

House Prices and Credit Cycles - Bayesian Regression Results

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1 Description

The following Bayesian regression implementation is based on Metropolis-Hasting random walk algorithm from Chapter 5 - Applied Bayesian econometrics for Central Bankers. The posterior results are summarized from 1,100,000 iterations with the first 100,000 iterations discarded for each model.

2 REGRESSION RESULTS

Table 1: Parameters description

Description	Parameter
Log-likelihood value	llv
Credit to household	
Credit to household 1st AR parameter	ϕ_y^1
Credit to household 2nd AR parameter	ϕ_y^2
Credit to household 1st cross cycle AR parameter	ϕ_y^{x1}
Credit to household 2nd cross cycle AR parameter	ϕ_y^{x2}
S.D. of permanent shocks to Credit to household	σ_{ny}
S.D. of transitory shocks to Credit to household	σ_{ey}
Housing Price Index	
Housing Price Index 1st AR parameter	ϕ_h^1
Housing Price Index 2nd AR parameter	ϕ_h^2
Housing Price Index 1st cross cycle AR parameter	ϕ_h^{x1}
Housing Price Index 2nd cross cycle AR parameter	ϕ_h^{x2}
S.D. of permanent shocks to Housing Price Index	σ_{nh}
S.D. of transitory shocks to Housing Price Index	σ_{eh}
Cross-series correlations	
Correlation: Permanent credit to household/Permanent Housing Price Index	σ_{nynh}
Correlation: Transitory credit to household/Transitory Housing Price Index	σ_{eyeh}

Table 2: UK Regression Results

Parameters	VAR2			VAR2 1-cross lag			VAR2 2-cross lags		
	Median	10pct	90pct	Median	10pct	90pct	Median	10pct	90pct
ϕ_y^1	1.2969	1.1847	1.5488	1.0941	0.9247	1.2049	1.0671	0.8830	1.2228
ϕ_y^2	-0.3206	-0.5724	-0.2085	-0.1067	-0.2195	0.0636	-0.0831	-0.2392	0.1082
ϕ_y^{x1}				0.0569	0.0376	0.0848	-0.0074	-0.1111	0.0865
ϕ_y^{x2}							0.0624	-0.0199	0.1589
ϕ_h^1	1.4649	1.3309	1.5908	1.3838	1.1391	1.5723	1.3021	0.9619	1.6432
ϕ_h^2	-0.5603	-0.6847	-0.4299	-0.4858	-0.6548	-0.2574	-0.4081	-0.7219	-0.0863
ϕ_h^{x1}				-0.0259	-0.0651	0.0022	0.0600	-0.4258	0.3702
ϕ_h^{x2}							-0.0996	-0.4042	0.3721
σ_{ny}	0.6988	0.5950	0.7959	0.6691	0.5907	0.7610	0.7191	0.6254	0.8337
σ_{ey}	0.5408	0.4132	0.6523	0.3770	0.3027	0.4678	0.3763	0.3017	0.4696
σ_{nh}	1.9626	1.8086	2.2683	2.0646	1.9601	2.1112	2.0615	1.9309	2.1100
σ_{eh}	1.2192	0.8815	1.4347	1.1221	0.8250	1.4645	1.1900	0.7222	1.7458
σ_{nynh}	0.5170	0.3689	0.6583	0.6004	0.4852	0.7374	0.6527	0.5277	0.8704
σ_{eyeh}	0.6912	0.4098	0.9811	0.5606	0.3084	0.8706	0.6213	0.3281	0.9110
llv	-340.8600	-344.2500	-338.2200	-333.7900	-337.7400	-330.7600	-337.7200	-343.7400	-332.3200

Note:

UK Bayesian regression results

Table 3: US Regression Results

Parameters	VAR2			VAR2 1-cross lag			VAR2 2-cross lags		
	Median	10pct	90pct	Median	10pct	90pct	Median	10pct	90pct
ϕ_y^1	1.2789	1.1169	1.4000	0.7835	0.4222	1.3063	0.6041	0.4366	0.8366
ϕ_y^2	-0.3040	-0.4243	-0.1443	0.1794	-0.3365	0.5534	0.3266	0.0987	0.4635
ϕ_y^{x1}				0.0315	0.0129	0.0504	-0.0834	-0.2359	0.0479
ϕ_y^{x2}							0.1186	-0.0188	0.2754
ϕ_h^1	1.8453	1.7859	1.8983	1.7615	1.6240	1.8650	1.7165	1.5794	1.8597
ϕ_h^2	-0.8856	-0.9385	-0.8263	-0.7820	-0.8901	-0.6459	-0.7523	-0.8918	-0.6269
ϕ_h^{x1}				-0.0550	-0.1341	0.0030	0.5426	0.1327	0.9264
ϕ_h^{x2}							-0.6214	-1.0474	-0.2012
σ_{ny}	0.7302	0.6143	0.8483	0.8920	0.7331	0.9977	0.8979	0.8105	1.0005
σ_{ey}	0.6224	0.4981	0.7343	0.3885	0.3093	0.4902	0.3899	0.3164	0.4992
σ_{nh}	0.6597	0.5424	0.7688	0.7474	0.6110	0.8752	0.6337	0.5247	0.7530
σ_{eh}	0.8503	0.7208	0.9852	0.6735	0.5474	0.8247	0.6446	0.5206	0.7624
σ_{nynh}	0.4576	0.2960	0.6908	0.5280	0.3374	0.7092	0.6487	0.4493	0.8546
σ_{eyeh}	0.5154	0.3361	0.7381	0.6366	0.3769	0.9131	0.8122	0.5298	0.9697
llv	-263.1900	-267.3400	-260.2800	-266.4900	-271.1000	-262.3600	-265.3300	-269.9200	-262.2100

Note:

US Bayesian regression results

3 Trend-Cycle Decompositon Graphs

3.1 UK graphs

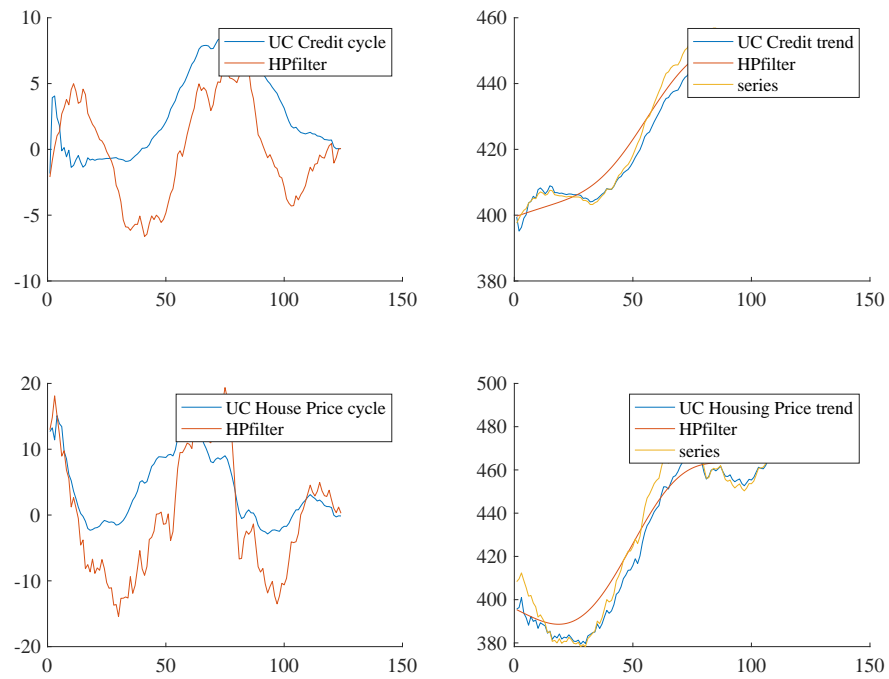


Figure 1: UK VAR(2)

