

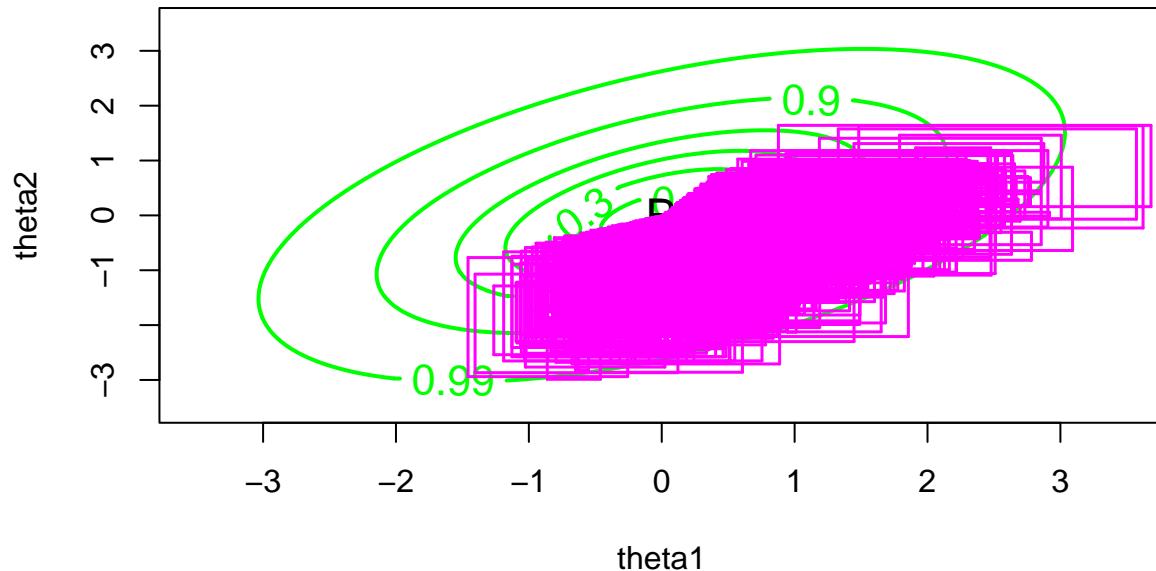
HW2\_7751512

Fabio Enrico Traverso

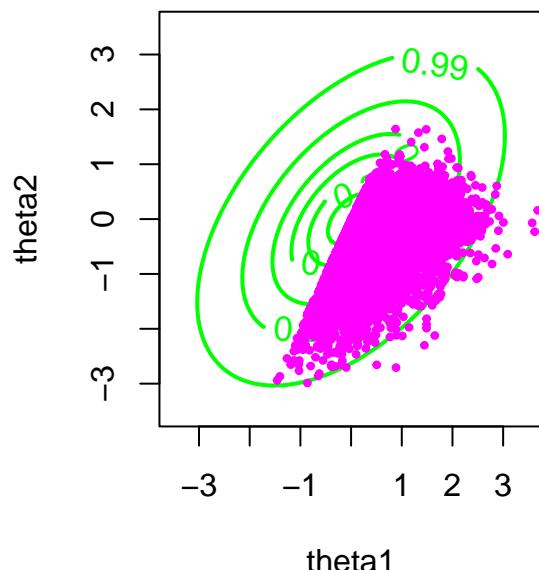
2022-11-23

Question 1

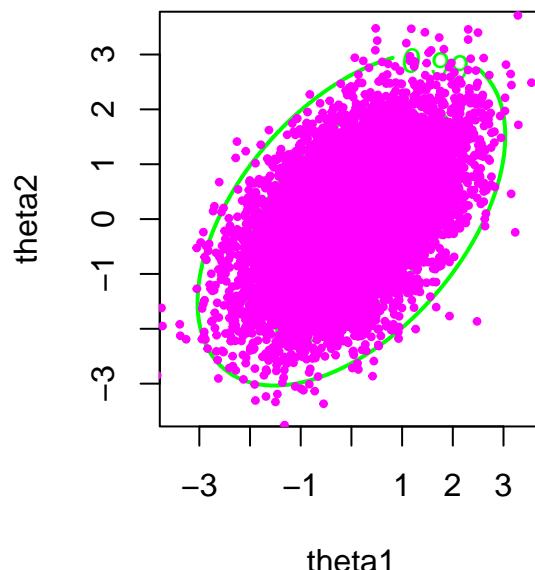
**TruncGibbs Sampler with Intermediate Moves: Rho = 0.5**



