

# Advanced Macroeconometrics – Assignment 4

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## Contents

<b>Exercise 1 – Different Prior Values for the Variance</b>	<b>2</b>
Default Lambda Values . . . . .	2
Variant 1: $\lambda_1 = 0.1$ , $\lambda_2 = 100$ . . . . .	5
Variant 2: $\lambda_1 = 100$ , $\lambda_2 = 0.1$ . . . . .	8
Variant 3: $\lambda_1 = 0.1$ , $\lambda_2 = 0.1$ . . . . .	11
Variant 4: $\lambda_1 = 100$ , $\lambda_2 = 100$ . . . . .	14
Discussion . . . . .	17
<b>Exercise 2 – Replicating Kilian (2009)</b>	<b>18</b>

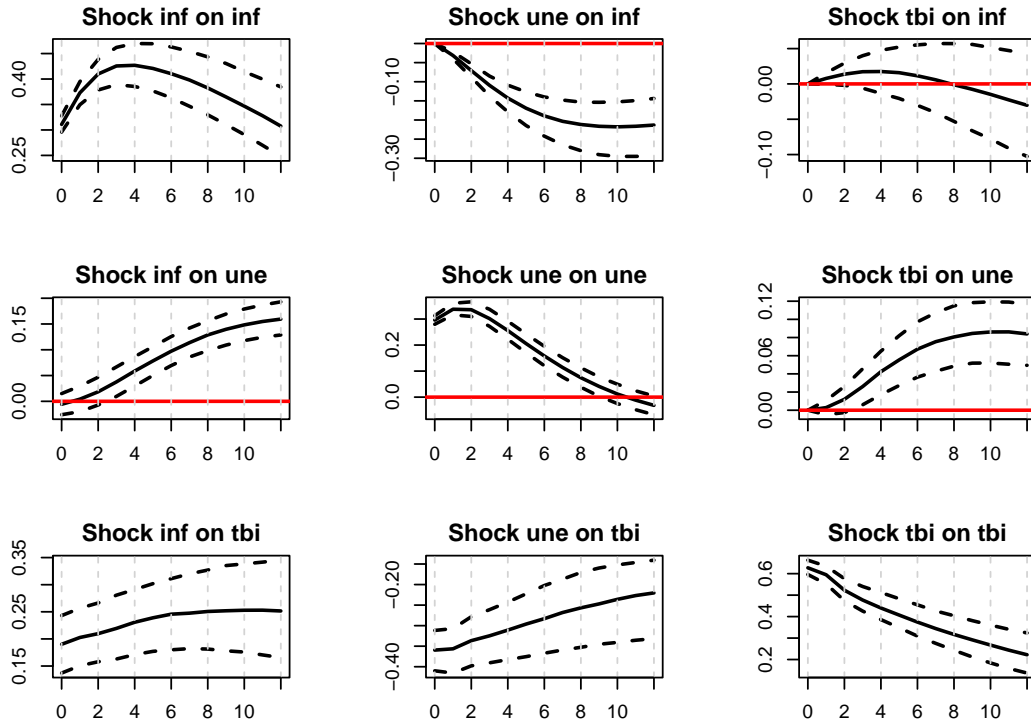
*The executable code that was used in compiling the assignment is available on GitHub at  
<https://github.com/maxmheinze/macrometrics>.*

## Exercise 1 – Different Prior Values for the Variance

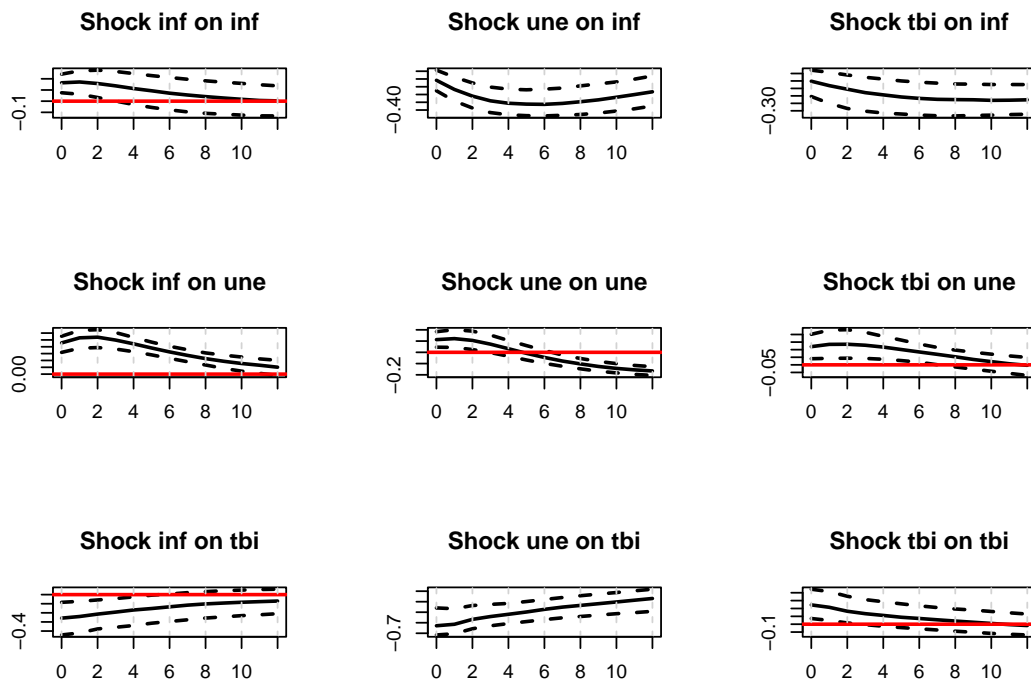
Using the sample code provided, we estimate the VAR using different  $\lambda_1$  and  $\lambda_2$  values for the Minnesota prior.

