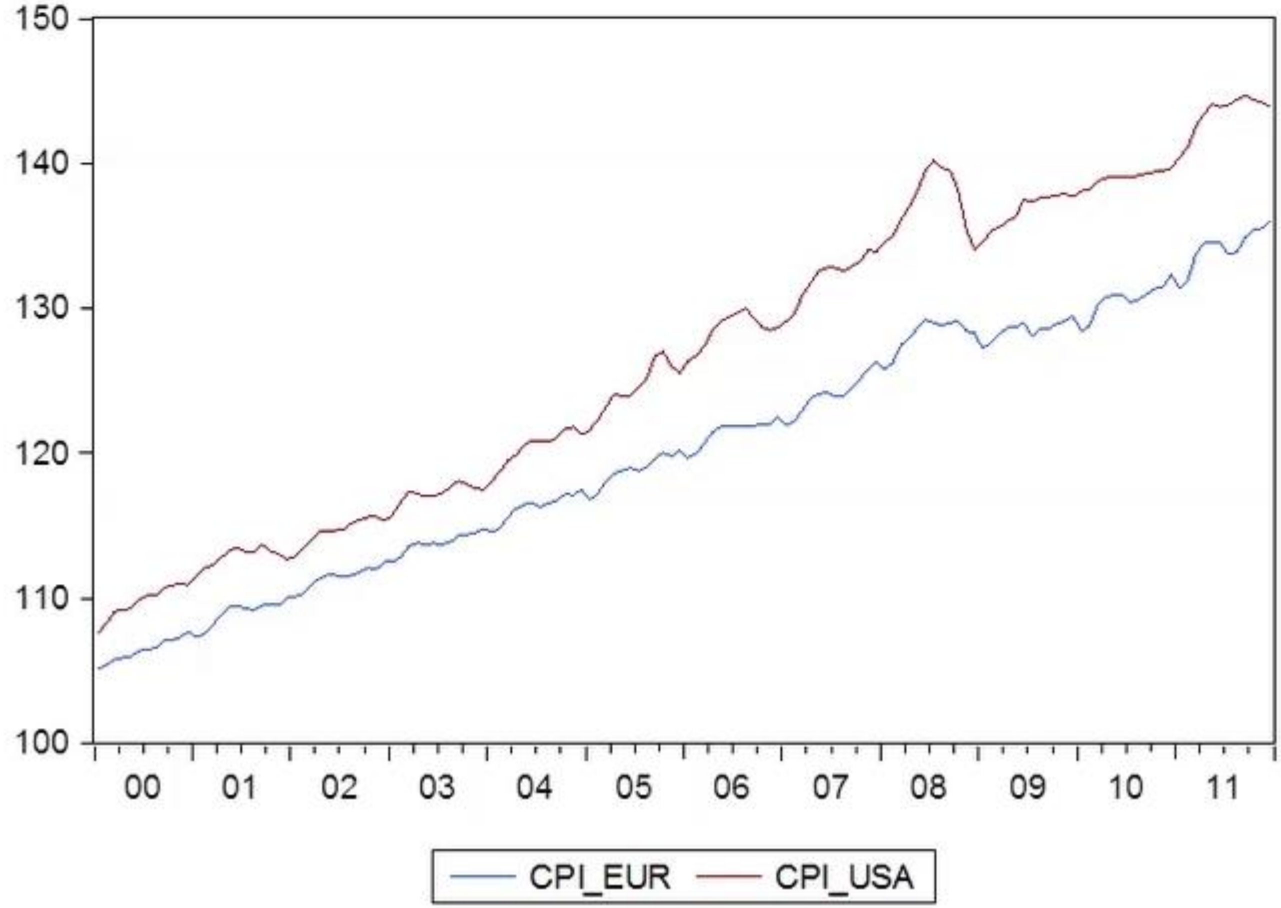
