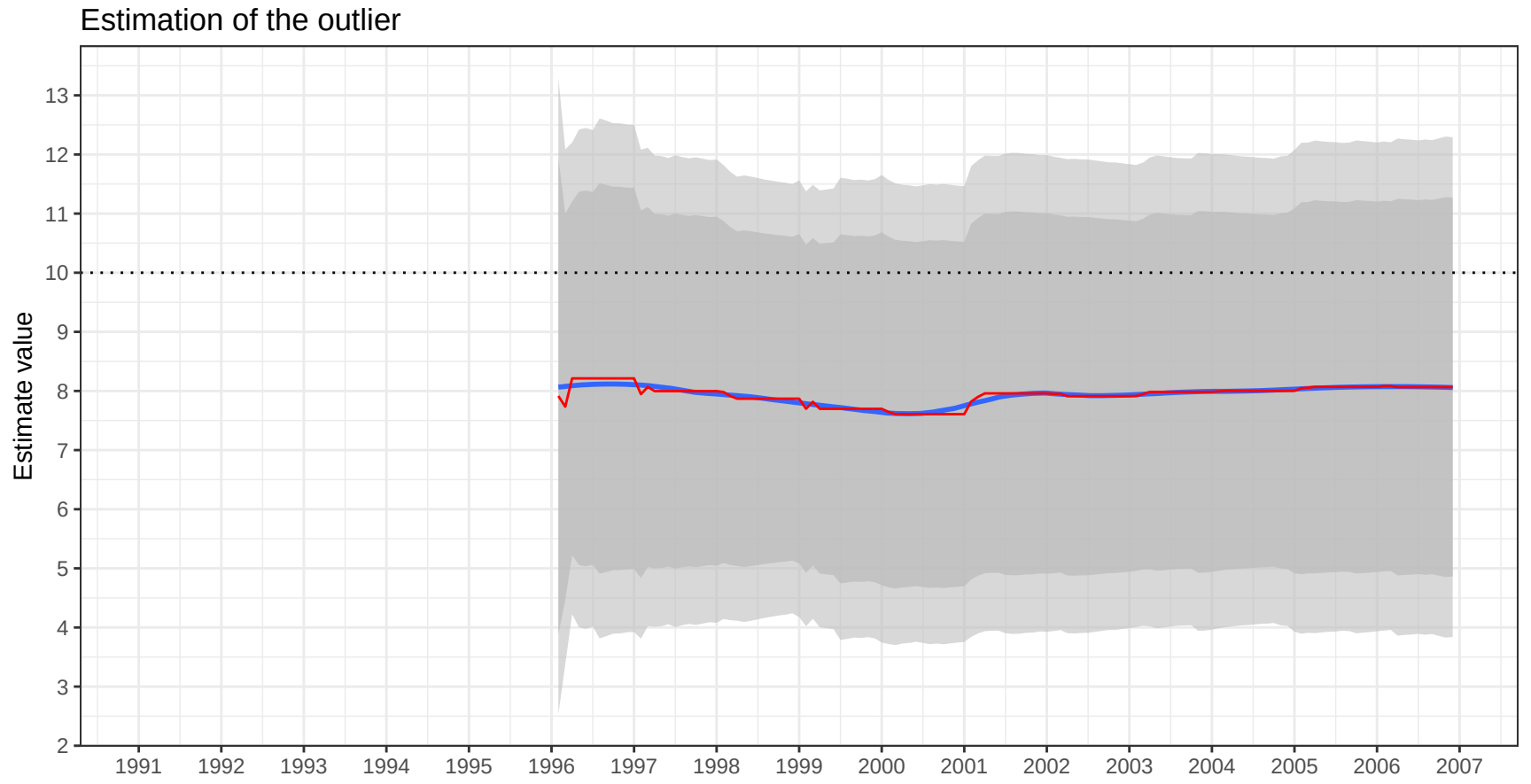
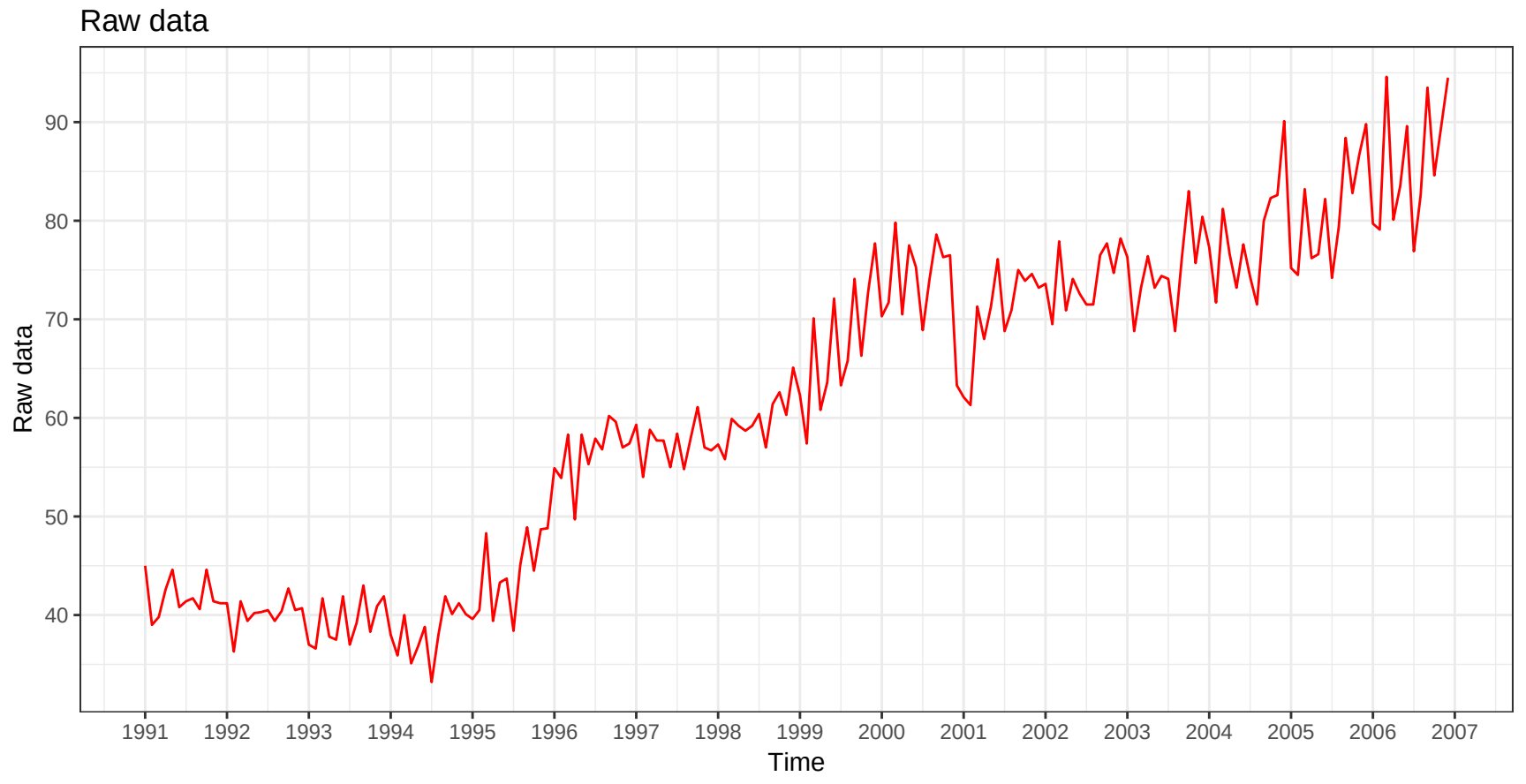
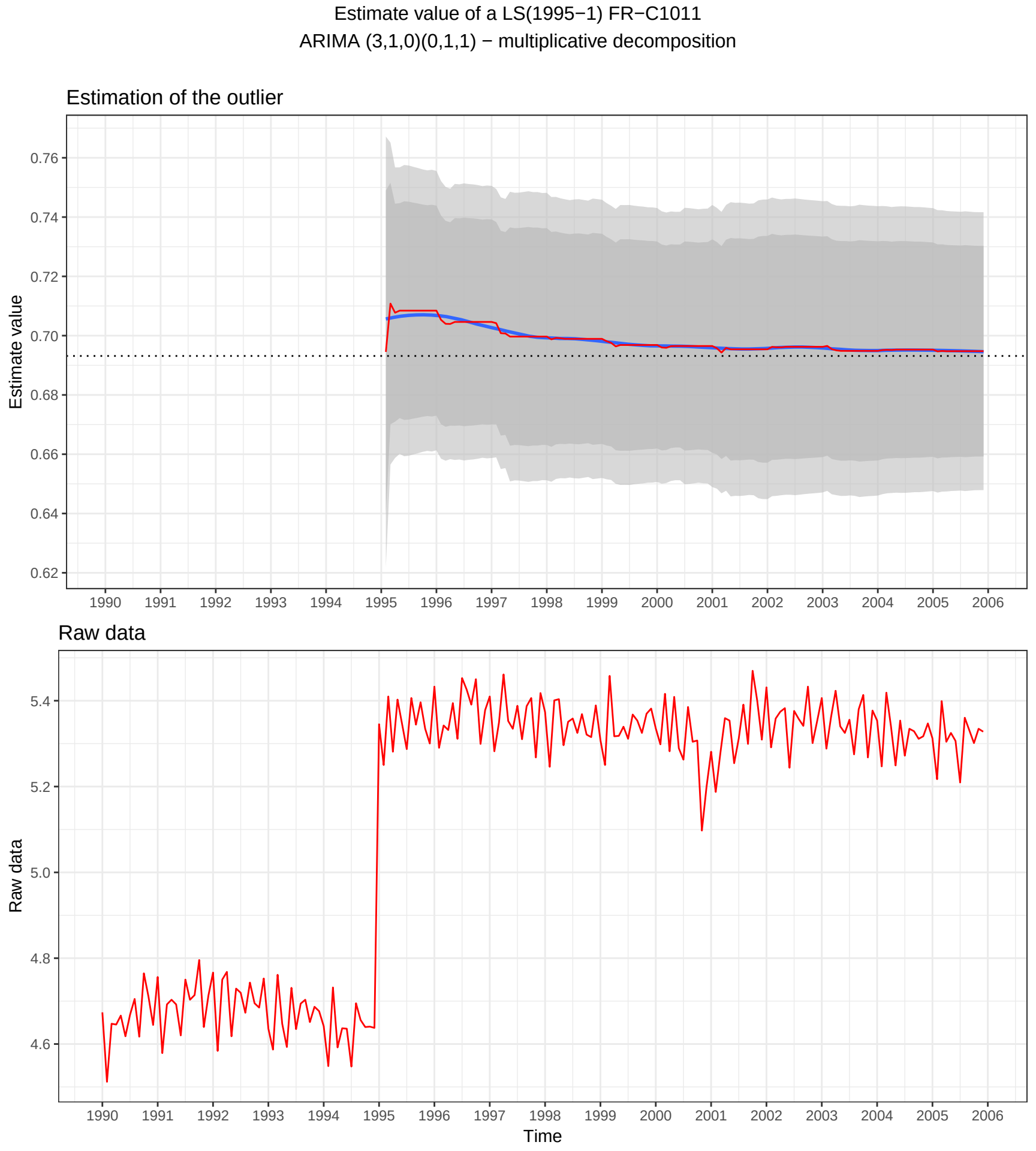
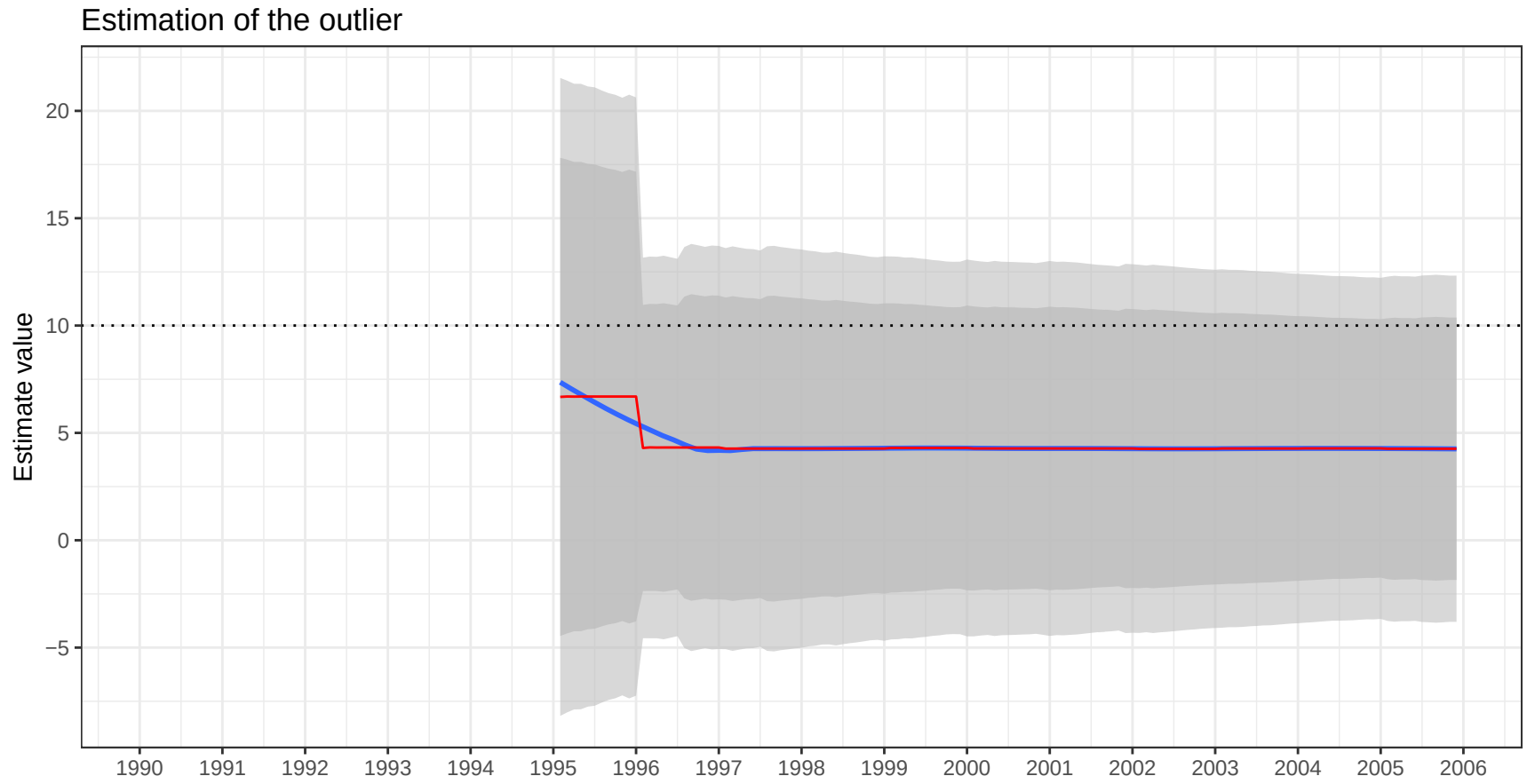
Estimate value of a LS(1996−1) DE−C1011
ARIMA (2,1,0)(0,1,1) − additive decomposition

