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On the Performances of Classical VAR and Sims-Zha Bayesian VAR Models in the Presence of Collinearity and Autocorrelated Error Terms

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Abstract

In time series literature, many authors have found out that multicollinearity and autocorrelation usually afflict time series data. In this paper, we compare the performances of classical VAR and Sims-Zha Bayesian VAR models with quadratic decay on bivariate time series data jointly influenced by collinearity and autocorrelation. We simulate bivariate time series data for different collinearity levels (−0.99, −0.95, −0.9, −0.85, −0.8, 0.8, 0.85, 0.9, 0.95, 0.99) and autocorrelation levels (−0.99, −0.95, −0.9, −0.85, −0.8, 0.8, 0.85, 0.9, 0.95, 0.99) for time series length of 8, 16, 32, 64, 128, 256 respectively. The results from 10,000 simulations reveal that the models performance varies with the collinearity and autocorrelation levels, and with the time series lengths. In addition, the results reveal that the BVAR4 model is a viable model for forecasting. Therefore, we recommend that the levels of collinearity and autocorrelation, and the time series length should be considered in using an appropriate model for forecasting.

Keywords

Vector Autoregression (VAR), Classical VAR, Bayesian VAR (BVAR), Sims-Zha Prior, Collinearity, Autocorrelation

1. Introduction

There are various objectives for studying time series. These include the understanding and description of the generated mechanism, the forecasting of future value and optimum control of a system [1]. In time series litera-

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ture, many authors have found out that multicollinearity and autocorrelation usually afflict time series data. For instance, Gujarati [2] observed that multicollinearity problem usually afflicted the VAR models. It was reported that correlation coefficients $|r| > 0.7$ was an appropriate indicator when collinearity began to severely distort model estimation and subsequent prediction [3]. In a recent work of Garba *et al*. [4], they observed that the autocorrelation problem usually afflicted time series data. Lastly, Adenomon and Oyejola [5] studied the performances of VAR and BVAR model (assuming harmonic decay) when the bivariate time series were jointly influenced by collinearity and autocorrelation.

The aim of this study is to examine the performances of the classical VAR and Sims-Zha Bayesian VAR model in the presence of collinearity and autocorrelated error terms.

2. Model Description

2.1. Vector Autoregression (VAR) Model

Given a set of *k* time series variables, $y_t = \left[y_{it}, \cdots, y_{Kt}\right]'$, VAR models of the form

$$y_t = A_1 y_{t-1} + \cdots + A_p y_{t-p} + u_t \tag{1}$$

provide a fairly general framework for the Data General Process (DGP) of the series. More precisely this model is called a VAR process of order p or VAR(p) process. Here $u_t = \left[u_{1t}, \cdots, u_{Kt}\right]'$ is a zero mean independent white noise process with non singular time invariant covariance matrix $\sum_u$ and the A_i are $(k \times k)$ coefficient matrices. The process is easy to use for forecasting purpose though it is not easy to determine the exact relations between the variables represented by the VAR model in Equation (1) above [6].

Also, polynomial trends or seasonal dummies can be included in the model.

The process is stable if

$$\det\left(I_K - A_1 z - \cdots - A_p z^p\right) \neq 0 \quad \text{for } |z| \leq 1 \tag{2}$$

In that case it generates stationary time series with time invariant means and variance covariance structure. The basic assumptions and properties of a VAR processes is the stability condition. A VAR(p) processes is said to be stable or fulfills stability condition, if all its eigenvalues have modulus less than 1 [7].

Therefore To estimate the VAR model, one can write a VAR(p) with a concise matrix notation as:

$$\begin{aligned} &Y = BZ + U \\ &\text{where } Y = \left[y_1, \cdots, y_T\right], \quad Z_{t-1} = \begin{bmatrix} y_{t-1} \\ \vdots \\ y_{t-p} \end{bmatrix}, \quad Z = \left[Z_0, \cdots, Z_{T-1}\right] \end{aligned} \tag{3}$$

Then the Multivariate Least Squares (MLS) for *B* yields

$$\hat{B} = \left(ZZ'\right)^{-1} Z'Y \tag{4}$$

2.2. Bayesian Vector Autoregression with Sims-Zha Prior

In recent times, the BVAR model of Sims and Zha [8] has gained popularity both in economic time series and political analysis. The Sims-Zha BVAR allows for a more general specification and can produce a tractable multivariate normal posterior distribution. Again, the Sims-Zha BVAR estimates the parameters for the full system in a multivariate regression [9].

Given the reduced form model

$$y_t = c + y_{t-1} B_1 + \cdots + y_{t-p} B_p + u_t$$

$$\text{where } c = dA_0^{-1}, \ B_l = -A_l A_0^{-1}, \ l = 1, 2, \cdots, p, \ u_t = \varepsilon_t A_0^{-1} \text{ and } \Sigma = A_0^{-1\prime} A_0^{-1}$$

The matrix representation of the reduced form is given as:

$$\underset{T\times m}{Y} = \underset{T\times(mp+1)}{X} \ \underset{(mp+1)\times m}{\beta} + \underset{T\times m}{U}, \quad U \sim MVN\left(0, \Sigma\right)$$

We can then construct a reduced form Bayesian SUR with the Sims-Zha prior as follows. The prior means for

the reduced form coefficients are that $B_1 = I$ and $B_2, \cdots, B_p = 0$. We assume that the prior has a conditional structure that is multivariate Normal-inverse Wishart distribution for the parameters in the model. To estimate the coefficients for the system of the reduced form model with the following estimators

$$\hat{\beta} = \left(\Psi^{-1} + X'X\right)^{-1}\left(\Psi^{-1}\bar{\beta} + X'Y\right)$$

$$\hat{\Sigma} = T^{-1}\left(Y'Y - \hat{\beta}'\left(X'X + \Psi^{-1}\right)\hat{\beta} + \bar{\beta}'\Psi^{-1}\bar{\beta} + \bar{S}\right)$$

where the Normal-inverse Wishart prior for the coefficients is

$$\beta/\Sigma \sim N\left(\bar{\beta}, \Psi\right) \text{ and } \Sigma \sim IW\left(\bar{S}, v\right)$$

This representation translates the prior proposed by Sims and Zha form from the structural model to the reduced form ([10] [9]), and ([8] [11]).

The summary of the Sims-Zha prior is given in **Table 1**.

3. Simulation Procedure

The simulation procedure is as follows:

Step 1: We generated an artificial two-dimensional (Bivariate data) VAR (2) process that obeys the following form:

$$\begin{bmatrix} y_1 \\ y_2 \end{bmatrix}_t = \begin{bmatrix} 5.0 \\ 10.0 \end{bmatrix} + \begin{bmatrix} 0.5 & 0.2 \\ -0.2 & -0.5 \end{bmatrix}\begin{bmatrix} y_1 \\ y_2 \end{bmatrix}_{t-1} + \begin{bmatrix} -0.3 & -0.7 \\ -0.1 & 0.3 \end{bmatrix}\begin{bmatrix} y_1 \\ y_2 \end{bmatrix}_{t-2} + \begin{bmatrix} u_1 \\ u_2 \end{bmatrix}_t$$

such that $u_{1t} = \delta u_{1t} + \varepsilon_{1t}$ and $u_{2t} = \delta u_{2t-1} + \varepsilon_{2t}$ where $\varepsilon_{it} \sim N(0,1)$ and $i = 1, 2, \cdots, T$. Our choice here is similar to the work and illustration of Cowpertwait, [12]. We considered ten autocorrelated levels as $\delta = (-0.99, -0.95, -0.9, -0.85, -0.8, 0.8, 0.85, 0.9, 0.95, 0.99)$. Our choice for this form model is to obtain a stable process and a VAR process with a true lag length [13].

Step 2: We then use the Cholesky Decomposition to apply to the data generated in **Step 1** in order to create a bivariate time series data so that y_1 and y_2 have the desired correlation level [14]. We considered ten multicollinearity levels as $\rho = (-0.99, -0.95, -0.9, -0.85, -0.8, 0.8, 0.85, 0.9, 0.95, 0.99)$.

The combination of **Step 1** and **2** therefore produce a bivariate time series such that y_1 and y_2 are jointly influenced by multicollinearity and autocorrelation.

The simulated data assumed time series lengths of 8, 16, 32, 64, 128 and 256. A sample of simulated data is presented in **Table 2** below.

3.1. Model Specification

The time series were generated data using a VAR model with lag 2. The choice here is to obtain a bivariate time series with the true lag length. While the VAR and BVAR models of lag length of 2 was used for modeling and forecasting purpose.

Table 1. Hyperparameters of Sims-Zha reference prior.

Parameter	Range	Interpretation
λ_0	[0, 1]	Overall scale of the error covariance matrix
λ_1	>0	Standard deviation around A_1 (persistence)
λ_2	=1	Weight of own lag versus other lags
λ_3	>0	Lag decay
λ_4	≥0	Scale of standard deviation of intercept
λ_5	≥0	Scale of standard deviation of exogenous variable coefficients
μ_5	≥0	Sum of coefficients/Cointegration (long-term trends)
μ_6	≥0	Initial observations/dummy observation (impacts of initial conditions)
v	>0	Prior degrees of freedom

Source: Brandt and Freeman, [10].

Table 2. Sample of simulated data for $T = 8$.

	$\rho = 0.9$		Residuals		$\delta = 0.9$	
	y_1	y_2	[U, 1]	[U ,2]	−0.36417791	−1.05632564
1	4.635822	8.562592	0.55065249	0.3621112	−2.63216817	−2.31257463
2	8.276017	9.102328	0.90145401	0.6982855	−0.97256527	−1.03760062
3	−1.176551	2.678471	1.46132912	1.0779790	0.19179026	0.85192775
4	−1.324869	1.132437	−8.63500727	−5.8296621	0.07215923	−0.24242029
5	−1.217209	2.879577	−0.02956038	−1.4306597	−0.43158786	−0.92545664
6	1.841691	4.163813	0.11858453	1.7689057	−1.16868494	−1.66643992
7	1.244165	4.437567	3.15291385	1.3667331	−2.00270147	−2.87661209
8	3.418945	5.086300	−0.30830834	0.4905413		
			2.45848960	0.8676871		
	Estimated correlation = 0.9449642		Estimated correlation = 0.925		Estimated value = 0.616	

For the BVAR model with Sims-Zha prior, we considered the following range of values for the hyperparameters given below and the Normal-inverse Wishart prior was employed.

We considered two tight priors and two loose priors as follows:

The Tight priors are as follows

$$\text{BVAR1} = \left(\lambda_0 = 0.6,\ \lambda_1 = 0.1,\ \lambda_3 = 2,\ \lambda_4 = 0.1,\ \lambda_5 = 0.07,\ \mu_5 = \mu_6 = 5\right)$$

$$\text{BVAR2} = \left(\lambda_0 = 0.8,\ \lambda_1 = 0.1,\ \lambda_3 = 2,\ \lambda_4 = 0.1,\ \lambda_5 = 0.07,\ \mu_5 = \mu_6 = 5\right)$$

The Loose priors are as follows

$$\text{BVAR3} = \left(\lambda_0 = 0.6,\ \lambda_1 = 0.15,\ \lambda_3 = 2,\ \lambda_4 = 0.15,\ \lambda_5 = 0.07,\ \mu_5 = \mu_6 = 2\right)$$

$$\text{BVAR4} = \left(\lambda_0 = 0.8,\ \lambda_1 = 0.15,\ \lambda_3 = 2,\ \lambda_4 = 0.15,\ \lambda_5 = 0.07,\ \mu_5 = \mu_6 = 2\right)$$

where $n\mu$ is prior degrees of freedom given as $m + 1$ where m is the number of variables in the multiple time series data. In work $n\mu$ is 3 (that is two (2) time series variables plus 1 (one)).

Our choice of Normal-inverse Wishart prior for the BVAR models follow the work of Kadiyala & Karlsson, [15] that Normal Wishart prior tends to performed better when compared to other priors. In addition Sims and Zha, [8] proposed Normal-inverse Wishart prior because of its suitability for large systems while Breheny, [16] reported that the most advantage of Wishart distribution is that it guaranteed to produce positive definite draws. Our choice of the overall tightness $\lambda_0 = 0.6$ and 0.8 is in line with work of Brandt, Colaresi and Freeman, [17]. In this work we assumed that the bivariate time series follows a quadratic decay. The Quadratic Decay (QD) model has many attractive theoretical properties that is why it is been applied to many fields of endeavour ([18] [19]) [20].

The following are the criteria for Forecast assessments used:

1) Mean Absolute Error (MAE) has a formular $\text{MAE}_j = \dfrac{\sum_{i=1}^{n} |e_i|}{n}$. This criterion measures deviation from the series in absolute terms, and measures how much the forecast is biased. This measure is one of the most common ones used for analyzing the quality of different forecasts.

2) The Root Mean Square Error (RMSE) is given as $\text{RMSE}_j = \sqrt{\dfrac{\sum_{i}^{n} \left(y_i - y^f\right)^2}{n}}$ where y_i is the time series data and y^f is the forecast value of y [13].

For the two measures above, the smaller the value, the better the fit of the model [21].

In this simulation study, $\text{RMSE} = \dfrac{\sum_{j}^{N} \text{RMSE}_j}{N}$ and $\text{MAE} = \dfrac{\sum_{j}^{N} \text{MAE}_j}{N}$ where N = 10,000. Therefore, the

model with the minimum RMSE and MAE result as the preferred model.

3.2. Statistical Packages (R)

In this study three procedures in the *R* package will be used. They are: Dynamic System Estimation (DSE) [22]; the vars [23], and the MSBVAR [24].

4. Results and Discussion

The Root Mean Square Error (RMSE) and Mean Absolute Error (MAE) were obtained for the various models in the work and are presented in **Appendix A**, while the ranks are presented in **Appendix B**. But here the preferred models with respect to their rank are presented. The preferred model for the time series length of 8, 16, 32, 64, 128 and 256 are presented in **Tables 3-8** respectively.

In **Table 3** below, when $T = 8$ the BVAR models are preferred in all levels of collinearity and autocorrelation. Also in **Table 4** below, when $T = 16$ the BVAR models are preferred in all levels of collinearity and autocorrelation.

In **Table 5** below, when $T = 32$ the BVAR models are preferred in all levels of collinearity and autocorrelation except in few cases where classical VAR is preferred. In **Table 6** below, when $T = 64$ the BVAR models are preferred in all levels of collinearity and autocorrelation except in some cases where classical VAR is preferred.

In **Table 7** below, when $T = 128$ the BVAR models are preferred in some levels of collinearity and autocorre-

Table 3. Preferred model at different levels of collinearity and autocorrelation when $T = 8$.

AUTOCO LEVELS (δ)	COLLINERITY (ρ)											
	−0.99		−0.95		−0.9		−0.85		−0.8		0.8	
	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
−0.99	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR2
−0.95	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR3	BVAR2
−0.9	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR2	BVAR1
−0.85	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR1	BVAR1
−0.8	BVAR3	BVAR3	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR1	BVAR1
0.8	BVAR1	BVAR1	BVAR3	BVAR3	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR3	BVAR1	BVAR1
0.85	BVAR3	BVAR1	BVAR3	BVAR3	BVAR4	BVAR4	BVAR4	BVAR3	BVAR3	BVAR3	BVAR1	BVAR1
0.9	BVAR1	BVAR1	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR3	BVAR1	BVAR1
0.95	BVAR3	BVAR1	BVAR3	BVAR3	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR1	BVAR1
0.99	BVAR1	BVAR1	BVAR4	BVAR3	BVAR4	BVAR3	BVAR4	BVAR3	BVAR4	BVAR4	BVAR1	BVAR1

AUTOCO LEVELS (δ)	COLLINEARITY (ρ)							
	0.85		0.9		0.95		0.99	
	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
−0.99	BVAR4	BVAR1	BVAR3	BVAR1	BVAR4	BVAR1	BVAR4	BVAR1
−0.95	BVAR3	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR3	BVAR1
−0.9	BVAR1	BVAR1	BVAR2	BVAR1	BVAR1	BVAR1	BVAR3	BVAR1
−0.85	BVAR1	BVAR1	BVAR1	BVAR1	BVAR2	BVAR1	BVAR1	BVAR1
−0.8	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR2	BVAR1
0.8	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1
0.85	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1
0.9	BVAR1	BVAR1	BVAR2	BVAR1	BVAR2	BVAR1	BVAR1	BVAR1
0.95	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1
0.99	BVAR2	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1

lation and the classical VAR is preferred in some levels of collinearity and autocorrelation. In **Table 8** below, when $T = 256$ the BVAR models are preferred in some levels of collinearity and autocorrelation and the classical VAR is preferred in some levels of collinearity and autocorrelation.

Table 4. Preferred model at different levels of collinearity and autocorrelation when $T = 16$.

AUTOCO LEVELS (δ)	COLLINERITY (ρ)											
	−0.99		−0.95		−0.9		−0.85		−0.8		0.8	
	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
−0.99	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4
−0.95	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR3	BVAR3
−0.9	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR3	BVAR2
−0.85	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR2	BVAR2
−0.8	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR1	BVAR1
0.8	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR1	BVAR1
0.85	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR2	BVAR2
0.9	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR1	BVAR1
0.95	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR1	BVAR1
0.99	BVAR3	BVAR3	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR2	BVAR2

AUTOCO LEVELS (δ)	COLLINEARITY (ρ)							
	0.85		0.9		0.95		0.99	
	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
−0.99	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4
−0.95	BVAR3	BVAR3	BVAR4	BVAR2	BVAR4	BVAR4	BVAR4	BVAR4
−0.9	BVAR4	BVAR2	BVAR4	BVAR2	BVAR4	BVAR2	BVAR4	BVAR4
−0.85	BVAR2	BVAR2	BVAR2	BVAR2	BVAR4	BVAR2	BVAR4	BVAR4
−0.8	BVAR2	BVAR1	BVAR1	BVAR1	BVAR2	BVAR1	BVAR4	BVAR4
0.8	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1
0.85	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR2	BVAR2
0.9	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR4	BVAR1
0.95	BVAR1	BVAR1	BVAR2	BVAR2	BVAR1	BVAR1	BVAR3	BVAR1
0.99	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR3	BVAR2

Table 5. Preferred model at different levels of collinearity and autocorrelation when $T = 32$.

