Curso de Macroeconometria

Resolução da Lista 11

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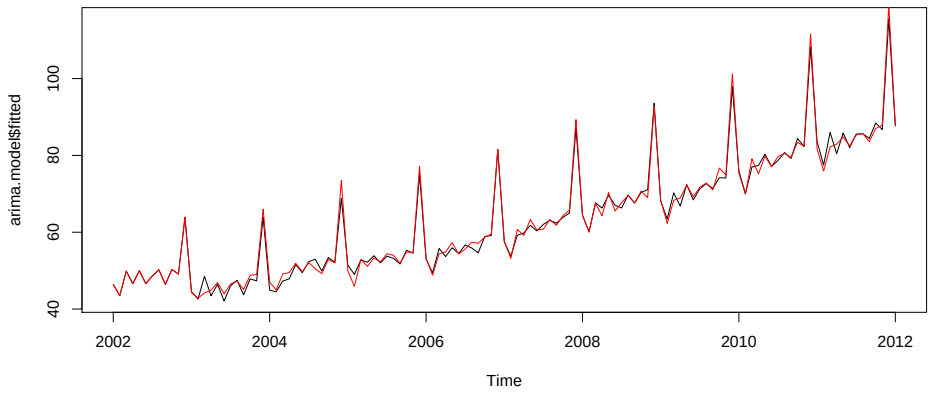
Resolução dos Exercícios

```
library(BETS)
library(forecast)
library(urca)
library(stargazer)
library(png)
library(xtable)
library(mFilter)
library(ggplot2)
library(XLConnect)
#1.
setwd( "C:/Users/rodney/Documents/Macroeconometria/Aula11")
# Modelo Arimax com Expec. inflação,PIB,IPCA,Cambio,Comoditties,Sel
# ,etc
pmc <- BETS.get(1455)
consumidor <- BETS.get(4393)
data <- ts.intersect(pmc, consumidor)
data.model <- window(data,start=c(2000,01),end=c(2012,01))
data.forecast <- window(data, start=c(2012,02))
data2 <- ts(read.csv2('data2.csv', header=T, sep=';', dec=',')[,-1],
start=c(2000,01),end=c(2012,01), freq=12)
arima.model <- Arima(data.model[,1], order=c(2,1,0),
                     seasonal=c(0,1,1),xreg=data2)
data2 <- ts(read.csv2('data2.csv', header=T, sep=';', dec=',')[,-1],
start=c(2012,02),end=c(2017,10), freq=12)
f.arima.model <- forecast(arima.model,level=95,xreg=data2)
ac1 <- accuracy(f.arima.model, data.forecast[,1])


# Modelo Arimax com o PIB

data2 <- ts(read.csv2('data2.csv', header=T, sep=';', dec=',')[,-1],
start=c(2000,01),end=c(2012,01), freq=12)
data2 <- data2[,5]
arima.model <- Arima(data.model[,1], order=c(2,1,0),
                     seasonal=c(0,1,1),xreg=data2)
data2 <- ts(read.csv2('data2.csv', header=T, sep=';', dec=',')[,-1],
start=c(2012,02),end=c(2017,10), freq=12)
data2 <- data2[,5]
```

