

PREVISÃO

Valor Esperado

A previsão é relativamente fácil e direta.

$$y_{t+1} = c + \phi y_t + \varepsilon_{t+1}$$

Assim:

$$\begin{aligned} E_t(y_{t+1}) &= c + \phi y_t = y_{t+1} - \varepsilon_{t+1} \\ E_t(y_{t+2}) &= c + \phi E_t(y_{t+1}) = c + \phi(c + \phi y_t) \end{aligned}$$

O erro de previsão no período h , $e_t(h)$ é dado por:

$$e_t(1) = y_{t+1} - E_t(y_{t+1}) = \varepsilon_{t+1}$$

$$\begin{aligned} e_t(2) &= y_{t+2} - E_t(y_{t+2}) \\ &= c + \phi y_{t+1} + \varepsilon_{t+2} - c - \phi E_t(y_{t+1}) \\ &= \phi \varepsilon_{t+1} + \varepsilon_{t+2} \end{aligned}$$

$$\begin{aligned} e_t(3) &= y_{t+3} - E_t(y_{t+3}) \\ &= c + \phi y_{t+2} + \varepsilon_{t+3} - c - \phi E_t(y_{t+1}) \\ &= \phi^2 \varepsilon_{t+1} + \phi \varepsilon_{t+2} + \varepsilon_{t+3} \end{aligned}$$