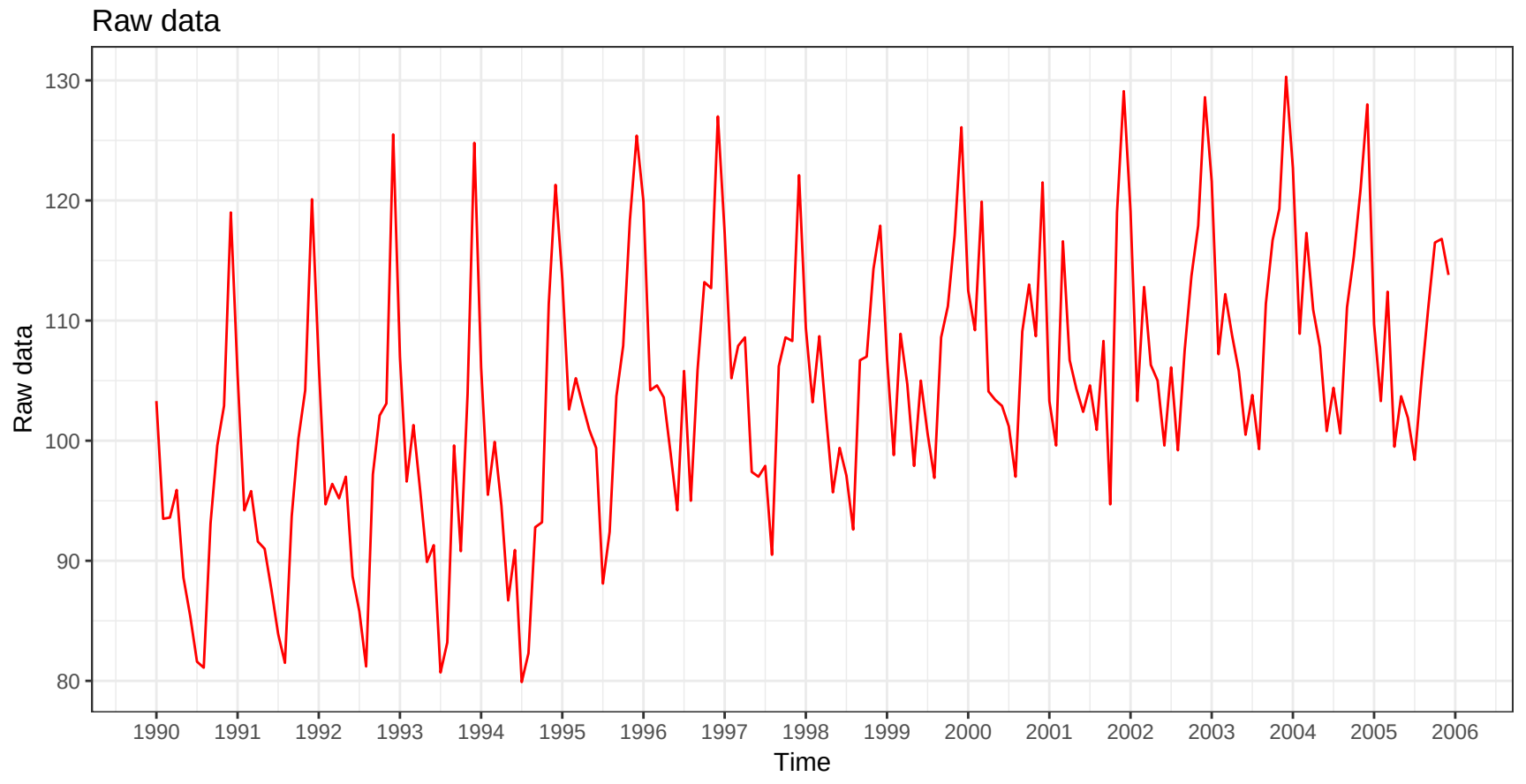




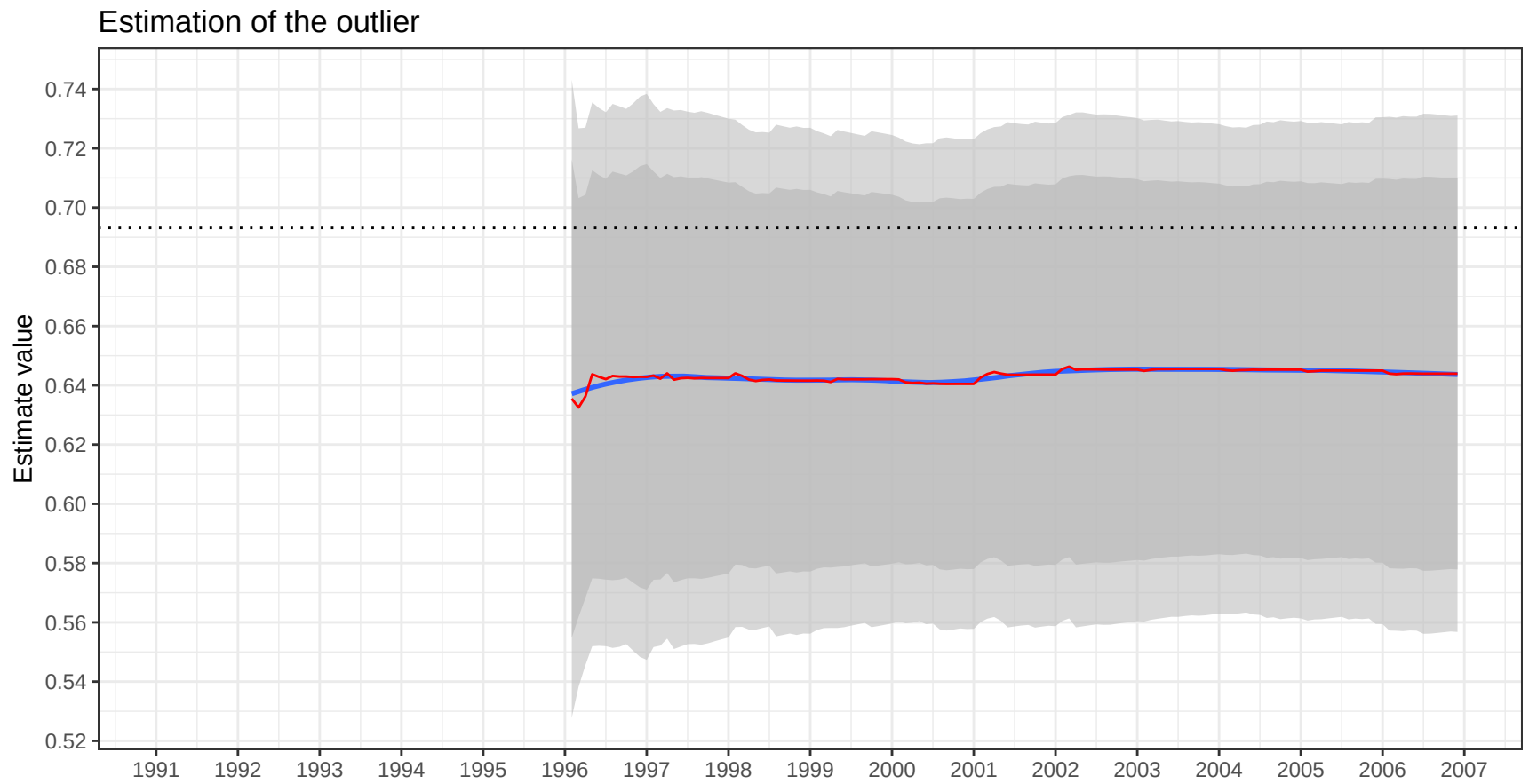

Estimate value of a LS(1995−1) FR−C1011
ARIMA (3,1,0)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.76
0.74
0.72
0.70
0.68
0.66
0.64
0.62
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
5.4
5.2
5.0
4.8
4.6
Time

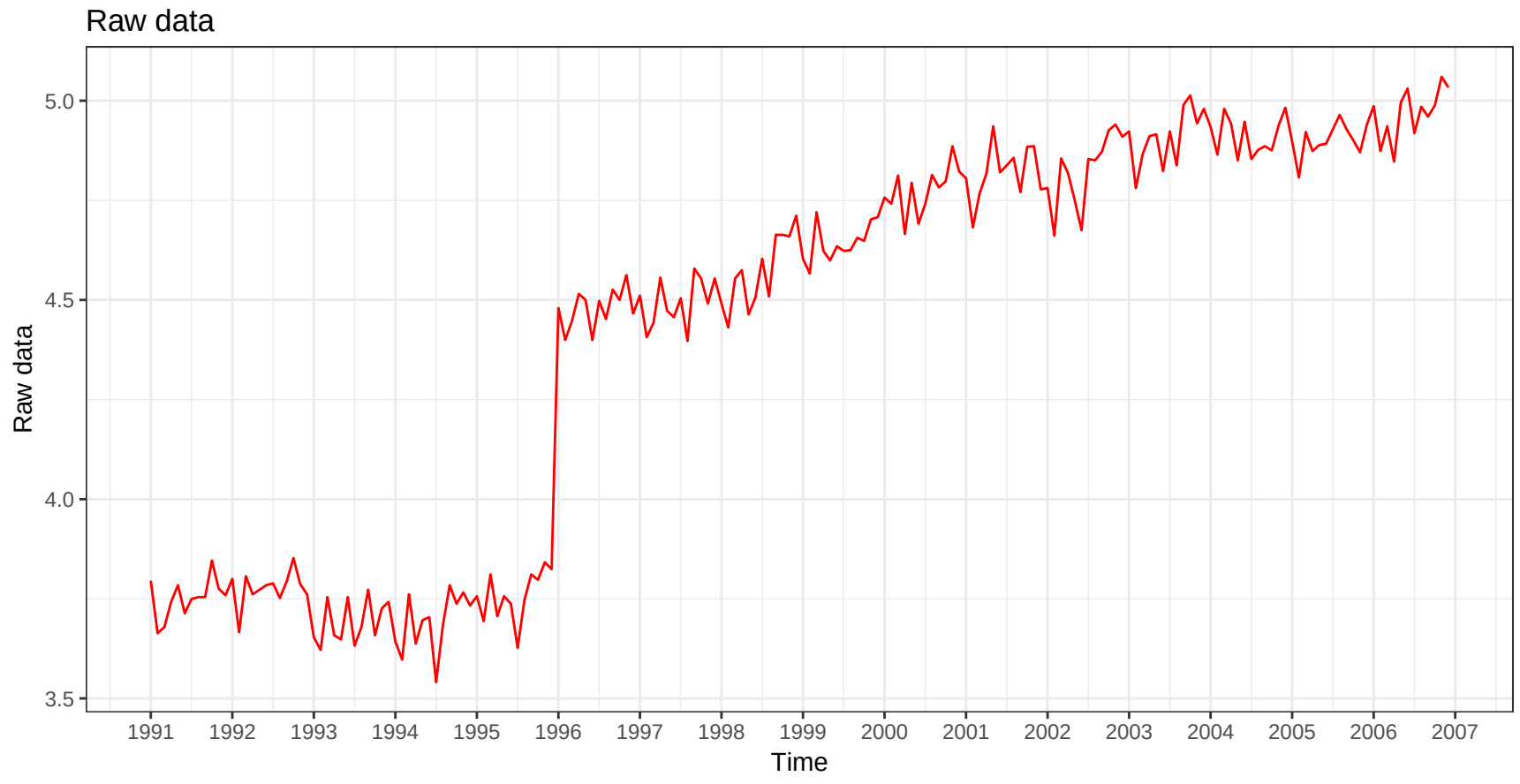
Estimate value of a LS(1995−1) IT−C1011
ARIMA (1,1,1)(1,1,1) − additive decomposition