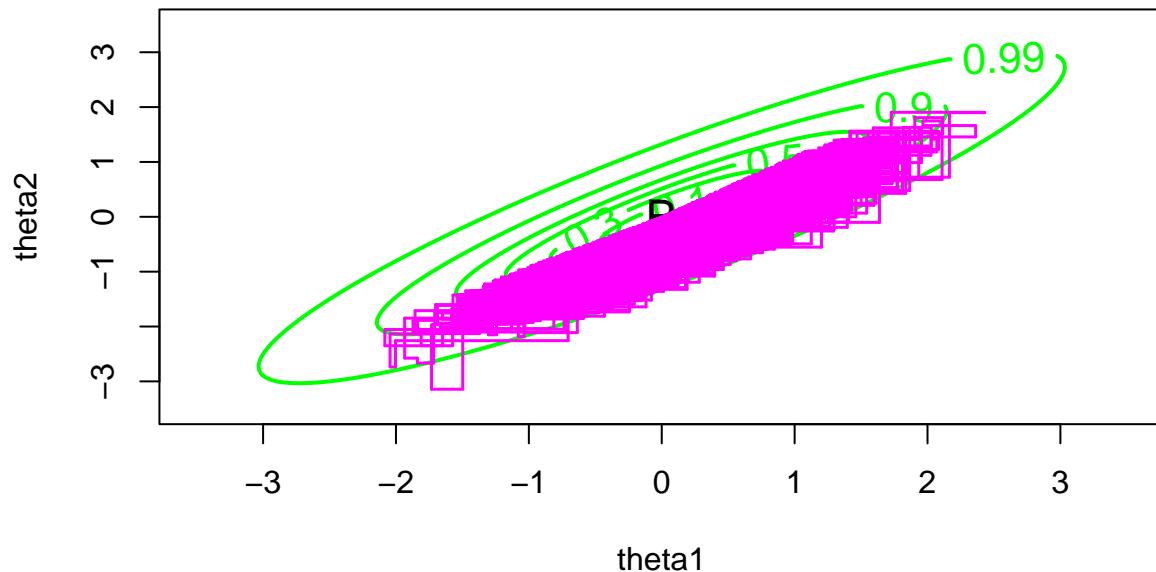
**Gibbs Draws: Rho = 0.5**



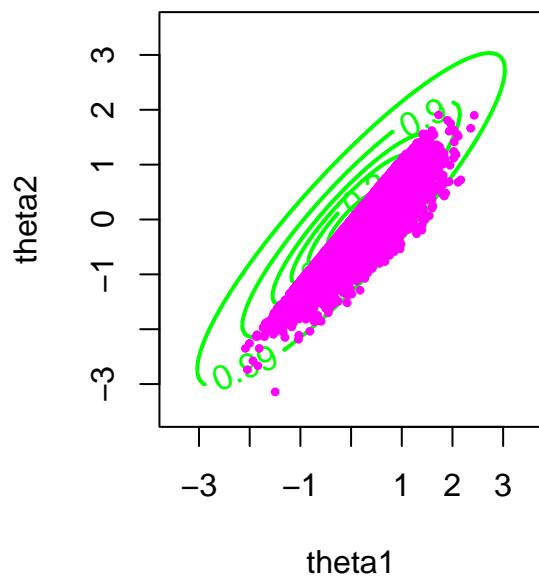
**IID draws: Rho = 0.5**



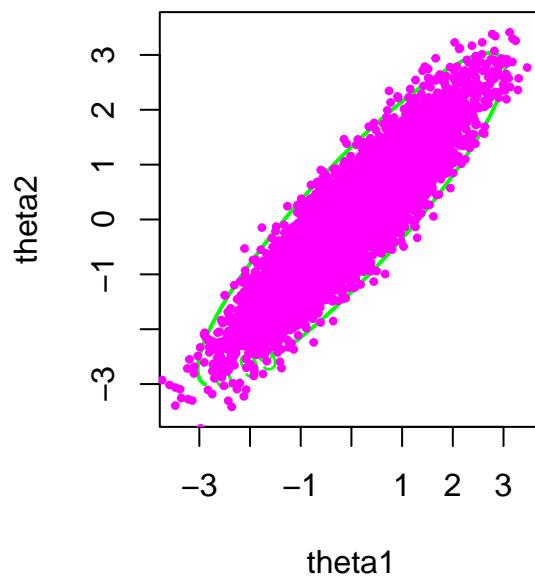
### TruncGibbs Sampler with Intermediate Moves: Rho = 0.9



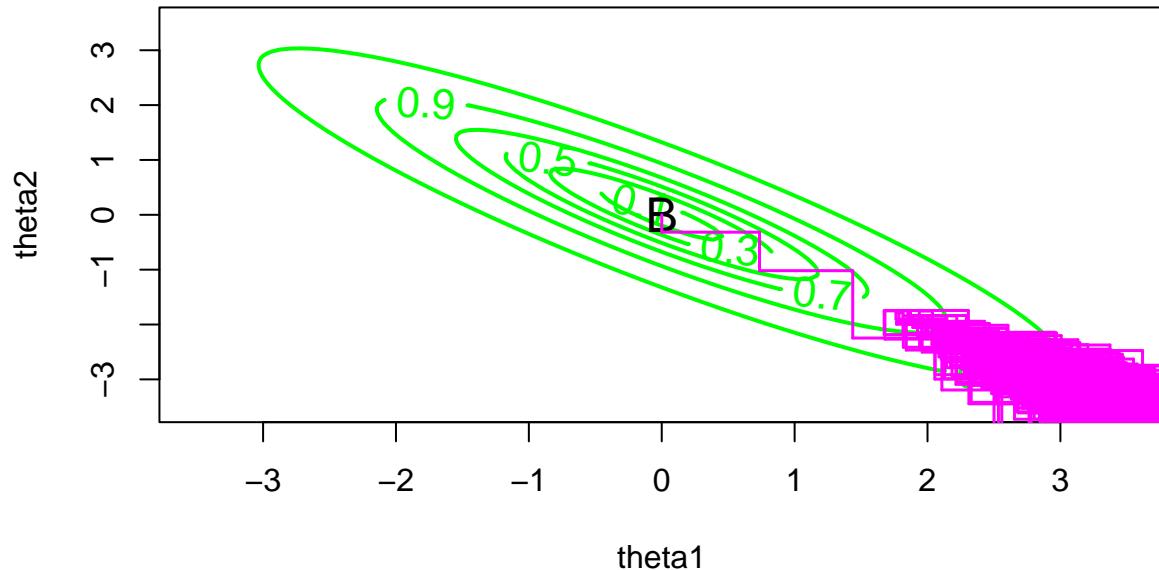
Gibbs Draws: Rho = 0.9



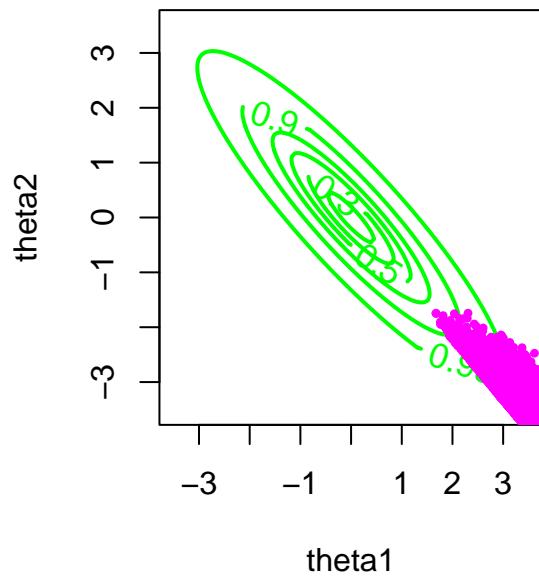
IID draws: Rho = 0.9



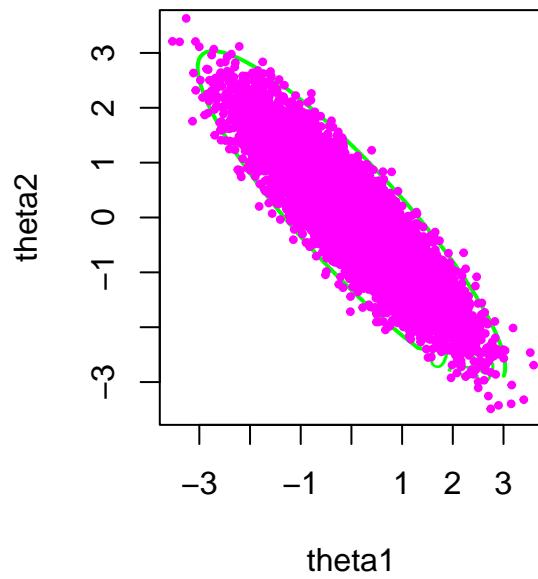
### TruncGibbs Sampler with Intermediate Moves: Rho = -0.9



