IRF

CLMENT CARRIER

Forecast performance

In this section, using a sample from Q1 1998 to Q4 2009, I forecast HICP from Q1 2010 to Q4 2013 with several models. These models difer thanks to the number of lag used, if they are adaptive or not.

I plot the results and give the RMSE of these forecasts.

Here is the R code :

```
library(knitr); opts_chunk$set(message=FALSE)
```

```
require(lassovar)
require(ggplot2)
require(reshape2)
require(urca)
require(MSBVAR)
library(xtable)
```

```
forecast2<-function(data,lag,horizon,preforecast,adap){
  fore<-matrix(0,nrow=dim(data)[2],ncol=horizon+preforecast)
  fore[,1:(preforecast)]<-t(data[(dim(data)[1]-preforecast+1):dim(data)[1],])
  lv<-lassovar(dat=data,lags=lag,adaptive=adap)
  intercept<-as.matrix(lv$coefficients[1,],dim(data)[2],1)
  if(lag==1){
    coeff<-as.matrix(t(lv$coefficients[-1,]),dim(data)[2],dim(data)[2])
    for (i in (preforecast+1):(horizon+preforecast)){
      fore[,i]<-intercept+coeff%*%fore[,i-1]
    }
  } else {
    if(lag==2){
      coeff1<-as.matrix(t(lv$coefficients[2:(dim(data)[2]+1),]),dim(data)[2],dim(data)[2]
      coeff2<-as.matrix(t(lv$coefficients[(dim(data)[2]+2):(2*dim(data)[2]+1),]),dim(data
      for (i in (preforecast+1):(horizon+preforecast)){
        fore[,i]<-intercept+coeff1%*%fore[,i-1]+coeff2%*%fore[,i-2]
      }
    } else {
      if(lag==3){
        coeff1<-as.matrix(t(lv$coefficients[2:(dim(data)[2]+1),]),dim(data)[2],dim(data)[
        coeff2<-as.matrix(t(lv$coefficients[(dim(data)[2]+2):(2*dim(data)[2]+1),]),dim(da
        coeff3<-as.matrix(t(lv$coefficients[(2*dim(data)[2]+2):(3*dim(data)[2]+1),]),dim(
```

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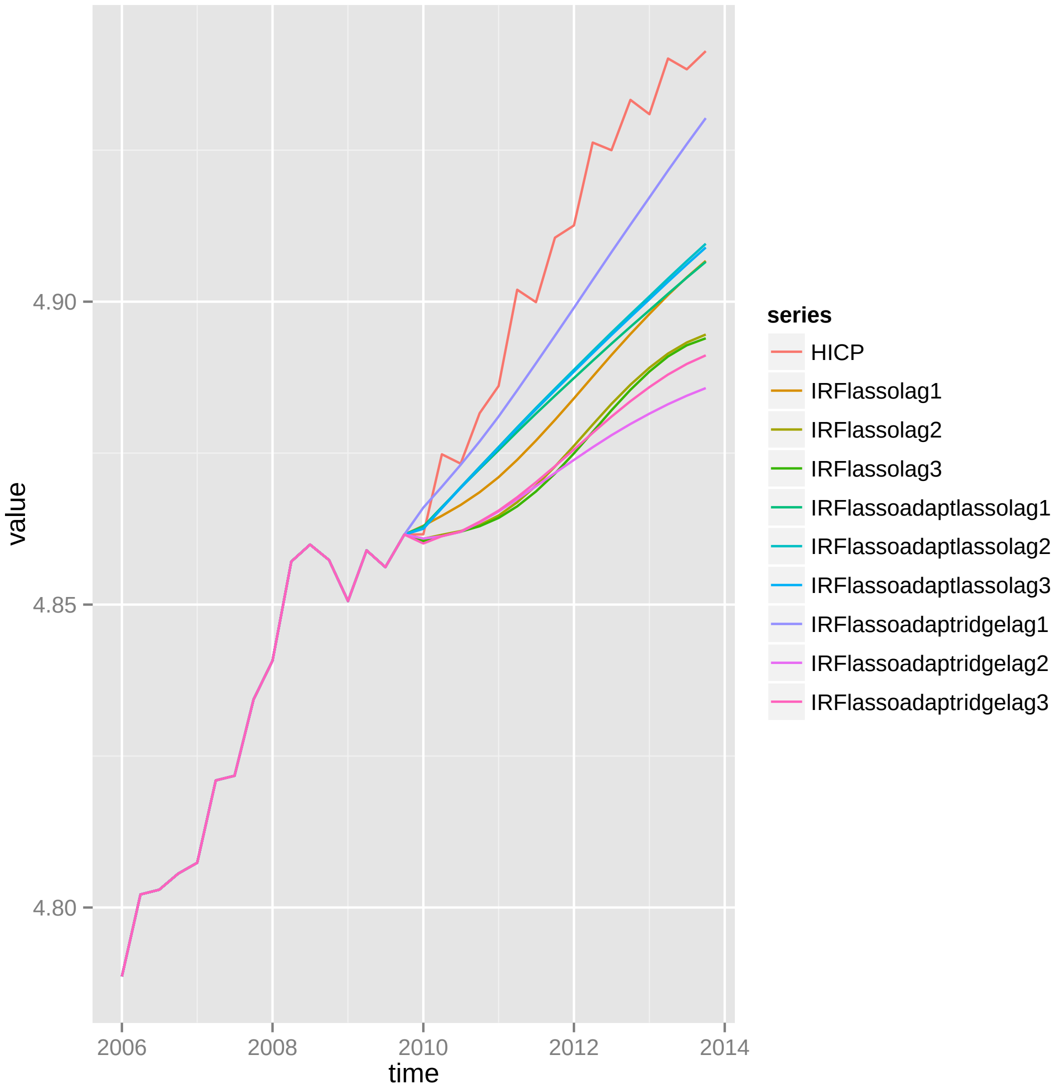
```
        for (i in (preforecast+1):(horizon+preforecast)){
          fore[,i]<-intercept+coeff1%*%fore[,i-1]+coeff2%*%fore[,i-2]+coeff3%*%fore[,i-3]
        }
      }
      else {
        coeff1<-as.matrix(t(lv$coefficients[2:(dim(data)[2]+1),]),dim(data)[2],dim(data)[
        coeff2<-as.matrix(t(lv$coefficients[(dim(data)[2]+2):(2*dim(data)[2]+1),]),dim(da
        coeff3<-as.matrix(t(lv$coefficients[(2*dim(data)[2]+2):(3*dim(data)[2]+1),]),dim(
        coeff4<-as.matrix(t(lv$coefficients[(3*dim(data)[2]+2):(4*dim(data)[2]+1),]),dim(
        for (i in (preforecast+1):(horizon+preforecast)){
          fore[,i]<-intercept+coeff1%*%fore[,i-1]+coeff2%*%fore[,i-2]+coeff3%*%fore[,i-3]
        }
      }
    }
  }
  rownames(fore)<-names(data)
  return(t(fore))
}
```

