how to program RSDC-GARCH

ZHU Cai
Department of Applied Mathematics

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$\mathbf{P}$ denotes the transition matrix of HMM:

$Y_t = \{y_t, y_{t-1}, y_{t-2}, \cdots\}$, history information set of data obtained through date t;

$f(y_t|s_t = j, Y_{t-1}; \theta)$ denotes the conditional density of y_t;
η_t is a $R \times 1$ vector, and $\eta_t[j] = f(y_t|s_t = j, Y_{t-1}; \theta)$

$\mathcal{P}(S_t = j|Y_t; \theta)$ denotes probability of HMM stays at the state j at time t, based on data obtained through date t and based on knowledge of population paremeters θ;
$\xi_{t|t}$ is a $R \times 1$ vector, and $\xi_{t|t}[j] = \mathcal{P}(S_t = j|Y_t; \theta)$

$\mathcal{P}(S_{t+1} = j|Y_t; \theta)$ denotes probability of HMM stays at the state j at time t+1, based on data obtained through date t and based on knowledge of population paremeters θ;
$\xi_{t+1|t}$ is a $R \times 1$ vector, and $\xi_{t+1|t}[j] = \mathcal{P}(S_{t+1} = j|Y_t; \theta)$

$\mathcal{P}(S_t = j|Y_{t-1}; \theta)$ denotes probability of HMM stays at the state j at time t, based on data obtained through date t and based on knowledge of population paremeters θ;
$\xi_{t|t-1}$ is a $R \times 1$ vector, and $\xi_{t|t-1}[j] = \mathcal{P}(S_t = j|Y_{t-1}; \theta)$

At each date t, there are following equations:

$$\hat{\xi}_{t|t} = \frac{\hat{\xi}_{t|t-1} \odot \eta_t}{\mathbf{1}'(\hat{\xi}_{t|t-1} \odot \eta_t)} \tag{1}$$

$$\hat{\xi}_{t+1|t} = \mathbf{P} \cdot \hat{\xi}_{t|t} \tag{2}$$