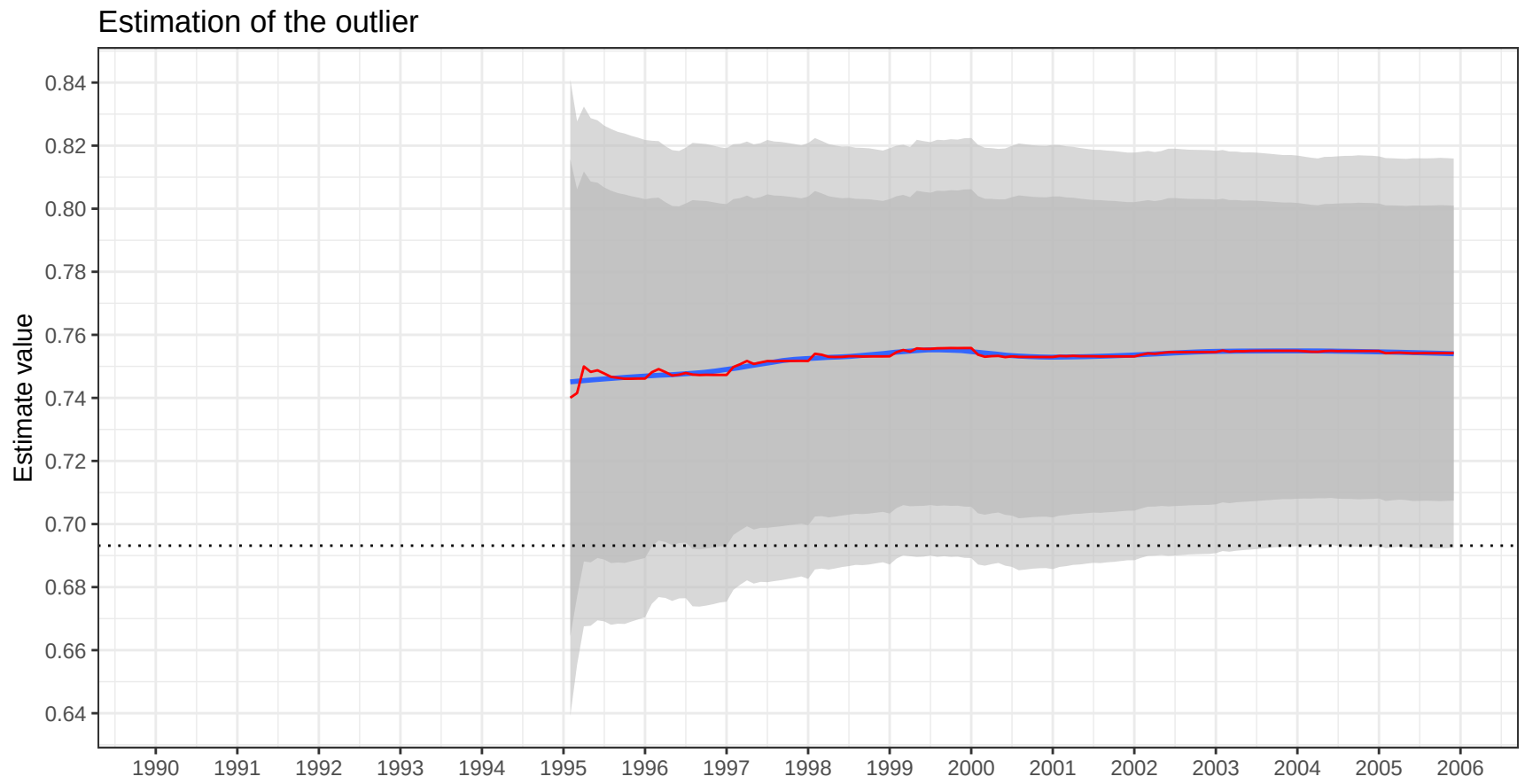
Estimate value of a LS(1996−1) DE−C1012
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