I load and keep the data from Q1 1998 to Q4 2009 :

```
load("vardata2")
data<-subset(vardataframe[117:164,])
```

```
HICPtrue<-subset(vardataframe[149:180,])["HICP"]

IRFlassolag1<-forecast2(data,1,16,16,"none")[,"HICP"]
IRFlassolag2<-forecast2(data,2,16,16,"none")[,"HICP"]
IRFlassolag3<-forecast2(data,3,16,16,"none")[,"HICP"]
IRFlassoadaptlassolag1<-forecast2(data,1,16,16,"lasso")[,"HICP"]
## initial estimator for the adapive lasso: lasso
IRFlassoadaptlassolag2<-forecast2(data,2,16,16,"lasso")[,"HICP"]
## initial estimator for the adapive lasso: lasso
IRFlassoadaptlassolag3<-forecast2(data,3,16,16,"lasso")[,"HICP"]
## initial estimator for the adapive lasso: lasso
IRFlassoadaptridgelag1<-forecast2(data,1,16,16,"ridge")[,"HICP"]
## initial estimator for the adapive lasso: ridge
IRFlassoadaptridgelag2<-forecast2(data,2,16,16,"ridge")[,"HICP"]
## initial estimator for the adapive lasso: ridge
IRFlassoadaptridgelag3<-forecast2(data,3,16,16,"ridge")[,"HICP"]
## initial estimator for the adapive lasso: ridge
df<-data.frame(HICPtrue,IRFlassolag1,IRFlassolag2,IRFlassolag3,IRFlassoadaptlassolag1,
               IRFlassoadaptlassolag2,IRFlassoadaptlassolag3,IRFlassoadaptridgelag1,
               IRFlassoadaptridgelag2,IRFlassoadaptridgelag3)

time<-seq(as.Date("2006/01/01"), as.Date("2013/10/01"), by = "quarter")
```

```
df$time<-time

mvar1 <- melt(df,  id = 'time', variable.name = 'series')

ggplot(mvar1, aes(time, value, col=series)) + geom_line()
```



I compute the RMSE :

```
df2<-df[17:32,]
RMSE<-NULL
for (i in 2:(length(df)-1)){
  RMSE[i]<-as.matrix(t(df2[,1]-df2[,i])%*%(df2[,1]-df2[,i]))/16
}
RMSEmodel<-RMSE[-1]
names(RMSEmodel)<-names(df[2:10])
```

Table 1. blabla

Model	lag	adaptive	RMSE
1	1	non	0.000794
2	2	non	0.001280
3	3	non	0.001330
4	1	lasso	0.000698
5	2	lasso	0.000616
6	3	lasso	0.000634
7	1	ridge	0.000184
8	2	ridge	0.001593
9	3	ridge	0.001390