Table 4.2. Frequency of non-converged replications.

| N | TP | ICC | 0.3-0.7 | 0.4-0.6 |
| --- | --- | --- | --- | --- |
| 200 | 5 | 0.5 | 3 | 153 |
| 200 | 5 | 0.7 | 0 | 51 |
| 200 | 7 | 0.5 | 2 | 53 |
| 200 | 7 | 0.7 | 0 | 7 |
| 200 | 9 | 0.5 | 0 | 20 |
| 500 | 5 | 0.5 | 0 | 77 |
| 500 | 5 | 0.7 | 0 | 9 |
| 500 | 7 | 0.5 | 0 | 8 |
| 1,000 | 5 | 0.5 | 0 | 31 |
| 2,000 | 5 | 0.5 | 0 | 3 |

Table 4.3. Relative bias and MSE ratio between GBIT and cML for the means of growth intercept

|  | | | **0.05-0.95** | | | **0.1-0.9** | | | **0.2-0.8** | | | **0.3-0.7** | | | **0.4-0.6** | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | **rBias** | | **MSER** | **rBias** | | **MSER** | **rBias** | | **MSER** | **rBias** | | **MSER** | **rBias** | | **MSER** |
| **N** | **TP** | **ICC** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** |
| **200** | **5** | **0.5** | 0.002 | 0 | **0.486** | 0.009 | 0 | **0.092** | 0.048 | 0.000 | **0.021** | 0.107 | -0.001 | **0.018** | 0.165 | -0.003 | **0.026** |
| **0.7** | 0.000 | 0 | 2.296 | 0.004 | 0 | **0.314** | 0.039 | -0.001 | **0.030** | 0.099 | -0.003 | **0.020** | 0.163 | -0.005 | **0.028** |
| **7** | **0.5** | 0.001 | 0 | 1.172 | 0.005 | 0 | **0.296** | 0.042 | -0.001 | **0.023** | 0.127 | -0.002 | **0.011** | 0.225 | -0.004 | **0.015** |
| **0.7** | -0.002 | 0 | **0.617** | -0.004 | 0 | **0.360** | 0.023 | -0.001 | **0.085** | 0.107 | -0.003 | **0.017** | 0.217 | -0.009 | **0.020** |
| **9** | **0.5** | 0.000 | 0 | 2.380 | 0.001 | 0 | 1.232 | 0.031 | -0.001 | **0.035** | 0.129 | -0.002 | **0.010** | 0.271 | -0.006 | **0.012** |
| **0.7** | -0.003 | 0 | **0.248** | -0.010 | 0 | **0.082** | 0.004 | -0.001 | **0.536** | 0.099 | -0.004 | **0.024** | 0.255 | -0.011 | **0.017** |
| **500** | **5** | **0.5** | 0.002 | 0 | **0.242** | 0.009 | 0 | **0.038** | 0.048 | 0.000 | **0.009** | 0.106 | -0.001 | **0.006** | 0.165 | -0.001 | **0.009** |
| **0.7** | 0.000 | 0 | 1.557 | 0.004 | 0 | **0.158** | 0.038 | 0.000 | **0.012** | 0.100 | -0.001 | **0.007** | 0.163 | -0.003 | **0.009** |
| **7** | **0.5** | 0.001 | 0 | **0.759** | 0.005 | 0 | **0.115** | 0.042 | 0.000 | **0.009** | 0.127 | 0.000 | **0.004** | 0.224 | -0.002 | **0.006** |
| **0.7** | -0.002 | 0 | **0.313** | -0.004 | 0 | **0.175** | 0.023 | 0.000 | **0.026** | 0.107 | -0.002 | **0.006** | 0.217 | -0.005 | **0.006** |
| **9** | **0.5** | 0.000 | 0 | 2.326 | 0.001 | 0 | 1.134 | 0.031 | 0.000 | **0.015** | 0.130 | -0.001 | **0.004** | 0.271 | -0.002 | **0.004** |
| **0.7** | -0.003 | 0 | **0.106** | -0.010 | 0 | **0.030** | 0.004 | 0.000 | **0.306** | 0.098 | -0.002 | **0.007** | 0.255 | -0.006 | **0.006** |
| **1,000** | **5** | **0.5** | 0.002 | 0 | **0.127** | 0.009 | 0 | **0.019** | 0.048 | 0.000 | **0.004** | 0.107 | 0.000 | **0.003** | 0.165 | 0.000 | **0.004** |
| **0.7** | 0.000 | 0 | 1.626 | 0.004 | 0 | **0.072** | 0.039 | 0.000 | **0.006** | 0.099 | -0.001 | **0.003** | 0.163 | -0.001 | **0.004** |
| **7** | **0.5** | 0.001 | 0 | **0.489** | 0.005 | 0 | **0.057** | 0.042 | 0.000 | **0.004** | 0.127 | 0.000 | **0.002** | 0.225 | -0.001 | **0.003** |
| **0.7** | -0.002 | 0 | **0.165** | -0.004 | 0 | **0.084** | 0.023 | 0.000 | **0.012** | 0.107 | -0.001 | **0.003** | 0.217 | -0.002 | **0.003** |
| **9** | **0.5** | 0.000 | 0 | 2.317 | 0.001 | 0 | **0.850** | 0.030 | 0.000 | **0.006** | 0.130 | 0.000 | **0.002** | 0.271 | -0.002 | **0.002** |
| **0.7** | -0.003 | 0 | **0.052** | -0.010 | 0 | **0.014** | 0.004 | 0.000 | **0.184** | 0.098 | -0.001 | **0.003** | 0.254 | -0.003 | **0.002** |
| **2,000** | **5** | **0.5** | 0.002 | 0 | **0.065** | 0.009 | 0 | **0.010** | 0.048 | 0.000 | **0.002** | 0.107 | 0.000 | **0.002** | 0.165 | -0.001 | **0.002** |
| **0.7** | 0.000 | 0 | 1.193 | 0.004 | 0 | **0.040** | 0.039 | 0.000 | **0.003** | 0.099 | 0.000 | **0.002** | 0.163 | -0.001 | **0.002** |
| **7** | **0.5** | 0.001 | 0 | **0.246** | 0.005 | 0 | **0.033** | 0.042 | 0.000 | **0.002** | 0.127 | 0.000 | **0.001** | 0.225 | -0.001 | **0.001** |
| **0.7** | -0.002 | 0 | **0.092** | -0.004 | 0 | **0.045** | 0.023 | 0.000 | **0.006** | 0.107 | 0.000 | **0.001** | 0.217 | -0.001 | **0.001** |
| **9** | **0.5** | 0.000 | 0 | 2.105 | 0.001 | 0 | **0.541** | 0.030 | 0.000 | **0.003** | 0.130 | 0.000 | **0.001** | 0.271 | -0.001 | **0.001** |
| **0.7** | -0.003 | 0 | **0.028** | -0.010 | 0 | **0.007** | 0.004 | 0.000 | **0.108** | 0.098 | -0.001 | **0.002** | 0.254 | -0.002 | **0.001** |
| Note. N: sample size; TP: the number of timepoints; GBIT: generalized tobit estimator; cML: ML estimator with censored data | | | | | | | | | | | | | | | | | |