Gibbs Draws: Rho = -0.9

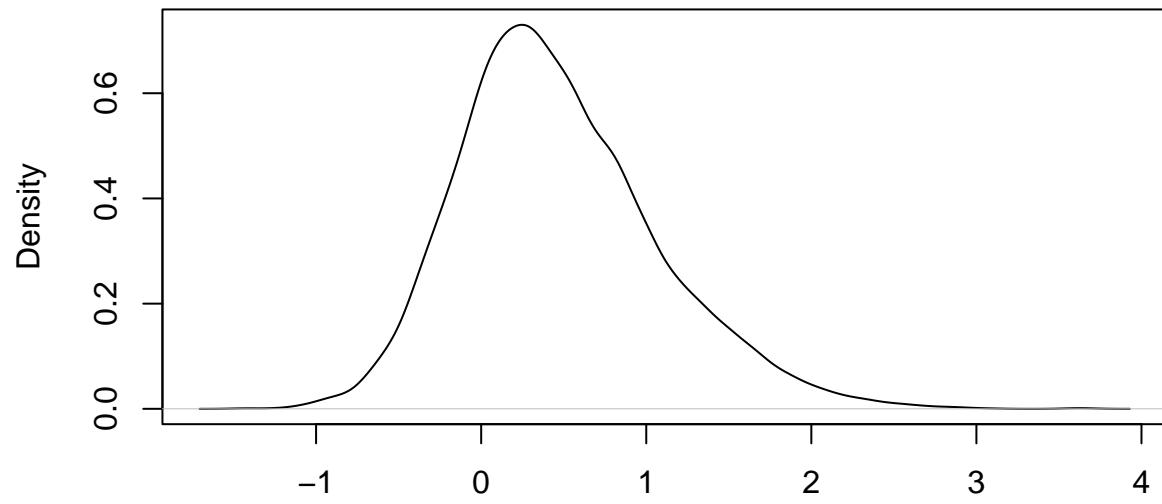


IID draws: Rho = -0.9



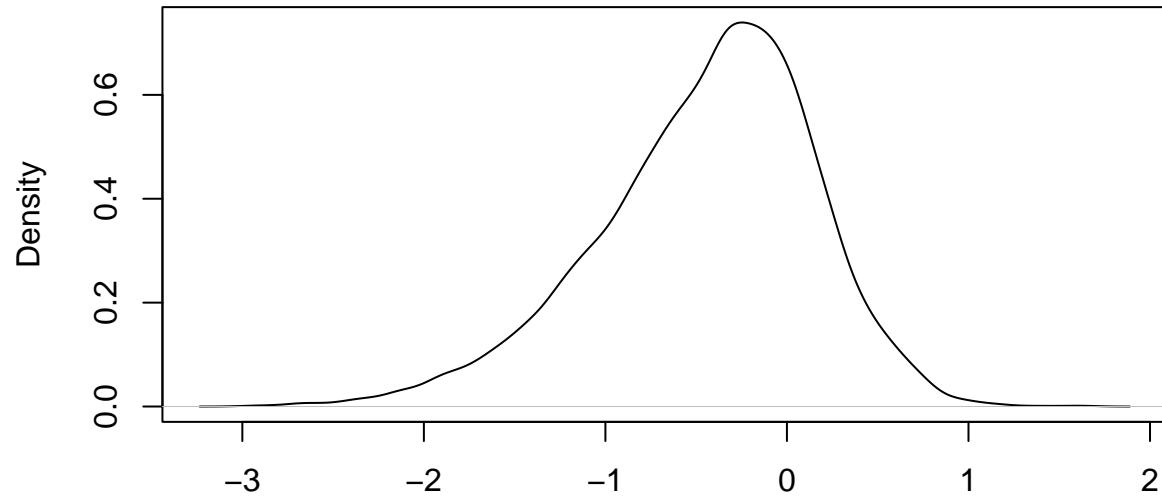
The function produces already graphs, but I added a chunk to show some other potential figure ideas (set `fig = TRUE`) to see them.