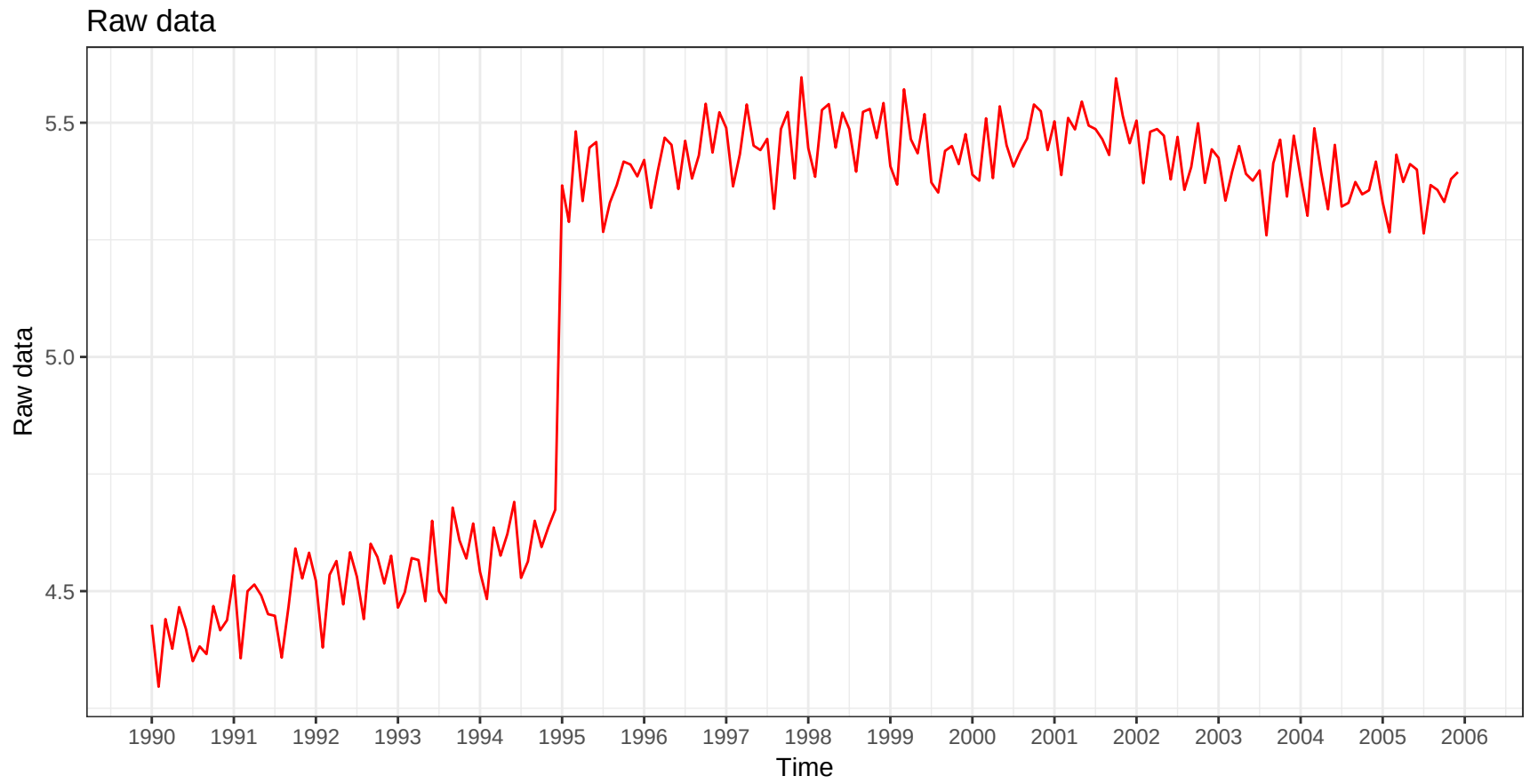


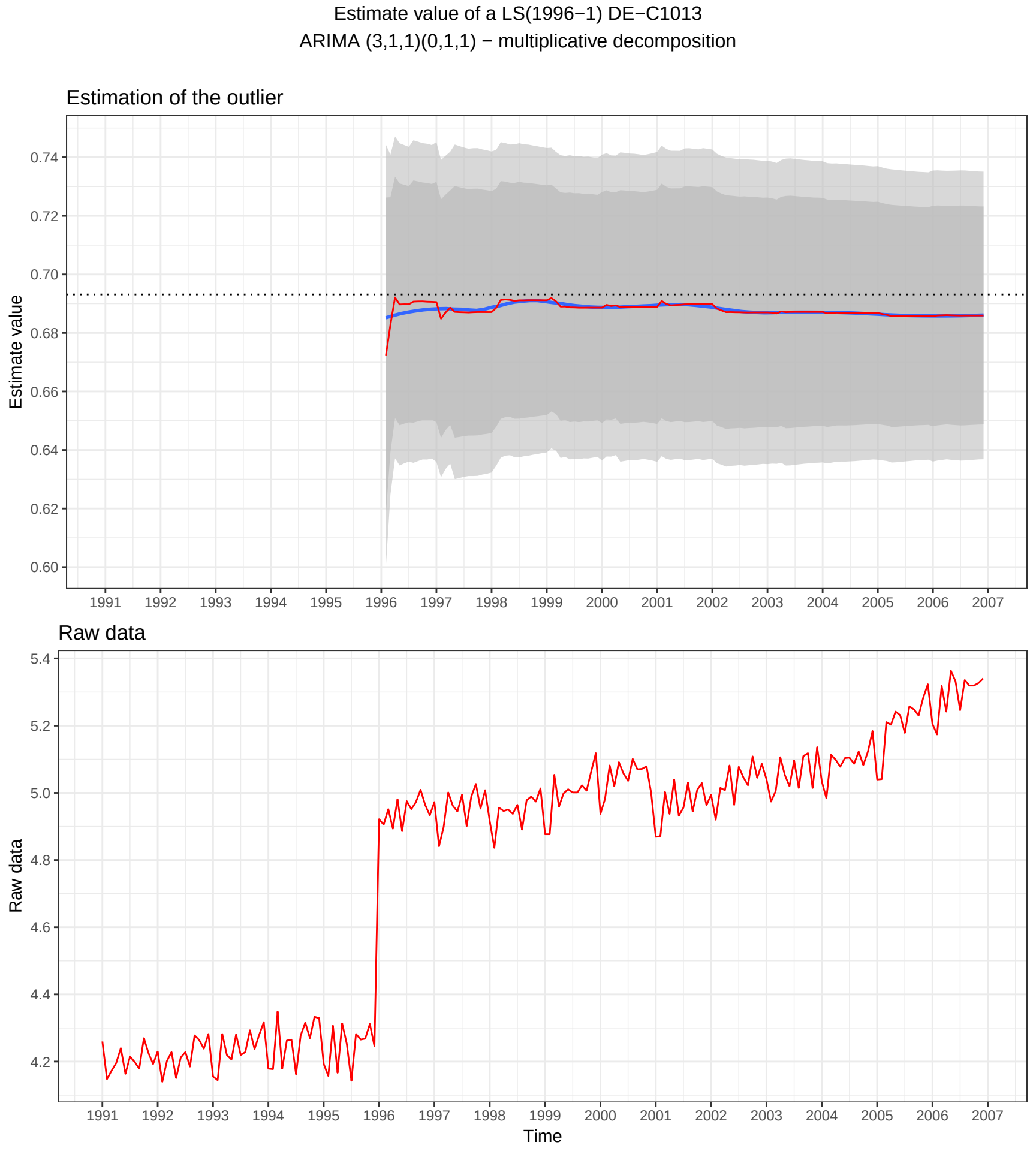


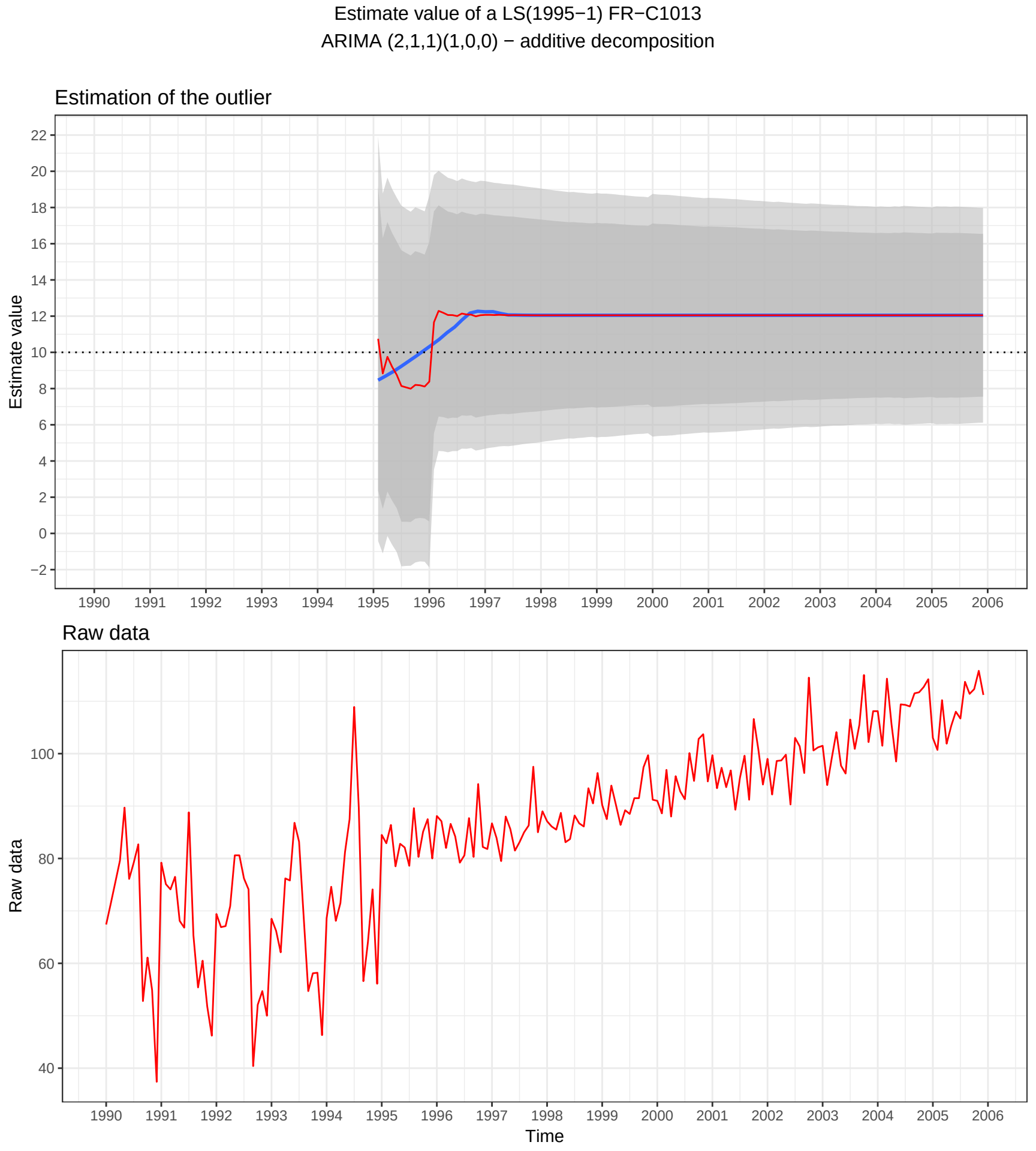
Estimate value of a LS(1995−1) FR−C1012

ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

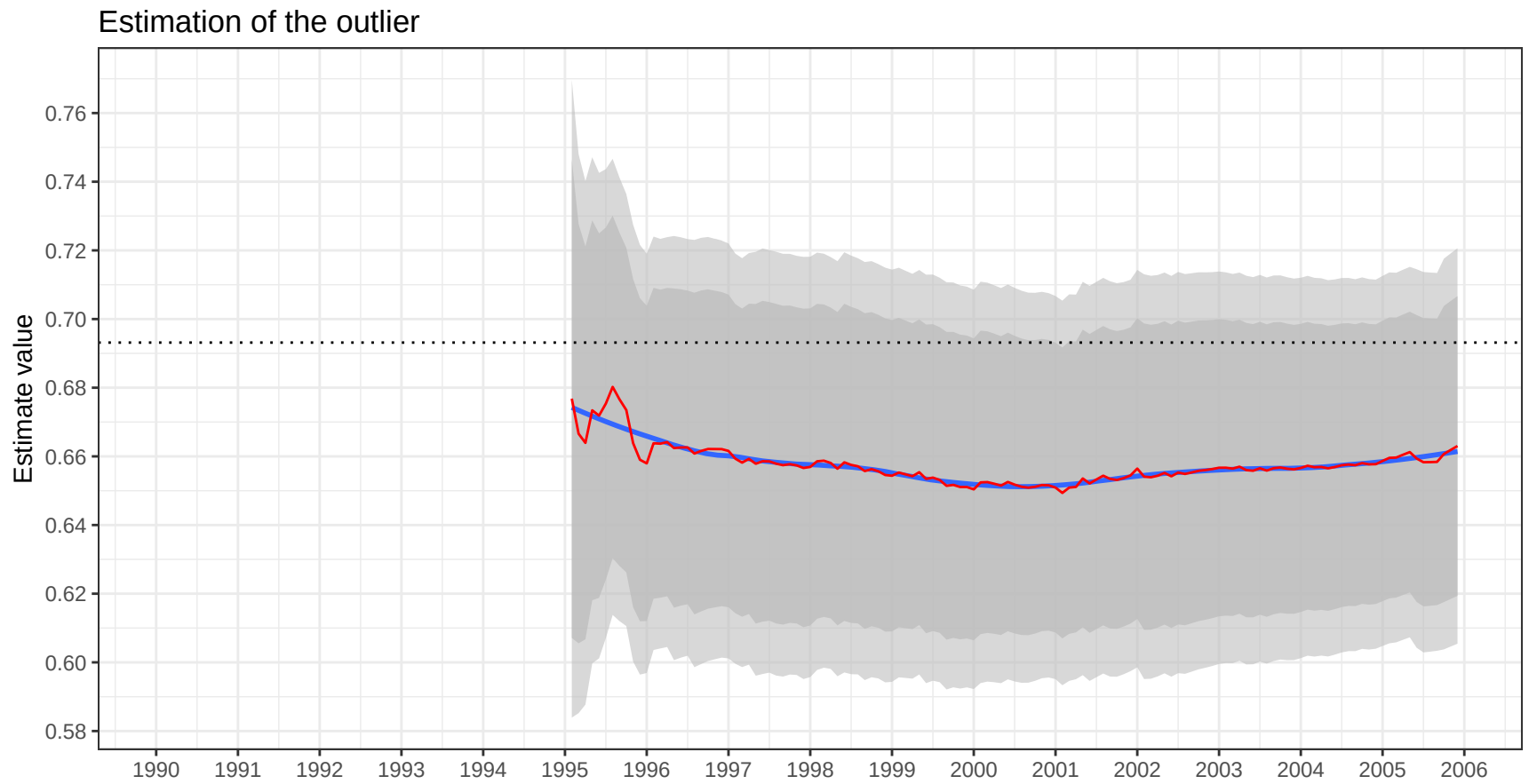


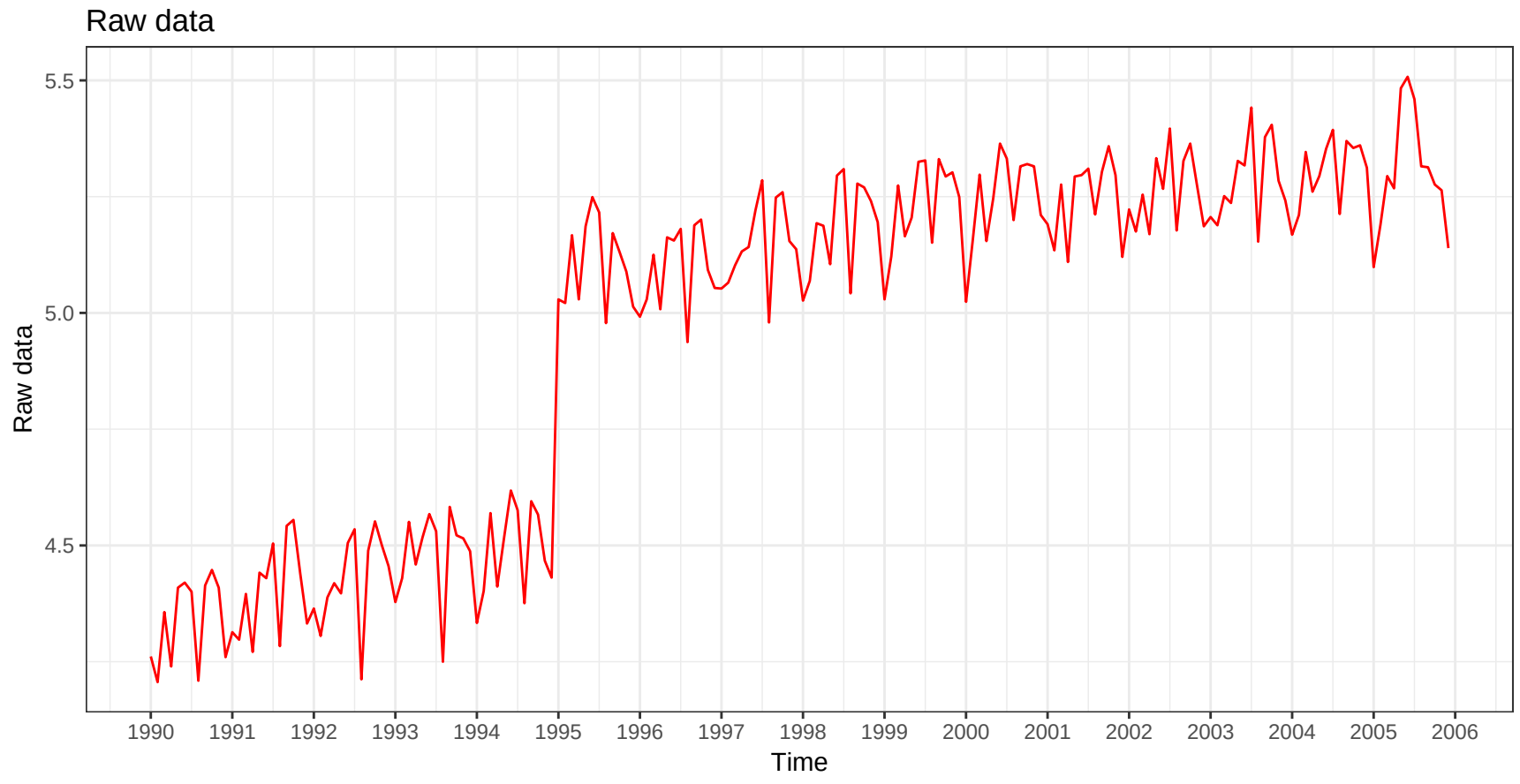


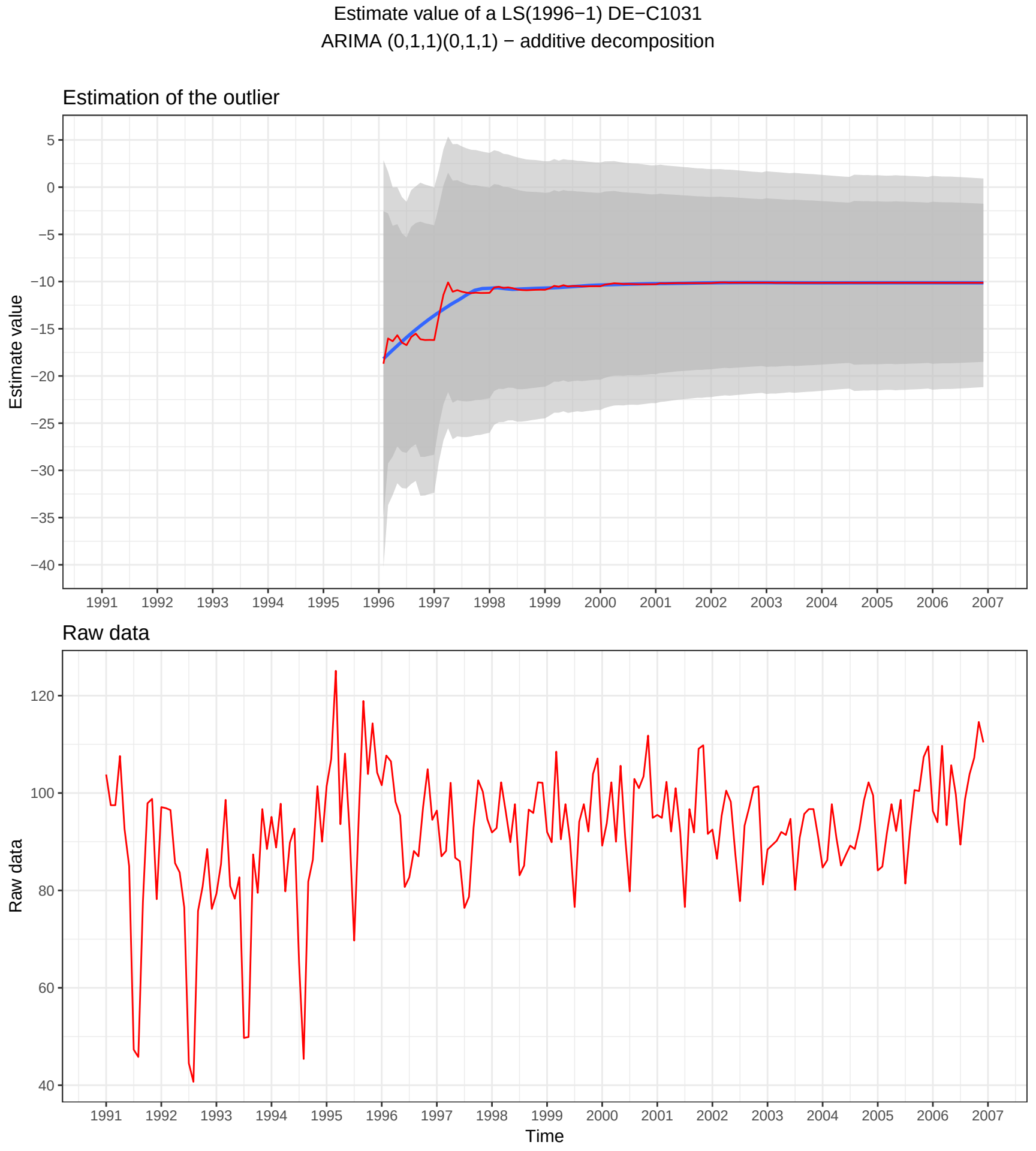

Estimate value of a LS(1996−1) DE−C1013
ARIMA (3,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.74
0.72
0.70
0.68
0.66
0.64
0.62
0.60
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
5.4
5.2
5.0
4.8
4.6
4.4
4.2
Time


Estimate value of a LS(1995−1) FR−C1013
ARIMA (2,1,1)(1,0,0) − additive decomposition
Estimation of the outlier
Estimate value
22
20
18
16
14
12
10
8
6
4
2
0
−2
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
100
80
60
40
Time