Table 4.4. Relative bias and MSE ratio between GBIT and cML for the means of growth slope

|  | | | **0.05-0.95** | | | **0.1-0.9** | | | **0.2-0.8** | | | **0.3-0.7** | | | **0.4-0.6** | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | **rBias** | | **MSER** | **rBias** | | **MSER** | **rBias** | | **MSER** | **rBias** | | **MSER** | **rBias** | | **MSER** |
| **N** | **TP** | **ICC** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** |
| **200** | **5** | **0.5** | -0.029 | 0.000 | **0.372** | -0.106 | 0.000 | **0.119** | -0.342 | -0.005 | **0.038** | -0.591 | -0.011 | **0.023** | -0.810 | -0.028 | **0.026** |
| **0.7** | -0.038 | -0.001 | **0.264** | -0.124 | -0.002 | **0.085** | -0.358 | -0.008 | **0.031** | -0.601 | -0.016 | **0.022** | -0.816 | -0.054 | **0.030** |
| **7** | **0.5** | -0.030 | 0.000 | **0.264** | -0.100 | -0.001 | **0.090** | -0.316 | -0.005 | **0.026** | -0.575 | -0.020 | **0.018** | -0.808 | -0.049 | **0.022** |
| **0.7** | -0.043 | -0.002 | **0.150** | -0.129 | -0.001 | **0.054** | -0.356 | -0.008 | **0.023** | -0.598 | -0.030 | **0.020** | -0.816 | -0.084 | **0.032** |
| **9** | **0.5** | -0.031 | 0.001 | **0.185** | -0.103 | 0.000 | **0.063** | -0.312 | -0.007 | **0.022** | -0.563 | -0.024 | **0.017** | -0.802 | -0.071 | **0.026** |
| **0.7** | -0.048 | -0.001 | **0.101** | -0.141 | -0.001 | **0.041** | -0.367 | -0.011 | **0.020** | -0.597 | -0.043 | **0.023** | -0.816 | -0.117 | **0.043** |
| **500** | **5** | **0.5** | -0.030 | 0.001 | **0.216** | -0.105 | 0.000 | **0.056** | -0.339 | -0.002 | **0.016** | -0.589 | -0.001 | **0.008** | -0.810 | -0.015 | **0.009** |
| **0.7** | -0.038 | -0.001 | **0.121** | -0.122 | 0.000 | **0.038** | -0.357 | -0.002 | **0.012** | -0.599 | -0.006 | **0.009** | -0.814 | -0.018 | **0.010** |
| **7** | **0.5** | -0.030 | 0.000 | **0.143** | -0.099 | 0.000 | **0.038** | -0.314 | 0.000 | **0.012** | -0.574 | -0.007 | **0.006** | -0.806 | -0.021 | **0.008** |
| **0.7** | -0.041 | 0.000 | **0.073** | -0.129 | -0.001 | **0.024** | -0.355 | -0.003 | **0.009** | -0.596 | -0.014 | **0.007** | -0.814 | -0.037 | **0.010** |
| **9** | **0.5** | -0.034 | -0.001 | **0.089** | -0.104 | 0.000 | **0.026** | -0.313 | -0.003 | **0.009** | -0.562 | -0.009 | **0.005** | -0.803 | -0.034 | **0.008** |
| **0.7** | -0.047 | 0.000 | **0.044** | -0.141 | -0.001 | **0.015** | -0.366 | -0.006 | **0.007** | -0.597 | -0.019 | **0.006** | -0.814 | -0.054 | **0.012** |
| **1,000** | **5** | **0.5** | -0.031 | 0.000 | **0.121** | -0.108 | -0.002 | **0.030** | -0.339 | -0.001 | **0.007** | -0.590 | -0.001 | **0.005** | -0.810 | -0.007 | **0.005** |
| **0.7** | -0.037 | 0.000 | **0.075** | -0.122 | 0.000 | **0.018** | -0.356 | 0.000 | **0.006** | -0.599 | -0.003 | **0.004** | -0.814 | -0.012 | **0.005** |
| **7** | **0.5** | -0.030 | 0.000 | **0.082** | -0.100 | 0.000 | **0.019** | -0.317 | -0.001 | **0.005** | -0.574 | -0.005 | **0.003** | -0.807 | -0.011 | **0.003** |
| **0.7** | -0.041 | 0.000 | **0.038** | -0.129 | -0.001 | **0.011** | -0.355 | -0.002 | **0.004** | -0.596 | -0.008 | **0.003** | -0.815 | -0.022 | **0.004** |
| **9** | **0.5** | -0.032 | 0.000 | **0.051** | -0.105 | -0.001 | **0.013** | -0.311 | -0.001 | **0.004** | -0.561 | -0.004 | **0.003** | -0.803 | -0.016 | **0.003** |
| **0.7** | -0.047 | 0.000 | **0.024** | -0.142 | -0.001 | **0.007** | -0.366 | -0.003 | **0.003** | -0.595 | -0.007 | **0.002** | -0.814 | -0.030 | **0.005** |
| **2,000** | **5** | **0.5** | -0.031 | 0.000 | **0.070** | -0.106 | 0.000 | **0.015** | -0.340 | -0.002 | **0.003** | -0.591 | -0.002 | **0.002** | -0.809 | 0.000 | **0.002** |
| **0.7** | -0.038 | 0.000 | **0.040** | -0.122 | 0.000 | **0.010** | -0.357 | 0.000 | **0.003** | -0.599 | -0.001 | **0.002** | -0.813 | -0.005 | **0.002** |
| **7** | **0.5** | -0.030 | 0.000 | **0.041** | -0.099 | 0.000 | **0.011** | -0.316 | -0.001 | **0.002** | -0.573 | -0.001 | **0.001** | -0.807 | -0.006 | **0.002** |
| **0.7** | -0.041 | 0.000 | **0.021** | -0.129 | -0.001 | **0.006** | -0.355 | 0.000 | **0.002** | -0.595 | -0.004 | **0.001** | -0.815 | -0.011 | **0.002** |
| **9** | **0.5** | -0.032 | 0.000 | **0.028** | -0.104 | 0.000 | **0.007** | -0.311 | 0.000 | **0.002** | -0.562 | -0.002 | **0.001** | -0.803 | -0.009 | **0.001** |
| **0.7** | -0.048 | 0.000 | **0.012** | -0.141 | 0.000 | **0.004** | -0.366 | -0.002 | **0.002** | -0.596 | -0.006 | **0.001** | -0.814 | -0.017 | **0.002** |
| Note. N: sample size; TP: the number of timepoints; GBIT: generalized tobit estimator; cML: ML estimator with censored data | | | | | | | | | | | | | | | | | |

Table 4.5. Relative bias and MSE ratio between GBIT and cML for the variances of growth intercepts

