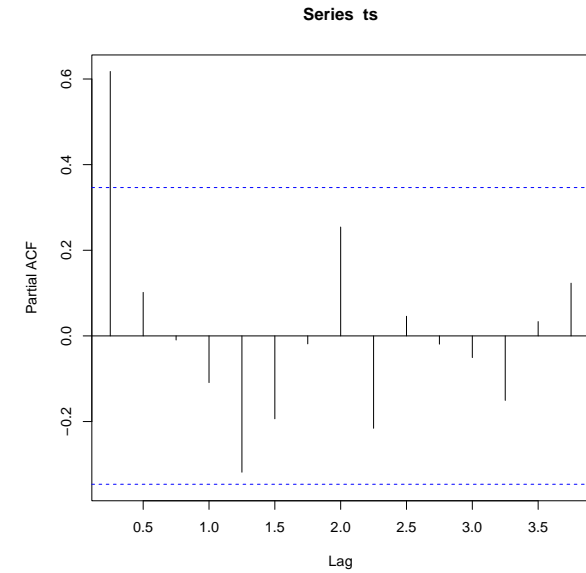
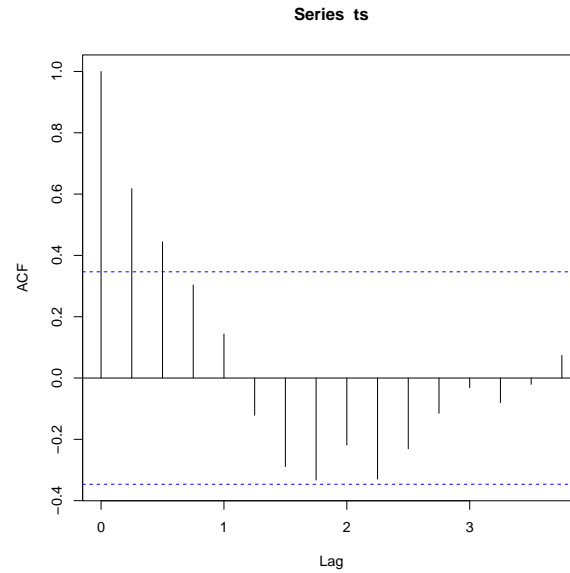
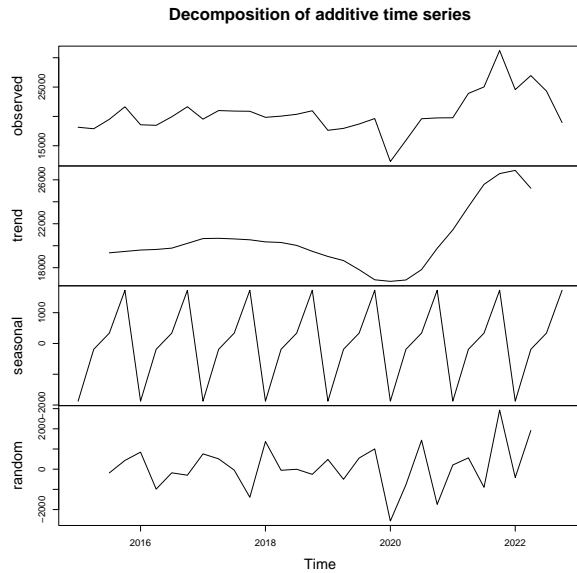




1 (S)ARIMA

1.1 FRANKFURT/MAIN airport - BEIJING/CAPITAL airport



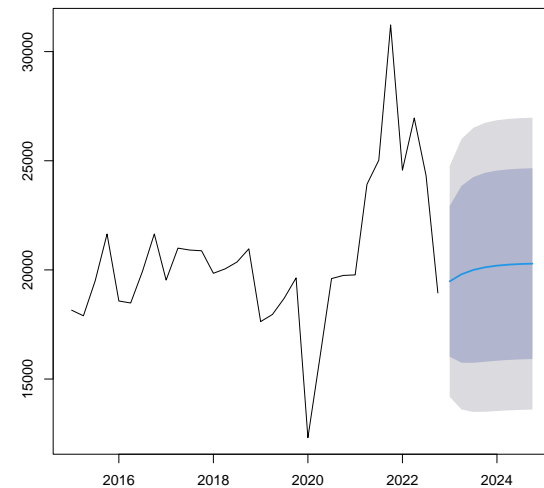
Augmented Dickey-Fuller Test

```
data: ts
Dickey-Fuller = -2.1119, Lag order = 3, p-value = 0.5297
alternative hypothesis: stationary
```

KPSS Test for Level Stationarity

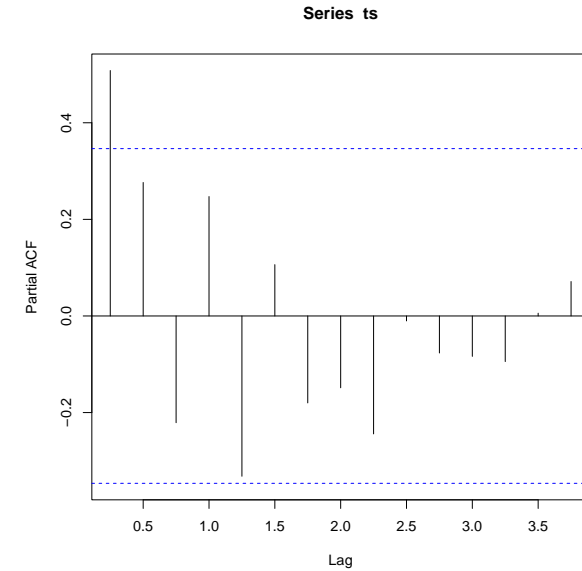
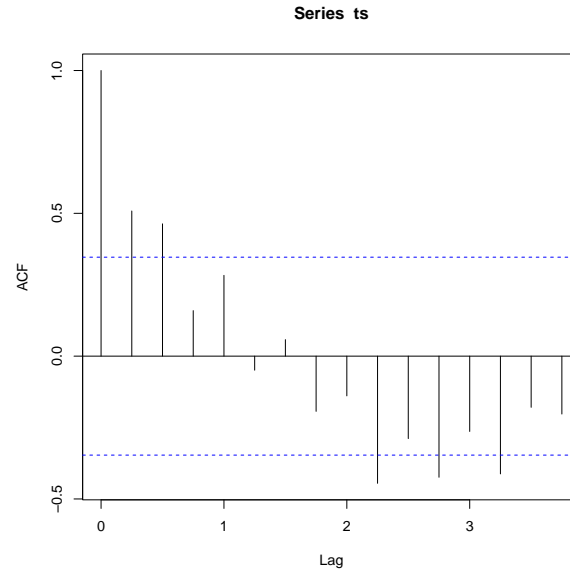
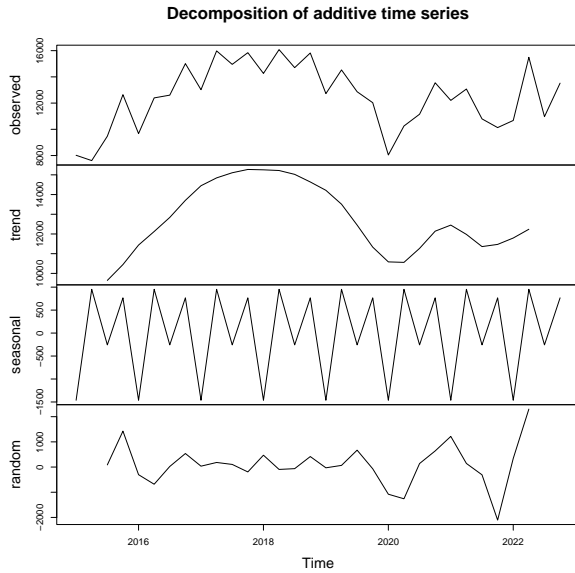
```
data: ts
KPSS Level = 0.26594, Truncation lag parameter = 3, p-value = 0.1
```

Forecasts from ARIMA(1,0,0) with non-zero mean





1.2 FRANKFURT/MAIN airport - GUANGZHOU/BAIYUN airport



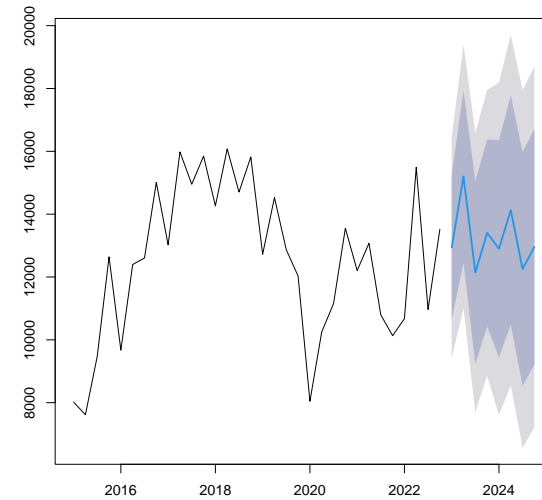
Augmented Dickey-Fuller Test

```
data: ts
Dickey-Fuller = -1.8297, Lag order = 3, p-value = 0.6385
alternative hypothesis: stationary
```

