Table des matières

1 Notes

1.1 Model description ETS(U,V,W)

- The first letter U denotes the error type : A (Additive), M (Multiplicative)
- The second letter V denotes the trend type : N (None), A (Additive), Ad (Additive damped), M (Multiplicative), Md (Multiplicative damped)
- The third letter W denotes the season type : N (None), A (Additive), M (Multiplicative)

1.2 Model description ARIMA(p,d,q)(P,D,Q)m

- p is the AR order
- d is the degree of differencing
- q is the MA order
- P is the seasonal AR order
- D is the seasonal degree of differencing
- Q is the seasonal MA order
- m is the seasonal frequency
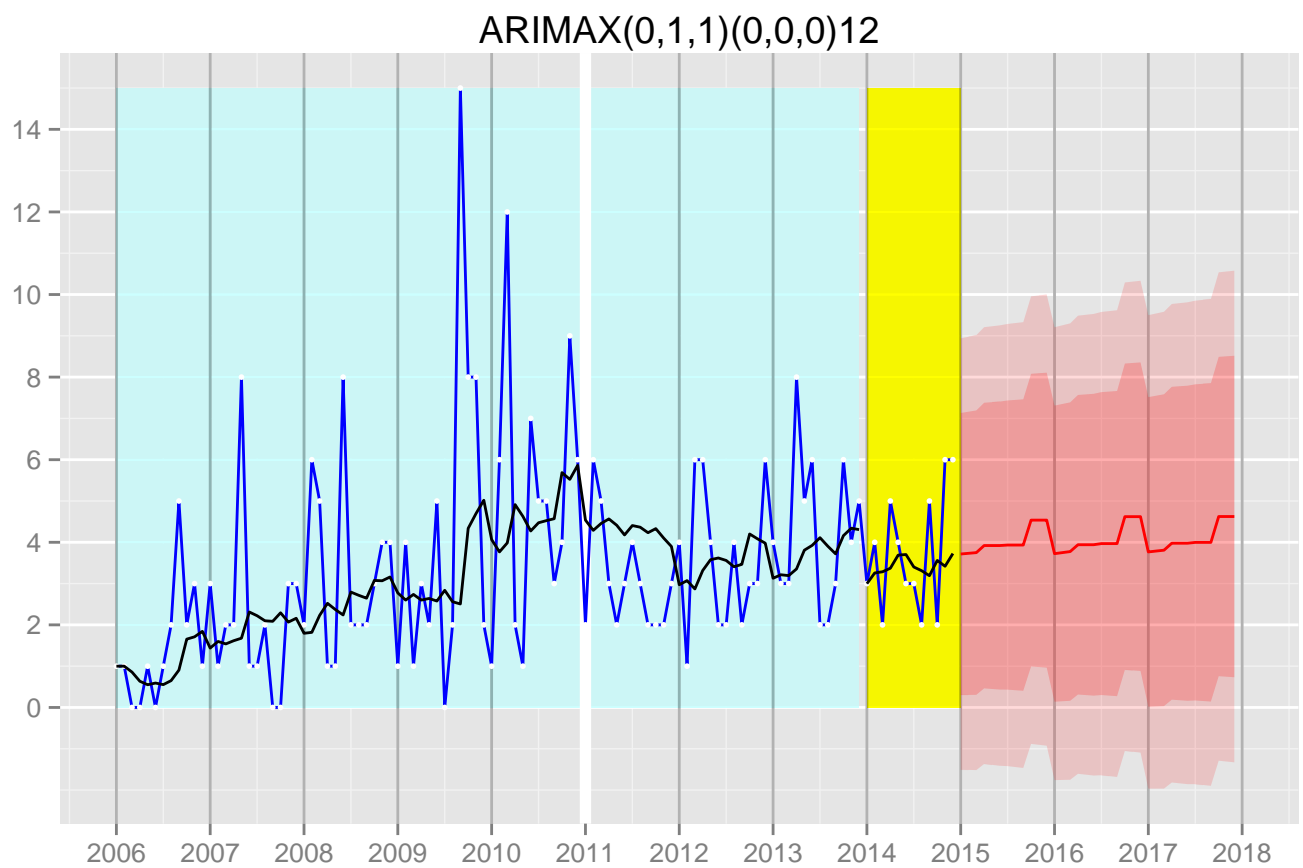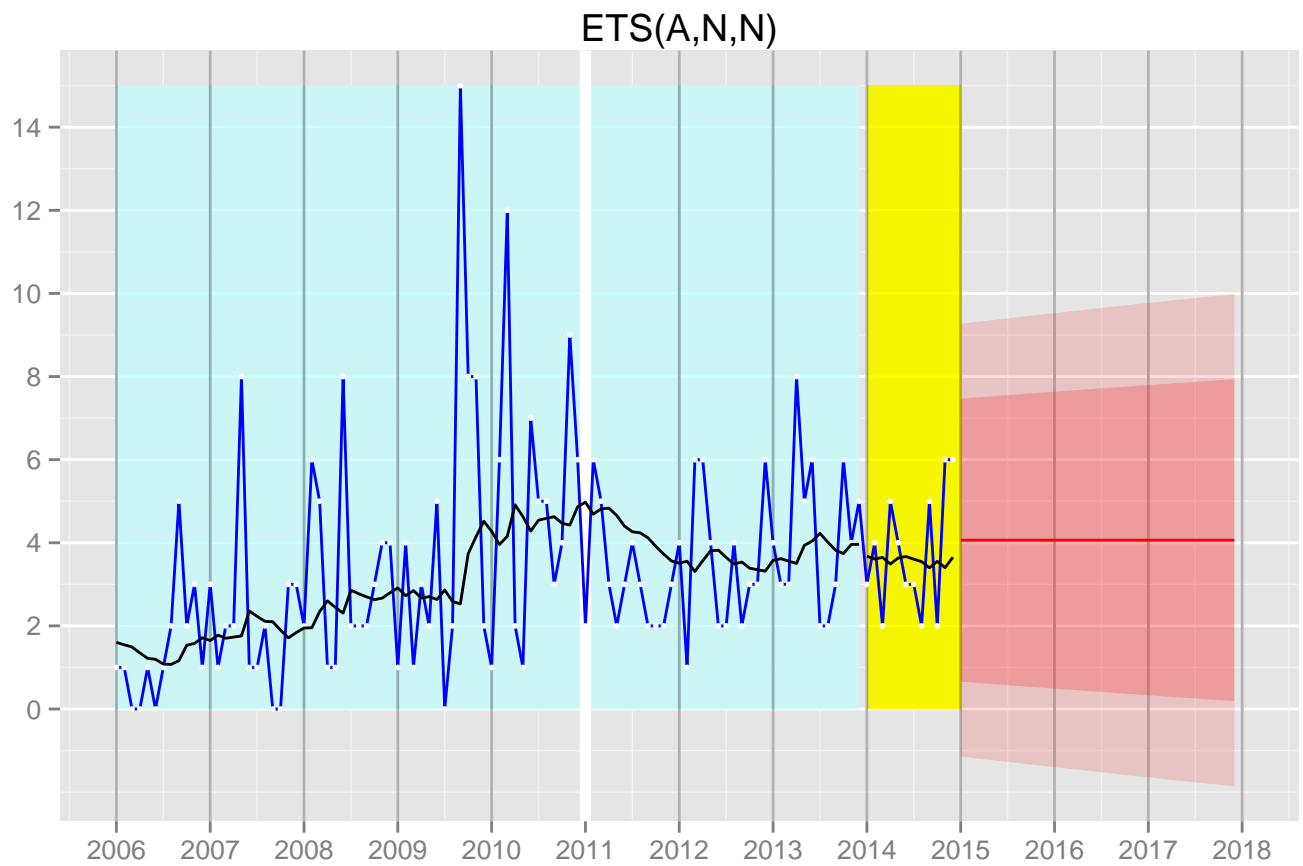
1.3 Model description HoltWinters

- alpha is the parameter of Holt-Winters Filter
- beta is the parameter of Holt-Winters Filter
- gamma is a parameter used for the seasonal component
- seasonal : ADDitive or MULtiplicative

2 Results for automatic ets and ARIMA

[1] TRUE

2.1 BHL_CAT_1

2.1.1 plots for BHL_CAT_1

ETS(A,N,N)

ARIMAX(0,1,1)(0,0,0)12

2.1.2 Outputs for BHL_CAT_1

$ETS(A, N, N)$

1. parameters :
   – alpha : 0.0965223

2. init state :
   – l : 1.604052

3. informations critereas :
   – loglik : -307.8063
   – aic : 619.6127
   – bic : 624.7414
   – aicc : 619.7417
   – mse : 6.348916
   – amse : 6.407542
   – sigma2 : 6.348916

4. accuracy :
   – ME : 0.1764995
   – RMSE : 1.477083
   – MAE : 1.292555
   – MPE : -11.56128
   – MAPE : 38.82496
   – MASE : 0.7483213
   – ACF1 : -0.1843822

$ARIMAX(0, 1, 1)(0, 0, 0)_{12}$

1. informations critereas :
   – loglik : -220.7457
   – aic : 447.4914
   – bic : 455.153
   – aicc : 447.7551
   – sigma2 : 6.37066

2. coefficients :
   – ma1 : -0.9023499
   – DEP_EQUIP_CAP_1 : 0.006954703

3. accuracy :
   – ME : 0.3401068
   – RMSE : 1.439376
   – MAE : 1.217433
   – MPE : -5.729456
   – MAPE : 35.06739
   – MASE : 0.7048298
   – ACF1 : -0.2574349

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2014.00	4.06	0.83	7.29	-0.88	9.00	3.64	0.41	6.88	-1.31	8.59
2014.08	4.06	0.82	7.31	-0.90	9.02	3.67	0.42	6.92	-1.30	8.65
2014.17	4.06	0.80	7.32	-0.92	9.05	3.71	0.44	6.97	-1.29	8.70
2014.25	4.06	0.79	7.34	-0.94	9.07	3.87	0.59	7.15	-1.15	8.89
2014.33	4.06	0.77	7.35	-0.97	9.09	3.87	0.57	7.16	-1.17	8.91
2014.42	4.06	0.76	7.37	-0.99	9.12	3.87	0.56	7.18	-1.19	8.93
2014.50	4.06	0.74	7.38	-1.01	9.14	3.91	0.59	7.24	-1.18	9.00
2014.58	4.06	0.73	7.40	-1.03	9.16	3.91	0.57	7.25	-1.20	9.02
2014.67	4.06	0.72	7.41	-1.06	9.18	3.91	0.56	7.27	-1.22	9.04
2014.75	4.06	0.70	7.42	-1.08	9.20	4.61	1.24	7.98	-0.54	9.76
2014.83	4.06	0.69	7.44	-1.10	9.23	4.61	1.22	8.00	-0.57	9.79
2014.92	4.06	0.67	7.45	-1.12	9.25	4.61	1.21	8.01	-0.59	9.81
2015.00	4.06	0.66	7.47	-1.14	9.27	3.72	0.30	7.13	-1.51	8.94
2015.08	4.06	0.64	7.48	-1.17	9.29	3.73	0.30	7.16	-1.51	8.98
2015.17	4.06	0.63	7.50	-1.19	9.31	3.75	0.31	7.19	-1.52	9.02
2015.25	4.06	0.62	7.51	-1.21	9.34	3.92	0.46	7.38	-1.37	9.21
2015.33	4.06	0.60	7.52	-1.23	9.36	3.92	0.45	7.39	-1.39	9.23
2015.42	4.06	0.59	7.54	-1.25	9.38	3.92	0.43	7.41	-1.41	9.25
2015.50	4.06	0.57	7.55	-1.27	9.40	3.93	0.43	7.43	-1.42	9.29
2015.58	4.06	0.56	7.57	-1.29	9.42	3.93	0.42	7.45	-1.44	9.31
2015.67	4.06	0.55	7.58	-1.32	9.44	3.93	0.40	7.46	-1.46	9.33
2015.75	4.06	0.53	7.59	-1.34	9.46	4.54	0.99	8.08	-0.88	9.96
2015.83	4.06	0.52	7.61	-1.36	9.48	4.54	0.98	8.09	-0.90	9.98
2015.92	4.06	0.50	7.62	-1.38	9.50	4.54	0.96	8.11	-0.93	10.00
2016.00	4.06	0.49	7.63	-1.40	9.53	3.72	0.14	7.31	-1.76	9.21
2016.08	4.06	0.48	7.65	-1.42	9.55	3.75	0.15	7.35	-1.76	9.26
2016.17	4.06	0.46	7.66	-1.44	9.57	3.78	0.16	7.39	-1.75	9.30
2016.25	4.06	0.45	7.68	-1.46	9.59	3.94	0.31	7.57	-1.61	9.49
2016.33	4.06	0.44	7.69	-1.48	9.61	3.94	0.30	7.58	-1.63	9.51
2016.42	4.06	0.42	7.70	-1.50	9.63	3.94	0.29	7.60	-1.65	9.53

2.2 BHL_CAT_2

2.2.1 plots for BHL_CAT_2

ETS(A,N,N)

ARIMAX(0,0,0)(0,0,0)6
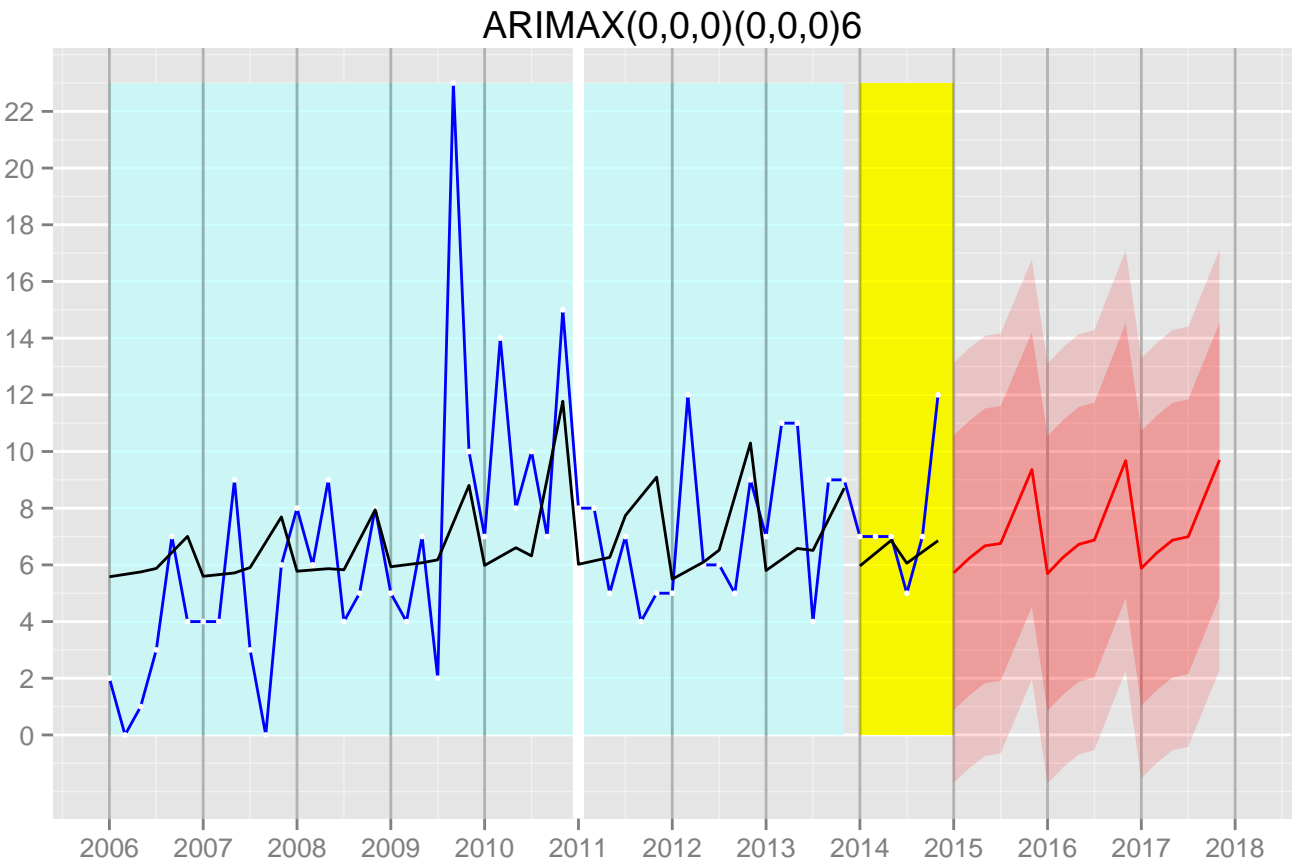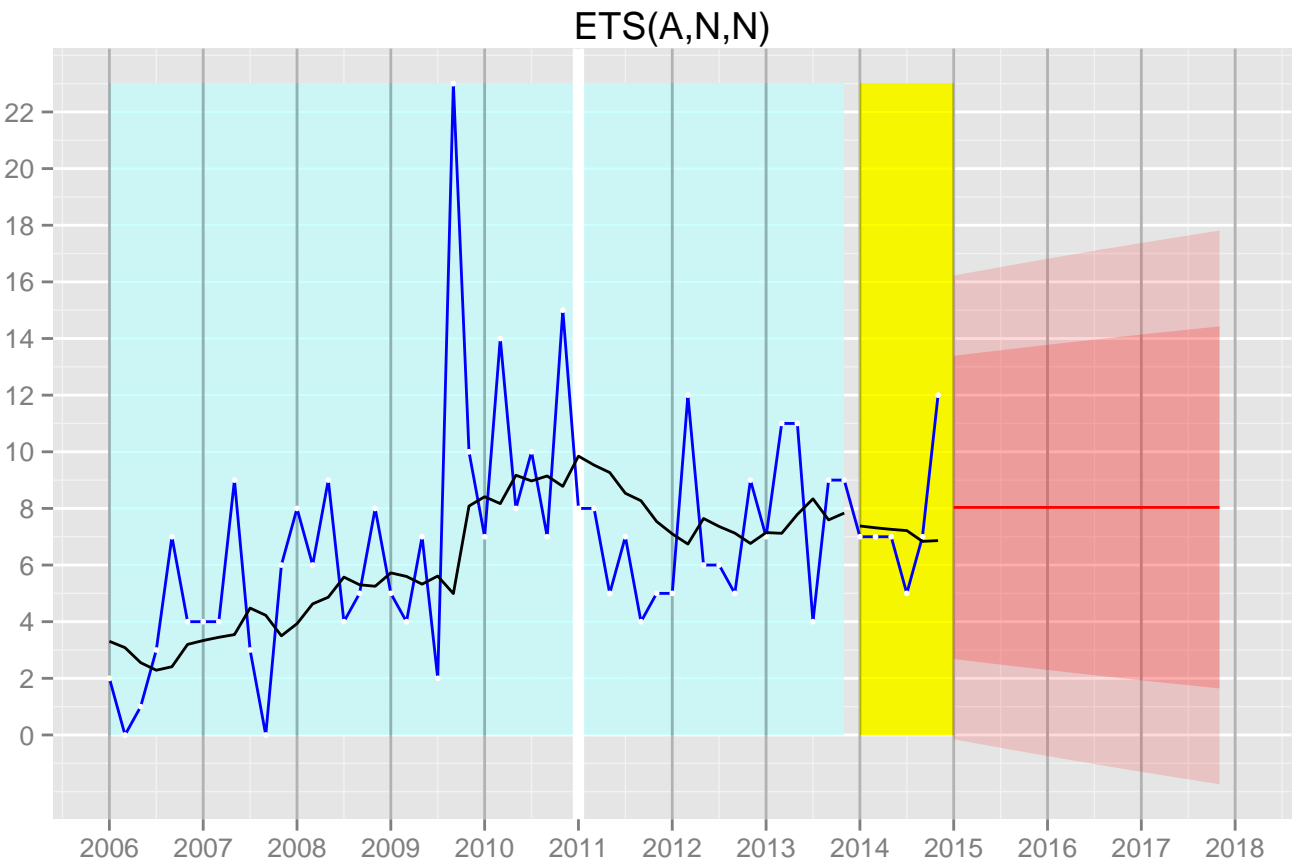
2.2.2 Outputs for BHL_CAT_2

$ETS(A, N, N)$

1. parameters :
   − alpha : 0.1717022

2. init state :
   − l : 3.307577

3. informations critereas :
   − loglik : -157.6226
   − aic : 319.2453
   − bic : 322.9877
   − aicc : 319.5119
   − mse : 14.82639
   − amse : 14.89811
   − sigma2 : 14.82639

4. accuracy :
   − ME : 0.3544983
   − RMSE : 2.296024
   − MAE : 1.412266
   − MPE : -2.141779
   − MAPE : 17.19071
   − MASE : 0.7845924
   − ACF1 : 0.06693588

$ARIMAX(0, 0, 0)(0, 0, 0)_6$

1. informations critereas :
   − loglik : -131.9619
   − aic : 269.9238
   − bic : 275.5374
   − aicc : 270.4692
   − sigma2 : 14.30394

2. coefficients :
   − intercept : 5.436858
   − DEP_EQUIP_CAP_2 : 0.01493484

3. accuracy :
   − ME : 1.06534
   − RMSE : 2.211084
   − MAE : 1.418039
   − MPE : 9.106575
   − MAPE : 16.16056
   − MASE : 0.7877997
   − ACF1 : 0.06262893

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2014.00	8.04	3.10	12.97	0.49	15.58	5.31	0.46	10.15	-2.11	12.72
2014.17	8.04	3.03	13.04	0.38	15.69	5.94	1.10	10.79	-1.47	13.36
2014.33	8.04	2.96	13.11	0.27	15.80	6.42	1.57	11.27	-0.99	13.83
2014.50	8.04	2.89	13.18	0.16	15.91	6.65	1.80	11.49	-0.77	14.06
2014.67	8.04	2.82	13.25	0.06	16.01	8.16	3.31	13.00	0.74	15.57
2014.83	8.04	2.75	13.32	-0.05	16.12	9.65	4.80	14.50	2.24	17.06
2015.00	8.04	2.68	13.39	-0.15	16.22	5.72	0.87	10.57	-1.69	13.13
2015.17	8.04	2.62	13.46	-0.25	16.32	6.24	1.39	11.08	-1.17	13.65
2015.33	8.04	2.55	13.52	-0.35	16.43	6.67	1.83	11.52	-0.74	14.08
2015.50	8.04	2.48	13.59	-0.45	16.52	6.76	1.91	11.60	-0.66	14.17
2015.67	8.04	2.42	13.65	-0.55	16.62	8.06	3.22	12.91	0.65	15.48
2015.83	8.04	2.36	13.71	-0.65	16.72	9.36	4.52	14.21	1.95	16.78
2016.00	8.04	2.29	13.78	-0.75	16.82	5.69	0.85	10.54	-1.72	13.11
2016.17	8.04	2.23	13.84	-0.84	16.91	6.27	1.42	11.12	-1.14	13.68
2016.33	8.04	2.17	13.90	-0.93	17.01	6.72	1.88	11.57	-0.69	14.14
2016.50	8.04	2.11	13.96	-1.03	17.10	6.88	2.03	11.72	-0.54	14.29
2016.67	8.04	2.05	14.02	-1.12	17.19	8.28	3.44	13.13	0.87	15.70
2016.83	8.04	1.99	14.08	-1.21	17.28	9.68	4.83	14.53	2.27	17.09
2017.00	8.04	1.93	14.14	-1.30	17.37	5.88	1.03	10.73	-1.53	13.29
2017.17	8.04	1.87	14.20	-1.39	17.46	6.43	1.58	11.28	-0.98	13.84
2017.33	8.04	1.81	14.26	-1.48	17.55	6.87	2.03	11.72	-0.54	14.29
2017.50	8.04	1.76	14.31	-1.57	17.64	6.99	2.15	11.84	-0.42	14.41
2017.67	8.04	1.70	14.37	-1.65	17.73	8.35	3.50	13.20	0.94	15.76
2017.83	8.04	1.64	14.43	-1.74	17.81	9.70	4.85	14.55	2.29	17.11

2.3 BHL_CAT_3

2.3.1 plots for BHL_CAT_3

ETS(M,Ad,N)

ARIMAX(1,0,0)(0,0,0)4
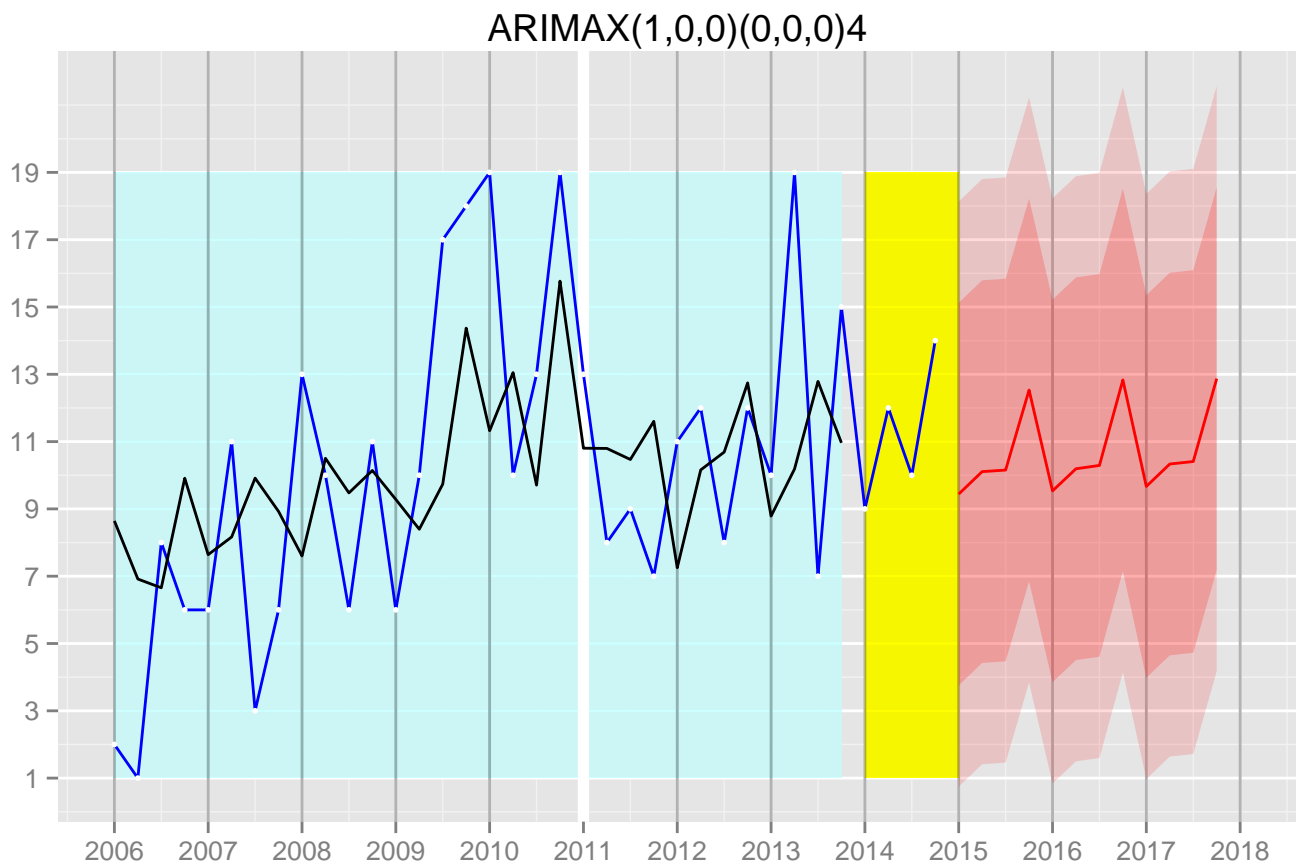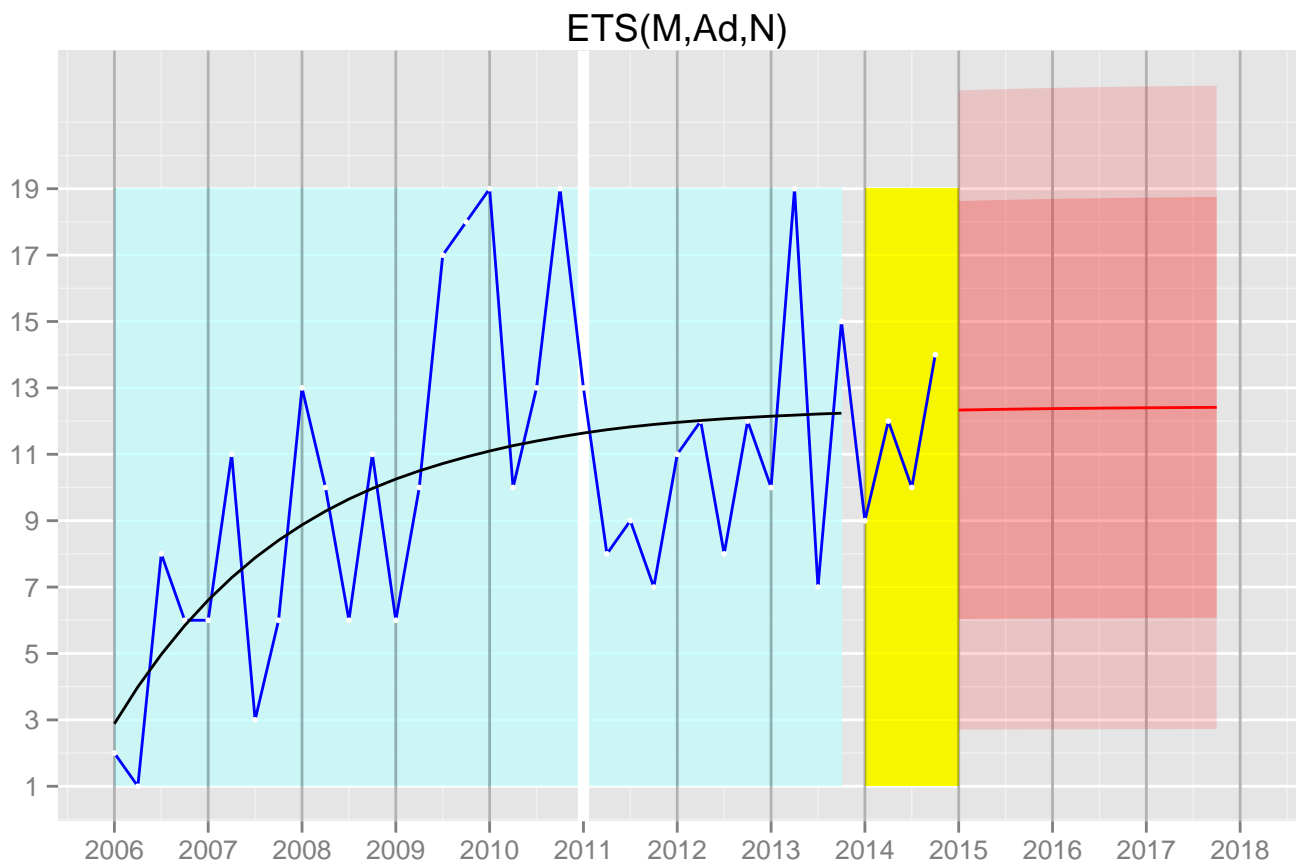
2.3.2 Outputs for BHL_CAT_3

