.4%, 83.9%) | 78.4% (70.2%, 85.3%) |
| Efficiency | | | | | | |
| | Mean (95% CI) | 79.1% (78.4%, 79.7%) | 78.7% (78%, 79.3%) | 78.7% (78.1%, 79.4%) | 83.7% (83.1%, 84.3%) | 84.1% (83.5%, 84.6%) |
| | Median (Q1, Q3) | 79% (79%, 80%) | 79% (78%, 80%) | 79% (78%, 80%) | 85% (80%, 90%) | 86% (81%, 90%) |
| | Min, Max | 71%, 80% | 69%, 80% | 70%, 80% | 59%, 90% | 56%, 90% |
| Rounds | | | | | | |
| | Mean (95% CI) | 1.7 (1.6, 1.8) | 1.6 (1.5, 1.7) | 1.6 (1.5, 1.7) | 5.4 (4.8, 6) | 5 (4.4, 5.6) |
| | Median (Q1, Q3) | 2 (1, 2) | 2 (1, 2) | 2 (1, 2) | 5 (1, 9) | 4 (1, 8.75) |
| | Min, Max | 1, 5 | 1, 5 | 1, 4 | 1, 11 | 1, 11 |

**TABLE S8** Hypred Mid Tier, Reverse, SD=1 ME=0.175, Estimated Betas

|  | | Linreg | MSS | LRSOE | MiniPred | Mini+alg |
|---|---|---|---|---|---|---|
| Sensitivity | | | | | | |
| | Mean (95% CI) | 58.6% (49.6%, 67.2%) | 61.7% (52.7%, 70.2%) | 60.9% (51.9%, 69.4%) | 72.7% (64.1%, 80.2%) | 75% (66.6%, 82.2%) |
| Efficiency | | | | | | |
| | Mean (95% CI) | 79.1% (78.4%, 79.7%) | 78.7% (78%, 79.3%) | 78.7% (78%, 79.4%) | 83.5% (82.9%, 84.1%) | 84% (83.4%, 84.6%) |
| | Median (Q1, Q3) | 79% (79%, 80%) | 79% (78%, 80%) | 79% (78%, 80%) | 86% (80%, 90%) | 87% (81%, 90%) |
| | Min, Max | 69%, 80% | 69%, 80% | 68%, 80% | 52%, 90% | 54%, 90% |
| Rounds | | | | | | |
| | Mean (95% CI) | 1.7 (1.6, 1.8) | 1.6 (1.5, 1.7) | 1.6 (1.5, 1.7) | 5.3 (4.7, 5.9) | 4.9 (4.3, 5.5) |
| | Median (Q1, Q3) | 2 (1, 2) | 2 (1, 2) | 2 (1, 2) | 5 (1, 9) | 4 (1, 8) |
| | Min, Max | 1, 6 | 1, 5 | 1, 4 | 1, 11 | 1, 11 |

**TABLE S9** Hypred Mid Tier, Reverse, SD=1 ME=0.2, Estimated Betas

|  | | Linreg | MSS | LRSOE | MiniPred | Mini+alg |
|---|---|---|---|---|---|---|
| Sensitivity | | | | | | |
| | Mean (95% CI) | 57% (48%, 65.7%) | 60.2% (51.1%, 68.7%) | 60.2% (51.1%, 68.7%) | 68% (59.1%, 75.9%) | 71.1% (62.4%, 78.8%) |
| Efficiency | | | | | | |
| | Mean (95% CI) | 79% (78.4%, 79.7%) | 78.6% (78%, 79.3%) | 78.7% (78%, 79.3%) | 83.4% (82.8%, 84%) | 83.9% (83.3%, 84.5%) |
| | Median (Q1, Q3) | 80% (79%, 80%) | 80% (78%, 80%) | 80% (78%, 80%) | 86% (80%, 90%) | 87% (81.2%, 90%) |
| | Min, Max | 67%, 80% | 68%, 80% | 67%, 80% | 46%, 90% | 50%, 90% |
| Rounds | | | | | | |
| | Mean (95% CI) | 1.7 (1.5, 1.8) | 1.5 (1.4, 1.6) | 1.6 (1.5, 1.7) | 5.2 (4.6, 5.9) | 4.8 (4.2, 5.4) |
| | Median (Q1, Q3) | 1 (1, 2) | 1 (1, 2) | 1 (1, 2) | 5 (1, 9) | 3.5 (1, 8) |
| | Min, Max | 1, 6 | 1, 5 | 1, 4 | 1, 11 | 1, 11 |