```
install.packages("Forecast")
```

```
library(forecast)
```

```
library(readxl)
```

```
IPCA <- read_excel("C:/Econometria/IPCA.xls", col_types = c("date","numeric"))
```

```
AR1 <- arima(Inflacao,order = c(1,0,0))
```

```
AR1
```

```
AR2 <- arima(Inflacao, order=c(2,0,0))
```

```
AR2
```

```
previsao1 <- forecast(AR1, 4)
previsao1

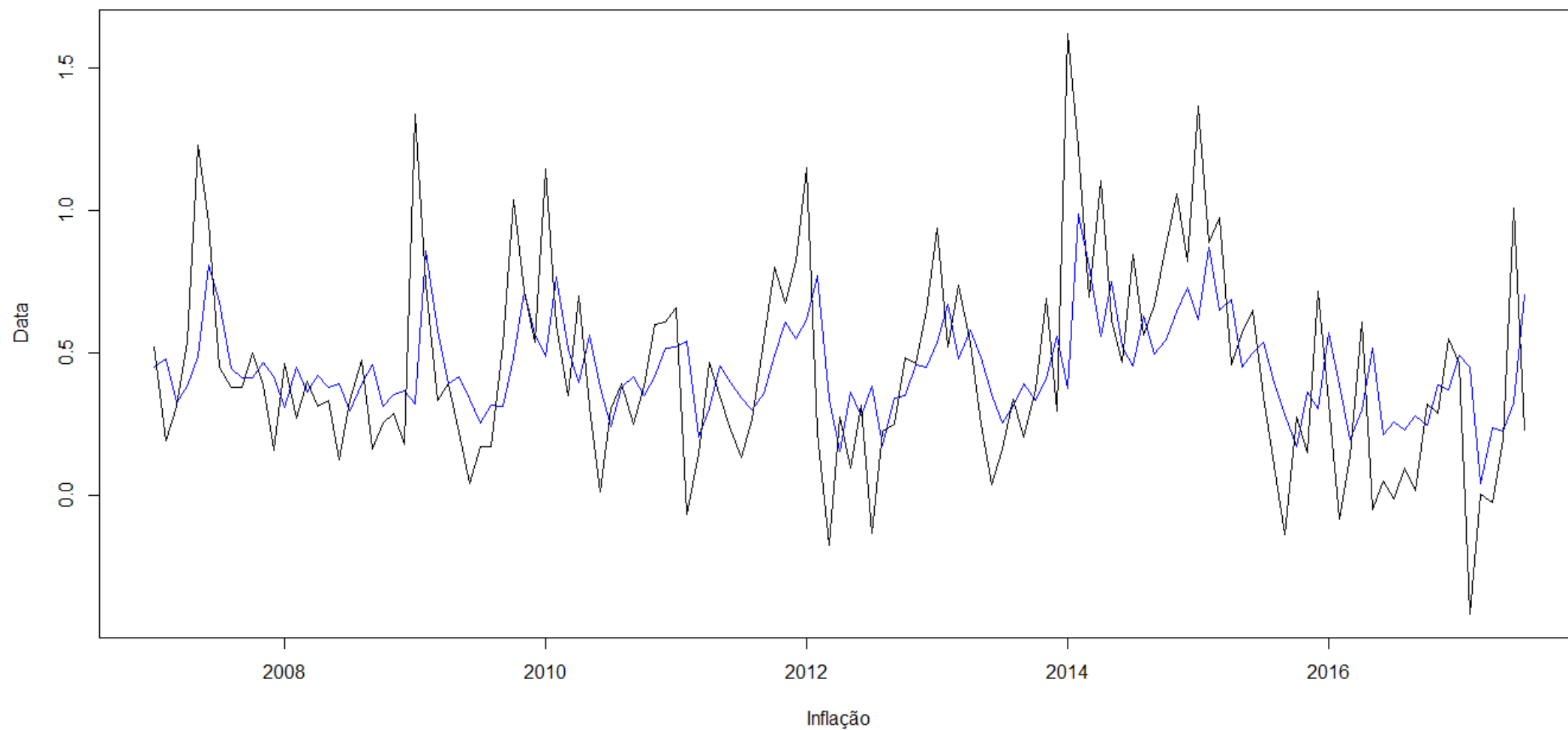
previstoAR1 <- previsao1$fitted

modelo1 <- data.frame(previstoAR1, Inflacao)

modelo1 <- ts(modelo1, start = 2008-01, frequency = 12)

plot(modelo1, main="Previsto e Observado - AR1",
      plot.type="single",
      ylab="Data",
      xlab="Inflação",
      col=c("Blue", "Black"))
```