|  | | | **0.05-0.95** | | | **0.1-0.9** | | | **0.2-0.8** | | | **0.3-0.7** | | | **0.4-0.6** | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | **rBias** | | **MSER** | **rBias** | | **MSER** | **rBias** | | **MSER** | **rBias** | | **MSER** | **rBias** | | **MSER** |
| **N** | **TP** | **ICC** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** |
| **200** | **5** | **0.5** | 0.104 | -0.004 | **0.103** | 0.112 | -0.008 | **0.237** | -0.128 | -0.015 | **0.642** | -0.528 | -0.030 | **0.124** | -0.868 | -0.031 | **0.131** |
| **0.7** | 0.053 | -0.005 | **0.201** | 0.028 | -0.018 | 1.064 | -0.192 | -0.034 | **0.214** | -0.541 | -0.067 | **0.089** | -0.869 | -0.121 | **0.089** |
| **7** | **0.5** | 0.091 | -0.004 | **0.083** | 0.132 | -0.012 | **0.111** | -0.005 | -0.027 | 2.314 | -0.400 | -0.063 | **0.164** | -0.822 | -0.116 | **0.105** |
| **0.7** | 0.027 | -0.010 | **0.508** | 0.023 | -0.021 | 1.427 | -0.125 | -0.051 | **0.451** | -0.455 | -0.104 | **0.122** | -0.829 | -0.216 | **0.131** |
| **9** | **0.5** | 0.079 | -0.007 | **0.086** | 0.123 | -0.015 | **0.092** | 0.062 | -0.037 | **0.949** | -0.311 | -0.081 | **0.251** | -0.778 | -0.156 | **0.126** |
| **0.7** | 0.002 | -0.011 | 1.902 | -0.008 | -0.025 | 2.236 | -0.107 | -0.070 | **0.707** | -0.415 | -0.141 | **0.204** | -0.800 | -0.260 | **0.158** |
| **500** | **5** | **0.5** | 0.106 | 0.000 | **0.047** | 0.111 | -0.005 | **0.111** | -0.124 | -0.003 | **0.313** | -0.524 | -0.010 | **0.049** | -0.869 | -0.028 | **0.046** |
| **0.7** | 0.054 | -0.002 | **0.079** | 0.031 | -0.006 | **0.516** | -0.188 | -0.015 | **0.084** | -0.543 | -0.027 | **0.031** | -0.868 | -0.056 | **0.033** |
| **7** | **0.5** | 0.093 | -0.001 | **0.033** | 0.133 | -0.006 | **0.044** | -0.003 | -0.013 | 2.036 | -0.400 | -0.026 | **0.056** | -0.820 | -0.049 | **0.038** |
| **0.7** | 0.030 | -0.003 | **0.170** | 0.026 | -0.010 | **0.618** | -0.121 | -0.023 | **0.167** | -0.452 | -0.048 | **0.042** | -0.827 | -0.105 | **0.043** |
| **9** | **0.5** | 0.081 | -0.004 | **0.035** | 0.128 | -0.006 | **0.037** | 0.067 | -0.017 | **0.416** | -0.304 | -0.035 | **0.086** | -0.776 | -0.072 | **0.045** |
| **0.7** | 0.006 | -0.005 | 1.308 | -0.002 | -0.010 | 2.094 | -0.099 | -0.030 | **0.256** | -0.407 | -0.065 | **0.060** | -0.798 | -0.139 | **0.056** |
| **1,000** | **5** | **0.5** | 0.106 | -0.001 | **0.023** | 0.111 | -0.002 | **0.058** | -0.126 | -0.002 | **0.160** | -0.527 | -0.008 | **0.026** | -0.869 | -0.016 | **0.025** |
| **0.7** | 0.054 | -0.002 | **0.042** | 0.031 | -0.003 | **0.284** | -0.188 | -0.009 | **0.044** | -0.542 | -0.014 | **0.014** | -0.868 | -0.035 | **0.016** |
| **7** | **0.5** | 0.093 | -0.001 | **0.017** | 0.136 | -0.002 | **0.019** | -0.003 | -0.006 | 1.823 | -0.396 | -0.012 | **0.029** | -0.821 | -0.022 | **0.019** |
| **0.7** | 0.031 | -0.002 | **0.088** | 0.027 | -0.005 | **0.267** | -0.118 | -0.010 | **0.076** | -0.450 | -0.025 | **0.017** | -0.827 | -0.066 | **0.019** |
| **9** | **0.5** | 0.083 | -0.001 | **0.016** | 0.131 | -0.003 | **0.016** | 0.069 | -0.007 | **0.197** | -0.304 | -0.019 | **0.038** | -0.776 | -0.045 | **0.020** |
| **0.7** | 0.007 | -0.002 | **0.779** | 0.000 | -0.006 | 1.826 | -0.096 | -0.015 | **0.103** | -0.404 | -0.034 | **0.024** | -0.797 | -0.078 | **0.021** |
| **2,000** | **5** | **0.5** | 0.106 | 0.000 | **0.012** | 0.112 | 0.000 | **0.028** | -0.126 | -0.001 | **0.080** | -0.527 | -0.002 | **0.012** | -0.869 | -0.005 | **0.012** |
| **0.7** | 0.054 | -0.001 | **0.020** | 0.032 | -0.001 | **0.147** | -0.187 | -0.003 | **0.022** | -0.543 | -0.009 | **0.006** | -0.869 | -0.022 | **0.008** |
| **7** | **0.5** | 0.095 | 0.000 | **0.009** | 0.135 | -0.001 | **0.009** | 0.000 | -0.003 | 1.972 | -0.396 | -0.004 | **0.014** | -0.821 | -0.015 | **0.009** |
| **0.7** | 0.031 | -0.001 | **0.041** | 0.028 | -0.002 | **0.119** | -0.118 | -0.006 | **0.036** | -0.450 | -0.015 | **0.008** | -0.827 | -0.036 | **0.008** |
| **9** | **0.5** | 0.083 | -0.001 | **0.008** | 0.131 | -0.002 | **0.008** | 0.071 | -0.004 | **0.106** | -0.301 | -0.008 | **0.018** | -0.775 | -0.015 | **0.009** |
| **0.7** | 0.008 | -0.001 | **0.469** | 0.001 | -0.003 | 1.500 | -0.094 | -0.008 | **0.050** | -0.402 | -0.018 | **0.010** | -0.797 | -0.043 | **0.009** |
| Note. N: sample size; TP: the number of timepoints; GBIT: generalized tobit estimator; cML: ML estimator with censored data | | | | | | | | | | | | | | | | | |

Table 4.6. Relative bias and MSE ratio between GBIT and cML for the variances of growth slope