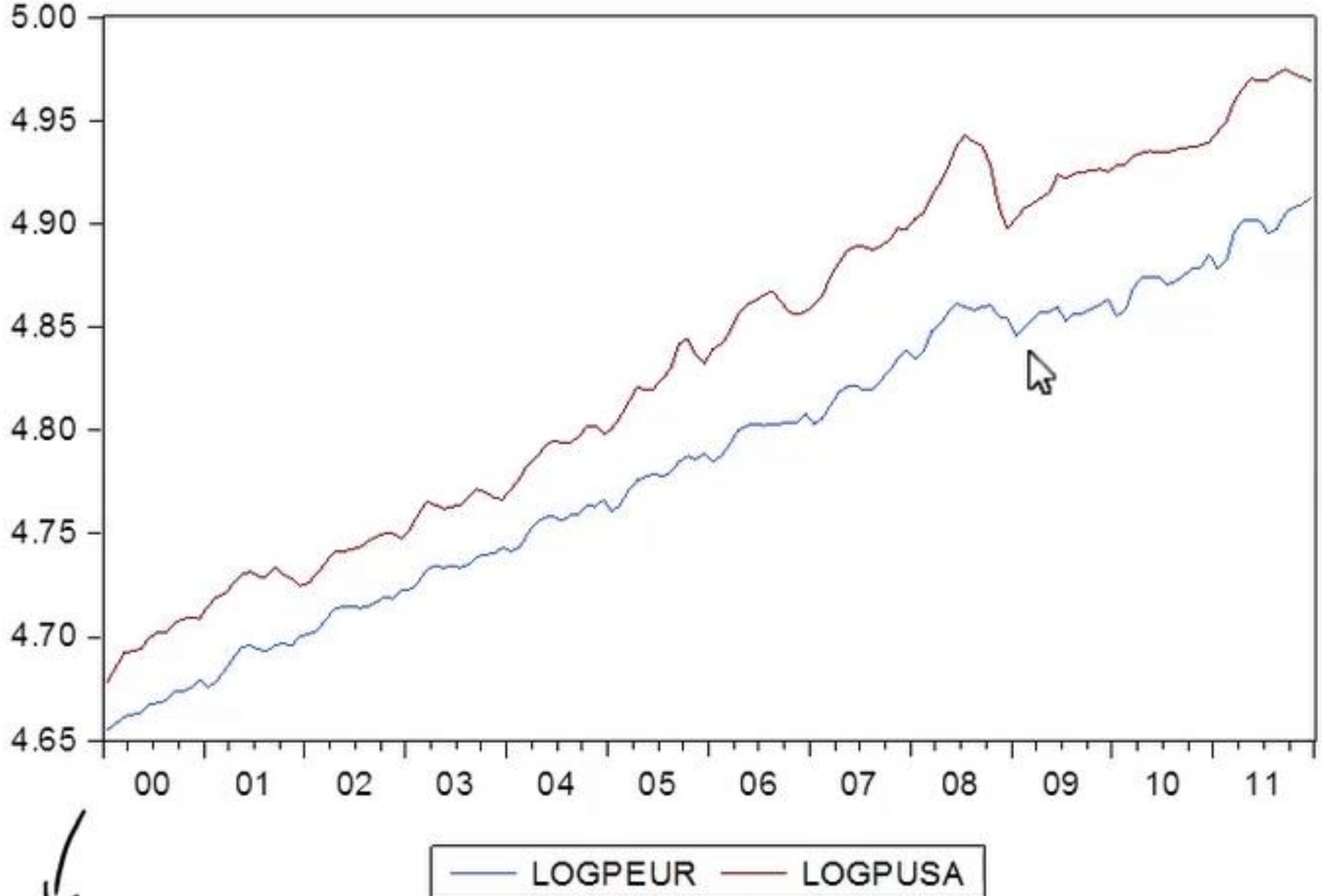