AUTOCO LEVELS (δ)	COLLINERITY (ρ)											
	−0.99		−0.95		−0.9		−0.85		−0.8		0.8	
	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
−0.99	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4
−0.95	BVAR4	BVAR4	BVAR4	BVAR4	BVAR3	BVAR3	BVAR4	BVAR4	BVAR4	BVAR4	BVAR2	BVAR2
−0.9	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR2	BVAR2
−0.85	BVAR4	BVAR3	BVAR4	BVAR4	BVAR4	BVAR4	BVAR3	BVAR3	BVAR4	BVAR3	BVAR2	BVAR2
−0.8	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	VAR(2)	VAR(2)
0.8	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	VAR(2)	VAR(2)
0.85	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	VAR(2
0.9	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4
0.95	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4
0.99	BVAR3	BVAR3	BVAR4	BVAR4	BVAR4	BVAR4	BVAR3	BVAR3	BVAR3	BVAR3	BVAR4	BVAR4

Continued

AUTOCO LEVELS (δ)	COLLINEARITY (ρ)							
	0.85		0.9		0.95		0.99	
	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
−0.99	BVAR4	BVAR4	BVAR4	BVAR2	BVAR4	BVAR4	BVAR4	BVAR4
−0.95	BVAR2	BVAR2	BVAR2	BVAR2	BVAR2	BVAR2	BVAR4	BVAR4
−0.9	BVAR2	BVAR2	BVAR2	BVAR2	BVAR2	BVAR2	BVAR4	BVAR4
−0.85	BVAR2	VAR(2)	BVAR2	BVAR2	BVAR2	BVAR2	BVAR4	BVAR4
−0.8	BVAR2	VAR(2)	BVAR2	VAR(2)	BVAR2	VAR(2)	BVAR4	BVAR4
0.8	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	BVAR4	BVAR4
0.85	BVAR4	VAR(2)	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4
0.9	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4
0.95	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4
0.99	BVAR4	BVAR4	BVAR3	BVAR3	BVAR4	BVAR4	BVAR4	BVAR4

Table 6. Preferred model at different levels of collinearity and autocorrelation when $T = 64$.

AUTOCO LEVELS (δ)	COLLINERITY(ρ)											
	−0.99		−0.95		−0.9		−0.85		−0.8		0.8	
	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
−0.99	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4
−0.95	BVAR2	BVAR2	BVAR2	BVAR2	BVAR4	BVAR4	BVAR4	BVAR2	BVAR4	BVAR1	BVAR2	BVAR2
−0.9	BVAR2	BVAR3	BVAR2	BVAR2	BVAR4	BVAR2	BVAR4	BVAR1	BVAR4	BVAR4	BVAR2	VAR(2)
−0.85	BVAR2	BVAR2	BVAR1	BVAR1	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	VAR(2)	VAR(2)
−0.8	BVAR2	BVAR2	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	VAR(2)	VAR(2)
0.8	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	VAR(2)	VAR(2)
0.85	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	VAR(2)	VAR(2)
0.9	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	VAR(2)
0.95	BVAR4	BVAR4	BVAR4	BVAR3	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4
0.99	BVAR4	BVAR4	BVAR4	BVAR4	BVAR3	BVAR3	BVAR3	BVAR3	BVAR4	BVAR4	BVAR4	BVAR4

AUTOCO LEVELS (δ)	COLLINEARITY (ρ)							
	0.85		0.9		0.95		0.99	
	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
−0.99	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4
−0.95	BVAR2	BVAR2	BVAR2	BVAR2	BVAR2	BVAR2	BVAR2	BVAR2
−0.9	BVAR2	VAR(2)	BVAR2	BVAR2	BVAR2	BVAR2	BVAR2	BVAR2
−0.85	VAR(2)	VAR(2)	BVAR2	VAR(2)	BVAR2	BVAR2	BVAR2	BVAR2
−0.8	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	BVAR2	BVAR2
0.8	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)
0.85	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)
0.9	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4
0.95	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4
0.99	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4

Table 7. Preferred model at different levels of collinearity and autocorrelation when $T = 128$.

AUTOCO LEVELS (δ)	COLLINERITY (ρ)											
	−0.99		−0.95		−0.9		−0.85		−0.8		0.8	
	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
−0.99	BVAR4	BVAR4	BVAR3	BVAR3	BVAR3	BVAR3	BVAR2	BVAR2	BVAR2	BVAR2	BVAR4	BVAR4
−0.95	BVAR1	BVAR2	BVAR1	BVAR2	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR4	BVAR4
−0.9	BVAR2	BVAR2	BVAR1	BVAR1	BVAR2	BVAR2	BVAR4	BVAR4	BVAR4	BVAR4	VAR(2)	VAR(2)
−0.85	BVAR1	BVAR1	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	VAR(2)	VAR(2)
−0.8	BVAR2	BVAR1	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	VAR(2)	BVAR4	VAR(2)	VAR(2)
0.8	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)
0.85	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	VAR(2)	BVAR4	VAR(2)	VAR(2)
0.9	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	VAR(2)	VAR(2)
0.95	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4
0.99	BVAR3	BVAR3	BVAR4	BVAR4	BVAR3	BVAR3	BVAR3	BVAR3	BVAR3	BVAR3	BVAR3	BVAR3

AUTOCO LEVELS (δ)	COLLINEARITY (ρ)							
	0.85		0.9		0.95		0.99	
	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
−0.99	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR3	BVAR4
−0.95	BVAR4	BVAR4	BVAR4	BVAR4	BVAR2	BVAR2	BVAR2	BVAR2
−0.9	VAR(2)	VAR(2)	BVAR4	VAR(2)	BVAR4	BVAR4	BVAR2	BVAR2
−0.85	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	BVAR2	BVAR2
−0.8	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	BVAR2	BVAR2
0.8	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)
0.85	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)
0.9	VAR(2)	VAR(2)	VAR(2)	VAR(2)	BVAR4	BVAR4	BVAR4	BVAR4
0.95	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4
0.99	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4

Table 8. Preferred model at different levels of collinearity and autocorrelation when $T = 256$.

AUTOCO LEVELS (δ)	COLLINERITY (ρ)											
	−0.99		−0.95		−0.9		−0.85		−0.8		0.8	
	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
−0.99	BVAR2	BVAR2	BVAR1	BVAR1	BVAR2	BVAR2	BVAR1	BVAR1	BVAR1	BVAR1	BVAR4	BVAR4
−0.95	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR1	BVAR4	BVAR4
−0.9	BVAR1	BVAR1	BVAR1	BVAR1	BVAR3	BVAR1	BVAR2	BVAR2	BVAR4	BVAR4	VAR(2)	VAR(2)
−0.85	BVAR2	BVAR2	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	VAR(2)	VAR(2)
−0.8	BVAR1	BVAR1	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	VAR(2)	VAR(2)	VAR(2)	VAR(2)
0.8	BVAR4	BVAR4	BVAR4	BVAR4	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)
0.85	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)
0.9	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	VAR(2)	VAR(2)
0.95	BVAR4	BVAR4	BVAR4	BVAR3	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4
0.99	BVAR4	BVAR4	BVAR3	BVAR3	BVAR1	BVAR1	BVAR3	BVAR3	BVAR3	BVAR3	BVAR4	BVAR4

Continued

AUTOCO LEVELS (δ)	COLLINEARITY (ρ)							
	0.85		0.9		0.95		0.99	
	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
−0.99	BVAR2	BVAR4	BVAR3	BVAR4	BVAR2	BVAR2	BVAR1	BVAR1
−0.95	BVAR4	BVAR4	BVAR4	BVAR4	BVAR2	BVAR2	BVAR2	BVAR2
−0.9	VAR(2)	VAR(2)	VAR(2)	VAR(2)	BVAR4	VAR(2)	BVAR2	BVAR4
−0.85	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	BVAR2	BVAR4
−0.8	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	BVAR4	VAR(2)
0.8	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)
0.85	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)
0.9	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	VAR(2)	BVAR4	BVAR4
0.95	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4
0.99	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR4	BVAR3	BVAR3

Table 9. Performance ratings of the classical VAR and Sims-Zha Bayesian VAR.

	Short Term				Medium Term				Long Term			
	$T = 8$		$T = 16$		$T = 32$		$T = 64$		$T = 128$		$T = 256$	
Models	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
VAR(2)	-	-	-	-	5%	11%	16%	20%	27%	26%	31%	33%
BVAR1	37%	53%	20%	24%	-	-	1%	3%	7%	6%	13%	14%
BVAR2	7%	2%	9%	14%	15%	12%	20%	18%	10%	11%	10%	7%
BVAR3	12%	11%	6%	4%	6%	8%	2%	4%	7%	7%	6%	5%
BVAR4	44%	34%	65%	58%	74%	69%	61%	55%	49%	50%	40%	41%

In **Table 9** above, the ratings of the model are compared. For short term time series the BVAR4 model dominate except when $T = 8$ using the MAE criterion, the BVAR1 model dominate. In the medium term and long term, the BVAR4 model dominated using both criteria. This result revealed that the BVAR4 model is a viable model for forecasting.

5. Conclusion and Recommendation

This work examines the performances of classical VAR and Sims-Zha Bayesian VAR in the presence of collinearity and autocorrelation. The results from 10,000 simulations reveal that the models performance varies with the collinearity and autocorrelation levels, and with the time series lengths. In addition, the results reveal that the BVAR4 model is a viable model for forecasting. Therefore, we recommend that the levels of collinearity and autocorrelation, and the time series length should be considered in using an appropriate model for forecasting.

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Appendix A

Table A1. The RMSE and MAE values of the model for $T = 8$.

$T = 8$		COLLINERITY (ρ)											
AUTOCO LEVELS (δ)	Models	−0.99		−0.95		−0.9		−0.85		−0.8		0.8	
		RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
−0.99	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	5.568972	4.357228	6.346049	4.906742	6.791074	5.226318	6.893263	5.304391	6.930938	5.378541	4.846500	3.749898
	BVAR2	5.471007	4.306492	6.151134	4.805023	6.519096	5.070815	6.713149	5.260478	6.650402	5.252652	4.806706	3.741190
	BVAR3	4.995865	4.107761	5.510815	4.545857	5.737559	4.752087	5.927203	4.932999	6.004684	4.990791	4.586969	3.749766
	BVAR4	4.913680	4.054765	5.337825	4.442210	5.571354	4.654506	5.696384	4.751056	5.789108	4.793418	4.548321	3.755239
−0.95	VAR(2)	N/A	N/A	N/A	N/A	N.A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	4.924112	3.811504	5.514037	4.239658	5.869246	4.486138	6.038599	4.618446	6.084726	4.694254	4.302530	3.300939
	BVAR2	4.894266	3.809230	5.419252	4.193870	5.667241	4.371583	5.914171	4.594582	5.841484	4.577024	4.274452	3.297456
	BVAR3	4.552996	3.663140	4.967818	4.020410	5.178609	4.219038	5.315171	4.352908	5.305581	4.340806	4.224433	3.406297
	BVAR4	4.509209	3.639075	4.804357	3.903115	4.988811	4.086084	5.110920	4.202868	5.201375	4.266454	4.233088	3.446089
−0.9	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	4.40456	3.36516	4.864724	3.699754	5.115519	3.885651	5.287358	4.021597	5.297730	4.052794	3.882735	2.947996
	BVAR2	4.421230	3.393082	4.830294	3.695425	5.050976	3.860234	5.142196	3.946026	5.164368	3.998000	3.873145	2.957112
	BVAR3	4.206626	3.303933	4.473879	3.529379	4.647730	3.690321	4.766993	3.816559	4.807192	3.862643	3.922100	3.129902
	BVAR4	4.189057	3.302355	4.408781	3.491686	4.536919	3.627604	4.636597	3.729925	4.664344	3.756938	3.936055	3.160707
−0.85	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	4.172696	3.150146	4.460275	3.361247	4.673119	3.524658	4.791012	3.615496	4.828145	3.665550	3.617484	2.722178
	BVAR2	4.144112	3.146404	4.459834	3.381266	4.630900	3.506207	4.693236	3.561376	4.736905	3.634963	3.621705	2.738192
	BVAR3	4.002858	3.082628	4.199869	3.248724	4.325427	3.368202	4.411859	3.463734	4.45633	3.51665	3.745665	2.964287
	BVAR4	3.964532	3.055228	4.160505	3.230431	4.282877	3.353908	4.308728	3.402976	4.331752	3.426619	3.788757	3.018653
−0.8	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	3.966541	2.963655	4.212467	3.146166	4.386190	3.277238	4.475193	3.354209	4.512634	3.394073	3.446991	2.570778
	BVAR2	3.982988	2.986436	4.192779	3.136875	4.359005	3.275833	4.445047	3.345427	4.453733	3.380426	3.457457	2.593641
	BVAR3	3.859199	2.928322	4.020930	3.058512	4.138915	3.174228	4.180315	3.229568	4.222451	3.285421	3.624815	2.857300
	BVAR4	3.865623	2.939495	3.977014	3.027379	4.060440	3.120372	4.088982	3.165973	4.135093	3.228313	3.667822	2.911481
0.8	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	3.664427	2.661856	3.702948	2.680361	3.743510	2.707372	3.712702	2.692807	3.716289	2.718694	3.172067	2.339266
	BVAR2	3.686138	2.696559	3.730683	2.712849	3.735139	2.708369	3.720690	2.706805	3.701537	2.724096	3.192730	2.372426
	BVAR3	3.671995	2.698841	3.668494	2.679722	3.664705	2.673309	3.661278	2.687255	3.626062	2.680750	3.418707	2.698835
	BVAR4	3.700297	2.727417	3.675868	2.682132	3.633804	2.653954	3.634072	2.674226	3.599764	2.680783	3.459038	2.751452
0.85	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	3.705972	2.704436	3.748004	2.721802	3.745347	2.714481	3.750389	2.725927	3.729666	2.734343	3.186470	2.348993
	BVAR2	3.702085	2.706138	3.752680	2.732167	3.738364	2.716470	3.736367	2.726194	3.751587	2.773472	3.213187	2.383334
	BVAR3	3.700710	2.722275	3.698570	2.709008	3.695413	2.704197	3.664489	2.693061	3.653480	2.715004	3.405944	2.680517
	BVAR4	3.720387	2.750880	3.701877	2.714742	3.679862	2.701747	3.651776	2.696512	3.654069	2.736138	3.469572	2.756269
0.9	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	3.695506	2.694242	3.756887	2.729671	3.791675	2.759002	3.777360	2.757002	3.766396	2.774918	3.200669	2.359688
	BVAR2	3.713280	2.721317	3.762058	2.742930	3.751100	2.734233	3.779886	2.767498	3.777727	2.804381	3.201165	2.375459
	BVAR3	3.717683	2.749170	3.723994	2.731201	3.708352	2.719700	3.694109	2.724118	3.690586	2.746572	3.428952	2.697854
	BVAR4	3.731138	2.763758	3.697047	2.711482	3.699408	2.719445	3.680536	2.723904	3.675044	2.756350	3.459280	2.743717
0.95	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	3.722003	2.721109	3.794420	2.761852	3.768156	2.745364	3.782314	2.761302	3.783861	2.795752	3.203982	2.358522
	BVAR2	3.724179	2.732423	3.768054	2.750236	3.789197	2.767812	3.800848	2.791411	3.800298	2.824817	3.225113	2.393398
	BVAR3	3.717546	2.744508	3.726093	2.731677	3.714950	2.727748	3.716211	2.749526	3.721622	2.782934	3.429190	2.692399
	BVAR4	3.743243	2.776283	3.741126	2.755417	3.694183	2.716774	3.696180	2.745173	3.693516	2.774400	3.477101	2.751985
0.99	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	3.717622	2.714390	3.792705	2.767841	3.798213	2.767834	3.789347	2.768060	3.815843	2.824166	3.220688	2.372169
	BVAR2	3.735449	2.744270	3.775062	2.758082	3.791127	2.768266	3.783690	2.776671	3.820224	2.845886	3.242346	2.406335
	BVAR3	3.719875	2.748584	3.739040	2.743129	3.728527	2.739729	3.732343	2.764869	3.722467	2.782521	3.434744	2.689321
	BVAR4	3.740953	2.770389	3.736597	2.752376	3.722800	2.745257	3.722079	2.772045	3.697656	2.780737	3.471326	2.736448

Continued

$T = 8$		COLLINEARITY (ρ)							
AUTOCO LEVELS (δ)	Models	0.85		0.9		0.95		0.99	
		RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
−0.99	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	4.537550	3.481325	4.311283	3.222246	4.184486	3.023109	4.462124	3.411701
	BVAR2	4.558609	3.520800	4.307658	3.239499	4.183656	3.042939	4.456530	3.436138
	BVAR3	4.394162	3.557580	4.217586	3.334594	4.158514	3.212328	4.282317	3.426102
	BVAR4	4.358627	3.554616	4.225348	3.373656	4.156735	3.244152	4.254922	3.411702
−0.95	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	4.110707	3.124814	3.937992	2.925000	3.887423	2.820268	4.103056	3.106144
	BVAR2	4.112315	3.143094	3.938351	2.944167	3.891292	2.847463	4.098306	3.127103
	BVAR3	4.082247	3.265733	3.976808	3.124123	3.925936	3.033313	4.037778	3.185102
	BVAR4	4.105616	3.309773	4.002506	3.172131	3.954466	3.080437	4.051955	3.207187
−0.9	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	3.741569	2.812975	3.682325	2.714770	3.645236	2.650995	3.840964	2.877191
	BVAR2	3.762917	2.848642	3.678935	2.734708	3.662074	2.683155	3.839072	2.897901
	BVAR3	3.839031	3.040055	3.780936	2.954366	3.751349	2.889068	3.835362	2.978061
	BVAR4	3.864931	3.082028	3.811408	3.000603	3.803668	2.956136	3.857246	3.008656
−0.85	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	3.527073	2.625006	3.503651	2.570472	3.532477	2.568397	3.676042	2.729773
	BVAR2	3.544249	2.654888	3.503690	2.587308	3.529305	2.584525	3.679151	2.745294
	BVAR3	3.695972	2.904785	3.651980	2.837787	3.645202	2.801735	3.719638	2.853858
	BVAR4	3.712037	2.939218	3.708709	2.911632	3.696717	2.863443	3.784225	2.921798
−0.8	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	3.404053	2.511238	3.398815	2.480924	3.449632	2.501783	3.600622	2.651085
	BVAR2	3.414053	2.538967	3.415838	2.509690	3.450560	2.520839	3.590963	2.661195
	BVAR3	3.592165	2.809641	3.572807	2.768130	3.589777	2.746322	3.652788	2.780575
	BVAR4	3.628137	2.864632	3.627878	2.838415	3.648316	2.821996	3.705193	2.838146
0.8	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	3.246592	2.399710	3.310064	2.453432	3.418468	2.528314	3.553209	2.611308
	BVAR2	3.246896	2.414905	3.33611	2.48113	3.430743	2.550211	3.566502	2.636769
	BVAR3	3.474274	2.738317	3.488536	2.725103	3.548691	2.732163	3.604319	2.723500
	BVAR4	3.491501	2.768120	3.560204	2.805069	3.593645	2.793134	3.670657	2.802106
0.85	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	3.244825	2.399588	3.326252	2.465507	3.422633	2.530439	3.546281	2.607774
	BVAR2	3.259229	2.428672	3.354776	2.500740	3.43176	2.54816	3.563459	2.635383
	BVAR3	3.460362	2.721740	3.495306	2.728309	3.575695	2.758226	3.631831	2.750430
	BVAR4	3.507471	2.779017	3.554798	2.803503	3.627435	2.819402	3.681626	2.800921
0.9	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	3.250787	2.403782	3.346172	2.477368	3.447617	2.550183	3.555696	2.614251
	BVAR2	3.280845	2.444396	3.341598	2.486364	3.438260	2.557878	3.557280	2.633103
	BVAR3	3.450879	2.710523	3.505097	2.731947	3.585112	2.761068	3.645190	2.756749
	BVAR4	3.512181	2.777651	3.544039	2.787914	3.644604	2.829573	3.682221	2.806372
0.95	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	3.262315	2.406743	3.333332	2.467128	3.456961	2.556855	3.559891	2.624751
	BVAR2	3.295988	2.454660	3.366857	2.513706	3.475588	2.583734	3.587850	2.657633
	BVAR3	3.474000	2.721437	3.526608	2.747001	3.588376	2.761531	3.656173	2.761867
	BVAR4	3.502802	2.764816	3.565433	2.797299	3.622213	2.814620	3.693817	2.812096
0.99	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	3.286196	2.432307	3.344424	2.473893	3.445813	2.550056	3.580162	2.636090
	BVAR2	3.284000	2.441861	3.371049	2.512374	3.476678	2.594105	3.582766	2.657574
	BVAR3	3.476431	2.720465	3.515471	2.733234	3.581961	2.751931	3.643776	2.754464
	BVAR4	3.530036	2.784255	3.583805	2.809573	3.646085	2.829619	3.726193	2.840205

Table A2. The RMSE and MAE values of the model for $T = 16$.