### Default Lambda Values

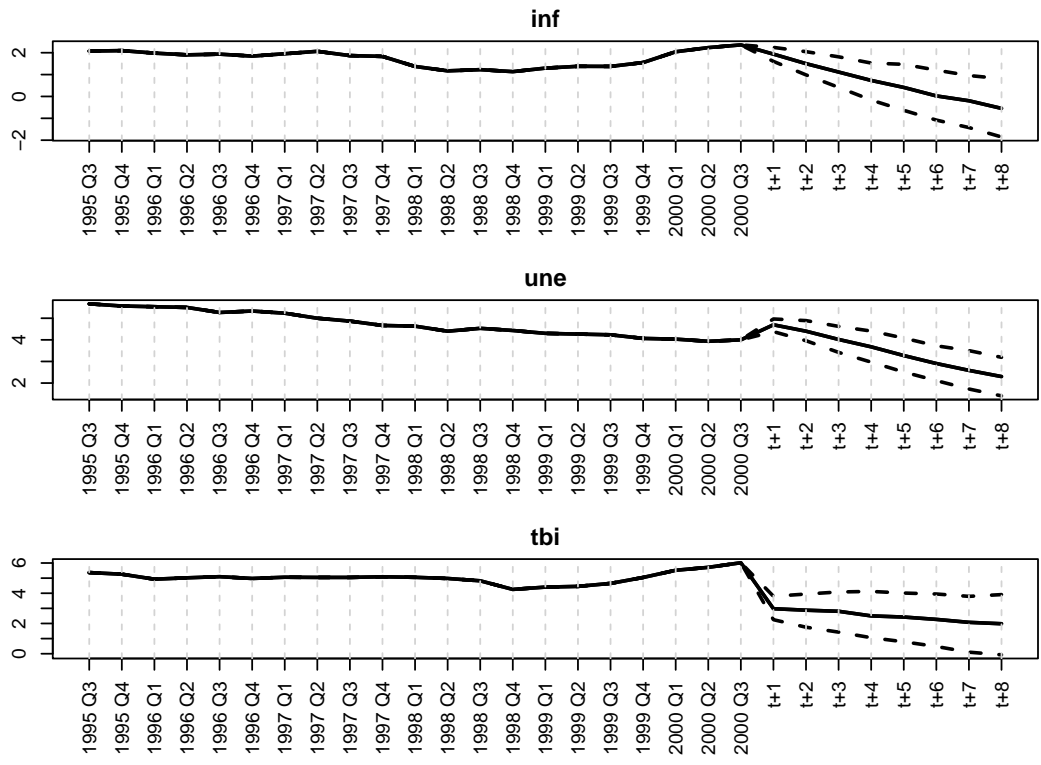
#### Sign IRFs



#### Cholesky IRFs



Predictions



## Coefficients

Coefficient means and standard deviations for the values  $\lambda_1 = 0.1$  and  $\lambda_2 = 0.5$  are as follows:

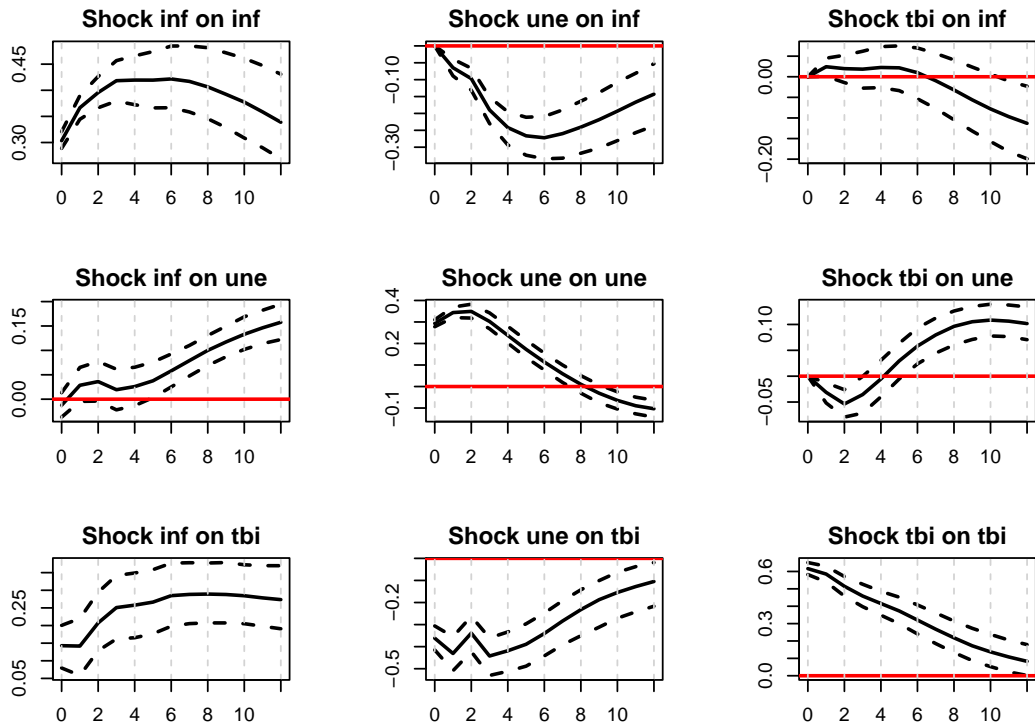
##		[,1]	[,2]	[,3]
##	[1,]	1.1869737409	0.0307077588	0.078058472
##	[2,]	-0.0911239980	1.1472750690	-0.057835606
##	[3,]	0.0120066994	0.0046499503	0.945512418
##	[4,]	-0.1120661119	-0.0017710669	0.003959823
##	[5,]	0.0001427858	-0.1542813583	0.008877474
##	[6,]	-0.0031750401	0.0089448209	-0.062188824
##	[7,]	-0.0576844792	-0.0004278102	-0.011760157
##	[8,]	0.0093524555	-0.0747201468	0.014753661
##	[9,]	-0.0025354566	0.0072771734	0.034842806
##	[10,]	-0.0274536376	0.0036873215	-0.004332003
##	[11,]	0.0122709070	-0.0112080838	0.025210074
##	[12,]	-0.0017566358	0.0037232109	0.002507592
##	[13,]	0.4208462460	0.2928079033	0.258447785

