Consider a $p-$order VAR for the $1\times m$ vector of observed variables $y_t$

$$y_t = \sum_{k=1}^{p} y_{t-k}A_k + u_t$$

where

$$u_t \sim \mathcal{N}(0,\Sigma_u).$$

Let $z_t$ be the $mp\times 1$ vector

$$Y = ZA + \mathcal{U}$$

Dummy observation prior for the VAR can be constructed using the VAR likelihood function $\mathcal{T}=\lambda T$ artificial data simulated from the DSGE model $(Y^*,Z^*)$, combined with diffuse priors.

The prior is given by

$$p_0(A,\Sigma|Y^*,Z^*) \propto |\Sigma|^{-\frac{\lambda T+m+1}{2}} \exp\left\{-\frac{1}{2}tr\left[\Sigma^{-1}\left(Y^{*'}Y^* - A'Z^{*'}Y^* - Y^{*'}Z^*A + A'Z^{*'}Z^*A\right)\right]\right\}$$

implying that $\Sigma$ follows an inverted Wishart distribution and A conditional on $\Sigma$ is gaussian.

Del Negro Schorfheide use the DSGE theoretical autcovariances matrices for a given $n\times 1$ vector of model parameters $\theta$, denoted $\Gamma_{YY}(\theta),\Gamma_{ZY}(\theta),\Gamma_{YZ}(\theta),\Gamma_{ZZ}(\theta)$ instead of artificial sample moments. In addition, the $p-th$ order VAR approximation of the DSGE provides the first moment of the prior distributions through the population least-square regression

$$A^*(\theta) = \Gamma_{ZZ}(\theta)^{-1}\Gamma_{ZY}(\theta) \tag{1.6.1}$$

$$\Sigma^*(\theta) = \Gamma_{YY}(\theta) - \Gamma_{YZ}(\theta)\Gamma_{ZZ}(\theta)^{-1}\Gamma_{ZY}(\theta) \tag{1.6.2}$$

**Conditional on the deep parameters of the DSGE model $\theta$ and the weight $\lambda$, the priors for the VAR parameters are given by**

$$vec(A)|\Sigma,\theta,\lambda \sim \mathcal{N}\left(vec(A^*(\theta)),\Sigma\otimes[\lambda T\Gamma_{ZZ}(\theta)]^{-1}\right) \tag{1.6.3}$$

$$\Sigma|\theta,\lambda \sim \mathcal{IW}(\lambda T\Sigma^*(\theta),\lambda T - mp - m) \tag{1.6.4}$$

where $\Gamma_{ZZ}(\theta)$ is assumed to be non-singular and $\lambda \geq \frac{mp+m}{T}$ for the priors to be proper.

**Problem** Dynare does not explicitly state the DSGE-based prior for the BVAR. It should, however, be possible to construct it according to (1.6.1), (1.6.2), (1.6.3) and (1.6.4).