

# The Block-Autoregressive Model in Non-Standard Base

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## Abstract

We propose a new autoregressive model for the analysis of time-series with periodic interdependencies. The model is based on the application of a vector autoregressive model to univariate data that is partitioned into ‘blocks’ of observations. For this reason, we refer to it as the block-autoregressive (BAR) model. The untransformed BAR model nests several other autoregressive models such as the regular AR model, the periodic AR model, the (mixed) seasonal AR model, and the scale-specific AR model that was introduced by Bandi et. al (2019). In addition, the BAR model can be transformed using orthonormal bases to unveil dependencies between weighted averages of observations in subsequent blocks. This yields parsimonious model representations that enhance interpretability and improve predictive performance. The model is estimated using OLS and parametric bootstrapping methods in the case of large samples, which is complemented by a basis-specific LASSO step for smaller samples. Both simulated and empirical examples are used to illustrate the model. This is a joint work with Joint with Dick van Dijk and Karel de Wit.