KPSS Test for Level Stationarity

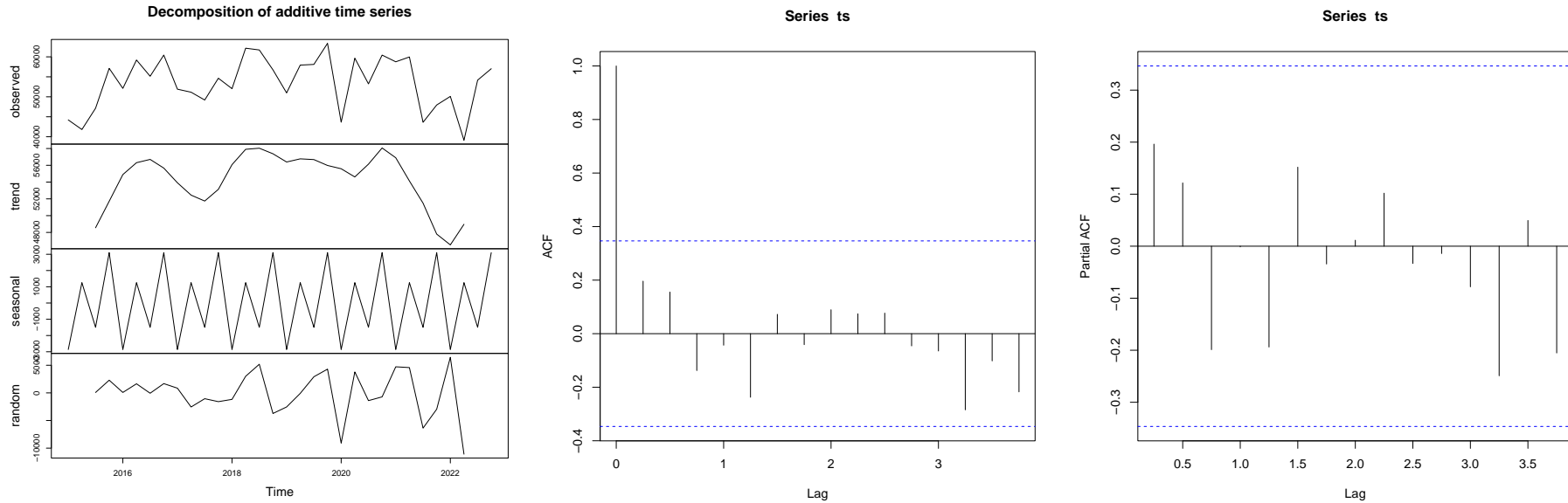
```
data: ts
KPSS Level = 0.15318, Truncation lag parameter = 3, p-value = 0.1
```

Forecasts from ARIMA(1,0,0)(1,0,0)[4] with non-zero mean





1.3 FRANKFURT/MAIN airport - SHANGHAI/PUDONG airport



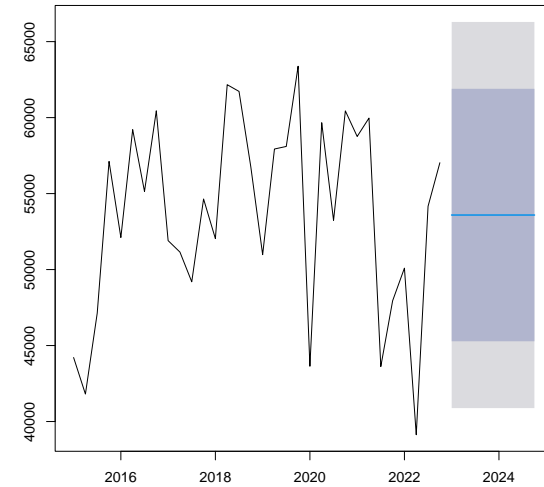
Augmented Dickey-Fuller Test

```
data: ts
Dickey-Fuller = -2.7939, Lag order = 3, p-value = 0.2665
alternative hypothesis: stationary
```

KPSS Test for Level Stationarity

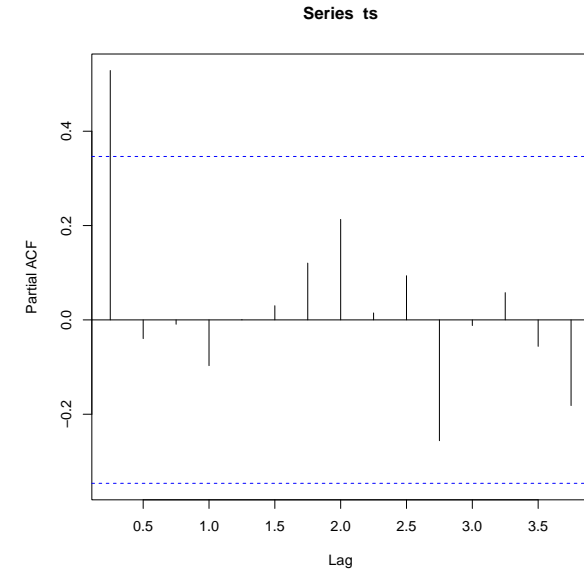
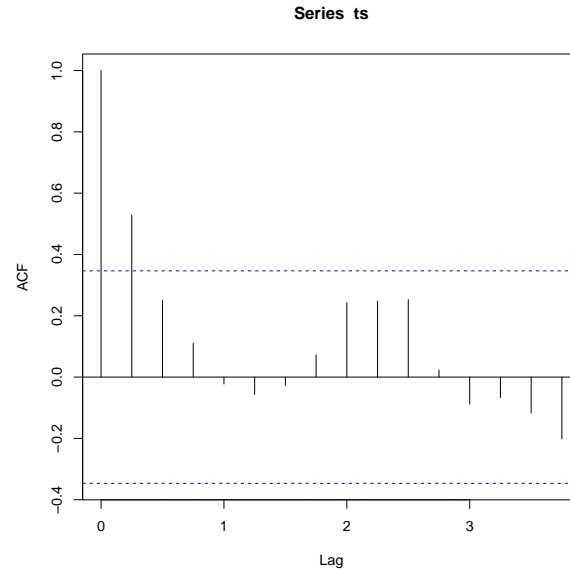
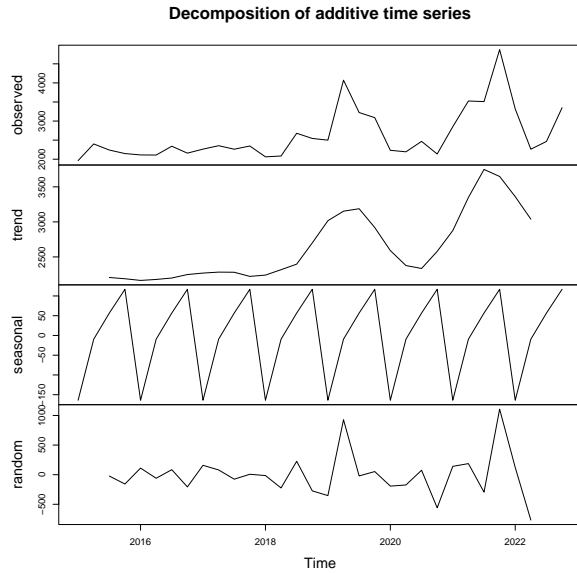
```
data: ts
KPSS Level = 0.14207, Truncation lag parameter = 3, p-value = 0.1
```

Forecasts from ARIMA(0,0,0) with non-zero mean





1.4 KOELN/BONN airport - GUANGZHOU/BAIYUN airport

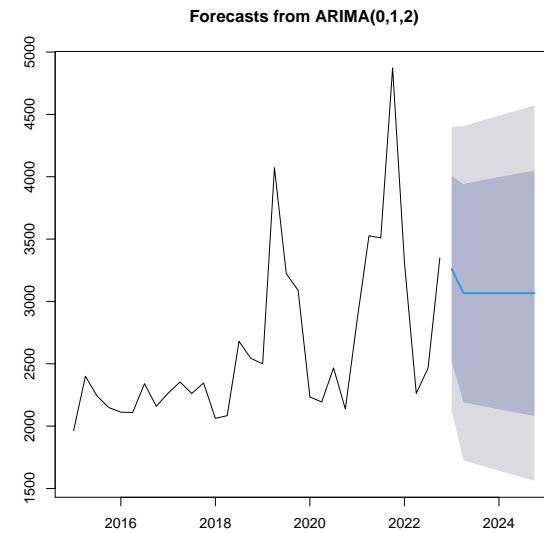


Augmented Dickey-Fuller Test

```
data: ts
Dickey-Fuller = -4.2491, Lag order = 3, p-value = 0.01277
alternative hypothesis: stationary
```