$ETS(M, Ad, N)$

1. parameters :
   - alpha : 0.0004226293
   - beta : 0.000422608
   - phi : 0.8833652

2. init state :
   - l : 1.62528
   - b : 1.424078

3. informations critereas :
   - loglik : -97.81853
   - aic : 205.6371
   - bic : 212.9657
   - aicc : 207.9448
   - mse : 14.88563
   - amse : 14.74936
   - sigma2 : 0.1586127

$ARIMAX(1, 0, 0)(0, 0, 0)_4$

1. informations critereas :
   - loglik : -91.38428
   - aic : 190.7686
   - bic : 196.6315
   - aicc : 192.25
   - sigma2 : 17.64097

2. coefficients :
   - ar1 : 0.3218121
   - intercept : 8.885583
   - DEP_EQUIP_CAP_3 : 0.009142325

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2014.00	12.26	6.00	18.52	2.69	21.83	10.27	4.89	15.65	2.04	18.50
2014.25	12.28	6.01	18.55	2.70	21.87	10.23	4.57	15.88	1.58	18.88
2014.50	12.30	6.02	18.58	2.70	21.90	10.16	4.48	15.85	1.47	18.85
2014.75	12.32	6.03	18.61	2.70	21.93	12.81	7.12	18.49	4.11	21.50
2015.00	12.33	6.04	18.63	2.71	21.96	9.44	3.76	15.13	0.75	18.13
2015.25	12.35	6.04	18.65	2.71	21.98	10.11	4.42	15.79	1.41	18.80
2015.50	12.36	6.05	18.66	2.71	22.00	10.15	4.47	15.84	1.46	18.85
2015.75	12.37	6.05	18.68	2.71	22.02	12.53	6.85	18.22	3.84	21.23
2016.00	12.38	6.06	18.69	2.72	22.04	9.54	3.85	15.22	0.84	18.23
2016.25	12.38	6.06	18.70	2.72	22.05	10.19	4.51	15.88	1.50	18.89
2016.50	12.39	6.07	18.71	2.72	22.06	10.29	4.61	15.98	1.60	18.99
2016.75	12.40	6.07	18.72	2.72	22.07	12.83	7.15	18.52	4.14	21.53
2017.00	12.40	6.07	18.73	2.72	22.08	9.67	3.98	15.35	0.97	18.36
2017.25	12.41	6.07	18.74	2.72	22.09	10.33	4.65	16.02	1.64	19.03
2017.50	12.41	6.08	18.74	2.72	22.10	10.41	4.72	16.09	1.71	19.10
2017.75	12.41	6.08	18.75	2.72	22.10	12.87	7.19	18.56	4.18	21.57

2.4 BHL_CAT_4

2.4.1 plots for BHL_CAT_4

ETS(A,N,N)
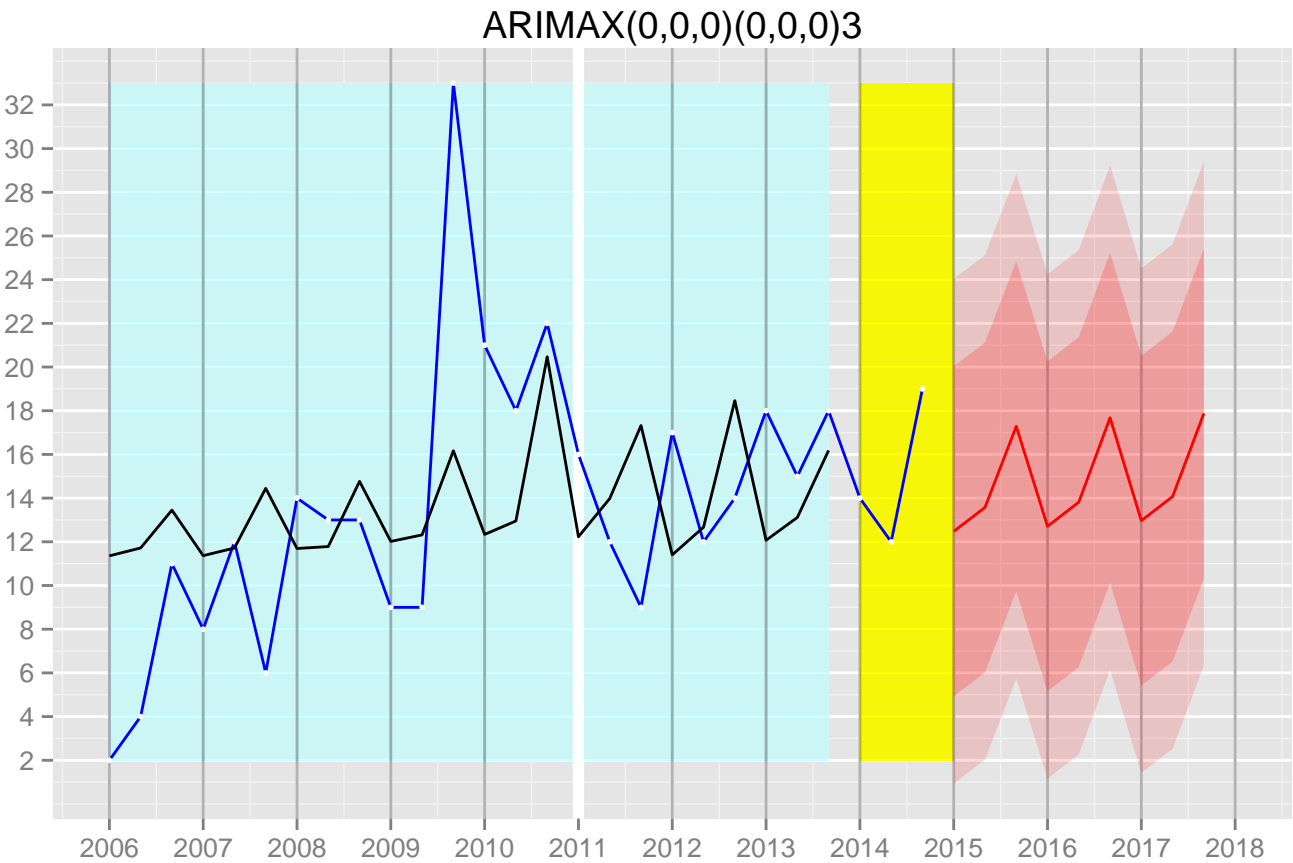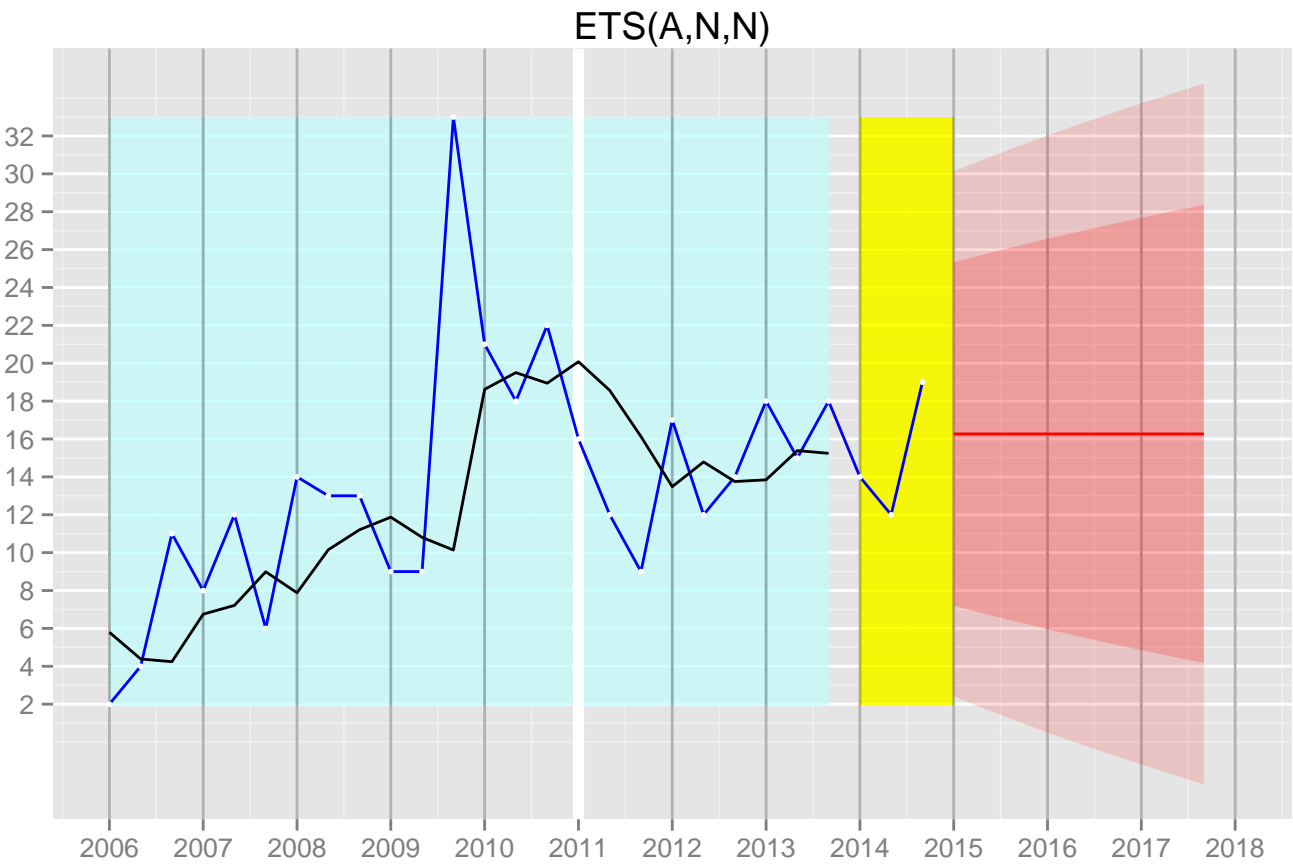
ARIMAX(0,0,0)(0,0,0)3

2.4.2 Outputs for BHL_CAT_4

$ETS(A, N, N)$

1. parameters :
   - alpha : 0.3711319
2. init state :
   - l : 5.794677
3. informations critereas :
   - loglik : -80.93827
   - aic : 165.8765
   - bic : 168.2326
   - aicc : 166.448
   - mse : 35.40319
   - amse : 39.94163
   - sigma2 : 35.40319

$ARIMAX(0, 0, 0)(0, 0, 0)_3$

1. informations critereas :
   - loglik : -76.62209
   - aic : 159.2442
   - bic : 162.7783
   - aicc : 160.4442
   - sigma2 : 34.71934

2. coefficients :
   - intercept : 11.00408
   - DEP_EQUIP_CAP_4 : 0.01421629

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2014.00	16.27	8.64	23.89	4.60	27.93	12.16	4.61	19.72	0.62	23.71
2014.33	16.27	8.13	24.40	3.83	28.71	13.29	5.74	20.84	1.74	24.84
2014.67	16.27	7.65	24.88	3.10	29.44	17.40	9.85	24.95	5.85	28.95
2015.00	16.27	7.20	25.33	2.40	30.13	12.48	4.93	20.03	0.93	24.03
2015.33	16.27	6.77	25.76	1.74	30.79	13.57	6.02	21.13	2.03	25.12
2015.67	16.27	6.36	26.18	1.11	31.42	17.29	9.74	24.84	5.74	28.84
2016.00	16.27	5.96	26.57	0.51	32.03	12.71	5.16	20.26	1.16	24.26
2016.33	16.27	5.58	26.95	-0.08	32.61	13.82	6.26	21.37	2.27	25.36
2016.67	16.27	5.21	27.32	-0.64	33.17	17.68	10.13	25.23	6.13	29.23
2017.00	16.27	4.85	27.68	-1.19	33.72	12.97	5.42	20.52	1.42	24.52
2017.33	16.27	4.51	28.02	-1.71	34.25	14.07	6.52	21.62	2.52	25.62
2017.67	16.27	4.17	28.36	-2.23	34.76	17.88	10.33	25.43	6.33	29.43

2.5 BHL_CAT_6

2.5.1 plots for BHL_CAT_6

ETS(A,N,N)
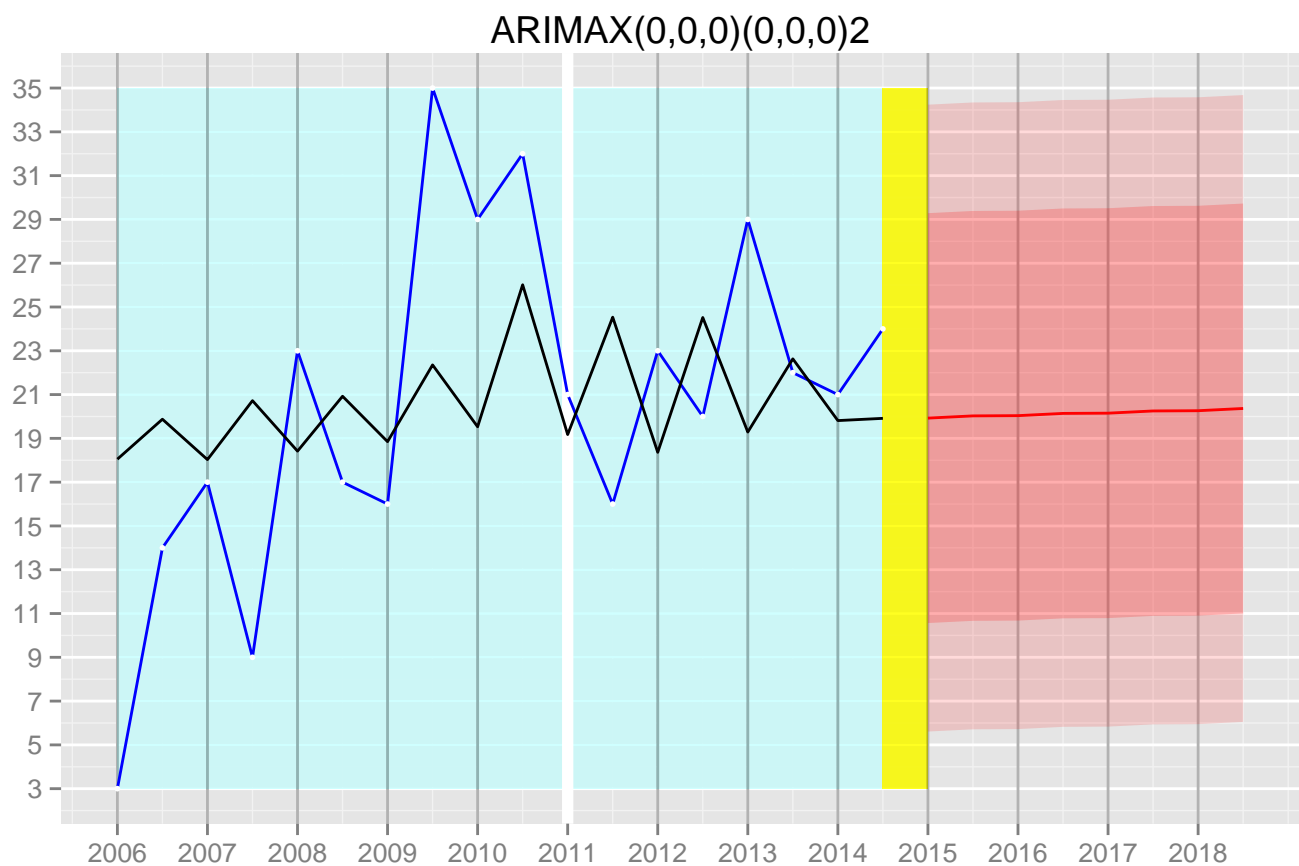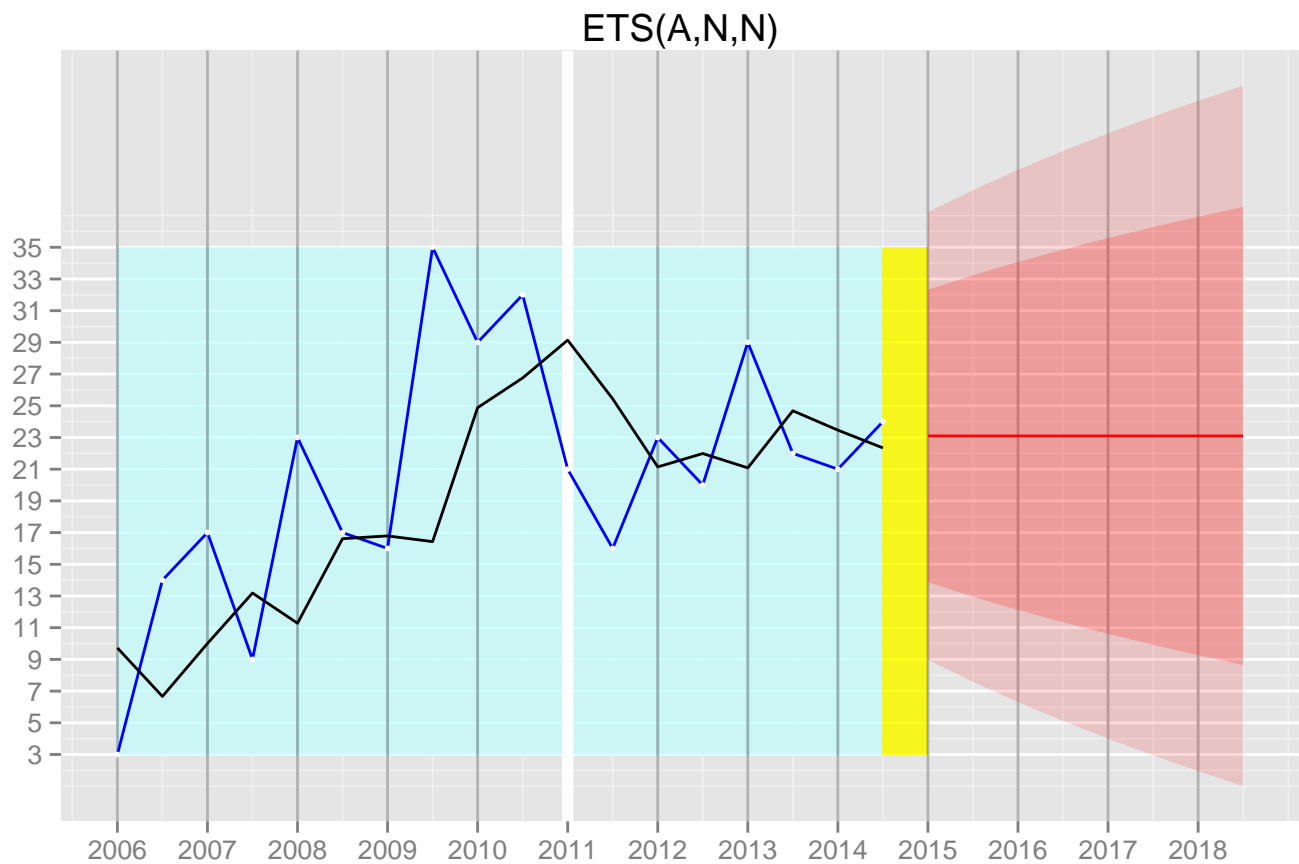
ARIMAX(0,0,0)(0,0,0)2

2.5.2 Outputs for BHL_CAT_6

$ETS(A, N, N)$

1. parameters :
   - alpha : 0.4550858
2. init state :
   - l : 9.723708
3. informations critereas :
   - loglik : -61.55892
   - aic : 127.1178
   - bic : 128.8986
   - aicc : 127.9178
   - mse : 51.90985
   - amse : 60.39
   - sigma2 : 51.90985

$ARIMAX(0, 0, 0)(0, 0, 0)_2$

1. informations critereas :
   - loglik : -61.33282
   - aic : 128.6656
   - bic : 131.3368
   - aicc : 130.3799
   - sigma2 : 53.35038

2. coefficients :
   - intercept : 17.51102
   - DEP_EQUIP_CAP_6 : 0.01173495

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2015.00	23.10	13.86	32.33	8.98	37.22	19.92	10.56	29.29	5.61	34.24
2015.50	23.10	12.95	33.24	7.58	38.61	20.03	10.67	29.39	5.71	34.34
2016.00	23.10	12.12	34.08	6.30	39.89	20.04	10.68	29.40	5.72	34.35
2016.50	23.10	11.34	34.85	5.12	41.08	20.14	10.78	29.50	5.82	34.46
2017.00	23.10	10.61	35.58	4.00	42.19	20.15	10.79	29.51	5.83	34.47
2017.50	23.10	9.92	36.27	2.95	43.24	20.25	10.89	29.61	5.94	34.57
2018.00	23.10	9.27	36.92	1.95	44.24	20.26	10.90	29.62	5.95	34.58
2018.50	23.10	8.65	37.55	0.99	45.20	20.36	11.00	29.73	6.05	34.68

2.6 BHL_CAT_12

2.6.1 plots for BHL_CAT_12

ETS(M,N,N)
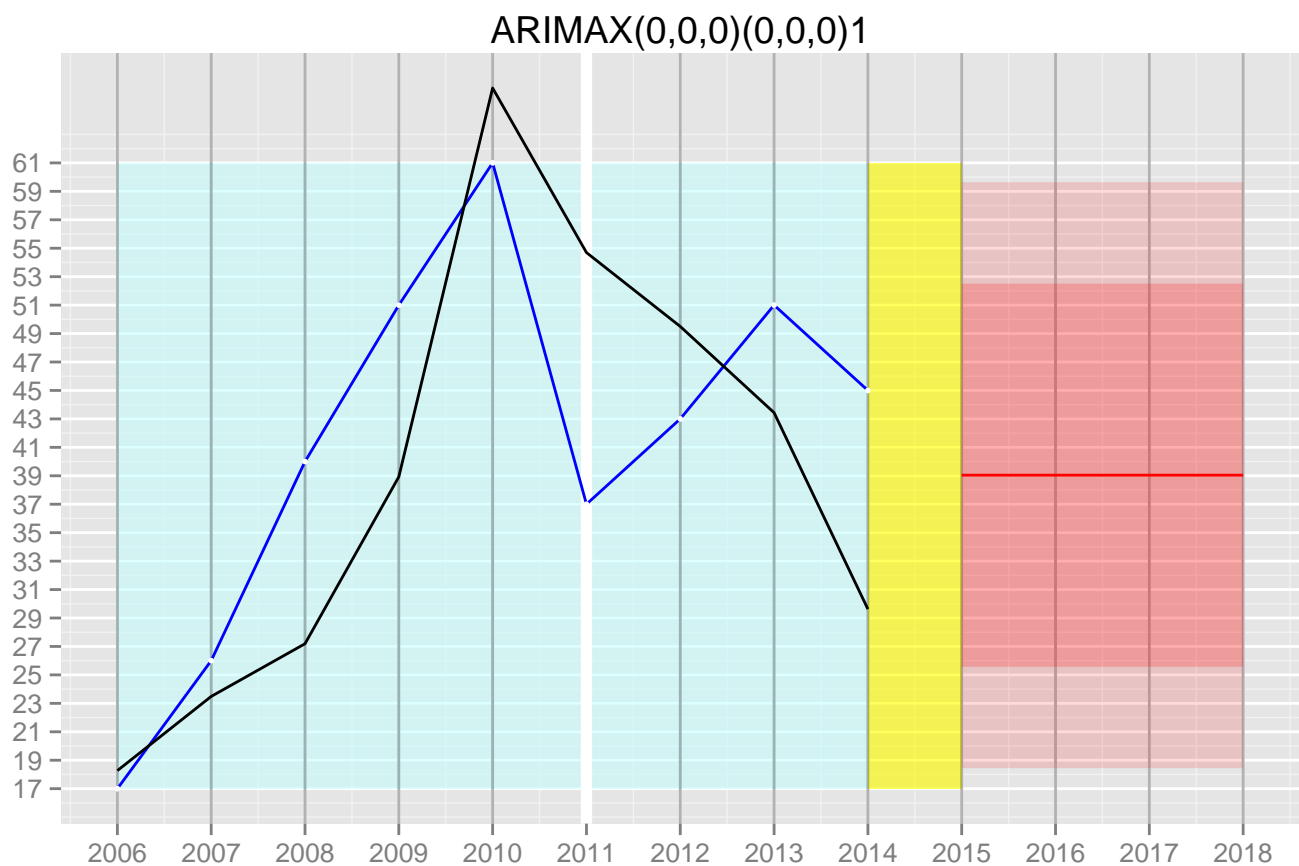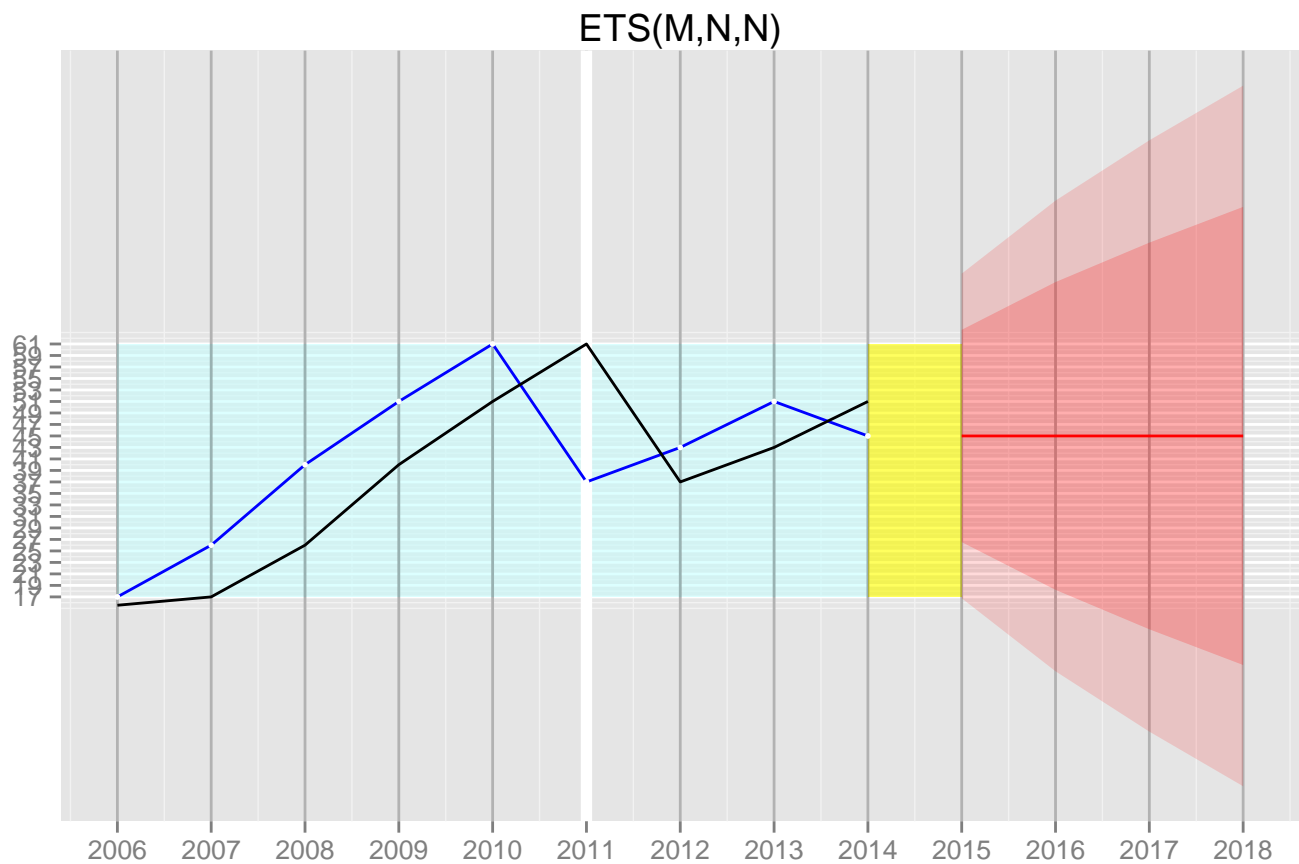
ARIMAX(0,0,0)(0,0,0)1

2.6.2 Outputs for BHL_CAT_12

$ETS(M, N, N)$

1. parameters :
   − alpha : 0.9998999
2. init state :
   − l : 15.54883
3. informations critereas :
   − loglik : -31.50834
   − aic : 67.01667
   − bic : 67.41112
   − aicc : 69.01667
   − mse : 134.6789
   − amse : 253.7839
   − sigma2 : 0.1025138