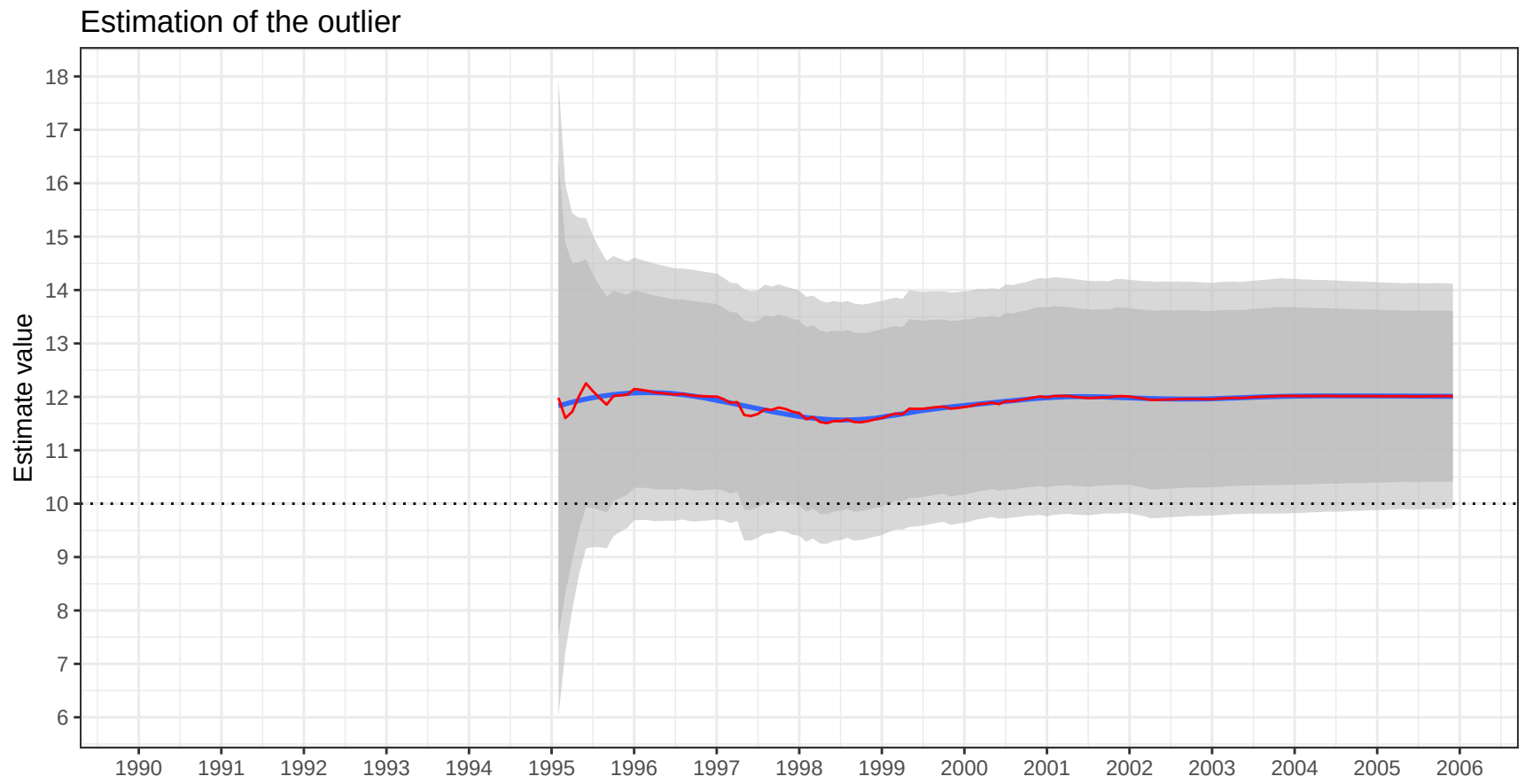
Estimate value of a LS(1995−1) IT−C1013
ARIMA (1,0,1)(0,1,1) − multiplicative decomposition

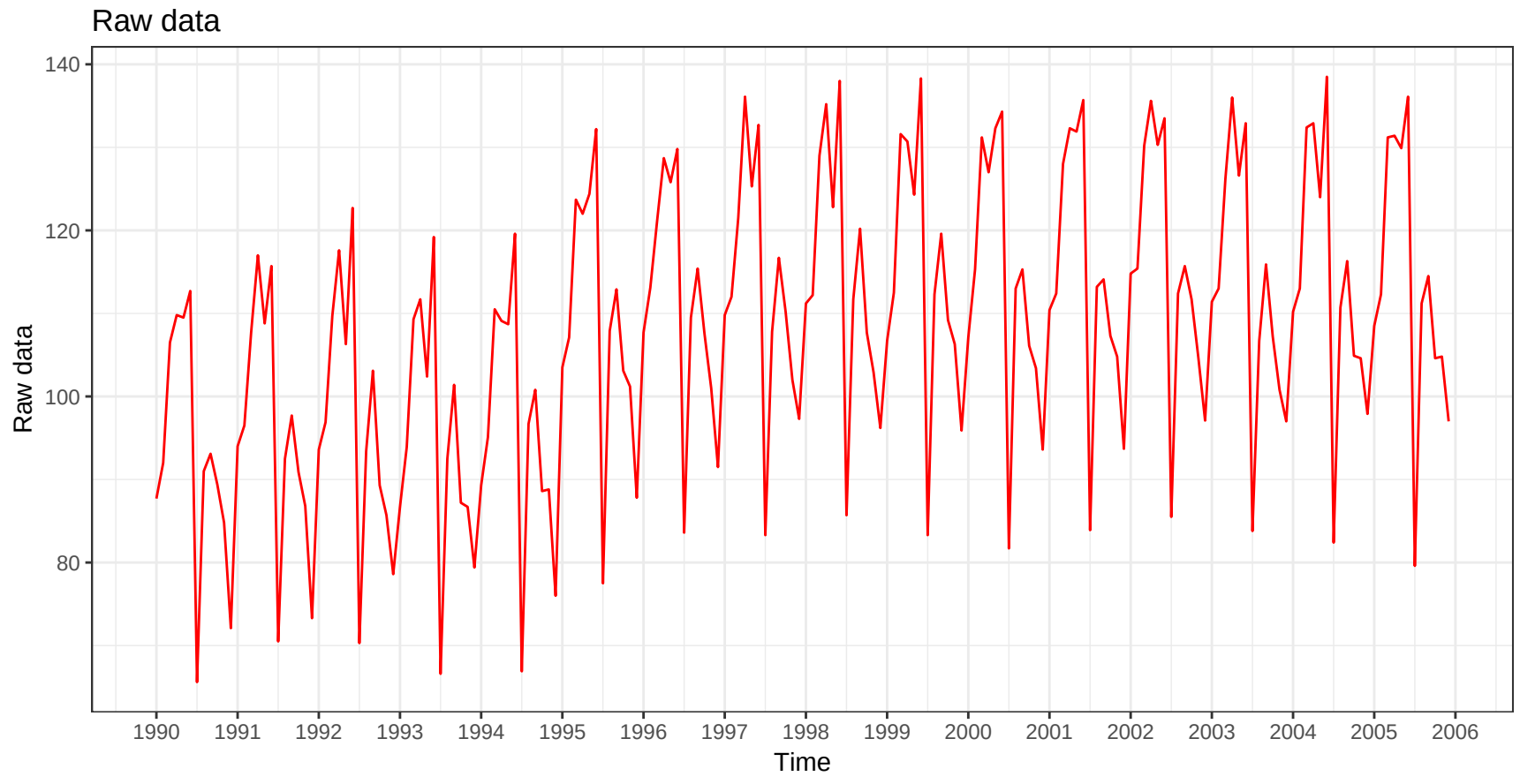


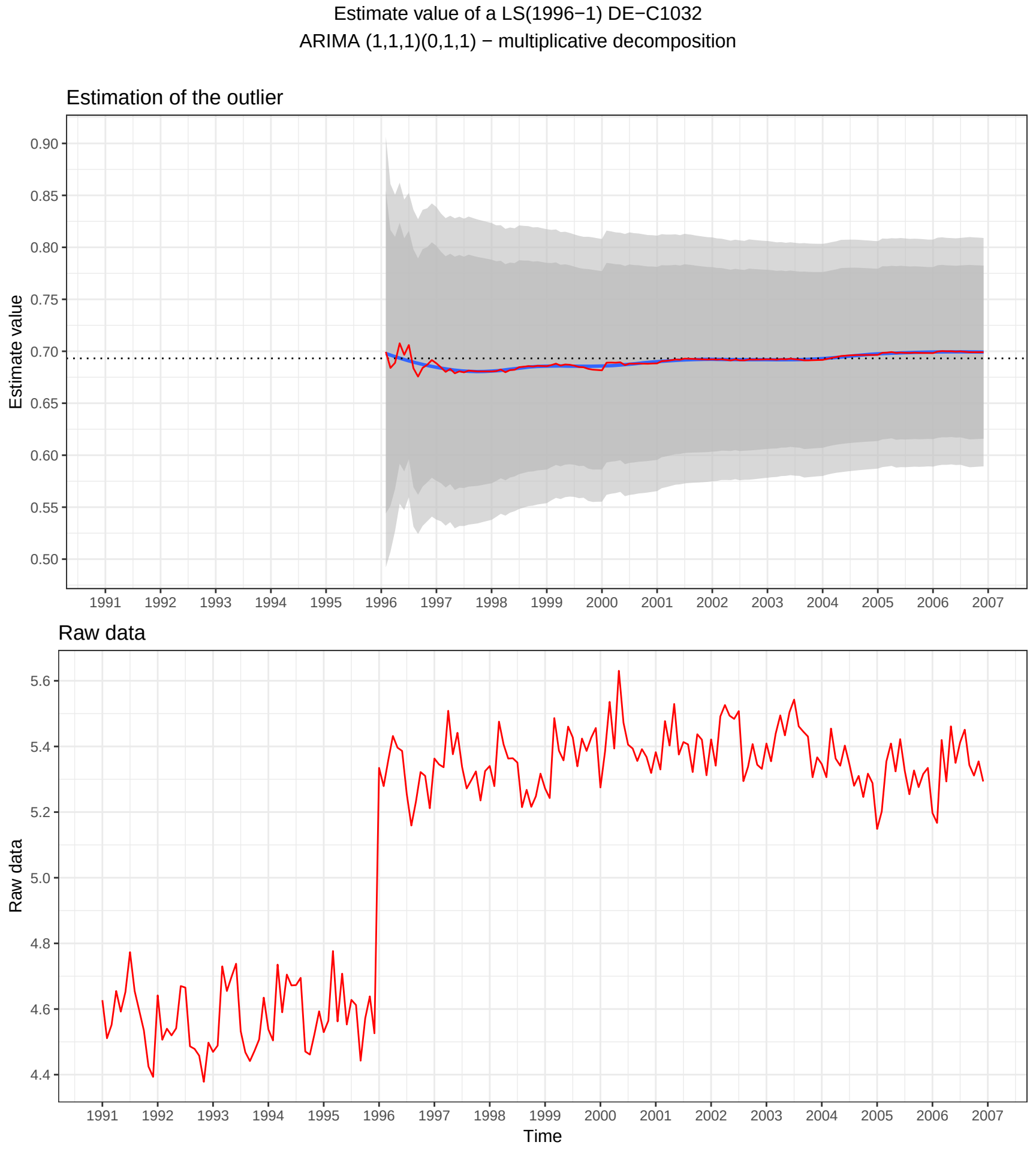


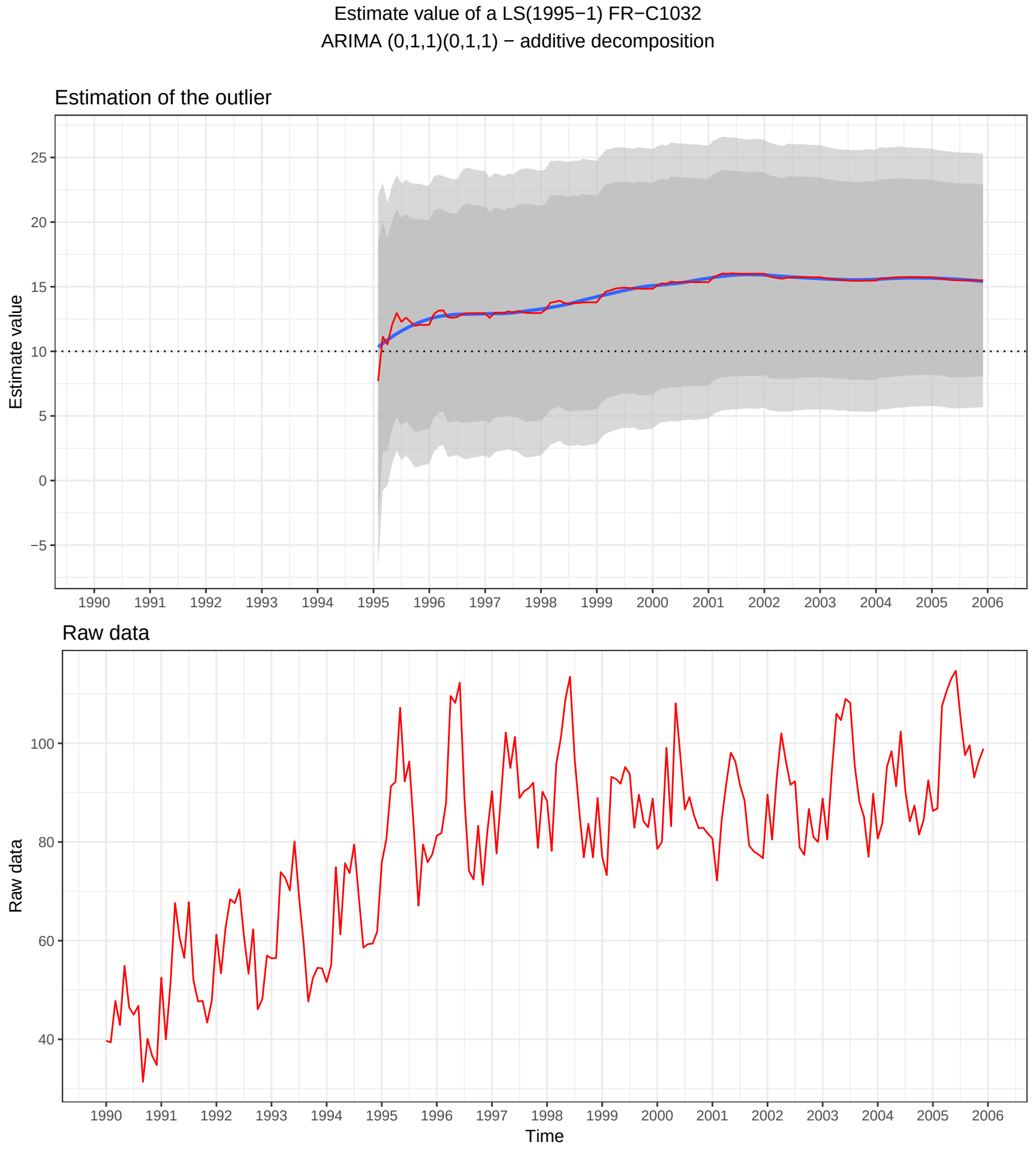

Estimate value of a LS(1996−1) DE−C1031
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
5
0
−5
−10
−15
−20
−25
−30
−35
−40
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
120
100
80
60
40
Time

