Testing for Presence of Structural Change and Spatial Heterogeneity in Spatio-Temporal Models with Temporary Volatility

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A thesis submitted in partial fulfilment of the requirements for the degree of

Master of Science (Statistics)

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March 2010

ABSTRACT

A spatio-temporal model is postulated. But due to the interaction of space and time dependencies, this model is easily affected by a temporary structural change in the context of volatility. Although temporary, volatility affects not only the variance, but also the mean as well as the spatial dependencies captured by the parameter of a spatial indicator. Bootstrap methods along with the forward search algorithm are used to test presence of structural change and spatial heterogeneity in the postulated model. Simulation studies indicated that the test procedure is properly sized and with high power especially when more spatial units are analyzed or that the temporary volatility becomes pervasive..

Keywords: bootstrap; forward search; spatio-temporal model; structural change; spatial heterogeneity