**TABLE S10** Hypred Mid Tier, Reverse, SD=1 ME=0.225, Estimated Betas

|  | | Linreg | MSS | LRSOE | MiniPred | Mini+alg |
|---|---|---|---|---|---|---|
| Sensitivity | | | | | | |
| | Mean (95% CI) | 50% (41.2%, 58.8%) | 53% (44.2%, 61.7%) | 52.2% (43.4%, 60.9%) | 64.2% (55.4%, 72.3%) | 68.7% (60.1%, 76.4%) |
| Efficiency | | | | | | |
| | Mean (95% CI) | 79% (78.4%, 79.7%) | 78.7% (78%, 79.3%) | 78.7% (78%, 79.3%) | 83.2% (82.6%, 83.8%) | 83.6% (83%, 84.2%) |
| | Median (Q1, Q3) | 80% (79%, 80%) | 80% (78%, 80%) | 80% (78%, 80%) | 86% (80%, 90%) | 87% (82%, 90%) |
| | Min, Max | 67%, 80% | 68%, 80% | 64%, 80% | 44%, 90% | 48%, 90% |
| Rounds | | | | | | |
| | Mean (95% CI) | 1.7 (1.5, 1.8) | 1.5 (1.4, 1.7) | 1.5 (1.4, 1.6) | 5.3 (4.6, 5.9) | 4.9 (4.3, 5.6) |
| | Median (Q1, Q3) | 1 (1, 2) | 1 (1, 2) | 1 (1, 2) | 5 (1, 9.75) | 4 (1, 9) |
| | Min, Max | 1, 6 | 1, 5 | 1, 4 | 1, 11 | 1, 11 |

**TABLE S11** Hypred Mid Tier, Reverse, SD=1 ME=0.25, Estimated betas

| | | Linreg | MSS | LRSOE | MiniPred | Mini+alg |
|---|---|---|---|---|---|---|
| Sensitivity | | | | | | |
| | Mean (95% CI) | 45.9% (37.6%, 54.3%) | 47.9% (39.6%, 56.4%) | 47.3% (38.9%, 55.7%) | 61.6% (53.2%, 69.6%) | 63.7% (55.3%, 71.5%) |
| Efficiency | | | | | | |
| | Mean (95% CI) | 79.1% (78.4%, 79.7%) | 78.7% (78%, 79.4%) | 78.7% (78.1%, 79.4%) | 82.9% (82.3%, 83.5%) | 83.3% (82.7%, 83.9%) |
| | Median (Q1, Q3) | 80% (79%, 80%) | 80% (78%, 80%) | 80% (78%, 80%) | 86% (80%, 90%) | 87% (80%, 90%) |
| | Min, Max | 63%, 80% | 63%, 80% | 62%, 80% | 40%, 90% | 41%, 90% |
| Rounds | | | | | | |
| | Mean (95% CI) | 1.6 (1.5, 1.8) | 1.5 (1.4, 1.7) | 1.5 (1.4, 1.6) | 5.4 (4.7, 6.1) | 5 (4.3, 5.6) |
| | Median (Q1, Q3) | 1 (1, 2) | 1 (1, 2) | 1 (1, 2) | 5 (1, 10) | 4 (1, 9) |
| | Min, Max | 1, 6 | 1, 6 | 1, 4 | 1, 11 | 1, 11 |

