

| $N =$         |   | 50                                                                   | 100   | 150   | 200   | 250   | 300   | 350   | 400   | 800   | 1200  | 1600  |
|---------------|---|----------------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|               |   | Overall mean of the posterior estimated mean of $\sigma$             |       |       |       |       |       |       |       |       |       |       |
| True<br>$\nu$ | 3 | 1.16                                                                 | 1.09  | 1.05  | 1.04  | 1.03  | 1.02  | 1.02  | 1.02  | 1.0   | 1.0   | 1.0   |
|               | 5 | 1.11                                                                 | 1.08  | 1.05  | 1.05  | 1.03  | 1.03  | 1.02  | 1.02  | 1.01  | 1.0   | 1.0   |
|               | 7 | 1.07                                                                 | 1.05  | 1.05  | 1.04  | 1.04  | 1.04  | 1.03  | 1.02  | 1.01  | 1.0   | 1.0   |
|               |   | Overall sd of the posterior estimated mean of $\sigma$               |       |       |       |       |       |       |       |       |       |       |
| True<br>$\nu$ | 3 | 0.192                                                                | 0.143 | 0.113 | 0.096 | 0.081 | 0.075 | 0.073 | 0.065 | 0.046 | 0.038 | 0.033 |
|               | 5 | 0.157                                                                | 0.131 | 0.113 | 0.094 | 0.087 | 0.075 | 0.07  | 0.064 | 0.044 | 0.035 | 0.032 |
|               | 7 | 0.141                                                                | 0.109 | 0.093 | 0.086 | 0.079 | 0.075 | 0.068 | 0.06  | 0.043 | 0.034 | 0.031 |
|               |   | Overall 2.5%-tile of the posterior estimated mean of $\sigma$        |       |       |       |       |       |       |       |       |       |       |
| True<br>$\nu$ | 3 | 0.81                                                                 | 0.852 | 0.849 | 0.871 | 0.882 | 0.89  | 0.894 | 0.89  | 0.916 | 0.931 | 0.942 |
|               | 5 | 0.809                                                                | 0.816 | 0.836 | 0.864 | 0.875 | 0.891 | 0.9   | 0.897 | 0.924 | 0.938 | 0.943 |
|               | 7 | 0.81                                                                 | 0.839 | 0.859 | 0.873 | 0.887 | 0.898 | 0.9   | 0.912 | 0.926 | 0.941 | 0.947 |
|               |   | Overall 97.5%-tile of the posterior estimated mean of $\sigma$       |       |       |       |       |       |       |       |       |       |       |
| True<br>$\nu$ | 3 | 1.55                                                                 | 1.39  | 1.29  | 1.25  | 1.2   | 1.18  | 1.18  | 1.16  | 1.09  | 1.08  | 1.07  |
|               | 5 | 1.42                                                                 | 1.32  | 1.27  | 1.23  | 1.21  | 1.18  | 1.17  | 1.15  | 1.09  | 1.08  | 1.06  |
|               | 7 | 1.35                                                                 | 1.26  | 1.23  | 1.2   | 1.19  | 1.18  | 1.16  | 1.14  | 1.1   | 1.08  | 1.06  |
|               |   | Overall mean of the posterior estimated sd of $\sigma$               |       |       |       |       |       |       |       |       |       |       |
| True<br>$\nu$ | 3 | 0.193                                                                | 0.136 | 0.109 | 0.094 | 0.083 | 0.076 | 0.07  | 0.065 | 0.046 | 0.038 | 0.033 |
|               | 5 | 0.165                                                                | 0.124 | 0.103 | 0.09  | 0.08  | 0.074 | 0.067 | 0.063 | 0.044 | 0.035 | 0.031 |
|               | 7 | 0.148                                                                | 0.112 | 0.094 | 0.085 | 0.076 | 0.07  | 0.065 | 0.061 | 0.043 | 0.035 | 0.03  |