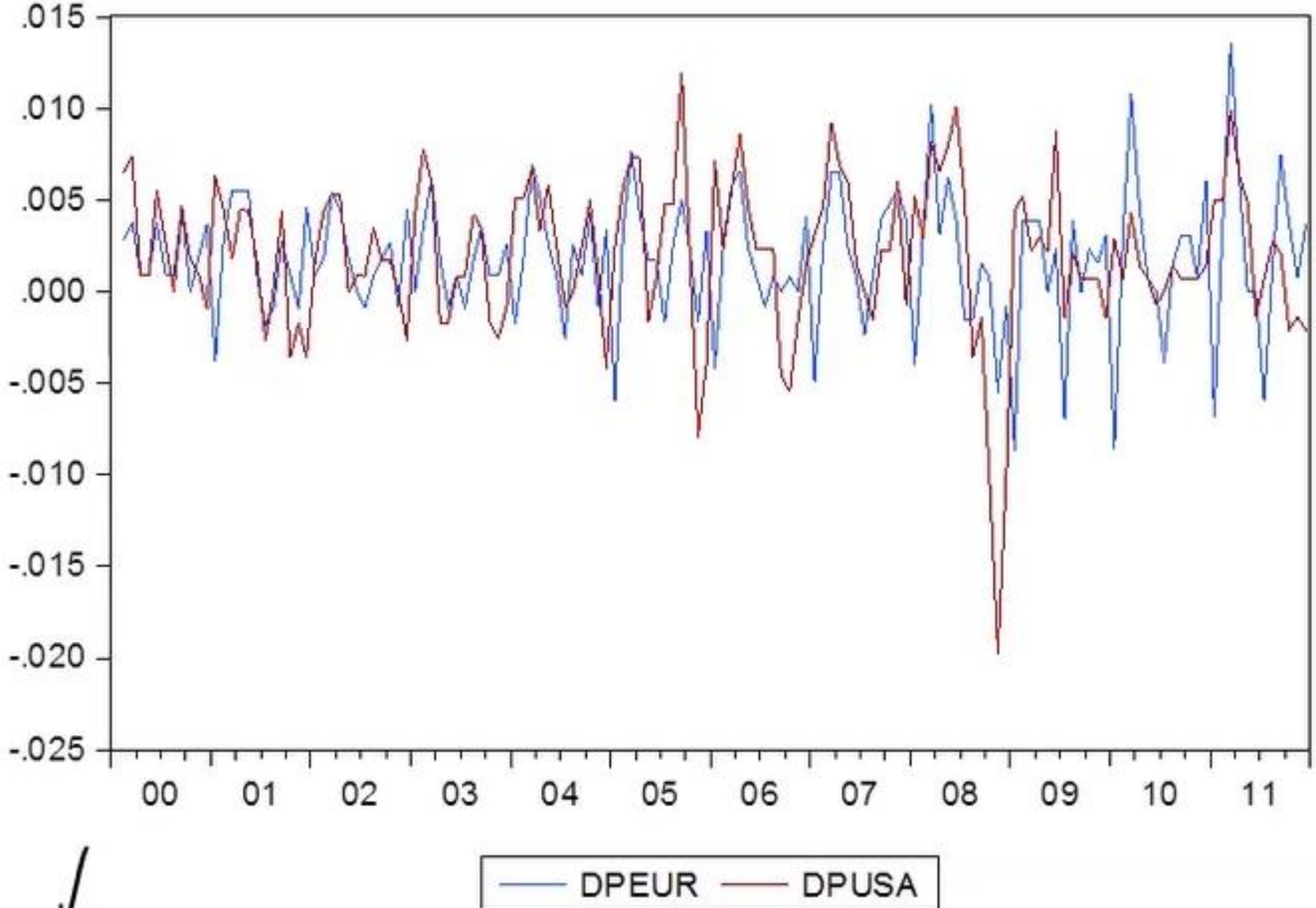
a)