$ARIMAX(0, 0, 0)(0, 0, 0)_1$

1. informations critereas :
   − loglik : -33.94286
   − aic : 71.88571
   − bic : 72.28016
   − aicc : 73.88571
   − sigma2 : 110.496
2. coefficients :
   − DEP_EQUIP_CAP_12 : 0.07389597

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2015.00	45.00	26.54	63.47	16.76	73.24	39.04	25.57	52.51	18.44	59.65
2016.00	45.00	18.23	71.77	4.06	85.95	39.04	25.57	52.51	18.44	59.65
2017.00	45.00	11.37	78.63	-6.44	96.44	39.04	25.57	52.51	18.44	59.65
2018.00	45.00	5.15	84.85	-15.94	105.94	39.04	25.57	52.51	18.44	59.65

2.7 BHL_1

2.7.1 plots for BHL_1

ETS(M,N,N)

ARIMAX(0,1,1)(0,0,0)12
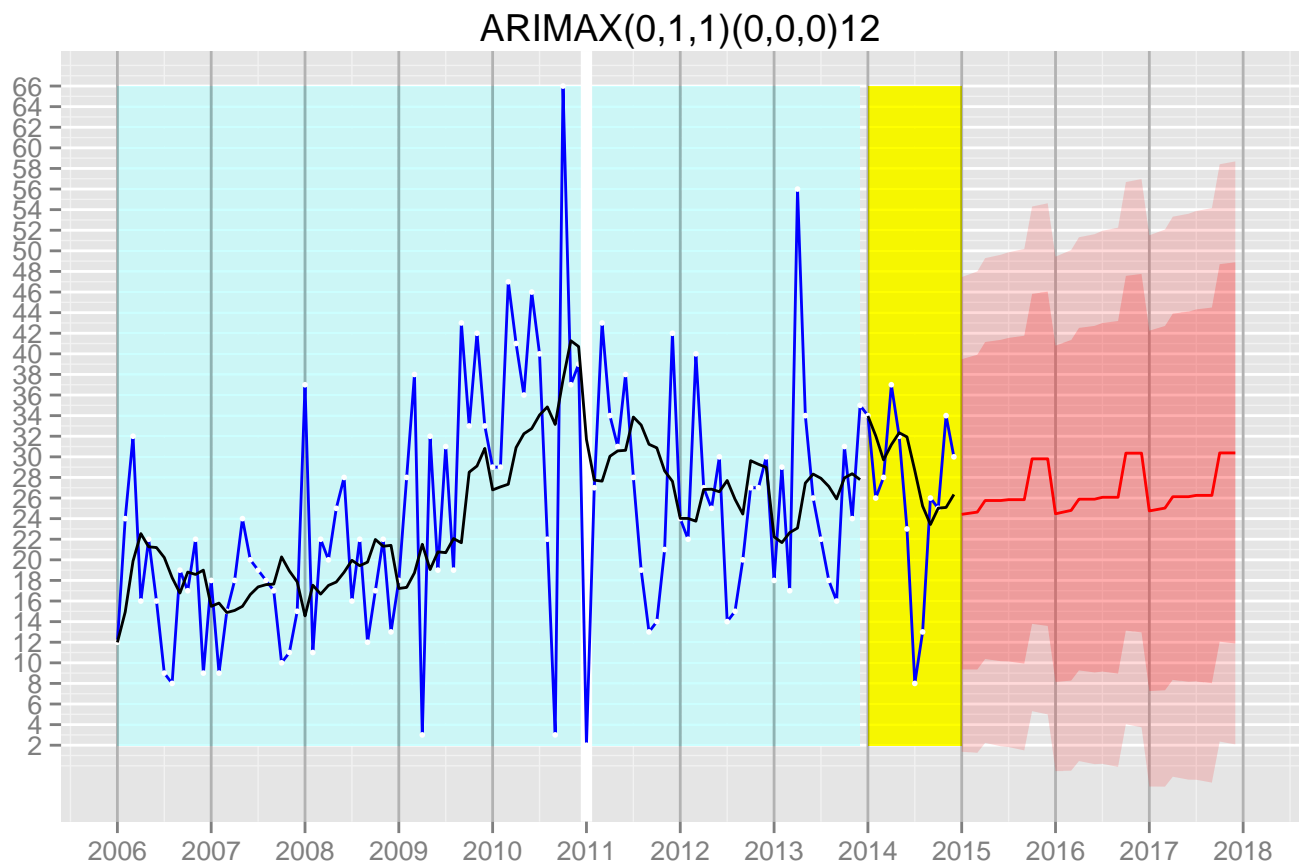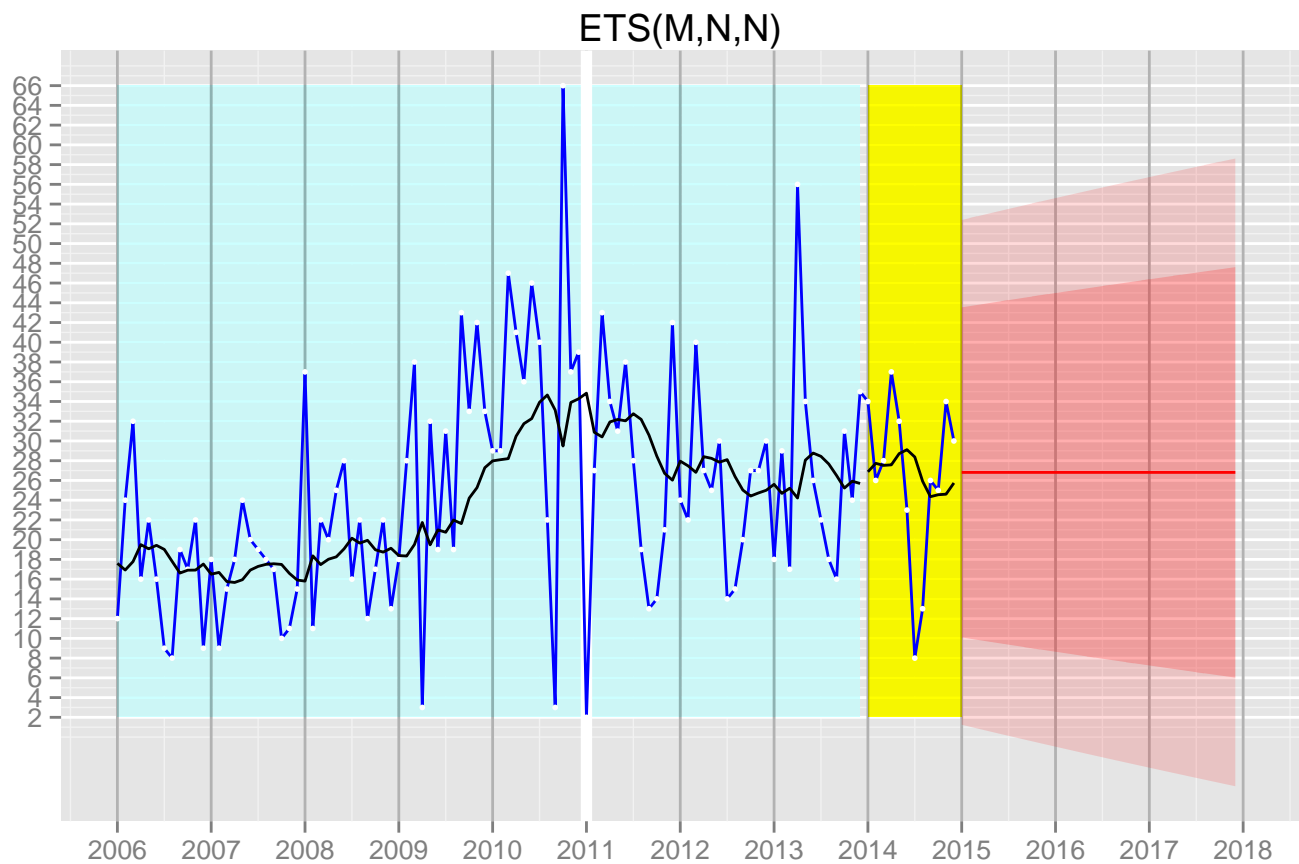
2.7.2 Outputs for BHL_1

$ETS(M, N, N)$

1. parameters :
   – alpha : 0.1207778

2. init state :
   – l : 17.5995

3. informations critereas :
   – loglik : -441.9717
   – aic : 887.9434
   – bic : 893.0721
   – aicc : 888.0725
   – mse : 116.4663
   – amse : 117.6822
   – sigma2 : 0.1951939

4. accuracy :
   – ME : -0.4254003
   – RMSE : 8.573996
   – MAE : 6.431789
   – MPE : -23.25401
   – MAPE : 41.30077
   – MASE : 0.884371
   – ACF1 : 0.4618342

$ARIMAX(0, 1, 1)(0, 0, 0)_{12}$

1. informations critereas :

   – loglik : -356.1869
   – aic : 718.3738
   – bic : 726.0354
   – aicc : 718.6375
   – sigma2 : 114.0309

2. coefficients :

   – ma1 : -0.8672164
   – DEP_EQUIP_CAP_1 : 0.04569666

3. accuracy :

   – ME : -2.410587
   – RMSE : 8.312333
   – MAE : 5.910032
   – MPE : -29.79239
   – MAPE : 40.47993
   – MASE : 0.8126295
   – ACF1 : 0.467305

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2014.00	26.82	11.63	42.00	3.60	50.04	23.92	10.23	37.60	2.99	44.85
2014.08	26.82	11.50	42.13	3.39	50.24	24.14	10.34	37.95	3.03	45.26
2014.17	26.82	11.37	42.26	3.19	50.44	24.36	10.44	38.29	3.07	45.66
2014.25	26.82	11.24	42.39	2.99	50.64	25.42	11.38	39.46	3.94	46.89
2014.33	26.82	11.11	42.52	2.80	50.84	25.42	11.26	39.58	3.76	47.07
2014.42	26.82	10.98	42.65	2.60	51.03	25.42	11.14	39.69	3.59	47.25
2014.50	26.82	10.85	42.78	2.40	51.23	25.69	11.30	40.09	3.69	47.70
2014.58	26.82	10.73	42.91	2.21	51.43	25.69	11.19	40.20	3.51	47.88
2014.67	26.82	10.60	43.03	2.01	51.62	25.69	11.08	40.31	3.34	48.05
2014.75	26.82	10.47	43.16	1.82	51.81	30.29	15.56	45.02	7.76	52.82
2014.83	26.82	10.35	43.29	1.63	52.00	30.29	15.44	45.13	7.59	52.99
2014.92	26.82	10.22	43.41	1.44	52.20	30.29	15.33	45.24	7.42	53.16
2015.00	26.82	10.10	43.54	1.25	52.39	24.42	9.35	39.48	1.38	47.45
2015.08	26.82	9.97	43.66	1.06	52.58	24.53	9.35	39.70	1.32	47.73
2015.17	26.82	9.85	43.78	0.87	52.76	24.63	9.35	39.92	1.26	48.00
2015.25	26.82	9.73	43.91	0.68	52.95	25.76	10.37	41.15	2.22	49.29
2015.33	26.82	9.60	44.03	0.49	53.14	25.76	10.26	41.25	2.06	49.46
2015.42	26.82	9.48	44.15	0.31	53.33	25.76	10.16	41.36	1.90	49.62
2015.50	26.82	9.36	44.27	0.12	53.51	25.84	10.13	41.55	1.82	49.86
2015.58	26.82	9.24	44.39	-0.06	53.70	25.84	10.03	41.65	1.66	50.02
2015.67	26.82	9.12	44.51	-0.25	53.88	25.84	9.92	41.76	1.50	50.18
2015.75	26.82	9.00	44.63	-0.43	54.06	29.80	13.78	45.82	5.30	54.30
2015.83	26.82	8.88	44.75	-0.61	54.25	29.80	13.68	45.93	5.15	54.46
2015.92	26.82	8.76	44.87	-0.79	54.43	29.80	13.58	46.03	4.99	54.62
2016.00	26.82	8.64	44.99	-0.98	54.61	24.47	8.14	40.79	-0.50	49.44
2016.08	26.82	8.53	45.11	-1.16	54.79	24.64	8.21	41.06	-0.49	49.76
2016.17	26.82	8.41	45.22	-1.34	54.97	24.80	8.27	41.33	-0.47	50.08
2016.25	26.82	8.29	45.34	-1.51	55.15	25.89	9.26	42.52	0.46	51.32
2016.33	26.82	8.17	45.46	-1.69	55.33	25.89	9.17	42.62	0.31	51.47
2016.42	26.82	8.06	45.57	-1.87	55.50	25.89	9.07	42.71	0.16	51.62

2.8   BHL_2

2.8.1   plots for BHL_2

ETS(M,N,N)

ARIMAX(1,1,1)(0,0,1)6
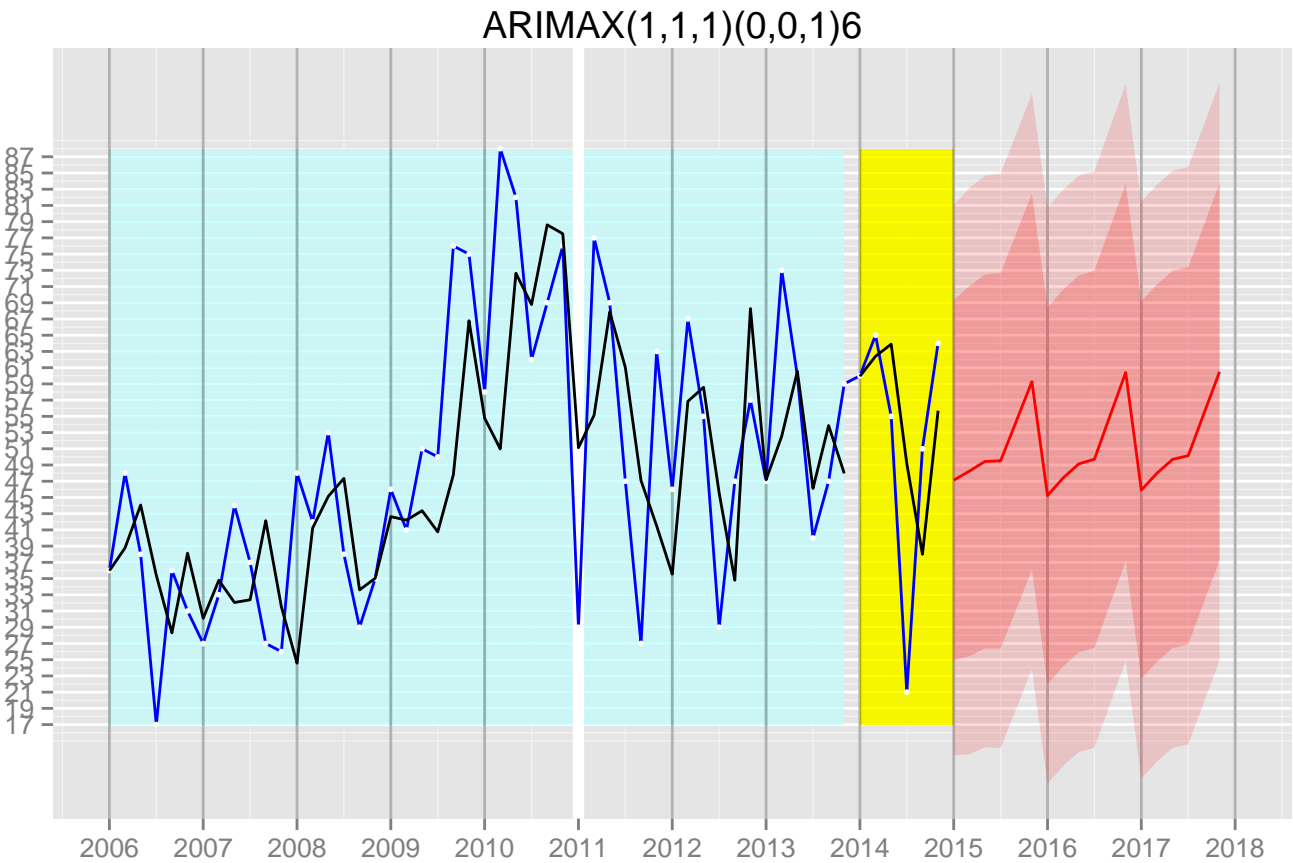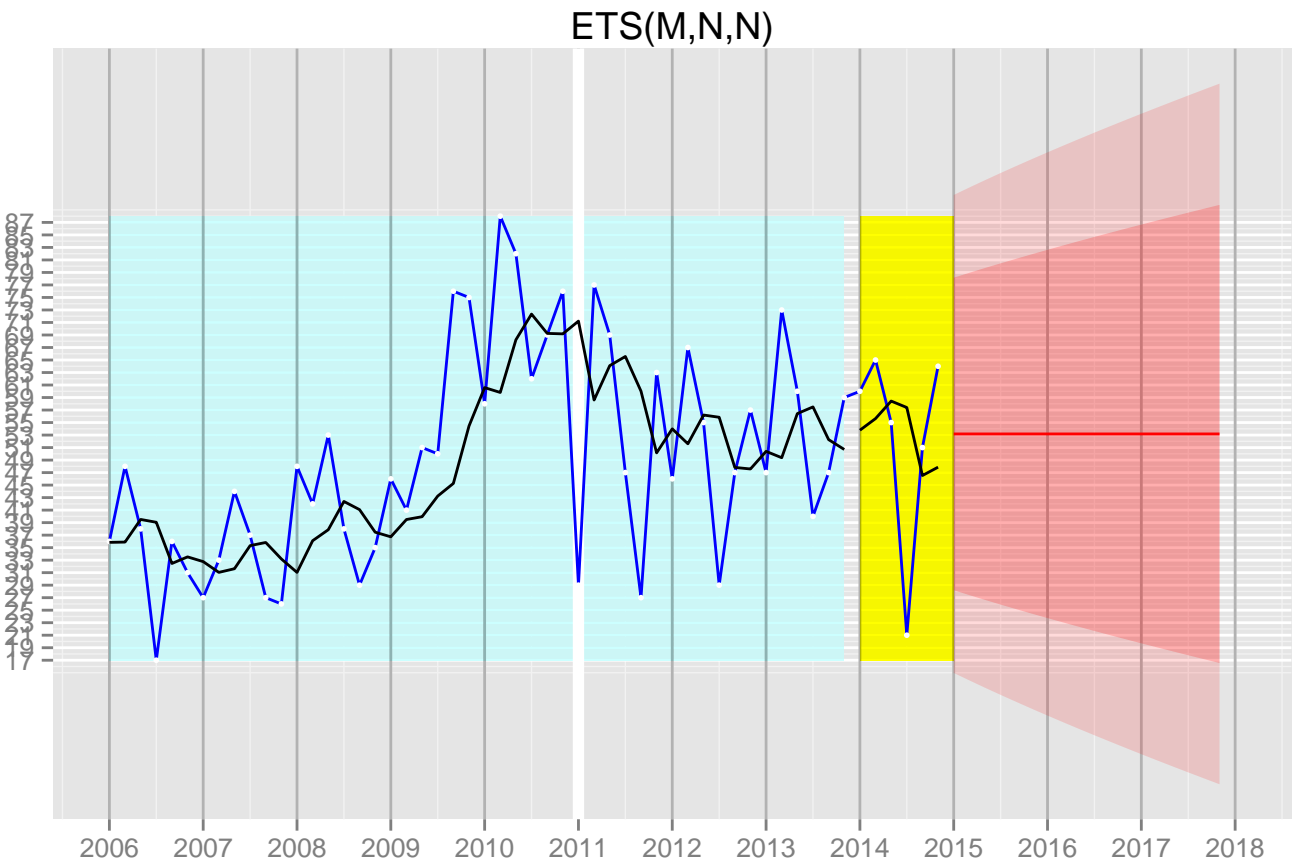
2.8.2 Outputs for BHL_2

$ETS(M, N, N)$

1. parameters :
   − alpha : 0.2987116
2. init state :
   − l : 35.84253
3. informations critereas :
   − loglik : -217.7566
   − aic : 439.5133
   − bic : 443.2557
   − aicc : 439.78
   − mse : 214.7588
   − amse : 227.504
   − sigma2 : 0.08444072
4. accuracy :
   − ME : -0.6090436
   − RMSE : 17.04869
   − MAE : 12.67133
   − MPE : -20.14472
   − MAPE : 39.7262
   − MASE : 0.6886592
   − ACF1 : 0.02544851

$ARIMAX(1, 1, 1)(0, 0, 1)_6$

1. informations critereas :
   − loglik : -184.4404
   − aic : 378.8807
   − bic : 388.1315
   − aicc : 380.3442
   − sigma2 : 169.2711
2. coefficients :
   − ar1 : 0.5279712
   − ma1 : -0.9915511
   − sma1 : 0.49392
   − DEP_EQUIP_CAP_2 : 0.05701983
3. accuracy :
   − ME : -2.182975
   − RMSE : 13.64604
   − MAE : 10.17057
   − MPE : -17.95434
   − MAPE : 32.14292
   − MASE : 0.5527485
   − ACF1 : -0.07551234

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2014.00	53.18	33.37	72.98	22.89	83.46	44.66	27.89	61.43	19.02	70.30
2014.17	53.18	32.44	73.92	21.46	84.90	56.63	37.52	75.74	27.40	85.86
2014.33	53.18	31.54	74.82	20.08	86.28	53.25	33.45	73.04	22.97	83.52
2014.50	53.18	30.66	75.69	18.75	87.61	48.60	28.58	68.63	17.98	79.22
2014.67	53.18	29.82	76.54	17.45	88.90	51.02	30.91	71.12	20.27	81.77
2014.83	53.18	29.00	77.36	16.19	90.16	63.78	43.64	83.93	32.98	94.59
2015.00	53.18	28.19	78.16	14.97	91.39	47.13	24.95	69.32	13.20	81.06
2015.17	53.18	27.41	78.94	13.77	92.58	48.24	25.42	71.06	13.34	83.14
2015.33	53.18	26.65	79.71	12.60	93.75	49.44	26.39	72.49	14.19	84.69
2015.50	53.18	25.90	80.46	11.46	94.90	49.51	26.37	72.66	14.12	84.91
2015.67	53.18	25.16	81.19	10.33	96.02	54.38	31.20	77.57	18.92	89.84
2015.83	53.18	24.44	81.91	9.23	97.12	59.28	36.08	82.49	23.79	94.77
2016.00	53.18	23.73	82.62	8.15	98.21	45.23	22.01	68.45	9.71	80.74
2016.17	53.18	23.04	83.32	7.08	99.27	47.41	24.18	70.64	11.88	82.94
2016.33	53.18	22.35	84.00	6.03	100.32	49.14	25.90	72.37	13.60	84.67
2016.50	53.18	21.67	84.68	5.00	101.36	49.71	26.47	72.96	14.17	85.26
2016.67	53.18	21.01	85.35	3.98	102.38	55.08	31.83	78.33	19.53	90.63
2016.83	53.18	20.35	86.01	2.97	103.38	60.41	37.16	83.66	24.85	95.97
2017.00	53.18	19.70	86.66	1.98	104.38	45.91	22.65	69.16	10.34	81.47
2017.17	53.18	19.06	87.30	0.99	105.36	48.00	24.74	71.26	12.43	83.57
2017.33	53.18	18.42	87.93	0.02	106.33	49.70	26.43	72.96	14.12	85.28
2017.50	53.18	17.79	88.56	-0.94	107.29	50.15	26.88	73.42	14.56	85.74
2017.67	53.18	17.17	89.18	-1.89	108.25	55.34	32.06	78.61	19.74	90.93
2017.83	53.18	16.55	89.80	-2.83	109.19	60.49	37.21	83.77	24.89	96.09

2.9 BHL_3

2.9.1 plots for BHL_3

ETS(M,N,N)
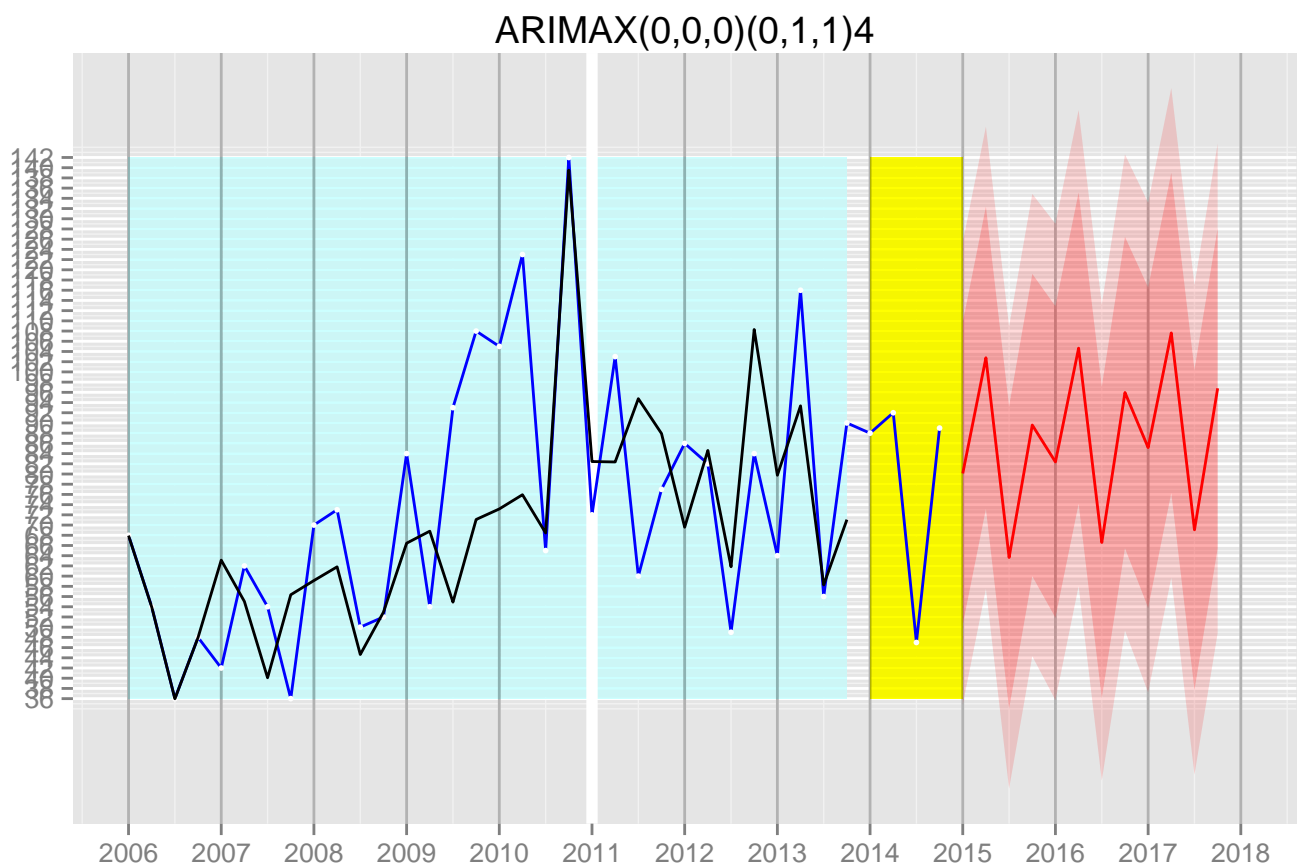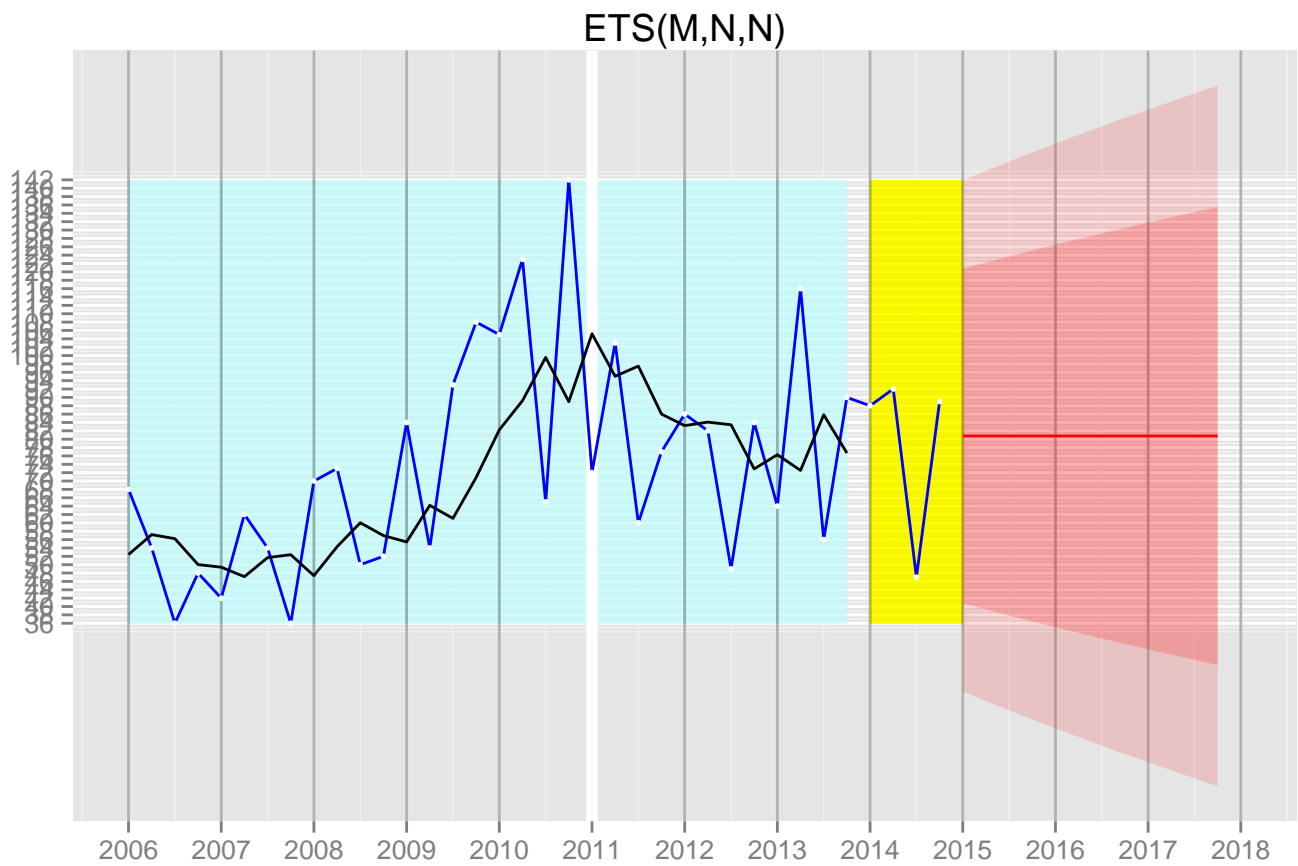
ARIMAX(0,0,0)(0,1,1)4