|  | | | **0.05-0.95** | | | **0.1-0.9** | | | **0.2-0.8** | | | **0.3-0.7** | | | **0.4-0.6** | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | **rBias** | | **MSER** | **rBias** | | **MSER** | **rBias** | | **MSER** | **rBias** | | **MSER** | **rBias** | | **MSER** |
| **N** | **TP** | **ICC** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** |
| **200** | **5** | **0.5** | -0.379 | -0.003 | **0.025** | -0.631 | -0.009 | **0.022** | -0.865 | -0.018 | **0.028** | -0.954 | -0.038 | **0.047** | -0.989 | -0.088 | **0.089** |
| **0.7** | -0.402 | -0.009 | **0.019** | -0.647 | -0.018 | **0.019** | -0.864 | -0.049 | **0.029** | -0.950 | -0.088 | **0.050** | -0.989 | -0.210 | **0.116** |
| **7** | **0.5** | -0.404 | -0.010 | **0.014** | -0.668 | -0.021 | **0.012** | -0.893 | -0.044 | **0.018** | -0.967 | -0.104 | **0.040** | -0.993 | -0.212 | **0.093** |
| **0.7** | -0.441 | -0.016 | **0.013** | -0.700 | -0.035 | **0.014** | -0.899 | -0.085 | **0.026** | -0.966 | -0.175 | **0.060** | -0.993 | -0.372 | **0.184** |
| **9** | **0.5** | -0.419 | -0.013 | **0.009** | -0.692 | -0.027 | **0.009** | -0.911 | -0.076 | **0.019** | -0.974 | -0.150 | **0.045** | -0.995 | -0.316 | **0.140** |
| **0.7** | -0.475 | -0.024 | **0.011** | -0.738 | -0.049 | **0.013** | -0.922 | -0.124 | **0.033** | -0.974 | -0.260 | **0.098** | -0.994 | -0.482 | **0.272** |
| **500** | **5** | **0.5** | -0.385 | -0.005 | **0.010** | -0.631 | -0.003 | **0.009** | -0.864 | -0.006 | **0.013** | -0.954 | -0.015 | **0.020** | -0.990 | -0.037 | **0.037** |
| **0.7** | -0.405 | -0.005 | **0.008** | -0.646 | -0.008 | **0.007** | -0.864 | -0.018 | **0.010** | -0.950 | -0.037 | **0.018** | -0.989 | -0.088 | **0.043** |
| **7** | **0.5** | -0.404 | -0.003 | **0.006** | -0.667 | -0.005 | **0.004** | -0.893 | -0.016 | **0.007** | -0.967 | -0.045 | **0.013** | -0.993 | -0.097 | **0.032** |
| **0.7** | -0.442 | -0.008 | **0.005** | -0.698 | -0.012 | **0.005** | -0.899 | -0.037 | **0.008** | -0.966 | -0.084 | **0.020** | -0.993 | -0.188 | **0.063** |
| **9** | **0.5** | -0.419 | -0.005 | **0.004** | -0.692 | -0.011 | **0.003** | -0.911 | -0.030 | **0.006** | -0.974 | -0.061 | **0.011** | -0.995 | -0.154 | **0.042** |
| **0.7** | -0.473 | -0.009 | **0.003** | -0.737 | -0.020 | **0.004** | -0.921 | -0.054 | **0.009** | -0.974 | -0.121 | **0.026** | -0.994 | -0.261 | **0.090** |
| **1,000** | **5** | **0.5** | -0.383 | -0.001 | **0.005** | -0.631 | -0.002 | **0.005** | -0.865 | -0.003 | **0.006** | -0.954 | -0.009 | **0.009** | -0.990 | -0.018 | **0.019** |
| **0.7** | -0.403 | -0.001 | **0.004** | -0.646 | -0.004 | **0.003** | -0.864 | -0.007 | **0.005** | -0.951 | -0.021 | **0.009** | -0.989 | -0.047 | **0.021** |
| **7** | **0.5** | -0.405 | -0.003 | **0.003** | -0.668 | -0.004 | **0.002** | -0.894 | -0.013 | **0.003** | -0.967 | -0.021 | **0.006** | -0.993 | -0.055 | **0.015** |
| **0.7** | -0.440 | -0.003 | **0.002** | -0.698 | -0.007 | **0.002** | -0.899 | -0.016 | **0.003** | -0.966 | -0.042 | **0.007** | -0.993 | -0.104 | **0.024** |
| **9** | **0.5** | -0.420 | -0.004 | **0.002** | -0.692 | -0.004 | **0.001** | -0.911 | -0.018 | **0.003** | -0.973 | -0.033 | **0.005** | -0.995 | -0.073 | **0.015** |
| **0.7** | -0.472 | -0.004 | **0.002** | -0.737 | -0.010 | **0.002** | -0.921 | -0.030 | **0.004** | -0.974 | -0.060 | **0.008** | -0.994 | -0.148 | **0.034** |
| **2,000** | **5** | **0.5** | -0.384 | -0.002 | **0.003** | -0.632 | -0.002 | **0.002** | -0.865 | -0.002 | **0.003** | -0.954 | -0.007 | **0.005** | -0.990 | -0.011 | **0.010** |
| **0.7** | -0.403 | -0.001 | **0.002** | -0.644 | 0.000 | **0.002** | -0.864 | -0.004 | **0.003** | -0.950 | -0.009 | **0.004** | -0.989 | -0.026 | **0.009** |
| **7** | **0.5** | -0.405 | -0.001 | **0.001** | -0.668 | -0.003 | **0.001** | -0.894 | -0.001 | **0.002** | -0.967 | -0.011 | **0.003** | -0.993 | -0.027 | **0.007** |
| **0.7** | -0.440 | -0.002 | **0.001** | -0.698 | -0.003 | **0.001** | -0.899 | -0.010 | **0.002** | -0.966 | -0.022 | **0.003** | -0.993 | -0.053 | **0.009** |
| **9** | **0.5** | -0.419 | -0.001 | **0.001** | -0.692 | -0.002 | **0.001** | -0.911 | -0.007 | **0.001** | -0.973 | -0.017 | **0.002** | -0.995 | -0.045 | **0.007** |
| **0.7** | -0.472 | -0.002 | **0.001** | -0.737 | -0.005 | **0.001** | -0.920 | -0.014 | **0.002** | -0.974 | -0.031 | **0.003** | -0.994 | -0.083 | **0.012** |
| Note. N: sample size; TP: the number of timepoints; GBIT: generalized tobit estimator; cML: ML estimator with censored data | | | | | | | | | | | | | | | | | |

Table 4.7. Relative bias and MSE ratio between GBIT and cML for the covariances between growth factors