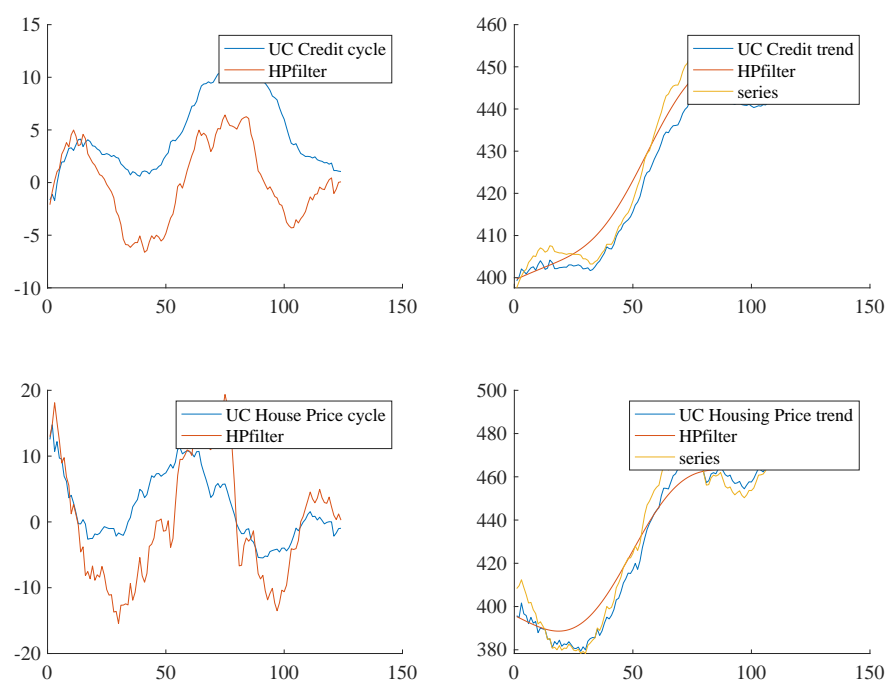


Figure 2: UK VAR(2) 1 cross-lag

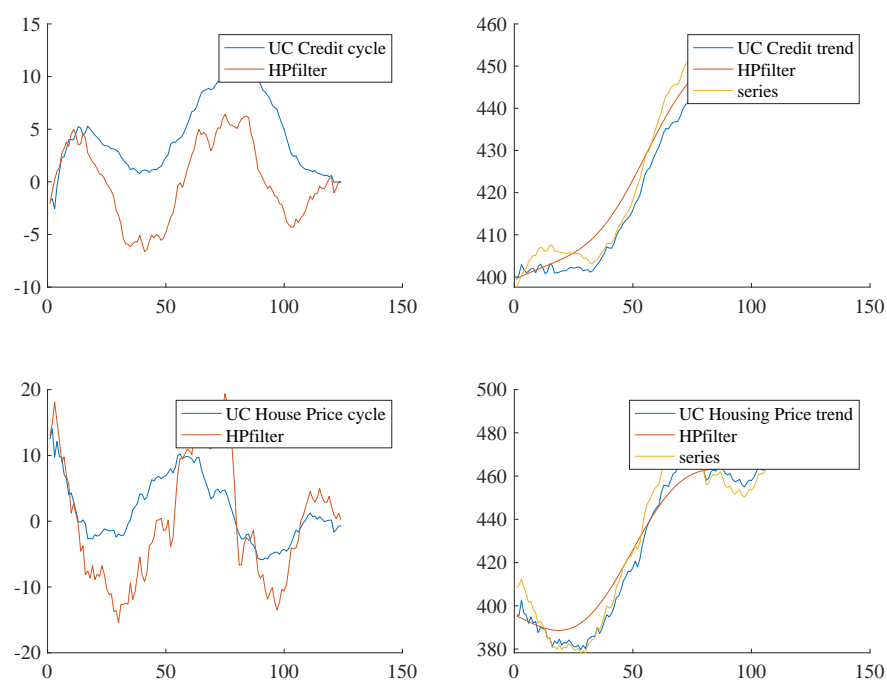


Figure 3: UK VAR(2) 2 cross-lags

3.2 US graphs

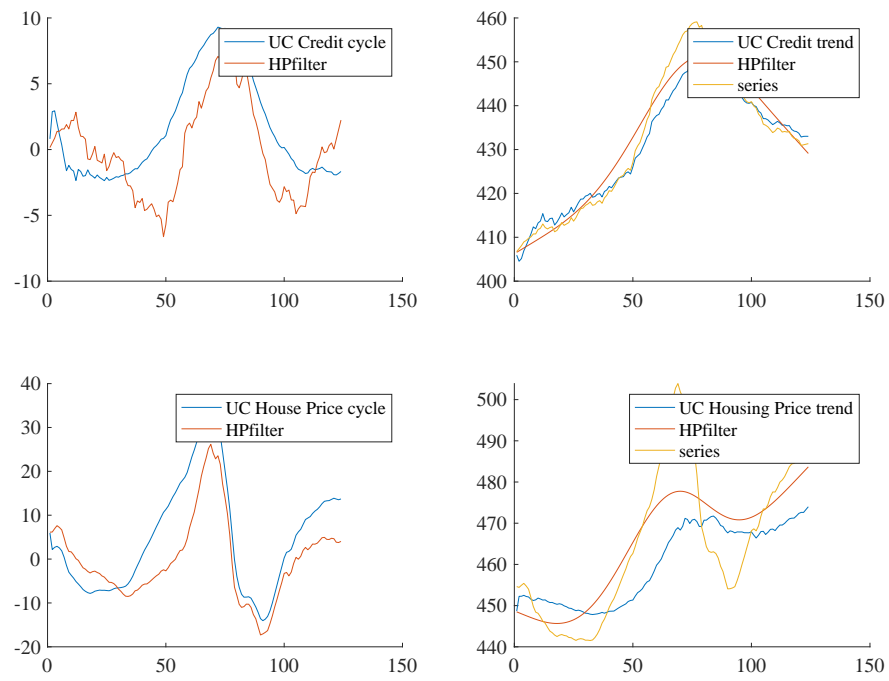


Figure 4: US VAR(2)