2.9.2 Outputs for BHL_3

$ETS(M, N, N)$

1. parameters :
   – alpha : 0.3062739

2. init state :
   – l : 52.42152

3. informations critereas :
   – loglik : -154.738
   – aic : 313.4759
   – bic : 316.4074
   – aicc : 313.8897
   – mse : 570.965
   – amse : 576.2653
   – sigma2 : 0.1049424

$ARIMAX(0, 0, 0)(0, 1, 1)_4$

1. informations critereas :
   – loglik : -108.1338
   – aic : 222.2677
   – bic : 226.2643
   – aicc : 223.2677
   – sigma2 : 499.2693

2. coefficients :
   – sma1 : -0.7447722
   – DEP_EQUIP_CAP_3 : 0.1937968

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2014.00	80.78	47.24	114.31	29.49	132.06	76.71	48.02	105.40	32.83	120.59
2014.25	80.78	45.55	116.01	26.90	134.66	98.59	69.90	127.29	54.71	142.47
2014.50	80.78	43.91	117.64	24.40	137.15	61.68	32.99	90.37	17.80	105.56
2014.75	80.78	42.34	119.22	21.99	139.57	94.75	66.06	123.45	50.87	138.64
2015.00	80.78	40.80	120.75	19.64	141.91	80.11	50.50	109.72	34.83	125.40
2015.25	80.78	39.32	122.24	17.37	144.18	102.77	73.16	132.38	57.49	148.06
2015.50	80.78	37.86	123.69	15.15	146.40	63.65	34.04	93.26	18.36	108.93
2015.75	80.78	36.45	125.10	12.98	148.57	89.59	59.98	119.20	44.31	134.88
2016.00	80.78	35.06	126.49	10.86	150.69	82.37	51.87	112.86	35.72	129.01
2016.25	80.78	33.70	127.85	8.78	152.77	104.65	74.15	135.15	58.01	151.29
2016.50	80.78	32.37	129.18	6.74	154.81	66.59	36.09	97.09	19.95	113.23
2016.75	80.78	31.06	130.49	4.74	156.81	95.97	65.47	126.46	49.32	142.61
2017.00	80.78	29.77	131.78	2.77	158.78	85.17	53.81	116.53	37.21	133.14
2017.25	80.78	28.50	133.05	0.83	160.72	107.64	76.28	139.00	59.68	155.60
2017.50	80.78	27.25	134.30	-1.09	162.64	69.07	37.70	100.43	21.10	117.03
2017.75	80.78	26.02	135.54	-2.97	164.53	96.79	65.43	128.15	48.83	144.75

2.10 BHL_4

2.10.1 plots for BHL_4

ETS(A,N,N)
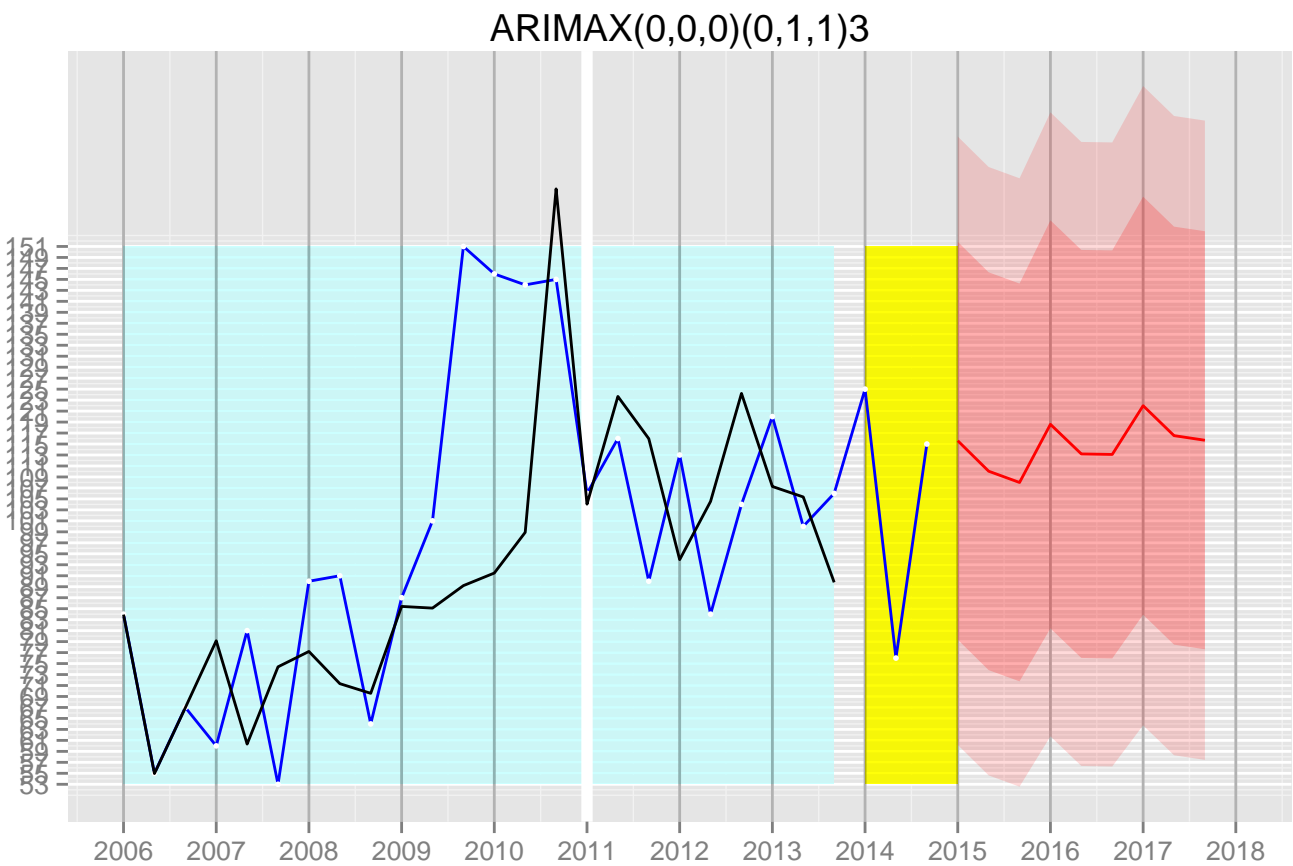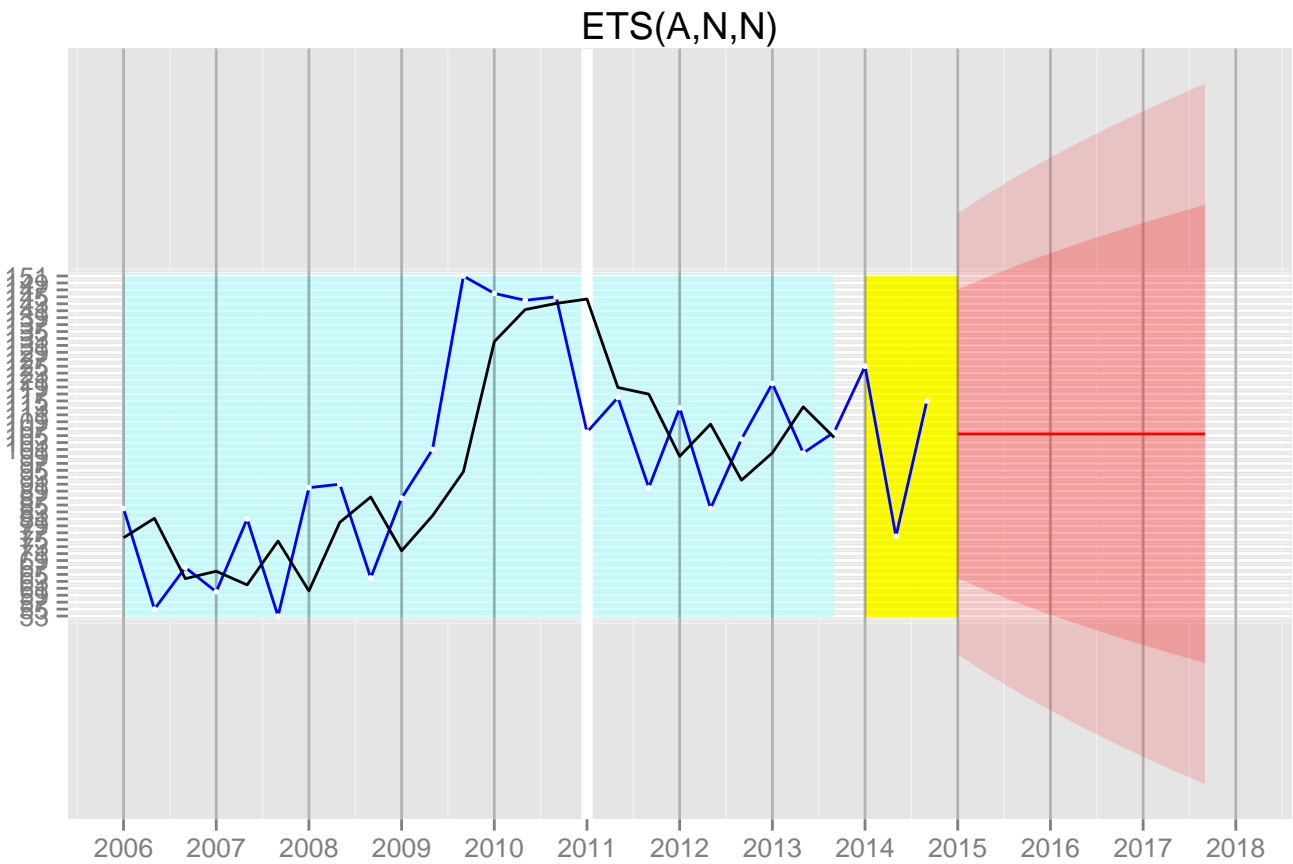
ARIMAX(0,0,0)(0,1,1)3

2.10.2   Outputs for BHL_4

$ETS(A, N, N)$

1. parameters :
   − alpha : 0.664554

2. init state :
   − l : 75.57255

3. informations critereas :
   − loglik : -111.5273
   − aic : 227.0547
   − bic : 229.4108
   − aicc : 227.6261
   − mse : 452.9997
   − amse : 657.9783
   − sigma2 : 452.9997

$ARIMAX(0, 0, 0)(0, 1, 1)_3$

1. informations critereas :

   − loglik : -84.89413
   − aic : 175.7883
   − bic : 178.9218
   − aicc : 177.2
   − sigma2 : 753.8577

2. coefficients :

   − sma1 : -0.7650275
   − DEP_EQUIP_CAP_4 : 0.1847904

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2014.00	105.48	78.21	132.76	63.77	147.20	111.54	76.25	146.83	57.57	165.51
2014.33	105.48	72.73	138.23	55.40	155.57	106.40	71.11	141.69	52.43	160.37
2014.67	105.48	68.05	142.92	48.24	162.73	109.49	74.21	144.78	55.53	163.46
2015.00	105.48	63.89	147.07	41.88	169.09	115.60	79.36	151.85	60.17	171.03
2015.33	105.48	60.12	150.85	36.10	174.87	110.05	73.81	146.30	54.62	165.48
2015.67	105.48	56.63	154.34	30.77	180.20	108.00	71.75	144.24	52.57	163.43
2016.00	105.48	53.37	157.59	25.79	185.18	118.59	81.41	155.76	61.73	175.44
2016.33	105.48	50.31	160.66	21.10	189.86	113.20	76.02	150.37	56.34	170.05
2016.67	105.48	47.41	163.56	16.67	194.30	113.10	75.93	150.28	56.25	169.96
2017.00	105.48	44.65	166.32	12.44	198.53	121.99	83.90	160.07	63.74	180.23
2017.33	105.48	42.00	168.96	8.40	202.57	116.53	78.45	154.62	58.29	174.78
2017.67	105.48	39.47	171.50	4.52	206.45	115.69	77.61	153.78	57.45	173.94

2.11 BHL_6

2.11.1 plots for BHL_6

ETS(A,N,A)

ARIMAX(0,0,1)(0,1,0)2
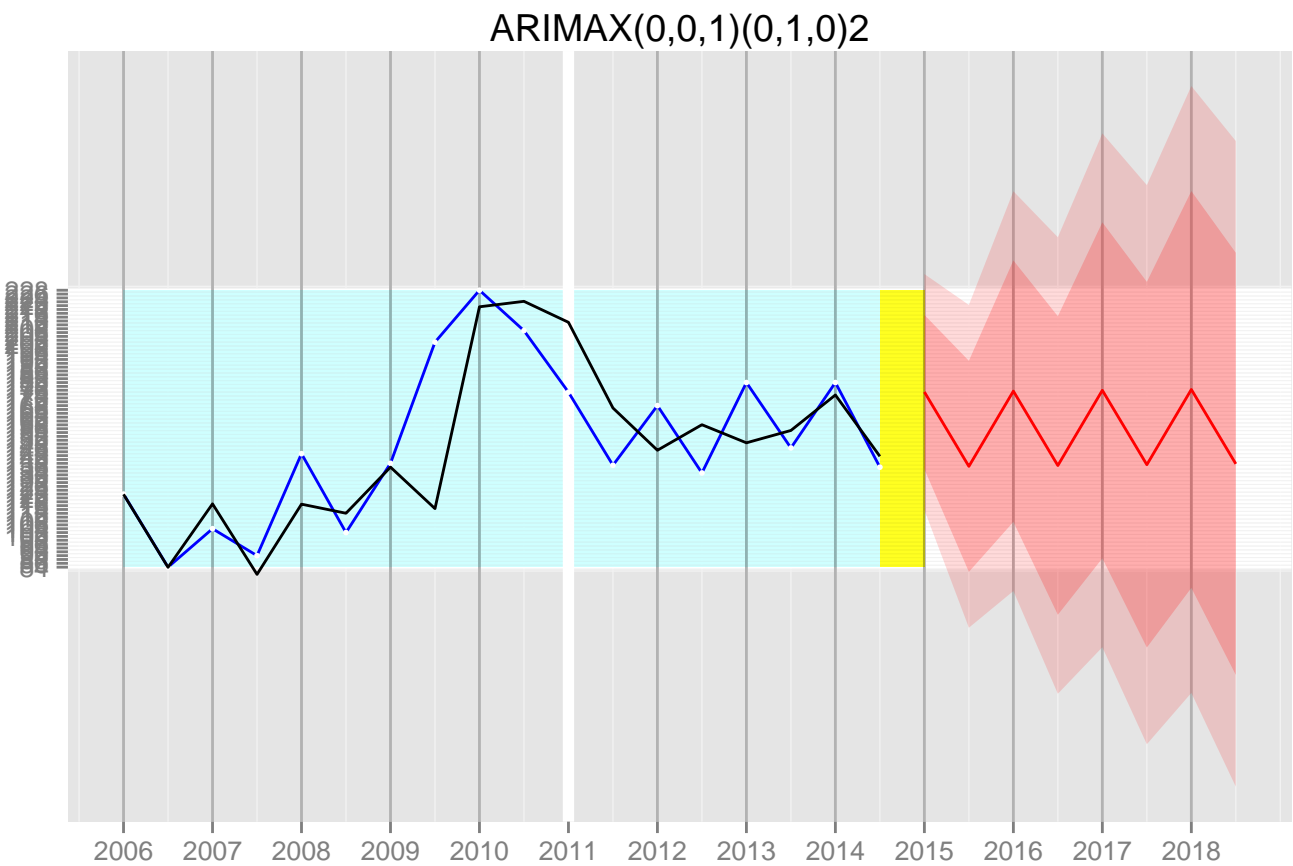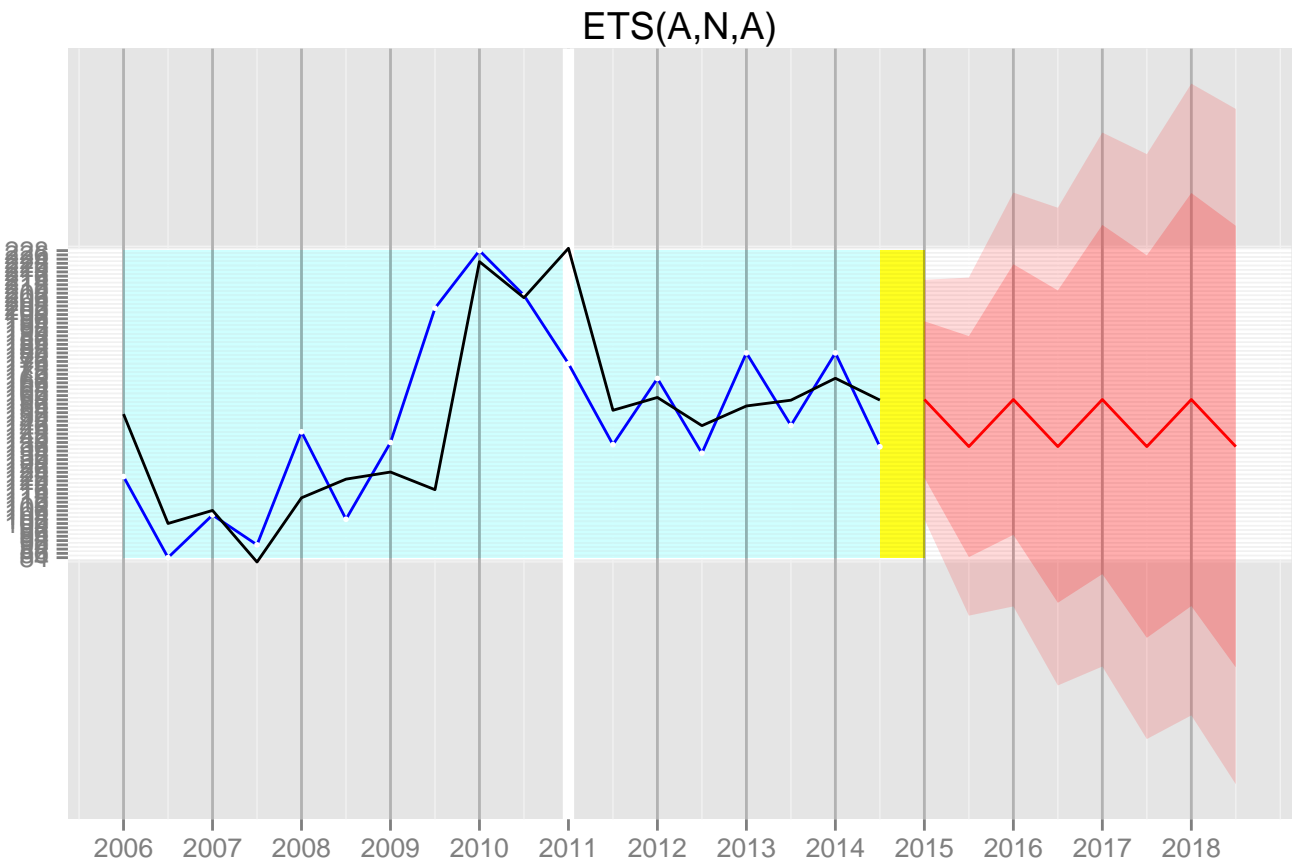
2.11.2 Outputs for BHL_6

$ETS(A, N, A)$

1. parameters :
   - alpha : 0.9966577
   - gamma : 0.0001002108
2. init state :
   - l : 140.272
   - s1 : -11.04126
   - s2 : 11.04126
3. informations critereas :
   - loglik : -86.40458
   - aic : 180.8092
   - bic : 184.3706
   - aicc : 183.8861
   - mse : 820.6831
   - amse : 1629.398
   - sigma2 : 820.6831

$ARIMAX(0, 0, 1)(0, 1, 0)_2$

1. informations critereas :
   - loglik : -67.94564
   - aic : 141.8913
   - bic : 144.209
   - aicc : 143.8913
   - sigma2 : 954.517
2. coefficients :
   - ma1 : 0.9597398
   - DEP_EQUIP_CAP_6 : 0.04484582

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2015.00	158.15	121.44	194.87	102.01	214.30	175.10	135.00	215.20	113.77	236.43
2015.50	136.07	84.24	187.90	56.80	215.34	136.43	81.55	191.31	52.50	220.36
2016.00	158.15	94.70	221.60	61.12	255.19	175.53	107.56	243.50	71.58	279.48
2016.50	136.07	62.83	209.32	24.05	248.09	136.86	59.25	214.47	18.17	255.56
2017.00	158.15	76.28	240.03	32.93	283.38	175.96	88.60	263.32	42.36	309.57
2017.50	136.07	46.39	225.75	-1.09	273.23	137.29	42.24	232.34	-8.08	282.66
2018.00	158.15	61.29	255.02	10.02	306.29	176.39	73.23	279.56	18.61	334.17
2018.50	136.07	32.53	239.61	-22.28	294.42	137.72	27.97	247.48	-30.14	305.58

ETS(M,N,N)
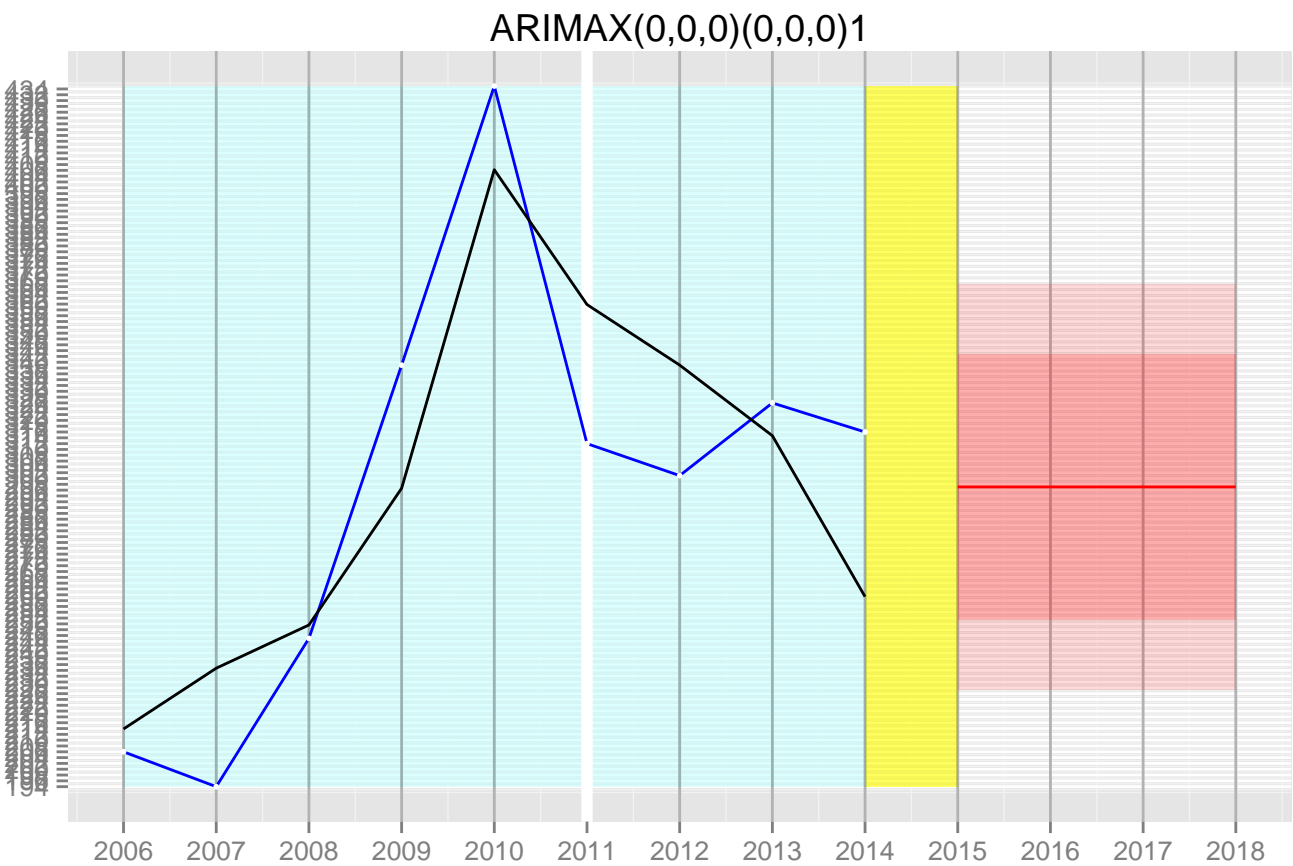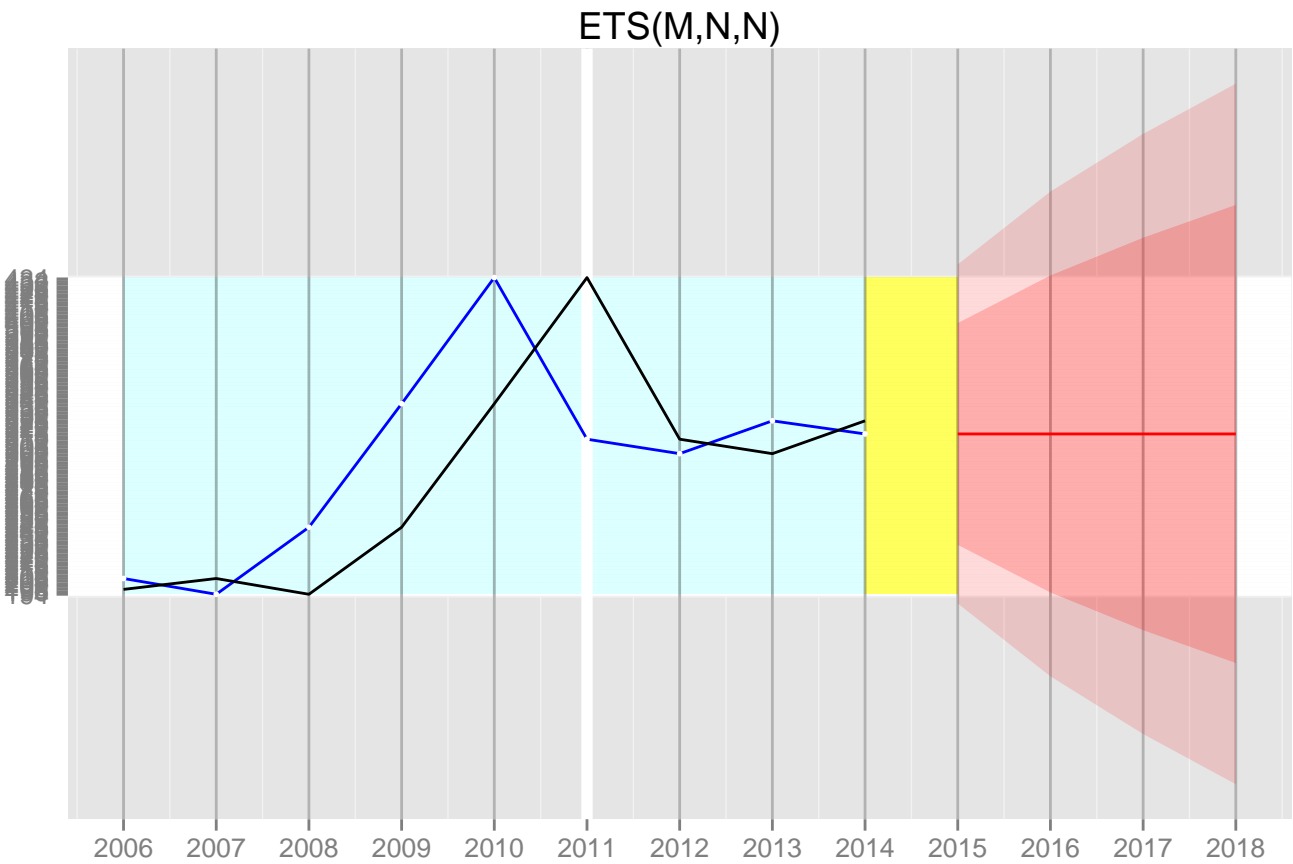
ARIMAX(0,0,0)(0,0,0)1

2.12.2 Outputs for BHL_12

$ETS(M, N, N)$

1. parameters :
   – alpha : 0.9998999
2. init state :
   – l : 197.6983
3. informations critereas :
   – loglik : -46.29324
   – aic : 96.58649
   – bic : 96.98094
   – aicc : 98.58649
   – mse : 4093.483
   – amse : 7794.077
   – sigma2 : 0.04341452

$ARIMAX(0, 0, 0)(0, 0, 0)_1$

1. informations critereas :

   – loglik : -44.93373
   – aic : 95.86745
   – bic : 96.45912
   – aicc : 100.6675
   – sigma2 : 1270.791

2. coefficients :

   – intercept : 140.6222
   – DEP_EQUIP_CAP_12 : 0.2961832

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2015.00	316.00	231.62	400.38	186.95	445.05	297.11	251.43	342.80	227.24	366.98
2016.00	316.00	195.39	436.62	131.54	500.46	297.11	251.43	342.80	227.24	366.98
2017.00	316.00	166.68	465.33	87.63	544.37	297.11	251.43	342.80	227.24	366.98
2018.00	316.00	141.69	490.31	49.42	582.59	297.11	251.43	342.80	227.24	366.98