Estimate value of a LS(1995−1) FR−C1031
ARIMA (0,1,1)(0,1,1) − additive decomposition

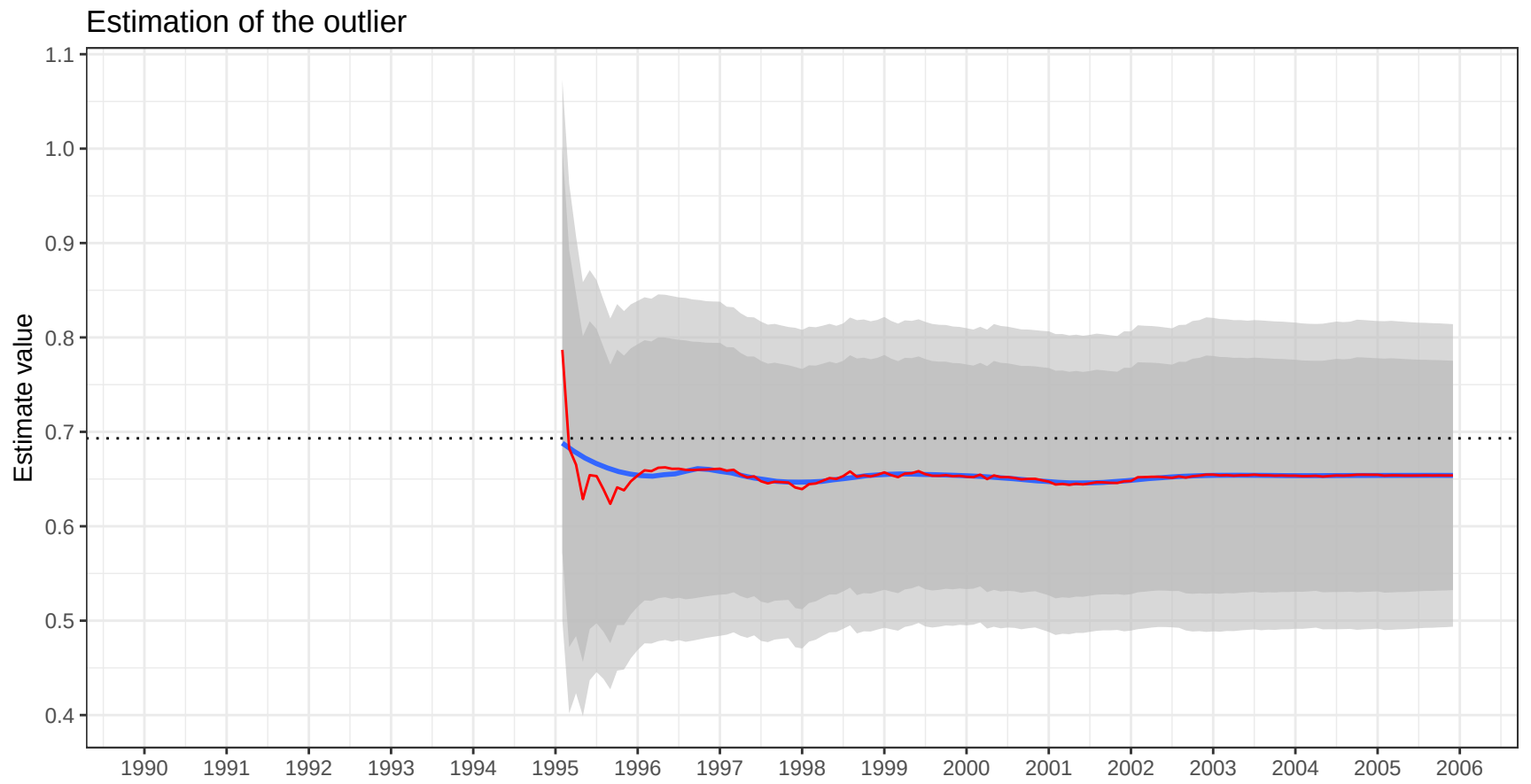


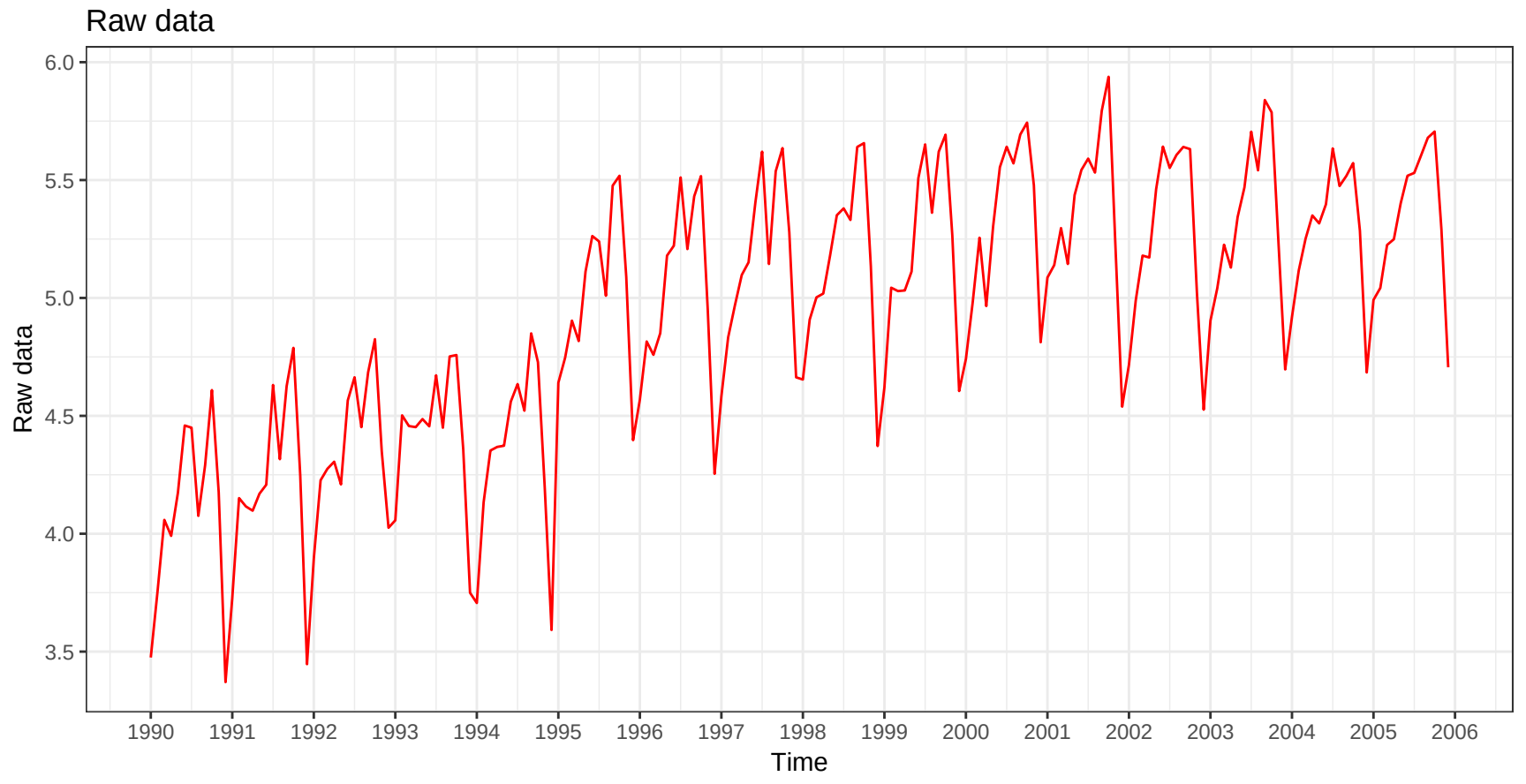



Estimate value of a LS(1996−1) DE−C1032
ARIMA (1,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
5.6
5.4
5.2
5.0
4.8
4.6
4.4
Time


Estimate value of a LS(1995−1) FR−C1032
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
25
20
15
10
5
0
−5
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
100
80
60
40
Time

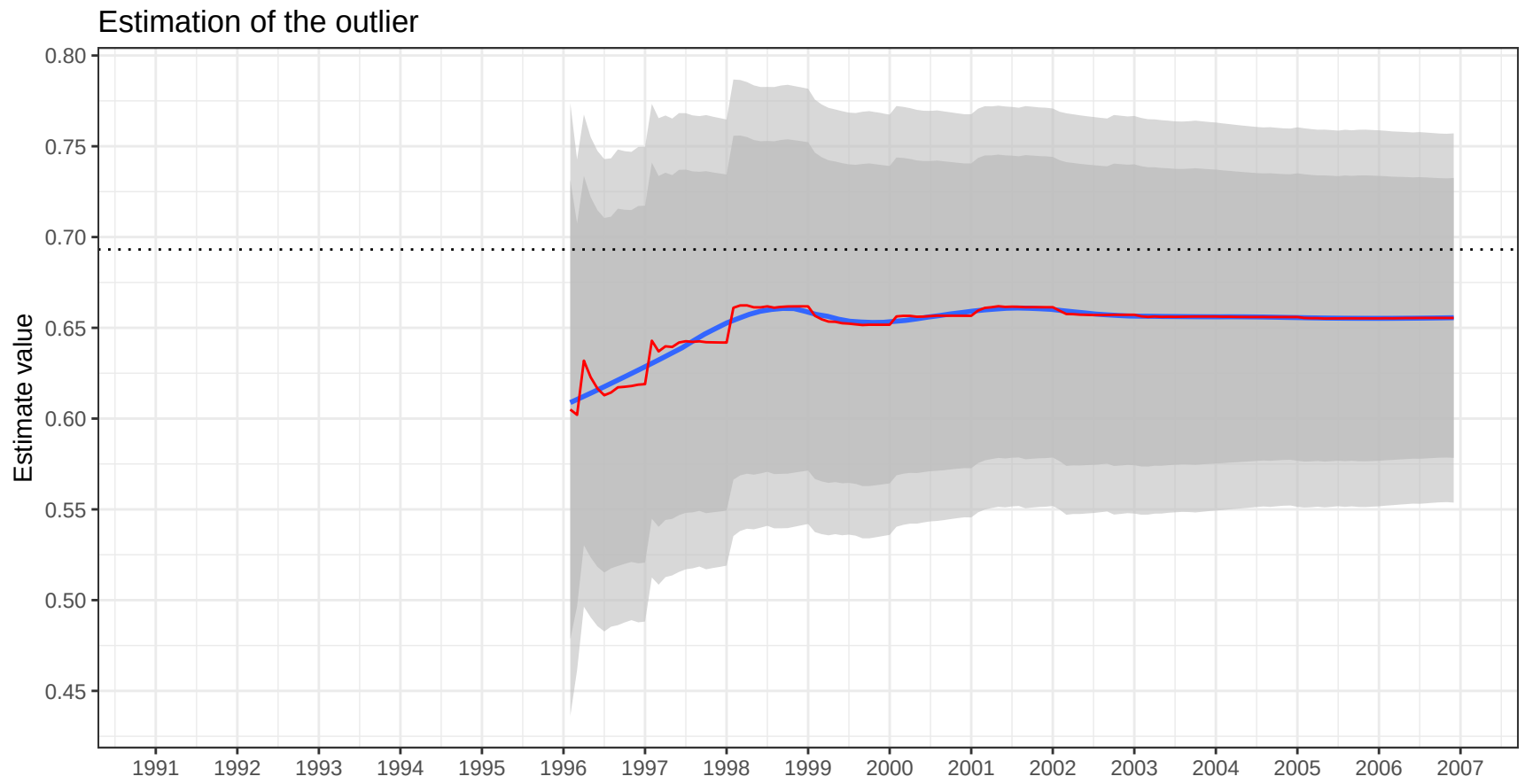
Estimate value of a LS(1995−1) IT−C1032
ARIMA (0,1,2)(0,1,1) − multiplicative decomposition