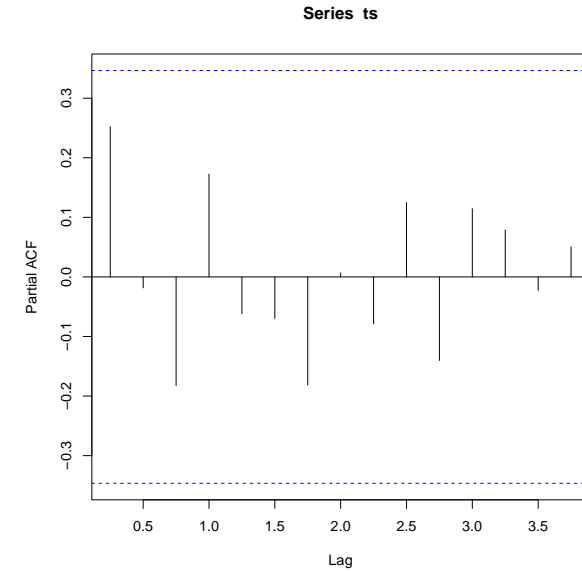
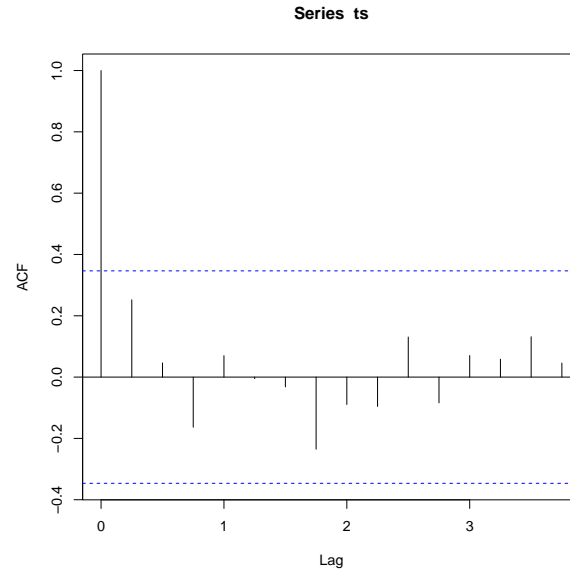
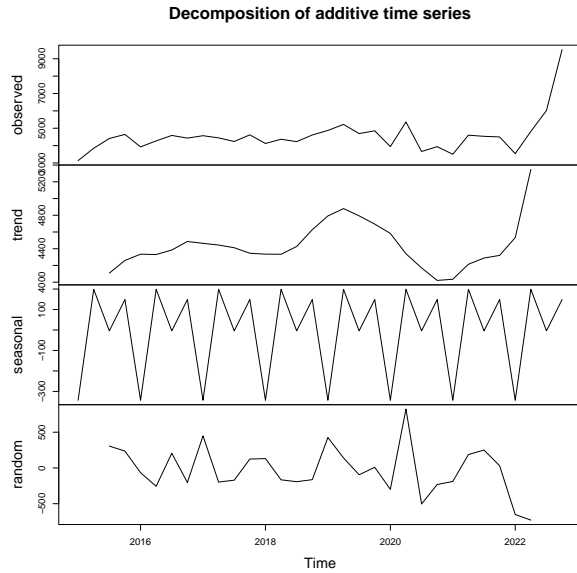
KPSS Test for Level Stationarity

```
data: ts
KPSS Level = 0.5149, Truncation lag parameter = 3, p-value = 0.03831
```





1.5 KOELN/BONN airport - SHENZHEN/BAOAN airport



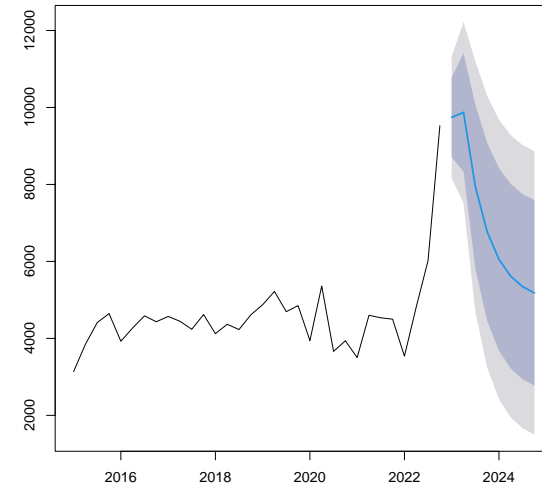
Augmented Dickey-Fuller Test

```
data: ts
Dickey-Fuller = -0.17785, Lag order = 3, p-value = 0.9897
alternative hypothesis: stationary
```

KPSS Test for Level Stationarity

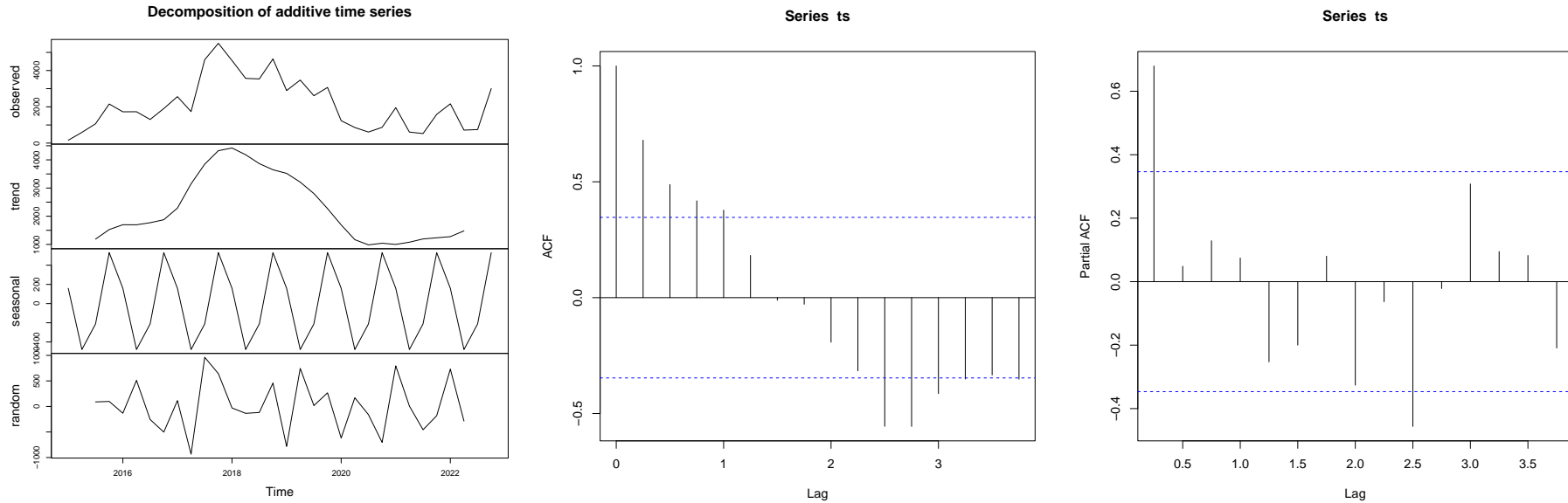
```
data: ts
KPSS Level = 0.34768, Truncation lag parameter = 3, p-value = 0.09971
```

Forecasts from ARIMA(1,0,2) with non-zero mean





1.6 KOELN/BONN airport - SHANGHAI/PUDONG airport



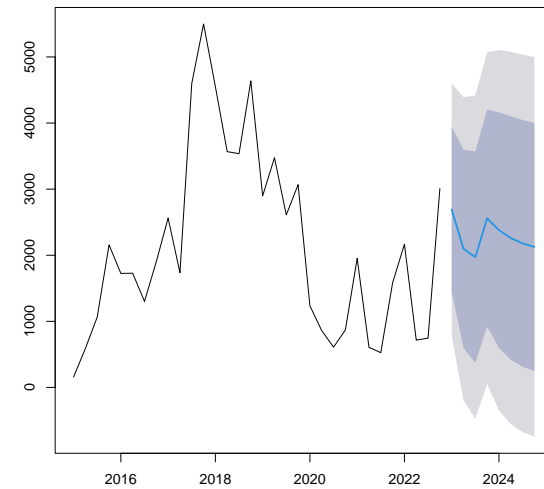
Augmented Dickey-Fuller Test

```
data: ts
Dickey-Fuller = -1.5581, Lag order = 3, p-value = 0.7433
alternative hypothesis: stationary
```

KPSS Test for Level Stationarity

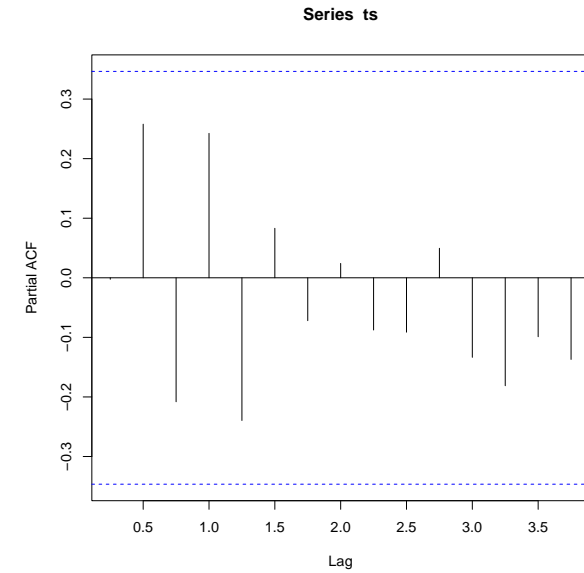
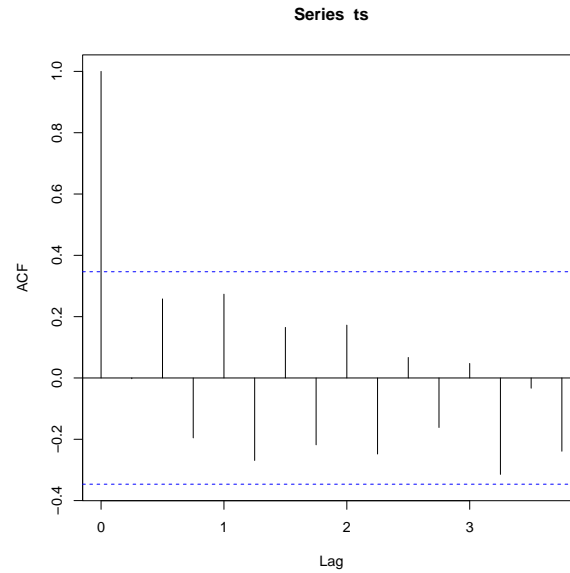
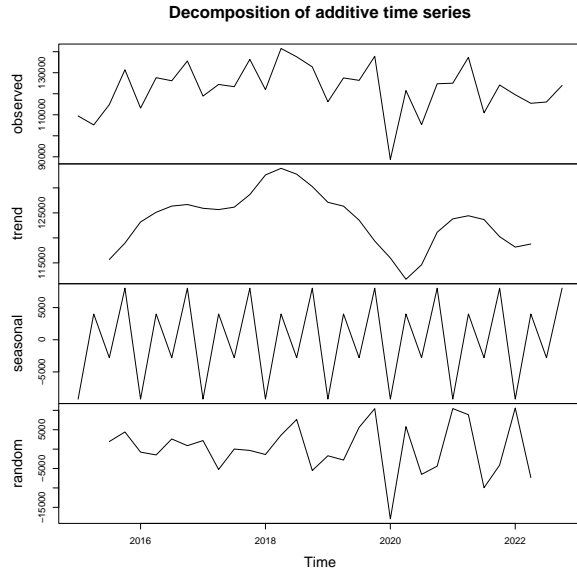
```
data: ts
KPSS Level = 0.19354, Truncation lag parameter = 3, p-value = 0.1
```