Previsto e Observado - AR1



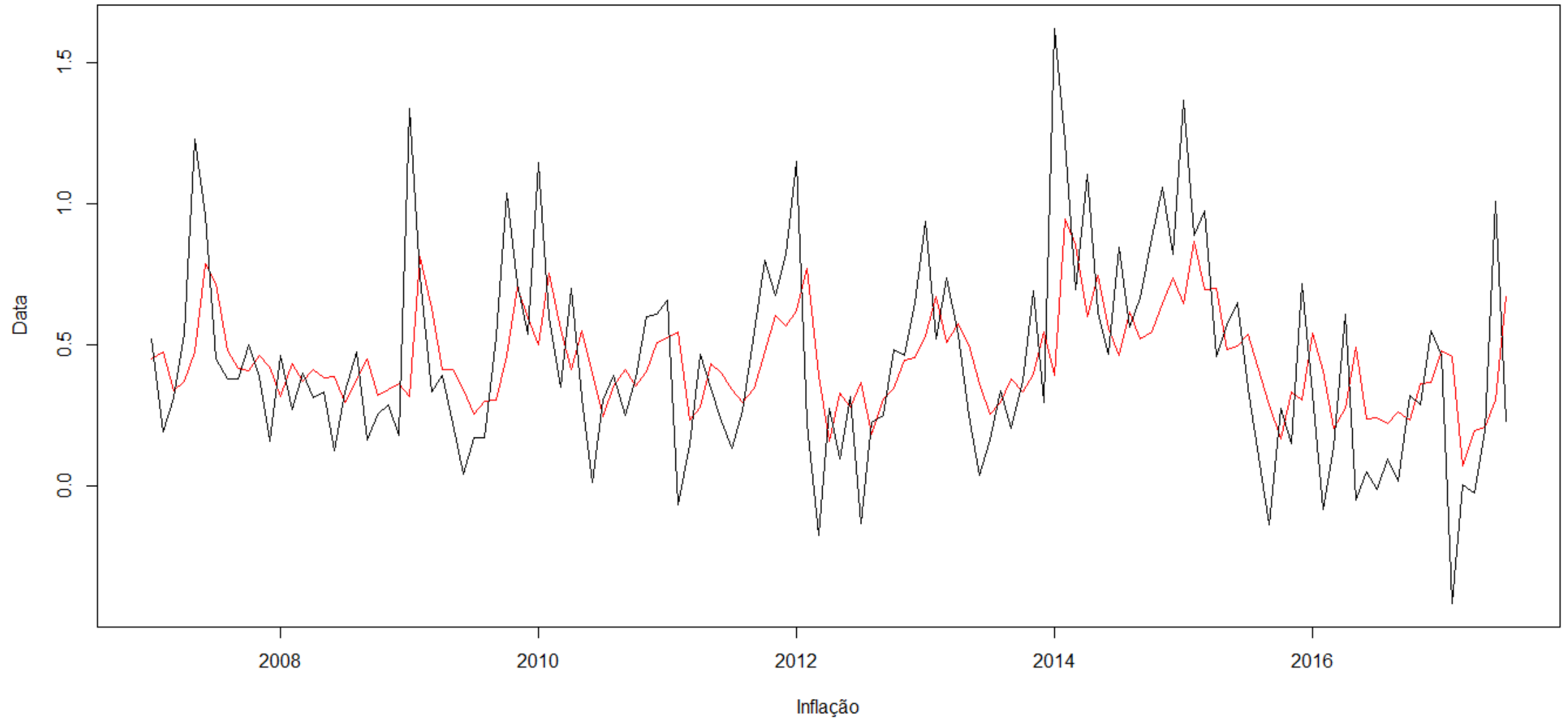
```
previsao2 <- forecast(AR2, 4)
previsao2
```

```
previstoAR2 <- previsao2$fitted
```

```
modelo2 <- data.frame(previstoAR2, Inflacao)
modelo2 <- ts(modelo2, start = 2008-01, frequency = 12)
```

```
plot(modelo2, main="Previsto e Observado AR2",
      plot.type="single",
      ylab="Data",
      xlab="Inflação",
      col=c("Red", "Black"))|
```

