

**AN INVESTIGATION OF A GENERALIZED LEAST SQUARES  
ESTIMATOR FOR NON-LINEAR TIME SERIES MODEL**

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ABSTRACT.

Ochi(1983) proposed an estimator for the autoregressive coefficient of the first-order autoregressive model (AR(1)) by using two constants for the end points of the process. Classical estimators for AR(1), such as the least squares estimator, Burg's estimator, and Yule-Walker estimator are obtained as special cases by choice of the constants in Ochi's estimator. By writing the first-order autoregressive conditional heteroskedastic model, ARCH(1), in a form similar to that of AR(1), we extend Ochi's estimator to ARCH(1) models. This allows introducing analogues of the least squares estimator, Burg's estimator and Yule-Walker estimator, and we compare the relations of these with Ochi's estimator for ARCH(1) models. We then provide a simulation for AR(1) models and examine the performance of Ochi's estimator. Also, we simulate Ochi's estimator for ARCH(1) with different parameter values and sample sizes.

*Key words and phrases.* Burg's method, Least squares estimator, Mean Square Error, Ochi's estimator, Yule-Walker estimator.