**TABLE S12** Hypred Mid Tier, Reverse, SD=1 ME=0.5, Estimated betas

| | | Linreg | MSS | LRSOE | MiniPred | Mini+alg |
|---|---|---|---|---|---|---|
| Sensitivity | | | | | | |
| | Mean (95% CI) | 23.5% (18.1%, 29.5%) | 25.7% (20.1%, 31.9%) | 24.3% (18.9%, 30.5%) | 48.2% (41.6%, 55%) | 47.8% (41.1%, 54.5%) |
| Efficiency | | | | | | |
| | Mean (95% CI) | 78.3% (77.6%, 78.9%) | 77.9% (77.2%, 78.5%) | 77.8% (77.1%, 78.5%) | 78% (77.3%, 78.7%) | 78.3% (77.7%, 79%) |
| | Median (Q1, Q3) | 80% (79%, 80%) | 80% (78%, 80%) | 80% (78%, 80%) | 87.5% (72.2%, 90%) | 87% (73.2%, 90%) |
| | Min, Max | 31%, 80% | 29%, 80% | 31%, 80% | -5%, 90% | -6%, 90% |
| Rounds | | | | | | |
| | Mean (95% CI) | 1.9 (1.6, 2.2) | 1.6 (1.4, 1.8) | 1.5 (1.3, 1.6) | 5.3 (4.6, 6.1) | 5.2 (4.5, 5.9) |
| | Median (Q1, Q3) | 1 (1, 2) | 1 (1, 2) | 1 (1, 2) | 3 (1, 11) | 4 (1, 11) |
| | Min, Max | 1, 13 | 1, 12 | 1, 7 | 1, 11 | 1, 11 |

**TABLE S13** Hypred Mid Tier, Reverse, SD=1 ME=0.75, Estimated betas

| | | Linreg | MSS | LRSOE | MiniPred | Mini+alg |
|---|---|---|---|---|---|---|
| **Sensitivity** | | | | | | |
| | Mean (95% CI) | 13.9% (10.6%, 17.8%) | 15.5% (12%, 19.5%) | 15.5% (12%, 19.5%) | 32.8% (28.1%, 37.8%) | 34.1% (29.4%, 39.1%) |
| **Efficiency** | | | | | | |
| | Mean (95% CI) | 76.7% (76%, 77.3%) | 76.2% (75.5%, 76.9%) | 75.7% (75%, 76.4%) | 73.4% (72.7%, 74.1%) | 73.7% (73%, 74.4%) |
| | Median (Q1, Q3) | 80% (79%, 80%) | 80% (77.2%, 80%) | 80% (77.2%, 80%) | 88% (67.5%, 90%) | 88% (67.5%, 90%) |
| | Min, Max | -20%, 80% | -20%, 80% | -20%, 80% | -10%, 90% | -10%, 90% |
| **Rounds** | | | | | | |
| | Mean (95% CI) | 2.3 (1.8, 2.9) | 1.9 (1.5, 2.4) | 1.7 (1.4, 1.9) | 5.3 (4.6, 6) | 5.4 (4.6, 6.1) |
| | Median (Q1, Q3) | 1 (1, 2) | 1 (1, 2) | 1 (1, 2) | 2.5 (1, 11) | 3 (1, 11) |
| | Min, Max | 1, 28 | 1, 22 | 1, 10 | 1, 11 | 1, 11 |

**TABLE S14** Hypred Low Tier, Reverse, SD=1 ME=0, Estimated Betas

| | | Linreg | MSS | LRSOE | MiniPred | Mini+alg |
|---|---|---|---|---|---|---|
| **Sensitivity** | | | | | | |
| | Mean (95% CI) | 97.6% (97%, 98.2%) | 97.3% (96.6%, 97.8%) | 98.3% (97.7%, 98.7%) | 100% (99.9%, 100%) | 100% (99.9%, 100%) |
| **Efficiency** | | | | | | |
| | Mean (95% CI) | 55.7% (55.1%, 56.2%) | 64.1% (63.5%, 64.6%) | 51.6% (51%, 52.2%) | 28.4% (27.9%, 28.9%) | 48.4% (47.8%, 48.9%) |
| | Median (Q1, Q3) | 56% (50%, 62%) | 65% (61%, 68.2%) | 53% (45.8%, 60%) | 30% (19%, 38%) | 49% (40.8%, 57%) |
| | Min, Max | 29%, 75% | 41%, 76% | 20%, 74% | -6%, 70% | 18%, 78% |
| **Rounds** | | | | | | |
| | Mean (95% CI) | 7.1 (6.9, 7.3) | 4.8 (4.6, 4.9) | 4.4 (4.3, 4.5) | 11 (11, 11) | 10.4 (10.3, 10.5) |
| | Median (Q1, Q3) | 7 (6, 8) | 5 (4, 6) | 4 (4, 5) | 11 (11, 11) | 11 (10, 11) |
| | Min, Max | 3, 12 | 2, 9 | 2, 7 | 11, 11 | 6, 11 |