150
140
130
120
110
100
00
01
02
03
04
05
06
07
08
09
10
11
CPI_EUR
CPI_USA



gap seems to widen gradually over time



rather stationary

b) include constant and trend in ADF test equation

5% critical value ADF = -3.5

EUR: coeff of $\log(CPI_{t-1})$ has $t = -2.45 > -3.5$

US: coeff of $\log(CPI_{t-1})$ has $t = -2.40 > -3.5$

$\rightarrow$ H_0 of non-stationarity is not rejected

$\rightarrow$ take the differences

c)

	AC	PAC
lag 6	0.403	0.374
lag 12	0.554	0.398

→ motivates lag 6 & 12 in the AR model

$$DPEUR_t = 0.00 + 0.19\, DPEUR_{t-6} + 0.60\, DPEUR_{t-12} + e_t$$

d) Results of extended model:

$$DpEUR_t = 0.00 + 0.20\,DpEUR_{t-6} + 0.64\,DpEUR_{t-12} + 0.23\,DpUSA_{t-1}$$

$$- 0.06\,DpUSA_{t-6} - 0.23\,DpUSA_{t-12} + e_t$$

t-stat = −1.0234

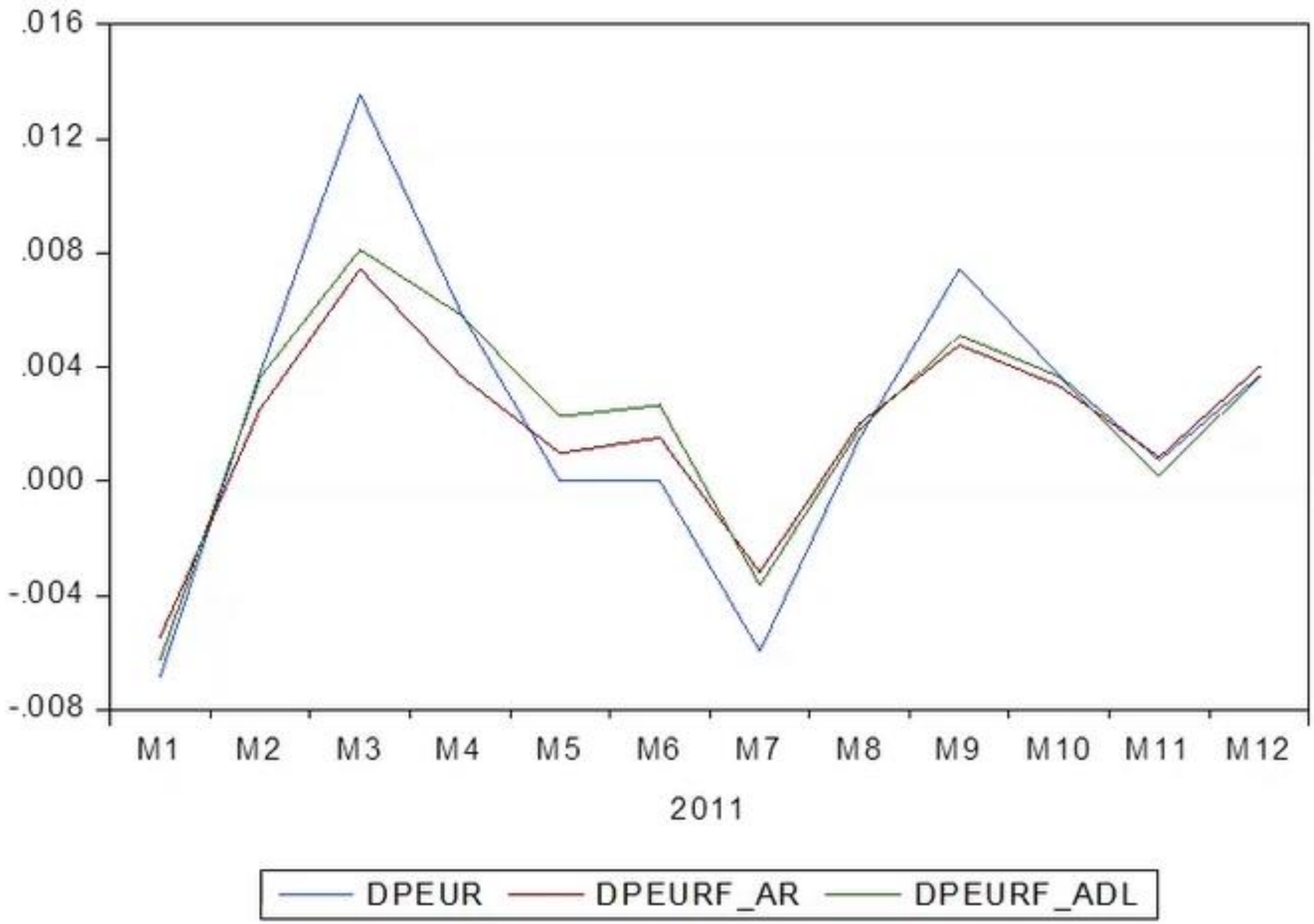
p-value = 0.3033 → not significant

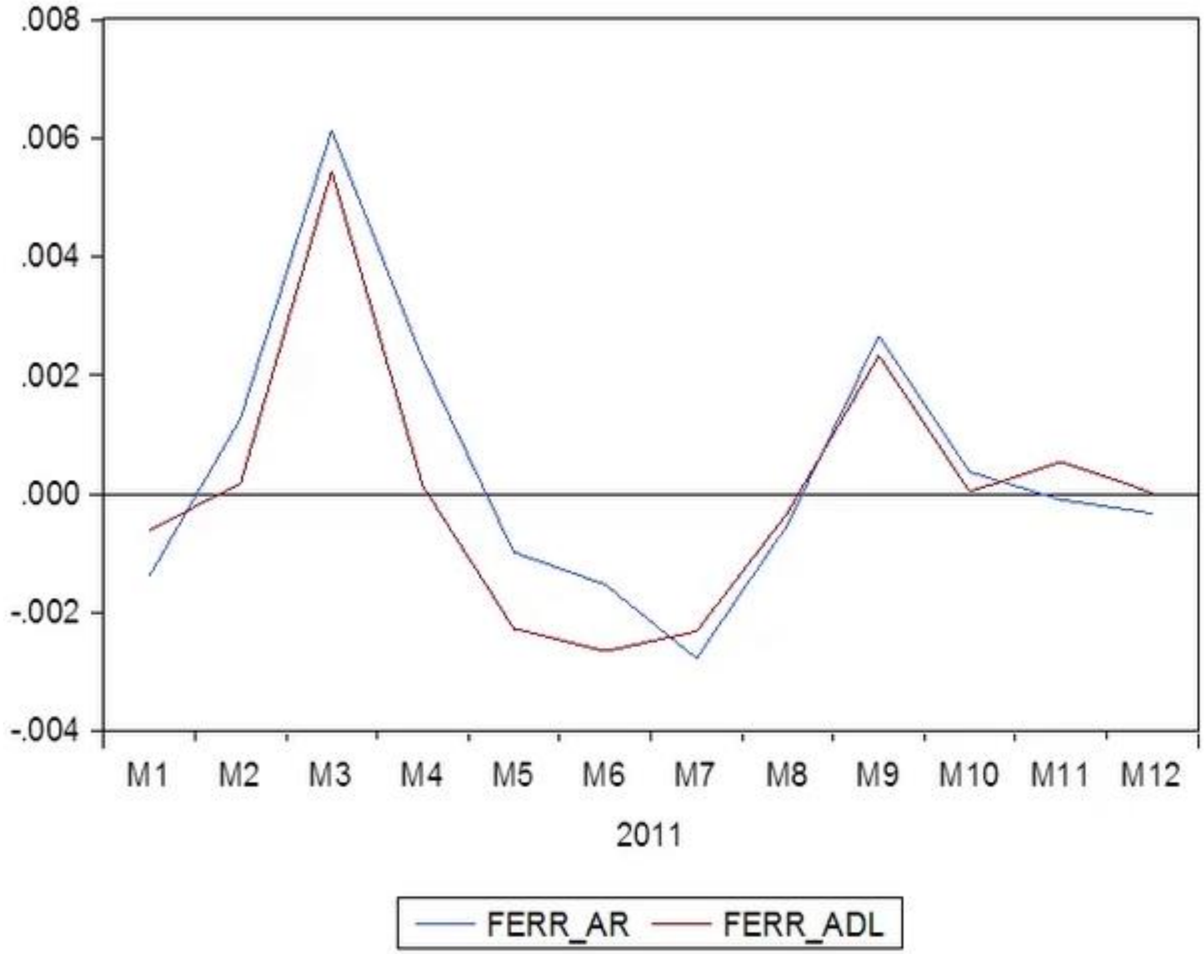
ADL without $DpUSA_{t-6}$:

$$DpEUR_t = 0.00 + 0.17\,DpEUR_{t-6} + 0.66\,DpEUR_{t-12} + 0.23\,DpUSA_{t-1}$$

$$- 0.23\,DpUSA_{t-12} + e_t$$

e)


.016
.012
.008
.004
.000
-.004
-.008
M1 M2 M3 M4 M5 M6 M7 M8 M9 M10 M11 M12
2011
DPEUR
DPEURF_AR
DPEURF_ADL



forecast errors

	AR (lags 6 & 12)	ADL (AR lags 6 & 12, DL lags 1 & 12)
RMSE	0.0023	0.0021
MAE	0.0017	0.0014
SUM	0.0051	0.0005

0.51% overestimation

slightly better

0.05% overestimation

inflation for the USA has some predictive power for out-of-sample prediction of inflation in the Euro area.

→ conforms in-sample result part (d), where lagged USA inflation was sign (at 1 & 12) in the model for current Euro area inflation.