$T = 16$		COLLINERITY(ρ)											
AUTOCO LEVELS (δ)	Models	−0.99		−0.95		−0.9		−0.85		−0.8		0.8	
		RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
−0.99	VAR(2)	10.104799	8.456366	11.662473	9.690137	12.66125	10.44485	14.42257	11.37282	13.57665	11.21268	7.515034	6.158201
	BVAR1	7.057613	6.177713	7.849259	6.829913	8.272915	7.127584	8.547135	7.257813	8.833861	7.381579	5.702785	4.801708
	BVAR2	6.738948	5.953202	7.508877	6.566234	7.981810	6.867741	8.477262	7.170677	8.768585	7.305375	5.521963	4.715452
	BVAR3	6.184788	5.463797	6.977209	6.084434	7.570095	6.488661	8.013359	6.761561	8.396624	6.992618	5.150044	4.442723
	BVAR4	6.050583	5.331047	6.880579	5.968021	7.493272	6.370001	7.815218	6.536759	8.124370	6.704089	5.106301	4.370440
−0.95	VAR(2)	7.678307	6.211153	8.303226	6.793905	11.308509	8.339395	9.527971	7.683493	11.21796	8.52040	5.624492	4.435031
	BVAR1	5.505853	4.667212	6.084709	5.154172	6.369825	5.378279	6.515062	5.452414	6.709748	5.533295	4.536764	3.685262
	BVAR2	5.319160	4.553144	5.828086	4.968387	6.120845	5.171722	6.334533	5.276264	6.613226	5.425574	4.407507	3.621460
	BVAR3	4.878560	4.180554	5.398251	4.619672	5.729895	4.841492	5.983213	4.982744	6.283266	5.171398	4.20787	3.52632
	BVAR4	4.810342	4.123814	5.284490	4.508032	5.661293	4.765141	5.980158	4.961985	6.212964	5.091025	4.220202	3.526784
−0.9	VAR(2)	5.854310	4.690379	6.477140	5.185866	6.995178	5.562253	7.582853	5.943795	7.643981	6.022657	4.555767	3.484886
	BVAR1	4.614129	3.797536	5.020880	4.139763	5.179632	4.262361	5.289110	4.329547	5.421667	4.391354	3.809260	3.012381
	BVAR2	4.450614	3.687862	4.820959	3.992000	5.058707	4.175689	5.184678	4.232059	5.334255	4.297975	3.751630	2.991785
	BVAR3	4.104153	3.377469	4.400405	3.644523	4.642098	3.825978	4.854366	3.963737	5.065288	4.098932	3.675500	3.009166
	BVAR4	4.071496	3.355203	4.338959	3.588372	4.559153	3.746148	4.847457	3.953264	4.999804	4.036309	3.694839	3.029760
−0.85	VAR(2)	4.946986	3.877881	6.013903	4.605914	5.798416	4.558384	7.329457	5.273400	6.282278	4.894794	3.786689	2.841218
	BVAR1	4.109101	3.311935	4.413881	3.551440	4.582538	3.695440	4.670595	3.754787	4.750471	3.791391	3.431442	2.668702
	BVAR2	3.993817	3.217678	4.280075	3.456838	4.465277	3.605462	4.573579	3.673399	4.693650	3.732105	3.402612	2.662855
	BVAR3	3.732416	2.983089	3.912973	3.151018	4.065521	3.272145	4.234938	3.387504	4.407741	3.508467	3.420873	2.767120
	BVAR4	3.689729	2.945622	3.865327	3.112801	4.036813	3.246235	4.218368	3.371677	4.371729	3.474609	3.413330	2.762652
−0.8	VAR(2)	4.328863	3.336645	4.815955	3.725205	4.999448	3.834761	5.262485	4.045803	5.379765	4.094426	3.519662	2.577843
	BVAR1	3.797618	2.998849	4.039335	3.195628	4.195887	3.321051	4.257734	3.369215	4.334430	3.416061	3.169352	2.431206
	BVAR2	3.725240	2.945679	3.944386	3.120916	4.078796	3.233748	4.166259	3.289814	4.271319	3.353768	3.170976	2.449823
	BVAR3	3.500115	2.729684	3.635803	2.859659	3.759752	2.967010	3.883878	3.057697	4.054369	3.182999	3.257645	2.612378
	BVAR4	3.455610	2.683336	3.584260	2.814451	3.725542	2.940846	3.864419	3.042865	3.991043	3.132924	3.256856	2.618299
0.8	VAR(2)	9.169207	5.816766	7.166017	4.733346	5.237995	3.940595	106.55088	32.24409	5.819887	4.279046	4.438421	3.132075
	BVAR1	3.531091	2.713261	3.579678	2.733357	3.582729	2.732724	3.593424	2.756996	3.617573	2.803957	3.043399	2.356369
	BVAR2	3.531584	2.723348	3.559071	2.723116	3.583307	2.740745	3.602642	2.772088	3.602071	2.805649	3.052146	2.377214
	BVAR3	3.426493	2.622135	3.406866	2.584685	3.388663	2.574540	3.386178	2.585670	3.413973	2.632233	3.298014	2.677571
	BVAR4	3.397454	2.588296	3.344255	2.522182	3.343396	2.532280	3.349195	2.552199	3.363534	2.584499	3.253758	2.633728
0.85	VAR(2)	6.614856	4.866322	6.271850	4.738372	7.039926	5.147593	6.425993	4.797527	7.698145	5.428037	5.840824	3.854588
	BVAR1	3.660079	2.839646	3.728276	2.877470	3.734515	2.882276	3.762497	2.922289	3.778606	2.958079	3.162561	2.463015
	BVAR2	3.665528	2.851825	3.702065	2.863910	3.718088	2.877763	3.740573	2.911049	3.802609	3.000973	3.150983	2.462302
	BVAR3	3.575071	2.774962	3.529572	2.715610	3.557259	2.739649	3.541282	2.739087	3.563884	2.779773	3.376575	2.747796
	BVAR4	3.536856	2.734677	3.486953	2.671755	3.504762	2.693079	3.512819	2.713625	3.517804	2.732695	3.350006	2.712317
0.9	VAR(2)	8.863685	6.333016	7.584496	5.640342	9.793658	6.679243	9.693014	6.800805	8.937345	6.383594	8.307060	5.020883
	BVAR1	3.821654	2.994222	3.904125	3.046576	3.907610	3.047809	3.930620	3.078871	3.927038	3.102053	3.229146	2.513260
	BVAR2	3.809364	2.980448	3.866087	3.020521	3.903331	3.053602	3.922982	3.089716	3.962460	3.159034	3.247241	2.540260
	BVAR3	3.693154	2.895018	3.711670	2.898301	3.709158	2.897278	3.731214	2.929301	3.724193	2.929317	3.437700	2.796026
	BVAR4	3.668832	2.872028	3.676103	2.862822	3.659952	2.850157	3.656811	2.853717	3.695755	2.907544	3.431987	2.780009
0.95	VAR(2)	11.059256	7.658089	9.336427	6.939669	14.54079	9.17960	11.499214	7.986411	13.417157	8.656018	11.09983	6.65157
	BVAR1	3.978572	3.139282	4.099155	3.229476	4.138013	3.262516	4.118019	3.258656	4.149411	3.312617	3.349929	2.612055
	BVAR2	3.977398	3.144526	4.048213	3.190857	4.106580	3.247566	4.115803	3.273147	4.169012	3.352899	3.375640	2.646056
	BVAR3	3.861636	3.064289	3.901387	3.088188	3.913092	3.099173	3.967308	3.153481	3.995572	3.193913	3.546365	2.875031
	BVAR4	3.843570	3.044004	3.852881	3.039761	3.867478	3.048743	3.886660	3.077931	3.883450	3.093823	3.511981	2.842078
0.99	VAR(2)	11.849856	8.342975	12.307512	8.677149	11.438582	8.148918	9.916682	7.481900	9.760764	7.414246	8.243687	5.679374
	BVAR1	4.105596	3.249944	4.196453	3.315011	4.231578	3.352555	4.296974	3.432939	4.333651	3.492325	3.516985	2.757741
	BVAR2	4.104060	3.262222	4.188436	3.318962	4.257999	3.391724	4.268755	3.424997	4.320151	3.505213	3.494499	2.743970
	BVAR3	3.974140	3.170775	4.014777	3.194907	4.039272	3.218157	4.084954	3.267891	4.105856	3.298539	3.614303	2.925156
	BVAR4	3.980389	3.173613	3.988237	3.161692	4.022405	3.203606	4.030510	3.216684	4.026813	3.228284	3.621642	2.931720

Continued

$T = 16$		COLLINEARITY (ρ)							
AUTOCO LEVELS (δ)	Models	0.85		0.9		0.95		0.99	
		RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
−0.99	VAR(2)	7.099558	5.488038	6.521014	4.816776	6.585069	4.887567	7.684958	6.278895
	BVAR1	5.354367	4.368050	5.091192	3.915295	5.069587	3.872711	5.569227	4.708213
	BVAR2	5.141425	4.248849	4.938309	3.860671	4.920665	3.812141	5.406792	4.618110
	BVAR3	4.832524	4.074875	4.633212	3.769205	4.660507	3.713638	5.024710	4.285318
	BVAR4	4.815467	4.053705	4.557603	3.727673	4.557807	3.652285	4.973870	4.240757
−0.95	VAR(2)	5.544257	4.186718	5.112994	3.697093	5.975801	4.158646	5.658868	4.539939
	BVAR1	4.324869	3.429009	4.172032	3.185216	4.171876	3.196001	4.494514	3.697396
	BVAR2	4.220449	3.381017	4.055720	3.134407	4.083852	3.160311	4.391751	3.641695
	BVAR3	4.003888	3.300624	3.926039	3.172842	3.961607	3.147595	4.179838	3.447062
	BVAR4	4.010320	3.316631	3.893640	3.163165	3.883255	3.098337	4.133488	3.414553
−0.9	VAR(2)	4.980604	3.463746	4.287961	3.065169	4.268945	3.127354	4.649767	3.627321
	BVAR1	3.687533	2.859690	3.606291	2.734738	3.655296	2.798103	3.916813	3.150820
	BVAR2	3.639701	2.844916	3.560013	2.719446	3.617843	2.787296	3.847798	3.106193
	BVAR3	3.603180	2.919753	3.523595	2.814447	3.566352	2.799926	3.701483	2.958137
	BVAR4	3.588368	2.919223	3.497328	2.805292	3.535946	2.787899	3.659214	2.921385
−0.85	VAR(2)	3.931436	2.836340	3.752833	2.672187	3.914835	2.807772	4.153217	3.173080
	BVAR1	3.361689	2.566424	3.327498	2.511070	3.365351	2.561936	3.590020	2.833207
	BVAR2	3.316281	2.550419	3.298469	2.503870	3.347638	2.561983	3.545986	2.805145
	BVAR3	3.376193	2.710927	3.351763	2.651112	3.374493	2.632058	3.484812	2.733155
	BVAR4	3.337128	2.681466	3.320024	2.634910	3.340993	2.604237	3.455871	2.708515
−0.8	VAR(2)	3.561568	2.513821	3.499674	2.428740	3.460913	2.464968	3.715763	2.771846
	BVAR1	3.141871	2.376008	3.122570	2.341436	3.185755	2.407006	3.377952	2.621657
	BVAR2	3.130818	2.385163	3.122629	2.353909	3.171209	2.407891	3.342798	2.599312
	BVAR3	3.235323	2.576755	3.239783	2.548926	3.269472	2.537393	3.326908	2.569621
	BVAR4	3.217223	2.563044	3.199575	2.517306	3.239034	2.508146	3.316027	2.558102
0.8	VAR(2)	5.935846	3.875375	4.596944	3.336584	6.168058	4.172277	4.848704	3.574810
	BVAR1	3.092480	2.406703	3.168463	2.470473	3.278105	2.556307	3.403328	2.646337
	BVAR2	3.104172	2.425831	3.174154	2.488708	3.284224	2.572859	3.432744	2.683555
	BVAR3	3.333406	2.708006	3.390600	2.743593	3.404835	2.724011	3.430755	2.692097
	BVAR4	3.326683	2.691638	3.378089	2.725091	3.406680	2.721354	3.415459	2.683138
0.85	VAR(2)	5.906603	4.141382	6.431106	4.395475	5.362360	3.956971	9.670937	6.168488
	BVAR1	3.187109	2.486379	3.268792	2.560739	3.373927	2.649528	3.541941	2.779677
	BVAR2	3.212084	2.518349	3.295495	2.592801	3.388809	2.675846	3.509886	2.752773
	BVAR3	3.401360	2.762893	3.443323	2.790721	3.502990	2.817918	3.545501	2.809354
	BVAR4	3.384663	2.743115	3.424266	2.770110	3.521424	2.828056	3.531460	2.789153
0.9	VAR(2)	5.865847	4.201976	61.66698	26.38680	6.365724	4.768412	7.408496	5.488225
	BVAR1	3.297557	2.583295	3.370430	2.651448	3.493143	2.755960	3.657923	2.887093
	BVAR2	3.314972	2.615505	3.393415	2.686720	3.522315	2.795523	3.667833	2.904777
	BVAR3	3.498159	2.843494	3.535499	2.870239	3.590405	2.896881	3.658135	2.920263
	BVAR4	3.474059	2.817931	3.524660	2.859486	3.581698	2.885804	3.646798	2.905549
0.95	VAR(2)	7.603355	5.347943	7.375481	5.345211	8.208019	5.917109	7.718048	5.867731
	BVAR1	3.411263	2.676685	3.512366	2.778681	3.625132	2.871509	3.809260	3.022592
	BVAR2	3.418956	2.692997	3.504870	2.776759	3.627279	2.887530	3.819555	3.045406
	BVAR3	3.595808	2.921298	3.636408	2.951149	3.712393	3.001418	3.771147	3.027770
	BVAR4	3.574028	2.899565	3.663024	2.976121	3.696802	2.987986	3.790026	3.039191
0.99	VAR(2)	8.702855	5.976177	13.251931	8.125016	9.090280	6.638492	9.785179	7.055832
	BVAR1	3.539944	2.791661	3.658224	2.903635	3.739543	2.972059	3.923395	3.126881
	BVAR2	3.582537	2.844710	3.670373	2.931474	3.763571	3.009277	3.908205	3.124968
	BVAR3	3.682735	2.992844	3.762536	3.059895	3.793360	3.080622	3.888633	3.138854
	BVAR4	3.644202	2.955269	3.729751	3.032743	3.817374	3.094050	3.902983	3.149683

Table A3. The RMSE and MAE values of the model for $T = 32$.