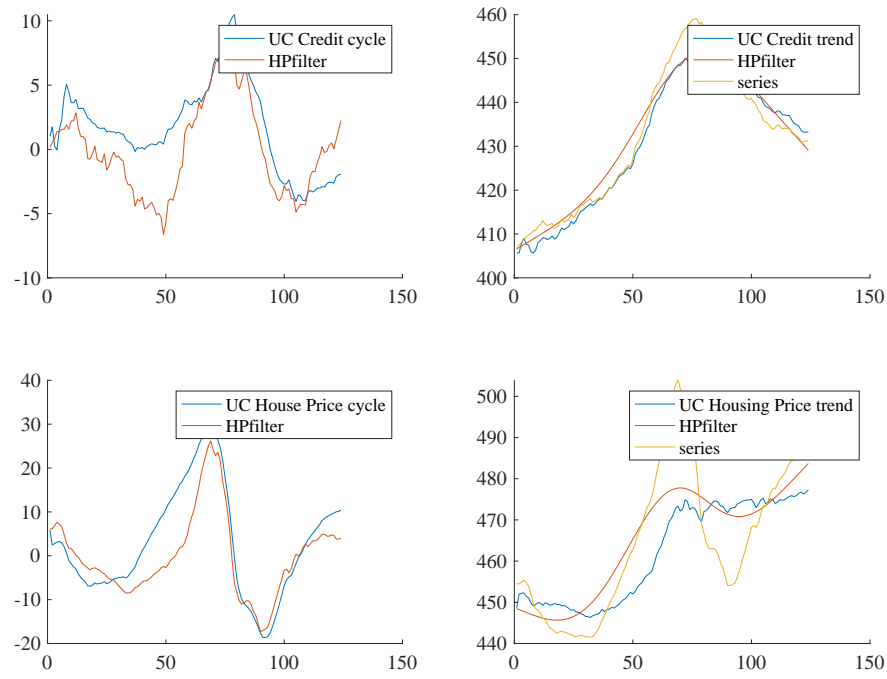


Figure 5: US VAR(2) 1 cross-lag

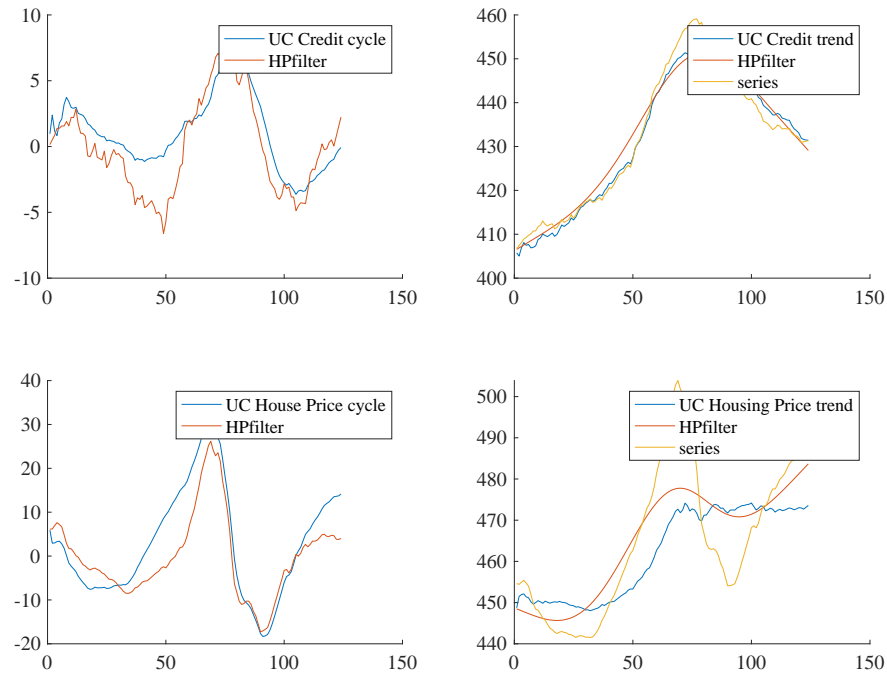


Figure 6: US VAR(2) 2 cross-lags

4 Posterior and Prior Distribution

4.1 UK Posterior and Prior Distribution

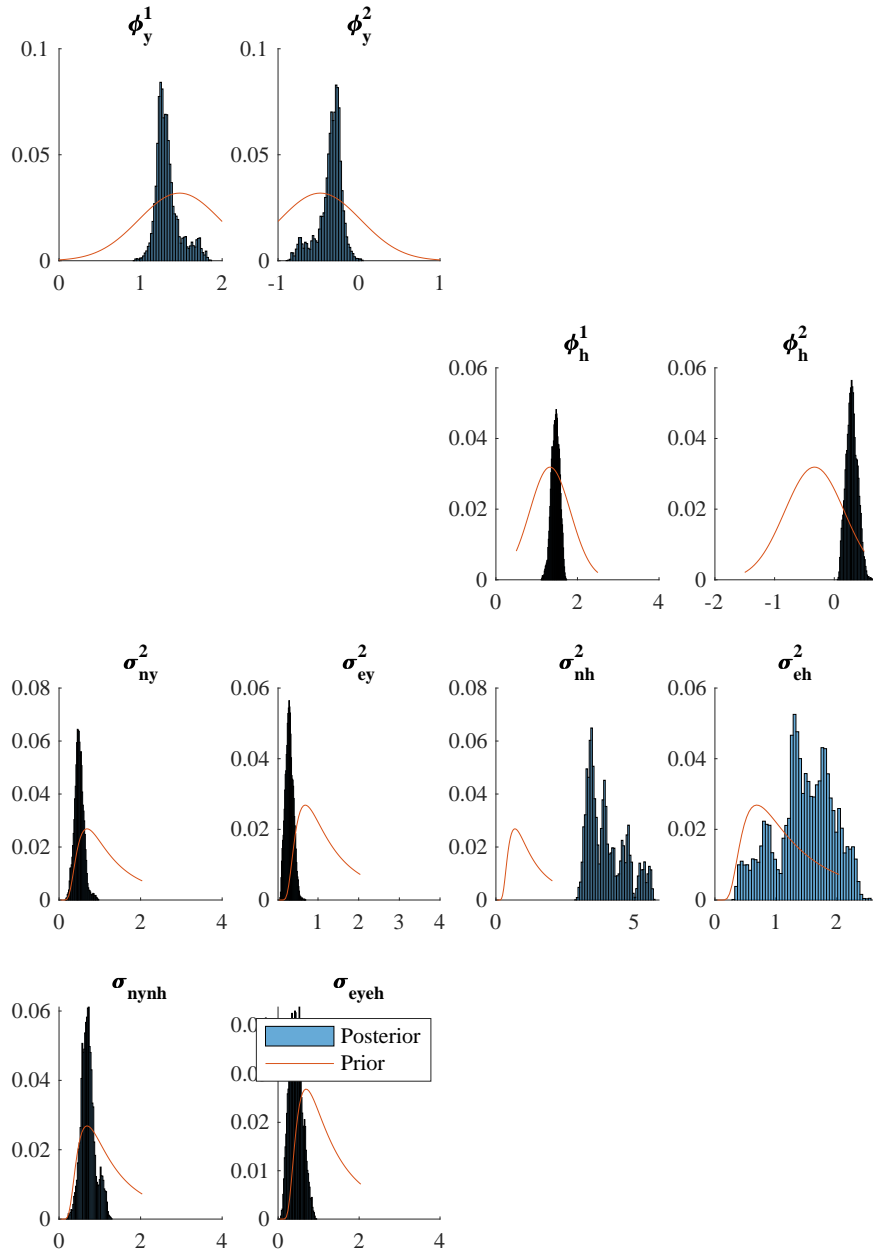


Figure 7: UK VAR(2)