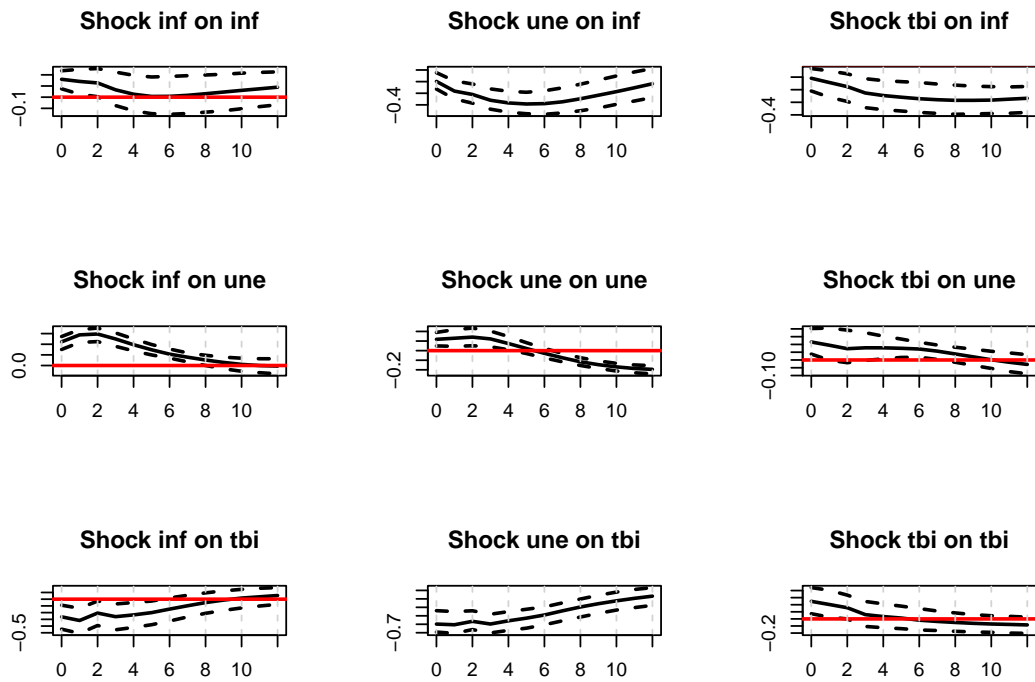
##		[,1]	[,2]	[,3]
##	[1,]	0.040493531	0.022760424	0.05841661
##	[2,]	0.028069359	0.040548527	0.06579154
##	[3,]	0.012776851	0.012583706	0.04462441
##	[4,]	0.042928008	0.020451272	0.04969236
##	[5,]	0.023526009	0.041734581	0.05634208
##	[6,]	0.009532931	0.009552783	0.03901131
##	[7,]	0.028392189	0.013950525	0.03548657
##	[8,]	0.015973411	0.027545283	0.03704010
##	[9,]	0.006972563	0.006316253	0.02804894
##	[10,]	0.021804734	0.010816602	0.02663073
##	[11,]	0.012385673	0.020324603	0.02848882
##	[12,]	0.005221739	0.004645782	0.02237922
##	[13,]	0.097555512	0.092134913	0.22471816

**Variant 1:**  $\lambda_1 = 0.1$ ,  $\lambda_2 = 100$

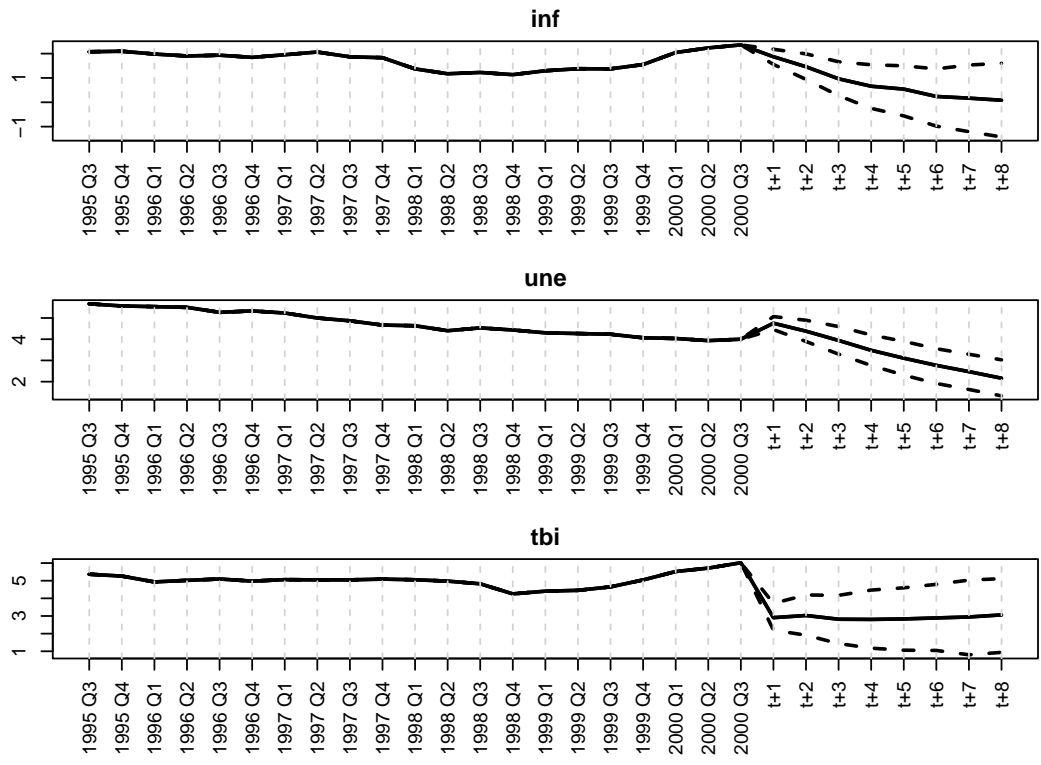
Sign IRFs



Cholesky IRFs



Predictions



## Coefficients

Coefficient means and standard deviations for the values  $\lambda_1 = 0.1$  and  $\lambda_2 = 100$  are as follows:

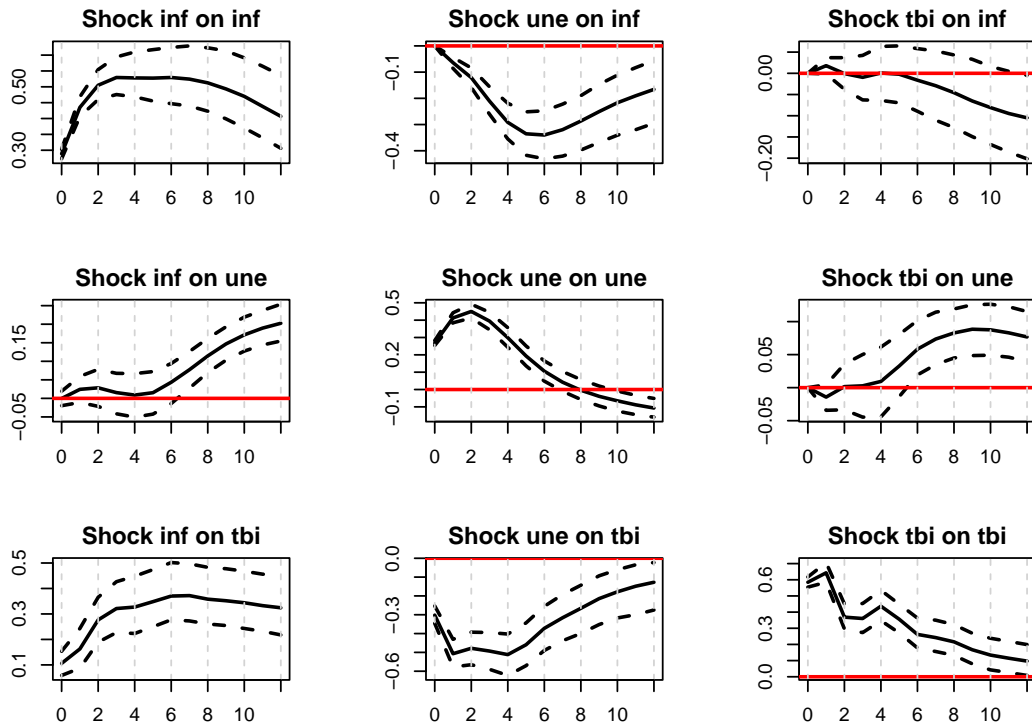
##		[,1]	[,2]	[,3]
##	[1,]	1.183502126	0.16335493	0.006764752
##	[2,]	-0.170266427	1.10922385	-0.307195724
##	[3,]	0.038430253	-0.05181942	0.948698566
##	[4,]	-0.096102631	-0.17223536	0.334440007
##	[5,]	0.106371779	-0.13835496	0.498126317
##	[6,]	-0.059649532	0.01389146	-0.083702770
##	[7,]	-0.055103882	-0.05982652	-0.247802937
##	[8,]	-0.226121191	-0.06598908	-0.651942362
##	[9,]	0.012106402	0.06179928	0.021186807
##	[10,]	-0.024365677	0.10420510	0.004260624
##	[11,]	0.223949873	-0.02151839	0.495868550
##	[12,]	0.003283528	0.01217484	0.004303834
##	[13,]	0.395330058	0.35770146	0.055828491

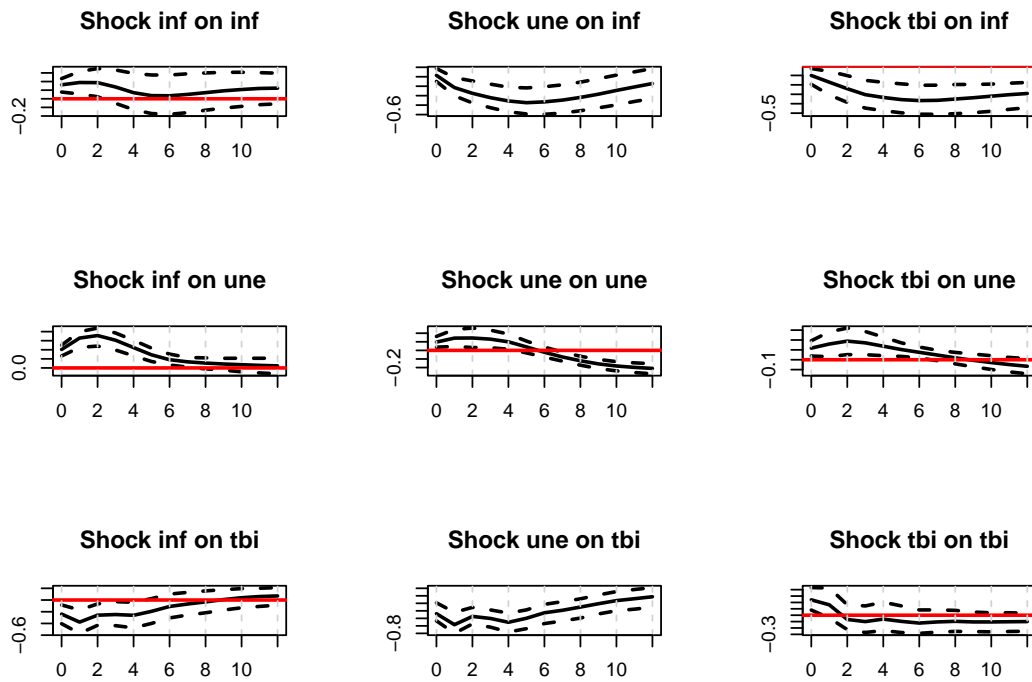
##		[,1]	[,2]	[,3]
##	[1,]	0.04063665	0.08000456	0.19195608
##	[2,]	0.09450448	0.04580209	0.20063906
##	[3,]	0.03715734	0.03126337	0.04779360
##	[4,]	0.04186534	0.13824840	0.32471486
##	[5,]	0.16202739	0.04288129	0.34475796
##	[6,]	0.05236671	0.04427377	0.04160733
##	[7,]	0.02873312	0.13193695	0.32354793
##	[8,]	0.15726365	0.02834683	0.31296264
##	[9,]	0.05270893	0.04361340	0.02929916
##	[10,]	0.02075191	0.07376447	0.18629452
##	[11,]	0.08409600	0.02109012	0.16309802
##	[12,]	0.03515291	0.02955391	0.02259416
##	[13,]	0.10792651	0.10772053	0.26429385