**TABLE S15** Hypred Low Tier, Reverse, SD=1 ME=0.025, Estimated Betas

| | | **Linreg** | **MSS** | **LRSOE** | **MiniPred** | **Mini+alg** |
|---|---|---|---|---|---|---|
| Sensitivity | | | | | | |
| | Mean (95% CI) | 91.4% (90.3%, 92.4%) | 89.9% (88.6%, 91%) | 92.9% (91.9%, 93.9%) | 98.2% (97.6%, 98.6%) | 97% (96.3%, 97.6%) |
| Efficiency | | | | | | |
| | Mean (95% CI) | 53.8% (53.2%, 54.4%) | 60.2% (59.7%, 60.8%) | 49.5% (49%, 50.1%) | 28.6% (28.1%, 29.1%) | 46.5% (45.9%, 47%) |
| | Median (Q1, Q3) | 55% (47%, 62%) | 62% (55%, 67%) | 50% (42%, 58%) | 29% (19%, 38%) | 47% (38.7%, 55%) |
| | Min, Max | 12%, 74% | 16%, 77% | 12%, 75% | -8%, 71% | 9%, 76% |
| Rounds | | | | | | |
| | Mean (95% CI) | 8 (7.7, 8.3) | 5.6 (5.4, 5.9) | 4.8 (4.6, 4.9) | 11 (11, 11) | 10.6 (10.5, 10.7) |
| | Median (Q1, Q3) | 8 (6, 10) | 5 (4, 7) | 5 (4, 5) | 11 (11, 11) | 11 (10, 11) |
| | Min, Max | 3, 17 | 2, 14 | 2, 8 | 11, 11 | 6, 11 |

**TABLE S16** Hypred Low Tier, Reverse, SD=1 ME=0.05, Estimated Betas

| | | **Linreg** | **MSS** | **LRSOE** | **MiniPred** | **Mini+alg** |
|---|---|---|---|---|---|---|
| Sensitivity | | | | | | |
| | Mean (95% CI) | 88.1% (86.8%, 89.3%) | 86.6% (85.2%, 87.8%) | 90.2% (89%, 91.3%) | 96.3% (95.5%, 97%) | 95.5% (94.6%, 96.3%) |
| Efficiency | | | | | | |
| | Mean (95% CI) | 52.8% (52.2%, 53.4%) | 59.1% (58.5%, 59.6%) | 48.8% (48.2%, 49.4%) | 28.6% (28.1%, 29.1%) | 45.4% (44.9%, 46%) |
| | Median (Q1, Q3) | 54.5% (45%, 62%) | 60% (53%, 67%) | 49% (40%, 59%) | 29% (19%, 38%) | 45.5% (37%, 55%) |
| | Min, Max | 12%, 73% | 16%, 77% | 12%, 75% | -9%, 70% | 0%, 76% |
| Rounds | | | | | | |
| | Mean (95% CI) | 8.4 (8.1, 8.7) | 5.9 (5.6, 6.1) | 4.9 (4.8, 5) | 11 (11, 11) | 10.6 (10.5, 10.7) |
| | Median (Q1, Q3) | 8 (6, 10) | 6 (4, 7) | 5 (4, 6) | 11 (11, 11) | 11 (11, 11) |
| | Min, Max | 3, 18 | 2, 15 | 2, 8 | 11, 11 | 6, 11 |