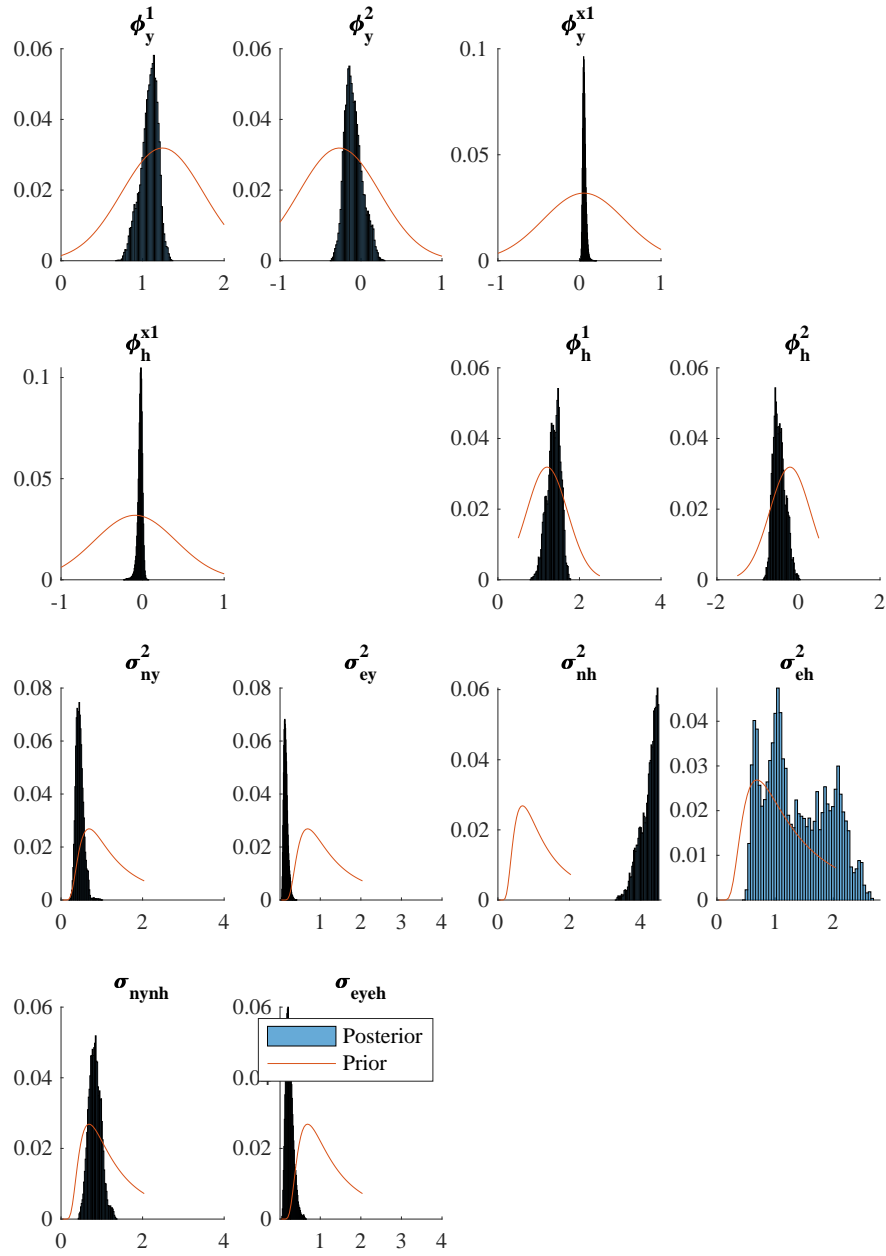


Figure 8: UK VAR(2) 1 cross-lag

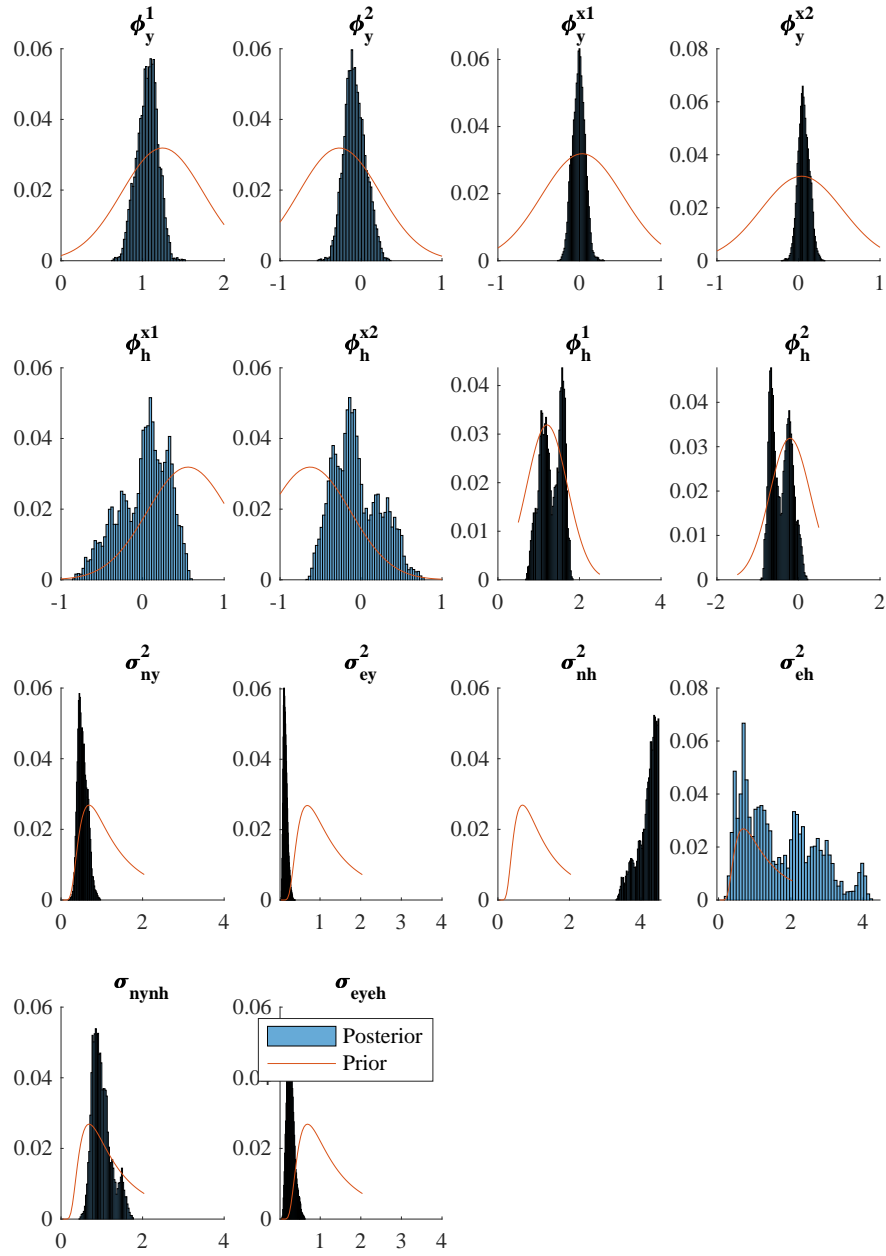


Figure 9: UK VAR(2) 2 cross-lags

4.2 US Posterior and Prior Distribution

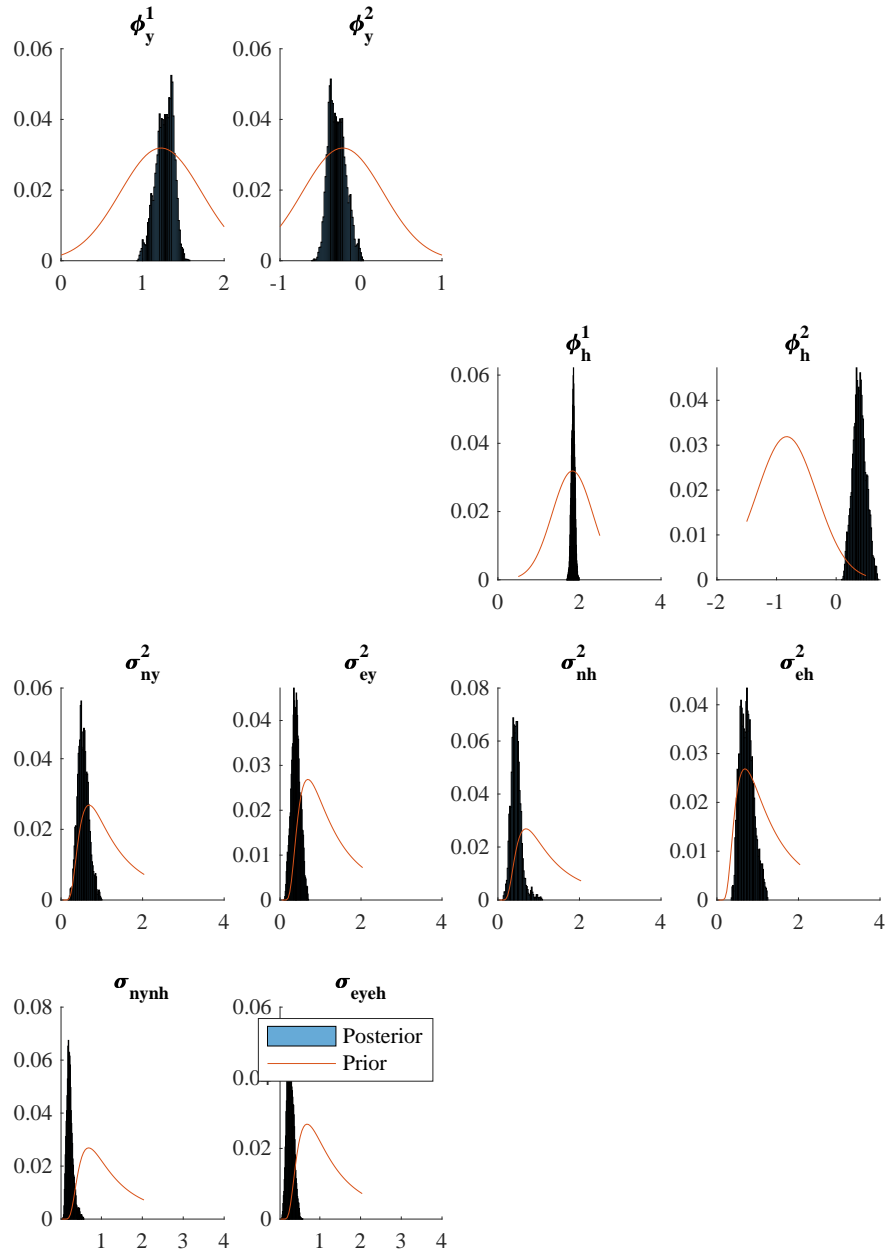


Figure 10: US VAR(2)