$T = 32$		COLLINERITY (ρ)											
AUTOCO LEVELS (∂)	Models	−0.99		−0.95		−0.9		−0.85		−0.8		0.8	
		RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
−0.99	VAR(2)	14.66326	12.02723	14.49286	12.43827	16.99112	14.07718	16.69649	13.97181	17.92657	14.74797	9.116383	7.499980
	BVAR1	8.868865	7.985698	10.102584	8.909668	11.231955	9.719722	11.92844	10.17850	12.40430	10.45598	6.826402	5.942840
	BVAR2	8.784330	7.892726	10.158533	8.929935	10.985347	9.457289	11.71362	9.93686	11.95375	10.00748	6.760333	5.873528
	BVAR3	8.384759	7.436469	9.541767	8.280112	10.144903	8.641844	10.671738	8.963683	11.066390	9.201769	6.793669	5.796042
	BVAR4	8.074158	7.105130	8.988559	7.738964	9.631319	8.138354	9.936045	8.274346	10.374309	8.564269	6.590898	5.585019
−0.95	VAR(2)	7.961468	6.722484	9.565847	7.915558	10.085588	8.349892	10.48444	8.62861	10.641119	8.743647	5.733142	4.571978
	BVAR1	5.665201	4.906067	6.354424	5.432254	6.891470	5.789703	7.365829	6.097293	7.715081	6.318872	4.471984	3.718808
	BVAR2	5.541683	4.792473	6.310088	5.371322	6.866607	5.750905	7.319716	6.049675	7.653206	6.261866	4.451677	3.698245
	BVAR3	5.46905	4.72311	6.183366	5.277268	6.669163	5.596393	7.157648	5.938573	7.464696	6.126180	4.725151	3.960498
	BVAR4	5.421003	4.674783	6.145703	5.225297	6.712264	5.627363	7.065304	5.851712	7.335338	6.017297	4.644578	3.891115
−0.9	VAR(2)	5.841933	4.849300	6.46564	5.31107	7.004660	5.702322	7.361425	5.974679	7.928795	6.366810	4.045249	3.175013
	BVAR1	4.322259	3.621030	4.754169	3.949948	5.150787	4.227924	5.500133	4.458332	5.802533	4.658706	3.578792	2.909100
	BVAR2	4.241650	3.547739	4.715024	3.908967	5.130988	4.197488	5.450288	4.405916	5.746614	4.603175	3.536624	2.878184
	BVAR3	4.176008	3.489640	4.608181	3.837052	4.987416	4.102516	5.294466	4.306556	5.550953	4.473654	3.858831	3.225961
	BVAR4	4.162391	3.486574	4.596080	3.822992	4.983092	4.096438	5.279011	4.294784	5.533153	4.462557	3.833990	3.203973
−0.85	VAR(2)	4.721373	3.824896	4.919008	4.011737	5.380163	4.337040	5.722676	4.590195	5.810400	4.656082	3.366717	2.590805
	BVAR1	3.712822	3.034552	4.028760	3.276196	4.305397	3.472099	4.600571	3.672320	4.885385	3.869882	3.132456	2.511884
	BVAR2	3.628486	2.960760	3.969323	3.220633	4.293373	3.452355	4.606864	3.673849	4.845367	3.836360	3.095521	2.490810
	BVAR3	3.552807	2.890184	3.823768	3.111200	4.136698	3.342128	4.384609	3.510920	4.621882	3.663847	3.464844	2.886642
	BVAR4	3.543409	2.891573	3.814055	3.105385	4.123026	3.331461	4.399845	3.526143	4.616055	3.664718	3.408097	2.840940
−0.8	VAR(2)	3.808556	3.052834	4.239043	3.368964	4.291196	3.438790	4.549485	3.624453	5.149671	3.989592	2.831364	2.138279
	BVAR1	3.305102	2.644278	3.562016	2.845597	3.823200	3.035168	4.069328	3.210558	4.345022	3.415132	2.864495	2.272026
	BVAR2	3.243816	2.584761	3.528487	2.806951	3.812184	3.021101	4.060453	3.201939	4.315298	3.390845	2.856141	2.274289
	BVAR3	3.186754	2.529159	3.380490	2.696674	3.632793	2.886910	3.869228	3.052689	4.069984	3.189529	3.217359	2.665676
	BVAR4	3.150463	2.501813	3.365043	2.685716	3.625036	2.881452	3.831084	3.025776	4.016312	3.149059	3.152122	2.608140
0.8	VAR(2)	3.732897	2.842723	3.49767	2.71882	3.530011	2.742267	3.443827	2.693251	3.734037	2.855492	2.715320	2.054366
	BVAR1	3.313597	2.633425	3.316029	2.614770	3.353025	2.652087	3.380967	2.684577	3.465971	2.777635	2.984894	2.399354
	BVAR2	3.266739	2.590845	3.283241	2.584817	3.298040	2.598611	3.364418	2.672576	3.443605	2.759310	2.987995	2.407203
	BVAR3	3.087334	2.404135	3.037585	2.353041	3.043436	2.357823	3.066925	2.389038	3.092260	2.417901	3.089470	2.515941
	BVAR4	3.023425	2.342413	2.993906	2.306430	2.995605	2.311568	3.017887	2.340079	3.023834	2.353389	2.949539	2.376680
0.85	VAR(2)	3.986471	3.192565	4.249872	3.362915	4.253023	3.344118	4.463272	3.502106	4.314869	3.431765	3.159290	2.420794
	BVAR1	3.607701	2.910104	3.625257	2.904919	3.638141	2.918589	3.698064	2.978903	3.742047	3.034855	3.172923	2.562054
	BVAR2	3.562427	2.865036	3.575762	2.866121	3.595043	2.876212	3.630191	2.922750	3.726171	3.022565	3.192029	2.582575
	BVAR3	3.333652	2.646939	3.324058	2.624462	3.330410	2.631034	3.326336	2.630352	3.344339	2.654069	3.25450	2.65923
	BVAR4	3.293919	2.604514	3.248592	2.550524	3.253474	2.559676	3.294338	2.600510	3.273909	2.589784	3.141835	2.544247
0.9	VAR(2)	7.341626	5.356272	5.689411	4.555991	5.555286	4.492584	5.899174	4.724377	5.607266	4.499744	4.056663	3.135429
	BVAR1	4.019399	3.284759	4.059390	3.308286	4.078738	3.327450	4.120367	3.374136	4.173862	3.428979	3.484817	2.824452
	BVAR2	3.995822	3.273663	4.016448	3.273467	4.060717	3.312161	4.089725	3.347477	4.111696	3.376803	3.497303	2.838614
	BVAR3	3.759712	3.049572	3.733388	3.012368	3.742516	3.023017	3.750787	3.028037	3.756089	3.037540	3.504424	2.871266
	BVAR4	3.683127	2.972334	3.683439	2.964628	3.674642	2.956385	3.685515	2.964958	3.690723	2.976093	3.415987	2.782976
0.95	VAR(2)	8.145542	6.570007	9.508336	7.313701	9.459770	7.365879	8.430181	6.769306	8.532818	6.899061	6.454197	4.744584
	BVAR1	4.641040	3.847504	4.723674	3.913560	4.778199	3.961433	4.808107	3.997918	4.862071	4.066127	3.910754	3.172627
	BVAR2	4.607863	3.826239	4.687587	3.886086	4.721712	3.922829	4.781962	3.987344	4.807260	4.024241	3.920832	3.188766
	BVAR3	4.354838	3.605449	4.375087	3.609372	4.448615	3.677085	4.379007	3.607476	4.466676	3.694930	3.905550	3.204876
	BVAR4	4.251027	3.504735	4.311251	3.547510	4.337292	3.572457	4.373170	3.603382	4.444653	3.672500	3.816804	3.122586
0.99	VAR(2)	9.910239	8.108691	10.231123	8.329465	12.840126	9.674357	11.277482	8.859553	11.194561	8.953436	8.788139	6.385497
	BVAR1	5.273782	4.418413	5.380396	4.505540	5.444321	4.564565	5.516622	4.648955	5.600328	4.735702	4.428247	3.595652
	BVAR2	5.263627	4.428455	5.375204	4.520336	5.469501	4.609911	5.551135	4.699438	5.608524	4.757579	4.475890	3.659284
	BVAR3	5.008186	4.212243	5.127955	4.304945	5.109050	4.278658	5.172752	4.340818	5.181618	4.347265	4.395432	3.616917
	BVAR4	5.015417	4.223160	5.058428	4.244019	5.084977	4.264155	5.202984	4.367991	5.241316	4.412264	4.337231	3.569237

Continued

$T = 32$		COLLINEARITY (ρ)							
AUTOCO LEVELS (δ)	Models	0.85		0.9		0.95		0.99	
		RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
−0.99	VAR(2)	8.183544	6.409968	8.171164	5.886140	13.761278	8.646975	9.660148	8.225798
	BVAR1	6.255208	5.232098	5.954346	4.687005	6.061907	4.846714	6.838000	6.038562
	BVAR2	6.225226	5.205574	5.883918	4.642069	5.971372	4.783738	6.707916	5.924713
	BVAR3	6.319025	5.269976	5.972126	4.828020	5.912063	4.753435	6.602793	5.748045
	BVAR4	6.127081	5.083030	5.832870	4.702794	5.782263	4.637809	6.419753	5.570510
−0.95	VAR(2)	5.419512	4.117640	5.410199	3.927946	5.650153	4.293156	6.297137	5.262456
	BVAR1	4.278932	3.470092	4.144168	3.266110	4.191661	3.340760	4.561301	3.850747
	BVAR2	4.210253	3.421989	4.077051	3.225904	4.094175	3.269946	4.505046	3.817464
	BVAR3	4.467069	3.733129	4.256684	3.515731	4.196531	3.405027	4.544496	3.832547
	BVAR4	4.400286	3.670985	4.199415	3.458578	4.165205	3.382798	4.442278	3.746108
−0.9	VAR(2)	4.156610	3.094199	3.896820	2.847562	4.261132	3.219722	4.677126	3.795311
	BVAR1	3.435454	2.741574	3.401299	2.662821	3.458562	2.727781	3.701453	3.041555
	BVAR2	3.399575	2.721451	3.320739	2.612250	3.366029	2.656156	3.609712	2.961387
	BVAR3	3.682001	3.079270	3.530001	2.911328	3.458037	2.778508	3.661370	2.989493
	BVAR4	3.621324	3.027212	3.467940	2.857803	3.393824	2.726651	3.570615	2.915543
−0.85	VAR(2)	3.135666	2.338310	3.172442	2.309062	3.577560	2.635234	3.660426	2.926463
	BVAR1	3.062404	2.414592	3.010045	2.341620	3.091658	2.417700	3.258536	2.618544
	BVAR2	3.017451	2.389854	2.962397	2.308213	3.001191	2.337642	3.174013	2.543425
	BVAR3	3.306289	2.750929	3.172644	2.599510	3.127430	2.485342	3.231151	2.572105
	BVAR4	3.241433	2.694858	3.096611	2.534366	3.030196	2.404734	3.153569	2.509348
−0.8	VAR(2)	2.784587	2.049203	2.813672	2.019906	2.869672	2.139474	3.106624	2.427903
	BVAR1	2.814113	2.201595	2.794123	2.158500	2.852458	2.207132	2.995363	2.368584
	BVAR2	2.765962	2.171642	2.746840	2.124867	2.776470	2.142921	2.918323	2.295031
	BVAR3	3.085280	2.549175	2.967020	2.412485	2.916558	2.295532	2.985039	2.333521
	BVAR4	3.020429	2.492657	2.893054	2.342757	2.828328	2.216337	2.901840	2.259205
0.8	VAR(2)	2.842527	2.152664	2.810912	2.169077	2.952656	2.290625	3.307669	2.547600
	BVAR1	3.025476	2.440972	3.090351	2.500016	3.150829	2.548073	3.246468	2.615978
	BVAR2	3.029957	2.451758	3.089930	2.505098	3.150130	2.554562	3.226010	2.599928
	BVAR3	3.132378	2.549708	3.178715	2.583167	3.216895	2.601105	3.200862	2.555826
	BVAR4	2.999509	2.414277	3.056396	2.455273	3.107721	2.487607	3.133152	2.484048
0.85	VAR(2)	3.331595	2.580975	3.793309	2.842995	3.717028	2.929144	3.807675	3.040937
	BVAR1	3.252981	2.642329	3.321229	2.710138	3.38536	2.76281	3.508926	2.858963
	BVAR2	3.249162	2.644656	3.314847	2.705682	3.408850	2.789758	3.490607	2.846291
	BVAR3	3.304187	2.702467	3.351939	2.740538	3.403712	2.774270	3.407476	2.748869
	BVAR4	3.196640	2.590177	3.247441	2.631263	3.310554	2.676317	3.338701	2.681568
0.9	VAR(2)	4.293119	3.336612	4.519025	3.574176	4.776709	3.802752	5.144674	4.141709
	BVAR1	3.572668	2.915571	3.636147	2.983366	3.758688	3.096874	3.870640	3.185365
	BVAR2	3.556106	2.910716	3.615754	2.975477	3.723412	3.070471	3.847066	3.171730
	BVAR3	3.563569	2.925840	3.606210	2.962859	3.672251	3.014741	3.737134	3.062082
	BVAR4	3.450073	2.813604	3.531307	2.885237	3.610613	2.949436	3.687554	3.008539
0.95	VAR(2)	5.994791	4.662920	6.393341	5.021365	6.471447	5.281929	7.911398	6.255814
	BVAR1	3.986404	3.262290	4.055031	3.335684	4.227944	3.503378	4.403969	3.662445
	BVAR2	3.967685	3.252945	4.054657	3.352590	4.208908	3.497806	4.414250	3.682337
	BVAR3	3.945150	3.251867	4.019074	3.325958	4.100253	3.403174	4.217873	3.500569
	BVAR4	3.856760	3.163625	3.967639	3.273244	4.062039	3.362454	4.158784	3.443901
0.99	VAR(2)	7.98958	6.14510	8.463565	6.573965	10.269673	7.868398	10.538601	8.359982
	BVAR1	4.505180	3.695378	4.632210	3.841432	4.758618	3.972241	4.987143	4.177887
	BVAR2	4.503203	3.711759	4.631356	3.848661	4.781808	4.003160	4.985718	4.189164
	BVAR3	4.491434	3.720080	4.494059	3.736156	4.678435	3.922521	4.869713	4.101869
	BVAR4	4.443043	3.678880	4.505566	3.751414	4.594163	3.840406	4.812612	4.041900

Table A4. The RMSE and MAE values of the model for $T = 64$.

$T = 64$		COLLINERITY (ρ)											
AUTOCO LEVELS (δ)	Models	−0.99		−0.95		−0.9		−0.85		−0.8		0.8	
		RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
−0.99	VAR(2)	15.60961	13.49267	18.07064	15.37213	19.71727	16.58878	21.61992	17.76051	20.92315	17.43460	10.504524	8.587219
	BVAR1	11.46939	10.19435	13.09585	11.39752	14.29593	12.23065	14.99266	12.65584	15.31937	12.80392	8.504290	7.257119
	BVAR2	11.33424	10.04413	12.83739	11.13458	13.95068	11.87831	14.40817	12.10325	14.71918	12.21020	8.433383	7.186270
	BVAR3	10.393633	9.075173	11.674118	9.980774	12.70827	10.70607	13.29599	11.07513	13.74958	11.36994	8.130523	6.846395
	BVAR4	9.994874	8.678252	11.452749	9.768842	12.29447	10.35022	13.06578	10.89042	13.69994	11.36628	7.614861	6.378013
−0.95	VAR(2)	8.383893	7.067358	9.655344	8.010587	10.127803	8.357616	11.106993	9.023202	11.154161	9.007396	6.094194	4.746929
	BVAR1	6.054704	5.130622	6.948606	5.804250	7.593816	6.244246	8.09136	6.57944	8.408085	6.776973	4.895636	4.034753
	BVAR2	6.028815	5.111177	6.880661	5.732709	7.601027	6.241448	8.033711	6.537276	8.406621	6.784209	4.828257	3.977608
	BVAR3	6.101289	5.177180	6.962924	5.820154	7.598739	6.263761	8.115210	6.630601	8.386429	6.791154	5.079400	4.240575
	BVAR4	6.151252	5.217093	6.991892	5.843543	7.541576	6.223971	8.004034	6.538172	8.364121	6.782812	4.893208	4.041501
−0.9	VAR(2)	5.260202	4.387309	5.813456	4.815562	6.241283	5.116870	6.816967	5.518313	7.185829	5.758953	3.877919	3.010369
	BVAR1	4.310264	3.560062	4.871217	3.976989	5.326900	4.285672	5.673882	4.512546	6.033064	4.754550	3.733896	3.085129
	BVAR2	4.278509	3.540720	4.852454	3.959338	5.315123	4.274960	5.703989	4.540852	5.966621	4.709866	3.678327	3.034653
	BVAR3	4.281429	3.538884	4.860214	3.975913	5.317118	4.297216	5.682409	4.540495	5.892455	4.666515	4.038027	3.412802
	BVAR4	4.302870	3.564755	4.890745	4.004158	5.299228	4.285557	5.632351	4.513925	5.833117	4.643925	3.759980	3.137605
−0.85	VAR(2)	4.057297	3.317115	4.461450	3.623774	4.969968	3.979682	5.198608	4.123492	5.820459	4.428792	2.855396	2.211781
	BVAR1	3.498572	2.835034	3.897501	3.136541	4.308327	3.425581	4.627766	3.638906	4.907163	3.824280	3.223494	2.661245
	BVAR2	3.469369	2.814946	3.931286	3.160528	4.323880	3.432997	4.606818	3.621454	4.871123	3.800238	3.165957	2.610390
	BVAR3	3.489324	2.835115	3.905329	3.150414	4.257981	3.392493	4.555086	3.597710	4.795215	3.751707	3.580932	3.034515
	BVAR4	3.476760	2.825088	3.902691	3.150074	4.229035	3.374859	4.507953	3.564845	4.714880	3.707744	3.312065	2.777421
−0.8	VAR(2)	3.277890	2.632196	3.769544	2.988581	3.924631	3.129050	4.060144	3.221381	4.274940	3.380856	2.478411	1.895043
	BVAR1	3.031720	2.415329	3.373929	2.681704	3.716239	2.927085	4.019306	3.140814	4.284086	3.320737	2.922556	2.404180
	BVAR2	2.999372	2.389678	3.391303	2.692547	3.734031	2.940980	4.011632	3.131288	4.238038	3.288068	2.866138	2.354839
	BVAR3	3.029278	2.422018	3.342599	2.662681	3.650452	2.883028	3.910502	3.060122	4.107552	3.188801	3.321659	2.806316
	BVAR4	3.001746	2.399163	3.334189	2.658396	3.625195	2.863128	3.854035	3.023937	4.030069	3.141156	3.041197	2.549028
0.8	VAR(2)	2.810315	2.207486	2.850188	2.241584	2.881579	2.262786	2.890928	2.272384	2.863114	2.248359	2.335504	1.794989
	BVAR1	2.978927	2.364922	2.982259	2.354772	3.079775	2.443186	3.164619	2.525822	3.266420	2.619893	2.900073	2.350184
	BVAR2	2.942782	2.329299	2.946586	2.323064	3.032298	2.399321	3.122161	2.483368	3.210009	2.567070	2.806345	2.259498
	BVAR3	2.807824	2.201907	2.782325	2.176855	2.818668	2.211739	2.849104	2.237374	2.882040	2.268192	2.804422	2.269090
	BVAR4	2.765080	2.166512	2.767764	2.161917	2.786543	2.181607	2.817992	2.208545	2.833942	2.226876	2.658767	2.130071
0.85	VAR(2)	3.289245	2.636293	3.675594	2.862963	3.436975	2.744711	3.379543	2.714136	3.430162	2.746420	2.694655	2.091958
	BVAR1	3.357904	2.704315	3.363311	2.695690	3.424146	2.751442	3.491139	2.814536	3.576680	2.890728	3.155153	2.563944
	BVAR2	3.281714	2.633135	3.309355	2.647381	3.352500	2.688024	3.426064	2.754646	3.501837	2.822685	3.098410	2.506451
	BVAR3	3.122439	2.487813	3.096772	2.461153	3.125829	2.485300	3.152716	2.507731	3.167574	2.519834	3.029096	2.458432
	BVAR4	3.055098	2.426874	3.076407	2.437918	3.096576	2.459122	3.108977	2.469156	3.130619	2.489803	2.892868	2.330261
0.9	VAR(2)	4.303766	3.541903	4.534682	3.732747	4.569826	3.728954	4.579045	3.717489	4.696541	3.817790	3.358154	2.630087
	BVAR1	3.950114	3.233224	3.958768	3.234213	4.011014	3.273486	4.065105	3.323376	4.098976	3.353858	3.623202	2.957049
	BVAR2	3.900101	3.191164	3.893982	3.177029	3.963059	3.229209	3.982975	3.248075	4.031447	3.295606	3.535024	2.876112
	BVAR3	3.645300	2.953421	3.643486	2.949505	3.660824	2.960681	3.699359	2.994209	3.700648	2.997655	3.403221	2.775237
	BVAR4	3.59670	2.91165	3.614176	2.923150	3.619210	2.925299	3.640562	2.939275	3.674514	2.973086	3.282248	2.662536
0.95	VAR(2)	7.399854	6.076538	7.475618	6.243605	7.656434	6.345574	7.420693	6.142446	7.710607	6.315597	8.534871	5.660741
	BVAR1	5.137436	4.298933	5.218394	4.359780	5.265360	4.397508	5.243674	4.381406	5.342945	4.469960	4.439834	3.635345
	BVAR2	5.085147	4.255915	5.110901	4.267637	5.210220	4.357695	5.194227	4.340276	5.233543	4.372968	4.382403	3.585276
	BVAR3	4.763168	3.962527	4.799530	3.980349	4.826999	4.004062	4.895486	4.065861	4.905022	4.075951	4.199595	3.450845
	BVAR4	4.705414	3.908203	4.795625	3.984978	4.792639	3.975185	4.818079	3.992608	4.819966	3.996624	4.125768	3.385711
0.99	VAR(2)	13.94482	11.36835	13.89216	11.37667	15.85095	12.48919	13.09808	11.03334	14.46850	11.91383	11.121667	8.181236
	BVAR1	7.080895	6.054866	7.306613	6.244493	7.432235	6.351495	7.486951	6.404039	7.545406	6.459999	5.855950	4.799674
	BVAR2	7.054366	6.043512	7.290005	6.245802	7.352421	6.297172	7.475933	6.413686	7.590449	6.522315	5.868612	4.826717
	BVAR3	6.834535	5.857399	7.001530	5.976842	6.969472	5.943162	7.058195	6.022529	7.348942	6.290457	5.691735	4.698703
	BVAR4	6.828429	5.847847	6.924037	5.910194	7.111204	6.079811	7.167811	6.121913	7.229497	6.174797	5.638314	4.654588