**TABLE S17** Hypred Low Tier, Reverse, SD=1 ME=0.075, Estimated Betas

| | Linreg | MSS | LRSOE | MiniPred | Mini+alg |
|---|---|---|---|---|---|
| Sensitivity | | | | | |
| Mean (95% CI) | 86.3% (84.9%, 87.6%) | 84% (82.6%, 85.4%) | 88.5% (87.2%, 89.7%) | 94.5% (93.6%, 95.4%) | 94.2% (93.2%, 95%) |
| Efficiency | | | | | |
| Mean (95% CI) | 52.4% (51.8%, 53%) | 58% (57.5%, 58.6%) | 48.3% (47.7%, 48.9%) | 28.7% (28.2%, 29.3%) | 44.7% (44.1%, 45.3%) |
| Median (Q1, Q3) | 54% (44%, 61%) | 61% (51%, 67%) | 49% (40%, 58%) | 29% (18%, 39%) | 45% (35%, 56%) |
| Min, Max | 12%, 74% | 16%, 76% | 4%, 75% | -9%, 70% | -2%, 74% |
| Rounds | | | | | |
| Mean (95% CI) | 8.6 (8.3, 8.9) | 6.1 (5.8, 6.4) | 5 (4.9, 5.1) | 11 (11, 11) | 10.6 (10.5, 10.7) |
| Median (Q1, Q3) | 8 (6, 10) | 6 (4, 8) | 5 (4, 6) | 11 (11, 11) | 11 (11, 11) |
| Min, Max | 3, 16 | 2, 15 | 2, 8 | 10, 11 | 6, 11 |

**TABLE S18** Hypred Low Tier, Reverse, SD=1 ME=0.1, Estimated Betas

| | Linreg | MSS | LRSOE | MiniPred | Mini+alg |
|---|---|---|---|---|---|
| Sensitivity | | | | | |
| Mean (95% CI) | 84.3% (82.9%, 85.7%) | 82.4% (80.9%, 83.8%) | 86.9% (85.6%, 88.2%) | 93.3% (92.3%, 94.3%) | 93.1% (92.1%, 94.1%) |
| Efficiency | | | | | |
| Mean (95% CI) | 52.1% (51.5%, 52.6%) | 57.6% (57.1%, 58.2%) | 48.2% (47.6%, 48.8%) | 28.7% (28.2%, 29.2%) | 43.8% (43.3%, 44.4%) |
| Median (Q1, Q3) | 54% (43%, 62%) | 60% (50%, 67%) | 49% (39.8%, 58%) | 29% (18%, 39%) | 44% (33%, 56%) |
| Min, Max | 3%, 74% | 7%, 77% | -4%, 75% | -9%, 70% | -2%, 76% |
| Rounds | | | | | |
| Mean (95% CI) | 8.8 (8.4, 9.1) | 6.2 (5.9, 6.5) | 5 (4.8, 5.1) | 11 (11, 11) | 10.6 (10.5, 10.7) |
| Median (Q1, Q3) | 8 (7, 10) | 6 (4, 8) | 5 (4, 6) | 11 (11, 11) | 11 (11, 11) |
| Min, Max | 3, 19 | 2, 16 | 2, 9 | 10, 11 | 6, 11 |

**TABLE S19** Hypred Low Tier, Reverse, SD=1 ME=0.125, Estimated Betas

|  | | Linreg | MSS | LRSOE | MiniPred | Mini+alg |
|---|---|---|---|---|---|---|
| **Sensitivity** | | | | | | |
| | Mean (95% CI) | 83.5% (82%, 84.9%) | 81% (79.4%, 82.4%) | 85.3% (83.9%, 86.6%) | 92% (90.9%, 93%) | 91.9% (90.8%, 92.9%) |
| **Efficiency** | | | | | | |
| | Mean (95% CI) | 52% (51.4%, 52.5%) | 57.4% (56.9%, 58%) | 47.9% (47.4%, 48.5%) | 28.8% (28.3%, 29.3%) | 43.3% (42.8%, 43.9%) |
| | Median (Q1, Q3) | 54% (44%, 62%) | 61% (49%, 67%) | 50% (38%, 58%) | 29% (18%, 40%) | 43% (32%, 57%) |
| | Min, Max | -2%, 74% | 1%, 77% | -9%, 75% | -10%, 70% | -3%, 77% |
| **Rounds** | | | | | | |
| | Mean (95% CI) | 8.9 (8.5, 9.2) | 6.2 (5.9, 6.6) | 5 (4.9, 5.2) | 11 (11, 11) | 10.6 (10.5, 10.7) |
| | Median (Q1, Q3) | 8.5 (7, 11) | 6 (4, 8) | 5 (4, 6) | 11 (11, 11) | 11 (11, 11) |
| | Min, Max | 3, 21 | 2, 18 | 2, 9 | 10, 11 | 6, 11 |

