variance comparision

This file is to compare the variance from the simulation. Based on the result, we calcuate three types of simulations

1. Posterior variance: variance estimated from the posterior distribution, take average of 500 samples
2. Sandwich variance: variance estimated by sandwich method, taking average of 500 samples

$$\mathrm{Cov}\left(\mu_k^{XZ}, \tau_k^{XZ^2}\right) = \frac{1}{n}\mathrm{H}^{-1}\left(\mu_k^{XZ}, \tau_k^{XZ^2}\right)\mathrm{J}\left(\mu_k^{XZ}, \tau_k^{XZ^2}\right)\mathrm{H}^{-1}\left(\mu_k^{XZ}, \tau_k^{XZ^2}\right)$$

3. MCMC variance: variance estimated by 500 simulations

Variance Estimation for μ

```
##                  BA1      CA1      BA2      CA2
## Posterior 0.019739 0.019886 0.020057 0.019907
## Sandwich  0.000096 0.000087 0.000109 0.000067
## MC        0.134128 0.148982 0.118534 0.127756
```

Variance estimate for τ

```
##                  BA1      CA1      BA2      CA2
## Posterior 0.010108 0.010052 0.010080 0.010121
## Sandwich  0.000096 0.000087 0.000109 0.000067
## MC        0.046812 0.040109 0.042449 0.039863
```