|  | | | **0.05-0.95** | | | **0.1-0.9** | | | **0.2-0.8** | | | **0.3-0.7** | | | **0.4-0.6** | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | **rBias** | | **MSER** | **rBias** | | **MSER** | **rBias** | | **MSER** | **rBias** | | **MSER** | **rBias** | | **MSER** |
| **N** | **TP** | **ICC** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** |
| **200** | **5** | **0.5** | -0.352 | -0.005 | **0.031** | -0.644 | -0.021 | **0.027** | -0.946 | -0.052 | **0.033** | -1.025 | -0.099 | **0.060** | -1.014 | -0.267 | **0.176** |
| **0.7** | -0.377 | -0.014 | **0.019** | -0.667 | -0.029 | **0.017** | -0.961 | -0.089 | **0.032** | -1.032 | -0.170 | **0.069** | -1.016 | -0.387 | **0.236** |
| **7** | **0.5** | -0.288 | -0.010 | **0.021** | -0.564 | -0.027 | **0.017** | -0.893 | -0.075 | **0.024** | -1.006 | -0.160 | **0.056** | -1.010 | -0.342 | **0.184** |
| **0.7** | -0.363 | -0.015 | **0.011** | -0.658 | -0.047 | **0.014** | -0.944 | -0.123 | **0.033** | -1.026 | -0.246 | **0.089** | -1.014 | -0.526 | **0.341** |
| **9** | **0.5** | -0.269 | -0.010 | **0.016** | -0.542 | -0.031 | **0.012** | -0.868 | -0.096 | **0.025** | -0.992 | -0.193 | **0.064** | -1.008 | -0.416 | **0.230** |
| **0.7** | -0.387 | -0.022 | **0.009** | -0.684 | -0.058 | **0.015** | -0.944 | -0.155 | **0.041** | -1.024 | -0.332 | **0.140** | -1.014 | -0.620 | **0.433** |
| **500** | **5** | **0.5** | -0.357 | -0.005 | **0.013** | -0.640 | -0.006 | **0.009** | -0.947 | -0.025 | **0.012** | -1.026 | -0.038 | **0.021** | -1.013 | -0.107 | **0.055** |
| **0.7** | -0.380 | -0.006 | **0.007** | -0.668 | -0.013 | **0.006** | -0.957 | -0.029 | **0.009** | -1.032 | -0.081 | **0.019** | -1.015 | -0.168 | **0.066** |
| **7** | **0.5** | -0.285 | -0.005 | **0.008** | -0.558 | -0.009 | **0.006** | -0.890 | -0.031 | **0.007** | -1.006 | -0.068 | **0.016** | -1.010 | -0.152 | **0.049** |
| **0.7** | -0.365 | -0.008 | **0.004** | -0.656 | -0.019 | **0.004** | -0.945 | -0.055 | **0.009** | -1.026 | -0.120 | **0.025** | -1.015 | -0.279 | **0.108** |
| **9** | **0.5** | -0.265 | -0.003 | **0.006** | -0.543 | -0.014 | **0.004** | -0.865 | -0.040 | **0.006** | -0.993 | -0.086 | **0.016** | -1.007 | -0.202 | **0.060** |
| **0.7** | -0.384 | -0.009 | **0.003** | -0.685 | -0.024 | **0.003** | -0.944 | -0.070 | **0.009** | -1.024 | -0.159 | **0.035** | -1.014 | -0.340 | **0.142** |
| **1,000** | **5** | **0.5** | -0.356 | -0.002 | **0.007** | -0.640 | -0.005 | **0.005** | -0.946 | -0.013 | **0.006** | -1.024 | -0.019 | **0.011** | -1.013 | -0.047 | **0.026** |
| **0.7** | -0.376 | -0.002 | **0.004** | -0.666 | -0.006 | **0.003** | -0.958 | -0.016 | **0.004** | -1.031 | -0.038 | **0.008** | -1.015 | -0.096 | **0.025** |
| **7** | **0.5** | -0.284 | -0.001 | **0.004** | -0.562 | -0.007 | **0.003** | -0.890 | -0.015 | **0.003** | -1.005 | -0.030 | **0.006** | -1.010 | -0.088 | **0.019** |
| **0.7** | -0.363 | -0.004 | **0.002** | -0.656 | -0.010 | **0.002** | -0.945 | -0.027 | **0.003** | -1.027 | -0.062 | **0.008** | -1.014 | -0.156 | **0.037** |
| **9** | **0.5** | -0.267 | -0.003 | **0.003** | -0.543 | -0.007 | **0.002** | -0.866 | -0.020 | **0.002** | -0.993 | -0.048 | **0.006** | -1.007 | -0.108 | **0.021** |
| **0.7** | -0.384 | -0.005 | **0.001** | -0.684 | -0.012 | **0.001** | -0.944 | -0.035 | **0.003** | -1.025 | -0.083 | **0.011** | -1.014 | -0.196 | **0.053** |
| **2,000** | **5** | **0.5** | -0.356 | -0.002 | **0.003** | -0.640 | -0.002 | **0.002** | -0.945 | -0.005 | **0.003** | -1.024 | -0.013 | **0.005** | -1.013 | -0.029 | **0.011** |
| **0.7** | -0.378 | -0.002 | **0.002** | -0.666 | -0.002 | **0.001** | -0.959 | -0.008 | **0.002** | -1.031 | -0.019 | **0.003** | -1.015 | -0.053 | **0.010** |
| **7** | **0.5** | -0.286 | -0.002 | **0.002** | -0.561 | -0.003 | **0.001** | -0.890 | -0.007 | **0.001** | -1.005 | -0.017 | **0.003** | -1.010 | -0.042 | **0.007** |
| **0.7** | -0.363 | -0.002 | **0.001** | -0.657 | -0.005 | **0.001** | -0.944 | -0.014 | **0.001** | -1.026 | -0.033 | **0.003** | -1.014 | -0.084 | **0.013** |
| **9** | **0.5** | -0.265 | -0.001 | **0.001** | -0.542 | -0.003 | **0.001** | -0.865 | -0.010 | **0.001** | -0.993 | -0.021 | **0.002** | -1.007 | -0.058 | **0.007** |
| **0.7** | -0.383 | -0.002 | **0.000** | -0.683 | -0.006 | **0.001** | -0.944 | -0.018 | **0.001** | -1.025 | -0.041 | **0.003** | -1.014 | -0.110 | **0.018** |
| Note. N: sample size; TP: the number of timepoints; GBIT: generalized tobit estimator; cML: ML estimator with censored data | | | | | | | | | | | | | | | | | |

Table 4.8. Relative bias and MSE ratio between GBIT and cML for the covariate coefficient on growth intercept across the sample sizes and the number of timepoints

|  | | | **0.05-0.95** | | | **0.1-0.9** | | | **0.2-0.8** | | | **0.3-0.7** | | | **0.4-0.6** | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | **rBias** | | **MSER** | **rBias** | | **MSER** | **rBias** | | **MSER** | **rBias** | | **MSER** | **rBias** | | **MSER** |
| **N** | **TP** | **ICC** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** |
| **200** | **5** | **0.5** | 0.059 | -0.002 | **0.043** | 0.075 | -0.006 | **0.082** | -0.034 | -0.015 | **0.782** | -0.271 | -0.028 | **0.107** | -0.582 | -0.079 | **0.086** |
| **0.7** | 0.057 | -0.004 | **0.040** | 0.065 | -0.010 | **0.123** | -0.052 | -0.027 | **0.742** | -0.273 | -0.059 | **0.167** | -0.590 | -0.144 | **0.146** |
| **7** | **0.5** | 0.086 | -0.002 | **0.020** | 0.138 | -0.007 | **0.025** | 0.087 | -0.020 | **0.263** | -0.144 | -0.049 | **0.436** | -0.495 | -0.112 | **0.145** |
| **0.7** | 0.086 | -0.005 | **0.025** | 0.134 | -0.013 | **0.040** | 0.072 | -0.036 | **0.601** | -0.145 | -0.080 | **0.687** | -0.498 | -0.211 | **0.327** |
| **9** | **0.5** | 0.104 | -0.002 | **0.015** | 0.180 | -0.008 | **0.014** | 0.185 | -0.021 | **0.071** | -0.032 | -0.053 | 3.188 | -0.413 | -0.135 | **0.247** |
| **0.7** | 0.104 | -0.005 | **0.019** | 0.180 | -0.015 | **0.025** | 0.174 | -0.044 | **0.154** | -0.037 | -0.108 | 6.185 | -0.412 | -0.248 | **0.578** |
| **500** | **5** | **0.5** | 0.060 | -0.001 | **0.016** | 0.075 | -0.003 | **0.031** | -0.034 | -0.005 | **0.422** | -0.271 | -0.010 | **0.033** | -0.578 | -0.034 | **0.026** |
| **0.7** | 0.057 | -0.001 | **0.015** | 0.065 | -0.004 | **0.037** | -0.052 | -0.010 | **0.262** | -0.277 | -0.025 | **0.041** | -0.587 | -0.059 | **0.034** |
| **7** | **0.5** | 0.086 | -0.001 | **0.008** | 0.138 | -0.003 | **0.008** | 0.086 | -0.009 | **0.092** | -0.146 | -0.019 | **0.120** | -0.493 | -0.045 | **0.038** |
| **0.7** | 0.086 | -0.002 | **0.008** | 0.133 | -0.006 | **0.011** | 0.070 | -0.015 | **0.191** | -0.147 | -0.036 | **0.191** | -0.498 | -0.098 | **0.081** |
| **9** | **0.5** | 0.104 | -0.001 | **0.005** | 0.180 | -0.003 | **0.005** | 0.183 | -0.010 | **0.021** | -0.037 | -0.024 | 1.213 | -0.415 | -0.060 | **0.060** |
| **0.7** | 0.104 | -0.002 | **0.006** | 0.181 | -0.006 | **0.006** | 0.171 | -0.019 | **0.042** | -0.037 | -0.047 | 2.203 | -0.411 | -0.116 | **0.143** |
| **1,000** | **5** | **0.5** | 0.060 | 0.000 | **0.008** | 0.075 | -0.001 | **0.017** | -0.035 | -0.003 | **0.260** | -0.273 | -0.006 | **0.016** | -0.578 | -0.017 | **0.012** |
| **0.7** | 0.057 | -0.001 | **0.007** | 0.065 | -0.002 | **0.019** | -0.052 | -0.006 | **0.143** | -0.277 | -0.011 | **0.016** | -0.589 | -0.035 | **0.014** |
| **7** | **0.5** | 0.087 | 0.000 | **0.004** | 0.138 | -0.001 | **0.004** | 0.086 | -0.003 | **0.045** | -0.144 | -0.008 | **0.051** | -0.495 | -0.024 | **0.015** |
| **0.7** | 0.085 | -0.001 | **0.004** | 0.133 | -0.003 | **0.004** | 0.071 | -0.007 | **0.074** | -0.147 | -0.018 | **0.066** | -0.499 | -0.054 | **0.027** |
| **9** | **0.5** | 0.105 | 0.000 | **0.002** | 0.179 | -0.002 | **0.002** | 0.182 | -0.004 | **0.009** | -0.038 | -0.013 | **0.562** | -0.414 | -0.035 | **0.025** |
| **0.7** | 0.104 | -0.001 | **0.003** | 0.181 | -0.003 | **0.002** | 0.173 | -0.009 | **0.013** | -0.036 | -0.025 | **0.992** | -0.411 | -0.063 | **0.050** |
| **2,000** | **5** | **0.5** | 0.060 | 0.000 | **0.004** | 0.075 | 0.000 | **0.008** | -0.035 | -0.001 | **0.141** | -0.274 | -0.003 | **0.007** | -0.577 | -0.008 | **0.005** |
| **0.7** | 0.057 | 0.000 | **0.004** | 0.065 | -0.001 | **0.009** | -0.052 | -0.002 | **0.066** | -0.278 | -0.007 | **0.008** | -0.589 | -0.019 | **0.006** |
| **7** | **0.5** | 0.087 | 0.000 | **0.002** | 0.137 | -0.001 | **0.002** | 0.087 | -0.002 | **0.018** | -0.145 | -0.004 | **0.023** | -0.494 | -0.012 | **0.006** |
| **0.7** | 0.085 | 0.000 | **0.002** | 0.134 | -0.001 | **0.002** | 0.070 | -0.004 | **0.033** | -0.148 | -0.011 | **0.030** | -0.498 | -0.029 | **0.010** |
| **9** | **0.5** | 0.104 | 0.000 | **0.001** | 0.180 | -0.001 | **0.001** | 0.182 | -0.002 | **0.004** | -0.038 | -0.005 | **0.259** | -0.415 | -0.014 | **0.009** |
| **0.7** | 0.104 | -0.001 | **0.001** | 0.181 | -0.002 | **0.001** | 0.173 | -0.005 | **0.006** | -0.035 | -0.012 | **0.457** | -0.412 | -0.034 | **0.018** |
| Note. N: sample size; TP: the number of timepoints; GBIT: generalized tobit estimator; cML: ML estimator with censored data | | | | | | | | | | | | | | | | | |