2.13 SSL216_1

2.13.1 plots for SSL216_1

ETS(A,A,N)

ARIMAX(0,1,1)(0,0,0)12
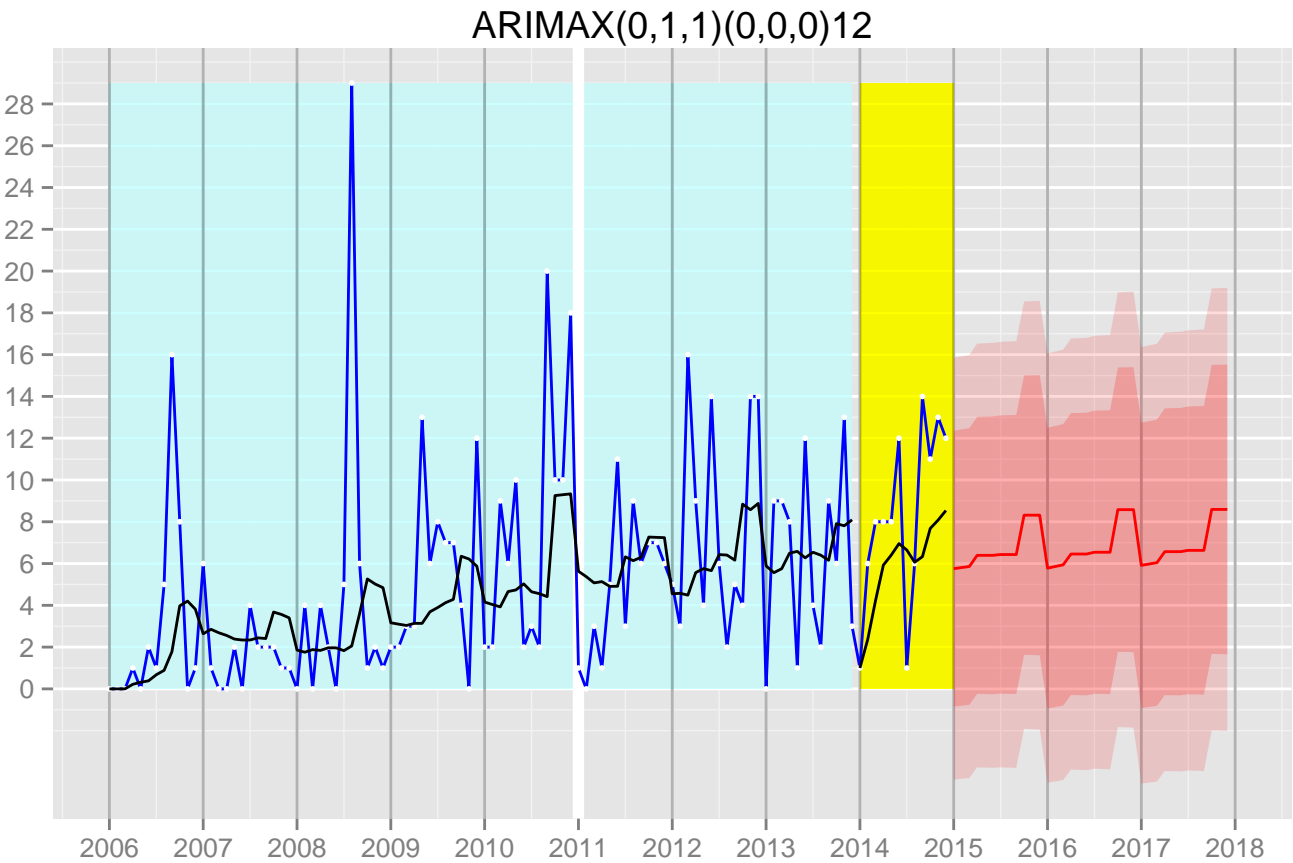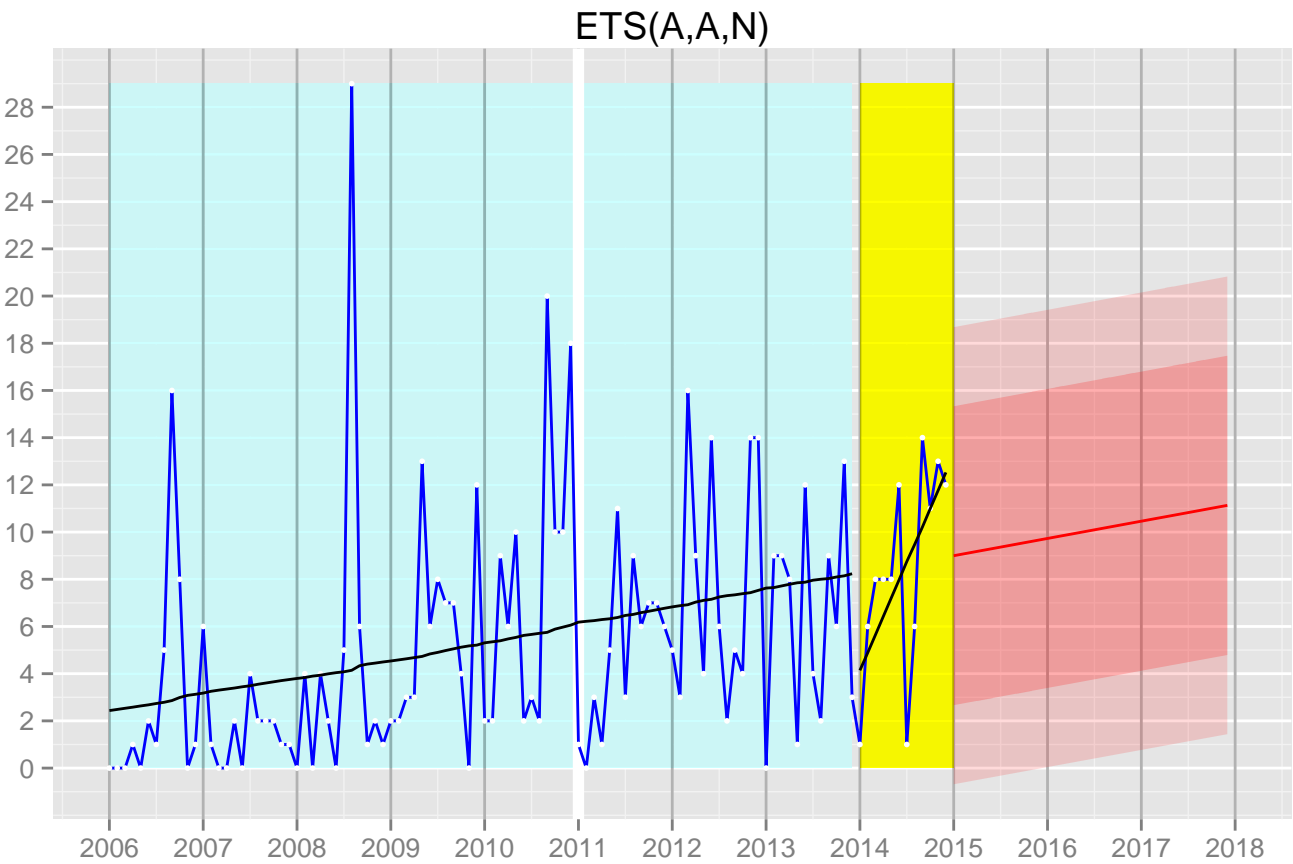
2.13.2 Outputs for SSL216_1

$ETS(A, A, N)$

1. parameters :
   − alpha : 0.005319404
   − beta : 0.0001000067
2. init state :
   − l : 2.375512
   − b : 0.06171269
3. informations critereas :
   − loglik : -372.4305
   − aic : 752.8609
   − bic : 763.1183
   − aicc : 753.3005
   − mse : 24.4009
   − amse : 24.33956
   − sigma2 : 24.4009
4. accuracy :
   − ME : 0.0003254674
   − RMSE : 3.217913
   − MAE : 2.482079
   − MPE : -83.64312
   − MAPE : 108.2681
   − MASE : 0.6659235
   − ACF1 : -0.08735863

$ARIMAX(0, 1, 1)(0, 0, 0)_{12}$

1. informations critereas :
   − loglik : -286.3655
   − aic : 578.7311
   − bic : 586.3927
   − aicc : 578.9948
   − sigma2 : 25.58856
2. coefficients :
   − ma1 : -0.9445451
   − DEP_EQUIP_CAP_1 : 0.02173453
3. accuracy :
   − ME : 2.482755
   − RMSE : 4.059544
   − MAE : 3.434531
   − MPE : -18.20187
   − MAPE : 76.11344
   − MASE : 0.9214596
   − ACF1 : -0.06769864

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2014.00	8.27	1.94	14.60	-1.41	17.95	5.52	-0.97	12.00	-4.40	15.43
2014.08	8.33	2.00	14.66	-1.35	18.01	5.62	-0.87	12.12	-4.31	15.55
2014.17	8.39	2.06	14.72	-1.29	18.07	5.73	-0.77	12.23	-4.22	15.67
2014.25	8.45	2.12	14.78	-1.23	18.13	6.23	-0.28	12.74	-3.73	16.19
2014.33	8.51	2.18	14.84	-1.17	18.19	6.23	-0.29	12.75	-3.74	16.21
2014.42	8.57	2.24	14.90	-1.11	18.25	6.23	-0.30	12.76	-3.76	16.22
2014.50	8.63	2.30	14.96	-1.05	18.32	6.36	-0.18	12.90	-3.64	16.37
2014.58	8.69	2.36	15.02	-0.99	18.38	6.36	-0.19	12.91	-3.66	16.38
2014.67	8.75	2.42	15.09	-0.93	18.44	6.36	-0.20	12.92	-3.67	16.40
2014.75	8.82	2.48	15.15	-0.87	18.50	8.55	1.97	15.12	-1.50	18.60
2014.83	8.88	2.54	15.21	-0.81	18.56	8.55	1.96	15.13	-1.52	18.61
2014.92	8.94	2.61	15.27	-0.75	18.62	8.55	1.95	15.14	-1.53	18.63
2015.00	9.00	2.67	15.33	-0.69	18.68	5.75	-0.85	12.36	-4.34	15.85
2015.08	9.06	2.73	15.39	-0.62	18.74	5.81	-0.80	12.42	-4.30	15.92
2015.17	9.12	2.79	15.45	-0.56	18.80	5.86	-0.76	12.48	-4.27	15.98
2015.25	9.18	2.85	15.51	-0.50	18.87	6.39	-0.24	13.02	-3.75	16.53
2015.33	9.24	2.91	15.57	-0.44	18.93	6.39	-0.25	13.03	-3.76	16.55
2015.42	9.30	2.97	15.64	-0.38	18.99	6.39	-0.26	13.04	-3.78	16.56
2015.50	9.36	3.03	15.70	-0.32	19.05	6.43	-0.23	13.09	-3.75	16.62
2015.58	9.42	3.09	15.76	-0.26	19.11	6.43	-0.24	13.10	-3.77	16.63
2015.67	9.49	3.15	15.82	-0.20	19.17	6.43	-0.25	13.11	-3.78	16.65
2015.75	9.55	3.21	15.88	-0.14	19.23	8.32	1.63	15.01	-1.91	18.55
2015.83	9.61	3.27	15.94	-0.08	19.29	8.32	1.62	15.02	-1.93	18.56
2015.92	9.67	3.33	16.00	-0.02	19.36	8.32	1.61	15.02	-1.94	18.58
2016.00	9.73	3.40	16.06	0.04	19.42	5.78	-0.94	12.50	-4.49	16.05
2016.08	9.79	3.46	16.12	0.10	19.48	5.86	-0.87	12.59	-4.43	16.15
2016.17	9.85	3.52	16.19	0.16	19.54	5.94	-0.80	12.67	-4.37	16.24
2016.25	9.91	3.58	16.25	0.22	19.60	6.46	-0.29	13.20	-3.86	16.77
2016.33	9.97	3.64	16.31	0.29	19.66	6.46	-0.30	13.21	-3.88	16.79
2016.42	10.03	3.70	16.37	0.35	19.72	6.46	-0.31	13.22	-3.89	16.80

2.14 SSL216_2

2.14.1 plots for SSL216_2

ETS(A,A,N)

ARIMAX(0,0,0)(0,0,0)6
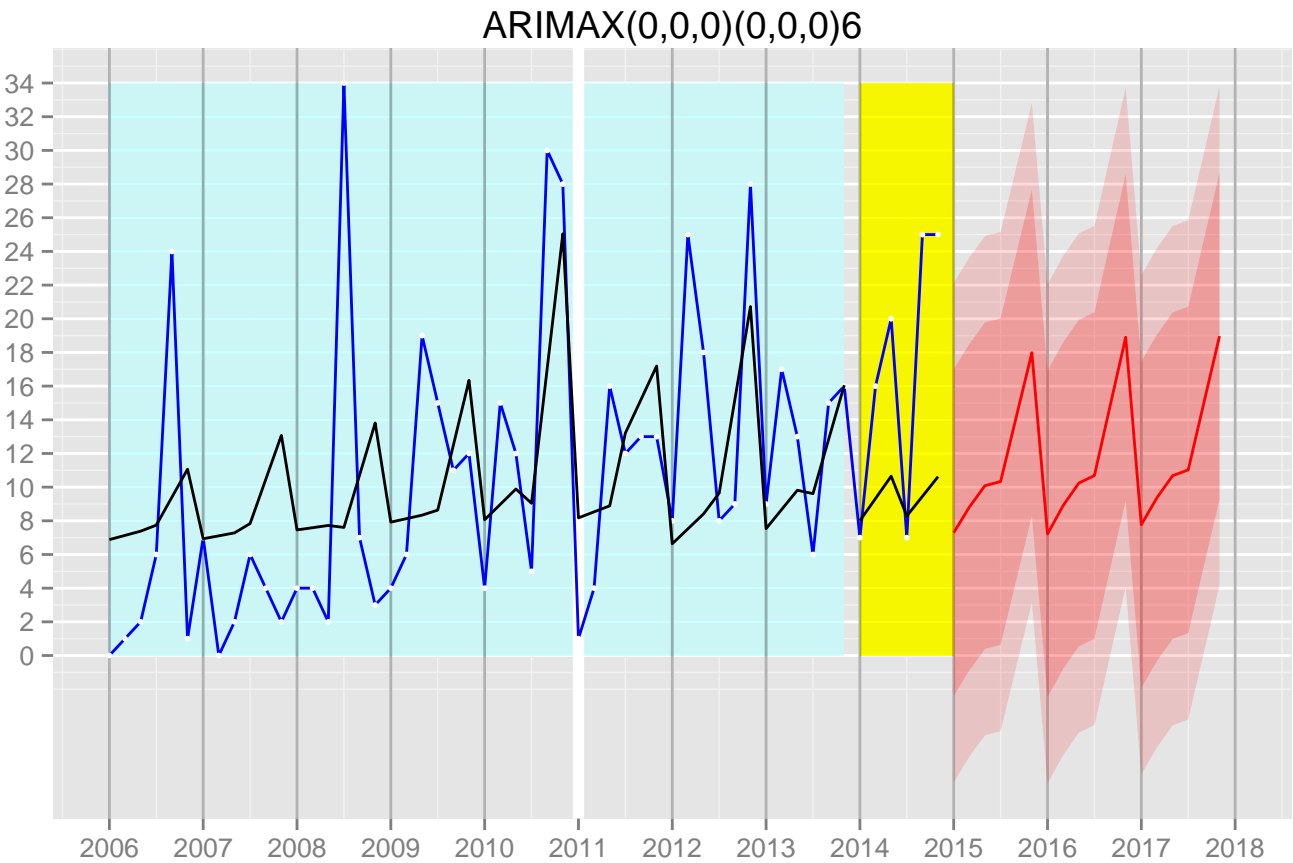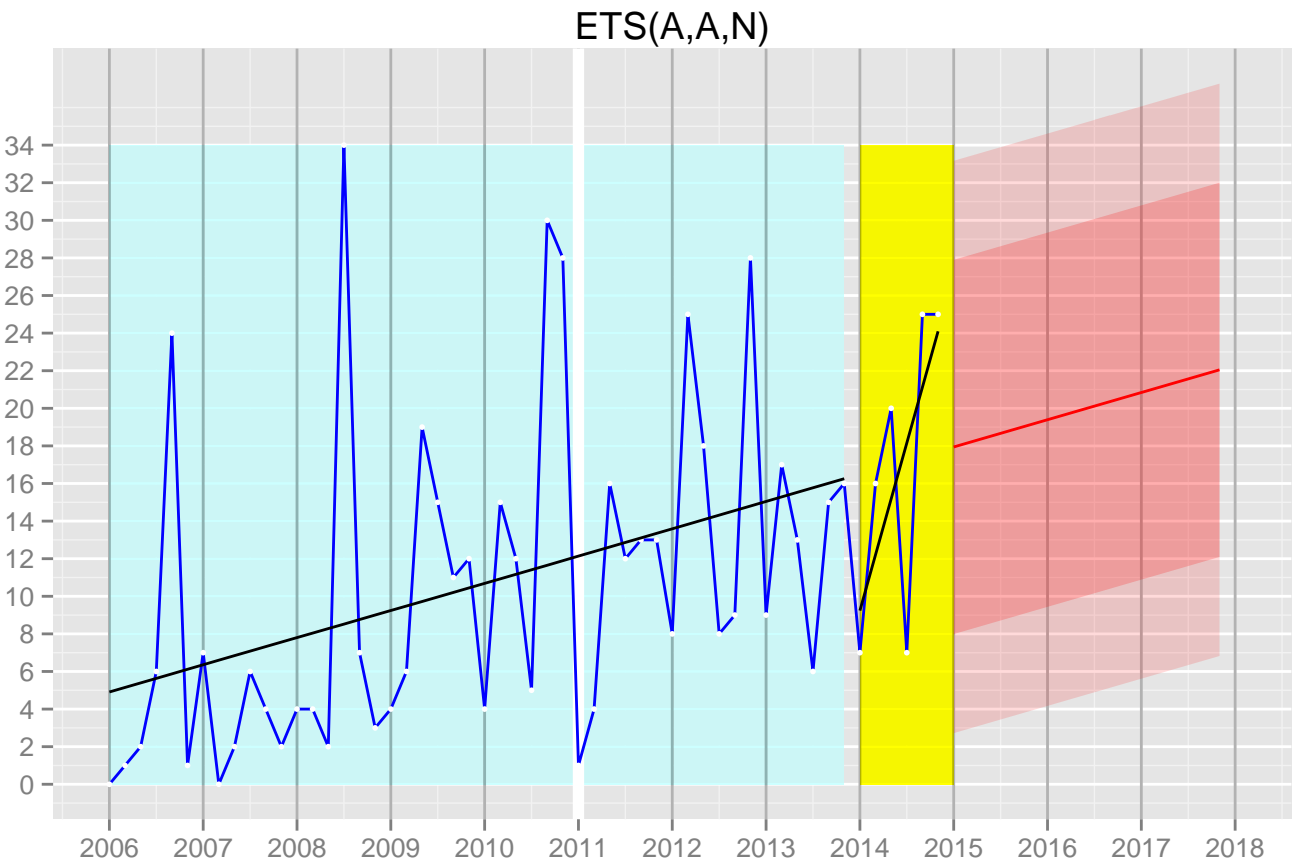
2.14.2 Outputs for SSL216_2

$ETS(A, A, N)$

1. parameters :
   - alpha : 0.0001000833
   - beta : 0.0001000262
2. init state :
   - l : 4.667526
   - b : 0.242016
3. informations critereas :
   - loglik : -191.3055
   - aic : 390.611
   - bic : 398.0958
   - aicc : 391.5412
   - mse : 60.33188
   - amse : 59.87302
   - sigma2 : 60.33188
4. accuracy :
   - ME : -6.113098e-05
   - RMSE : 5.520442
   - MAE : 4.463833
   - MPE : -20.73266
   - MAPE : 43.03726
   - MASE : 0.5072538
   - ACF1 : -0.4577195

$ARIMAX(0, 0, 0)(0, 0, 0)_6$

1. informations critereas :
   - loglik : -165.2379
   - aic : 336.4757
   - bic : 342.0894
   - aicc : 337.0212
   - sigma2 : 57.22749
2. coefficients :
   - intercept : 6.464751
   - DEP_EQUIP_CAP_2 : 0.04379392
3. accuracy :
   - ME : 7.276029
   - RMSE : 9.857763
   - MAE : 8.039951
   - MPE : 29.23597
   - MAPE : 40.14914
   - MASE : 0.9136308
   - ACF1 : -0.09829107

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2014.00	16.50	6.54	26.45	1.27	31.72	6.08	-3.61	15.78	-8.74	20.91
2014.17	16.74	6.78	26.69	1.51	31.96	7.95	-1.74	17.65	-6.87	22.78
2014.33	16.98	7.02	26.93	1.75	32.20	9.35	-0.35	19.04	-5.48	24.17
2014.50	17.22	7.27	27.17	2.00	32.44	10.01	0.32	19.71	-4.82	24.84
2014.67	17.46	7.51	27.42	2.24	32.68	14.44	4.74	24.13	-0.39	29.26
2014.83	17.70	7.75	27.66	2.48	32.93	18.82	9.12	28.51	3.99	33.65
2015.00	17.94	7.99	27.90	2.72	33.17	7.29	-2.40	16.99	-7.53	22.12
2015.17	18.18	8.23	28.14	2.96	33.41	8.81	-0.88	18.51	-6.01	23.64
2015.33	18.43	8.47	28.38	3.20	33.65	10.09	0.39	19.78	-4.74	24.91
2015.50	18.67	8.71	28.62	3.44	33.89	10.33	0.64	20.03	-4.50	25.16
2015.67	18.91	8.95	28.86	3.69	34.13	14.17	4.47	23.86	-0.66	28.99
2015.83	19.15	9.20	29.10	3.93	34.37	17.98	8.29	27.68	3.16	32.81
2016.00	19.39	9.44	29.35	4.17	34.62	7.22	-2.48	16.91	-7.61	22.04
2016.17	19.63	9.68	29.59	4.41	34.86	8.91	-0.79	18.60	-5.92	23.73
2016.33	19.87	9.92	29.83	4.65	35.10	10.24	0.54	19.93	-4.59	25.07
2016.50	20.12	10.16	30.07	4.89	35.34	10.69	0.99	20.38	-4.14	25.52
2016.67	20.36	10.40	30.31	5.13	35.58	14.81	5.12	24.51	-0.02	29.64
2016.83	20.60	10.64	30.55	5.37	35.82	18.90	9.21	28.60	4.08	33.73
2017.00	20.84	10.89	30.79	5.62	36.06	7.77	-1.93	17.46	-7.06	22.59
2017.17	21.08	11.13	31.04	5.86	36.31	9.37	-0.32	19.07	-5.45	24.20
2017.33	21.32	11.37	31.28	6.10	36.55	10.68	0.98	20.37	-4.15	25.51
2017.50	21.56	11.61	31.52	6.34	36.79	11.03	1.33	20.72	-3.80	25.85
2017.67	21.81	11.85	31.76	6.58	37.03	15.01	5.32	24.71	0.18	29.84
2017.83	22.05	12.09	32.00	6.82	37.27	18.97	9.27	28.66	4.14	33.79

2.15 SSL216_3

2.15.1 plots for SSL216_3

ETS(A,A,N)

ARIMAX(3,1,0)(1,0,0)4
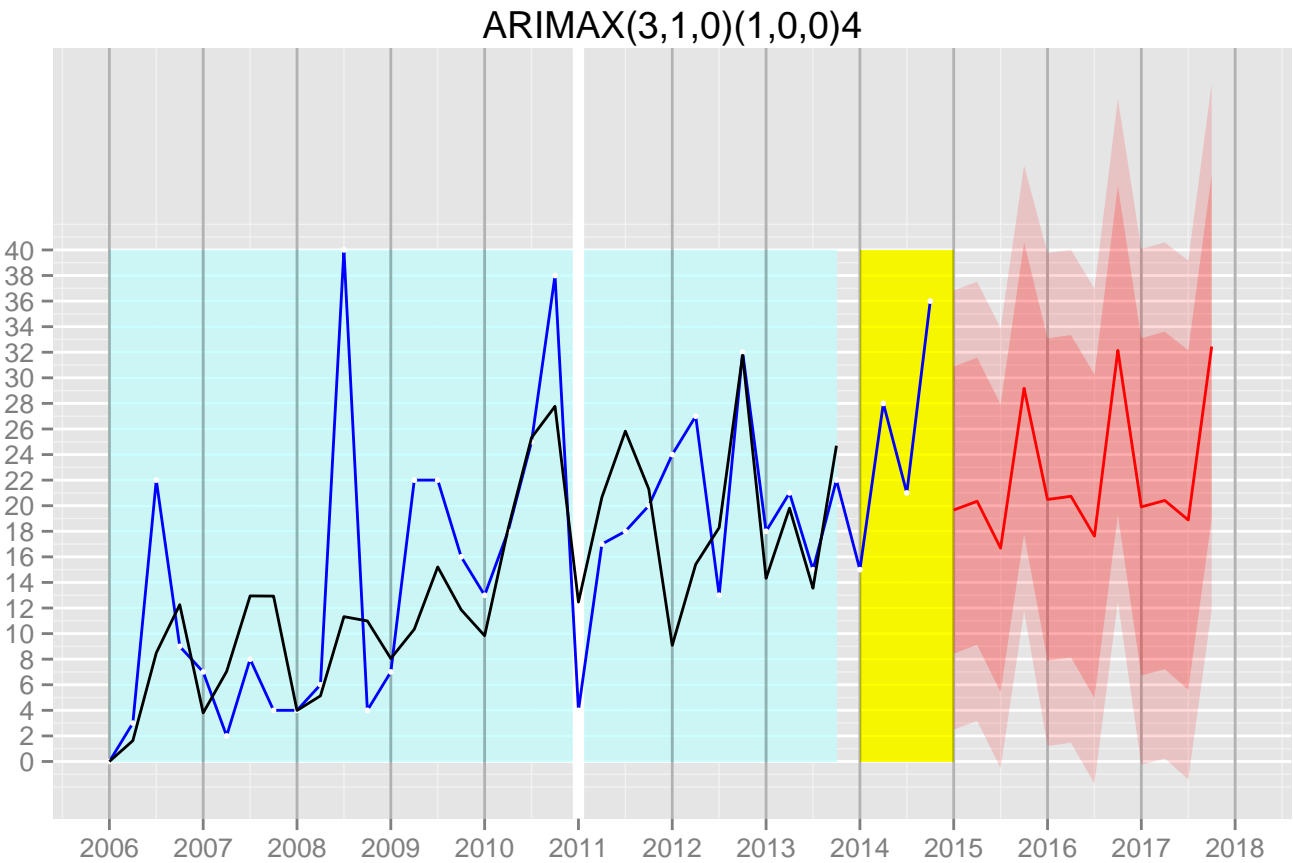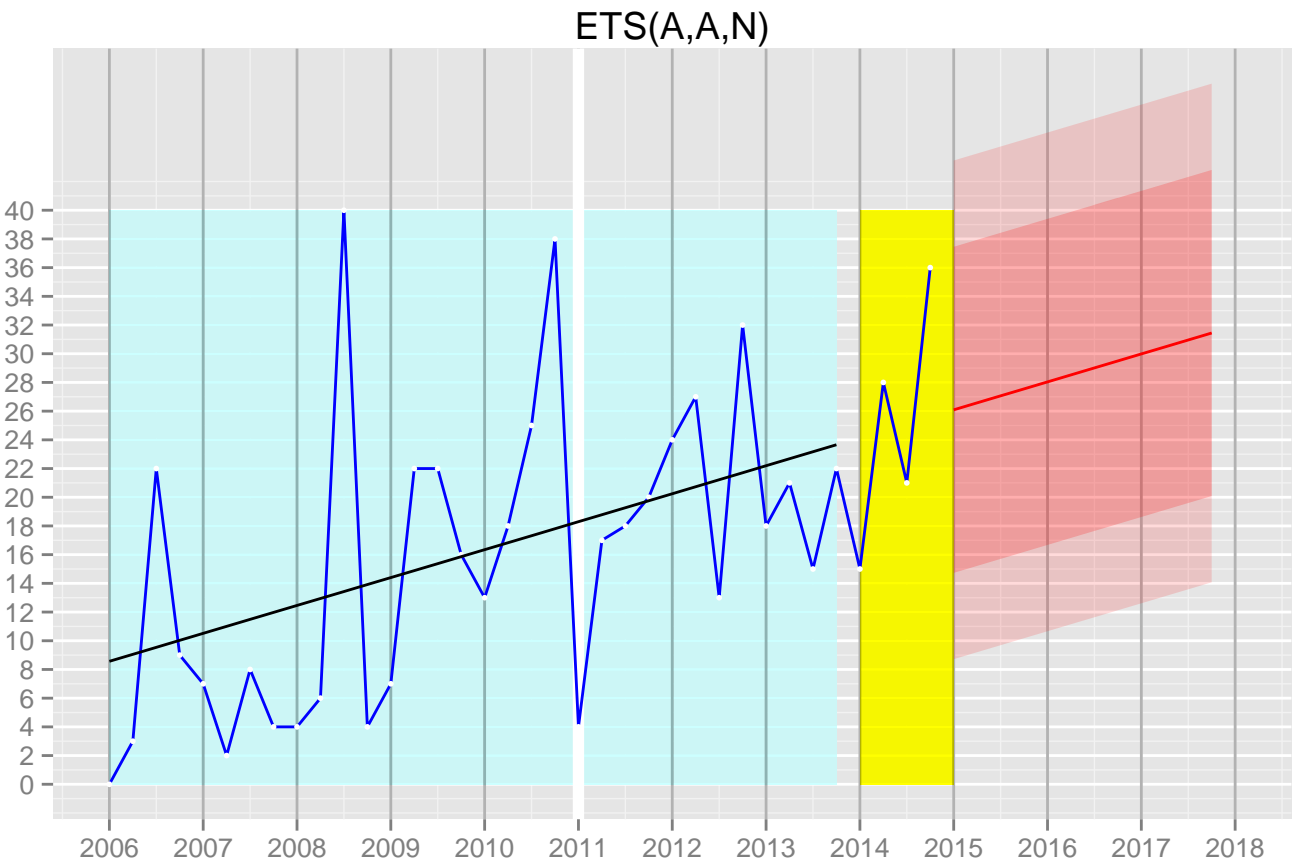
2.15.2 Outputs for SSL216_3