**TABLE S20** Hypred Low Tier, Reverse, SD=1 ME=0.15, Estimated Betas

|  | | Linreg | MSS | LRSOE | MiniPred | Mini+alg |
|---|---|---|---|---|---|---|
| **Sensitivity** | | | | | | |
| | Mean (95% CI) | 81.5% (80%, 83%) | 79% (77.3%, 80.5%) | 83.8% (82.3%, 85.2%) | 90.5% (89.3%, 91.6%) | 90.6% (89.4%, 91.6%) |
| **Efficiency** | | | | | | |
| | Mean (95% CI) | 52% (51.5%, 52.6%) | 57.2% (56.7%, 57.8%) | 47.9% (47.3%, 48.5%) | 28.7% (28.2%, 29.2%) | 42.8% (42.3%, 43.4%) |
| | Median (Q1, Q3) | 54% (43%, 63%) | 61% (49.8%, 68%) | 50% (38%, 59%) | 29% (17%, 41%) | 43% (31%, 57%) |
| | Min, Max | -7%, 77% | 0%, 77% | -11%, 75% | -10%, 70% | -4%, 78% |
| **Rounds** | | | | | | |
| | Mean (95% CI) | 8.9 (8.5, 9.3) | 6.3 (6, 6.6) | 5.1 (4.9, 5.2) | 11 (11, 11) | 10.5 (10.4, 10.7) |
| | Median (Q1, Q3) | 9 (6, 11) | 6 (4, 8) | 5 (4, 6) | 11 (11, 11) | 11 (11, 11) |
| | Min, Max | 3, 22 | 2, 19 | 2, 9 | 10, 11 | 6, 11 |

**TABLE S21** Hypred Low Tier, Reverse, SD=1 ME=0.175, Estimated Betas

|  |  | Linreg | MSS | LRSOE | MiniPred | Mini+alg |
|---|---|---|---|---|---|---|
| Sensitivity |  |  |  |  |  |  |
|  | Mean (95% CI) | 79.4% (77.8%, 80.9%) | 77.4% (75.8%, 79%) | 82% (80.4%, 83.4%) | 88.8% (87.5%, 90%) | 89% (87.7%, 90.2%) |
| Efficiency |  |  |  |  |  |  |
|  | Mean (95% CI) | 52% (51.4%, 52.6%) | 56.8% (56.3%, 57.4%) | 47.8% (47.2%, 48.4%) | 28.7% (28.2%, 29.2%) | 42.4% (41.8%, 42.9%) |
|  | Median (Q1, Q3) | 54% (43%, 63%) | 61% (48.8%, 68%) | 50% (37%, 59%) | 29% (15%, 42%) | 43% (29.8%, 58%) |
|  | Min, Max | -11%, 78% | -11%, 77% | -14%, 76% | -10%, 70% | -10%, 79% |
| Rounds |  |  |  |  |  |  |
|  | Mean (95% CI) | 9 (8.6, 9.4) | 6.4 (6, 6.7) | 5 (4.9, 5.2) | 11 (11, 11) | 10.5 (10.4, 10.6) |
|  | Median (Q1, Q3) | 9 (6, 11) | 6 (4, 8.25) | 5 (4, 6) | 11 (11, 11) | 11 (11, 11) |
|  | Min, Max | 2, 24 | 2, 20 | 2, 10 | 9, 11 | 6, 11 |

