

**On Detecting A Break Point  
In Models Involving Structural Change :  
A Bayesian Approach**

**Arnulfo P. Supe**

*submitted to*

The UP Statistical Center  
University of the Philippines  
Diliman, Quezon City

*In partial fulfillment of the requirements*

*for the degree*

**Ph. D. in Statistics**

October, 1994

## ABSTRACT

Linear Regression models and Time Series models are analyzed for possible changes in the parameters. The cases of both equal error variances and unequal error variances across two regimes are examined using the Bayesian approach. The analysis of structural change for the Distributed Lag Model is presented for the first time in this paper.

Three types of prior distributions are used in deriving the posterior mass function of the break point. The first uses auxiliary information while the second uses past data to formulate the prior densities of the parameters. The third is Jeffreys' noninformative prior. The use of these priors allows one to come up with prior distributions that are free from hyperparameters.

The Bayesian method of estimating the break point is illustrated by numerical examples. Simulation studies are performed to evaluate the effectiveness of the method in capturing the break point. Results showed that the procedures developed in this paper are useful for applications.