Forecasts from ARIMA(1,0,0)(0,0,1)[4] with non-zero mean





1.7 Germany - China total



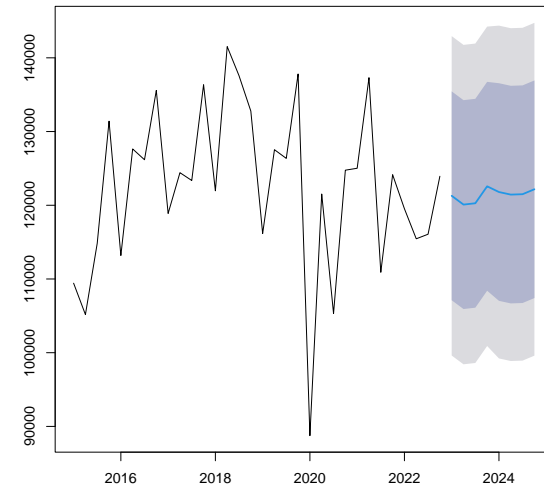
Augmented Dickey-Fuller Test

data: ts
 Dickey-Fuller = -2.2043, Lag order = 3, p-value = 0.494
 alternative hypothesis: stationary

KPSS Test for Level Stationarity

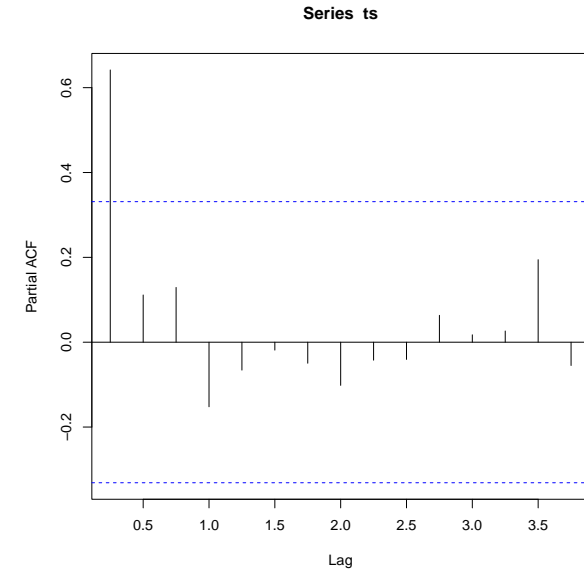
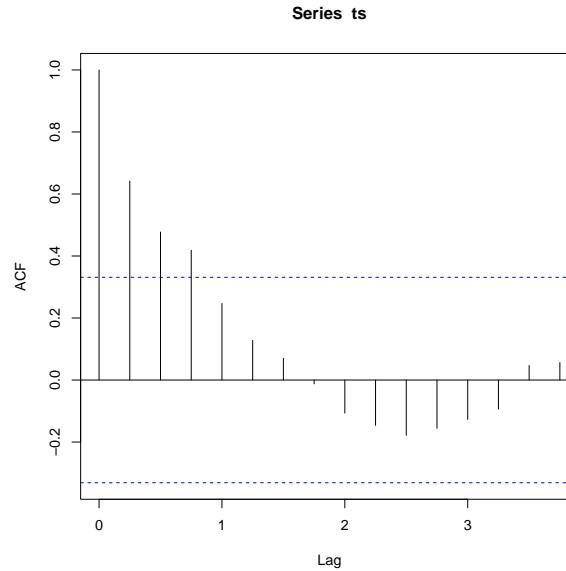
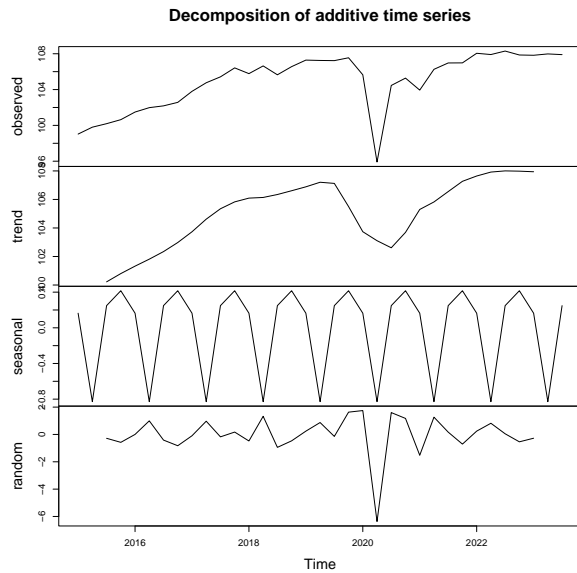
data: ts
 KPSS Level = 0.14209, Truncation lag parameter = 3, p-value = 0.1

Forecasts from ARIMA(0,0,0)(1,0,0)[4] with non-zero mean





1.8 HDP v miliardách eur

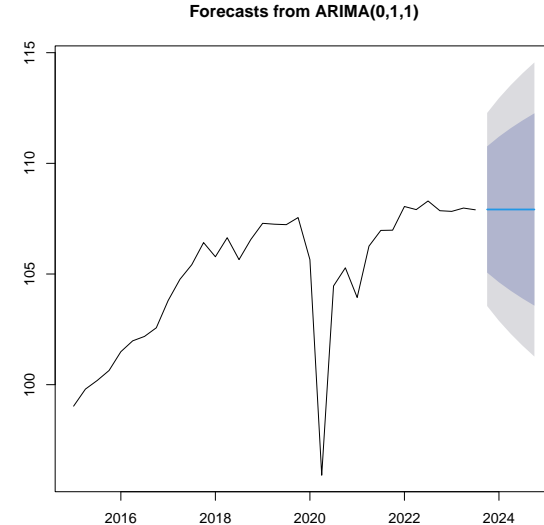


Augmented Dickey-Fuller Test

```
data: ts
Dickey-Fuller = -2.3548, Lag order = 3, p-value = 0.4353
alternative hypothesis: stationary
```

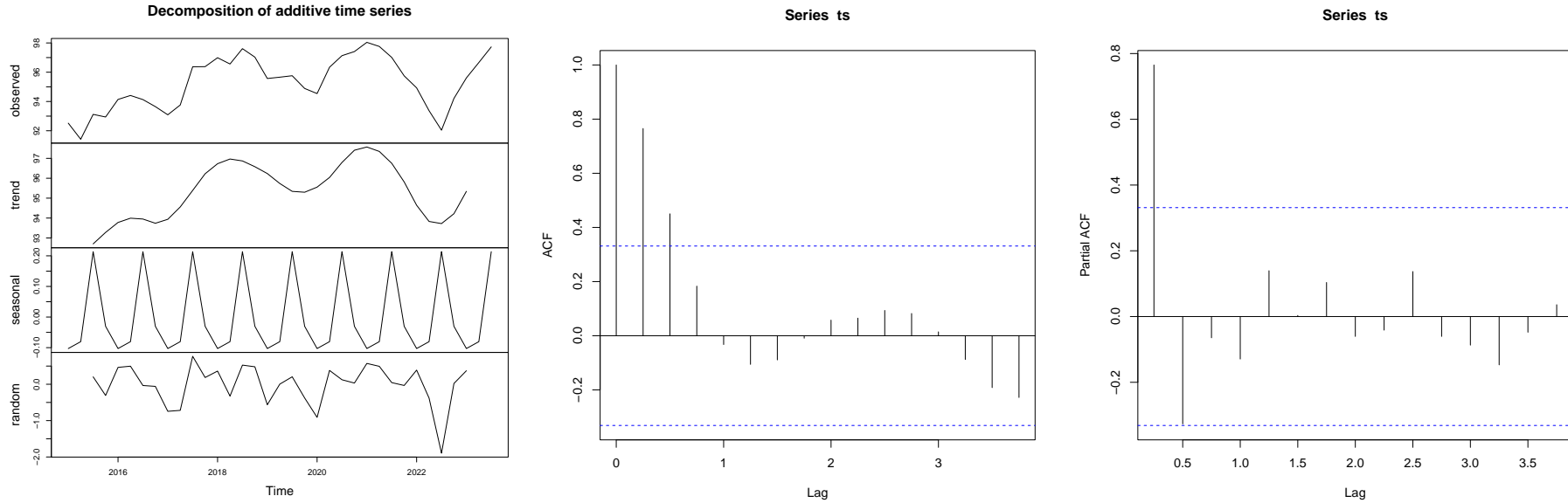
KPSS Test for Level Stationarity

```
data: ts
KPSS Level = 0.60787, Truncation lag parameter = 3, p-value = 0.02192
```