**Density of the first variate for Draws for rho = 0.5**



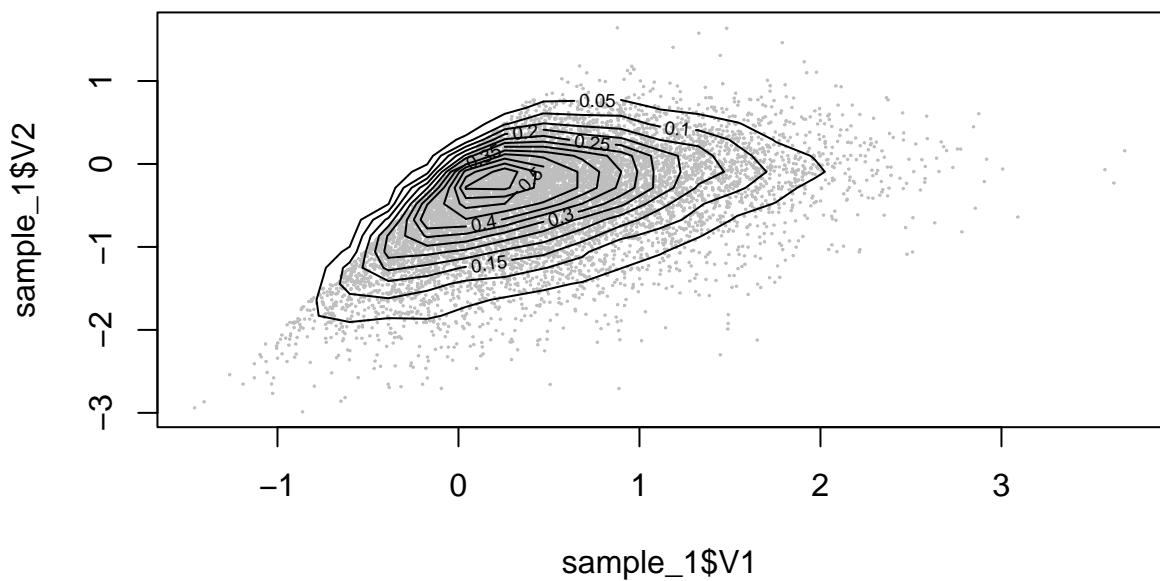
N = 10000 Bandwidth = 0.08257

**Density of the second variate for Draws for rho = 0.5**



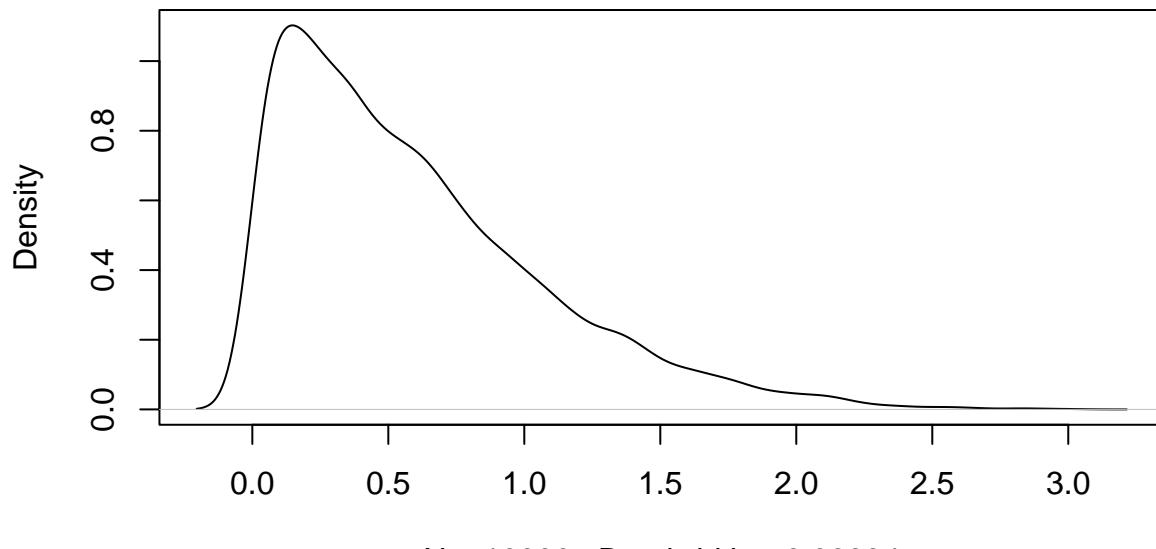
N = 10000 Bandwidth = 0.08259

### Joint density of the covariates when rho = 0.5

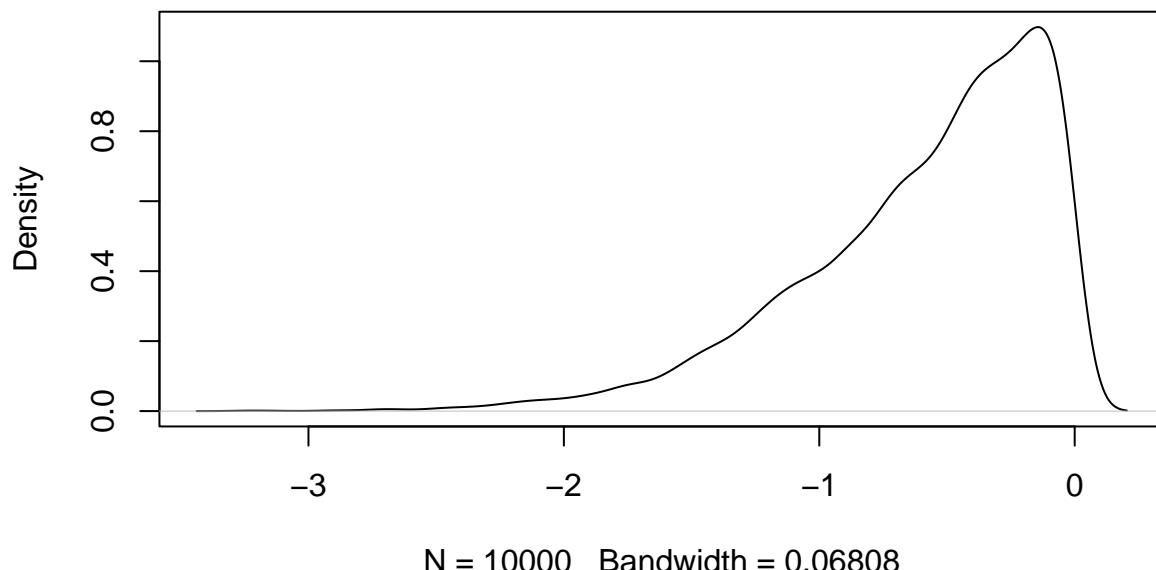


**Question 2**

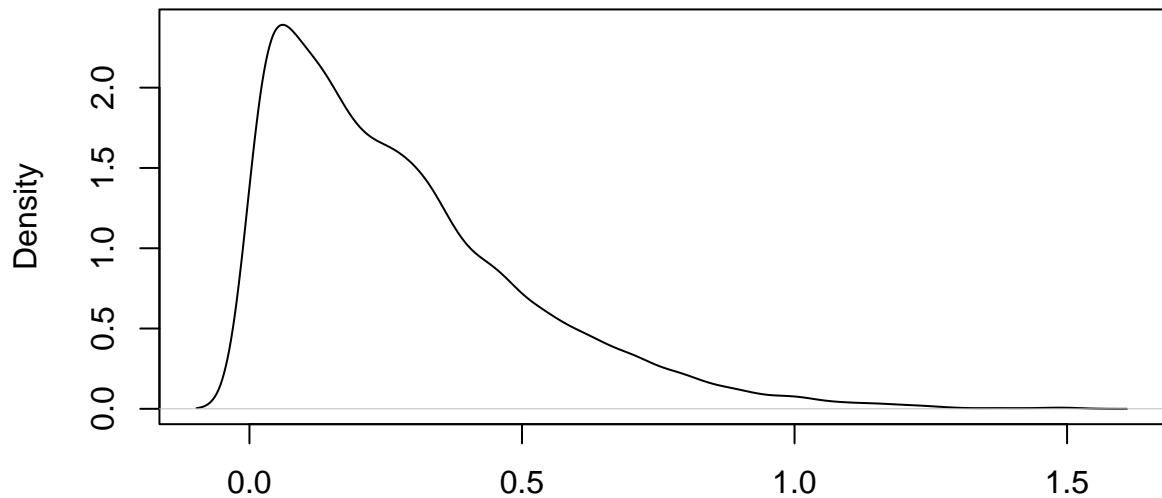
**Density of the first variate, rho = 0.5**



