

**DEVELOPMENT OF GSTAR MODEL WITH ERROR ARCH
AND IT'S APPLICATION ON INFLATION**

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ABSTRACT

This dissertation presents the integration of Generalized Space-time AutoRegressive model (GSTAR) with an error AutoRegressive Conditional Heteroscedastic (ARCH), called GSTAR-ARCH model. This model is a multivariate time series with the mean GSTAR and variance ARCH. GSTAR development was motivated by a variable that often has a non constant variance, such as inflation. The non constant variance in inflation can be influenced by the presence of interventions such as socio-political situation, economic policy etc. Therefore, GSTAR-ARCH can be used to model the phenomenon of intervention on inflation.

Estimation of parameter is done by representing the GSTAR-ARCH as a regression-ARCH model. The explanatory matrix stated in sub-column matrix. Sub-column matrix arrangement provides advantages such as easier data input, simplifying the model parameter estimation GSTAR-order one. Parameter estimation of GSTAR-ARCH done in two stages. First, the variance equation parameters are estimated by Maximum Likelihood (ML) via the method of scoring. Second, the mean equation parameters GSTAR estimated with Generalized Least Squares (GLS). GLS method is obtained by performing a linear transformation of the model in order to obtain a transformation that meets the assumptions of least squares estimation method. It has been proven that the GLS estimator of GSTAR-ARCH parameters is unbiased.

GSTAR-ARCH model with uniform weighting applied to the inflation data of three cities in West Java province, namely: Bandung, Tasikmalaya and Cirebon. The phenomenon of inflation in the three locations were observed during the 219 months, in January 1990 to March 2008. Central Statistics Agency (BPS) sets these three cities representing West Java Province. ARCH significant influence on the confidence level of 95%. Furthermore, the ARCH variance model is calculated at each location shows the coefficients of ARCH models statisfy positive variance.

Therefore, GSTAR-ARCH model is applied to the three locations. The model obtained can be used to forecast inflation in future time at the location of the observation taking into account inflation from two other locations.

Key words: GSTAR, ARCH, inflation, intervention.