Previsto e Observado AR2

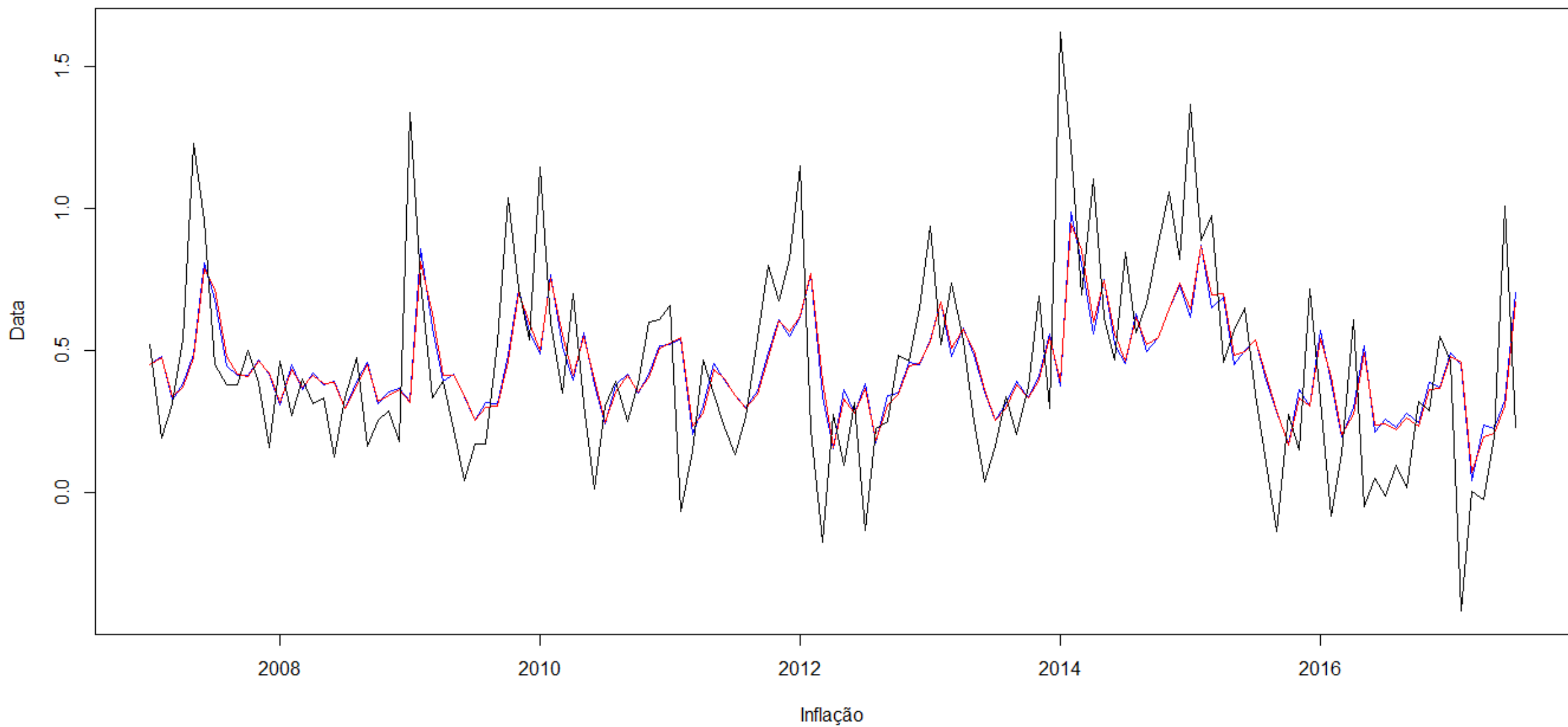


```
modeloconjunto <- data.frame(previstoAR1,previstoAR2,Inflacao)
```