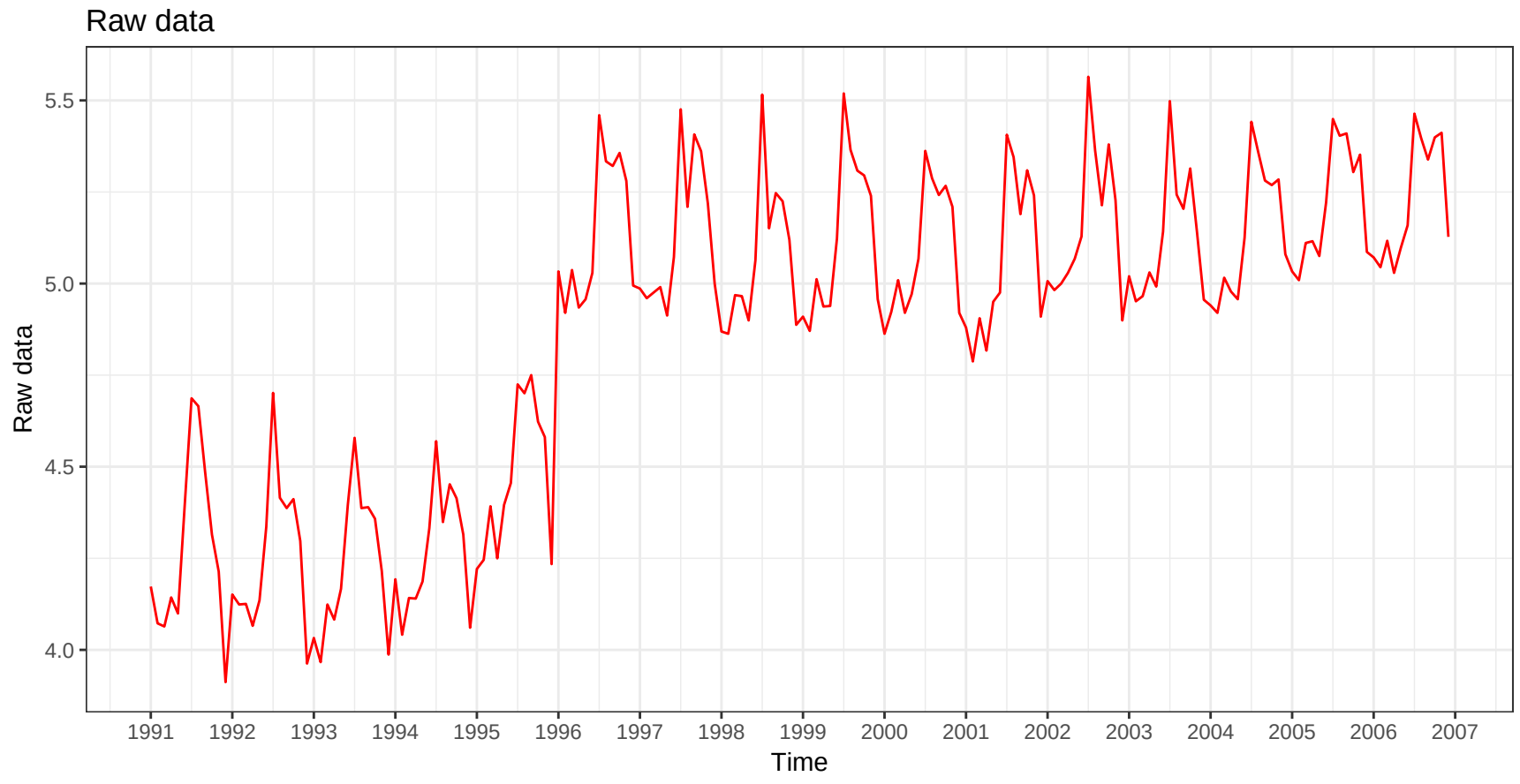




Estimate value of a LS(1996−1) DE−C1039

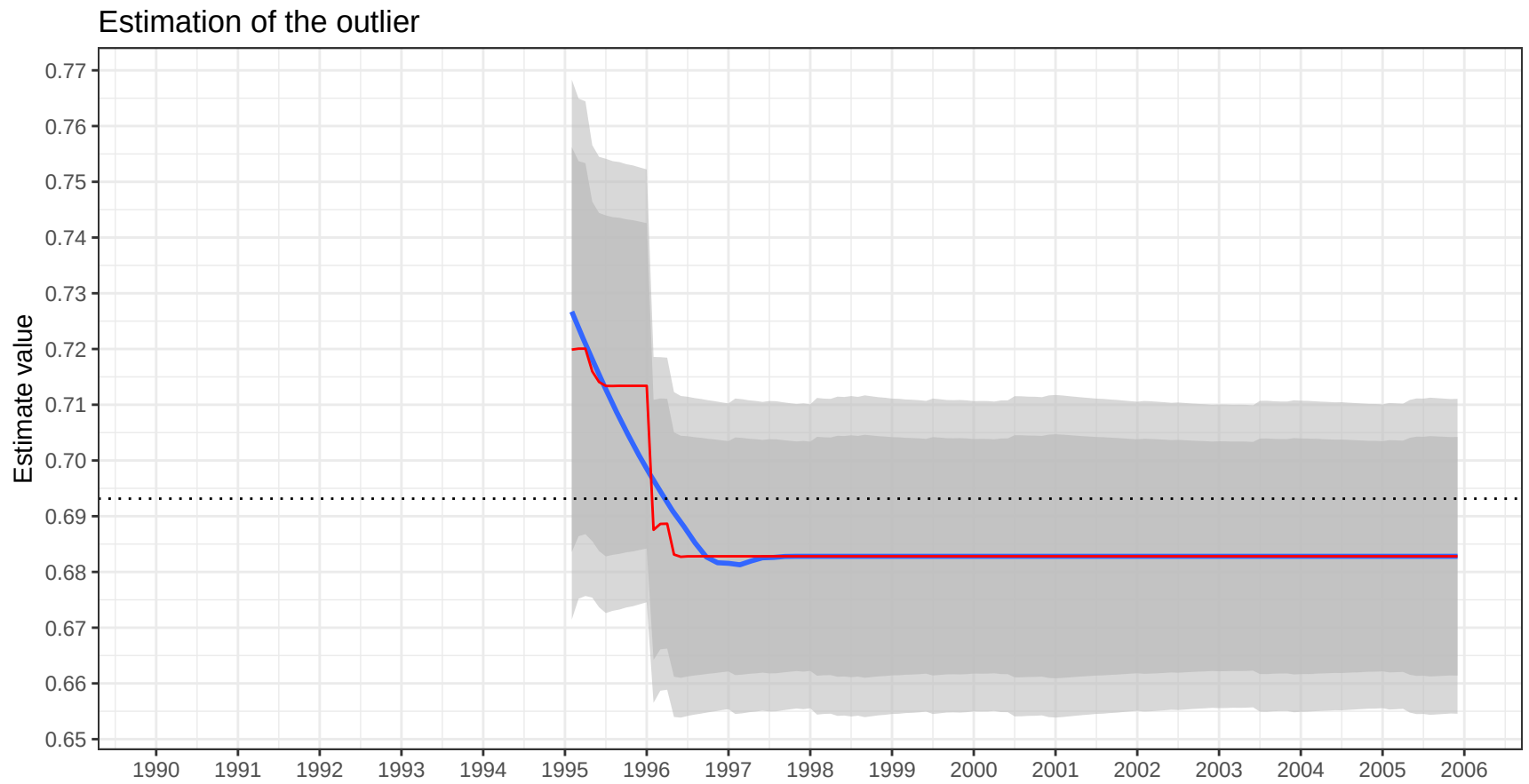
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