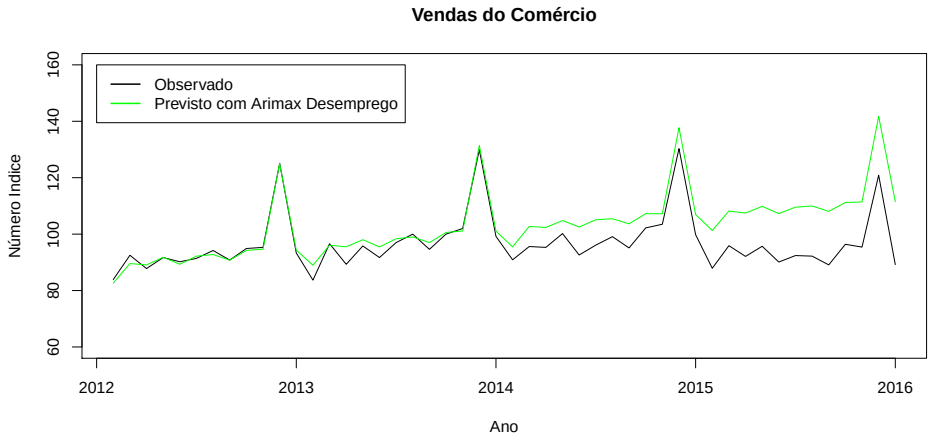
```
f.arima.model <- forecast(arima.model,level=95,xreg=data2)
ac2 <- accuracy(f.arima.model, data.forecast[,1])



# Modelo Arimax com o Desemprego
pmc <- BETS.get(1455)
consumidor <- BETS.get(4393)
data <- ts.intersect(pmc, consumidor)
data.model <- window(data,start=c(2002,01),end=c(2012,01))
data.forecast <- window(data, start=c(2012,02),end=c(2016,01))
data2 <-  BETS.get(10777)
data2 <- window(data2,start=c(2002,01),end=c(2012,01))
arima.model <- Arima(data.model[,1], order=c(2,1,0),
                     seasonal=c(0,1,1),xreg=data2)
data2 <-  BETS.get(10777)
data2 <- window(data2,start=c(2012,02),end=c(2016,01))
f.arima.model <- forecast(arima.model,level=c(50,75,95),xreg=data2)
plot(arima.model$fitted)
lines(data.model[,1],col='red')
```




```
ac3 <- accuracy(f.arima.model, data.forecast[,1])
table <- cbind(ac1[2,],ac2[2,],ac3[2,])
colnames(table) <- c('Arimax Conjuntura','Arimax PIB',
                     'Arimax Desemprego')
xtable(table,align=c(
                "p{0.10\\textwidth}|",
                "R{0.37\\textwidth}|",
                "R{0.27\\textwidth}|",
                "R{0.12\\textwidth}|"))
```

	Arimax Conjuntura	Arimax PIB	Arimax Desemprego
ME	-10.85	-15.56	-6.22
RMSE	17.37	20.84	9.28
MAE	13.41	15.72	6.66
MPE	-12.06	-17.11	-6.52
MAPE	14.73	17.29	6.99
MASE	3.39	3.98	1.45
ACF1	0.95	0.95	0.85
Theil's U	1.75	2.09	0.80

```
plot(data.forecast[,1],ylim=c(60,160),main='Vendas do Comércio',
     ylab='Número Indice',xlab='Ano')
lines(f.arima.model$mean,col='green')
legend(2012,160,c('Observado','Previsto com Arimax Desemprego'),
lty=c(1,1),lwd=c(1.5,1.5),col=c('black','green'))
```




```
#2.
# Variáveis Exogenas: Desemprego e Salário mínimo
data2 <-  BETS.get(10777)
data2 <- cbind(data2,BETS.get(1619))
data2 <- window(data2,start=c(2002,01),end=c(2012,01))
aux <- window(data[,2],start=c(2002,01),end=c(2012,01))
data2 <- cbind(data2,aux)
arima.model <- Arima(data.model[,1], order=c(2,1,0),
                     seasonal=c(0,1,1),xreg=data2)
data2 <-  BETS.get(10777)
data2 <- cbind(data2,BETS.get(1619))
data2 <- window(data2,start=c(2012,02),end=c(2016,01))
aux <- window(data[,2],start=c(2012,02),end=c(2016,01))
data2 <- cbind(data2,aux)
f.arima.model <- forecast(arima.model,level=95,xreg=data2)
fmelhor <-  forecast(arima.model,level=c(50,75,95),xreg=data2)
datamelhor <- data2
ac2 <- accuracy(f.arima.model, data.forecast[,1])
xtable(ac2)
```