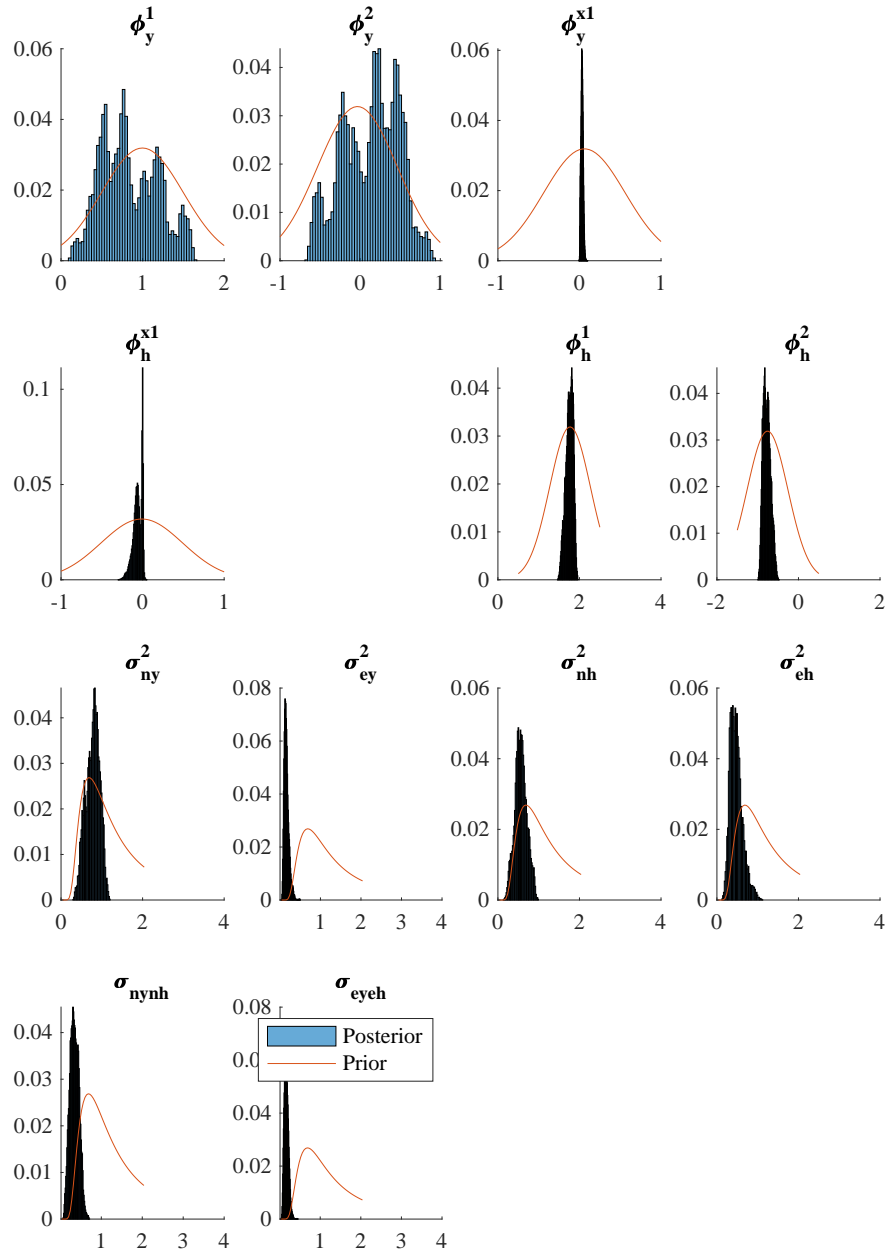


Figure 11: US VAR(2) 1 cross-lag

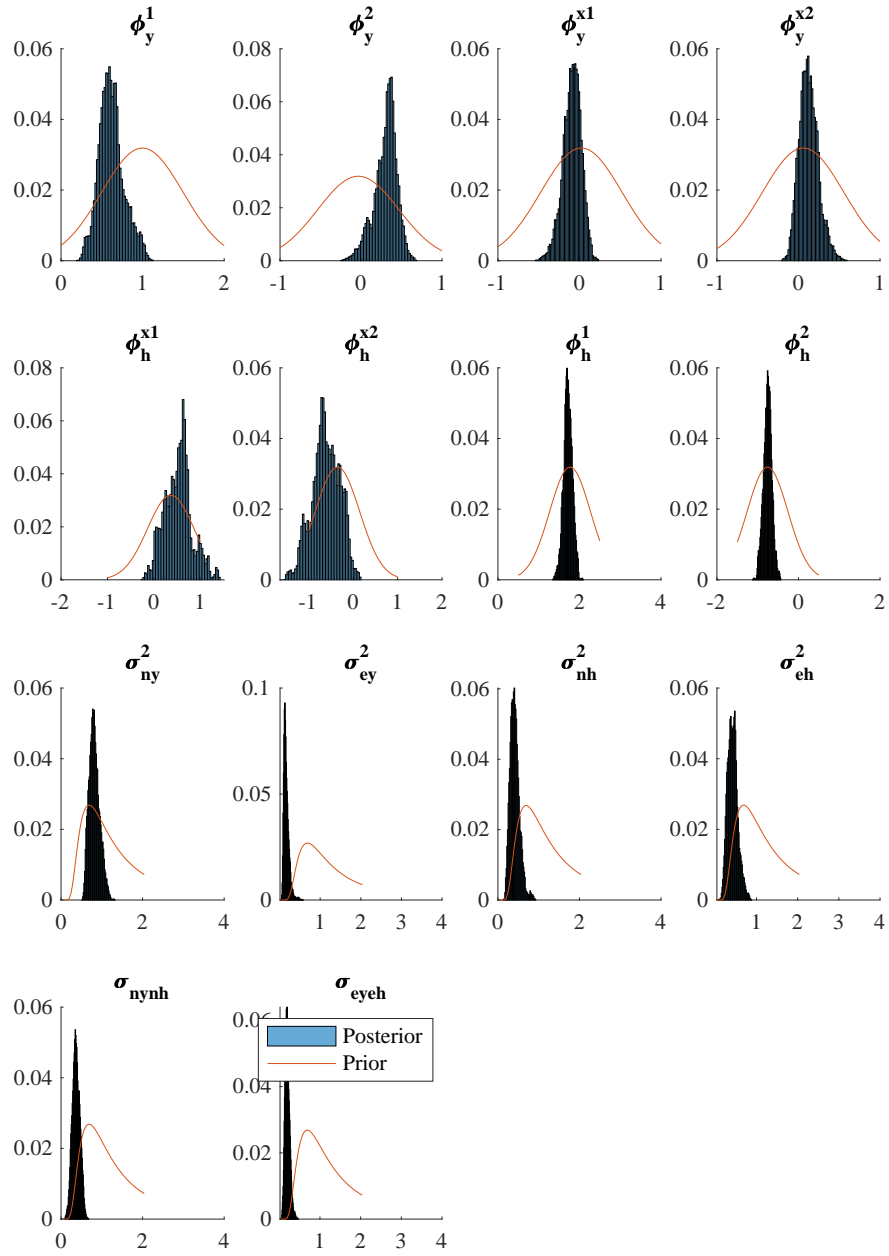


Figure 12: US VAR(2) 2 cross-lags

5 Posterior chain

5.1 UK Posterior chain

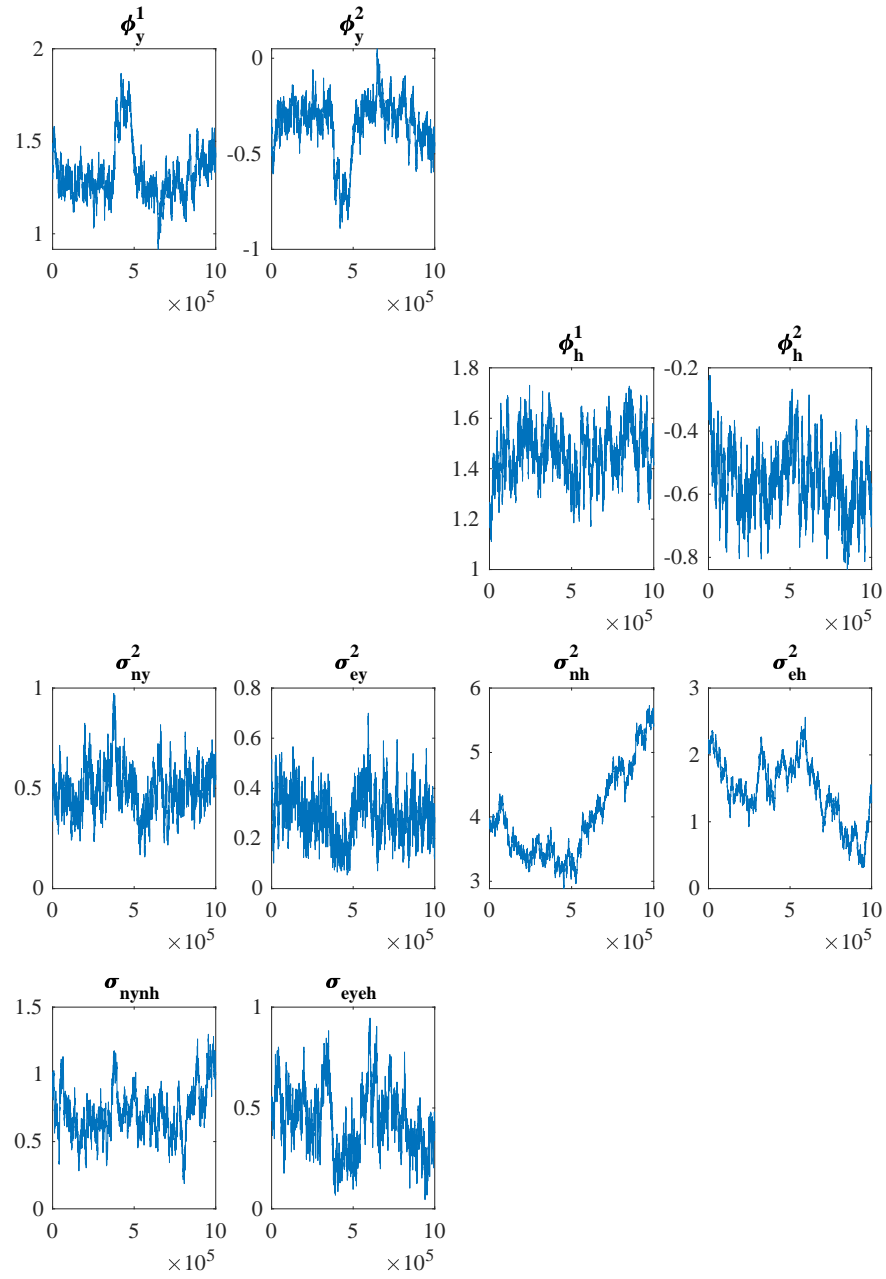


Figure 13: UK VAR(2)