Table 4.9. Relative bias and MSE ratio between GBIT and the censored data for the covariate coefficient on growth slope across the sample sizes and the number of timepoints

|  | | | **0.05-0.95** | | | **0.1-0.9** | | | **0.2-0.8** | | | **0.3-0.7** | | | **0.4-0.6** | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | **rBias** | | **MSER** | **rBias** | | **MSER** | **rBias** | | **MSER** | **rBias** | | **MSER** | **rBias** | | **MSER** |
| **N** | **TP** | **ICC** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** |
| **200** | **5** | **0.5** | -0.247 | 0.000 | **0.018** | -0.459 | -0.003 | **0.012** | -0.737 | -0.010 | **0.012** | -0.892 | -0.024 | **0.017** | -0.979 | -0.077 | **0.036** |
| **0.7** | -0.245 | -0.003 | **0.018** | -0.451 | -0.008 | **0.014** | -0.726 | -0.026 | **0.016** | -0.888 | -0.054 | **0.023** | -0.975 | -0.156 | **0.064** |
| **7** | **0.5** | -0.225 | -0.003 | **0.013** | -0.430 | -0.008 | **0.009** | -0.719 | -0.021 | **0.010** | -0.887 | -0.058 | **0.017** | -0.977 | -0.136 | **0.043** |
| **0.7** | -0.221 | -0.006 | **0.017** | -0.424 | -0.017 | **0.013** | -0.708 | -0.043 | **0.015** | -0.882 | -0.100 | **0.029** | -0.974 | -0.261 | **0.108** |
| **9** | **0.5** | -0.208 | -0.004 | **0.011** | -0.406 | -0.010 | **0.008** | -0.706 | -0.037 | **0.010** | -0.879 | -0.078 | **0.019** | -0.974 | -0.199 | **0.067** |
| **0.7** | -0.206 | -0.010 | **0.018** | -0.401 | -0.023 | **0.015** | -0.695 | -0.065 | **0.020** | -0.874 | -0.154 | **0.051** | -0.972 | -0.344 | **0.167** |
| **500** | **5** | **0.5** | -0.252 | -0.002 | **0.007** | -0.460 | -0.001 | **0.005** | -0.737 | -0.005 | **0.005** | -0.891 | -0.008 | **0.007** | -0.981 | -0.028 | **0.013** |
| **0.7** | -0.248 | -0.002 | **0.007** | -0.452 | -0.004 | **0.005** | -0.725 | -0.010 | **0.005** | -0.888 | -0.023 | **0.007** | -0.975 | -0.059 | **0.018** |
| **7** | **0.5** | -0.225 | -0.001 | **0.005** | -0.429 | -0.002 | **0.003** | -0.720 | -0.008 | **0.003** | -0.887 | -0.025 | **0.005** | -0.978 | -0.057 | **0.012** |
| **0.7** | -0.223 | -0.003 | **0.006** | -0.423 | -0.006 | **0.005** | -0.710 | -0.020 | **0.005** | -0.882 | -0.047 | **0.009** | -0.974 | -0.121 | **0.029** |
| **9** | **0.5** | -0.209 | -0.001 | **0.004** | -0.407 | -0.004 | **0.003** | -0.705 | -0.013 | **0.003** | -0.879 | -0.031 | **0.004** | -0.975 | -0.088 | **0.016** |
| **0.7** | -0.207 | -0.004 | **0.006** | -0.403 | -0.009 | **0.004** | -0.696 | -0.027 | **0.005** | -0.874 | -0.067 | **0.011** | -0.972 | -0.165 | **0.042** |
| **1,000** | **5** | **0.5** | -0.250 | 0.000 | **0.004** | -0.459 | -0.001 | **0.002** | -0.737 | -0.002 | **0.002** | -0.892 | -0.005 | **0.003** | -0.982 | -0.011 | **0.006** |
| **0.7** | -0.247 | 0.000 | **0.004** | -0.451 | -0.001 | **0.002** | -0.725 | -0.004 | **0.003** | -0.888 | -0.013 | **0.004** | -0.975 | -0.030 | **0.008** |
| **7** | **0.5** | -0.226 | -0.001 | **0.002** | -0.430 | -0.002 | **0.002** | -0.721 | -0.006 | **0.002** | -0.887 | -0.011 | **0.002** | -0.978 | -0.034 | **0.005** |
| **0.7** | -0.223 | -0.001 | **0.003** | -0.424 | -0.004 | **0.002** | -0.709 | -0.008 | **0.002** | -0.882 | -0.023 | **0.003** | -0.974 | -0.062 | **0.009** |
| **9** | **0.5** | -0.210 | -0.002 | **0.002** | -0.407 | -0.001 | **0.001** | -0.706 | -0.008 | **0.001** | -0.879 | -0.017 | **0.002** | -0.975 | -0.042 | **0.005** |
| **0.7** | -0.207 | -0.002 | **0.003** | -0.403 | -0.005 | **0.002** | -0.696 | -0.014 | **0.002** | -0.874 | -0.033 | **0.004** | -0.972 | -0.088 | **0.014** |
| **2,000** | **5** | **0.5** | -0.251 | 0.000 | **0.002** | -0.460 | -0.001 | **0.001** | -0.737 | 0.000 | **0.001** | -0.892 | -0.003 | **0.002** | -0.982 | -0.009 | **0.003** |
| **0.7** | -0.248 | 0.000 | **0.002** | -0.451 | 0.000 | **0.001** | -0.725 | -0.002 | **0.001** | -0.888 | -0.006 | **0.002** | -0.975 | -0.017 | **0.003** |
| **7** | **0.5** | -0.226 | -0.001 | **0.001** | -0.430 | -0.001 | **0.001** | -0.720 | 0.000 | **0.001** | -0.887 | -0.006 | **0.001** | -0.978 | -0.015 | **0.002** |
| **0.7** | -0.223 | -0.001 | **0.002** | -0.424 | -0.001 | **0.001** | -0.710 | -0.005 | **0.001** | -0.882 | -0.012 | **0.001** | -0.974 | -0.031 | **0.003** |
| **9** | **0.5** | -0.210 | 0.000 | **0.001** | -0.408 | 0.000 | **0.001** | -0.706 | -0.003 | **0.001** | -0.880 | -0.008 | **0.001** | -0.975 | -0.025 | **0.002** |
| **0.7** | -0.207 | -0.001 | **0.001** | -0.403 | -0.002 | **0.001** | -0.696 | -0.007 | **0.001** | -0.874 | -0.016 | **0.001** | -0.972 | -0.048 | **0.005** |
| Note. N: sample size; TP: the number of timepoints; GBIT: generalized tobit estimator; cML: ML estimator with censored data | | | | | | | | | | | | | | | | | |