$ETS(A, A, N)$

1. parameters :
   - alpha : 0.0001000133
   - beta : 0.0001000023
2. init state :
   - l : 8.079453
   - b : 0.488227
3. informations critereas :
   - loglik : -125.2787
   - aic : 258.5573
   - bic : 264.4203
   - aicc : 260.0388
   - mse : 78.58494
   - amse : 76.66702
   - sigma2 : 78.58494

$ARIMAX(3, 1, 0)(1, 0, 0)_4$

1. informations critereas :
   - loglik : -107.1492
   - aic : 226.2985
   - bic : 234.9024
   - aicc : 229.7985
   - sigma2 : 69.29821
2. coefficients :
   - ar1 : -1.005576
   - ar2 : -0.9628224
   - ar3 : -0.8053021
   - sar1 : -0.5206692
   - DEP_EQUIP_CAP_3 : 0.04291688

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2014.00	24.14	12.78	35.50	6.77	41.52	21.50	10.83	32.16	5.18	37.81
2014.25	24.63	13.27	35.99	7.26	42.01	22.23	11.56	32.90	5.92	38.55
2014.50	25.12	13.76	36.48	7.74	42.49	15.17	4.49	25.85	-1.16	31.50
2014.75	25.60	14.24	36.96	8.23	42.98	30.61	19.80	41.42	14.08	47.14
2015.00	26.09	14.73	37.45	8.72	43.47	19.66	8.44	30.89	2.49	36.83
2015.25	26.58	15.22	37.94	9.20	43.95	20.35	9.12	31.57	3.17	37.52
2015.50	27.06	15.70	38.43	9.69	44.44	16.68	5.42	27.93	-0.53	33.89
2015.75	27.55	16.19	38.91	10.18	44.93	29.18	17.78	40.58	11.75	46.62
2016.00	28.04	16.68	39.40	10.66	45.41	20.49	7.88	33.09	1.21	39.76
2016.25	28.52	17.16	39.89	11.15	45.90	20.74	8.13	33.34	1.46	40.02
2016.50	29.01	17.65	40.37	11.64	46.39	17.62	4.96	30.28	-1.74	36.98
2016.75	29.50	18.14	40.86	12.12	46.87	32.15	19.28	45.01	12.47	51.83
2017.00	29.98	18.62	41.35	12.61	47.36	19.91	6.72	33.10	-0.26	40.08
2017.25	30.47	19.11	41.83	13.10	47.85	20.41	7.22	33.61	0.23	40.59
2017.50	30.96	19.60	42.32	13.58	48.33	18.88	5.61	32.15	-1.41	39.18
2017.75	31.45	20.08	42.81	14.07	48.82	32.44	18.97	45.92	11.84	53.05

2.16.1   plots for SSL216_4

ETS(A,A,N)
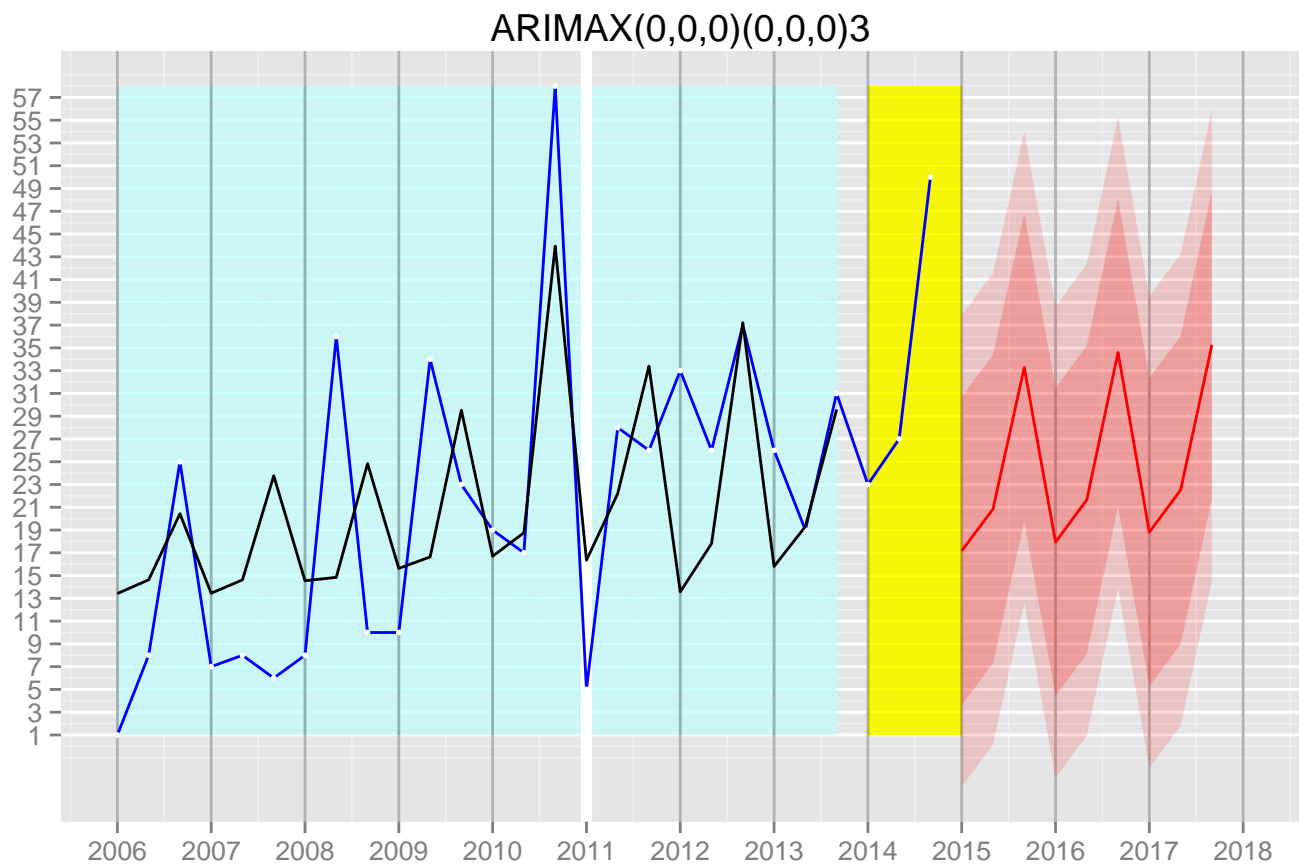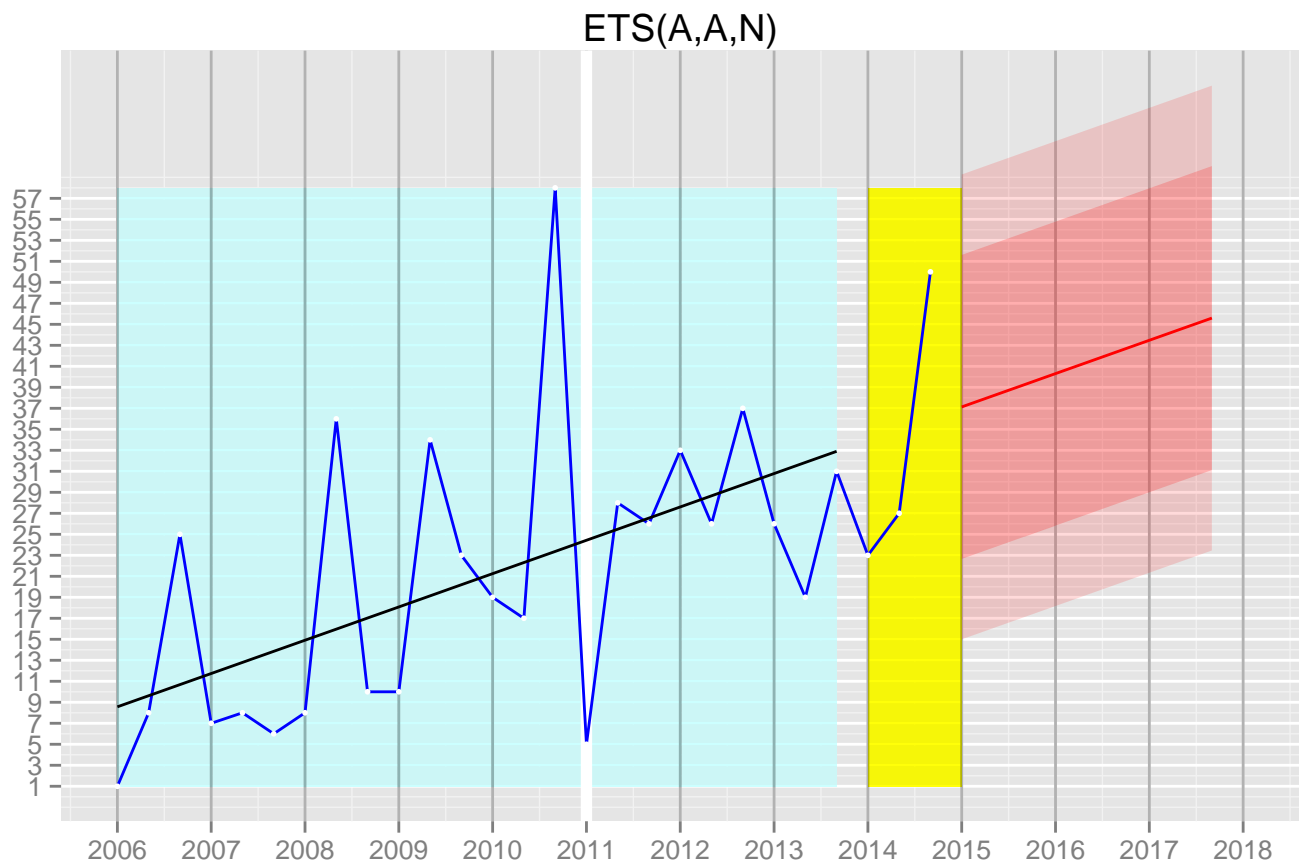
ARIMAX(0,0,0)(0,0,0)3

2.16.2 Outputs for SSL216_4

$ETS(A, A, N)$

1. parameters :
   - alpha : 0.0001000091
   - beta : 0.0001000045
2. init state :
   - l : 7.511143
   - b : 1.057549
3. informations critereas :
   - loglik : -96.32286
   - aic : 200.6457
   - bic : 205.3579
   - aicc : 202.751
   - mse : 127.5937
   - amse : 125.9493
   - sigma2 : 127.5937

$ARIMAX(0, 0, 0)(0, 0, 0)_3$

1. informations critereas :
   - loglik : -90.64194
   - aic : 187.2839
   - bic : 190.818
   - aicc : 188.4839
   - sigma2 : 111.6778
2. coefficients :
   - intercept : 12.23774
   - DEP_EQUIP_CAP_4 : 0.04760678

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2014.00	33.96	19.48	48.43	11.82	56.10	16.12	2.58	29.67	-4.59	36.84
2014.33	35.02	20.54	49.49	12.88	57.16	19.90	6.36	33.45	-0.81	40.62
2014.67	36.07	21.60	50.55	13.94	58.21	33.66	20.12	47.21	12.95	54.37
2015.00	37.13	22.66	51.61	14.99	59.27	17.17	3.63	30.71	-3.54	37.88
2015.33	38.19	23.71	52.67	16.05	60.33	20.84	7.30	34.39	0.13	41.56
2015.67	39.25	24.77	53.72	17.11	61.39	33.28	19.73	46.82	12.56	53.99
2016.00	40.31	25.83	54.78	18.17	62.45	17.94	4.40	31.48	-2.77	38.65
2016.33	41.36	26.89	55.84	19.22	63.50	21.66	8.11	35.20	0.94	42.37
2016.67	42.42	27.95	56.90	20.28	64.56	34.59	21.05	48.14	13.88	55.30
2017.00	43.48	29.00	57.96	21.34	65.62	18.82	5.27	32.36	-1.90	39.53
2017.33	44.54	30.06	59.01	22.40	66.68	22.51	8.97	36.06	1.80	43.23
2017.67	45.60	31.12	60.07	23.46	67.74	35.26	21.72	48.80	14.55	55.97

ETS(A,N,N)
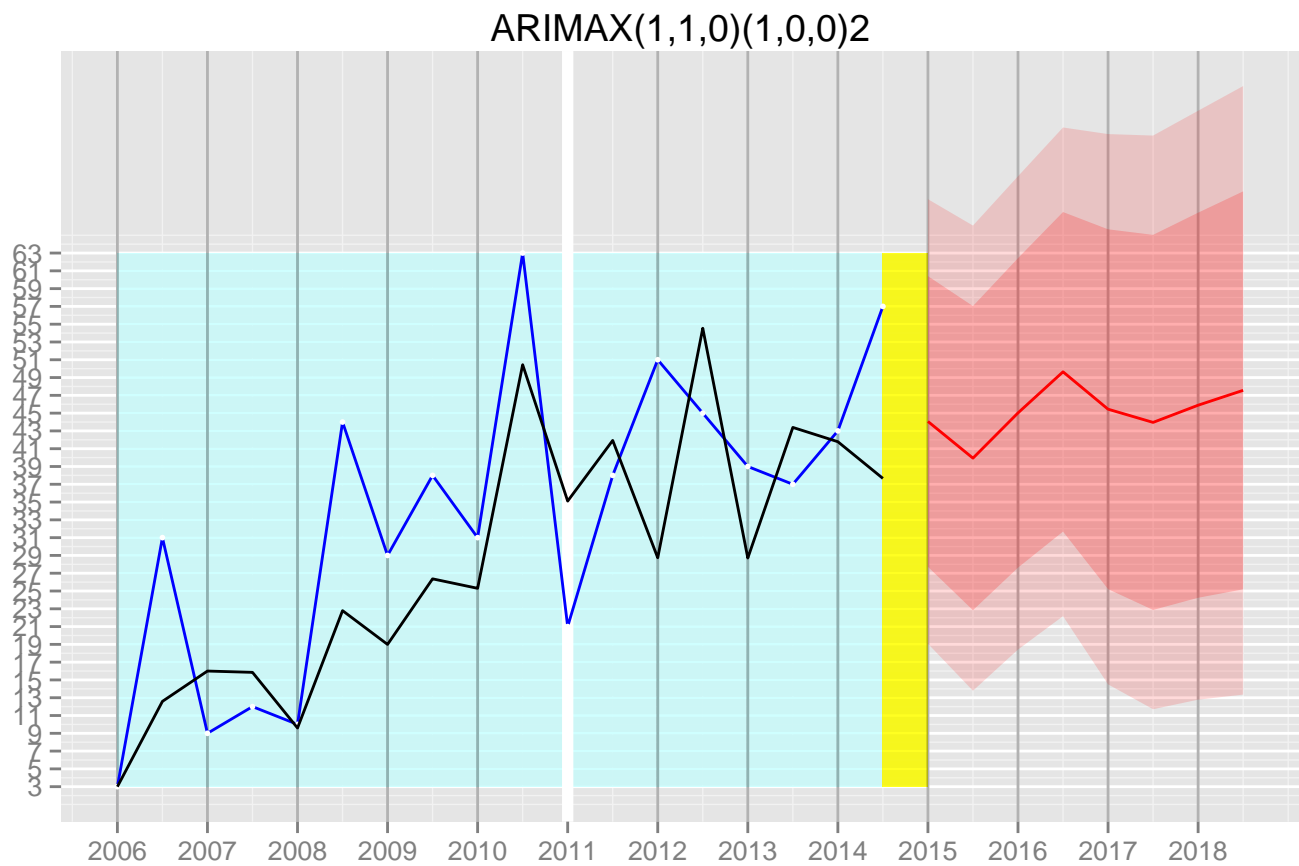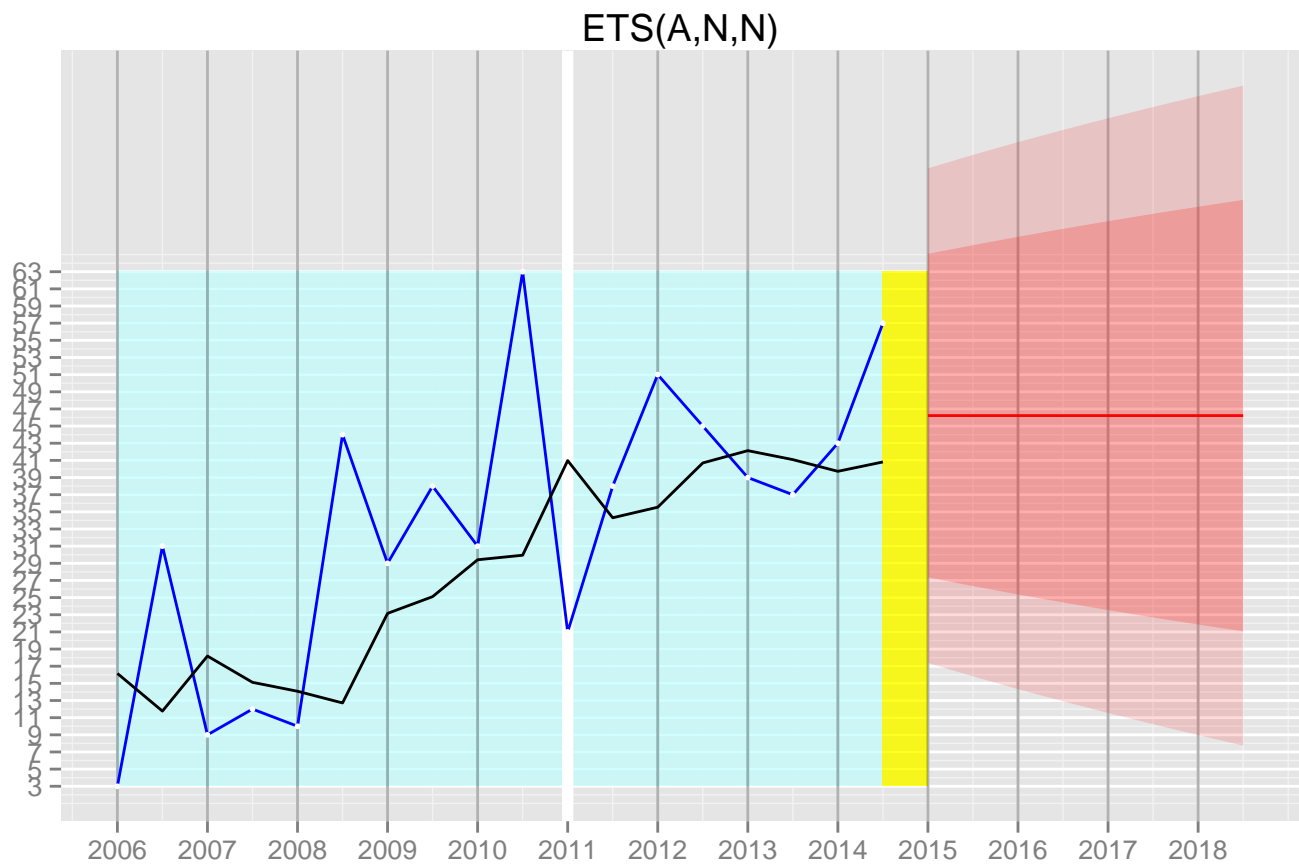
ARIMAX(1,1,0)(1,0,0)2

2.17.2   Outputs for SSL216_6

$ETS(A, N, N)$

1. parameters :
   - alpha : 0.3338296
2. init state :
   - l : 16.1568
3. informations critereas :
   - loglik : -74.41265
   - aic : 152.8253
   - bic : 154.606
   - aicc : 153.6253
   - mse : 216.5237
   - amse : 212.279
   - sigma2 : 216.5237

$ARIMAX(1, 1, 0)(1, 0, 0)_2$

1. informations critereas :
   - loglik : -63.42548
   - aic : 134.851
   - bic : 138.1838
   - aicc : 138.1843
   - sigma2 : 162.6258

2. coefficients :
   - ar1 : -0.6916704
   - sar1 : -0.5906315
   - DEP_EQUIP_CAP_6 : 0.02812653

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2015.00	46.22	27.36	65.08	17.38	75.06	44.07	27.72	60.41	19.07	69.06
2015.50	46.22	26.34	66.10	15.81	76.62	39.94	22.84	57.04	13.78	66.09
2016.00	46.22	25.37	67.07	14.33	78.11	45.02	27.62	62.42	18.41	71.63
2016.50	46.22	24.44	68.00	12.91	79.53	49.64	31.68	67.61	22.17	77.12
2017.00	46.22	23.55	68.89	11.54	80.90	45.44	25.21	65.67	14.50	76.38
2017.50	46.22	22.69	69.75	10.23	82.21	43.96	22.87	65.05	11.71	76.21
2018.00	46.22	21.86	70.58	8.96	83.47	45.89	24.24	67.54	12.78	79.00
2018.50	46.22	21.06	71.38	7.74	84.70	47.56	25.19	69.94	13.35	81.78

2.18 SSL216_12

2.18.1 plots for SSL216_12

ETS(A,N,N)
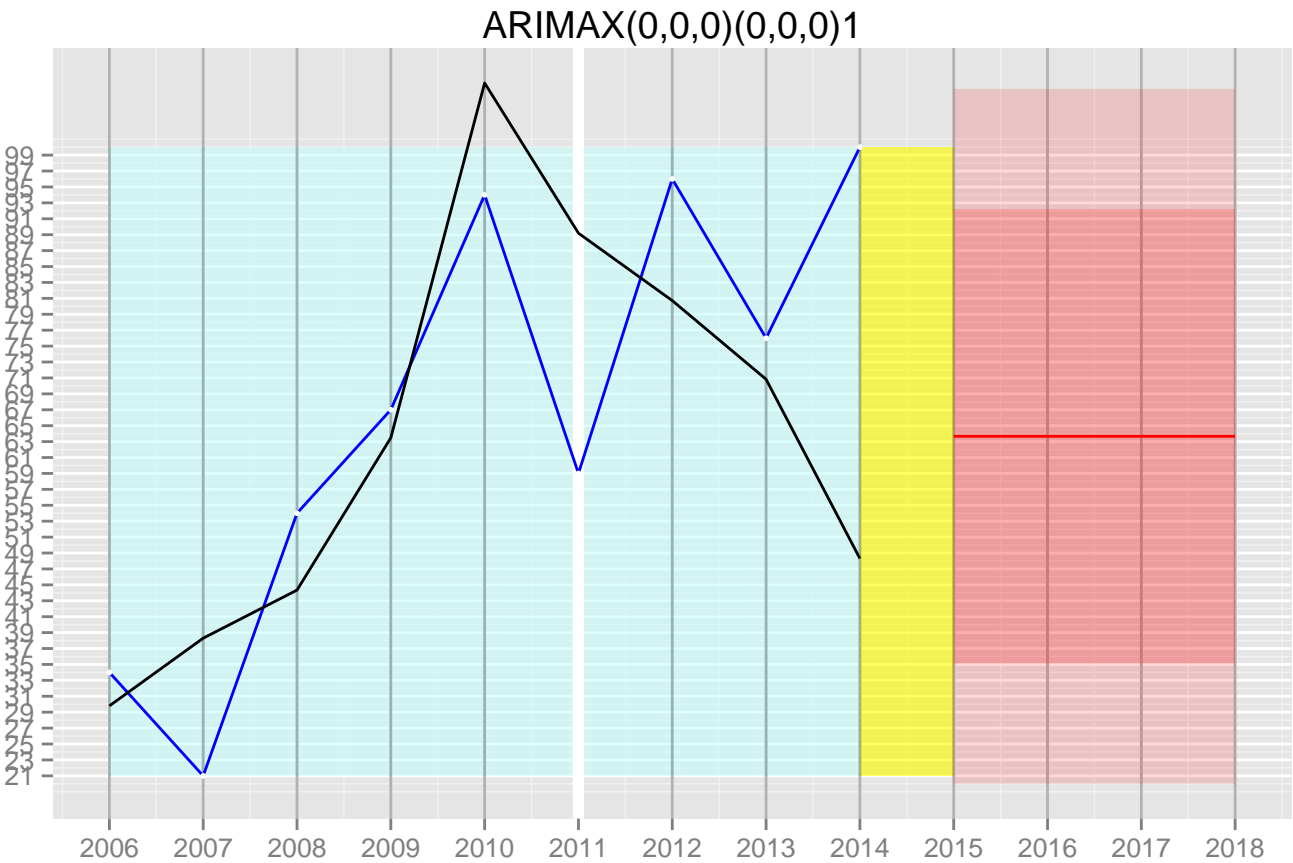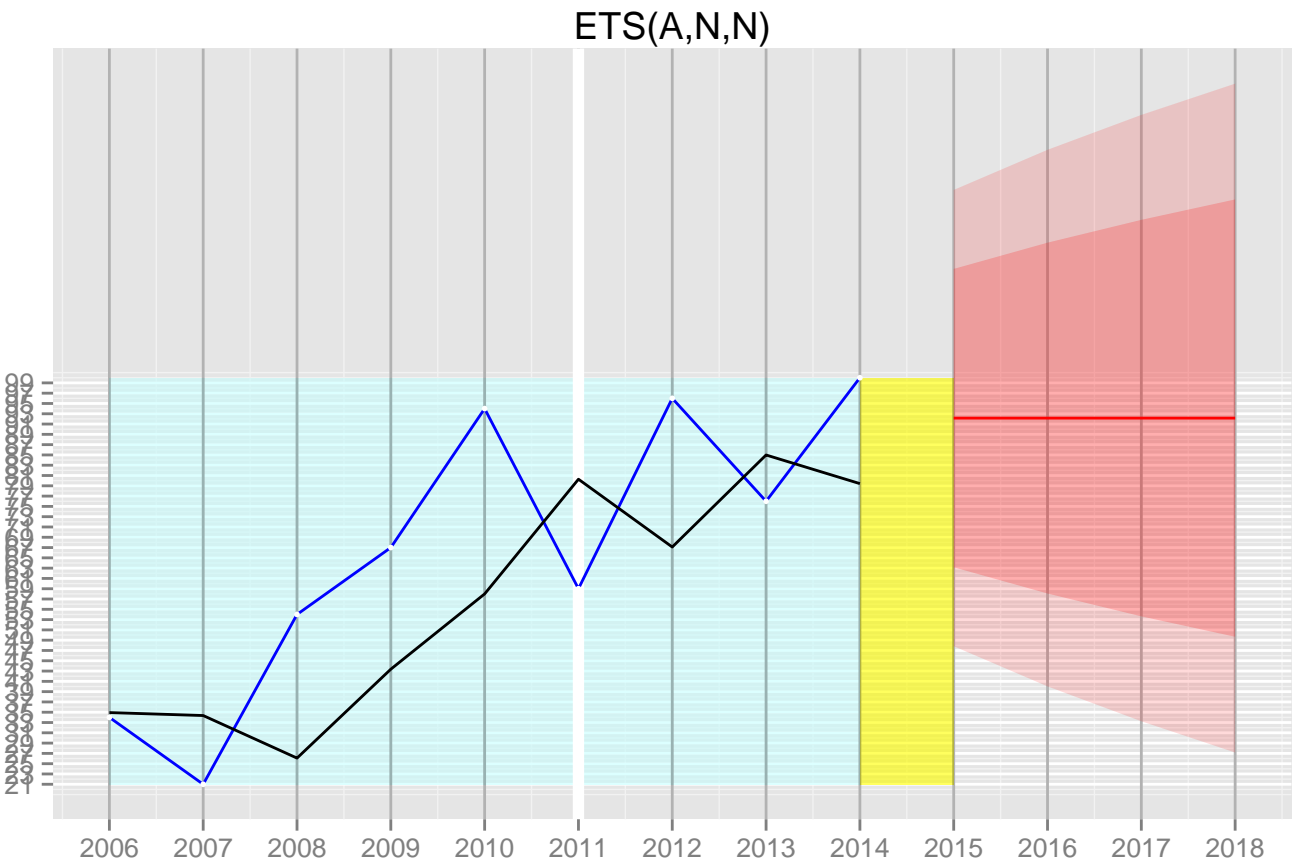
ARIMAX(0,0,0)(0,0,0)1

2.18.2 Outputs for SSL216_12

$ETS(A, N, N)$

1. parameters :
   − alpha : 0.6189166
2. init state :
   − l : 34.93054
3. informations critereas :
   − loglik : -37.95705
   − aic : 79.9141
   − bic : 80.30855
   − aicc : 81.9141
   − mse : 511.6678
   − amse : 696.5081
   − sigma2 : 511.6678

$ARIMAX(0, 0, 0)(0, 0, 0)_1$

1. informations critereas :
   − loglik : -40.70025
   − aic : 85.40051
   − bic : 85.79495
   − aicc : 87.40051
   − sigma2 : 496.0236
2. coefficients :
   − DEP_EQUIP_CAP_12 : 0.1205028

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2015.00	92.16	63.17	121.15	47.83	136.49	63.67	35.13	92.21	20.02	107.32
2016.00	92.16	58.07	126.25	40.02	144.30	63.67	35.13	92.21	20.02	107.32
2017.00	92.16	53.63	130.68	33.24	151.08	63.67	35.13	92.21	20.02	107.32
2018.00	92.16	49.66	134.66	27.16	157.15	63.67	35.13	92.21	20.02	107.32

2.19   SSL216_CAT_1

2.19.1   plots for SSL216_CAT_1

ETS(A,A,N)