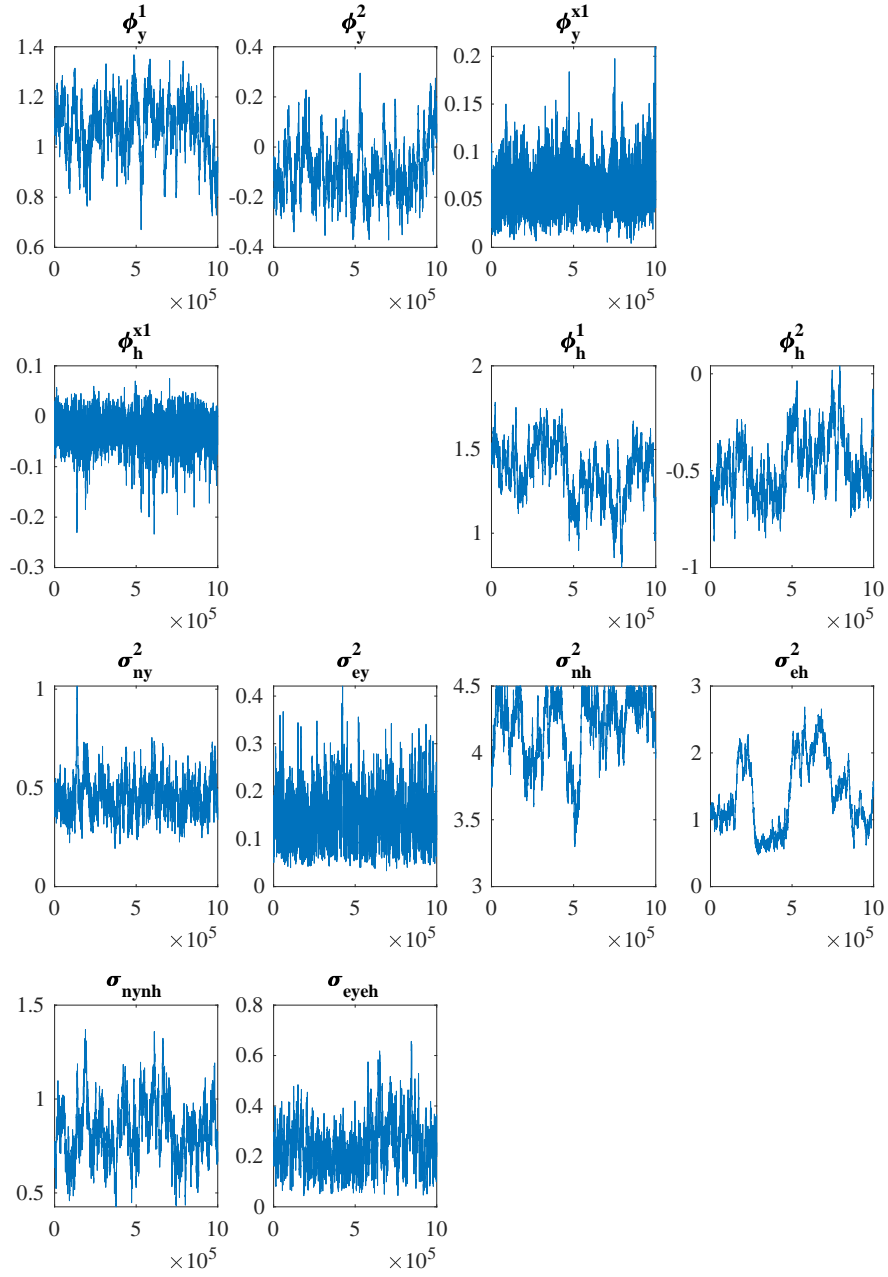


Figure 14: UK VAR(2) 1 cross-lag

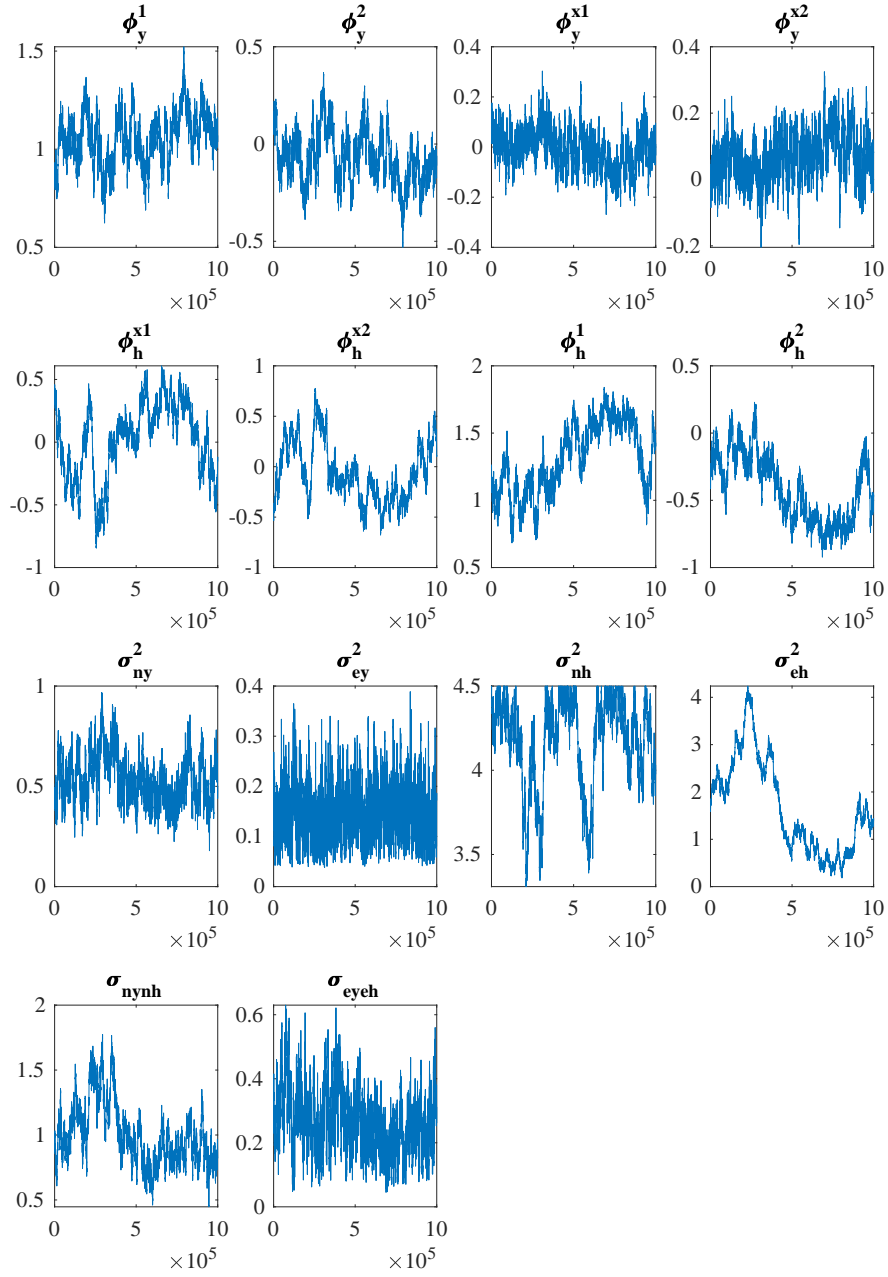