**TABLE S22** Hypred Low Tier, Reverse, SD=1 ME=0.2, Estimated Betas

|  |  | Linreg | MSS | LRSOE | MiniPred | Mini+alg |
|---|---|---|---|---|---|---|
| Sensitivity |  |  |  |  |  |  |
|  | Mean (95% CI) | 78.2% (76.6%, 79.7%) | 76.1% (74.5%, 77.7%) | 80.8% (79.2%, 82.3%) | 87.6% (86.3%, 88.8%) | 87.7% (86.4%, 89%) |
| Efficiency |  |  |  |  |  |  |
|  | Mean (95% CI) | 51.9% (51.3%, 52.5%) | 56.7% (56.1%, 57.2%) | 48.1% (47.5%, 48.6%) | 28.7% (28.2%, 29.3%) | 42% (41.5%, 42.6%) |
|  | Median (Q1, Q3) | 54.5% (42%, 64%) | 61% (49%, 68%) | 50% (38%, 60%) | 28.5% (15%, 42%) | 42.5% (28%, 59%) |
|  | Min, Max | -16%, 78% | -15%, 77% | -17%, 77% | -10%, 75% | -10%, 80% |
| Rounds |  |  |  |  |  |  |
|  | Mean (95% CI) | 9.1 (8.7, 9.5) | 6.4 (6, 6.8) | 5 (4.8, 5.2) | 11 (11, 11) | 10.5 (10.4, 10.6) |
|  | Median (Q1, Q3) | 9 (7, 11) | 6 (4, 8) | 5 (4, 6) | 11 (11, 11) | 11 (11, 11) |
|  | Min, Max | 2, 25 | 2, 21 | 2, 11 | 9, 11 | 6, 11 |

**TABLE S23** Hypred Low Tier, Reverse, SD=1 ME=0.225, Estimated Betas

| | Linreg | MSS | LRSOE | MiniPred | Mini+alg |
|---|---|---|---|---|---|
| Sensitivity | | | | | |
| Mean (95% CI) | 76.3% (74.6%, 77.9%) | 74.9% (73.2%, 76.5%) | 79.4% (77.8%, 80.9%) | 86.3% (85%, 87.6%) | 86.5% (85.2%, 87.8%) |
| Efficiency | | | | | |
| Mean (95% CI) | 52% (51.5%, 52.6%) | 56.4% (55.9%, 57%) | 47.9% (47.4%, 48.5%) | 28.8% (28.3%, 29.3%) | 41.8% (41.2%, 42.4%) |
| Median (Q1, Q3) | 55% (41.8%, 65%) | 61% (47%, 68%) | 50% (37.8%, 60%) | 28% (14%, 43%) | 43% (27%, 59%) |
| Min, Max | -16%, 79% | -15%, 78% | -18%, 78% | -10%, 80% | -10%, 82% |
| Rounds | | | | | |
| Mean (95% CI) | 9.1 (8.7, 9.5) | 6.4 (6.1, 6.8) | 5 (4.8, 5.2) | 11 (11, 11) | 10.4 (10.3, 10.6) |
| Median (Q1, Q3) | 9 (6, 11) | 6 (4, 8) | 5 (4, 6) | 11 (11, 11) | 11 (11, 11) |
| Min, Max | 2, 26 | 2, 21 | 2, 11 | 9, 11 | 4, 11 |

**TABLE S24** Hypred Low Tier, Reverse, SD=1 ME=0.25, Estimated betas

| | Linreg | MSS | LRSOE | MiniPred | Mini+alg |
|---|---|---|---|---|---|
| Sensitivity | | | | | |
| Mean (95% CI) | 74.6% (72.9%, 76.2%) | 72.8% (71.1%, 74.5%) | 78% (76.3%, 79.5%) | 85.4% (84%, 86.7%) | 85.5% (84.1%, 86.8%) |
| Efficiency | | | | | |
| Mean (95% CI) | 52% (51.4%, 52.5%) | 56.5% (55.9%, 57%) | 47.9% (47.3%, 48.5%) | 28.9% (28.4%, 29.4%) | 41.6% (41.1%, 42.2%) |
| Median (Q1, Q3) | 55% (42.8%, 65%) | 61% (49%, 69%) | 50% (37.8%, 60%) | 28% (14%, 43%) | 44% (25.8%, 58.2%) |
| Min, Max | -20%, 79% | -20%, 78% | -20%, 78% | -10%, 81% | -10%, 87% |
| Rounds | | | | | |
| Mean (95% CI) | 9.2 (8.7, 9.6) | 6.4 (6, 6.8) | 5 (4.8, 5.2) | 11 (10.9, 11) | 10.4 (10.3, 10.6) |
| Median (Q1, Q3) | 9 (6, 11) | 6 (4, 8) | 5 (4, 6) | 11 (11, 11) | 11 (11, 11) |
| Min, Max | 2, 27 | 2, 22 | 2, 11 | 6, 11 | 3, 11 |