Continued

$T = 64$		COLLINEARITY (ρ)							
AUTOCO LEVELS (∂)	Models	0.85		0.9		0.95		0.99	
		RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
−0.99	VAR(2)	10.41419	7.75547	10.087394	7.099848	10.491135	8.167993	11.88104	10.17857
	BVAR1	7.879778	6.447886	7.559675	5.890353	7.554888	6.048543	8.649083	7.578297
	BVAR2	7.866083	6.442775	7.433292	5.760846	7.528471	6.008551	8.578764	7.519786
	BVAR3	7.669444	6.277168	7.286438	5.767222	7.346953	5.870459	8.202491	7.093822
	BVAR4	7.227625	5.847979	6.965772	5.417850	7.136368	5.663818	7.996016	6.881898
−0.95	VAR(2)	5.515226	4.120926	5.486319	3.962742	5.676161	4.412665	6.800705	5.622775
	BVAR1	4.601067	3.744133	4.406236	3.518880	4.421690	3.527713	4.840530	4.044271
	BVAR2	4.534269	3.680055	4.345974	3.456424	4.354782	3.474134	4.791665	4.017778
	BVAR3	4.801356	4.000953	4.594733	3.780083	4.522771	3.662970	4.890993	4.091825
	BVAR4	4.591103	3.756402	4.433209	3.571501	4.439083	3.568040	4.873218	4.083426
−0.9	VAR(2)	3.826275	2.825683	3.808973	2.734953	3.694262	2.865819	4.277465	3.498500
	BVAR1	3.534278	2.906586	3.362479	2.709000	3.335914	2.639133	3.602621	2.929623
	BVAR2	3.465804	2.838998	3.308653	2.659251	3.264809	2.583192	3.528374	2.874659
	BVAR3	3.808458	3.229122	3.605108	3.020947	3.471339	2.819498	3.608456	2.940455
	BVAR4	3.579565	2.983339	3.411765	2.807640	3.372967	2.712851	3.556532	2.899122
−0.85	VAR(2)	2.786939	2.092726	2.927670	2.123987	2.956185	2.255688	3.292199	2.634300
	BVAR1	3.047345	2.501938	2.899607	2.334643	2.865764	2.254033	3.033291	2.420453
	BVAR2	2.980301	2.440607	2.818605	2.261592	2.773553	2.177460	2.940077	2.346569
	BVAR3	3.362504	2.860345	3.170085	2.667629	3.001249	2.431842	3.047829	2.436188
	BVAR4	3.131269	2.626230	2.977860	2.465824	2.878135	2.308610	2.974949	2.380450
−0.8	VAR(2)	2.563719	1.866971	2.413336	1.770143	2.460161	1.865071	2.765376	2.174472
	BVAR1	2.765201	2.260260	2.637194	2.115751	2.596897	2.031406	2.705866	2.129469
	BVAR2	2.701178	2.205068	2.557811	2.044494	2.500364	1.948117	2.619745	2.055440
	BVAR3	3.123461	2.647115	2.927014	2.453578	2.737009	2.209300	2.722047	2.143268
	BVAR4	2.882840	2.416694	2.728992	2.256397	2.609029	2.081249	2.642185	2.077236
0.8	VAR(2)	2.384340	1.847579	2.456279	1.916364	2.559812	2.006761	2.676730	2.104725
	BVAR1	2.926542	2.373617	2.971888	2.414482	3.021903	2.452398	3.027127	2.440837
	BVAR2	2.850652	2.299951	2.891917	2.335971	2.958457	2.388264	2.972621	2.387389
	BVAR3	2.82495	2.27897	2.836890	2.277432	2.897326	2.317965	2.914402	2.315717
	BVAR4	2.69156	2.14932	2.710707	2.157766	2.764935	2.193781	2.809153	2.217734
0.85	VAR(2)	2.788461	2.171616	2.851412	2.260241	2.911770	2.326237	3.07246	2.46561
	BVAR1	3.195656	2.605438	3.243095	2.649101	3.295623	2.693263	3.343212	2.722561
	BVAR2	3.126292	2.538026	3.193553	2.599884	3.240708	2.638987	3.297007	2.674201
	BVAR3	3.050595	2.468853	3.088025	2.493688	3.163816	2.549461	3.192363	2.564826
	BVAR4	2.919833	2.347208	2.969034	2.381272	3.019581	2.417416	3.086137	2.467136
0.9	VAR(2)	3.623288	2.868317	3.527514	2.855164	4.027746	3.218235	4.061071	3.324801
	BVAR1	3.649271	2.990935	3.721894	3.065972	3.787166	3.122032	3.897328	3.214863
	BVAR2	3.588610	2.934248	3.651061	2.997455	3.720466	3.062137	3.834919	3.157984
	BVAR3	3.448331	2.809900	3.519245	2.868675	3.589405	2.927547	3.636149	2.962102
	BVAR4	3.326695	2.698520	3.397685	2.755271	3.462768	2.811275	3.565531	2.896450
0.95	VAR(2)	5.815011	4.565871	6.010590	4.823818	6.359985	5.238172	6.385236	5.332214
	BVAR1	4.473675	3.688176	4.589992	3.811018	4.720950	3.944863	4.961381	4.157459
	BVAR2	4.453470	3.668865	4.534502	3.760519	4.706124	3.929342	4.849424	4.058908
	BVAR3	4.244755	3.495875	4.318832	3.569387	4.431429	3.678013	4.601010	3.833053
	BVAR4	4.125876	3.388459	4.240229	3.495942	4.372050	3.623511	4.508561	3.744225
0.99	VAR(2)	10.356067	8.039591	10.404217	8.460912	12.255648	9.648472	11.684346	9.806151
	BVAR1	5.982988	4.959825	6.135503	5.141708	6.333499	5.366900	6.664584	5.676046
	BVAR2	6.004868	4.995543	6.119139	5.145547	6.305826	5.346008	6.678079	5.711101
	BVAR3	5.770993	4.806477	5.864026	4.924136	6.158097	5.219477	6.343388	5.409572
	BVAR4	5.746963	4.791406	5.811905	4.891243	6.034546	5.108078	6.298889	5.371982

Table A5. The RMSE and MAE values of the model for $T = 128$.

$T = 128$		COLLINERITY(ρ)											
AUTOCO LEVELS (δ)	Models	−0.99		−0.95		−0.9		−0.85		−0.8		0.8	
		RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
−0.99	VAR(2)	17.22937	14.91646	21.90444	18.05359	26.30329	20.31245	22.50873	18.84262	24.97179	20.52555	12.366555	9.867055
	BVAR1	13.23589	11.46483	15.27269	12.99190	16.48863	13.79484	17.25900	14.30382	17.90545	14.70387	9.753913	8.111029
	BVAR2	13.17653	11.40185	15.11556	12.82739	16.1352	13.4810	16.85251	13.90399	17.42538	14.27669	9.570891	7.934374
	BVAR3	12.83013	11.00485	14.59160	12.30363	16.00448	13.34275	16.99634	14.05692	17.74118	14.55775	9.178303	7.535906
	BVAR4	12.77960	10.93795	14.85439	12.55301	16.80178	14.08308	18.03695	14.98198	18.97865	15.70669	8.947292	7.289670
−0.95	VAR(2)	7.661783	6.418051	9.043002	7.333829	9.371350	7.650303	13.00170	9.43545	13.643892	9.933668	5.286082	4.131556
	BVAR1	6.370249	5.269217	7.332931	5.968955	8.031373	6.448491	8.500655	6.762176	8.895059	7.019988	5.142322	4.229382
	BVAR2	6.372227	5.266374	7.333282	5.966015	8.052061	6.481550	8.517979	6.787717	8.921330	7.061148	4.918230	3.985872
	BVAR3	6.500161	5.386179	7.476272	6.102912	8.107454	6.535236	8.615760	6.889719	8.936636	7.099140	4.985552	4.054149
	BVAR4	6.541526	5.420125	7.533171	6.152550	8.200229	6.629064	8.653810	6.938885	9.027275	7.191605	4.785342	3.824915
−0.9	VAR(2)	4.771435	3.908307	5.385200	4.360758	5.820793	4.662540	6.076943	4.834553	6.324809	5.009219	3.364688	2.607623
	BVAR1	4.362781	3.551253	4.980801	3.993930	5.469379	4.323643	5.827049	4.557198	6.126422	4.753069	3.947152	3.308077
	BVAR2	4.337249	3.526718	4.991824	4.002132	5.429540	4.292408	5.807013	4.553049	6.074564	4.723629	3.660195	3.018613
	BVAR3	4.393323	3.577711	5.030188	4.038974	5.458506	4.332745	5.764595	4.531048	6.029237	4.711636	3.745564	3.103055
	BVAR4	4.410897	3.591264	5.027744	4.040220	5.457475	4.342046	5.734579	4.518639	6.015870	4.707262	3.468725	2.803851
−0.85	VAR(2)	3.680692	2.967355	4.095767	3.276760	4.422976	3.506239	4.615566	3.638250	4.777651	3.748394	2.669983	2.050323
	BVAR1	3.454091	2.779658	3.938882	3.133889	4.342657	3.406856	4.665832	3.623807	4.899277	3.774418	3.468023	2.926042
	BVAR2	3.461064	2.789749	3.944574	3.137978	4.320403	3.395097	4.595528	3.575939	4.810876	3.715687	3.162908	2.633049
	BVAR3	3.479713	2.803527	3.939841	3.141700	4.285884	3.380606	4.562836	3.561649	4.765831	3.697382	3.244371	2.718677
	BVAR4	3.490724	2.810091	3.929547	3.131812	4.258821	3.359982	4.500178	3.523309	4.683267	3.643135	2.936963	2.398665
−0.8	VAR(2)	3.055373	2.441863	3.391013	2.689424	3.626211	2.849274	3.807329	2.979370	3.907342	3.046263	2.254541	1.728246
	BVAR1	2.944984	2.352791	3.331575	2.633942	3.698470	2.890197	3.983771	3.079893	4.212778	3.231453	3.191163	2.692211
	BVAR2	2.944741	2.353353	3.348329	2.646829	3.675676	2.875018	3.910292	3.027415	4.116140	3.165877	2.874961	2.401644
	BVAR3	2.955164	2.360062	3.323106	2.633752	3.636439	2.852393	3.849498	2.993170	4.046711	3.126502	2.979943	2.511278
	BVAR4	2.953468	2.359096	3.311263	2.622841	3.579884	2.809669	3.777316	2.943939	3.924045	3.038138	2.645861	2.174288
0.8	VAR(2)	2.654206	2.097200	2.697913	2.130844	2.719481	2.148089	2.709711	2.138585	2.702218	2.134435	2.220256	1.723677
	BVAR1	2.728965	2.158179	2.779625	2.198143	2.883034	2.283512	2.973552	2.361480	3.057197	2.435315	2.731553	2.207627
	BVAR2	2.705974	2.139148	2.764075	2.183157	2.854555	2.260852	2.924987	2.321468	2.981809	2.370179	2.588041	2.073646
	BVAR3	2.665213	2.105128	2.68787	2.12321	2.731597	2.158491	2.781588	2.200491	2.826168	2.237295	2.673238	2.171811
	BVAR4	2.648128	2.091308	2.680723	2.117680	2.706527	2.137788	2.738719	2.165865	2.750725	2.176400	2.503954	2.007818
0.85	VAR(2)	3.050589	2.436472	3.117300	2.487087	3.104689	2.477465	3.105600	2.478757	3.085249	2.461835	2.508883	1.957726
	BVAR1	3.100007	2.473666	3.139194	2.500250	3.218102	2.566508	3.307878	2.642758	3.371854	2.697790	2.996137	2.420239
	BVAR2	3.071986	2.449269	3.117831	2.485876	3.184090	2.539957	3.247531	2.591621	3.290611	2.630079	2.858626	2.291587
	BVAR3	3.004581	2.393383	3.043114	2.423359	3.073587	2.449375	3.119071	2.484352	3.138801	2.502352	2.911674	2.362096
	BVAR4	2.985086	2.377309	3.017451	2.402853	3.057904	2.435876	3.066501	2.441635	3.087073	2.460630	2.748926	2.206288
0.9	VAR(2)	3.764386	3.059702	3.803230	3.082635	3.962934	3.216458	3.887860	3.147939	3.881184	3.152091	3.041222	2.389360
	BVAR1	3.740808	3.022111	3.765262	3.036083	3.829513	3.084710	3.897016	3.144560	3.933268	3.171288	3.457976	2.795069
	BVAR2	3.680259	2.966716	3.729521	3.006810	3.794741	3.057041	3.827421	3.085142	3.866029	3.113105	3.326255	2.673346
	BVAR3	3.594659	2.898046	3.626014	2.919360	3.666482	2.951201	3.692122	2.972574	3.709252	2.986345	3.315510	2.687656
	BVAR4	3.553195	2.860565	3.597044	2.896358	3.629607	2.921500	3.653226	2.938109	3.648013	2.936770	3.169645	2.547928
0.95	VAR(2)	5.804847	4.855117	6.458031	5.262287	6.343540	5.262355	6.284473	5.229915	6.462951	5.341590	4.535777	3.608310
	BVAR1	5.157735	4.250161	5.175174	4.255861	5.301088	4.359783	5.270171	4.334131	5.269785	4.325537	4.506465	3.660309
	BVAR2	5.074068	4.175784	5.13902	4.22378	5.167625	4.244808	5.189649	4.258897	5.197418	4.263038	4.393451	3.555035
	BVAR3	4.884419	4.013207	4.951390	4.063292	5.035572	4.132024	5.037693	4.129435	5.062795	4.150245	4.289787	3.489605
	BVAR4	4.835171	3.970884	4.926808	4.041924	4.993293	4.097031	5.027825	4.124057	4.965637	4.070103	4.162256	3.367875
0.99	VAR(2)	15.78162	13.28442	14.98277	12.76054	16.91082	13.88216	17.29287	14.11688	16.82134	14.01105	11.04608	8.68497
	BVAR1	9.202420	7.865673	9.300202	7.935610	9.541168	8.142277	9.531320	8.127908	9.585189	8.180462	7.420486	6.085577
	BVAR2	8.956609	7.661451	9.356678	7.998900	9.593496	8.194518	9.519450	8.131793	9.713431	8.294674	7.315312	5.995111
	BVAR3	8.837134	7.555928	9.218690	7.875251	9.303724	7.946998	9.380312	8.011799	9.448674	8.069179	7.143228	5.861300
	BVAR4	8.862659	7.567703	9.167212	7.823893	9.364018	8.004640	9.669616	8.264426	9.522039	8.127670	7.163405	5.869270

Continued

T = 128		COLLINEARITY (ρ)							
AUTOCO LEVELS (δ)	Models	0.85		0.9		0.95		0.99	
		RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
−0.99	VAR(2)	11.945267	8.861576	12.795160	8.681859	11.85843	9.25846	13.42278	11.42555
	BVAR1	9.179577	7.320466	8.819682	6.748474	8.942636	7.083999	10.185347	8.754547
	BVAR2	9.037003	7.133194	8.697249	6.544172	8.979889	7.091445	10.180364	8.740516
	BVAR3	8.707451	6.855307	8.478398	6.397376	8.752523	6.889068	9.9200541	8.442729
	BVAR4	8.462042	6.577923	8.258024	6.126412	8.563999	6.706095	9.799041	8.330114
−0.95	VAR(2)	5.015870	3.725254	5.203213	3.696729	5.426878	4.146475	6.062297	4.980789
	BVAR1	4.836986	3.953661	4.644456	3.728887	4.642191	3.679435	5.055933	4.151075
	BVAR2	4.653996	3.708048	4.471611	3.492956	4.550617	3.572558	5.019349	4.122661
	BVAR3	4.726680	3.790807	4.585791	3.614554	4.633726	3.660861	5.112308	4.202335
	BVAR4	4.575834	3.568500	4.471021	3.415283	4.567308	3.573860	5.125466	4.213588
−0.9	VAR(2)	3.264372	2.433065	3.348979	2.426611	3.336172	2.564084	3.771946	3.064766
	BVAR1	3.714970	3.118219	3.504954	2.898950	3.379134	2.701847	3.563928	2.875681
	BVAR2	3.458167	2.836522	3.298093	2.657997	3.262088	2.578714	3.496387	2.821228
	BVAR3	3.551787	2.938455	3.400993	2.777254	3.369001	2.689641	3.597387	2.904003
	BVAR4	3.306702	2.644407	3.221331	2.533225	3.249320	2.549904	3.544725	2.859338
−0.85	VAR(2)	2.567553	1.921773	2.541639	1.883283	2.626303	2.007082	3.018725	2.408264
	BVAR1	3.244740	2.745461	3.016541	2.519631	2.848164	2.288249	2.915867	2.326463
	BVAR2	2.972959	2.470611	2.809365	2.294248	2.728691	2.166030	2.853590	2.277067
	BVAR3	3.075161	2.582631	2.920878	2.421964	2.838472	2.285118	2.933008	2.345572
	BVAR4	2.801145	2.275310	2.706614	2.165321	2.700311	2.127450	2.886501	2.303731
−0.8	VAR(2)	2.196236	1.646146	2.183864	1.622701	2.265826	1.723982	2.503623	1.975381
	BVAR1	2.973229	2.513734	2.747384	2.294729	2.547671	2.048411	2.548932	2.015365
	BVAR2	2.696030	2.249508	2.541589	2.084607	2.420984	1.922024	2.472584	1.952281
	BVAR3	2.819576	2.381977	2.659572	2.219254	2.549656	2.059531	2.567721	2.034474
	BVAR4	2.523249	2.066675	2.427958	1.958831	2.394875	1.891775	2.501872	1.978518
0.8	VAR(2)	2.269407	1.772237	2.338102	1.835759	2.422130	1.909445	2.532666	2.001992
	BVAR1	2.752129	2.217063	2.764549	2.221370	2.787988	2.232614	2.803706	2.237125
	BVAR2	2.597009	2.073938	2.631648	2.096248	2.669347	2.122810	2.700260	2.143836
	BVAR3	2.658591	2.142858	2.638225	2.111596	2.644182	2.103946	2.688484	2.131183
	BVAR4	2.504221	1.997949	2.514020	1.997147	2.546331	2.017356	2.600767	2.058269
0.85	VAR(2)	2.567649	2.018788	2.644502	2.093358	2.742656	2.183696	2.870326	2.291302
	BVAR1	3.021006	2.436361	3.053786	2.459015	3.094658	2.490691	3.127300	2.512577
	BVAR2	2.880938	2.306900	2.925930	2.342555	2.979290	2.385108	3.042191	2.435299
	BVAR3	2.89842	2.33901	2.905182	2.331787	2.928327	2.340648	2.992054	2.389238
	BVAR4	2.760013	2.208032	2.787058	2.224654	2.830560	2.258261	2.914858	2.326037
0.9	VAR(2)	3.137792	2.487511	3.191229	2.554643	3.344238	2.700335	3.564692	2.890408
	BVAR1	3.486373	2.818011	3.553037	2.873810	3.626711	2.938518	3.692615	2.991344
	BVAR2	3.363206	2.705538	3.421814	2.758570	3.502733	2.828356	3.596625	2.910104
	BVAR3	3.327585	2.691013	3.357432	2.706657	3.427382	2.764448	3.530147	2.848907
	BVAR4	3.200512	2.571322	3.239301	2.602163	3.324481	2.672839	3.441597	2.771189
0.95	VAR(2)	4.920988	3.944748	4.990236	4.055321	5.399281	4.430346	5.950925	4.832073
	BVAR1	4.595254	3.750031	4.668532	3.825789	4.792548	3.941870	4.948153	4.085370
	BVAR2	4.424569	3.596945	4.565638	3.732137	4.682770	3.845421	4.869442	4.013891
	BVAR3	4.343997	3.540982	4.421092	3.612574	4.482806	3.669919	4.728360	3.885237
	BVAR4	4.223473	3.429542	4.331716	3.532617	4.414773	3.608953	4.636423	3.809460
0.99	VAR(2)	11.455568	9.209777	11.893301	9.775085	13.54296	11.18886	13.50771	11.46993
	BVAR1	7.426306	6.151560	7.688341	6.443587	7.999046	6.774294	8.478266	7.229107
	BVAR2	7.434341	6.160498	7.577398	6.343787	8.036029	6.824181	8.367662	7.135695
	BVAR3	7.384678	6.145512	7.656384	6.421955	7.786935	6.602134	8.226474	7.007422
	BVAR4	7.364817	6.124219	7.471577	6.273514	7.717748	6.542996	8.117583	6.914989

Table A6. The RMSE and MAE values of the model for $T = 256$.