**Variant 2:**  $\lambda_1 = 100$ ,  $\lambda_2 = 0.1$

Sign IRFs

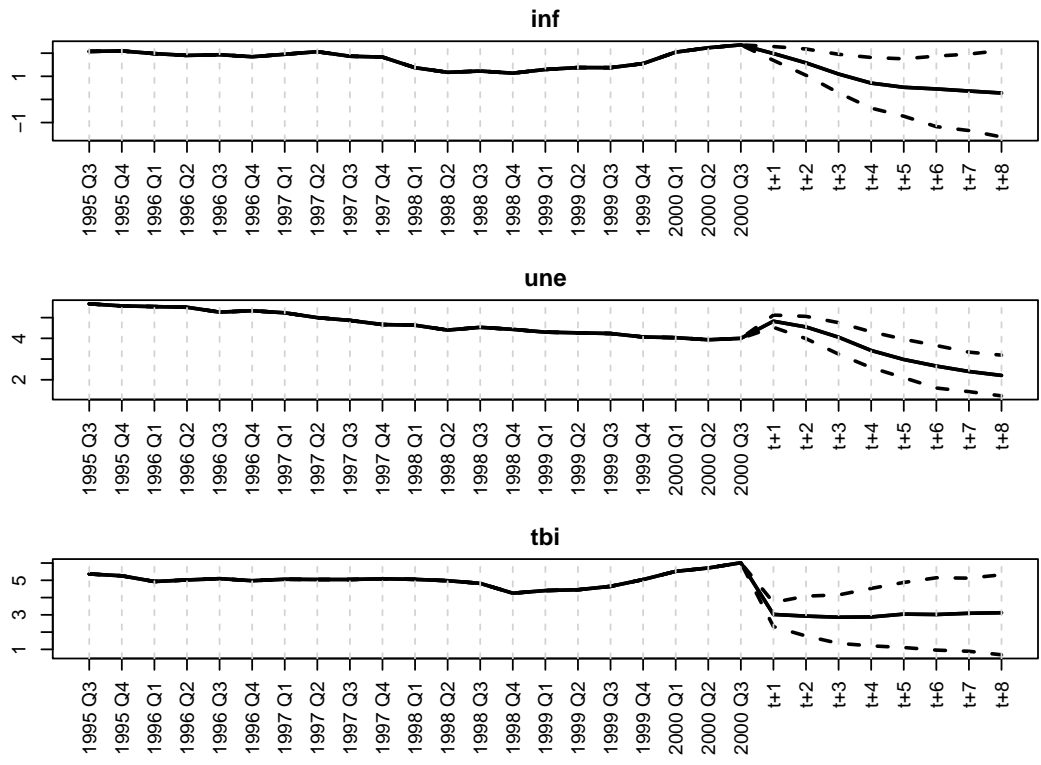


Cholesky IRFs





Predictions



## Coefficients

Coefficient means and standard deviations for the values  $\lambda_1 = 100$  and  $\lambda_2 = 0.1$  are as follows:

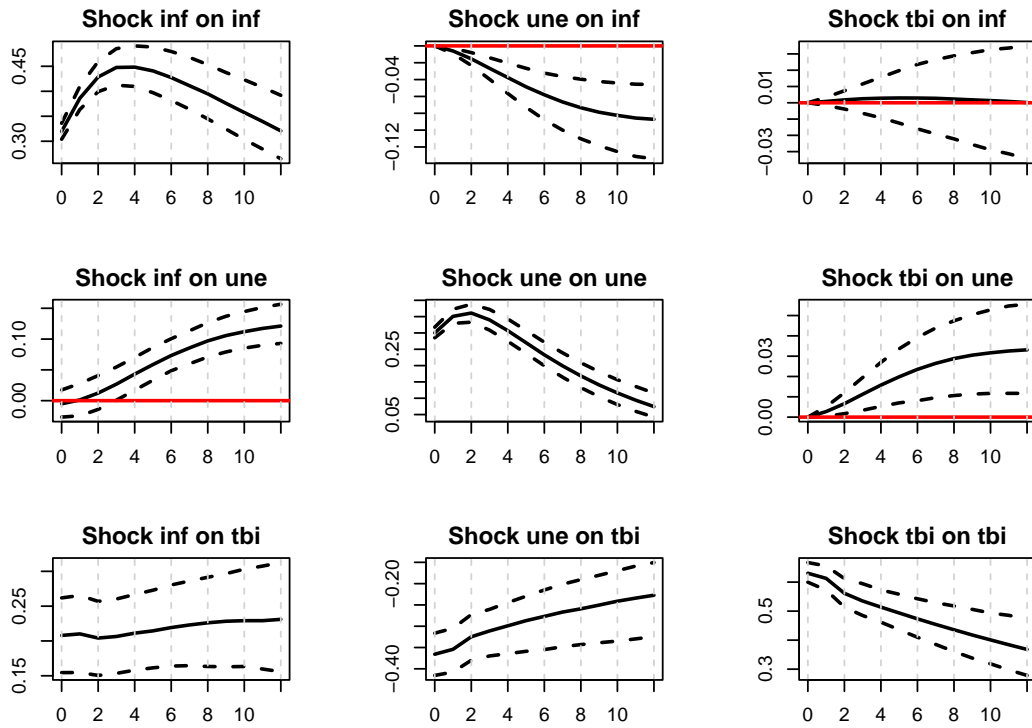
##		[,1]	[,2]	[,3]
##	[1,]	1.50113517	0.09538027	0.1700879
##	[2,]	-0.20668348	1.51523163	-0.6461248
##	[3,]	0.03040835	-0.02555929	1.1007218
##	[4,]	-0.48465826	-0.18685787	0.3482934
##	[5,]	0.19258260	-0.60617446	0.6609932
##	[6,]	-0.08435995	0.06691168	-0.6016099
##	[7,]	-0.06815789	0.07731690	-0.6175878
##	[8,]	-0.19006692	-0.14348572	-0.1227423
##	[9,]	0.07641435	-0.06667147	0.5899680
##	[10,]	0.05476728	0.04293276	0.2011294
##	[11,]	0.15295359	0.14139040	0.1177487
##	[12,]	-0.02494502	0.05186472	-0.1844243
##	[13,]	0.30688041	0.29485384	0.1108183