	ME	RMSE	MAE	MPE	MAPE	MASE	ACF1	Theil's U
Training set	0.18	1.38	0.96	0.22	1.52	0.21	-0.01	
Test set	-5.87	8.78	6.27	-6.17	6.59	1.36	0.84	0.75

```
# Houve uma pequena melhora no modelo

# 3,4,5.
# Variáveis independentes: Desemprego e Salário mínimo
pmc <- BETS.get(1455)
pmc <- window(pmc,start=c(2002,01),end=c(2012,01))
data2 <-  BETS.get(10777)
data2 <- cbind(data2,BETS.get(1619))
data2 <- window(data2,start=c(2002,01),end=c(2012,01))
```

```
aux <- window(data[,2],start=c(2002,01),end=c(2012,01))
dados <- cbind(data2,aux)
reg.model <- lm(pmc~dados)
pmc <- BETS.get(1455)
pmc <- window(pmc,start=c(2012,02),end=c(2016,01))
data2 <-  BETS.get(10777)
data2 <- cbind(data2,BETS.get(1619))
data2 <- window(data2,start=c(2012,02),end=c(2016,01))
aux <- window(data[,2],start=c(2012,02),end=c(2016,01))
dadosf <- cbind(data2,aux)
f.reg.model <- forecast(reg.model,newdata=as.data.frame(dadosf),
                        level=c(50, 75, 95))
b <- ts(f.reg.model$mean,start=c(2012,02),end=c(2017,10), freq=12)
ac4 <- accuracy(f.reg.model$mean, data.forecast[,1])
table <- cbind(ac1[2,],ac2[2,],ac3[2,],ac4[1,])
colnames(table) <- c('Arimax Conjuntura','Arimax PIB',
                     'Arimax Desemprego','Modelo Regressao')
xtable(table,align=c(
               "p{0.10\\textwidth}|",
               "R{0.37\\textwidth}|",
               "R{0.27\\textwidth}|",
               "R{0.27\\textwidth}|",
               "R{0.06\\textwidth}|"))
```

	Arimax Conjuntura	Arimax PIB	Arimax Desemprego	Modelo Regressao
ME	-10.85	-5.87	-6.22	0.84
RMSE	17.37	8.78	9.28	10.35
MAE	13.41	6.27	6.66	6.24
MPE	-12.06	-6.17	-6.52	0.02
MAPE	14.73	6.59	6.99	5.99
MASE	3.39	1.36	1.45	0.08
ACF1	0.95	0.84	0.85	0.86
Theil's U	1.75	0.75	0.80	0.84

```
#6.
# vendas no comercio vai até out de 2017
pmc <- BETS.get(1455)
# confiança do cons. vai até nov de 2017
consumidor <- BETS.get(4393)
data <- ts.intersect(pmc, consumidor)
data.model <- window(data,start=c(2002,01),end=c(2017,10))
# desemprego vai até fev de 2016
data2 <-  BETS.get(10777)


# ler total pessoas ativas e nao ativas
wb = loadWorkbook("Tabela1.xlsx")
df = readWorksheet(wb, sheet = "Tabela 1",
                   header = FALSE,startRow = 7,endRow= 7)
df <- ts(df,start=c(2002,03),freq=12)

# ler pessoas ocupadas
wb = loadWorkbook("Tabela2.xlsx")
df1 = readWorksheet(wb, sheet = "Tabela",
```

```
                    header = FALSE,startRow = 7,endRow=7)
df1 <- ts(df1[1,],start=c(2002,03),freq=12)

# extender a taxa de desemprego até out de 2017
pme <- ((df-df1)/df)*100
pme <-  ts(pme[1,],start=c(2002,03),freq=12)
pnad = BETS.get(24369)
data = cbind(pme,pnad)
desemprego = ts(data[complete.cases(data),],
                start=c(2012,03), freq=12)
reg = lm(pnad~pme, data=desemprego)
pnad.pme = ts(data[!complete.cases(data[,2]),],
              start=c(2002,03), freq=12)
pnad.pme[,2] = coef(reg)[1] +coef(reg)[2]*pnad.pme[,1]
data[1:nrow(pnad.pme),2] = pnad.pme[1:nrow(pnad.pme),2]
pnad = data[,2]


# Gerar Arima para prever vendas no comércio em 2017
data2 <-  ts.intersect(pnad, BETS.get(1619))
level <- c(50,75,95)
data <- ts.intersect(pmc, consumidor)
data2 <- window(data2,start=c(2002,03),end=c(2016,12))
data.model <- window(data,start=c(2002,03),end=c(2016,12))
arima.model <- Arima(data.model[,1], order=c(2,1,0),
                     seasonal=c(0,1,1),xreg=data2)

data2 <-  ts.intersect(pnad, BETS.get(1619))
data2 <- window(data2,start=c(2017,01),end=c(2017,10))
fmelhor <- forecast(arima.model,level=level,xreg=data2)
autoplot(fmelhor)
```