$T = 256$		COLLINERITY (ρ)											
AUTOCO LEVELS (δ)	Models	−0.99		−0.95		−0.9		−0.85		−0.8		0.8	
		RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
−0.99	VAR(2)	18.3946	15.5924	21.83711	18.14790	22.48374	18.61547	23.81353	19.54287	25.60013	20.73679	12.494381	9.859542
	BVAR1	14.94425	12.65669	17.02494	14.13990	18.60022	15.24951	19.65943	15.97972	20.42148	16.47341	10.43906	8.36823
	BVAR2	14.93444	12.61939	17.12534	14.20582	18.58637	15.23903	19.80157	16.07496	20.56437	16.61588	10.410406	8.307123
	BVAR3	15.29943	12.92135	17.63730	14.67914	19.77131	16.28300	20.94188	17.13175	22.33767	18.19815	10.345147	8.217326
	BVAR4	15.75648	13.35916	18.86639	15.78272	21.39742	17.71476	23.07249	18.94071	23.92799	19.57384	10.310096	8.163652
−0.95	VAR(2)	7.218011	5.847984	8.030496	6.467167	8.668218	6.894023	9.425220	7.393212	9.495944	7.448484	4.879222	3.746798
	BVAR1	6.568200	5.334939	7.544869	6.031629	8.240385	6.509597	8.704961	6.810649	9.101330	7.074803	5.004025	4.017078
	BVAR2	6.584163	5.345821	7.562459	6.046505	8.245682	6.517682	8.757776	6.858725	9.114170	7.095599	4.806489	3.783952
	BVAR3	6.682222	5.425272	7.657178	6.127892	8.348658	6.612652	8.874156	6.963380	9.160590	7.142968	4.848034	3.810604
	BVAR4	6.740172	5.474502	7.748135	6.206417	8.464405	6.702423	8.933227	7.017628	9.299936	7.267197	4.760293	3.695640
−0.9	VAR(2)	4.548186	3.661812	5.163005	4.096899	5.594353	4.395694	5.886288	4.588031	6.081617	4.714155	3.237686	2.479712
	BVAR1	4.410247	3.547042	5.058111	4.006136	5.510708	4.313132	5.879078	4.561168	6.107963	4.706490	3.715527	3.061258
	BVAR2	4.435212	3.567766	5.061483	4.014110	5.506703	4.315287	5.805862	4.508307	6.060609	4.674692	3.435002	2.751851
	BVAR3	4.458940	3.587023	5.064372	4.019333	5.502904	4.316899	5.807830	4.515899	6.046962	4.674377	3.432424	2.744897
	BVAR4	4.474700	3.599732	5.095676	4.041589	5.521115	4.331711	5.821811	4.532842	6.033776	4.668946	3.280912	2.568950
−0.85	VAR(2)	3.532991	2.825013	3.980707	3.147731	4.293063	3.358355	4.518400	3.511168	4.665189	3.608272	2.555692	1.959345
	BVAR1	3.472187	2.780203	3.960429	3.127099	4.33727	3.38154	4.606734	3.559702	4.835993	3.709757	3.192449	2.670262
	BVAR2	3.471253	2.777734	3.949921	3.118628	4.298323	3.355954	4.534228	3.508752	4.746031	3.650103	2.867236	2.330504
	BVAR3	3.479885	2.783814	3.952865	3.125543	4.273287	3.341796	4.518117	3.506743	4.692695	3.619978	2.866857	2.324536
	BVAR4	3.479531	2.783306	3.938482	3.113071	4.267845	3.337840	4.485010	3.482246	4.659591	3.600075	2.675640	2.113137
−0.8	VAR(2)	2.959363	2.355357	3.315679	2.612983	3.549758	2.772218	3.723084	2.890167	3.843216	2.970263	2.187576	1.678448
	BVAR1	2.915832	2.324298	3.324198	2.618957	3.647952	2.840735	3.890746	3.001934	4.088640	3.130138	2.912264	2.452986
	BVAR2	2.927606	2.333337	3.315964	2.612976	3.588153	2.796431	3.805687	2.940283	3.972382	3.050013	2.559063	2.097676
	BVAR3	2.934119	2.337806	3.294327	2.598272	3.573094	2.791090	3.760643	2.914655	3.905587	3.009587	2.553443	2.088967
	BVAR4	2.927636	2.332091	3.283496	2.589628	3.538577	2.764798	3.717292	2.883763	3.861316	2.980157	2.338844	1.859071
0.8	VAR(2)	2.614347	2.076150	2.656520	2.108033	2.658939	2.110030	2.661154	2.110605	2.648299	2.101099	2.187649	1.707408
	BVAR1	2.63402	2.09031	2.704446	2.146521	2.778743	2.205361	2.864080	2.274006	2.926658	2.327225	2.673885	2.177531
	BVAR2	2.618972	2.078547	2.685015	2.131414	2.741461	2.175220	2.788580	2.214311	2.831567	2.248978	2.462357	1.976192
	BVAR3	2.613630	2.076179	2.660450	2.112121	2.701794	2.144857	2.727534	2.165545	2.748650	2.183494	2.507330	2.024276
	BVAR4	2.602326	2.066396	2.647095	2.101200	2.669346	2.118583	2.677478	2.125707	2.682583	2.129126	2.338754	1.858694
0.85	VAR(2)	2.985969	2.382029	3.040012	2.423935	3.052704	2.432808	3.044404	2.426454	3.033946	2.416937	2.475642	1.934533
	BVAR1	2.999132	2.391651	3.063929	2.441990	3.142888	2.505482	3.211648	2.560161	3.264053	2.603258	2.918393	2.367700
	BVAR2	2.989405	2.384937	3.059359	2.437300	3.105940	2.474625	3.149707	2.509996	3.185160	2.539604	2.730449	2.186375
	BVAR3	2.968755	2.368240	3.027330	2.413446	3.069040	2.447164	3.087766	2.462067	3.106623	2.476152	2.761086	2.223583
	BVAR4	2.967988	2.367233	3.018417	2.407020	3.043088	2.426606	3.047539	2.428791	3.046364	2.428108	2.609852	2.072087
0.9	VAR(2)	3.629798	2.914350	3.704747	2.972385	3.731578	2.992888	3.732779	2.994493	3.718436	2.980110	2.966899	2.322628
	BVAR1	3.628762	2.911740	3.699430	2.965376	3.777637	3.026668	3.816494	3.055784	3.854139	3.086413	3.361970	2.712292
	BVAR2	3.615355	2.900748	3.683542	2.952034	3.730334	2.987159	3.769586	3.018176	3.786167	3.033074	3.191064	2.548203
	BVAR3	3.587281	2.877089	3.654505	2.931531	3.695062	2.961888	3.703219	2.968410	3.726128	2.985445	3.208336	2.574259
	BVAR4	3.575208	2.867450	3.649041	2.926987	3.669746	2.942000	3.666429	2.937888	3.671358	2.942870	3.068512	2.434251
0.95	VAR(2)	5.266993	4.302841	5.487562	4.486147	5.480728	4.463227	5.480620	4.472432	5.466501	4.457976	4.208272	3.309781
	BVAR1	5.024042	4.073294	5.120990	4.146785	5.206815	4.217585	5.226842	4.226614	5.239742	4.238858	4.396909	3.533885
	BVAR2	4.997996	4.053201	5.058593	4.096847	5.140416	4.158530	5.165222	4.177438	5.170006	4.182593	4.260906	3.401164
	BVAR3	4.938789	4.002242	5.039830	4.080811	5.093600	4.125176	5.106001	4.131230	5.111003	4.134270	4.232342	3.382767
	BVAR4	4.924007	3.991693	5.038282	4.080998	5.062517	4.097951	5.071595	4.103822	5.061422	4.096623	4.111348	3.264995
0.99	VAR(2)	16.98542	14.00534	16.40047	13.88880	17.23174	14.39398	16.69765	14.07403	18.86656	15.41792	11.683464	9.167292
	BVAR1	10.494091	8.872857	10.972920	9.271226	10.87925	9.16902	11.09565	9.36795	11.057284	9.322178	8.447998	6.877789
	BVAR2	10.468188	8.845084	10.748771	9.082232	10.889833	9.186896	11.053729	9.332792	10.999373	9.285424	8.310040	6.747735
	BVAR3	10.330308	8.736298	10.57758	8.92490	10.892671	9.194885	10.884812	9.173668	10.957336	9.247863	8.20648	6.64717
	BVAR4	10.268248	8.669719	10.813341	9.149265	10.958242	9.258199	10.983971	9.275027	11.094677	9.373178	8.106103	6.538399

Continued

$T = 256$		COLLINEARITY (ρ)							
AUTOCO LEVELS (δ)	Models	0.85		0.9		0.95		0.99	
		RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
−0.99	VAR(2)	12.292872	9.019249	12.328465	8.583864	11.88425	9.30928	14.38993	12.04130
	BVAR1	9.940012	7.615291	9.695786	7.151369	10.003641	7.811151	11.401214	9.578301
	BVAR2	9.860353	7.473166	9.645700	7.013643	9.984819	7.776508	11.433606	9.600694
	BVAR3	9.879126	7.456796	9.615907	6.996396	10.060146	7.804474	11.712333	9.807139
	BVAR4	9.872221	7.397829	9.693887	6.985854	10.175596	7.888045	11.771431	9.858685
−0.95	VAR(2)	4.675627	3.433047	4.591227	3.294811	4.834659	3.684773	5.489967	4.457119
	BVAR1	4.751472	3.753760	4.601855	3.563108	4.676203	3.631709	5.166012	4.171296
	BVAR2	4.575137	3.503607	4.451270	3.330402	4.558022	3.496429	5.160168	4.168281
	BVAR3	4.618396	3.533003	4.506708	3.375573	4.647846	3.573142	5.216748	4.211559
	BVAR4	4.526623	3.390034	4.438774	3.251366	4.627821	3.530552	5.220785	4.218392
−0.9	VAR(2)	3.122088	2.313956	3.083480	2.249458	3.197895	2.428867	3.603086	2.879401
	BVAR1	3.504443	2.878414	3.359757	2.713640	3.315275	2.621622	3.570148	2.859518
	BVAR2	3.260930	2.575507	3.162962	2.451965	3.202590	2.483038	3.535835	2.829658
	BVAR3	3.275876	2.585727	3.191852	2.476510	3.228760	2.507757	3.571913	2.857418
	BVAR4	3.152633	2.410320	3.084599	2.322219	3.178185	2.438380	3.540043	2.829462
−0.85	VAR(2)	2.477548	1.852433	2.451333	1.812685	2.543358	1.936024	2.841108	2.255355
	BVAR1	3.006656	2.517774	2.848012	2.350770	2.767444	2.215490	2.872582	2.290326
	BVAR2	2.727614	2.198541	2.619965	2.076338	2.616711	2.048485	2.821017	2.246513
	BVAR3	2.734891	2.202784	2.644389	2.098645	2.656329	2.083624	2.849932	2.268526
	BVAR4	2.574753	2.002080	2.515712	1.929908	2.570926	1.985405	2.823762	2.245788
−0.8	VAR(2)	2.125443	1.598810	2.107579	1.573870	2.17960	1.66439	2.414951	1.907861
	BVAR1	2.739682	2.311585	2.575504	2.146472	2.449498	1.975380	2.481309	1.969979
	BVAR2	2.425755	1.978843	2.326747	1.866837	2.296983	1.809410	2.419762	1.918207
	BVAR3	2.440397	1.988378	2.347586	1.886717	2.328026	1.838238	2.457924	1.948747
	BVAR4	2.250814	1.769048	2.200609	1.708180	2.227605	1.728900	2.411302	1.908411
0.8	VAR(2)	2.236399	1.754781	2.299736	1.814077	2.379149	1.884599	2.487192	1.974898
	BVAR1	2.627007	2.120110	2.599947	2.083388	2.588574	2.062693	2.620266	2.084377
	BVAR2	2.452804	1.957960	2.461771	1.957306	2.486751	1.973808	2.548413	2.023260
	BVAR3	2.501397	2.007570	2.504288	2.000493	2.509820	1.997461	2.550920	2.026514
	BVAR4	2.357946	1.871715	2.388347	1.895858	2.437277	1.934261	2.507633	1.990963
0.85	VAR(2)	2.531841	1.992353	2.608348	2.064005	2.703969	2.151654	2.828153	2.254426
	BVAR1	2.894148	2.332085	2.884802	2.310809	2.903956	2.318829	2.952580	2.357421
	BVAR2	2.732076	2.181343	2.756491	2.196467	2.801762	2.231792	2.880183	2.296912
	BVAR3	2.772147	2.222319	2.787752	2.229991	2.816011	2.246924	2.886455	2.303569
	BVAR4	2.638373	2.096798	2.683887	2.135190	2.747752	2.188503	2.846163	2.270006
0.9	VAR(2)	3.052437	2.409829	3.142645	2.499225	3.270464	2.616470	3.437442	2.760244
	BVAR1	3.363117	2.704008	3.380101	2.710087	3.438881	2.756910	3.522892	2.827787
	BVAR2	3.218510	2.569185	3.262358	2.605622	3.345030	2.676726	3.468972	2.781787
	BVAR3	3.237278	2.594169	3.282231	2.629490	3.341460	2.679199	3.445365	2.764382
	BVAR4	3.121272	2.483805	3.182059	2.539302	3.284477	2.628086	3.406939	2.732175
0.95	VAR(2)	4.365492	3.471970	4.480920	3.607913	4.766742	3.856211	4.938933	4.029858
	BVAR1	4.461304	3.588159	4.523729	3.646270	4.664817	3.771176	4.839329	3.923619
	BVAR2	4.344079	3.482217	4.421030	3.556775	4.553524	3.676655	4.746046	3.847426
	BVAR3	4.299452	3.450690	4.383871	3.527764	4.515636	3.648935	4.716871	3.821928
	BVAR4	4.174909	3.334882	4.293484	3.447778	4.448287	3.593866	4.653130	3.768907
0.99	VAR(2)	11.981223	9.694264	13.79347	11.11085	14.74004	11.94566	13.85595	11.80282
	BVAR1	8.696257	7.160028	8.932930	7.420823	9.202919	7.715310	9.746341	8.217796
	BVAR2	8.479994	6.960884	8.680591	7.202460	9.164582	7.676524	9.602264	8.101851
	BVAR3	8.475901	6.963413	8.714584	7.230251	9.034855	7.575599	9.403324	7.920777
	BVAR4	8.230192	6.741359	8.491010	7.038407	8.825268	7.392270	9.410795	7.930210

Appendix B

Table B1. The ranks of the performances of the model for $T = 8$.

$T = 8$		RANK COLLINERITY(ρ)											
AUTOCO LEVELS (δ)	Models	−0.99		−0.95		−0.9		−0.85		−0.8		0.8	
		RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
−0.99	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	4	4	4	4	4	4	4	4	4	4	4	3
	BVAR2	3	3	3	3	3	3	3	3	3	3	3	1
	BVAR3	2	2	2	2	2	2	2	2	2	2	2	2
	BVAR4	1	1	1	1	1	1	1	1	1	1	1	4
−0.95	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	**N/A**	N/A	N/A	N/A
	BVAR1	4	4	4	4	4	4	4	4	**4**	4	4	2
	BVAR2	3	3	3	3	3	3	3	3	**3**	3	3	1
	BVAR3	2	2	2	2	2	2	2	2	**2**	2	1	3
	BVAR4	1	1	1	1	1	1	1	1	**1**	1	2	4
−0.9	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	3	3	4	4	4	4	4	4	4	4	2	1
	BVAR2	4	4	3	3	3	3	3	3	3	3	1	2
	BVAR3	2	2	2	2	2	2	2	2	2	2	3	3
	BVAR4	1	1	1	1	1	1	1	1	1	1	4	4
−0.85	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	4	4	4	3	4	4	4	4	4	4	1	1
	BVAR2	3	3	3	4	3	3	3	3	3	3	2	2
	BVAR3	2	2	2	2	2	2	2	2	2	2	3	3
	BVAR4	1	1	1	1	1	1	1	1	1	1	4	4
−0.8	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	3	3	4	4	4	4	4	4	4	4	1	1
	BVAR2	4	4	3	3	3	3	3	3	3	3	2	2
	BVAR3	1	1	2	2	2	2	2	2	2	2	3	3
	BVAR4	2	2	1	1	1	1	1	1	1	1	4	4
0.8	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	1	1	3	2	4	3	3	3	4	3	1	1
	BVAR2	3	2	4	4	3	4	4	4	3	4	2	2
	BVAR3	2	3	1	1	2	2	2	2	2	1	3	3
	BVAR4	4	4	2	3	1	1	1	1	1	2	4	4
0.85	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	3	1	3	3	4	3	4	3	3	2	1	1
	BVAR2	2	2	4	4	3	4	3	4	4	4	2	2
	BVAR3	1	3	1	1	2	2	2	1	1	1	3	3
	BVAR4	4	4	2	2	1	1	1	2	2	3	4	4
0.9	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	1	1	3	2	4	4	3	3	3	3	1	1
	BVAR2	2	2	4	4	3	3	4	4	4	4	2	2
	BVAR3	3	3	2	3	2	2	2	2	2	1	3	3
	BVAR4	4	4	1	1	1	1	1	1	1	2	4	4
0.95	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	2	1	4	4	3	3	3	3	3	3	1	1
	BVAR2	3	2	3	2	4	4	4	4	4	4	2	2
	BVAR3	1	3	1	1	2	2	2	2	2	2	3	3
	BVAR4	4	4	2	3	1	1	1	1	1	1	4	4
0.99	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	1	1	4	4	4	3	4	2	3	3	1	1
	BVAR2	3	2	3	3	3	4	3	4	4	4	2	2
	BVAR3	2	3	2	1	2	1	2	1	2	2	3	3
	BVAR4	4	4	1	2	1	2	1	3	1	1	4	4

Continued

$T = 8$		COLLINEARITY (ρ)							
AUTOCO LEVELS (δ)	Models	0.85		0.9		0.95		0.99	
		RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
−0.99	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	3	1	4	1	4	1	4	1
	BVAR2	4	2	3	2	3	2	3	4
	BVAR3	2	4	1	3	2	3	2	3
	BVAR4	1	3	2	4	1	4	1	2
−0.95	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	3	1	1	1	1	1	4	1
	BVAR2	4	2	2	2	2	2	3	2
	BVAR3	1	3	3	3	3	3	1	3
	BVAR4	2	4	4	4	4	4	2	4
−0.9	VAR(2)	N/A	**N/A**	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	1	**1**	2	1	1	1	3	1
	BVAR2	2	**2**	1	2	2	2	2	2
	BVAR3	3	**3**	3	3	3	3	1	3
	BVAR4	4	**4**	4	4	4	4	4	4
−0.85	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	1	1	1	1	2	1	1	1
	BVAR2	2	2	2	2	1	2	2	2
	BVAR3	3	3	3	3	3	3	3	3
	BVAR4	4	4	4	4	4	4	4	4
−0.8	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	1	1	1	1	1	1	2	1
	BVAR2	2	2	2	2	2	2	1	2
	BVAR3	3	3	3	3	3	3	3	3
	BVAR4	4	4	4	4	4	4	4	4
0.8	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	1	1	1	1	1	1	1	1
	BVAR2	2	2	2	2	2	2	2	2
	BVAR3	3	3	3	3	3	3	3	3
	BVAR4	4	4	4	4	4	4	4	4
0.85	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	1	1	1	1	1	1	1	1
	BVAR2	2	2	2	2	2	2	2	2
	BVAR3	3	3	3	3	3	3	3	3
	BVAR4	4	4	4	4	4	4	4	4
0.9	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	1	1	2	1	2	1	1	1
	BVAR2	2	2	1	2	1	2	2	2
	BVAR3	3	3	3	3	3	3	3	3
	BVAR4	4	4	4	4	4	4	4	4
0.95	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	1	1	1	1	1	1	1	1
	BVAR2	2	2	2	2	2	2	2	2
	BVAR3	3	3	3	3	3	3	3	3
	BVAR4	4	4	4	4	4	4	4	4
0.99	VAR(2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	BVAR1	2	1	1	1	1	1	1	1
	BVAR2	1	2	2	2	2	2	2	2
	BVAR3	3	3	3	3	3	3	3	3
	BVAR4	4	4	4	4	4	4	4	4

Table B2. The ranks of the performances of the model for $T = 16$.