1.9 Real Effective Exchange Rate, based on Consumer Price Index

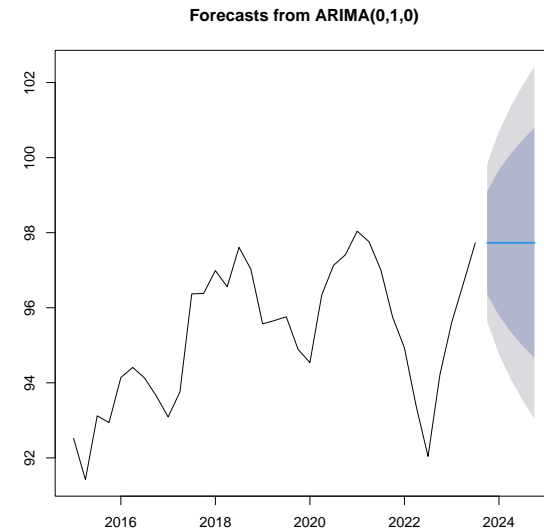


Augmented Dickey-Fuller Test

```
data: ts
Dickey-Fuller = -3.1776, Lag order = 3, p-value = 0.1159
alternative hypothesis: stationary
```

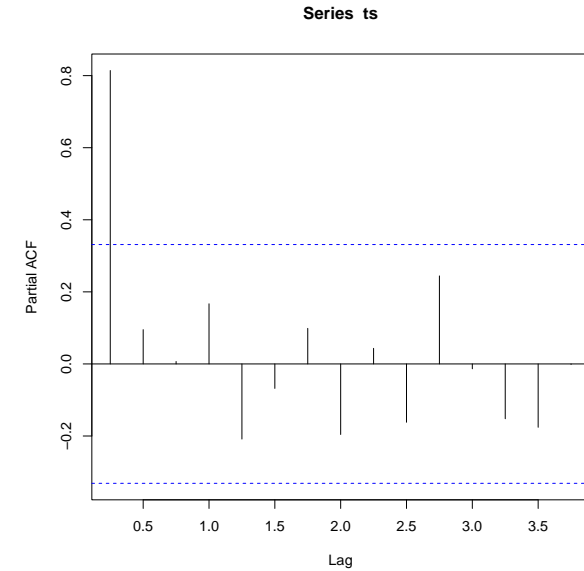
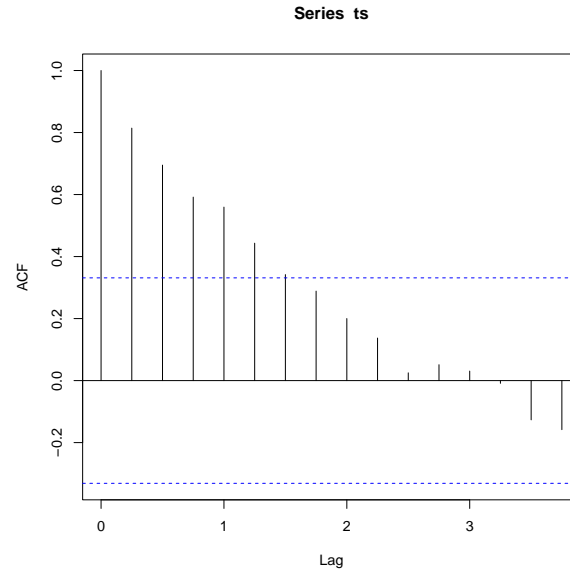
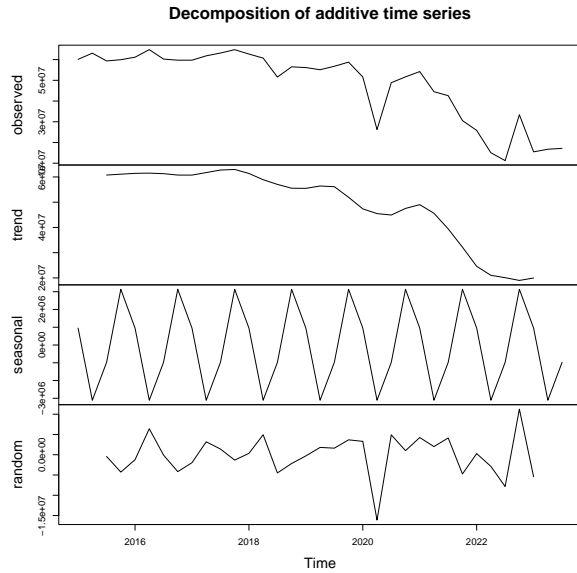
KPSS Test for Level Stationarity

```
data: ts
KPSS Level = 0.3573, Truncation lag parameter = 3, p-value = 0.09556
```





1.10 Saldo zahraničního obchodu (v tis. Eur)



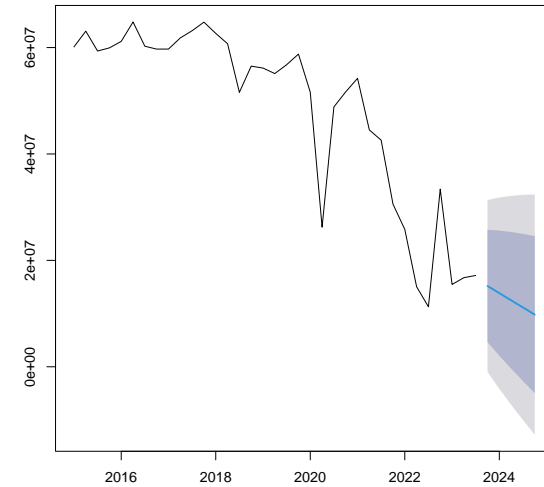
Augmented Dickey-Fuller Test

data: ts
 Dickey-Fuller = -1.9767, Lag order = 3, p-value = 0.5821
 alternative hypothesis: stationary

KPSS Test for Level Stationarity

data: ts
 KPSS Level = 0.8198, Truncation lag parameter = 3, p-value = 0.01

Forecasts from ARIMA(0,1,1) with drift



elapsed

29.44 sec



2 GLM

2.1 FRANKFURT/MAIN airport - BEIJING/CAPITAL airport

Call:

```
glm(formula = ts[, 1] ~ ts[, 2:6])
```

Coefficients:

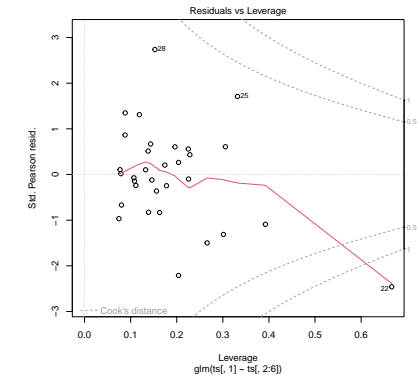
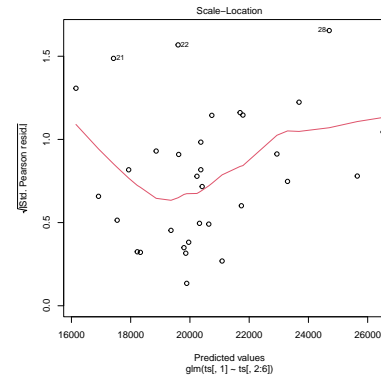
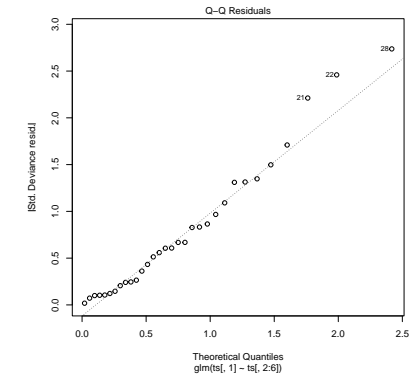
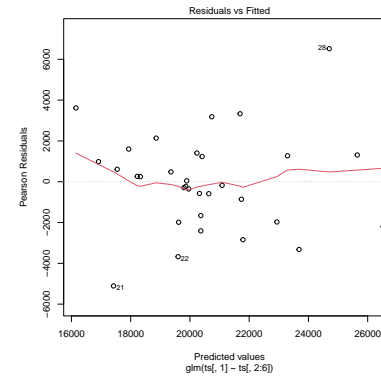
	Estimate	Std. Error	t value	Pr(> t)	
(Intercept)	-9.512e+04	4.564e+04	-2.084	0.04711	*
ts[, 2:6]Time	-4.210e+02	1.659e+02	-2.539	0.01746	*
ts[, 2:6]Quarter	8.417e+02	4.154e+02	2.026	0.05312	.
ts[, 2:6]HDP	6.840e+02	2.353e+02	2.907	0.00737	**
ts[, 2:6]CPI	6.661e+02	3.948e+02	1.687	0.10350	
ts[, 2:6]Saldo	-2.847e-04	8.230e-05	-3.459	0.00188	**

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for gaussian family taken to be 6700792)

Null deviance: 357329307 on 31 degrees of freedom
 Residual deviance: 174220583 on 26 degrees of freedom
 AIC: 601.14

Number of Fisher Scoring iterations: 2





2.2 FRANKFURT/MAIN airport - GUANGZHOU/BAIYUN airport

Call:

```
glm(formula = ts[, 1] ~ ts[, 2:6])
```

Coefficients:

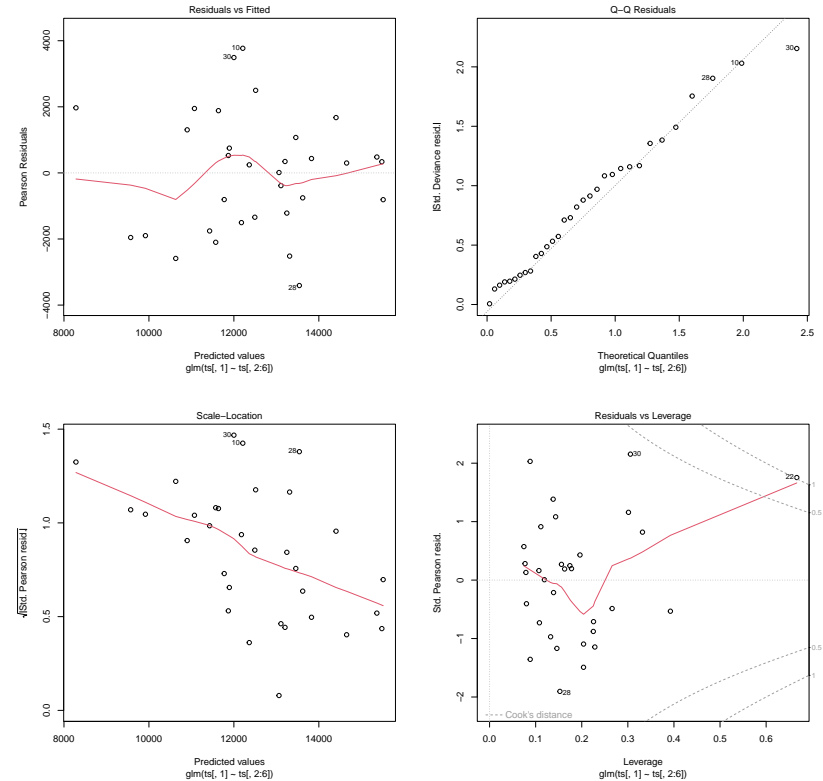
	Estimate	Std. Error	t value	Pr(> t)	
(Intercept)	-1.134e+05	3.429e+04	-3.306	0.00277	**
ts[, 2:6]Time	-2.703e+02	1.246e+02	-2.169	0.03942	*
ts[, 2:6]Quarter	4.986e+02	3.121e+02	1.598	0.12218	
ts[, 2:6]HDP	6.007e+02	1.768e+02	3.399	0.00219	**
ts[, 2:6]CPI	7.368e+02	2.966e+02	2.484	0.01974	*
ts[, 2:6]Saldo	-7.678e-05	6.182e-05	-1.242	0.22539	

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for gaussian family taken to be 3781746)

Null deviance: 185844258 on 31 degrees of freedom
 Residual deviance: 98325384 on 26 degrees of freedom
 AIC: 582.83

Number of Fisher Scoring iterations: 2





2.3 FRANKFURT/MAIN airport - SHANGHAI/PUDONG airport

Call:

```
glm(formula = ts[, 1] ~ ts[, 2:6])
```

Coefficients:

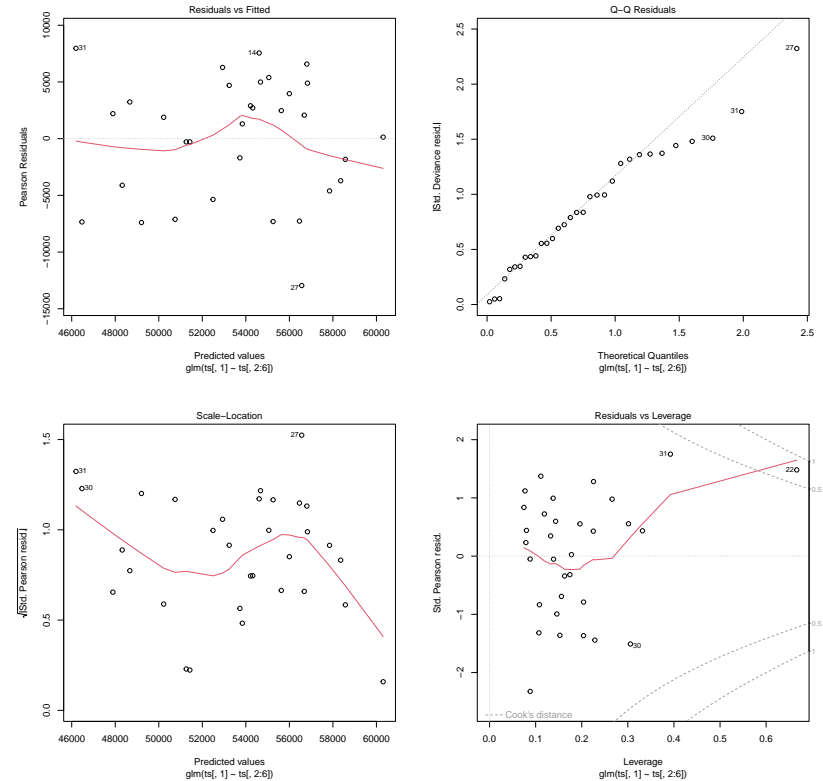
	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-3.413e+04	1.029e+05	-0.332	0.7429
ts[, 2:6]Time	1.934e+02	3.740e+02	0.517	0.6094
ts[, 2:6]Quarter	1.819e+03	9.367e+02	1.942	0.0631
ts[, 2:6]HDP	-3.786e+02	5.305e+02	-0.714	0.4819
ts[, 2:6]CPI	1.175e+03	8.902e+02	1.320	0.1984
ts[, 2:6]Saldo	1.534e-04	1.856e-04	0.827	0.4160

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for gaussian family taken to be 34070764)

Null deviance: 1302600413 on 31 degrees of freedom
 Residual deviance: 885839867 on 26 degrees of freedom
 AIC: 653.17

Number of Fisher Scoring iterations: 2





2.4 KOELN/BONN airport - GUANGZHOU/BAIYUN airport

Call:

```
glm(formula = ts[, 1] ~ ts[, 2:6])
```

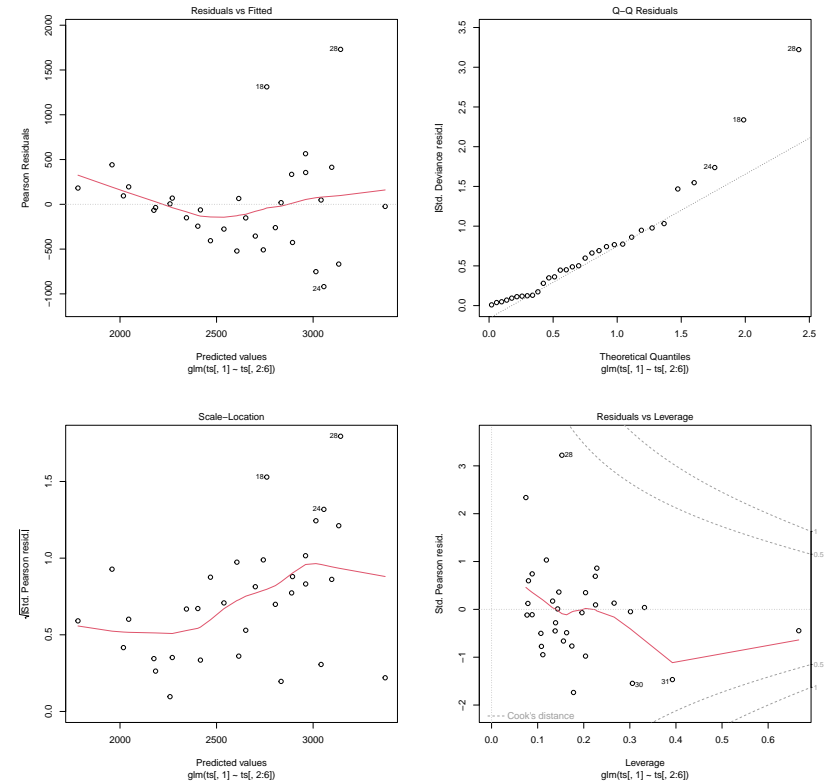
Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-9.867e+02	1.028e+04	-0.096	0.924
ts[, 2:6]Time	4.143e+01	3.737e+01	1.108	0.278
ts[, 2:6]Quarter	7.710e+01	9.361e+01	0.824	0.418
ts[, 2:6]HDP	3.233e+01	5.302e+01	0.610	0.547
ts[, 2:6]CPI	-1.063e+01	8.896e+01	-0.120	0.906
ts[, 2:6]Saldo	7.193e-06	1.854e-05	0.388	0.701

(Dispersion parameter for gaussian family taken to be 340232.8)

Null deviance: 13864468 on 31 degrees of freedom
 Residual deviance: 8846054 on 26 degrees of freedom
 AIC: 505.76

Number of Fisher Scoring iterations: 2





2.5 KOELN/BONN airport - SHENZHEN/BAOAN airport

Call:

```
glm(formula = ts[, 1] ~ ts[, 2:6])
```

Coefficients:

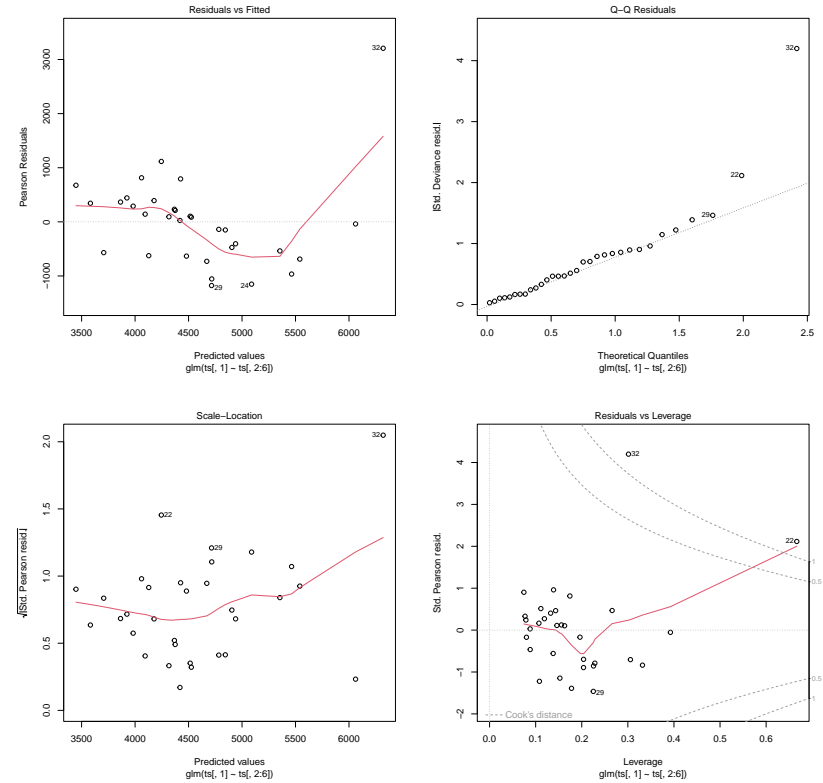
	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	3.080e+04	1.611e+04	1.912	0.0670 .
ts[, 2:6]Time	9.325e+01	5.854e+01	1.593	0.1233
ts[, 2:6]Quarter	3.185e+02	1.466e+02	2.172	0.0392 *
ts[, 2:6]HDP	-2.154e+01	8.304e+01	-0.259	0.7974
ts[, 2:6]CPI	-2.877e+02	1.393e+02	-2.065	0.0490 *
ts[, 2:6]Saldo	2.085e-05	2.905e-05	0.718	0.4794

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for gaussian family taken to be 834774.9)

Null deviance: 35417279 on 31 degrees of freedom
 Residual deviance: 21704147 on 26 degrees of freedom
 AIC: 534.48

Number of Fisher Scoring iterations: 2





2.6 KOELN/BONN airport - SHANGHAI/PUDONG airport

Call:

```
glm(formula = ts[, 1] ~ ts[, 2:6])
```

Coefficients:

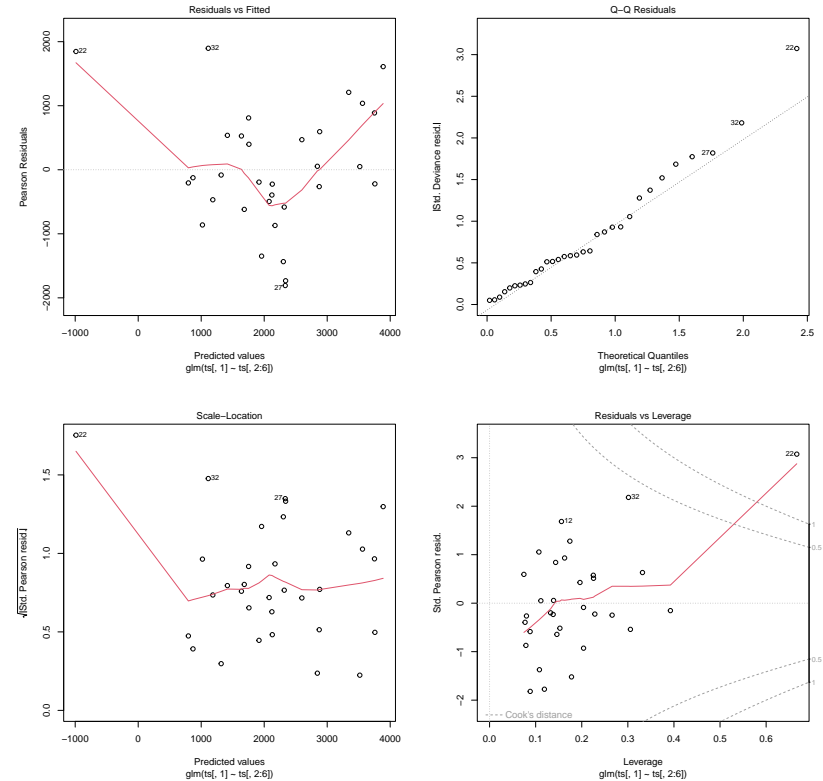
	Estimate	Std. Error	t value	Pr(> t)	
(Intercept)	-7.038e+04	1.835e+04	-3.836	0.000715	***
ts[, 2:6]Time	-1.540e+02	6.667e+01	-2.310	0.029066	*
ts[, 2:6]Quarter	1.486e+02	1.670e+02	0.890	0.381681	
ts[, 2:6]HDP	3.628e+02	9.458e+01	3.836	0.000716	***
ts[, 2:6]CPI	3.968e+02	1.587e+02	2.501	0.019025	*
ts[, 2:6]Saldo	-2.050e-05	3.308e-05	-0.620	0.540920	

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for gaussian family taken to be 1082683)

Null deviance: 62173103 on 31 degrees of freedom
 Residual deviance: 28149754 on 26 degrees of freedom
 AIC: 542.81

Number of Fisher Scoring iterations: 2





0.31 sec elapsed

3 (S)ARIMA + GLM

3.1 FRANKFURT/MAIN airport - BEIJING/CAPITAL airport

Call:

```
glm(formula = residuals_arima ~ Time + Quarter + HDP + CPI +
     Saldo, data = ddata)
```

Coefficients:

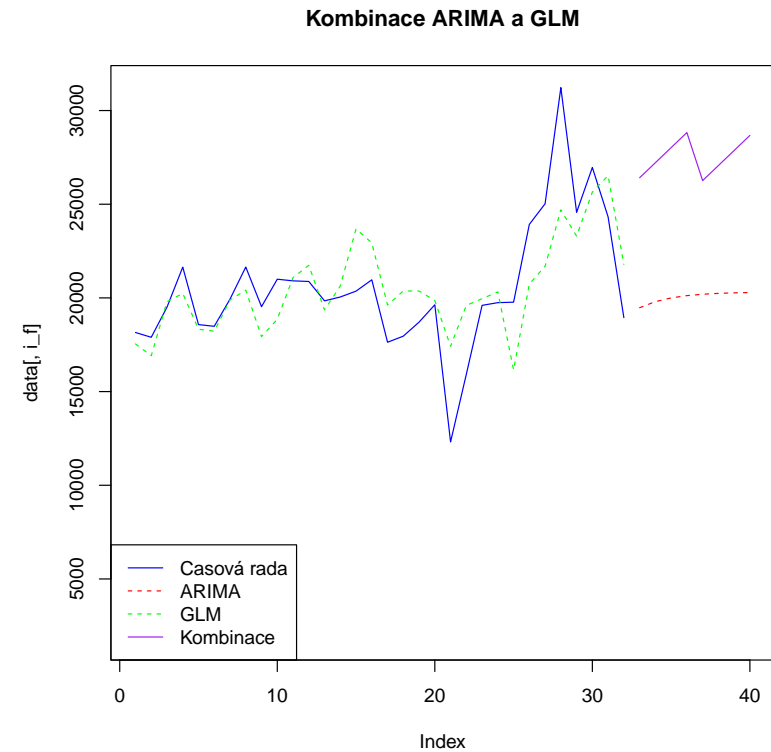
	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-7.757e+04	3.980e+04	-1.949	0.06216 .
Time	-2.754e+02	1.446e+02	-1.904	0.06802 .
Quarter	1.067e+03	3.622e+02	2.946	0.00671 **
HDP	1.139e+02	2.052e+02	0.555	0.58366
CPI	8.047e+02	3.442e+02	2.338	0.02736 *
Saldo	-1.762e-04	7.176e-05	-2.456	0.02106 *

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for gaussian family taken to be 5094585)

Null deviance: 217829161 on 31 degrees of freedom
Residual deviance: 132459214 on 26 degrees of freedom
AIC: 592.37

Number of Fisher Scoring iterations: 2





3.2 FRANKFURT/MAIN airport - GUANGZHOU/BAIYUN airport

Call:

```
glm(formula = residuals_arima ~ Time + Quarter + HDP + CPI +
     Saldo, data = ddata)
```

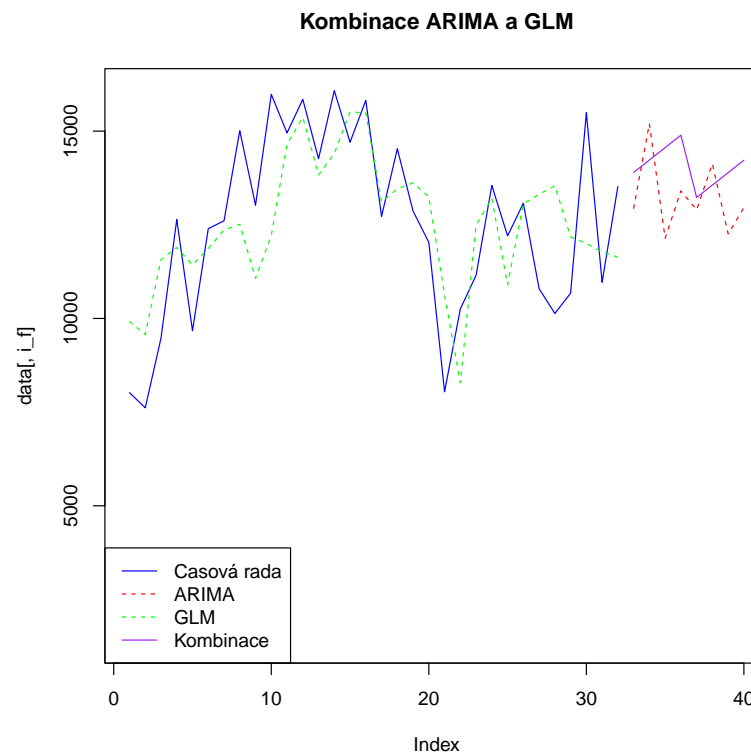
Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-2.638e+03	3.252e+04	-0.081	0.936
Time	-4.589e+00	1.182e+02	-0.039	0.969
Quarter	2.744e+02	2.960e+02	0.927	0.362
HDP	-2.824e+01	1.677e+02	-0.168	0.868
CPI	5.395e+01	2.813e+02	0.192	0.849
Saldo	1.058e-06	5.865e-05	0.018	0.986