Figure 15: UK VAR(2) 2 cross-lags

5.2 US Posterior chain

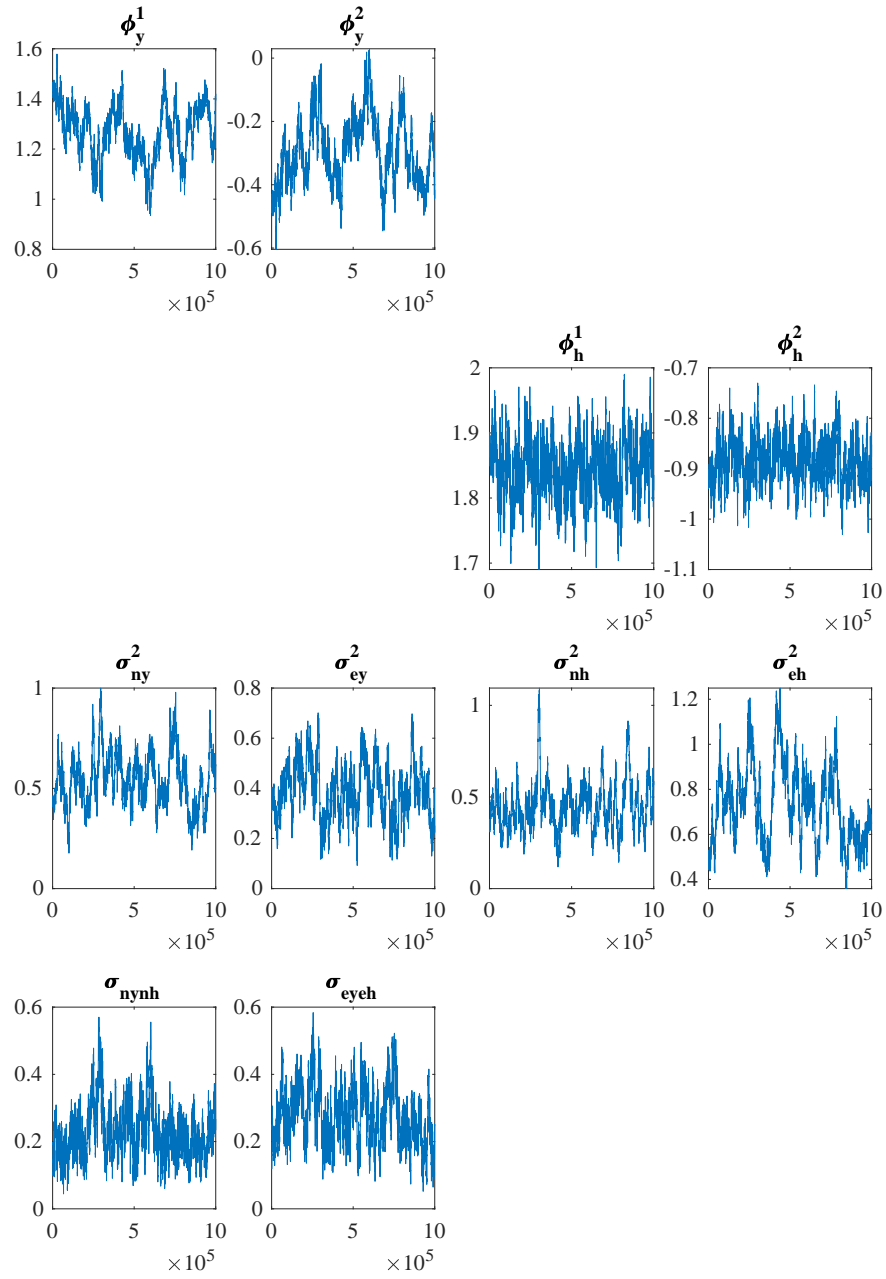


Figure 16: US VAR(2)