$T = 16$		COLLINERITY (ρ)											
AUTOCO LEVELS (δ)	Models	−0.99		−0.95		−0.9		−0.85		−0.8		0.8	
		RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
	VAR(2)	5	5	5	5	5	5	5	5	5	5	5	5
	BVAR1	4	4	4	4	4	4	4	4	4	4	4	4
−0.99	BVAR2	3	3	3	3	3	3	3	3	3	3	3	3
	BVAR3	2	2	2	2	2	2	2	2	2	2	2	2
	BVAR4	1	1	1	1	1	1	1	1	1	1	1	1
	VAR(2)	5	5	5	5	5	5	5	5	5	5	5	5
	BVAR1	4	4	4	4	4	4	4	4	4	4	4	4
−0.95	BVAR2	3	3	3	3	3	3	3	3	3	3	3	3
	BVAR3	2	2	2	2	2	2	2	2	2	2	1	1
	BVAR4	1	1	1	1	1	1	1	1	1	1	2	2
	VAR(2)	5	5	5	5	5	5	5	5	5	5	5	5
	BVAR1	4	4	4	4	4	4	4	4	4	4	4	3
−0.9	BVAR2	3	3	3	3	3	3	3	3	3	3	3	1
	BVAR3	2	2	2	2	2	2	2	2	2	2	1	2
	BVAR4	1	1	1	1	1	1	1	1	1	1	2	4
	VAR(2)	5	5	5	5	5	5	5	5	5	5	5	5
	BVAR1	4	4	4	4	4	4	4	4	4	4	4	2
−0.85	BVAR2	3	3	3	3	3	3	3	3	3	3	1	1
	BVAR3	2	2	2	2	2	2	2	2	2	2	3	4
	BVAR4	1	1	1	1	1	1	1	1	1	1	2	3
	VAR(2)	5	5	5	5	5	5	5	5	5	5	5	3
	BVAR1	4	4	4	4	4	4	4	4	4	4	1	1
−0.8	BVAR2	3	3	3	3	3	3	3	3	3	3	2	2
	BVAR3	2	2	2	2	2	2	2	2	2	2	4	4
	BVAR4	1	1	1	1	1	1	1	1	1	1	3	5
	VAR(2)	5	5	5	5	5	5	5	5	5	5	5	5
	BVAR1	3	3	4	4	3	3	3	3	4	3	1	1
0.8	BVAR2	4	4	3	3	4	4	4	4	3	4	2	2
	BVAR3	2	2	2	2	2	2	2	2	2	2	4	4
	BVAR4	1	1	1	1	1	1	1	1	1	1	3	3
	VAR(2)	5	5	5	5	5	5	5	5	5	5	5	5
	BVAR1	3	3	4	4	4	4	4	4	3	3	2	2
0.85	BVAR2	4	4	3	3	3	3	3	3	4	4	1	1
	BVAR3	2	2	2	2	2	2	2	2	2	2	4	4
	BVAR4	1	1	1	1	1	1	1	1	1	1	3	3
	VAR(2)	5	5	5	5	5	5	5	5	5	5	5	5
	BVAR1	4	4	4	4	4	3	4	3	3	3	1	1
0.9	BVAR2	3	3	3	3	3	4	3	4	4	4	2	2
	BVAR3	2	2	2	2	2	2	2	2	2	2	4	4
	BVAR4	1	1	1	1	1	1	1	1	1	1	3	3

Continued

	VAR(2)	5	5	5	5	5	5	5	5	5	5	5	5
	BVAR1	4	3	4	4	4	4	4	3	3	3	1	1
0.95	BVAR2	3	4	3	3	3	3	3	4	4	4	2	2
	BVAR3	2	2	2	2	2	2	2	2	2	2	4	4
	BVAR4	1	1	1	1	1	1	1	1	1	1	3	3
	VAR(2)	5	5	5	5	5	5	5	5	5	5	5	5
	BVAR1	4	3	4	3	3	3	4	4	4	3	2	2
0.99	BVAR2	3	4	3	4	4	4	3	3	3	4	1	1
	BVAR3	1	1	2	2	2	2	2	2	2	2	3	3
	BVAR4	2	2	1	1	1	1	1	1	1	1	4	4

$T = 16$		COLLINEARITY (ρ)							
AUTOCO LEVELS (δ)	Models	0.85		0.9		0.95		0.99	
		RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
	VAR(2)	5	5	5	5	5	5	5	5
	BVAR1	4	4	4	4	4	4	4	4
−0.99	BVAR2	3	3	3	3	3	3	3	3
	BVAR3	2	2	2	2	2	2	2	2
	BVAR4	1	1	1	1	1	1	1	1
	VAR(2)	5	5	5	5	5	5	5	5
	BVAR1	4	4	4	4	4	4	4	4
−0.95	BVAR2	3	3	3	1	3	3	3	3
	BVAR3	1	1	2	3	2	2	2	2
	BVAR4	2	2	1	2	1	1	1	1
	VAR(2)	5	5	5	5	5	5	5	5
	BVAR1	4	2	4	2	4	3	4	4
−0.9	BVAR2	3	1	3	1	3	1	3	3
	BVAR3	2	4	2	4	2	4	2	2
	BVAR4	1	3	1	3	1	2	1	1
	VAR(2)	5	5	5	5	5	5	5	5
	BVAR1	3	2	3	2	3	1	4	4
−0.85	BVAR2	1	1	1	1	2	2	3	3
	BVAR3	4	4	4	4	4	4	2	2
	BVAR4	2	3	2	3	1	3	1	1
	VAR(2)	5	3	5	3	5	3	5	5
	BVAR1	2	1	1	1	2	1	4	4
−0.8	BVAR2	1	2	2	2	1	2	3	3
	BVAR3	4	5	4	5	4	5	2	2
	BVAR4	3	4	3	4	3	4	1	1
	VAR(2)	5	5	5	5	5	5	5	5
	BVAR1	1	1	1	1	1	1	1	1
0.8	BVAR2	2	2	2	2	2	2	4	3
	BVAR3	4	4	4	4	3	4	3	4
	BVAR4	3	3	3	3	4	3	2	2

Continued

	VAR(2)	5	5	5	5	5	5	5	5
	BVAR1	1	1	1	1	1	1	3	2
0.85	BVAR2	2	2	2	2	2	2	1	1
	BVAR3	4	4	4	4	3	3	4	4
	BVAR4	3	3	3	3	4	4	2	3
	VAR(2)	5	5	5	5	5	5	5	5
	BVAR1	1	1	1	1	1	1	2	1
0.9	BVAR2	2	2	2	2	2	2	4	2
	BVAR3	4	4	4	4	4	4	3	4
	BVAR4	3	3	3	3	3	3	1	3
	VAR(2)	5	5	5	5	5	5	5	5
	BVAR1	1	1	2	2	1	1	3	1
0.95	BVAR2	2	2	1	1	2	2	4	4
	BVAR3	4	4	3	3	4	4	1	2
	BVAR4	3	3	4	4	3	3	2	3
	VAR(2)	5	5	5	5	5	5	5	5
	BVAR1	1	1	1	1	1	1	4	2
0.99	BVAR2	2	2	2	2	2	2	3	1
	BVAR3	4	4	4	4	3	3	1	3
	BVAR4	3	3	3	3	4	4	2	4

Table B3. The ranks of the performances of the model for $T = 32$.

$T = 32$		COLLINERITY(ρ)											
AUTOCO LEVELS (δ)	Models	−0.99		−0.95		−0.9		−0.85		−0.8		0.8	
		RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
	VAR(2)	5	5	5	5	5	5	5	5	5	5	5	5
	BVAR1	4	4	3	3	4	4	4	4	4	4	4	4
−0.99	BVAR2	3	3	4	4	3	3	3	3	3	3	2	3
	BVAR3	2	2	2	2	2	2	2	2	2	2	3	2
	BVAR4	1	1	1	1	1	1	1	1	1	1	1	1
	VAR(2)	5	5	5	5	5	5	5	5	5	5	5	5
	BVAR1	4	4	4	4	4	4	4	4	4	4	2	2
−0.95	BVAR2	3	3	3	3	3	3	3	3	3	3	1	1
	BVAR3	2	2	2	2	1	1	2	2	2	2	4	4
	BVAR4	1	1	1	1	2	2	1	1	1	1	3	3
	VAR(2)	5	5	5	5	5	5	5	5	5	5	5	3
	BVAR1	4	4	4	4	4	4	4	4	4	4	2	2
−0.9	BVAR2	3	3	3	3	3	3	3	3	3	3	1	1
	BVAR3	2	2	2	2	2	2	2	2	2	2	4	5
	BVAR4	1	1	1	1	1	1	1	1	1	1	3	4
	VAR(2)	5	5	5	5	5	5	5	5	5	5	3	3
	BVAR1	4	4	4	4	4	4	3	3	4	4	2	2
−0.85	BVAR2	3	3	3	3	3	3	4	4	3	3	1	1
	BVAR3	2	1	2	2	2	2	1	1	2	1	5	5
	BVAR4	1	2	1	1	1	1	2	2	1	2	4	4

Continued

	VAR(2)	5	5	5	5	5	5	5	5	5	5	1	1
	BVAR1	4	4	4	4	4	4	4	4	4	4	3	2
−0.8	BVAR2	3	3	3	3	3	3	3	3	3	3	2	3
	BVAR3	2	2	2	2	2	2	2	2	2	2	5	5
	BVAR4	1	1	1	1	1	1	1	1	1	1	4	4
	VAR(2)	5	5	5	5	5	5	5	5	5	5	1	1
	BVAR1	4	4	4	4	4	4	4	4	4	4	3	3
0.8	BVAR2	3	3	3	3	3	3	3	3	3	3	4	4
	BVAR3	2	2	2	2	2	2	2	2	2	2	5	5
	BVAR4	1	1	1	1	1	1	1	1	1	1	2	2
	VAR(2)	5	5	5	5	5	5	5	5	5	5	2	1
	BVAR1	4	4	4	4	4	4	4	4	4	4	3	3
0.85	BVAR2	3	3	3	3	3	3	3	3	3	3	4	4
	BVAR3	2	2	2	2	2	2	2	2	2	2	5	5
	BVAR4	1	1	1	1	1	1	1	1	1	1	1	2
	VAR(2)	5	5	5	5	5	5	5	5	5	5	5	5
	BVAR1	4	4	4	4	4	4	4	4	4	4	2	2
0.9	BVAR2	3	3	3	3	3	3	3	3	3	3	3	3
	BVAR3	2	2	2	2	2	2	2	2	2	2	4	4
	BVAR4	1	1	1	1	1	1	1	1	1	1	1	1
	VAR(2)	5	5	5	5	5	5	5	5	5	5	5	5
	BVAR1	4	4	4	4	4	4	4	4	4	4	3	2
0.95	BVAR2	3	3	3	3	3	3	3	3	3	3	4	3
	BVAR3	2	2	2	2	2	2	2	2	2	2	2	4
	BVAR4	1	1	1	1	1	1	1	1	1	1	1	1
	VAR(2)	5	5	5	5	5	5	5	5	5	5	5	5
	BVAR1	4	3	4	3	3	3	3	3	3	3	3	2
0.99	BVAR2	3	4	3	4	4	4	4	4	4	4	4	4
	BVAR3	1	1	2	2	2	2	1	1	1	1	2	3
	BVAR4	2	2	1	1	1	1	2	2	2	2	1	1

$T = 32$		COLLINEARITY (ρ)							
AUTOCO LEVELS (δ)	Models	0.85		0.9		0.95		0.99	
		RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
	VAR(2)	5	5	5	5	5	5	5	5
	BVAR1	3	3	3	2	4	4	4	4
−0.99	BVAR2	2	2	2	1	3	3	3	3
	BVAR3	4	4	4	4	2	2	2	2
	BVAR4	1	1	1	3	1	1	1	1
	VAR(2)	5	5	5	5	5	5	5	5
	BVAR1	2	2	2	2	3	2	4	4
−0.95	BVAR2	1	1	1	1	1	1	2	2
	BVAR3	4	4	4	4	4	4	3	3
	BVAR4	3	3	3	3	2	3	1	1

Continued

	VAR(2)	5	5	5	3	5	5	5	5
	BVAR1	2	2	2	2	4	3	4	4
−0.9	BVAR2	1	1	1	1	1	1	2	2
	BVAR3	4	4	4	5	3	4	3	3
	BVAR4	3	3	3	4	2	2	1	1
	VAR(2)	3	1	4	2	5	5	5	5
	BVAR1	2	3	2	3	3	3	4	4
−0.85	BVAR2	1	2	1	1	1	1	2	2
	BVAR3	5	5	5	5	4	4	3	3
	BVAR4	4	4	3	4	2	2	1	1
	VAR(2)	2	1	3	1	4	1	5	5
	BVAR1	3	3	2	3	3	3	4	4
−0.8	BVAR2	1	2	1	2	1	2	2	2
	BVAR3	5	5	5	5	5	5	3	3
	BVAR4	4	4	4	4	2	4	1	1
	VAR(2)	1	1	1	1	1	1	5	2
	BVAR1	3	3	4	3	4	3	4	5
0.8	BVAR2	4	4	3	4	3	4	3	4
	BVAR3	5	5	5	5	5	5	2	3
	BVAR4	2	2	2	2	2	2	1	1
	VAR(2)	5	1	5	5	5	5	5	5
	BVAR1	3	3	3	3	2	2	4	4
0.85	BVAR2	2	4	2	2	4	4	3	3
	BVAR3	4	5	4	4	3	3	2	2
	BVAR4	1	2	1	1	1	1	1	1
	VAR(2)	5	5	5	5	5	5	5	5
	BVAR1	4	3	4	4	4	4	4	4
0.9	BVAR2	2	2	3	3	3	3	3	3
	BVAR3	3	4	2	2	2	2	2	2
	BVAR4	1	1	1	1	1	1	1	1
	VAR(2)	5	5	5	5	5	5	5	5
	BVAR1	4	4	4	3	4	3	3	3
0.95	BVAR2	3	3	3	4	3	4	4	4
	BVAR3	2	2	2	2	2	2	2	2
	BVAR4	1	1	1	1	1	1	1	1
	VAR(2)	5	5	5	5	5	5	5	5
	BVAR1	4	2	4	3	3	3	4	3
0.99	BVAR2	3	3	3	4	4	4	3	4
	BVAR3	2	4	1	1	2	2	2	2
	BVAR4	1	1	2	2	1	1	1	1

Table B4. The ranks of the performances of the model for $T = 64$.