Table 4.10. Relative bias and MSE ratio between GBIT and the censored data for the effects of growth intercept on the distal outcome across the sample sizes and the number of timepoints

|  | | | **0.05-0.95** | | | **0.1-0.9** | | | **0.2-0.8** | | | **0.3-0.7** | | | **0.4-0.6** | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | **rBias** | | **MSER** | **rBias** | | **MSER** | **rBias** | | **MSER** | **rBias** | | **MSER** | **rBias** | | **MSER** |
| **N** | **TP** | **ICC** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** |
| **200** | **5** | **0.5** | 0.053 | 0.000 | **0.028** | 0.116 | 0.000 | **0.014** | 0.166 | -0.001 | **0.016** | 0.073 | 0.000 | **0.021** | 0.109 | 0.002 | **0.024** |
| **0.7** | 0.043 | 0.000 | **0.040** | 0.083 | -0.001 | **0.022** | 0.077 | -0.002 | **0.054** | -0.004 | 0.000 | **0.254** | 0.004 | -0.003 | **0.067** |
| **7** | **0.5** | 0.055 | 0.000 | **0.021** | 0.129 | 0.000 | **0.008** | 0.254 | -0.001 | **0.006** | 0.171 | -0.001 | **0.015** | 0.086 | -0.002 | **0.026** |
| **0.7** | 0.045 | 0.000 | **0.028** | 0.100 | 0.000 | **0.016** | 0.143 | -0.001 | **0.017** | 0.054 | -0.001 | **0.117** | -0.034 | -0.001 | **0.300** |
| **9** | **0.5** | 0.056 | 0.001 | **0.018** | 0.136 | 0.000 | **0.007** | 0.334 | 0.001 | **0.003** | 0.280 | 0.000 | **0.009** | 0.076 | 0.002 | **0.065** |
| **0.7** | 0.046 | 0.001 | **0.028** | 0.107 | 0.000 | **0.012** | 0.202 | 0.001 | **0.009** | 0.102 | -0.001 | **0.064** | -0.054 | 0.000 | **0.534** |
| **500** | **5** | **0.5** | 0.055 | 0.000 | **0.011** | 0.115 | 0.000 | **0.006** | 0.159 | 0.000 | **0.009** | 0.040 | 0.001 | **0.067** | 0.168 | 0.000 | **0.007** |
| **0.7** | 0.043 | 0.000 | **0.017** | 0.083 | 0.000 | **0.009** | 0.076 | 0.000 | **0.027** | -0.013 | -0.002 | **0.254** | -0.031 | 0.001 | **0.085** |
| **7** | **0.5** | 0.055 | 0.000 | **0.009** | 0.129 | 0.000 | **0.003** | 0.250 | 0.000 | **0.003** | 0.139 | -0.001 | **0.016** | 0.056 | 0.001 | **0.021** |
| **0.7** | 0.045 | 0.000 | **0.013** | 0.098 | 0.000 | **0.006** | 0.143 | 0.000 | **0.007** | 0.051 | -0.001 | **0.083** | -0.052 | -0.002 | **0.254** |
| **9** | **0.5** | 0.055 | 0.000 | **0.008** | 0.135 | 0.000 | **0.003** | 0.321 | -0.001 | **0.001** | 0.248 | -0.001 | **0.005** | 0.038 | -0.001 | **0.093** |
| **0.7** | 0.046 | 0.000 | **0.011** | 0.107 | 0.000 | **0.004** | 0.196 | -0.001 | **0.003** | 0.101 | -0.002 | **0.027** | -0.053 | 0.000 | **0.234** |
| **1,000** | **5** | **0.5** | 0.054 | 0.000 | **0.005** | 0.113 | 0.000 | **0.003** | 0.155 | 0.000 | **0.005** | 0.032 | 0.000 | **0.071** | 0.146 | -0.001 | **0.005** |
| **0.7** | 0.043 | 0.000 | **0.008** | 0.083 | 0.000 | **0.005** | 0.075 | 0.000 | **0.015** | -0.011 | 0.000 | **0.248** | -0.041 | 0.000 | **0.100** |
| **7** | **0.5** | 0.055 | 0.000 | **0.004** | 0.129 | 0.000 | **0.002** | 0.249 | 0.000 | **0.001** | 0.139 | 0.000 | **0.010** | 0.014 | 0.000 | **0.087** |
| **0.7** | 0.045 | 0.000 | **0.006** | 0.099 | 0.000 | **0.003** | 0.143 | 0.000 | **0.004** | 0.050 | -0.001 | **0.049** | -0.053 | -0.002 | **0.141** |
| **9** | **0.5** | 0.056 | 0.000 | **0.004** | 0.134 | 0.000 | **0.001** | 0.323 | 0.000 | **0.001** | 0.236 | -0.001 | **0.003** | 0.026 | -0.001 | **0.093** |
| **0.7** | 0.046 | 0.000 | **0.005** | 0.107 | 0.000 | **0.002** | 0.199 | 0.000 | **0.002** | 0.102 | 0.000 | **0.014** | -0.056 | -0.001 | **0.121** |
| **2,000** | **5** | **0.5** | 0.054 | 0.000 | **0.003** | 0.114 | 0.000 | **0.001** | 0.154 | 0.000 | **0.002** | 0.029 | 0.000 | **0.064** | 0.085 | 0.002 | **0.010** |
| **0.7** | 0.043 | 0.000 | **0.004** | 0.082 | 0.000 | **0.003** | 0.074 | 0.000 | **0.008** | -0.012 | 0.000 | **0.226** | -0.050 | 0.000 | **0.102** |
| **7** | **0.5** | 0.055 | 0.000 | **0.002** | 0.129 | 0.000 | **0.001** | 0.247 | 0.000 | **0.001** | 0.134 | 0.000 | **0.005** | 0.008 | 0.000 | **0.097** |
| **0.7** | 0.045 | 0.000 | **0.003** | 0.098 | 0.000 | **0.001** | 0.144 | 0.000 | **0.002** | 0.048 | -0.001 | **0.033** | -0.053 | -0.001 | **0.081** |
| **9** | **0.5** | 0.056 | 0.000 | **0.002** | 0.135 | 0.000 | **0.001** | 0.321 | 0.000 | **0.000** | 0.238 | 0.000 | **0.001** | 0.021 | 0.000 | **0.108** |
| **0.7** | 0.046 | 0.000 | **0.003** | 0.107 | 0.000 | **0.001** | 0.197 | 0.000 | **0.001** | 0.103 | 0.000 | **0.007** | -0.055 | 0.000 | **0.073** |
| Note. N: sample size; TP: the number of timepoints; GBIT: generalized tobit estimator; cML: ML estimator with censored data | | | | | | | | | | | | | | | | | |

