THE UNIVERSITY OF CHICAGO

Department of Statistics

MASTER'S THESIS PRESENTATION

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Using Kernel Regression to Model Time-Varying Persistence in AR Models

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ABSTRACT

The present paper explores a kernel smoother for fitting AR(1) processes with time-varying persistence proposed by Giraitis, Kapenaios, and Yates (2014) as an alternative to models of structural breaks traditionally used in time series econometrics and tests a data-based bandwidth selection drawing from Kim, et. al. (2009) and De Brabanter, et. al. (2011) as an alternative to the plug-in estimator originally proposed in their paper. Simulations suggest that the kernel smoother can be a viable and more flexible alternative to the traditional models, particularly if the underlying time-varying coefficients change smoothly over time, and both the plug-in and data-based estimators for the bandwidth do an acceptable job in approximating the optimal values for this parameter. Using real-world US inflation data, it is also shown that using kernel smoothing can allow the estimates of the time-varying parameters themselves to be treated as a variable that can be statistically modeled and thus opens the door for researching what affects inflation persistence rather than just considering it as a parameter to be estimated, although smoothers based on optimal univariate kernels would generally be unable to capture discontinuities in the true coefficient values if they are generated by a random process with a high variance.