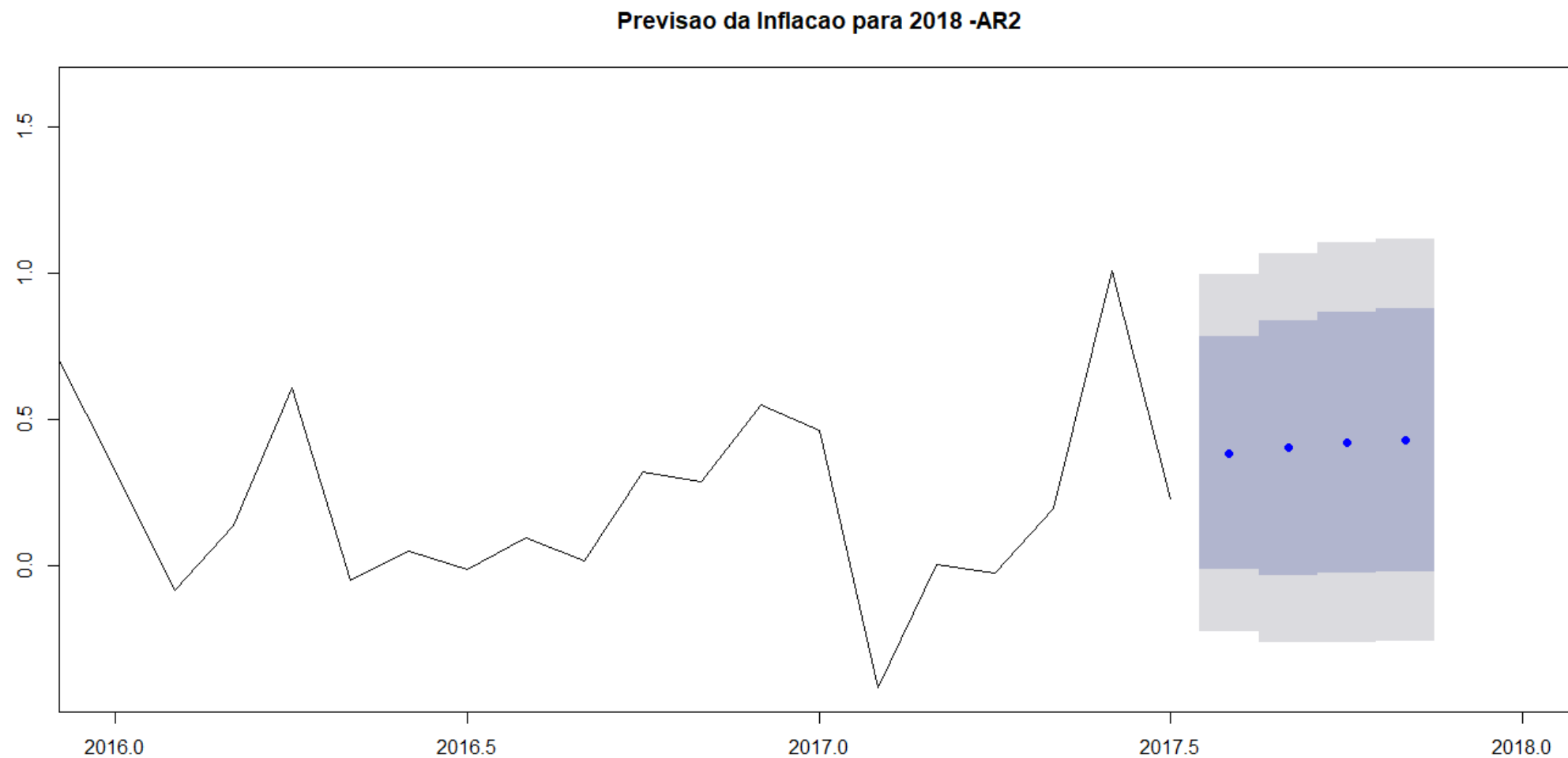
```
modeloconjunto <- ts(modeloconjunto,start = 2008-01, frequency = 12)
```

```
plot(modeloconjunto, main="Previsto e Observado AR1, AR2",  
      plot.type="single",  
      ylab="Data",  
      xlab="Inflação",  
      col=c("Blue", "Red","Black"))
```


Previsto e Observado AR1, AR2



```
plot(forecast(AR1, 4), main = "Previsao da Inflacao para 2017 - AR1", xlim=c(2017,2019))
plot(forecast(AR2, 4), main = "Previsao da Inflacao para 2017 -AR2", xlim=c(2017,2019))
```



Teste ARCH-LM

```
AR1_VAR <- arima(variacao_PIB,c(1,0,0))  
AR2_VAR <- arima(variacao_PIB,c(2,0,0))  
arch.test(AR1_VAR)
```

ARCH heteroscedasticity test for residuals
alternative: heteroscedastic

Portmanteau-Q test:

	order	PQ	p.value
[1,]	4	3.05	0.550
[2,]	8	4.67	0.793
[3,]	12	13.82	0.312
[4,]	16	15.90	0.460
[5,]	20	19.80	0.470
[6,]	24	22.47	0.551

Lagrange-Multiplier test:

	order	LM	p.value
[1,]	4	21.400	8.69e-05
[2,]	8	8.049	3.28e-01
[3,]	12	2.768	9.93e-01
[4,]	16	1.430	1.00e+00
[5,]	20	0.325	1.00e+00
[6,]	24	0.137	1.00e+00

Teste ARCH-LM