$T = 64$		COLLINERITY(ρ)											
AUTOCO LEVELS (δ)	Models	−0.99		−0.95		−0.9		−0.85		−0.8		0.8	
		RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
	VAR(2)	5	5	5	5	5	5	5	5	5	5	5	5
	BVAR1	4	4	4	4	4	4	4	4	4	4	4	4
−0.99	BVAR2	3	3	3	3	3	3	3	3	3	3	3	3
	BVAR3	2	2	2	2	2	2	2	2	2	2	2	2
	BVAR4	1	1	1	1	1	1	1	1	1	1	1	1
	VAR(2)	5	5	5	5	5	5	5	5	5	5	5	5
	BVAR1	2	2	2	2	2	3	3	3	4	1	3	2
−0.95	BVAR2	1	1	1	1	4	2	2	1	3	3	1	1
	BVAR3	3	3	3	3	3	4	4	4	2	4	4	4
	BVAR4	4	4	4	4	1	1	1	2	1	2	2	3
	VAR(2)	5	5	5	5	5	5	5	5	5	5	4	1
	BVAR1	4	3	3	3	4	3	2	1	4	4	2	3
−0.9	BVAR2	1	2	1	1	2	1	4	4	3	3	1	2
	BVAR3	2	1	2	2	3	4	3	3	2	2	5	5
	BVAR4	3	4	4	4	1	2	1	2	1	1	3	4
	VAR(2)	5	5	5	5	5	5	5	5	5	5	1	1
	BVAR1	4	3	1	1	3	3	4	4	4	4	3	3
−0.85	BVAR2	1	1	4	4	4	4	3	3	3	3	2	2
	BVAR3	3	4	3	3	2	2	2	2	2	2	5	5
	BVAR4	2	2	2	2	1	1	1	1	1	1	4	4
	VAR(2)	5	5	5	5	5	5	5	5	4	5	1	1
	BVAR1	4	3	3	3	3	3	4	4	5	4	3	3
−0.8	BVAR2	1	1	4	4	4	4	3	3	3	3	2	2
	BVAR3	3	4	2	2	2	2	2	2	2	2	5	5
	BVAR4	2	2	1	1	1	1	1	1	1	1	4	4
	VAR(2)	3	3	3	3	3	3	3	3	2	2	1	1
	BVAR1	5	5	5	5	5	5	5	5	5	5	5	5
0.8	BVAR2	4	4	4	4	4	4	4	4	4	4	4	3
	BVAR3	2	2	2	2	2	2	2	2	3	3	3	4
	BVAR4	1	1	1	1	1	1	1	1	1	1	2	2
	VAR(2)	4	4	5	5	5	4	3	3	3	3	1	1
	BVAR1	5	5	4	4	4	5	5	5	5	5	5	5
0.85	BVAR2	3	3	3	3	3	3	4	4	4	4	4	4
	BVAR3	2	2	2	2	2	2	2	2	2	2	3	3
	BVAR4	1	1	1	1	1	1	1	1	1	1	2	2
	VAR(2)	5	5	5	5	5	5	5	5	5	5	2	1
	BVAR1	4	4	4	4	4	4	4	4	4	4	5	5
0.9	BVAR2	3	3	3	3	3	3	3	3	3	3	4	4
	BVAR3	2	2	2	2	2	2	2	2	2	2	3	3
	BVAR4	1	1	1	1	1	1	1	1	1	1	1	2

Continued

	VAR(2)	5	5	5	5	5	5	5	5	5	5	5	5
	BVAR1	4	4	4	4	4	4	4	4	4	4	4	4
0.95	BVAR2	3	3	3	3	3	3	3	3	3	3	3	3
	BVAR3	2	2	2	1	2	2	2	2	2	2	2	2
	BVAR4	1	1	1	2	1	1	1	1	1	1	1	1
	VAR(2)	5	5	5	5	5	5	5	5	5	5	5	5
	BVAR1	4	4	4	3	4	4	4	3	3	3	3	3
0.99	BVAR2	3	3	3	4	3	3	3	4	4	4	4	4
	BVAR3	2	2	2	2	1	1	1	1	2	2	2	2
	BVAR4	1	1	1	1	2	2	2	2	1	1	1	1

$T = 64$		COLLINEARITY (ρ)							
AUTOCO LEVELS (δ)	Models	0.85		0.9		0.95		0.99	
		RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
	VAR(2)	5	5	5	5	5	5	5	5
	BVAR1	4	4	4	4	4	4	4	4
−0.99	BVAR2	3	3	3	2	3	3	3	3
	BVAR3	2	2	2	3	2	2	2	2
	BVAR4	1	1	1	1	1	1	1	1
	VAR(2)	5	5	5	5	5	5	5	5
	BVAR1	3	2	2	2	2	2	2	2
−0.95	BVAR2	1	1	1	1	1	1	1	1
	BVAR3	4	4	4	4	4	4	4	4
	BVAR4	2	3	3	3	3	3	3	3
	VAR(2)	5	1	5	3	5	5	5	5
	BVAR1	2	3	2	2	2	2	3	3
−0.9	BVAR2	1	2	1	1	1	1	1	1
	BVAR3	4	5	4	5	4	4	4	4
	BVAR4	3	4	3	4	3	3	2	2
	VAR(2)	1	1	3	1	4	3	5	5
	BVAR1	3	3	2	3	2	2	3	3
−0.85	BVAR2	2	2	1	2	1	1	1	1
	BVAR3	5	5	5	5	5	5	4	4
	BVAR4	4	4	4	4	3	4	2	2
	VAR(2)	1	1	1	1	1	1	5	5
	BVAR1	3	3	3	3	3	3	3	3
−0.8	BVAR2	2	2	2	2	2	2	1	1
	BVAR3	5	5	5	5	5	5	4	4
	BVAR4	4	4	4	4	4	4	2	2
	VAR(2)	1	1	1	1	1	1	1	1
	BVAR1	5	5	5	5	5	5	5	5
0.8	BVAR2	4	4	4	4	4	4	4	4
	BVAR3	3	3	3	3	3	3	3	3
	BVAR4	2	2	2	2	2	2	2	2

Continued

0.85	VAR(2)	1	1	1	1	1	1	1	1
	BVAR1	5	5	5	5	5	5	5	5
	BVAR2	4	4	4	4	4	4	4	4
	BVAR3	3	3	3	3	3	3	3	3
	BVAR4	2	2	2	2	2	2	2	2
0.9	VAR(2)	4	3	3	2	5	5	5	5
	BVAR1	5	5	5	5	4	4	4	4
	BVAR2	3	4	4	4	3	3	3	3
	BVAR3	2	2	2	3	2	2	2	2
	BVAR4	1	1	1	1	1	1	1	1
0.95	VAR(2)	5	5	5	5	5	5	5	5
	BVAR1	4	4	4	4	4	4	4	4
	BVAR2	3	3	3	3	3	3	3	3
	BVAR3	2	2	2	2	2	2	2	2
	BVAR4	1	1	1	1	1	1	1	1
0.99	VAR(2)	5	5	5	5	5	5	5	5
	BVAR1	3	3	4	3	4	4	3	3
	BVAR2	4	4	3	4	3	3	4	4
	BVAR3	2	2	2	2	2	2	2	2
	BVAR4	1	1	1	1	1	1	1	1

Table B5. The ranks of the performances of the model for $T = 128$.

$T = 128$		COLLINERITY (ρ)											
AUTOCO LEVELS (δ)	Models	−0.99		−0.95		−0.9		−0.85		−0.8		0.8	
		RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
−0.99	VAR(2)	5	5	5	5	5	5	5	5	5	5	5	5
	BVAR1	4	4	4	4	3	3	3	3	3	3	4	4
	BVAR2	3	3	3	3	2	2	1	1	1	1	3	3
	BVAR3	2	2	1	1	1	1	2	2	2	2	2	2
	BVAR4	1	1	2	2	4	4	4	4	4	4	1	1
−0.95	VAR(2)	5	5	5	5	5	5	5	5	5	5	5	4
	BVAR1	1	2	1	2	1	1	1	1	1	1	4	5
	BVAR2	2	1	2	1	2	2	2	2	3	2	2	2
	BVAR3	3	3	3	3	3	3	3	3	2	3	3	3
	BVAR4	4	4	4	4	4	4	4	4	4	4	1	1
−0.9	VAR(2)	5	5	5	5	5	5	5	5	5	5	1	1
	BVAR1	2	2	1	1	4	2	4	4	4	4	5	5
	BVAR2	1	1	2	2	1	1	3	3	3	3	3	3
	BVAR3	3	3	4	3	3	3	2	2	2	2	4	4
	BVAR4	4	4	3	4	2	4	1	1	1	1	2	2
−0.85	VAR(2)	5	5	5	5	5	5	4	5	3	4	1	1
	BVAR1	1	1	2	2	4	4	5	4	5	5	5	5
	BVAR2	2	2	4	3	3	3	3	3	4	3	3	3
	BVAR3	3	3	3	4	2	2	2	2	2	2	4	4
	BVAR4	4	4	1	1	1	1	1	1	1	1	2	2

Continued

	VAR(2)	5	5	5	5	2	2	2	2	1	2	1	1
	BVAR1	2	1	3	3	5	5	5	5	5	5	5	5
−0.8	BVAR2	1	2	4	4	4	4	4	4	4	4	3	3
	BVAR3	4	4	2	2	3	3	3	3	3	3	4	4
	BVAR4	3	3	1	1	1	1	1	1	2	1	2	2
	VAR(2)	2	2	3	3	2	2	1	1	1	1	1	1
	BVAR1	5	5	5	5	5	5	5	5	5	5	5	5
0.8	BVAR2	4	4	4	4	4	4	4	4	4	4	3	3
	BVAR3	3	3	2	2	3	3	3	3	3	3	4	4
	BVAR4	1	1	1	1	1	1	2	2	2	2	2	2
	VAR(2)	3	3	3	4	3	3	2	2	1	2	1	1
	BVAR1	5	5	5	5	5	5	5	5	5	5	5	5
0.85	BVAR2	4	4	4	3	4	4	4	4	4	4	3	3
	BVAR3	2	2	2	2	2	2	3	3	3	3	4	4
	BVAR4	1	1	1	1	1	1	1	1	2	1	2	2
	VAR(2)	5	5	5	5	5	5	4	5	4	4	1	1
	BVAR1	4	4	4	4	4	4	5	4	5	5	5	5
0.9	BVAR2	3	3	3	3	3	3	3	3	3	3	4	3
	BVAR3	2	2	2	2	2	2	2	2	2	2	3	4
	BVAR4	1	1	1	1	1	1	1	1	1	1	2	2
	VAR(2)	5	5	5	5	5	5	5	5	5	5	5	4
	BVAR1	4	4	4	4	4	4	4	4	4	4	4	5
0.95	BVAR2	3	3	3	3	3	3	3	3	3	3	3	3
	BVAR3	2	2	2	2	2	2	2	2	2	2	2	2
	BVAR4	1	1	1	1	1	1	1	1	1	1	1	1
	VAR(2)	5	5	5	5	5	5	5	5	5	5	5	5
	BVAR1	4	4	3	3	3	3	3	2	3	3	4	4
0.99	BVAR2	3	3	4	4	4	4	2	3	4	4	3	3
	BVAR3	1	1	2	2	1	1	1	1	1	1	2	1
	BVAR4	2	2	1	1	2	2	4	4	2	2	1	2

$T = 128$		COLLINEARITY (ρ)							
AUTOCO LEVELS (δ)	Models	0.85		0.9		0.95		0.99	
		RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
	VAR(2)	5	5	5	5	5	5	5	5
	BVAR1	4	4	4	4	3	3	4	4
−0.99	BVAR2	3	3	3	3	4	4	3	3
	BVAR3	2	2	2	2	2	2	1	2
	BVAR4	1	1	1	1	1	1	2	1
	VAR(2)	5	3	5	4	5	5	5	5
	BVAR1	4	5	4	5	4	4	2	2
−0.95	BVAR2	2	2	2	2	1	1	1	1
	BVAR3	3	4	3	3	3	3	3	3
	BVAR4	1	1	1	1	2	2	4	4

Continued

	VAR(2)	1	1	3	1	3	2	5	5
	BVAR1	5	5	5	5	5	5	3	3
−0.9	BVAR2	3	3	2	3	2	3	1	1
	BVAR3	4	4	4	4	4	4	4	4
	BVAR4	2	2	1	2	1	1	2	2
	VAR(2)	1	1	1	1	1	1	5	5
	BVAR1	5	5	5	5	5	5	3	3
−0.85	BVAR2	3	3	3	3	3	3	1	1
	BVAR3	4	4	4	4	4	4	4	4
	BVAR4	2	2	2	2	2	2	2	2
	VAR(2)	1	1	1	1	1	1	3	2
	BVAR1	5	5	5	5	4	4	4	4
−0.8	BVAR2	3	3	3	3	3	3	1	1
	BVAR3	4	4	4	4	5	5	5	5
	BVAR4	2	2	2	2	2	2	2	3
	VAR(2)	1	1	1	1	1	1	1	1
	BVAR1	5	5	5	5	5	5	5	5
0.8	BVAR2	3	3	3	3	4	4	4	4
	BVAR3	4	4	4	4	3	3	3	3
	BVAR4	2	2	2	2	2	2	2	2
	VAR(2)	1	1	1	1	1	1	1	1
	BVAR1	5	5	5	5	5	5	5	5
0.85	BVAR2	3	3	4	4	4	4	4	4
	BVAR3	4	4	3	3	3	3	3	3
	BVAR4	2	2	2	2	2	2	2	2
	VAR(2)	1	1	1	1	2	2	3	3
	BVAR1	5	5	5	5	5	5	5	5
0.9	BVAR2	4	4	4	4	4	4	4	4
	BVAR3	3	3	3	3	3	3	2	2
	BVAR4	2	2	2	2	1	1	1	1
	VAR(2)	5	5	5	5	5	5	5	5
	BVAR1	4	4	4	4	4	4	4	4
0.95	BVAR2	3	3	3	3	3	3	3	3
	BVAR3	2	2	2	2	2	2	2	2
	BVAR4	1	1	1	1	1	1	1	1
	VAR(2)	5	5	5	5	5	5	5	5
	BVAR1	3	3	4	4	3	3	4	4
0.99	BVAR2	4	4	2	2	4	4	3	3
	BVAR3	2	2	3	3	2	2	2	2
	BVAR4	1	1	1	1	1	1	1	1

Table B6. The ranks of the performances of the model for $T = 256$.

$T = 256$		COLLINERITY (ρ)											
AUTOCO LEVELS (δ)	Models	−0.99		−0.95		−0.9		−0.85		−0.8		0.8	
		RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
−0.99	VAR(2)	5	5	5	5	5	5	5	5	5	5	5	5
	BVAR1	2	2	1	1	2	2	1	1	1	1	4	4
	BVAR2	1	1	2	2	1	1	2	2	2	2	3	3
	BVAR3	3	3	3	3	3	3	3	3	3	3	2	2
	BVAR4	4	4	4	4	4	4	4	4	4	4	1	1
−0.95	VAR(2)	5	5	5	5	5	5	5	5	5	5	4	2
	BVAR1	1	1	1	1	1	1	1	1	1	1	5	5
	BVAR2	2	2	2	2	2	2	2	2	2	2	2	3
	BVAR3	3	3	3	3	3	3	3	3	3	3	3	4
	BVAR4	4	4	4	4	4	4	4	4	4	4	1	1
−0.9	VAR(2)	5	5	5	5	5	5	5	5	4	5	1	1
	BVAR1	1	1	1	1	3	1	4	4	5	4	5	5
	BVAR2	2	2	2	2	2	2	1	1	3	3	4	4
	BVAR3	3	3	3	3	1	3	2	2	2	2	3	3
	BVAR4	4	4	4	4	4	4	3	3	1	1	2	2
−0.85	VAR(2)	5	5	5	5	3	4	3	4	2	2	1	1
	BVAR1	2	2	4	4	5	5	5	5	5	5	5	5
	BVAR2	1	1	2	2	4	3	4	3	4	4	4	4
	BVAR3	4	4	3	3	2	2	2	2	3	3	3	3
	BVAR4	3	3	1	1	1	1	1	1	1	1	2	2
−0.8	VAR(2)	5	5	3	4	2	2	2	2	1	1	1	1
	BVAR1	1	1	5	5	5	5	5	5	5	5	5	5
	BVAR2	2	3	4	3	4	4	4	4	4	4	4	4
	BVAR3	4	4	2	2	3	3	3	3	3	3	3	3
	BVAR4	3	2	1	1	1	1	1	1	2	2	2	2
0.8	VAR(2)	3	2	2	2	1	1	1	1	1	1	1	1
	BVAR1	5	5	5	5	5	5	5	5	5	5	5	5
	BVAR2	4	4	4	4	4	4	4	4	4	4	3	3
	BVAR3	2	3	3	3	3	3	3	3	3	3	4	4
	BVAR4	1	1	1	1	2	2	2	2	2	2	2	2
0.85	VAR(2)	3	3	3	3	2	2	1	1	1	1	1	1
	BVAR1	5	5	5	5	5	5	5	5	5	5	5	5
	BVAR2	4	4	4	4	4	4	4	4	4	4	3	3
	BVAR3	2	2	2	2	3	3	3	3	3	3	4	4
	BVAR4	1	1	1	1	1	1	2	2	2	2	2	2
0.9	VAR(2)	5	5	5	5	4	4	3	3	2	2	1	1
	BVAR1	4	4	4	4	5	5	5	5	5	5	5	5
	BVAR2	3	3	3	3	3	3	4	4	4	4	3	3
	BVAR3	2	2	2	2	2	2	2	2	3	3	4	4
	BVAR4	1	1	1	1	1	1	1	1	1	1	2	2

Continued

	VAR(2)	5	5	5	5	5	5	5	5	5	5	2	2
	BVAR1	4	4	4	4	4	4	4	4	4	4	5	5
0.95	BVAR2	3	3	3	3	3	3	3	3	3	3	4	4
	BVAR3	2	2	2	1	2	2	2	2	2	2	3	3
	BVAR4	1	1	1	2	1	1	1	1	1	1	1	1
	VAR(2)	5	5	5	5	5	5	5	5	5	5	5	5
	BVAR1	4	4	4	4	1	1	4	4	3	3	4	4
0.99	BVAR2	3	3	2	2	2	2	3	3	2	2	3	3
	BVAR3	2	2	1	1	3	3	1	1	1	1	2	2
	BVAR4	1	1	3	3	4	4	2	2	4	4	1	1

$T = 256$		COLLINEARITY (ρ)							
AUTOCO LEVELS (δ)	Models	0.85		0.9		0.95		0.99	
		RMSE	MAE	RMSE	MAE	RMSE	MAE	RMSE	MAE
	VAR(2)	5	5	5	5	5	5	5	5
	BVAR1	4	4	4	4	2	3	1	1
−0.99	BVAR2	1	3	2	3	1	1	2	2
	BVAR3	3	2	1	2	3	2	3	3
	BVAR4	2	1	3	1	4	4	4	4
	VAR(2)	4	2	4	2	5	5	5	5
	BVAR1	5	5	5	5	4	4	2	2
−0.95	BVAR2	2	3	2	3	1	1	1	1
	BVAR3	3	4	3	4	3	3	3	3
	BVAR4	1	1	1	1	2	2	4	4
	VAR(2)	1	1	1	1	2	1	5	5
	BVAR1	5	5	5	5	5	5	3	4
−0.9	BVAR2	3	3	3	3	3	3	1	2
	BVAR3	4	4	4	4	4	4	4	3
	BVAR4	2	2	2	2	1	2	2	1
	VAR(2)	1	1	1	1	1	1	3	3
	BVAR1	5	5	5	5	5	5	5	5
−0.85	BVAR2	3	3	3	3	3	3	1	2
	BVAR3	4	4	4	4	4	4	4	4
	BVAR4	2	2	2	2	2	2	2	1
	VAR(2)	1	1	1	1	1	1	2	1
	BVAR1	5	5	5	5	5	5	5	5
−0.8	BVAR2	3	3	3	3	3	3	3	3
	BVAR3	4	4	4	4	4	4	4	4
	BVAR4	2	2	2	2	2	2	1	2
	VAR(2)	1	1	1	1	1	1	1	1
	BVAR1	5	5	5	5	5	5	5	5
0.8	BVAR2	3	3	3	3	3	3	3	3
	BVAR3	4	4	4	4	4	4	4	4
	BVAR4	2	2	2	2	2	2	2	2

Continued

	VAR(2)	1	1	1	1	1	1	1	1
	BVAR1	5	5	5	5	5	5	5	5
0.85	BVAR2	3	3	3	3	3	3	3	3
	BVAR3	4	4	4	4	4	4	4	4
	BVAR4	2	2	2	2	2	2	2	2
	VAR(2)	1	1	1	1	1	1	2	2
	BVAR1	5	5	5	5	5	5	5	5
0.9	BVAR2	3	3	3	3	4	3	4	4
	BVAR3	4	4	4	4	3	4	3	3
	BVAR4	2	2	2	2	2	2	1	1
	VAR(2)	4	3	4	4	5	5	5	5
	BVAR1	5	5	5	5	4	4	4	4
0.95	BVAR2	3	4	3	3	3	3	3	3
	BVAR3	2	2	2	2	2	2	2	2
	BVAR4	1	1	1	1	1	1	1	1
	VAR(2)	5	5	5	5	5	5	5	5
	BVAR1	4	4	4	4	4	4	4	4
0.99	BVAR2	3	2	2	2	3	3	3	3
	BVAR3	2	3	3	3	2	2	1	1
	BVAR4	1	1	1	1	1	1	2	2