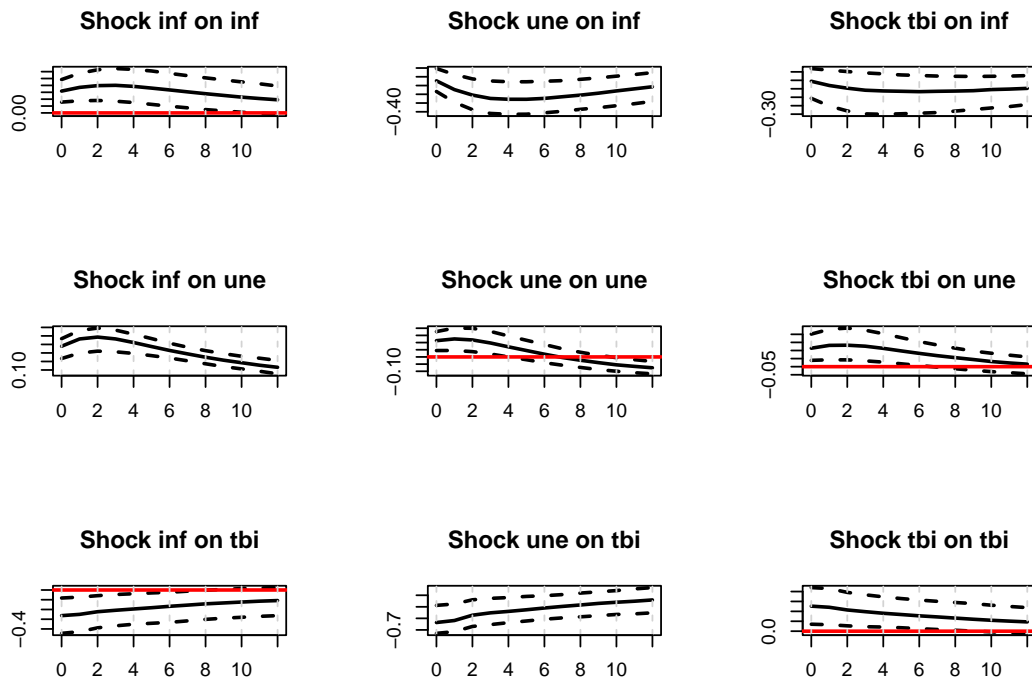
##		[,1]	[,2]	[,3]
##	[1,]	0.07641259	0.06766992	0.17242663
##	[2,]	0.08717337	0.08030016	0.19993006
##	[3,]	0.03416644	0.03258319	0.08375791
##	[4,]	0.13403873	0.11977363	0.31520901
##	[5,]	0.15070613	0.14282038	0.36836343
##	[6,]	0.04824343	0.04553834	0.11814719
##	[7,]	0.13149819	0.12296798	0.31526252
##	[8,]	0.14597287	0.13924778	0.36581248
##	[9,]	0.05069732	0.04579349	0.11730120
##	[10,]	0.07662951	0.07141530	0.17430691
##	[11,]	0.08017123	0.07260813	0.19046953
##	[12,]	0.03615836	0.03387900	0.08469338
##	[13,]	0.10306075	0.09657600	0.24305323