**TABLE S25** Hypred Low Tier, Reverse, SD=1 ME=0.5, Estimated betas

| | | Linreg | MSS | LRSOE | MiniPred | Mini+alg |
|---|---|---|---|---|---|---|
| Sensitivity | | | | | | |
| | Mean (95% CI) | 61.2% (59.4%, 62.9%) | 60.1% (58.3%, 61.9%) | 64.3% (62.5%, 66%) | 75.8% (74.2%, 77.3%) | 75.1% (73.5%, 76.6%) |
| Efficiency | | | | | | |
| | Mean (95% CI) | 52.2% (51.6%, 52.8%) | 55.4% (54.8%, 56%) | 47.7% (47.2%, 48.3%) | 30.2% (29.7%, 30.8%) | 40.9% (40.3%, 41.4%) |
| | Median (Q1, Q3) | 58.5% (38%, 70%) | 62% (44%, 72%) | 52% (35.8%, 65%) | 29% (8%, 49%) | 45.5% (20%, 64%) |
| | Min, Max | -20%, 80% | -20%, 80% | -20%, 80% | -10%, 90% | -10%, 90% |
| Rounds | | | | | | |
| | Mean (95% CI) | 9.3 (8.7, 9.9) | 6.6 (6.1, 7.1) | 4.8 (4.6, 5.1) | 10.8 (10.7, 10.9) | 10.1 (9.9, 10.3) |
| | Median (Q1, Q3) | 9 (5, 12) | 5 (3, 9) | 5 (3, 6) | 11 (11, 11) | 11 (11, 11) |
| | Min, Max | 1, 29 | 1, 22 | 1, 12 | 1, 11 | 1, 11 |

**TABLE S26** Hypred Low Tier, Reverse, SD=1 ME=0.75, Estimated betas

| | | Linreg | MSS | LRSOE | MiniPred | Mini+alg |
|---|---|---|---|---|---|---|
| Sensitivity | | | | | | |
| | Mean (95% CI) | 48.9% (47.2%, 50.6%) | 48.8% (47.1%, 50.5%) | 53.4% (51.7%, 55.1%) | 67.6% (66%, 69.2%) | 66.1% (64.4%, 67.7%) |
| Efficiency | | | | | | |
| | Mean (95% CI) | 53.1% (52.5%, 53.7%) | 55.1% (54.6%, 55.7%) | 48.3% (47.8%, 48.9%) | 32.7% (32.1%, 33.2%) | 41.9% (41.4%, 42.5%) |
| | Median (Q1, Q3) | 61% (38.2%, 75%) | 65% (43%, 75%) | 55% (32%, 70%) | 31% (4.8%, 58.5%) | 47% (13%, 72%) |
| | Min, Max | -20%, 80% | -20%, 80% | -20%, 80% | -10%, 90% | -10%, 90% |
| Rounds | | | | | | |
| | Mean (95% CI) | 9.1 (8.4, 9.8) | 6.7 (6.1, 7.3) | 4.7 (4.4, 5) | 10.5 (10.3, 10.7) | 9.7 (9.4, 10) |
| | Median (Q1, Q3) | 8 (4, 13) | 5 (2, 10) | 4 (3, 6) | 11 (11, 11) | 11 (10, 11) |
| | Min, Max | 1, 29 | 1, 22 | 1, 12 | 1, 11 | 1, 11 |