|               |   | Overall sd of the posterior estimated sd of $\sigma$                 |       |       |       |       |       |       |       |       |       |       |
| True<br>$\nu$ | 3 | 0.039                                                                | 0.022 | 0.014 | 0.011 | 0.008 | 0.007 | 0.006 | 0.005 | 0.002 | 0.001 | 0.001 |
|               | 5 | 0.034                                                                | 0.021 | 0.014 | 0.01  | 0.009 | 0.007 | 0.006 | 0.005 | 0.002 | 0.001 | 0.001 |
|               | 7 | 0.029                                                                | 0.02  | 0.014 | 0.012 | 0.009 | 0.008 | 0.007 | 0.005 | 0.002 | 0.002 | 0.001 |
|               |   | Overall 2.5%-tile of the posterior estimated sd of $\sigma$          |       |       |       |       |       |       |       |       |       |       |
| True<br>$\nu$ | 3 | 0.128                                                                | 0.101 | 0.085 | 0.077 | 0.07  | 0.064 | 0.06  | 0.056 | 0.042 | 0.035 | 0.03  |
|               | 5 | 0.11                                                                 | 0.086 | 0.075 | 0.071 | 0.065 | 0.062 | 0.058 | 0.055 | 0.04  | 0.033 | 0.029 |
|               | 7 | 0.103                                                                | 0.079 | 0.068 | 0.06  | 0.057 | 0.054 | 0.051 | 0.049 | 0.038 | 0.032 | 0.028 |
|               |   | Overall 97.5%-tile of the posterior estimated sd of $\sigma$         |       |       |       |       |       |       |       |       |       |       |
| True<br>$\nu$ | 3 | 0.278                                                                | 0.187 | 0.141 | 0.119 | 0.099 | 0.09  | 0.082 | 0.075 | 0.05  | 0.041 | 0.035 |
|               | 5 | 0.235                                                                | 0.166 | 0.131 | 0.112 | 0.099 | 0.088 | 0.079 | 0.073 | 0.048 | 0.038 | 0.033 |
|               | 7 | 0.21                                                                 | 0.153 | 0.121 | 0.106 | 0.094 | 0.084 | 0.078 | 0.071 | 0.048 | 0.038 | 0.032 |
|               |   | Overall mean of the posterior estimated 2.5%-tile of $\sigma$        |       |       |       |       |       |       |       |       |       |       |
| True<br>$\nu$ | 3 | 0.819                                                                | 0.844 | 0.851 | 0.867 | 0.874 | 0.883 | 0.891 | 0.894 | 0.916 | 0.932 | 0.94  |
|               | 5 | 0.807                                                                | 0.842 | 0.855 | 0.876 | 0.879 | 0.887 | 0.895 | 0.899 | 0.923 | 0.936 | 0.943 |
|               | 7 | 0.793                                                                | 0.837 | 0.865 | 0.878 | 0.889 | 0.901 | 0.903 | 0.908 | 0.927 | 0.938 | 0.946 |
|               |   | Overall sd of the posterior estimated 2.5%-tile of $\sigma$          |       |       |       |       |       |       |       |       |       |       |
| True<br>$\nu$ | 3 | 0.144                                                                | 0.113 | 0.09  | 0.078 | 0.069 | 0.064 | 0.064 | 0.058 | 0.043 | 0.036 | 0.031 |
|               | 5 | 0.135                                                                | 0.116 | 0.1   | 0.084 | 0.077 | 0.067 | 0.062 | 0.059 | 0.041 | 0.033 | 0.031 |
|               | 7 | 0.126                                                                | 0.104 | 0.09  | 0.082 | 0.076 | 0.07  | 0.063 | 0.056 | 0.04  | 0.033 | 0.03  |
|               |   | Overall 2.5%-tile of the posterior estimated 2.5%-tile of $\sigma$   |       |       |       |       |       |       |       |       |       |       |
| True<br>$\nu$ | 3 | 0.565                                                                | 0.662 | 0.693 | 0.73  | 0.751 | 0.769 | 0.781 | 0.784 | 0.834 | 0.862 | 0.882 |