**Variant 3:**  $\lambda_1 = 0.1$ ,  $\lambda_2 = 0.1$

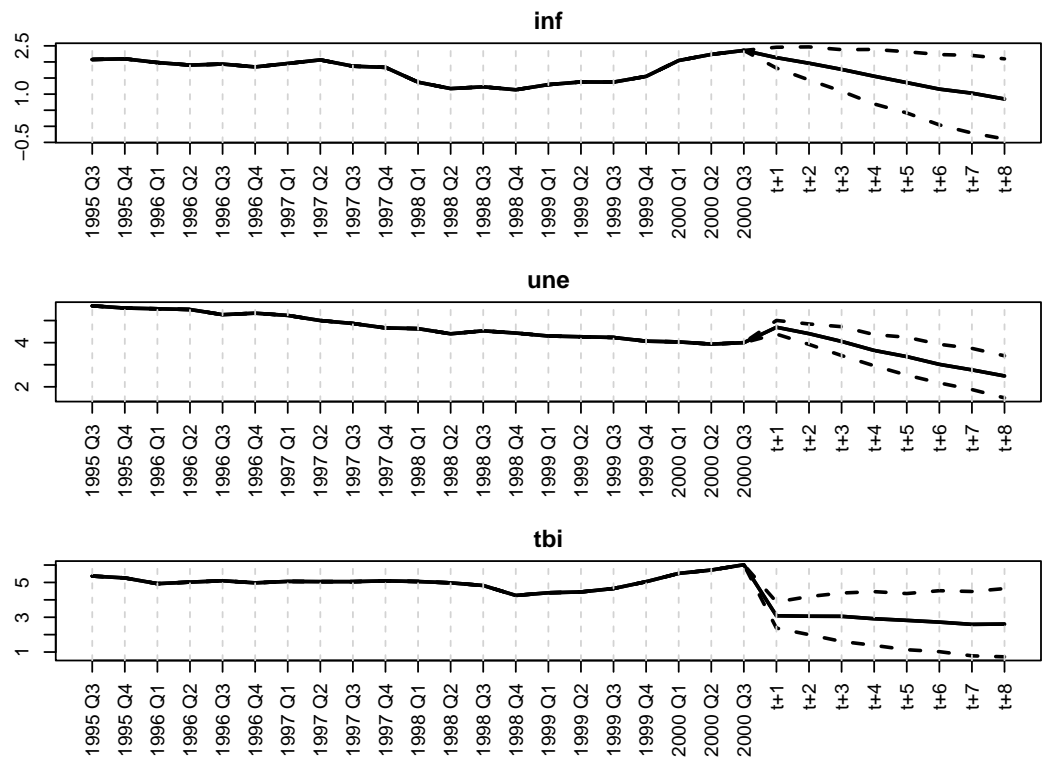
Sign IRFs



Cholesky IRFs



Predictions



## Coefficients

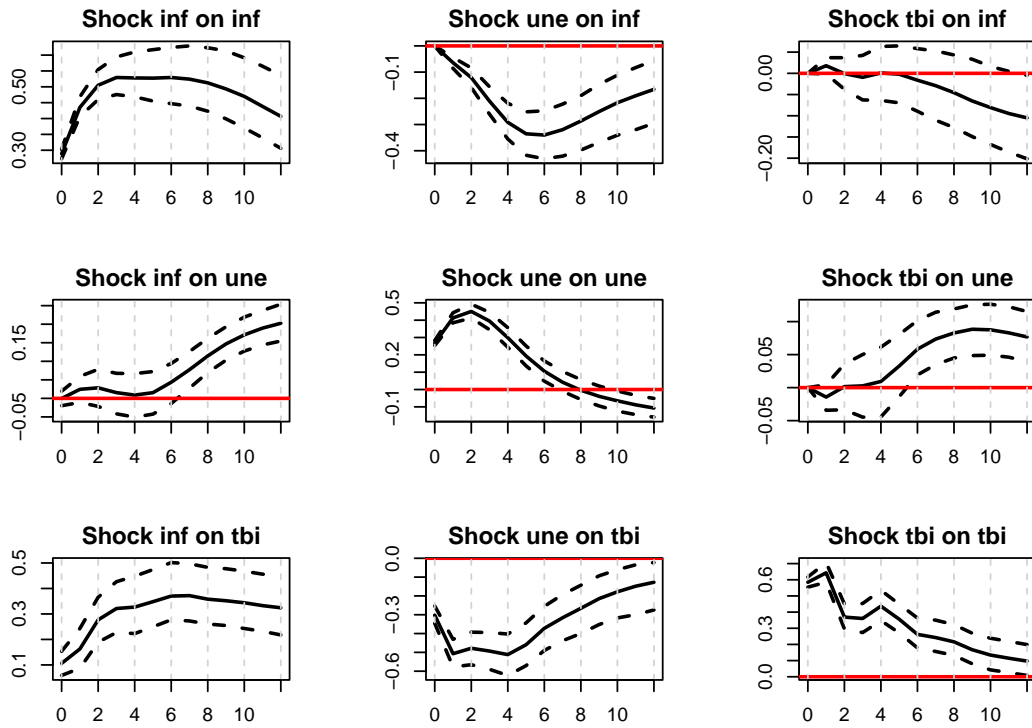
Coefficient means and standard deviations for the values  $\lambda_1 = 0.1$  and  $\lambda_2 = 0.1$  are as follows:

```
##           [,1]           [,2]           [,3]
## [1,]  1.208289e+00  0.0201425737  0.0245681538
## [2,] -1.893710e-02  1.1708241610 -0.0031510517
## [3,]  1.291261e-03  0.0043668961  0.9705690363
## [4,] -1.216811e-01  0.0043085721  0.0046209659
## [5,] -3.495852e-03 -0.1603989458 -0.0001303189
## [6,] -2.289923e-05  0.0014623427 -0.0526150737
## [7,] -7.067341e-02  0.0018402695  0.0010811282
## [8,] -8.720005e-04 -0.0774965560  0.0003091326
## [9,] -1.732131e-04  0.0007297346  0.0357895898
## [10,] -4.042392e-02  0.0010407948  0.0006397360
## [11,] -2.916986e-05 -0.0104886081  0.0009690857
## [12,] -1.644044e-04  0.0003650623  0.0027719249
## [13,]  2.240886e-01  0.3181800327  0.1472088969

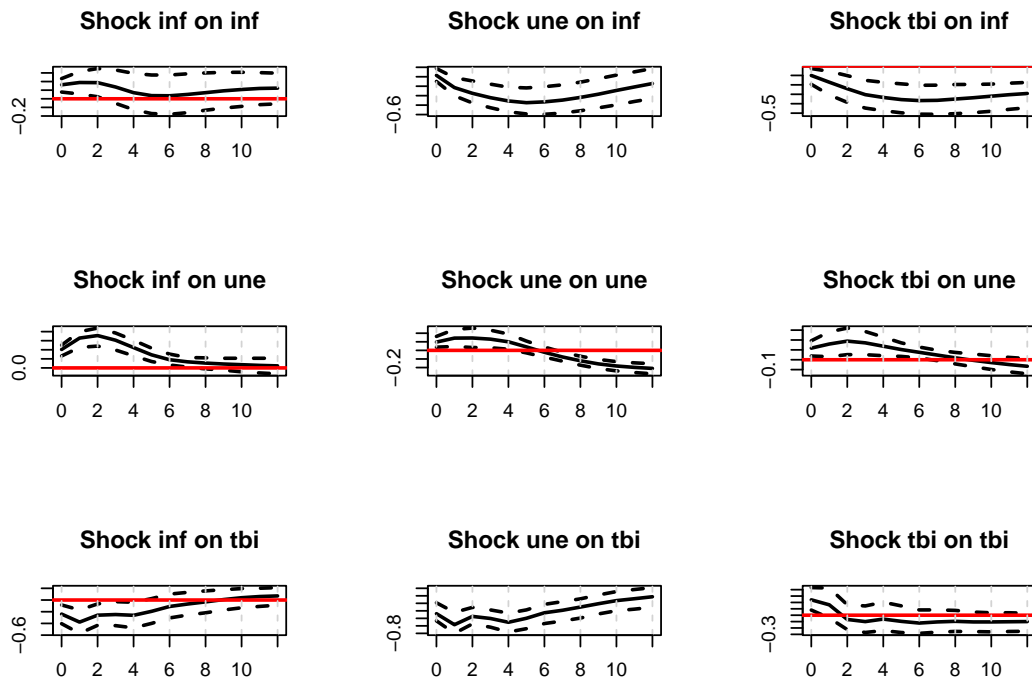
##           [,1]           [,2]           [,3]
## [1,]  0.0397770058  0.0073771959  0.018747292
## [2,]  0.009838601  0.0390792003  0.021301173
## [3,]  0.004085866  0.0037587441  0.041570510
## [4,]  0.041901364  0.0043742553  0.010814553
## [5,]  0.005157443  0.0416600177  0.011923207
## [6,]  0.002128828  0.0020315122  0.040268693
## [7,]  0.027406961  0.0029801435  0.007748079
## [8,]  0.003446878  0.0271200216  0.008324163
## [9,]  0.001458281  0.0012957048  0.028774039
## [10,] 0.020694443  0.0022482208  0.005812680
## [11,] 0.002651252  0.0193916874  0.005993468
## [12,] 0.001098033  0.0009490544  0.021342967
## [13,] 0.067902284  0.0834101881  0.161926963
```

