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ON AUTOREGRESSIVE ORDER SELECTION CRITERIA

Venus Khim-Sen Liew,

Labuan School of International Business and Finance,
Universiti Malaysia Sabah.

Sie-Hoe Lau

Faculty of Information Technology and Quantitative Science,
Universiti Teknologi MARA, Sarawak Campus.

Chin-Hong Puah

Faculty of Economics and Business,
Universiti Malaysia Sarawak.

Abstract

This study investigates the performance of various commonly applied order selection criteria in selecting order of Autoregressive (AR) processes. The most important finding of this study is that Akaike's information criterion, Schwarz information criterion, Hannan-Quinn criterion, final prediction error and Bayesian information criterion perform considerably well in estimating the true autoregressive order, even in small samples. Besides, there is no significant gain in differentiating these criteria unless one has a considerably large sample size. This study contributes to the empirical literature by providing helpful guidelines regarding the use of order selection criteria in determining the autoregressive order.

1.0 INTRODUCTION

Many order selection criteria have been employed in economic studies to determine the Autoregressive (AR) order of time series variables. Briefly, an AR process of order p refers to a time series in which its current value is dependent on its first p lagged values and is normally denoted by AR (p). Note that the AR order p is always unknown and therefore has to be estimated via various order selection criteria such as Akaike's information criterion (AIC) (Akaike, 1973), Schwarz's information criterion (SIC) (Schwarz, 1978) Hannan-Quinn's criterion (HQC) (Hannan and Quinn, 1979), the final prediction error (FPE) (Akaike, 1969), and the Bayesian information criterion (BIC) (Akaike, 1979). See Liew (2000) for an overview of these criteria.

These criteria have been popularly adopted in economic studies, see for example the work of Sarantis (1999, 2001) and Baum et al. (2001), who employed the AIC, Ahmed (2000) who used the AIC and BIC, Tan and Baharumshah (1999) who deployed the FPE, Yamada (2000) who used AIC and HQC and Xu (2003) who utilized the SIC in their empirical research. However, no special study has been carried out to contrast the performances of these order selection criteria, although few empirical studies (Taylor and Peel, 2000); Baum et al., 2001;