|               | 5 | 0.554                                                                | 0.638 | 0.668 | 0.725 | 0.741 | 0.766 | 0.786 | 0.788 | 0.847 | 0.873 | 0.886 |
|               | 7 | 0.553                                                                | 0.637 | 0.693 | 0.726 | 0.753 | 0.776 | 0.785 | 0.801 | 0.85  | 0.878 | 0.892 |
|               |   | Overall 97.5%-tile of the posterior estimated 2.5%-tile of $\sigma$  |       |       |       |       |       |       |       |       |       |       |
| True<br>$\nu$ | 3 | 1.13                                                                 | 1.1   | 1.04  | 1.03  | 1.02  | 1.02  | 1.03  | 1.02  | 0.998 | 1.01  | 1.01  |
|               | 5 | 1.07                                                                 | 1.07  | 1.06  | 1.05  | 1.03  | 1.03  | 1.03  | 1.02  | 1.01  | 1.0   | 1.0   |
|               | 7 | 1.03                                                                 | 1.04  | 1.04  | 1.04  | 1.04  | 1.04  | 1.03  | 1.02  | 1.01  | 1.01  | 1.0   |
|               |   | Overall mean of the posterior estimated 97.5%-tile of $\sigma$       |       |       |       |       |       |       |       |       |       |       |
| True<br>$\nu$ | 3 | 1.57                                                                 | 1.38  | 1.28  | 1.24  | 1.2   | 1.18  | 1.17  | 1.15  | 1.1   | 1.08  | 1.07  |
|               | 5 | 1.45                                                                 | 1.33  | 1.26  | 1.23  | 1.19  | 1.18  | 1.16  | 1.14  | 1.09  | 1.07  | 1.06  |
|               | 7 | 1.38                                                                 | 1.28  | 1.23  | 1.21  | 1.19  | 1.18  | 1.16  | 1.15  | 1.09  | 1.07  | 1.06  |
|               |   | Overall sd of the posterior estimated 97.5%-tile of $\sigma$         |       |       |       |       |       |       |       |       |       |       |
| True<br>$\nu$ | 3 | 0.247                                                                | 0.172 | 0.135 | 0.115 | 0.094 | 0.086 | 0.082 | 0.073 | 0.05  | 0.04  | 0.035 |
|               | 5 | 0.191                                                                | 0.142 | 0.121 | 0.101 | 0.095 | 0.083 | 0.077 | 0.07  | 0.047 | 0.037 | 0.033 |
|               | 7 | 0.17                                                                 | 0.116 | 0.095 | 0.086 | 0.08  | 0.076 | 0.07  | 0.062 | 0.046 | 0.037 | 0.032 |
|               |   | Overall 2.5%-tile of the posterior estimated 97.5%-tile of $\sigma$  |       |       |       |       |       |       |       |       |       |       |
| True<br>$\nu$ | 3 | 1.13                                                                 | 1.08  | 1.03  | 1.03  | 1.03  | 1.02  | 1.02  | 1.01  | 1.0   | 1.0   | 1.0   |
|               | 5 | 1.1                                                                  | 1.03  | 1.02  | 1.03  | 1.02  | 1.02  | 1.02  | 1.01  | 1.01  | 1.01  | 1.0   |
|               | 7 | 1.07                                                                 | 1.05  | 1.05  | 1.03  | 1.04  | 1.03  | 1.02  | 1.02  | 1.01  | 1.0   | 1.0   |
|               |   | Overall 97.5%-tile of the posterior estimated 97.5%-tile of $\sigma$ |       |       |       |       |       |       |       |       |       |       |
| True<br>$\nu$ | 3 | 2.1                                                                  | 1.74  | 1.57  | 1.49  | 1.41  | 1.36  | 1.34  | 1.3   | 1.19  | 1.17  | 1.14  |
|               | 5 | 1.83                                                                 | 1.6   | 1.5   | 1.42  | 1.38  | 1.34  | 1.32  | 1.3   | 1.19  | 1.15  | 1.13  |
|               | 7 | 1.72                                                                 | 1.51  | 1.42  | 1.37  | 1.35  | 1.32  | 1.29  | 1.27  | 1.19  | 1.15  | 1.13  |