ARIMAX(0,1,1)(0,0,0)12
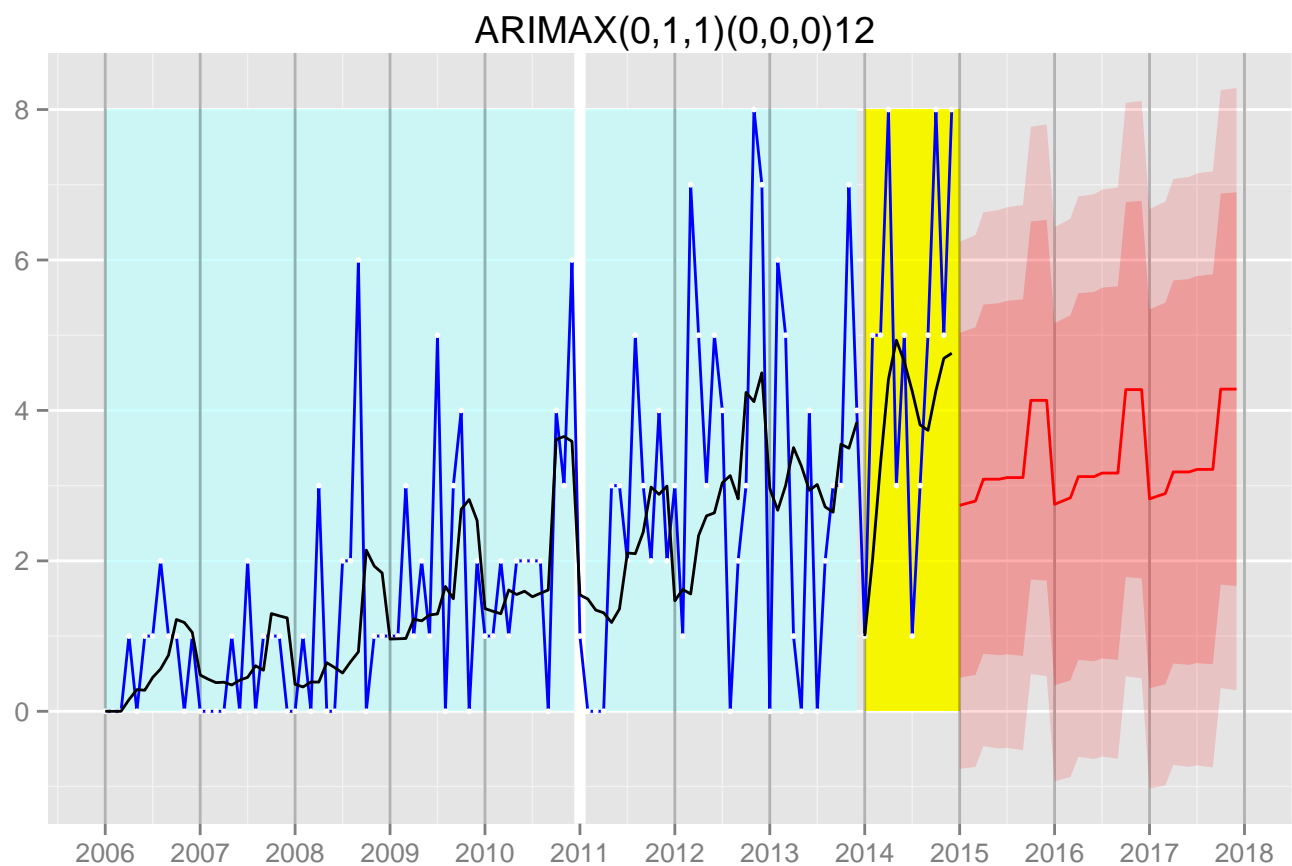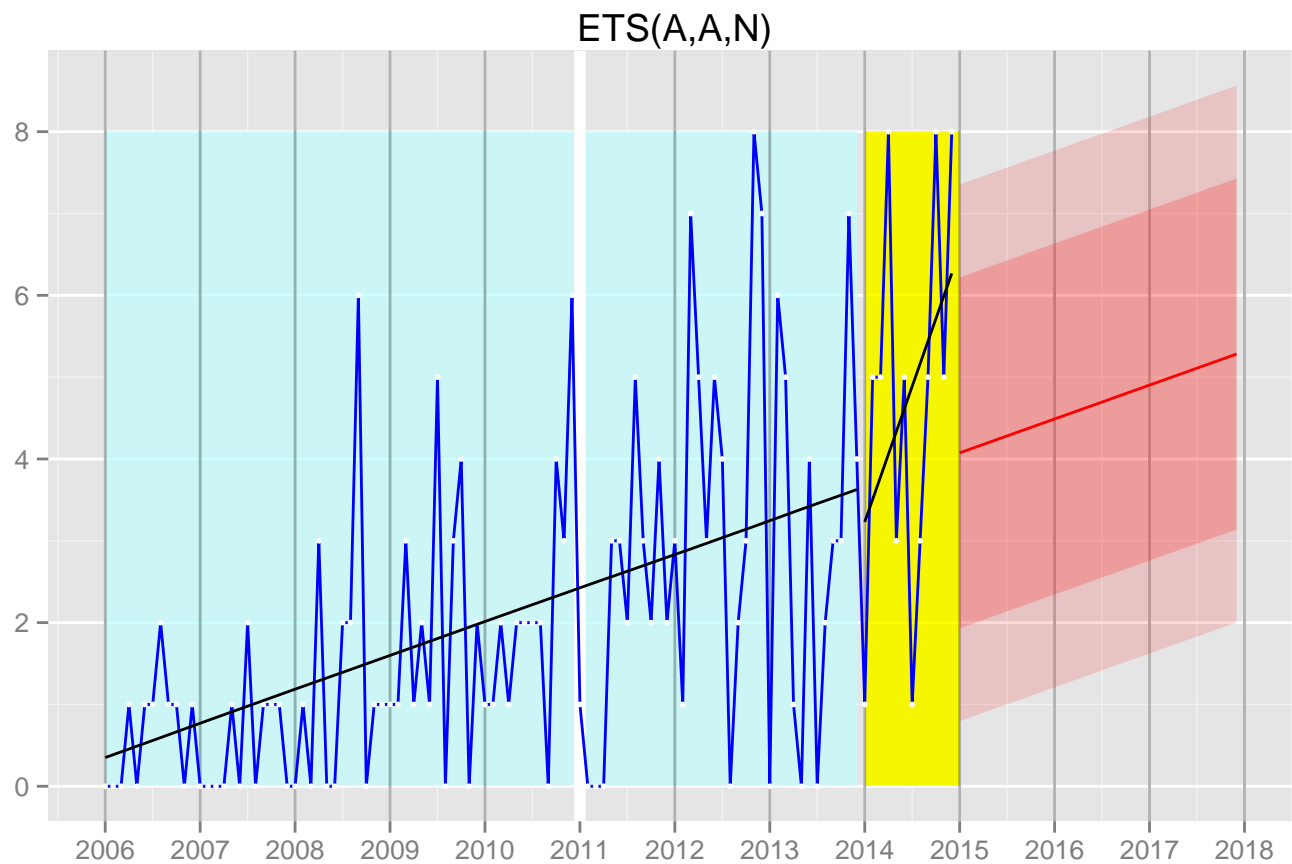
2.19.2 Outputs for SSL216_CAT_1

$ETS(A, A, N)$

1. parameters :
   - alpha : 0.0001000021
   - beta : 0.0001000009
2. init state :
   - l : 0.3156259
   - b : 0.0349313
3. informations critereas :
   - loglik : -268.5082
   - aic : 545.0165
   - bic : 555.2739
   - aicc : 545.456
   - mse : 2.799871
   - amse : 2.79848
   - sigma2 : 2.799871
4. accuracy :
   - ME : 0.0006192279
   - RMSE : 2.147828
   - MAE : 1.842324
   - MPE : -49.64309
   - MAPE : 76.55424
   - MASE : 0.6537278
   - ACF1 : 0.006724096

$ARIMAX(0, 1, 1)(0, 0, 0)_{12}$

1. informations critereas :
   - loglik : -183.1346
   - aic : 372.2692
   - bic : 379.9308
   - aicc : 372.5329
   - sigma2 : 2.86213
2. coefficients :
   - ma1 : -0.9013729
   - DEP_EQUIP_CAP_1 : 0.01183504
3. accuracy :
   - ME : 0.9306485
   - RMSE : 2.34292
   - MAE : 1.930208
   - MPE : -12.739
   - MAPE : 56.76187
   - MASE : 0.6849125
   - ACF1 : 0.04762958

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2014.00	3.66	1.52	5.81	0.38	6.94	2.61	0.44	4.78	-0.71	5.93
2014.08	3.70	1.55	5.84	0.42	6.97	2.67	0.49	4.85	-0.66	6.00
2014.17	3.73	1.59	5.87	0.45	7.01	2.72	0.54	4.91	-0.62	6.07
2014.25	3.76	1.62	5.91	0.48	7.04	3.00	0.80	5.20	-0.37	6.36
2014.33	3.80	1.65	5.94	0.52	7.08	3.00	0.79	5.21	-0.38	6.38
2014.42	3.83	1.69	5.98	0.55	7.11	3.00	0.78	5.22	-0.40	6.39
2014.50	3.87	1.72	6.01	0.59	7.15	3.07	0.84	5.30	-0.34	6.48
2014.58	3.90	1.76	6.05	0.62	7.18	3.07	0.83	5.31	-0.36	6.50
2014.67	3.94	1.79	6.08	0.66	7.22	3.07	0.82	5.32	-0.37	6.51
2014.75	3.97	1.83	6.12	0.69	7.25	4.26	2.00	6.52	0.80	7.72
2014.83	4.01	1.86	6.15	0.73	7.29	4.26	1.99	6.53	0.79	7.73
2014.92	4.04	1.90	6.18	0.76	7.32	4.26	1.98	6.54	0.77	7.75
2015.00	4.07	1.93	6.22	0.80	7.35	2.74	0.45	5.03	-0.77	6.24
2015.08	4.11	1.97	6.25	0.83	7.39	2.77	0.47	5.07	-0.75	6.29
2015.17	4.14	2.00	6.29	0.86	7.42	2.79	0.48	5.11	-0.74	6.33
2015.25	4.18	2.03	6.32	0.90	7.46	3.09	0.77	5.41	-0.46	6.64
2015.33	4.21	2.07	6.36	0.93	7.49	3.09	0.76	5.42	-0.48	6.65
2015.42	4.25	2.10	6.39	0.97	7.53	3.09	0.75	5.43	-0.49	6.67
2015.50	4.28	2.14	6.43	1.00	7.56	3.11	0.76	5.46	-0.49	6.70
2015.58	4.32	2.17	6.46	1.04	7.60	3.11	0.75	5.47	-0.50	6.72
2015.67	4.35	2.21	6.50	1.07	7.63	3.11	0.74	5.48	-0.52	6.73
2015.75	4.39	2.24	6.53	1.11	7.67	4.13	1.75	6.51	0.50	7.77
2015.83	4.42	2.28	6.56	1.14	7.70	4.13	1.74	6.52	0.48	7.79
2015.92	4.45	2.31	6.60	1.17	7.73	4.13	1.74	6.53	0.47	7.80
2016.00	4.49	2.34	6.63	1.21	7.77	2.75	0.34	5.16	-0.93	6.43
2016.08	4.52	2.38	6.67	1.24	7.80	2.80	0.38	5.21	-0.90	6.49
2016.17	4.56	2.41	6.70	1.28	7.84	2.84	0.41	5.26	-0.87	6.55
2016.25	4.59	2.45	6.74	1.31	7.87	3.12	0.68	5.56	-0.61	6.85
2016.33	4.63	2.48	6.77	1.35	7.91	3.12	0.67	5.57	-0.62	6.86
2016.42	4.66	2.52	6.81	1.38	7.94	3.12	0.67	5.58	-0.63	6.87

2.20   SSL216_CAT_2

2.20.1   plots for SSL216_CAT_2

ETS(A,A,N)

ARIMAX(2,1,2)(0,0,0)6
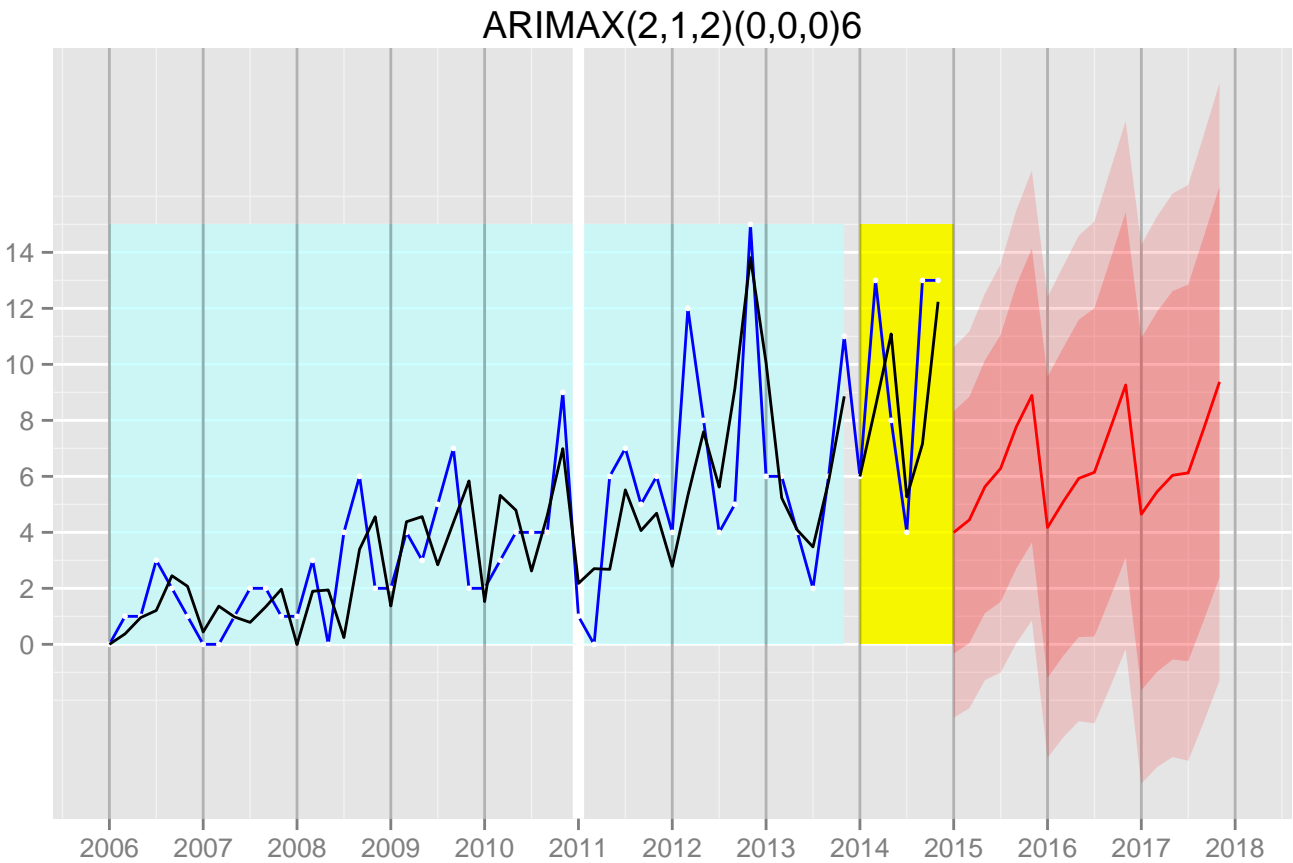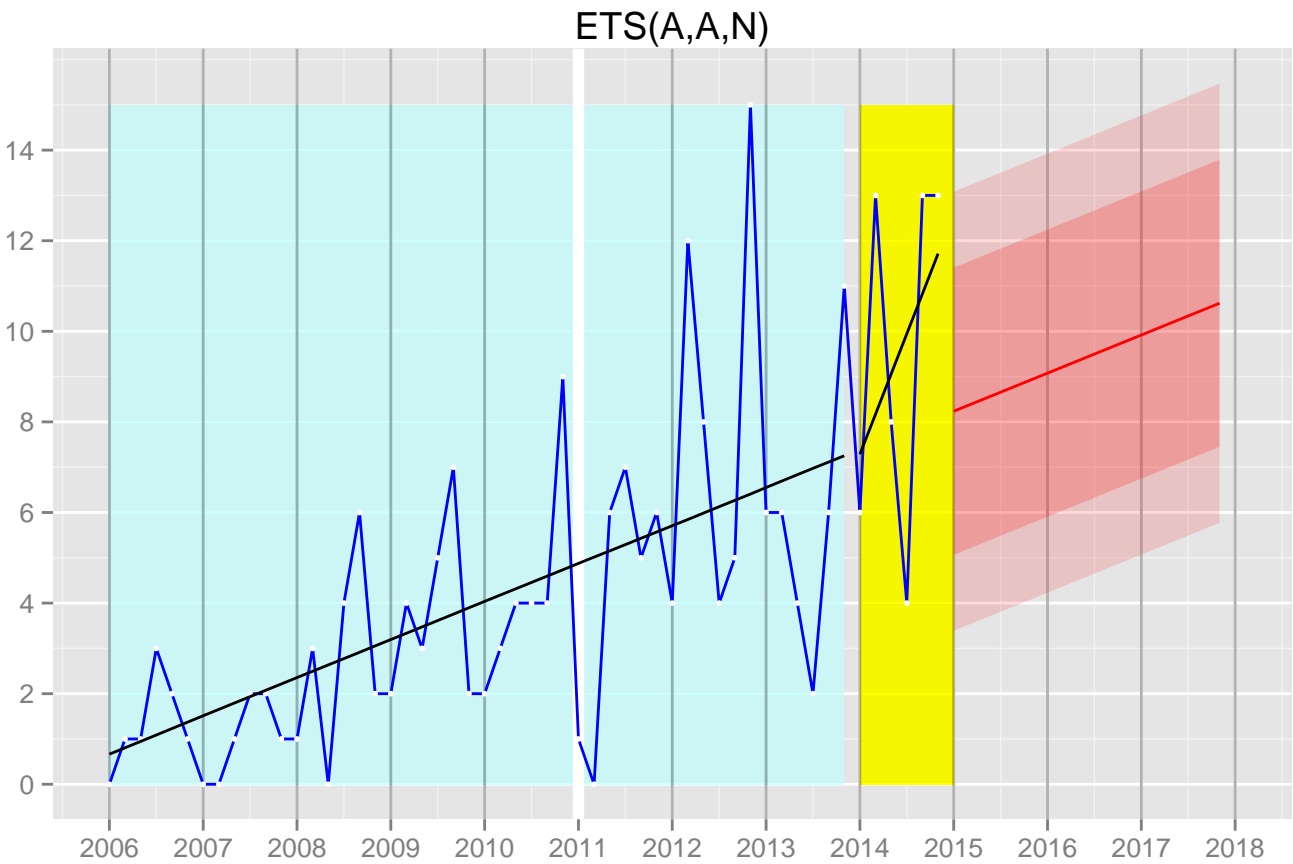
2.20.2 Outputs for SSL216_CAT_2

$ETS(A, A, N)$

1. parameters :
   - alpha : 0.0002648408
   - beta : 0.0002648371
2. init state :
   - l : 0.523346
   - b : 0.1411234
3. informations critereas :
   - loglik : -136.3722
   - aic : 280.7444
   - bic : 288.2292
   - aicc : 281.6747
   - mse : 6.116405
   - amse : 6.109017
   - sigma2 : 6.116405
4. accuracy :
   - ME : -0.0003084155
   - RMSE : 3.361731
   - MAE : 2.762747
   - MPE : -19.92213
   - MAPE : 41.17165
   - MASE : 0.5525493
   - ACF1 : -0.22338

$ARIMAX(2, 1, 2)(0, 0, 0)_6$

1. informations critereas :
   - loglik : -100.3445
   - aic : 212.689
   - bic : 223.7899
   - aicc : 214.789
   - sigma2 : 4.367896
2. coefficients :
   - ar1 : 0.630385
   - ar2 : -0.7177764
   - ma1 : -1.334891
   - ma2 : 0.8798962
   - DEP_EQUIP_CAP_2 : 0.01833599
3. accuracy :
   - ME : 1.127798
   - RMSE : 3.32107
   - MAE : 2.579388
   - MPE : 2.549716
   - MAPE : 25.98312
   - MASE : 0.5158776
   - ACF1 : -0.3576961

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2014.00	7.39	4.22	10.56	2.55	12.24	4.52	1.84	7.20	0.42	8.62
2014.17	7.53	4.36	10.70	2.69	12.38	3.11	0.32	5.91	-1.16	7.39
2014.33	7.67	4.50	10.84	2.83	12.52	3.97	1.18	6.76	-0.30	8.24
2014.50	7.81	4.64	10.98	2.97	12.66	5.99	3.05	8.93	1.50	10.49
2014.67	7.95	4.78	11.12	3.11	12.80	8.75	5.19	12.31	3.30	14.19
2014.83	8.09	4.93	11.26	3.25	12.94	9.90	5.78	14.02	3.60	16.20
2015.00	8.23	5.07	11.40	3.39	13.08	4.00	-0.33	8.32	-2.62	10.61
2015.17	8.38	5.21	11.54	3.53	13.22	4.44	0.04	8.84	-2.29	11.17
2015.33	8.52	5.35	11.68	3.67	13.36	5.63	1.11	10.15	-1.28	12.54
2015.50	8.66	5.49	11.83	3.81	13.50	6.28	1.52	11.05	-1.01	13.57
2015.67	8.80	5.63	11.97	3.95	13.64	7.76	2.71	12.82	0.03	15.50
2015.83	8.94	5.77	12.11	4.09	13.78	8.89	3.63	14.15	0.85	16.93
2016.00	9.08	5.91	12.25	4.23	13.92	4.17	-1.21	9.55	-4.05	12.40
2016.17	9.22	6.05	12.39	4.37	14.06	5.09	-0.41	10.59	-3.33	13.51
2016.33	9.36	6.19	12.53	4.51	14.20	5.93	0.26	11.60	-2.74	14.60
2016.50	9.50	6.33	12.67	4.65	14.34	6.14	0.28	12.01	-2.82	15.11
2016.67	9.64	6.47	12.81	4.79	14.49	7.69	1.65	13.72	-1.54	16.91
2016.83	9.78	6.61	12.95	4.93	14.63	9.26	3.10	15.43	-0.17	18.69
2017.00	9.92	6.75	13.09	5.07	14.77	4.65	-1.65	10.94	-4.98	14.27
2017.17	10.06	6.89	13.23	5.21	14.91	5.45	-0.98	11.88	-4.39	15.28
2017.33	10.20	7.03	13.37	5.35	15.05	6.04	-0.54	12.62	-4.03	16.10
2017.50	10.34	7.17	13.51	5.49	15.19	6.12	-0.60	12.85	-4.16	16.41
2017.67	10.48	7.31	13.65	5.63	15.33	7.72	0.86	14.58	-2.77	18.21
2017.83	10.62	7.45	13.79	5.77	15.47	9.37	2.40	16.35	-1.30	20.05

2.21   SSL216_CAT_3

2.21.1   plots for SSL216_CAT_3

ETS(A,A,N)

ARIMAX(2,1,0)(0,0,0)4
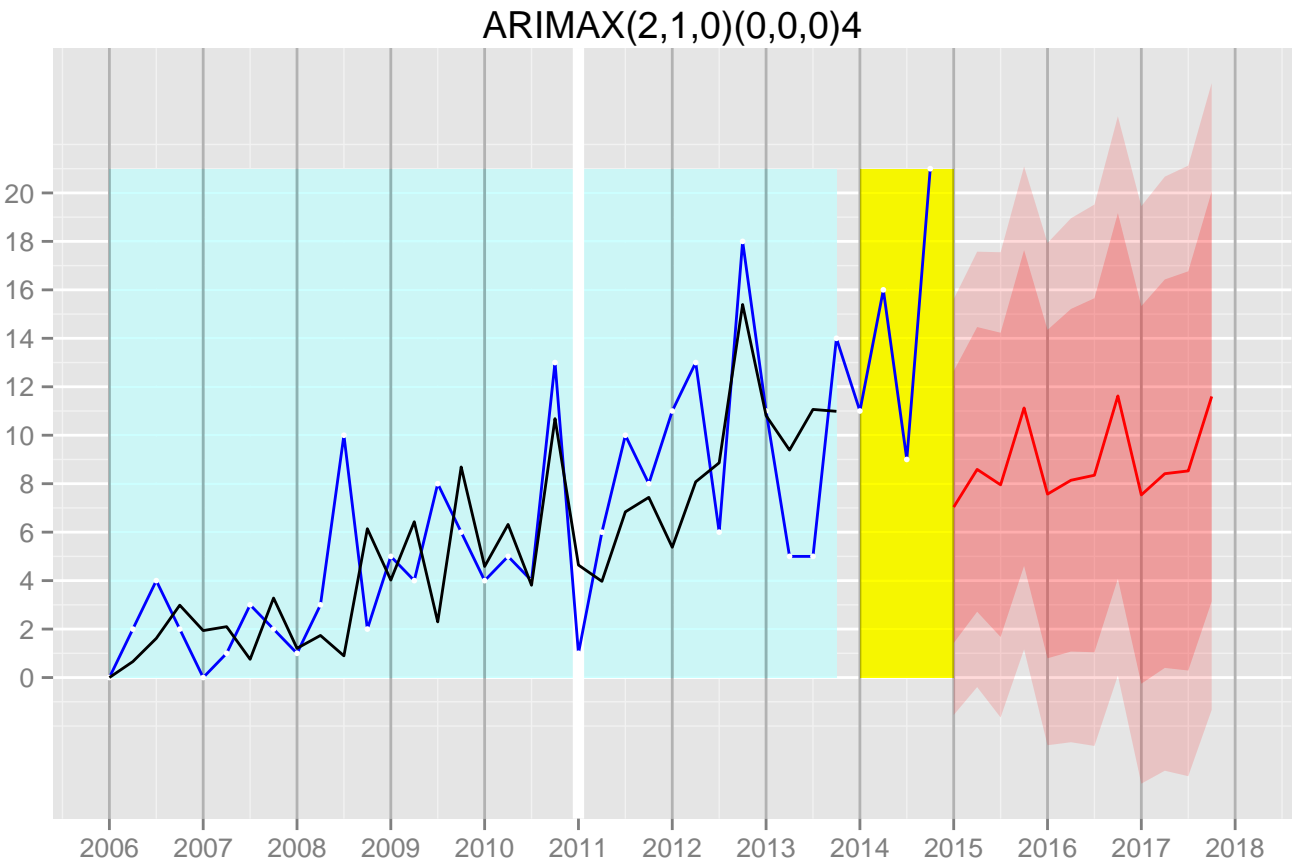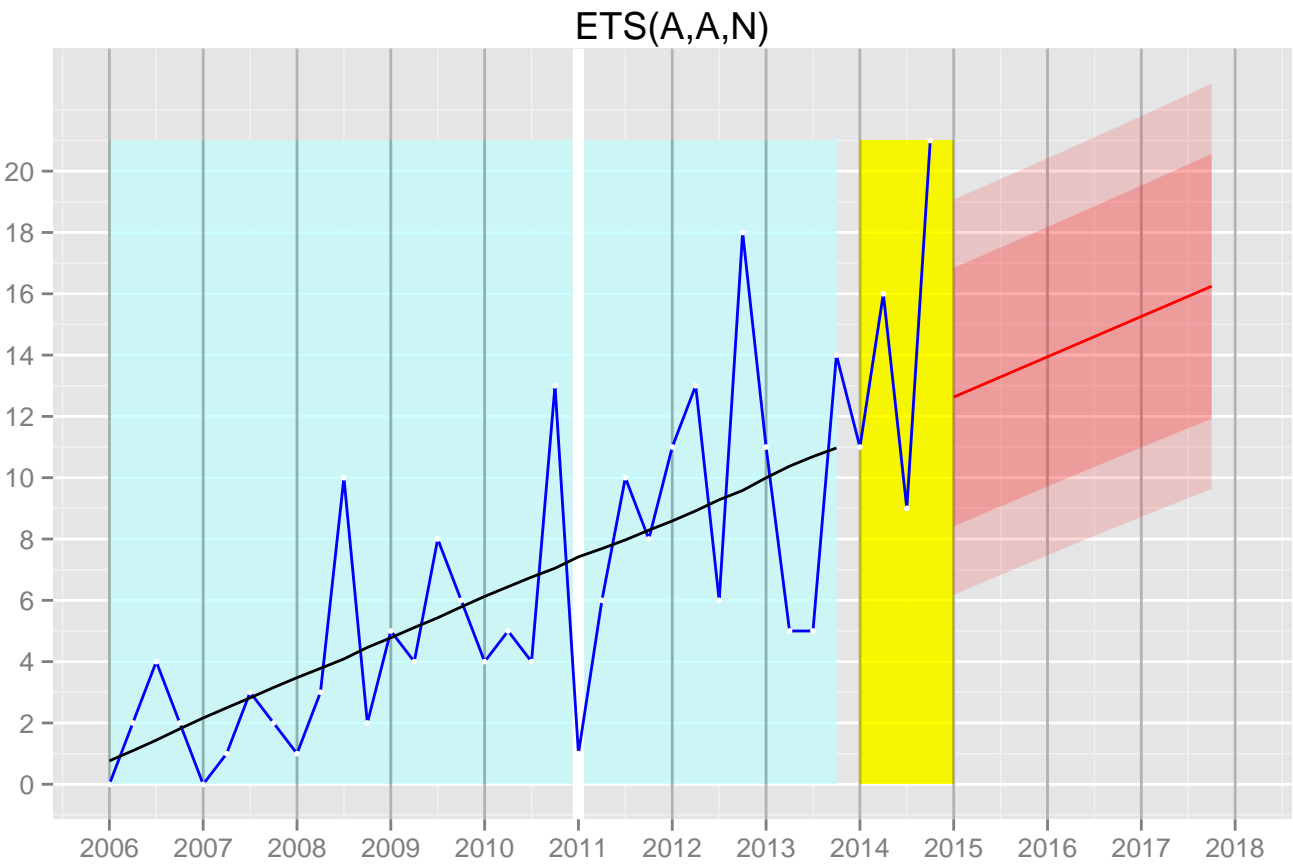
2.21.2 Outputs for SSL216_CAT_3