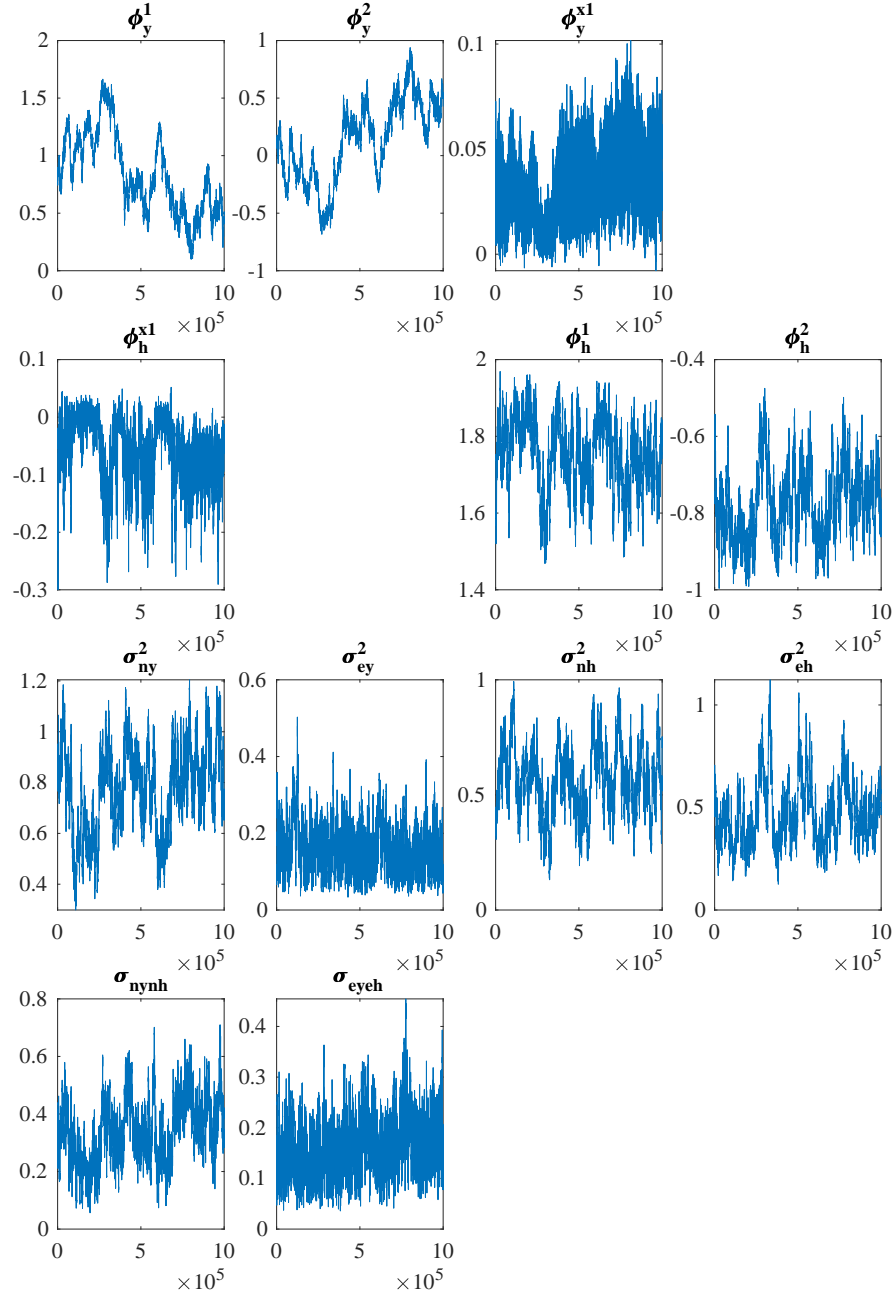


Figure 17: US VAR(2) 1 cross-lag

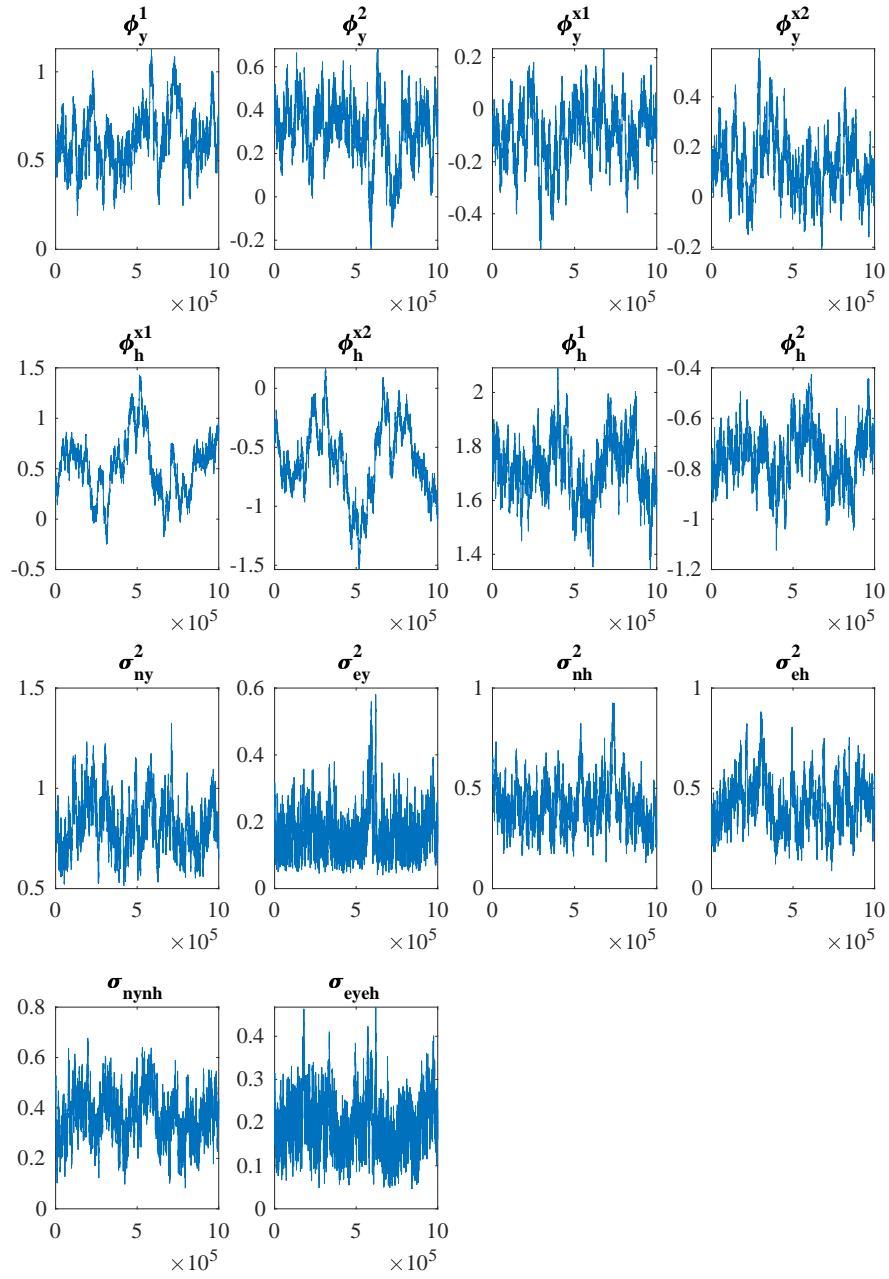


Figure 18: US VAR(2) 2 cross-lags