Hi, I am trying to estimate Realized GARCH as specified by Peter Hansen (2011) and defined as:

$$r_t = \sqrt{h_t} z_t \tag{1}$$

$$h_t = \omega + \beta h_{t-1} + \gamma x_{t-1} \tag{2}$$

$$x_t = \xi + \psi h_t + \tau_1 z_t + \tau_2 (z_t^2 - 1) + u_t \tag{3}$$

where:
r_t is daily return
h_t is volatility of daily return
x_t is realized volatility computed independently
$z_t \sim iid(0, 1)$
$u_t \sim iid(0, \sigma_u^2)$

The system is estimated using quasi maximum likelihood, Hansen specifies the equation as

$$l(r, x, parameters) = -\frac{1}{2} \sum_{t=1}^{n} \left[log(h_t) + \frac{r_t^2}{h_t} + log(\sigma_u^2) + \frac{u_t^2}{\sigma_u^2} \right] \tag{4}$$

I tried to estimate it in Eviews, but have several problems. The first one is that I do not know how to set the initial values of parameters. I have notices that as I change the initial values, the estimated values change. Second, I do not know how to estimate the parameter σ_u^2, I do not know how to say that it is variance of series u.

In Eviews, I did the following:

'initial values
$coef(1)omega = 1$
$coef(1)beta = 1$
$coef(1)gamma = 1$
$coef(1)xi = 1$
$coef(1)phi = 1$
$coef(2)tau = 1$
$coef(1)sigma = 1$ 'this is the problem

series $h = 1$

'set up Realized GARCH likelihood

$logl\ logl11$
$logl11.append@logllogl$
$logl11.appendh = omega(1) + beta(1) * h(-1) + gamma(1) * x(-1)$
$logl11.appendz = r/@sqrt(h)$
$logl11.appendu = x - xi(1) - phi(1) * h - tau(1) * z - tau(2) * (z^2 - 1)$
$logl11.appendlogl = -0.5 * (log(h) + r^2/h + log(sigma(1)) + u^2/sigma(1))$

$logl11.ml(showopts, m = 1000, c = 1e - 5)$
$show\ logl11.output$

The output I get says that convergence is not achieved after 1000 iterations. Also, the log likelihood is about -25866011! I would very much appreciate you help. Thank you very much.