Table 4.11. Relative bias and MSE ratio between GBIT and the censored data for the effects of growth slope on the distal outcome across the sample sizes and the number of timepoints

|  | | | **0.05-0.95** | | | **0.1-0.9** | | | **0.2-0.8** | | | **0.3-0.7** | | | **0.4-0.6** | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | **rBias** | | **MSER** | **rBias** | | **MSER** | **rBias** | | **MSER** | **rBias** | | **MSER** | **rBias** | | **MSER** |
| **N** | **TP** | **ICC** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** | **cML** | **GBIT** | **.** |
| **200** | **5** | **0.5** | 0.546 | -0.001 | **0.013** | 1.387 | -0.003 | **0.005** | 3.513 | -0.006 | **0.002** | 5.364 | 0.008 | **0.001** | 16.785 | 0.024 | **0.000** |
| **0.7** | 0.477 | -0.001 | **0.015** | 1.117 | -0.004 | **0.007** | 2.366 | -0.007 | **0.005** | 3.584 | -0.002 | **0.004** | 11.508 | 0.005 | **0.001** |
| **7** | **0.5** | 0.552 | 0.003 | **0.010** | 1.465 | 0.001 | **0.003** | 4.449 | -0.003 | **0.001** | 7.825 | 0.000 | **0.001** | 18.180 | 0.002 | **0.000** |
| **0.7** | 0.489 | 0.002 | **0.013** | 1.233 | 0.002 | **0.005** | 3.148 | -0.004 | **0.002** | 5.331 | 0.006 | **0.002** | 12.057 | 0.008 | **0.002** |
| **9** | **0.5** | 0.554 | 0.004 | **0.008** | 1.495 | 0.001 | **0.003** | 5.287 | 0.008 | **0.001** | 10.171 | 0.014 | **0.000** | 19.371 | 0.046 | **0.000** |
| **0.7** | 0.496 | 0.006 | **0.013** | 1.273 | 0.003 | **0.004** | 3.825 | 0.007 | **0.001** | 6.610 | 0.005 | **0.001** | 13.176 | 0.030 | **0.002** |
| **500** | **5** | **0.5** | 0.558 | 0.002 | **0.005** | 1.377 | -0.002 | **0.002** | 3.411 | 0.002 | **0.001** | 4.588 | 0.008 | **0.001** | 19.759 | 0.008 | **0.000** |
| **0.7** | 0.483 | 0.001 | **0.007** | 1.113 | -0.001 | **0.002** | 2.342 | -0.001 | **0.002** | 3.376 | -0.009 | **0.002** | 9.572 | 0.009 | **0.000** |
| **7** | **0.5** | 0.554 | 0.001 | **0.004** | 1.457 | -0.003 | **0.001** | 4.391 | -0.006 | **0.000** | 7.131 | 0.004 | **0.000** | 16.389 | 0.017 | **0.000** |
| **0.7** | 0.492 | 0.003 | **0.005** | 1.216 | -0.004 | **0.002** | 3.138 | -0.002 | **0.001** | 5.232 | 0.001 | **0.001** | 11.013 | -0.004 | **0.000** |
| **9** | **0.5** | 0.557 | 0.001 | **0.003** | 1.492 | 0.001 | **0.001** | 5.144 | -0.003 | **0.000** | 9.474 | -0.005 | **0.000** | 17.429 | 0.016 | **0.000** |
| **0.7** | 0.497 | 0.003 | **0.005** | 1.277 | 0.001 | **0.002** | 3.758 | -0.002 | **0.001** | 6.573 | -0.005 | **0.000** | 13.073 | 0.012 | **0.000** |
| **1,000** | **5** | **0.5** | 0.552 | -0.001 | **0.003** | 1.361 | -0.001 | **0.001** | 3.356 | 0.000 | **0.000** | 4.412 | 0.001 | **0.001** | 18.557 | -0.003 | **0.000** |
| **0.7** | 0.481 | -0.001 | **0.003** | 1.111 | -0.001 | **0.001** | 2.322 | -0.003 | **0.001** | 3.407 | 0.002 | **0.001** | 9.026 | 0.002 | **0.000** |
| **7** | **0.5** | 0.556 | 0.002 | **0.002** | 1.460 | 0.000 | **0.001** | 4.397 | 0.002 | **0.000** | 7.111 | 0.003 | **0.000** | 14.297 | 0.008 | **0.000** |
| **0.7** | 0.488 | 0.000 | **0.003** | 1.222 | 0.000 | **0.001** | 3.135 | -0.002 | **0.000** | 5.215 | 0.000 | **0.000** | 10.956 | -0.007 | **0.000** |
| **9** | **0.5** | 0.558 | 0.002 | **0.002** | 1.484 | -0.001 | **0.000** | 5.164 | 0.004 | **0.000** | 9.217 | -0.005 | **0.000** | 16.740 | -0.006 | **0.000** |
| **0.7** | 0.495 | 0.000 | **0.002** | 1.278 | 0.000 | **0.001** | 3.790 | 0.003 | **0.000** | 6.564 | -0.004 | **0.000** | 12.874 | -0.003 | **0.000** |
| **2,000** | **5** | **0.5** | 0.552 | 0.000 | **0.001** | 1.367 | 0.001 | **0.001** | 3.345 | -0.001 | **0.000** | 4.343 | 0.001 | **0.000** | 15.438 | 0.006 | **0.000** |
| **0.7** | 0.480 | 0.000 | **0.002** | 1.104 | -0.002 | **0.001** | 2.313 | 0.000 | **0.000** | 3.376 | -0.001 | **0.000** | 8.583 | -0.002 | **0.000** |
| **7** | **0.5** | 0.556 | 0.001 | **0.001** | 1.458 | 0.001 | **0.000** | 4.368 | -0.003 | **0.000** | 6.999 | 0.003 | **0.000** | 13.935 | 0.002 | **0.000** |
| **0.7** | 0.488 | 0.000 | **0.001** | 1.217 | -0.001 | **0.000** | 3.146 | 0.001 | **0.000** | 5.147 | -0.004 | **0.000** | 10.927 | -0.007 | **0.000** |
| **9** | **0.5** | 0.559 | 0.000 | **0.001** | 1.489 | -0.001 | **0.000** | 5.137 | 0.000 | **0.000** | 9.265 | 0.002 | **0.000** | 16.469 | 0.007 | **0.000** |
| **0.7** | 0.495 | 0.001 | **0.001** | 1.277 | 0.000 | **0.000** | 3.772 | 0.000 | **0.000** | 6.611 | 0.000 | **0.000** | 12.984 | 0.002 | **0.000** |
| Note. N: sample size; TP: the number of timepoints; GBIT: generalized tobit estimator; cML: ML estimator with censored data | | | | | | | | | | | | | | | | | |