SV model

**Model:**

**Likelihood ():**

**Prior distribution:**

**Posterior distribution:**

Where:

Where:

**This is a special distribution, but can be sampled by using the AR (Acceptance-Rejection) algorithm or the MH (Metropolis-Hastings) algorithm.**

**The method proposed in Chib and Greenberg (1994) is presented here. They neglected on the right-hand side in the above equation, which is a , i.e. :.**

**Then is a truncated normal distribution with mean variance** , **leaving a range of (-1, 1).**

**Sampling and together**

For , let its prior distribution be:

Hence

The posterior distribution of is:

**Sampling volatility:**

The conditional posterior distribution of the parameters（）of the SV model can be obtained by adding latent variables to the conditions and sampling from them. Therefore, to apply the Gibbs sampler, the latent variables should be treated as parameters in the same way as ().

There are three sampling methods for h proposed so far: single-move sampler, multi-move sampler and mixture sampler.

**single-move sampler:**

When :

When :

When :

Where

Then

Note that is a convex function and can be bounded by a function linear in . Let . Then

Hence