**Density of the second variate, rho = 0.5**

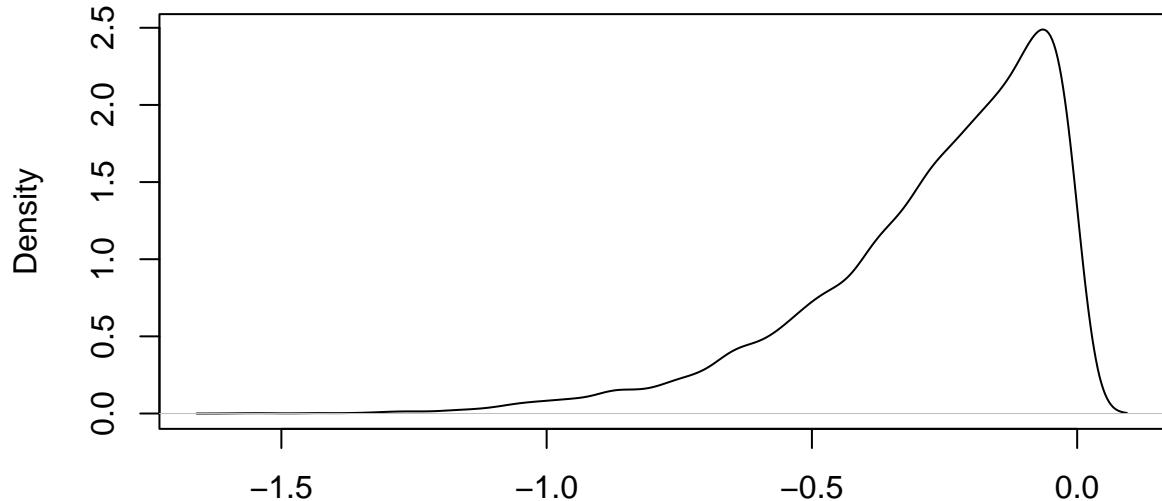


**Density of the first variate, rho = 0.9**



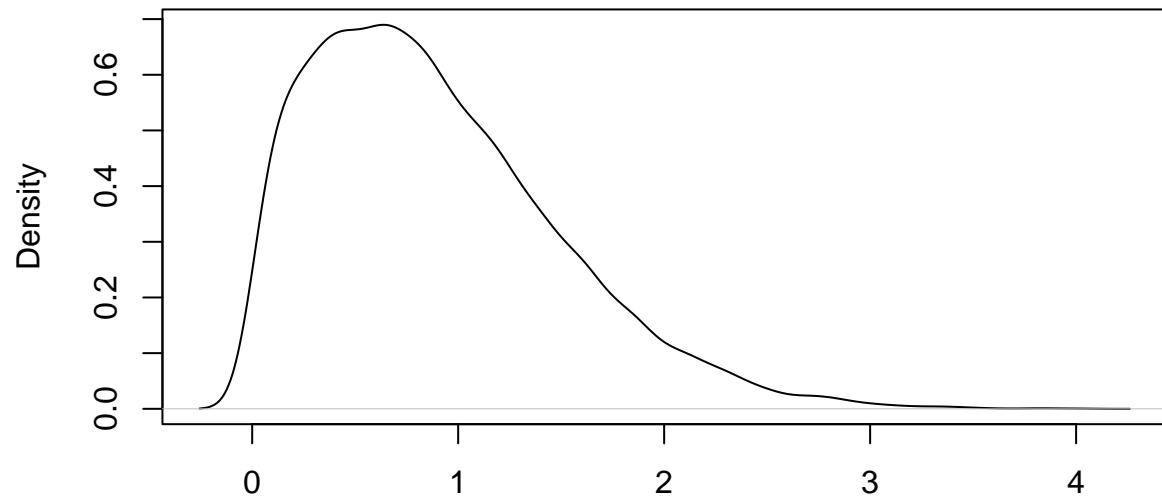
N = 10000 Bandwidth = 0.03229

**Density of the second variate, rho = 0.9**



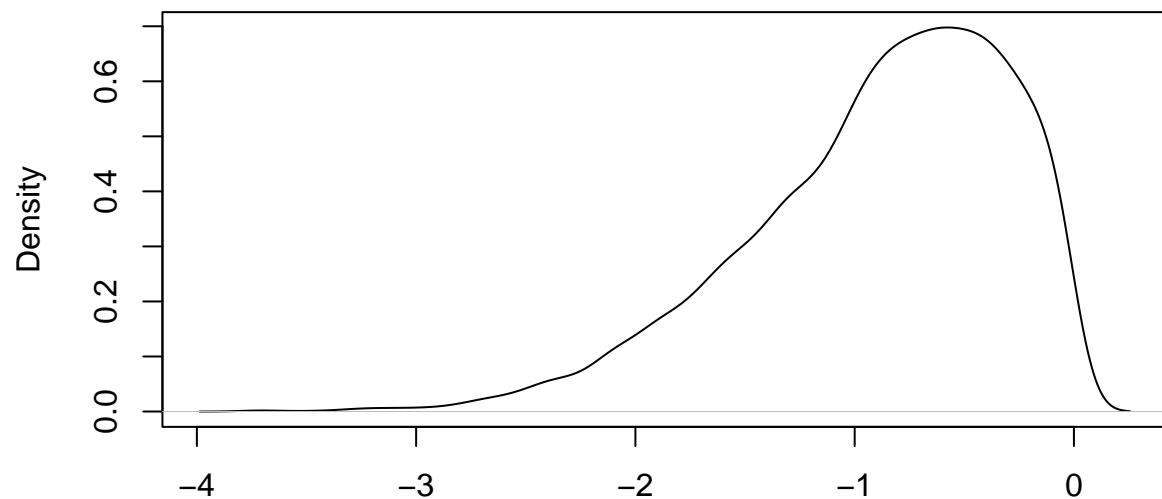
N = 10000 Bandwidth = 0.03121

