

Rully Septika Dewi, 2010. *Estimasi Model Conditional Heteroscedastic Autoregressive Moving Avarage berdasarkan Metode Maximum Likelihood*. Skripsi ini dibawah bimbingan Drs. H. Sediono M.Si, dan Nur Chamidah S.Si.M.Si. Departemen Matematika, Fakultas Sains dan Teknologi, Universitas Airlangga.

ABSTRAK

Model *Conditional Heteroscedastic Autoregressive Moving Avarage (CHARMA)* menggambarkan evolusi yang bergantung varian dengan menggunakan koefisien random untuk menghasilkan suatu *Conditional Heteroscedastic*. Model *CHARMA* tidak sama dengan model *ARCH*. Perbedaan utama antara model *CHARMA* dengan dengan model *ARCH* terletak pada penggunaan *Cross-product* dalam residual kuadrat.

Skripsi ini bertujuan untuk mengestimasi parameter model *CHARMA* berdasarkan metode *Maximum Likelihood* dan menerapkan model pada data saham Dow Jones yang mengandung kasus *heteroscedastic* serta meramalkanya untuk 5 data kedepan. Hasil estimasi model *CHARMA* diperoleh dengan menurunkan bentuk *ln likelihood* model pada masing masing parameter yang selanjutnya menyelesaikanya dengan metode *Newton Raphson*. Model *CHARMA(1)* dapat dituliskan sebagai berikut :

$$\sigma_t^2 = 1,87953.10^{14} + 0,00403[a_{t-1}]^2$$

Disamping itu, hasil MSE peramalan tanpa validasi lebih kecil daripada hasil MSE peramalan menggunakan validasi model *CHARMA*.

Kata Kunci : *Conditional Heteroscedastic, CHARMA, Metode Maximum Likelihood*

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ABSTRACT

Conditional Heteroscedastic Autoregressive Moving Average (CHARMA) model. The purpose of this *skripsi* is to describe the evolution of the conditional variance and used random coefficients to produce conditional heteroscedasticity. The *CHARMA* is not same as the *ARCH* model. An obvious difference between *ARCH* and *CHARMA* models is that the latter use *cross-product* of the lagged values of a_t in the volatility equation.

The *skripsi* has purpose to estimate the parameters of *CHARMA* model using *Maximum Likelihood Method* and to apply the *CHARMA* model on the asset data of Dow Jones which has heteroscedastic case. Then, forecasting the volatility at 5 next data. The result of estimate *CHARMA* model was got from *ln likelihood* derivative model at each parameters then, solve the equations with Newton Raphson method. *CHARMA(1)* model can be written as

$$\sigma_t^2 = 1,87953 \cdot 10^{14} + 0,00403[a_{t-1}]^2$$

Beside it, the result MSE of forecasting without validation much little than the result MSE of forecasting with validation of *CHARMA* model.

Key Words : *Conditional Heteroscedastic, CHARMA, Maximum Likelihood Method*