ID4
AR Identification

4.10 PARAMETRIC AND STRUCTURAL IDENTIFICATION OF MULTIVARIABLE AR MODELS

Redefining matrix H_i (3.18.1) as

$$\begin{aligned} H_i &= H(\nu_{i1}, \ldots, \nu_i, \ldots, \nu_{im}) \\ &= \left[H_{\nu_{i1}}(y_1), \ldots, H_{\nu_i}(y_i), \ldots, H_{\nu_{im}}(y_m) \right] \end{aligned} \tag{4.10.1}$$

and the parameter vector θ_i° (3.18.3) as

$$\theta_i^\circ = \left[\alpha_{i11} \ldots \alpha_{i1\nu_{i1}} \mid \ldots \mid \alpha_{im1} \ldots \alpha_{im\nu_{im}} \right]^T, \tag{4.10.2}$$

all expressions concerning the estimate of the parameters of multivariable ARX models can be used for AR models. It is also straightforward to extend the procedure for the estimation of increasing–order models described in Module ID4.4 to multivariable models with increasing structure. The structural identification of multivariable ARX models can be performed in the same way already described for ARX models.