**Density of the first variate, rho = -0.9**



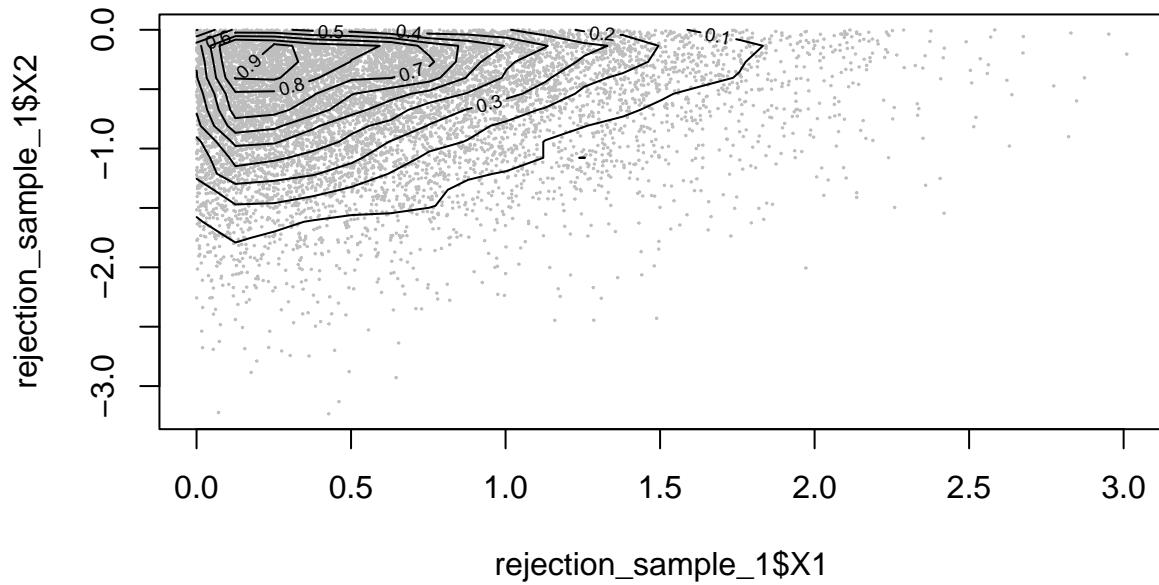
N = 10000 Bandwidth = 0.08508

**Density of the second variate, rho = -0.9**

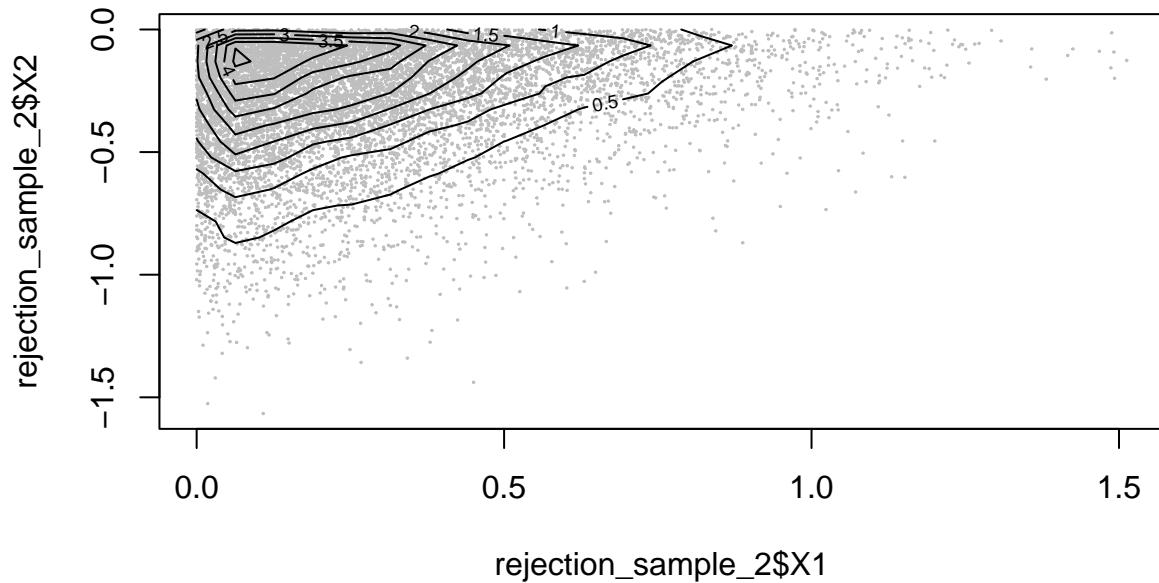


N = 10000 Bandwidth = 0.08504

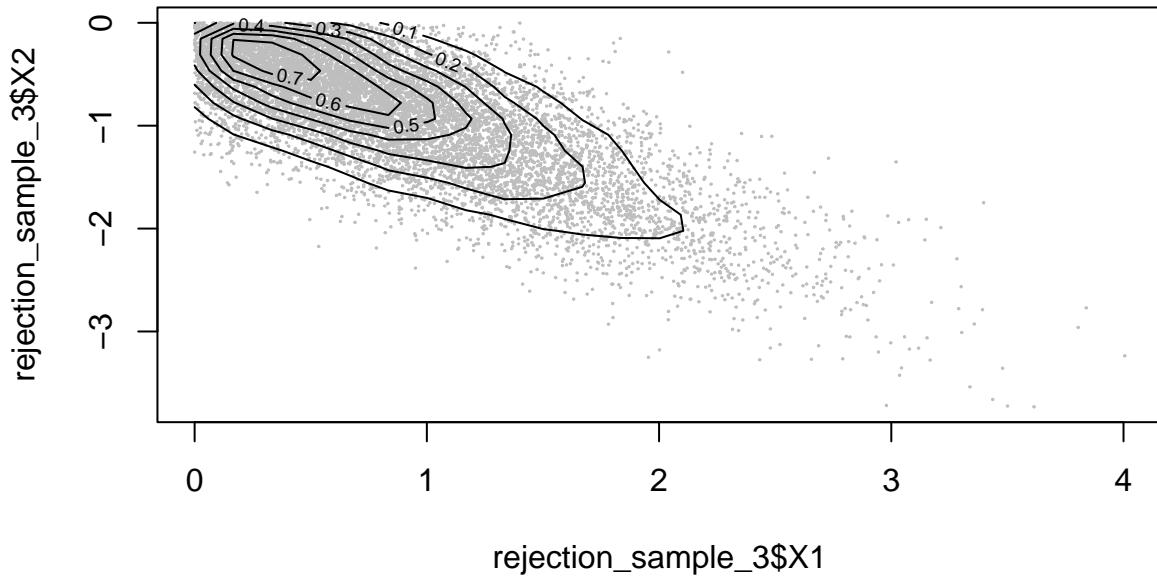
**Joint density of draws, rho = 0.5**



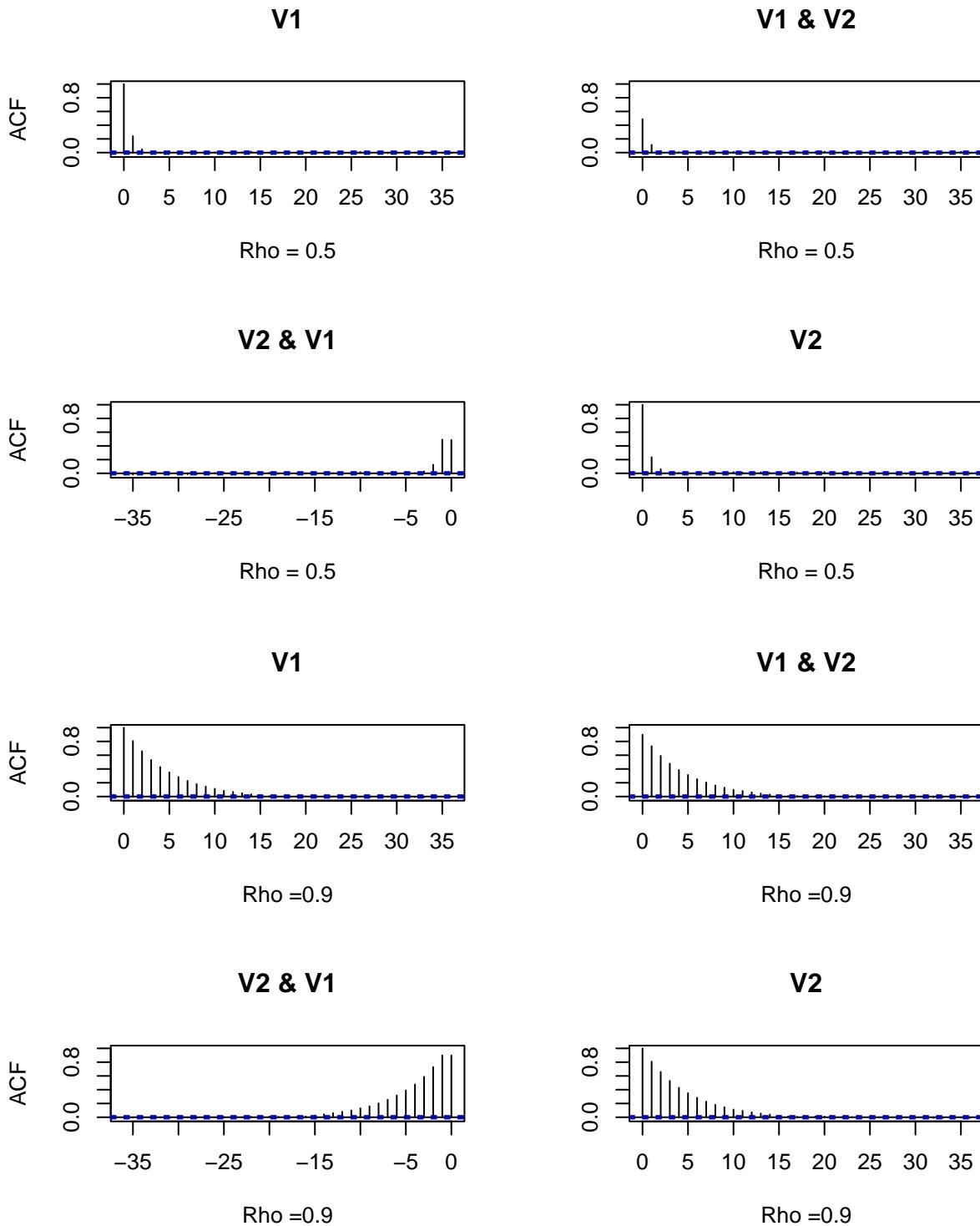
