

# GARCH-QMLE

DGP:

$$y_t = u_t = \sqrt{h_t} v_t, \quad v_t \sim \text{i.i.d.}, \quad E(v_t) = 0, \quad E(v_t^2) = 1$$

$$h_t = \omega + (av_{t-1}^2 + b)h_{t-1} \quad \omega = 0.2, \quad a = 0.3, \quad b = 0.4$$

Sample size = 1000

Error process (i.i.d.)

MODEL Garch (1,1)  
(TRUE)

Estimates/Diagnostics		N(0,1)	U(-1,1) standardized	t(5) standardized	t(1) standardized (*)
Std Errors based on Hessian	omega (p-val)	0.186914 (0.000)	0.132296 (0.004)	0.119383 (0.000)	did not converge
	alpha (p-val)	0.326310 (0.000)	0.245636 (0.000)	0.155813 (0.000)	
	beta (p-val)	0.405634(0.000)	0.553747 (0.000)	0.641271 (0.000)	
	log-likelihood value	-1166.126	-1179.046	-1105.803	
	AIC	2,340.25	2,366.09	2,219.61	
Robust Std Errors	omega (p-val)	0.186914 (0.000)	0.132296 (0.000)	0.119383 (0.012)	did not converge
	alpha (p-val)	0.326310 (0.000)	0.245636 (0.000)	0.155813 (0.002)	
	beta (p-val)	0.405634(0.000)	0.553747 (0.000)	0.641271 (0.000)	
	log-likelihood value	-1166.126	-1179.046	-1105.803	
	AIC	2,340.25	2,366.09	2,219.61	

**Note 1:** The simulation used artificial data coming from a random-number generator. Therefore the estimation results cannot be replicated exactly.

**Note 2:** The software used was Gretl.

(\*): We remind that the Student's t-distribution with one degree of freedom is the Standard Cauchy distribution and has no moments.