$ETS(A, A, N)$

1. parameters :
   – alpha : 0.005479229
   – beta : 0.005479189
2. init state :
   – l : 0.4269085
   – b : 0.3385663
3. informations critereas :
   – loglik : -93.51364
   – aic : 195.0273
   – bic : 200.8902
   – aicc : 196.5088
   – mse : 10.79267
   – amse : 10.71851
   – sigma2 : 10.79267

$ARIMAX(2, 1, 0)(0, 0, 0)_4$

1. informations critereas :
   – loglik : -78.90382
   – aic : 165.8076
   – bic : 171.5436
   – aicc : 167.3461
   – sigma2 : 11.31926
2. coefficients :
   – ar1 : -0.7586325
   – ar2 : -0.5078865
   – DEP_EQUIP_CAP_3 : 0.01153071

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2014.00	11.32	7.11	15.53	4.88	17.75	5.76	1.45	10.07	-0.84	12.35
2014.25	11.64	7.43	15.85	5.20	18.08	7.03	2.59	11.47	0.25	13.81
2014.50	11.97	7.76	16.18	5.53	18.41	9.38	4.75	14.01	2.29	16.46
2014.75	12.30	8.09	16.51	5.86	18.75	10.93	5.53	16.33	2.67	19.18
2015.00	12.63	8.41	16.85	6.18	19.08	7.04	1.42	12.65	-1.55	15.62
2015.25	12.96	8.74	17.18	6.51	19.41	8.59	2.72	14.46	-0.39	17.57
2015.50	13.29	9.06	17.51	6.83	19.75	7.95	1.68	14.23	-1.65	17.55
2015.75	13.62	9.39	17.84	7.15	20.08	11.13	4.61	17.64	1.16	21.09
2016.00	13.94	9.71	18.18	7.47	20.42	7.57	0.79	14.35	-2.79	17.94
2016.25	14.27	10.03	18.52	7.79	20.76	8.14	1.07	15.21	-2.67	18.95
2016.50	14.60	10.35	18.85	8.10	21.10	8.35	1.04	15.65	-2.82	19.52
2016.75	14.93	10.67	19.19	8.41	21.45	11.62	4.08	19.17	0.08	23.16
2017.00	15.26	10.99	19.53	8.72	21.80	7.54	-0.26	15.33	-4.38	19.45
2017.25	15.59	11.30	19.88	9.03	22.15	8.41	0.40	16.43	-3.85	20.67
2017.50	15.92	11.61	20.22	9.34	22.50	8.53	0.29	16.77	-4.07	21.13
2017.75	16.25	11.92	20.57	9.64	22.85	11.60	3.14	20.06	-1.33	24.53

2.22 SSL216_CAT_4

2.22.1 plots for SSL216_CAT_4

ETS(A,A,N)

ARIMAX(1,1,0)(0,0,0)3
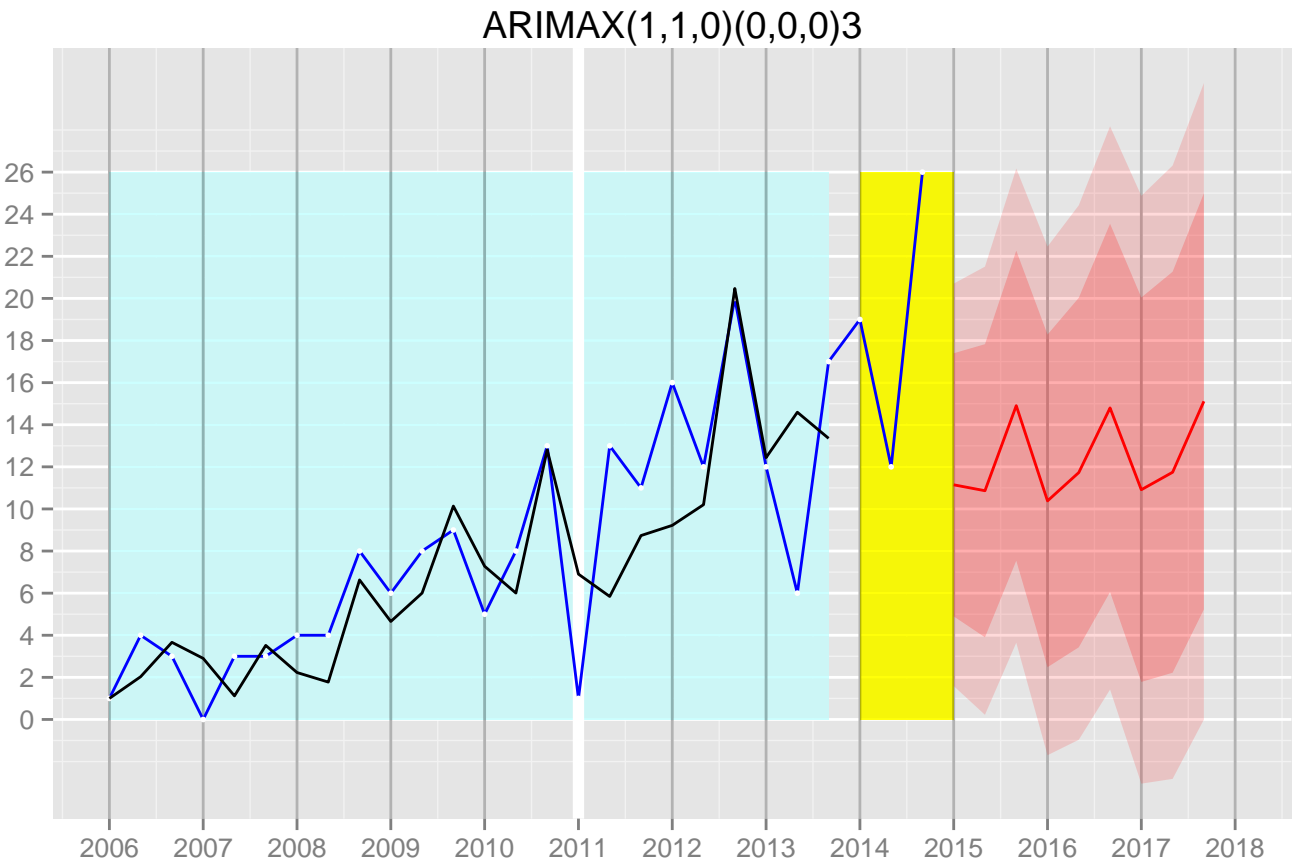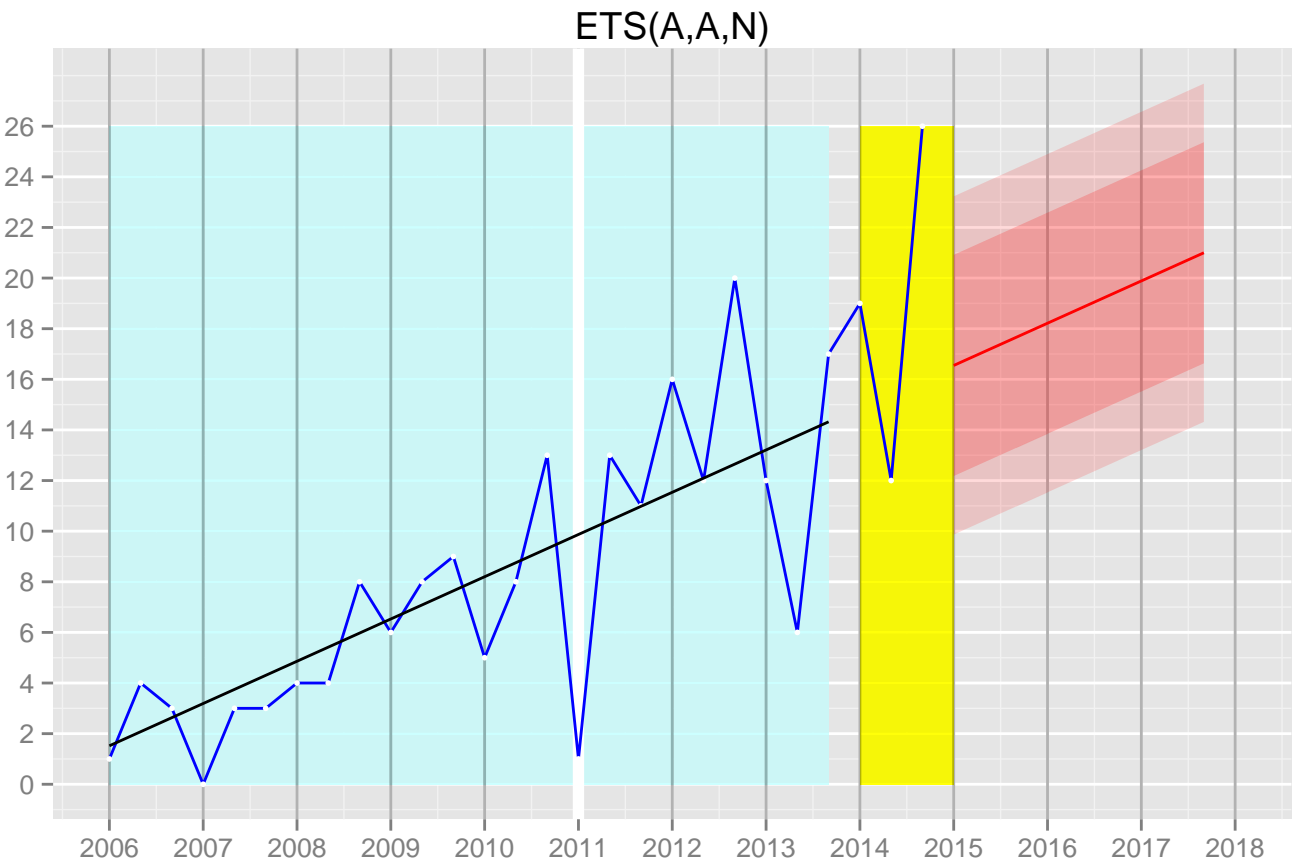
2.22.2 Outputs for SSL216_CAT_4

$ETS(A, A, N)$

1. parameters :
   - alpha : 0.0001000234
   - beta : 0.000100004
2. init state :
   - l : 0.9628432
   - b : 0.5569127
3. informations critereas :
   - loglik : -67.57261
   - aic : 143.1452
   - bic : 147.8574
   - aicc : 145.2505
   - mse : 11.62313
   - amse : 11.56322
   - sigma2 : 11.62313

$ARIMAX(1, 1, 0)(0, 0, 0)_3$

1. informations critereas :
   - loglik : -58.6388
   - aic : 123.2776
   - bic : 126.6841
   - aicc : 124.5408
   - sigma2 : 12.30767
2. coefficients :
   - ar1 : -0.6815206
   - DEP_EQUIP_CAP_4 : 0.01227002

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2014.00	14.88	10.51	19.25	8.20	21.56	7.84	3.34	12.34	0.96	14.72
2014.33	15.43	11.06	19.80	8.75	22.12	12.69	7.97	17.41	5.48	19.91
2014.67	15.99	11.62	20.36	9.31	22.67	13.60	7.71	19.48	4.59	22.60
2015.00	16.55	12.18	20.92	9.86	23.23	11.15	4.90	17.40	1.59	20.70
2015.33	17.10	12.73	21.47	10.42	23.79	10.87	3.90	17.83	0.22	21.51
2015.67	17.66	13.29	22.03	10.98	24.34	14.91	7.54	22.27	3.64	26.17
2016.00	18.22	13.85	22.59	11.53	24.90	10.38	2.48	18.28	-1.70	22.46
2016.33	18.77	14.40	23.14	12.09	25.46	11.73	3.43	20.03	-0.97	24.42
2016.67	19.33	14.96	23.70	12.65	26.01	14.80	6.05	23.55	1.42	28.18
2017.00	19.89	15.52	24.26	13.20	26.57	10.91	1.78	20.04	-3.05	24.88
2017.33	20.44	16.07	24.81	13.76	27.13	11.74	2.22	21.27	-2.82	26.31
2017.67	21.00	16.63	25.37	14.32	27.68	15.11	5.23	25.00	-0.01	30.23

2.23 SSL216_CAT_6

2.23.1 plots for SSL216_CAT_6

ETS(A,A,N)

ARIMAX(0,0,0)(1,1,0)2
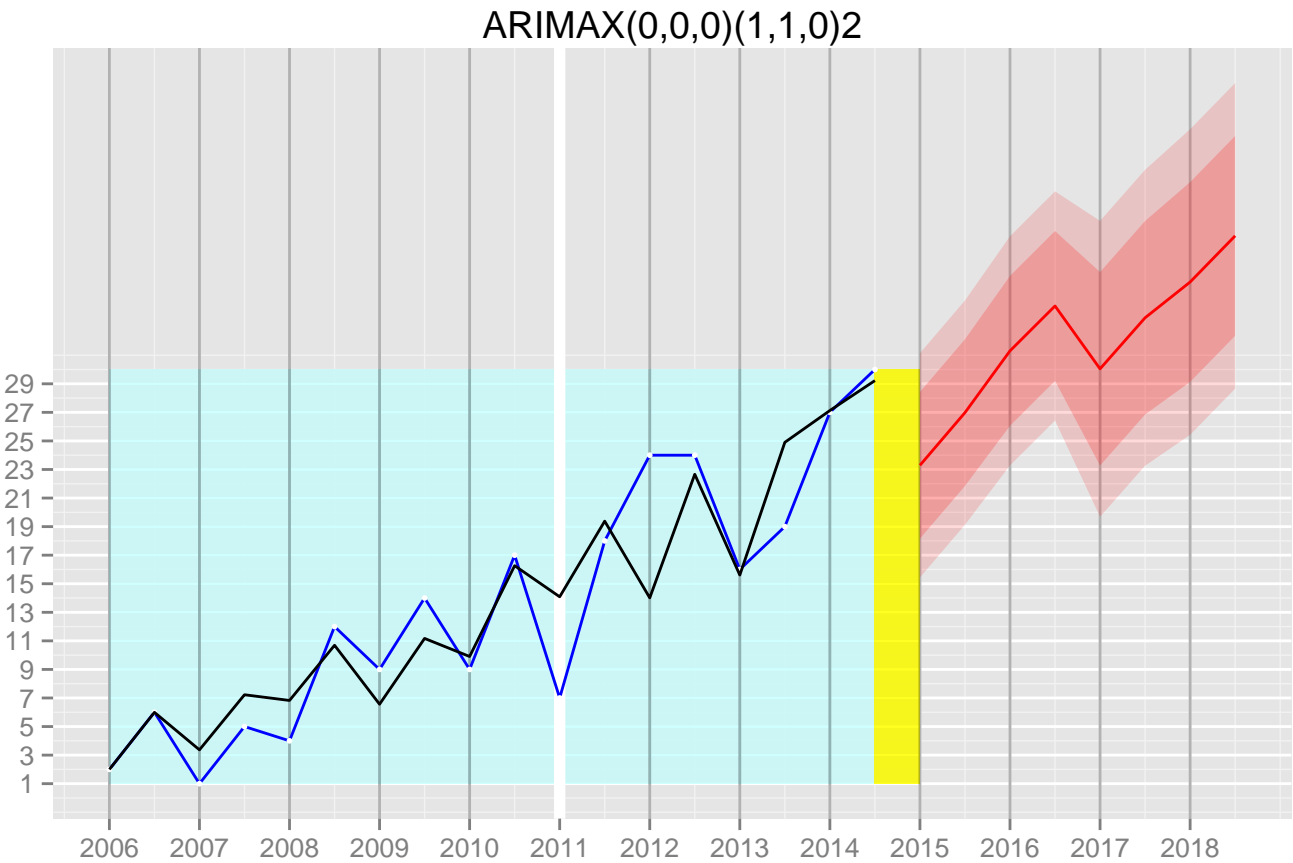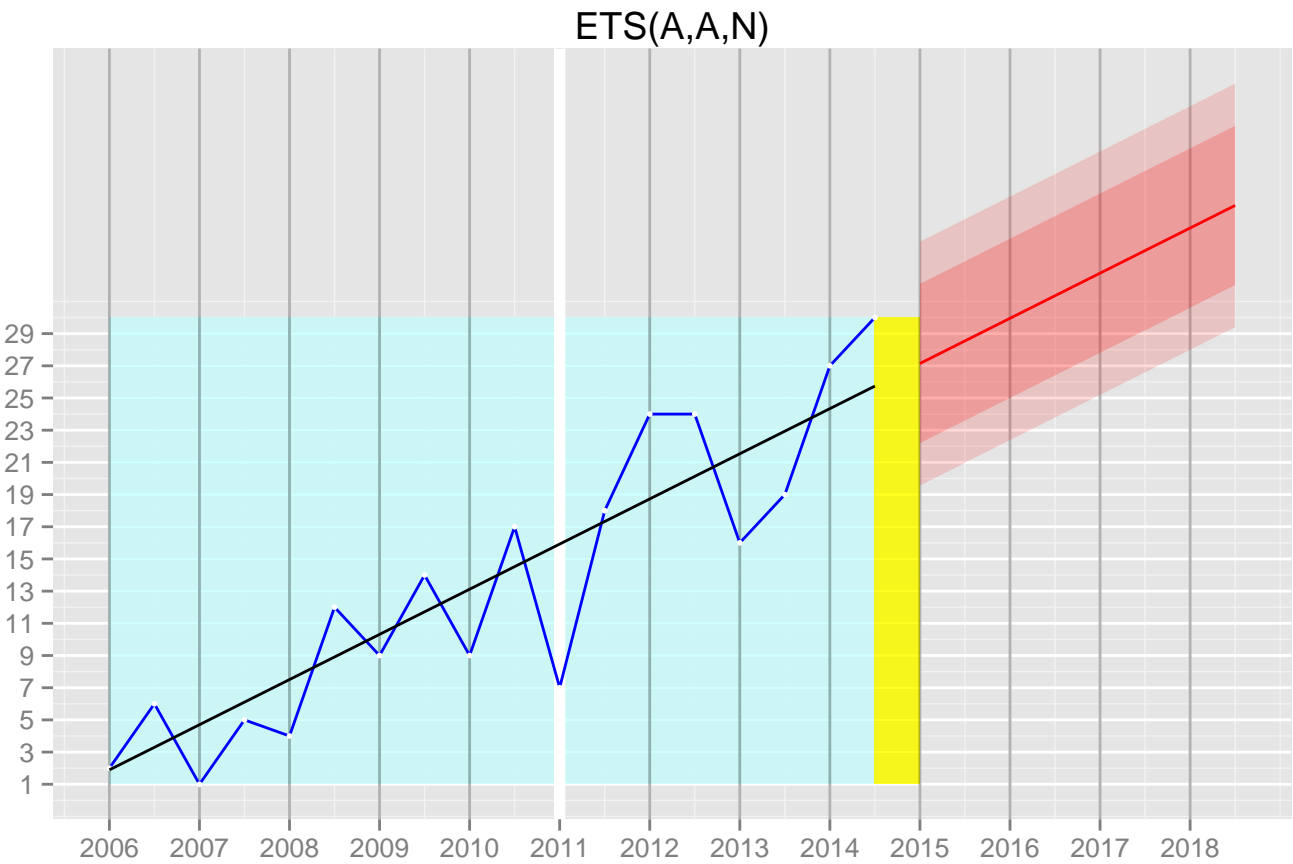
2.23.2 Outputs for SSL216_CAT_6

$ETS(A, A, N)$

1. parameters :
   - alpha : 0.0001000499
   - beta : 0.000100007
2. init state :
   - l : 0.4898752
   - b : 1.403338
3. informations critereas :
   - loglik : -50.33045
   - aic : 108.6609
   - bic : 112.2224
   - aicc : 111.7378
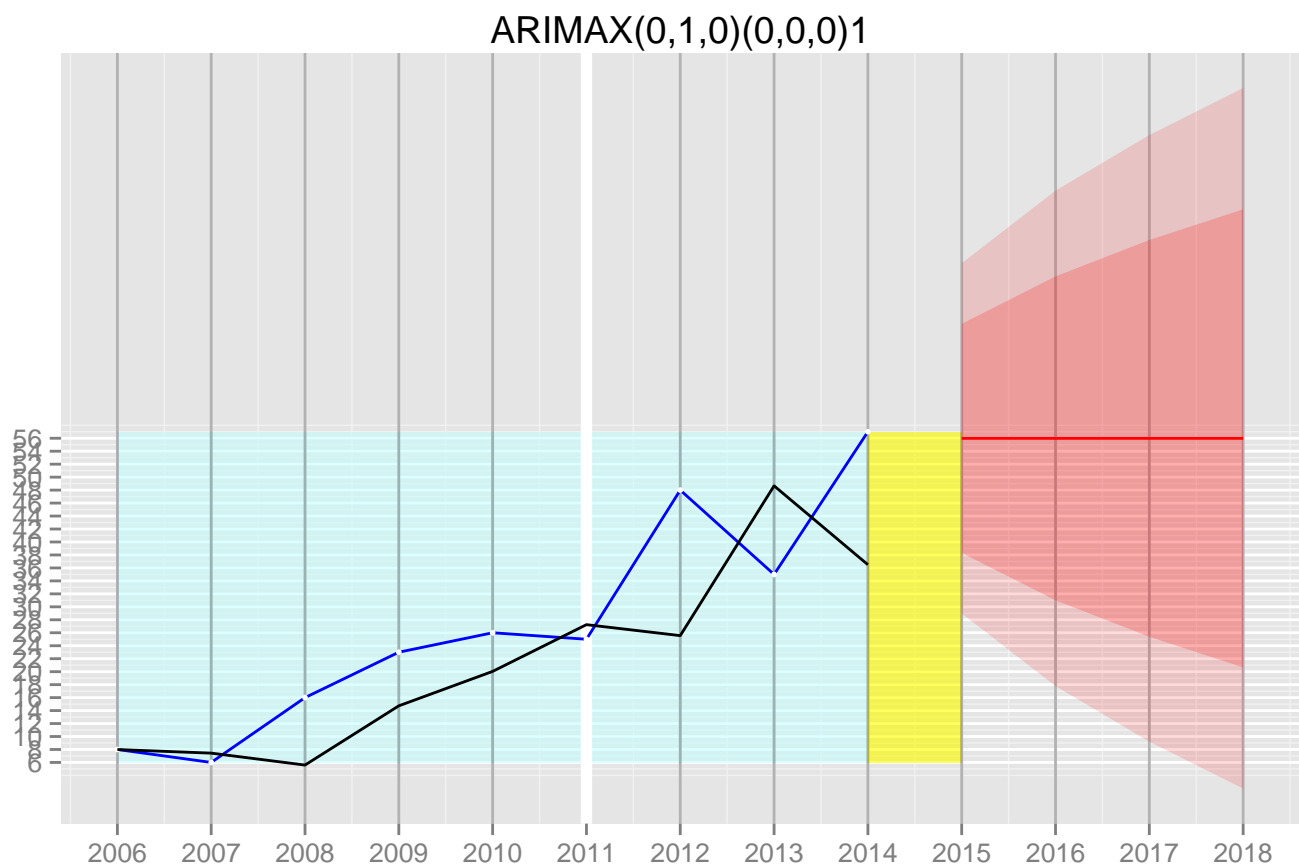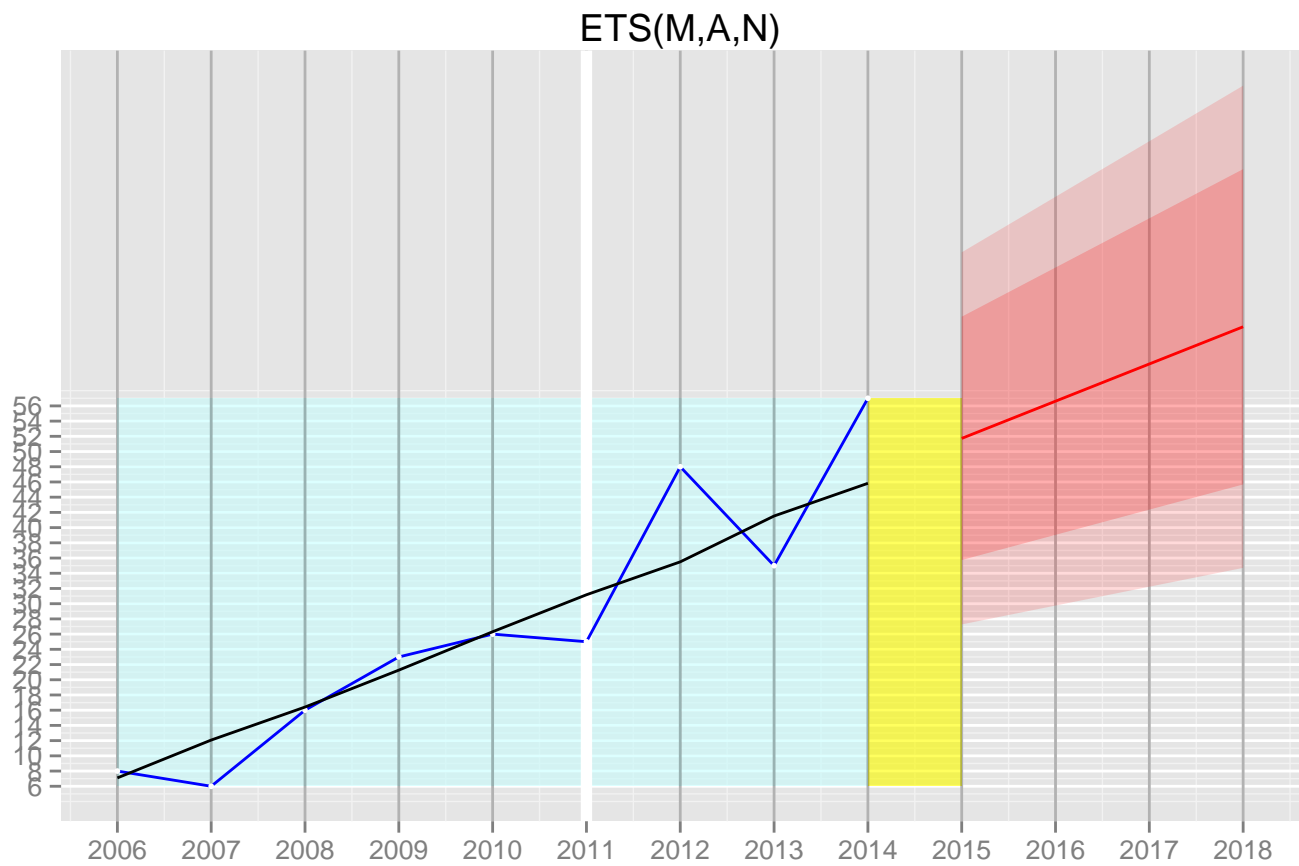   - mse : 14.90804
   - amse : 14.77106
   - sigma2 : 14.90804

$ARIMAX(0, 0, 0)(1, 1, 0)_2$

1. informations critereas :
   - loglik : -39.22469
   - aic : 86.44939
   - bic : 89.53974
   - aicc : 90.08575
   - sigma2 : 16.0592
2. coefficients :
   - sar1 : -0.7911318
   - drift : 1.43371
   - DEP_EQUIP_CAP_6 : -0.003154144

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2015.00	27.14	22.20	32.09	19.58	34.71	23.29	18.16	28.43	15.44	31.15
2015.50	28.55	23.60	33.50	20.98	36.11	26.98	21.85	32.12	19.13	34.84
2016.00	29.95	25.00	34.90	22.38	37.52	31.31	26.06	36.55	23.28	39.33
2016.50	31.35	26.40	36.30	23.79	38.92	34.45	29.20	39.70	26.43	42.47
2017.00	32.76	27.81	37.70	25.19	40.32	30.05	23.27	36.82	19.69	40.41
2017.50	34.16	29.21	39.11	26.59	41.73	33.62	26.85	40.40	23.26	43.98
2018.00	35.56	30.61	40.51	27.99	43.13	36.13	29.13	43.12	25.43	46.83
2018.50	36.96	32.02	41.91	29.40	44.53	39.36	32.36	46.36	28.66	50.06

ETS(M,A,N)

ARIMAX(0,1,0)(0,0,0)1

2.24.2 Outputs for SSL216_CAT_12

$ETS(M, A, N)$

1. parameters :
   - alpha : 0.09075673
   - beta : 0.0001001149

2. init state :
   - l : 2.213071
   - b : 4.889976

3. informations critereas :
   - loglik : -25.2272
   - aic : 58.4544
   - bic : 59.24329
   - aicc : 68.4544
   - mse : 44.75596
   - amse : 41.4023
   - sigma2 : 0.05820149

$ARIMAX(0, 1, 0)(0, 0, 0)_1$

1. informations critereas :
   - loglik : -27.82876
   - aic : 59.65752
   - bic : 59.8164
   - aicc : 62.05752
   - sigma2 : 189.9438

2. coefficients :
   - DEP_EQUIP_CAP_12 : -0.007997158

time	ETS	lo 80	up 80	lo 95	up 95	ARIMAX	lo 80	up 80	lo 95	up 95
2015.00	51.73	35.74	67.72	27.27	76.19	55.98	38.32	73.64	28.97	82.99
2016.00	56.62	39.05	74.19	29.75	83.49	55.98	31.00	80.96	17.78	94.18
2017.00	61.51	42.36	80.66	32.23	90.79	55.98	25.39	86.57	9.19	102.77
2018.00	66.40	45.67	87.13	34.70	98.10	55.98	20.66	91.31	1.96	110.00