**Joint density of draws, rho = 0.9**

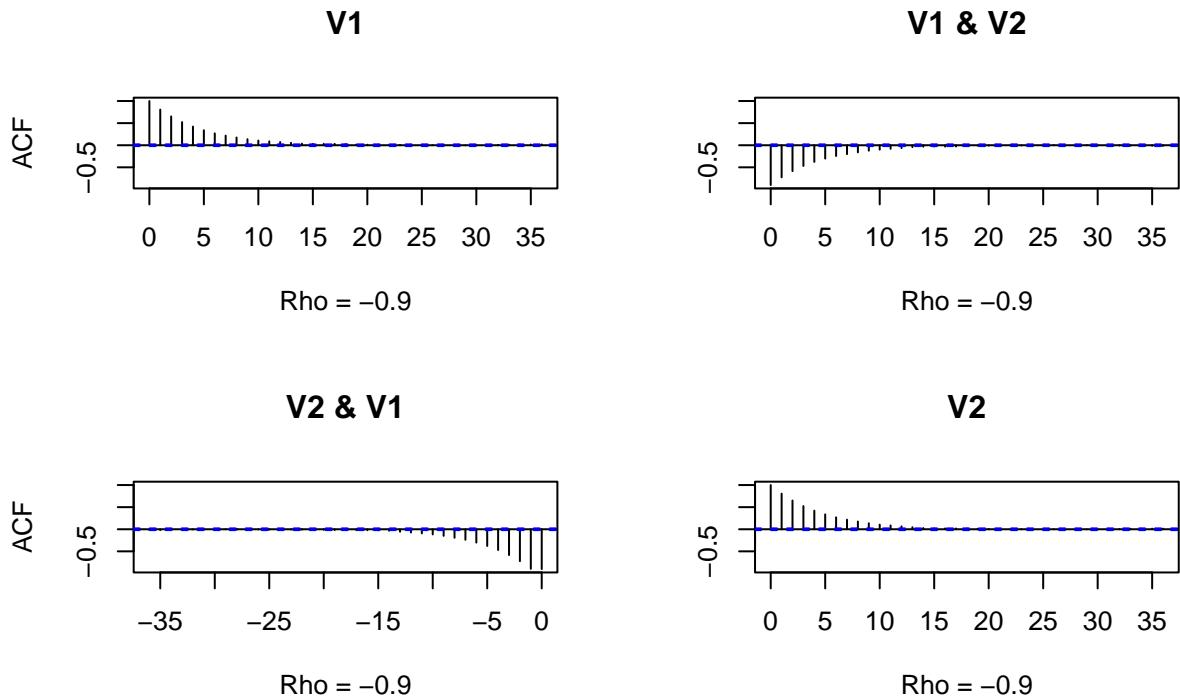


**Joint density of draws, rho = -0.9**

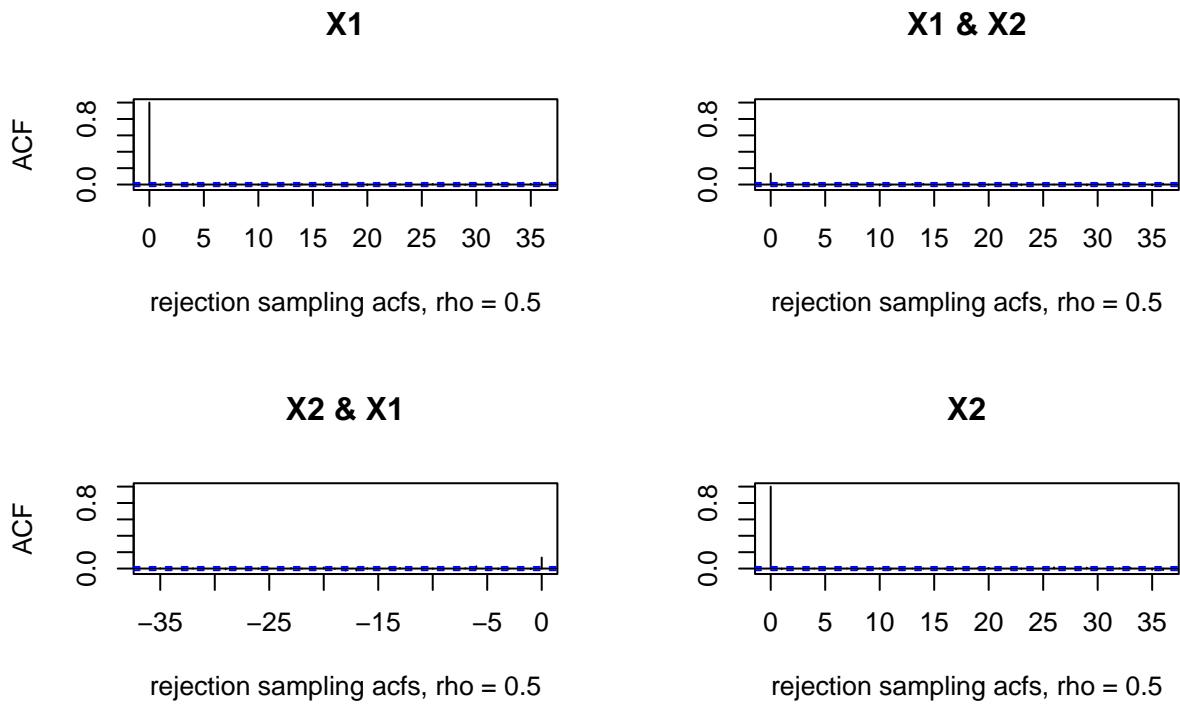


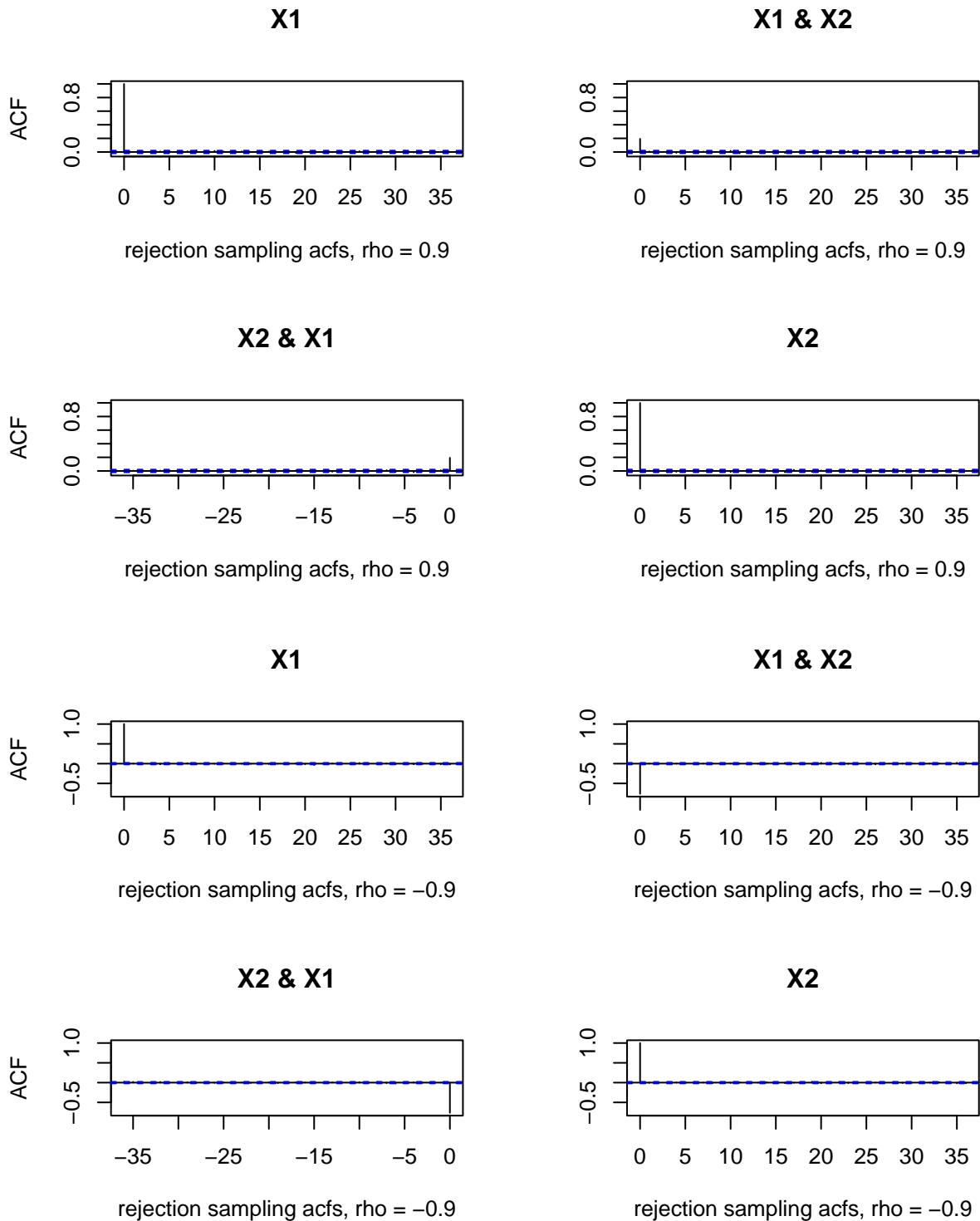
### Question 3





The autocorrelation functions of the sample clearly depend on the correlation that we impose in Question 1. The autocorrelation functions do depend on rho in the gibbs sampling case.





On the other hand, the acfs for the rejection sampling technique are all zero. This shows that rejection sampling is superior when we take into account its higher computational costs (a higher number of iterations due to the nature of the technique).