

Time Inhomogeneous Multivariate Markov Chains: Detecting and Testing Multiple Structural Breaks Occurring at Unknown Dates

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Markov chains models are used in several applications and different areas of study. Usually a Markov chain model is assumed to be homogeneous in the sense that the transition probabilities are time invariant. Yet, ignoring the inhomogeneous nature of a stochastic process by disregarding the presence of structural breaks can lead to misleading conclusions. Several methodologies are currently proposed for detecting structural breaks in a Markov chain, however, these methods have some limitations, namely they can only test directly for the presence of a single structural break. This paper proposes a new methodology for detecting and testing the presence multiple structural breaks in a Markov chain occurring at unknown dates.