Variant 4:  $\lambda_1 = 100$ ,  $\lambda_2 = 100$

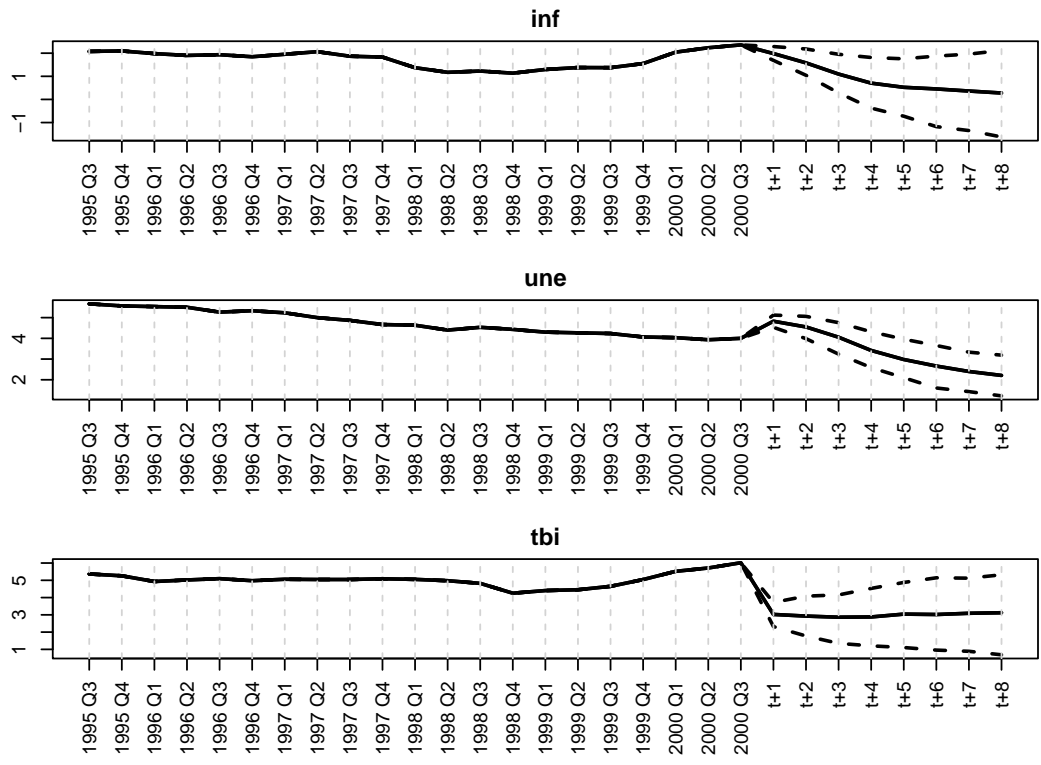
Sign IRFs



Cholesky IRFs



Predictions



## Coefficients

Coefficient means and standard deviations for the values  $\lambda_1 = 100$  and  $\lambda_2 = 100$  are as follows:

##		[,1]	[,2]	[,3]
##	[1,]	1.50113429	0.09550179	0.1697832
##	[2,]	-0.20683902	1.51525106	-0.6465219
##	[3,]	0.03044016	-0.02562298	1.1007987
##	[4,]	-0.48463743	-0.18723871	0.3494504
##	[5,]	0.19308851	-0.60621373	0.6618942
##	[6,]	-0.08441893	0.06703515	-0.6017617
##	[7,]	-0.06825208	0.07779605	-0.6192322
##	[8,]	-0.19067355	-0.14354145	-0.1234345
##	[9,]	0.07648881	-0.06683741	0.5901852
##	[10,]	0.05484792	0.04271635	0.2019359
##	[11,]	0.15321278	0.14146568	0.1179055
##	[12,]	-0.02499683	0.05196977	-0.1845643
##	[13,]	0.30686402	0.29485122	0.1109357

##		[,1]	[,2]	[,3]
##	[1,]	0.07641612	0.06769958	0.17250474
##	[2,]	0.08721968	0.08031498	0.20003704
##	[3,]	0.03417992	0.03259524	0.08377107
##	[4,]	0.13404882	0.11989469	0.31553600
##	[5,]	0.15087943	0.14286562	0.36878332
##	[6,]	0.04827994	0.04557062	0.11818701
##	[7,]	0.13151561	0.12316691	0.31578885
##	[8,]	0.14621389	0.13931271	0.36641780
##	[9,]	0.05075764	0.04584569	0.11735943
##	[10,]	0.07663863	0.07150961	0.17453694
##	[11,]	0.08027657	0.07264294	0.19073758
##	[12,]	0.03619578	0.03391186	0.08472175
##	[13,]	0.10306386	0.09658366	0.24307234



**Discussion**

Text

## Exercise 2 – Replicating Kilian (2009)