(Dispersion parameter for gaussian family taken to be 3402908)

Null deviance: 91796930 on 31 degrees of freedom
 Residual deviance: 88475615 on 26 degrees of freedom
 AIC: 579.45

Number of Fisher Scoring iterations: 2





3.3 FRANKFURT/MAIN airport - SHANGHAI/PUDONG airport

Call:

```
glm(formula = residuals_arima ~ Time + Quarter + HDP + CPI +
     Saldo, data = ddata)
```

Coefficients:

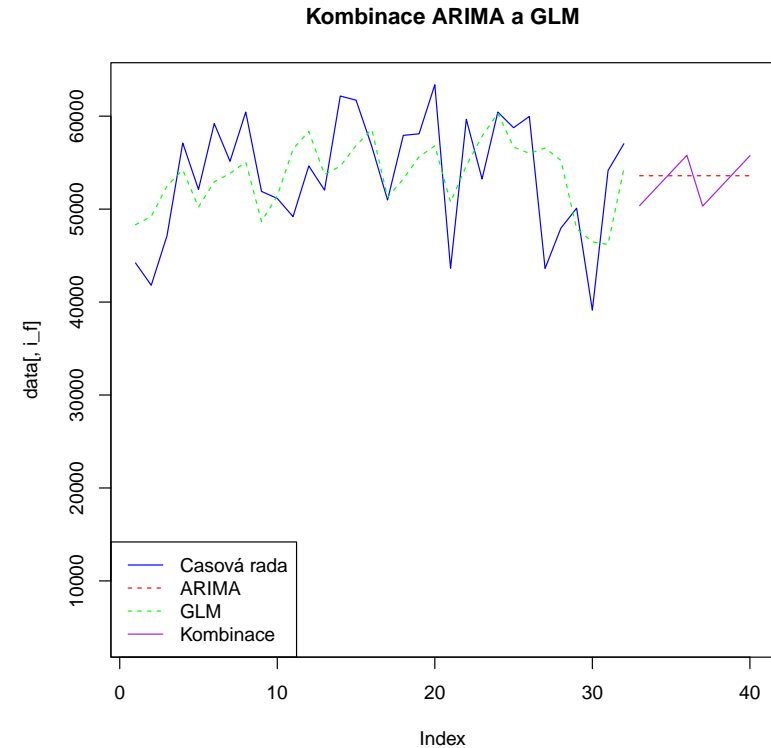
	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-8.771e+04	1.029e+05	-0.852	0.4018
Time	1.934e+02	3.740e+02	0.517	0.6094
Quarter	1.819e+03	9.367e+02	1.942	0.0631 .
HDP	-3.786e+02	5.305e+02	-0.714	0.4819
CPI	1.175e+03	8.902e+02	1.320	0.1984
Saldo	1.534e-04	1.856e-04	0.827	0.4160

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for gaussian family taken to be 34070764)

Null deviance: 1302600413 on 31 degrees of freedom
 Residual deviance: 885839867 on 26 degrees of freedom
 AIC: 653.17

Number of Fisher Scoring iterations: 2





3.4 KOELN/BONN airport - GUANGZHOU/BAIYUN airport

Call:

```
glm(formula = residuals_arima ~ Time + Quarter + HDP + CPI +
     Saldo, data = ddata)
```

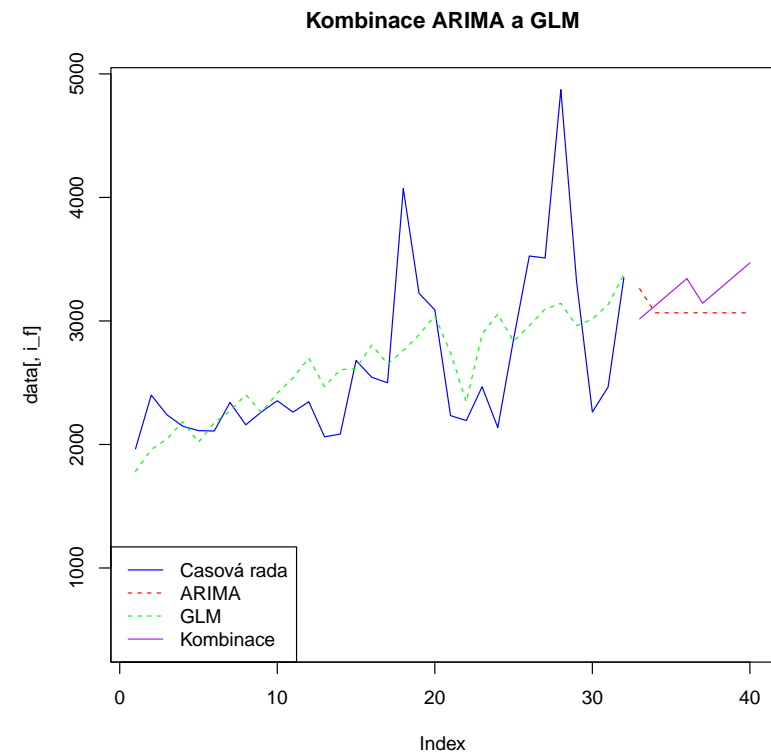
Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	1.693e+03	1.149e+04	0.147	0.884
Time	2.297e+01	4.174e+01	0.550	0.587
Quarter	1.107e+02	1.046e+02	1.059	0.299
HDP	-4.282e+01	5.921e+01	-0.723	0.476
CPI	1.597e+01	9.935e+01	0.161	0.874
Saldo	1.290e-05	2.071e-05	0.623	0.539

(Dispersion parameter for gaussian family taken to be 424432.3)

Null deviance: 12046965 on 31 degrees of freedom
 Residual deviance: 11035239 on 26 degrees of freedom
 AIC: 512.84

Number of Fisher Scoring iterations: 2





3.5 KOELN/BONN airport - SHENZHEN/BAOAN airport

Call:

```
glm(formula = residuals_arima ~ Time + Quarter + HDP + CPI +
     Saldo, data = ddata)
```

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)		
(Intercept)	2.161e+04	1.462e+04	1.478	0.1514		
Time	5.294e+01	5.313e+01	0.996	0.3283		
Quarter	2.688e+02	1.331e+02	2.020	0.0538 .		
HDP	-4.773e+01	7.537e+01	-0.633	0.5321		
CPI	-1.907e+02	1.265e+02	-1.508	0.1435		
Saldo	1.090e-06	2.636e-05	0.041	0.9673		

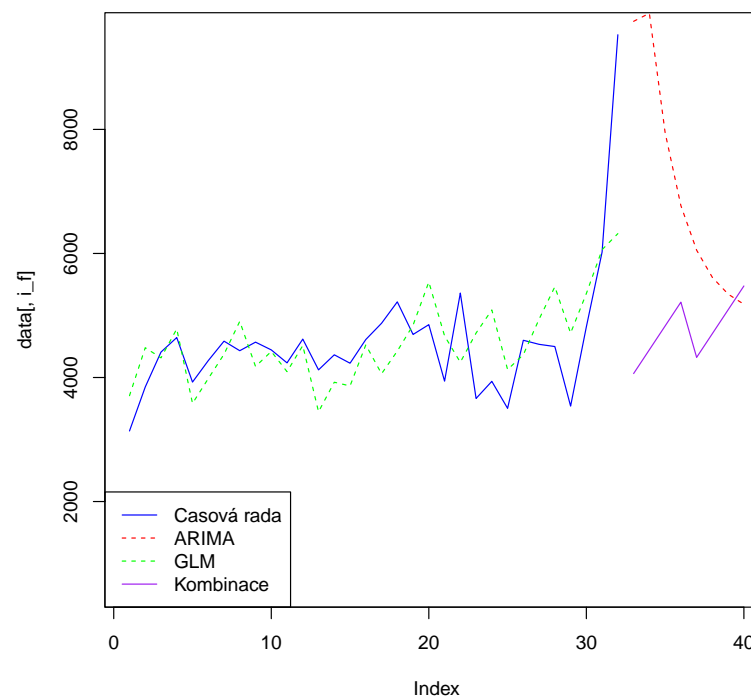
Signif. codes:	0 '***'	0.001 '**'	0.01 '*'	0.05 '.'	0.1 ' '	1

(Dispersion parameter for gaussian family taken to be 687603.8)

Null deviance: 26339647 on 31 degrees of freedom
 Residual deviance: 17877700 on 26 degrees of freedom
 AIC: 528.28

Number of Fisher Scoring iterations: 2

Kombinace ARIMA a GLM





3.6 KOELN/BONN airport - SHANGHAI/PUDONG airport

Call:

```
glm(formula = residuals_arima ~ Time + Quarter + HDP + CPI +
     Saldo, data = ddata)
```

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-9.512e+03	1.557e+04	-0.611	0.5467
Time	-1.631e+00	5.660e+01	-0.029	0.9772
Quarter	3.044e+02	1.418e+02	2.147	0.0413 *
HDP	6.840e+01	8.029e+01	0.852	0.4020
CPI	7.515e+00	1.347e+02	0.056	0.9559
Saldo	1.901e-05	2.808e-05	0.677	0.5045

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for gaussian family taken to be 780277.1)

Null deviance: 27355427 on 31 degrees of freedom
 Residual deviance: 20287204 on 26 degrees of freedom
 AIC: 532.32

Number of Fisher Scoring iterations: 2

Kombinace ARIMA a GLM