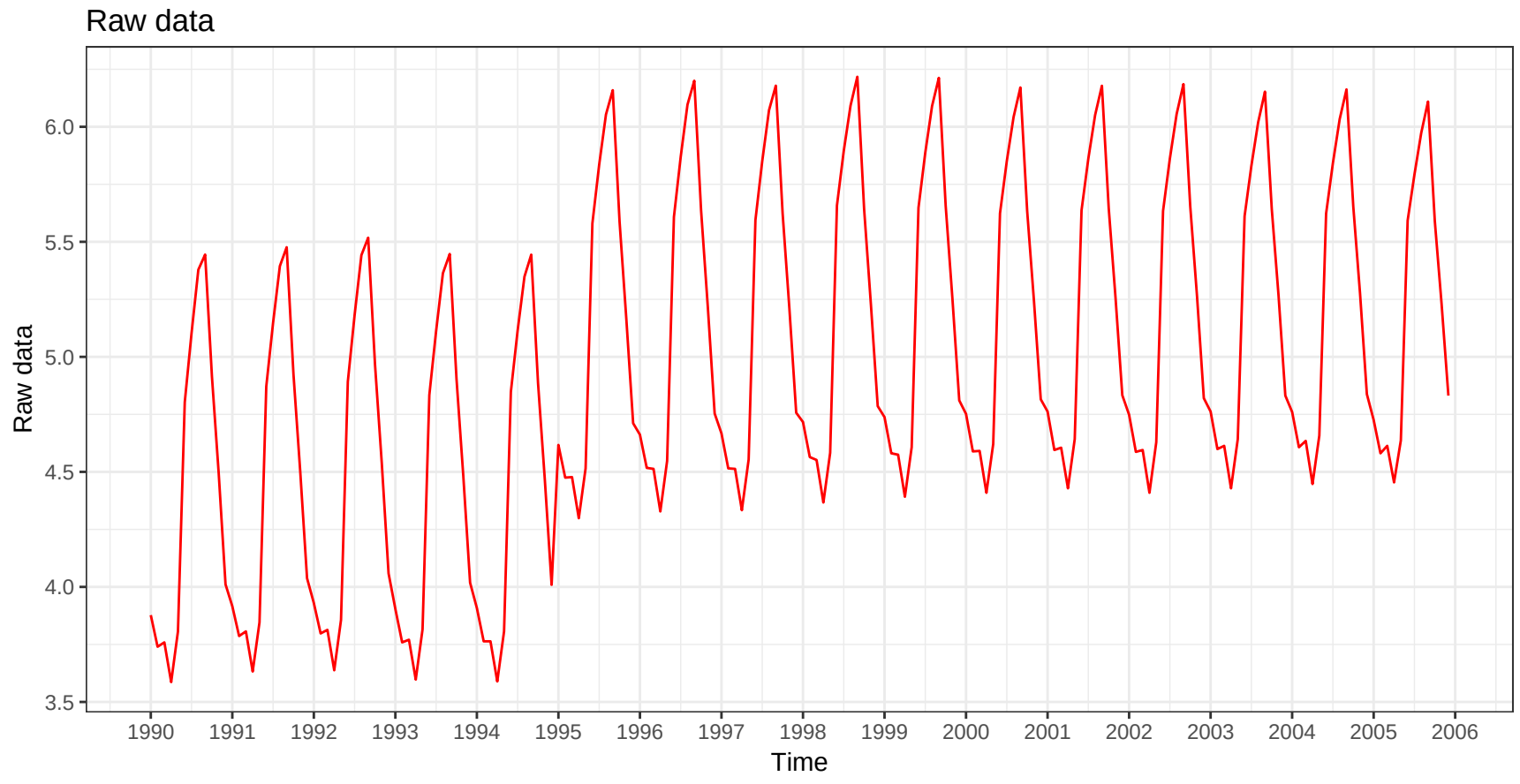


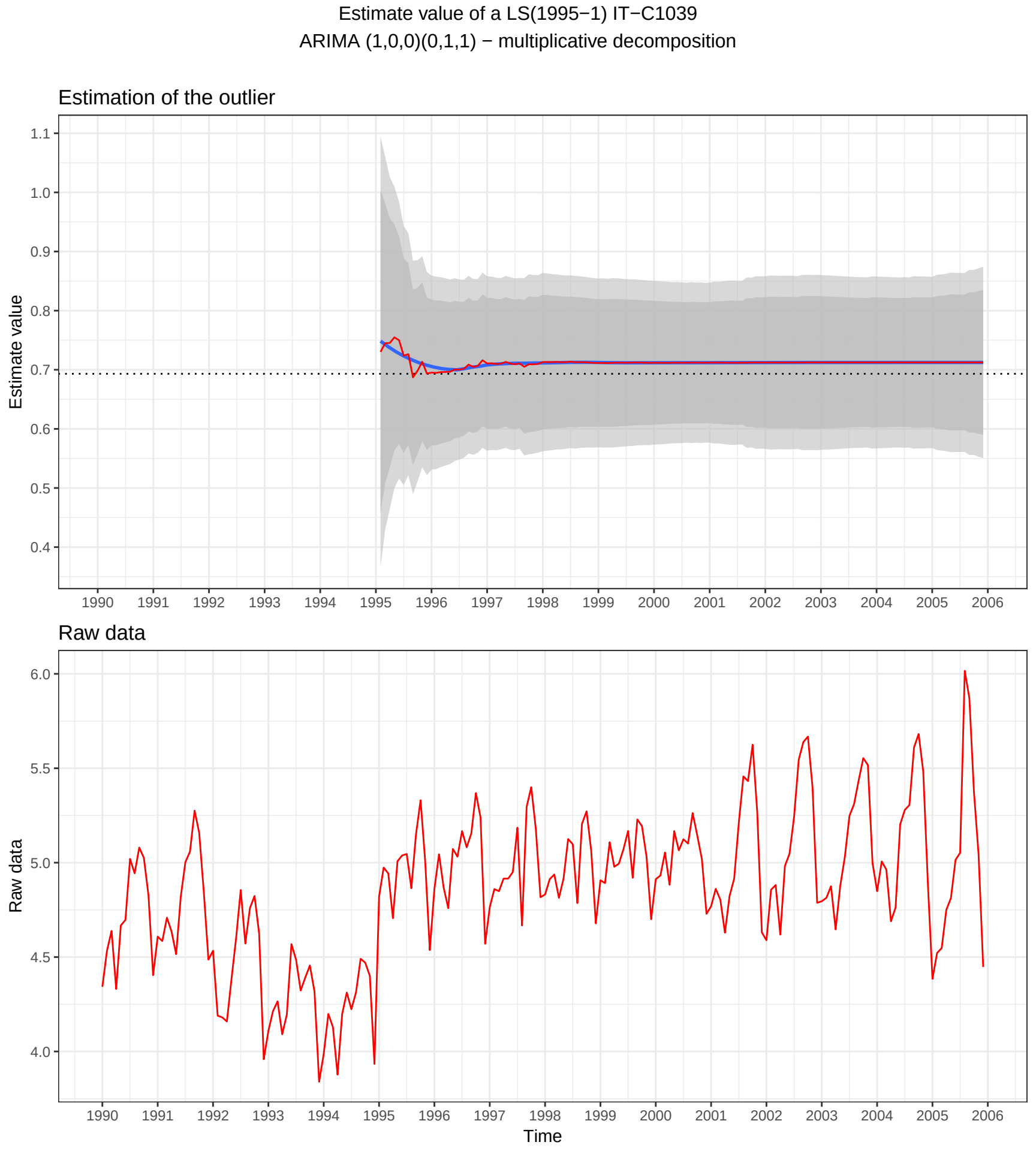


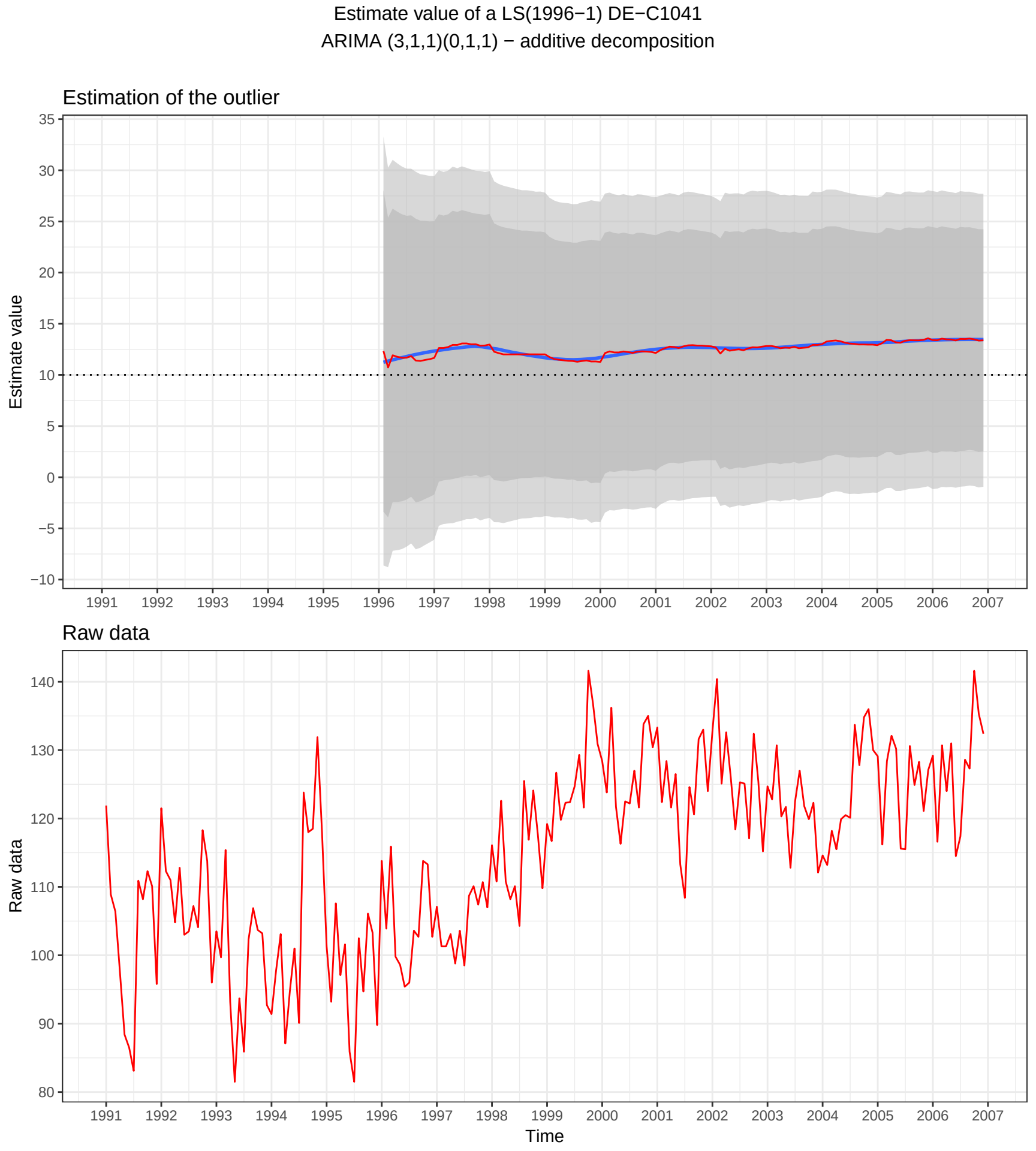
Estimate value of a LS(1995−1) FR−C1039

ARIMA (3,1,1)(0,1,0) − multiplicative decomposition

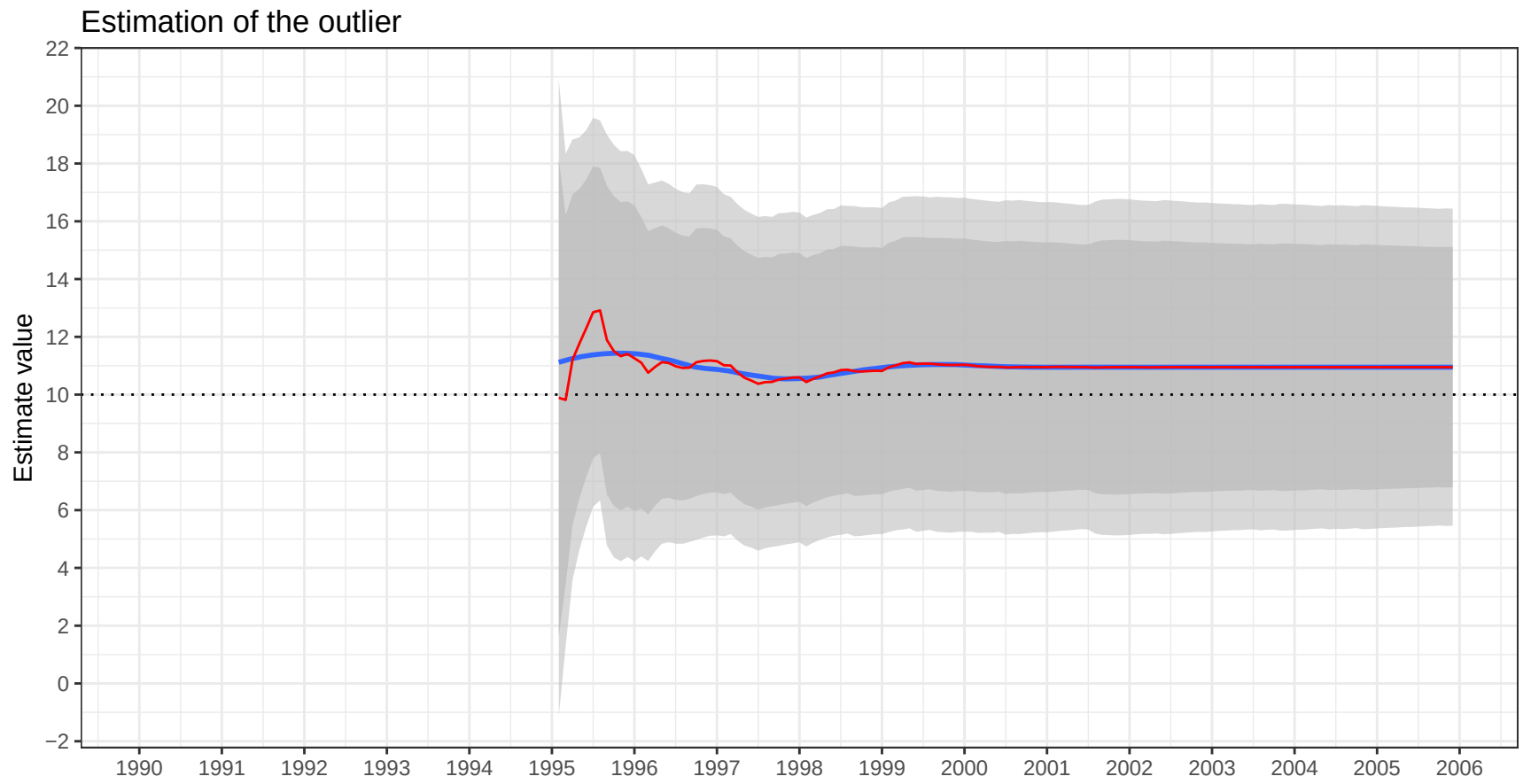


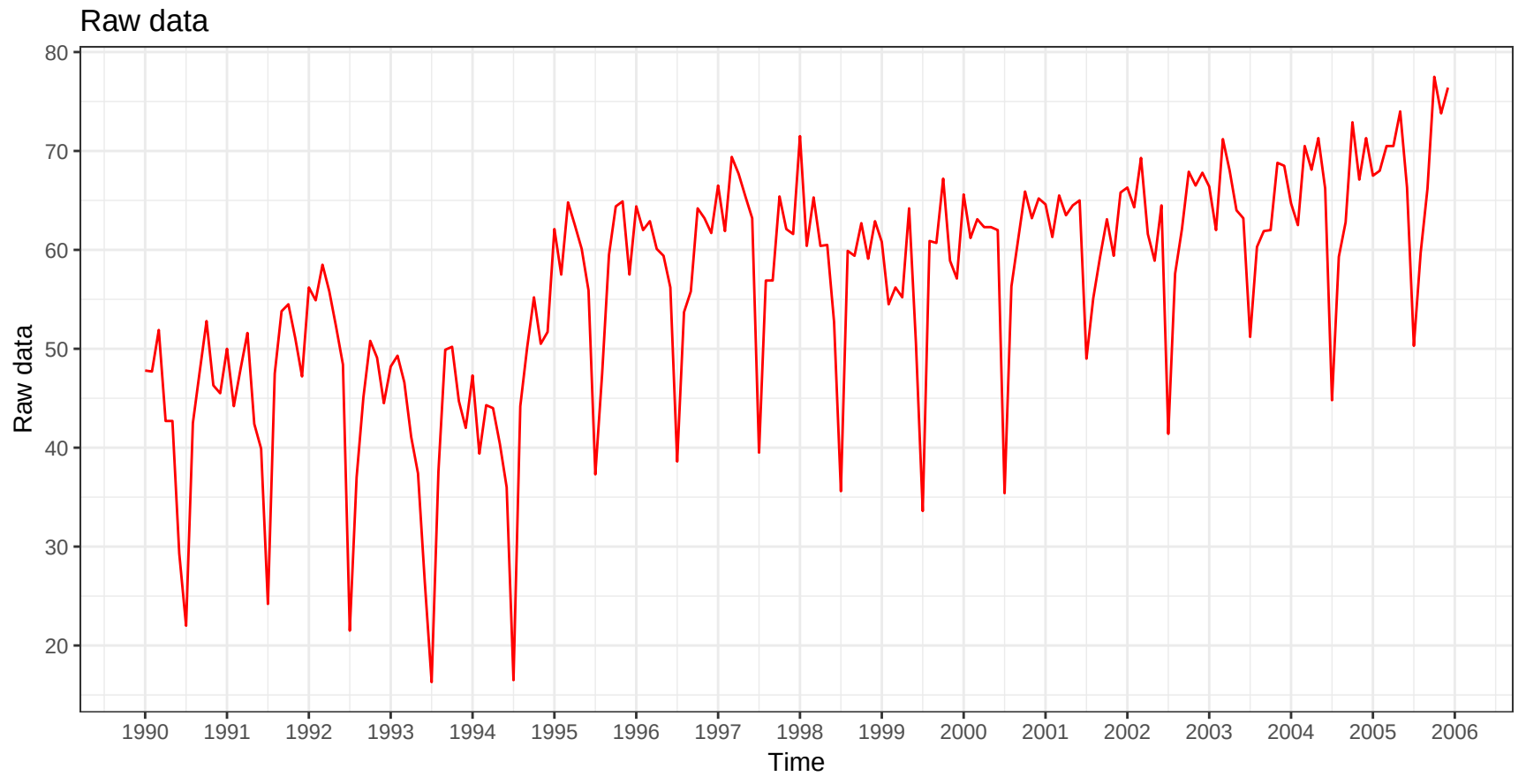


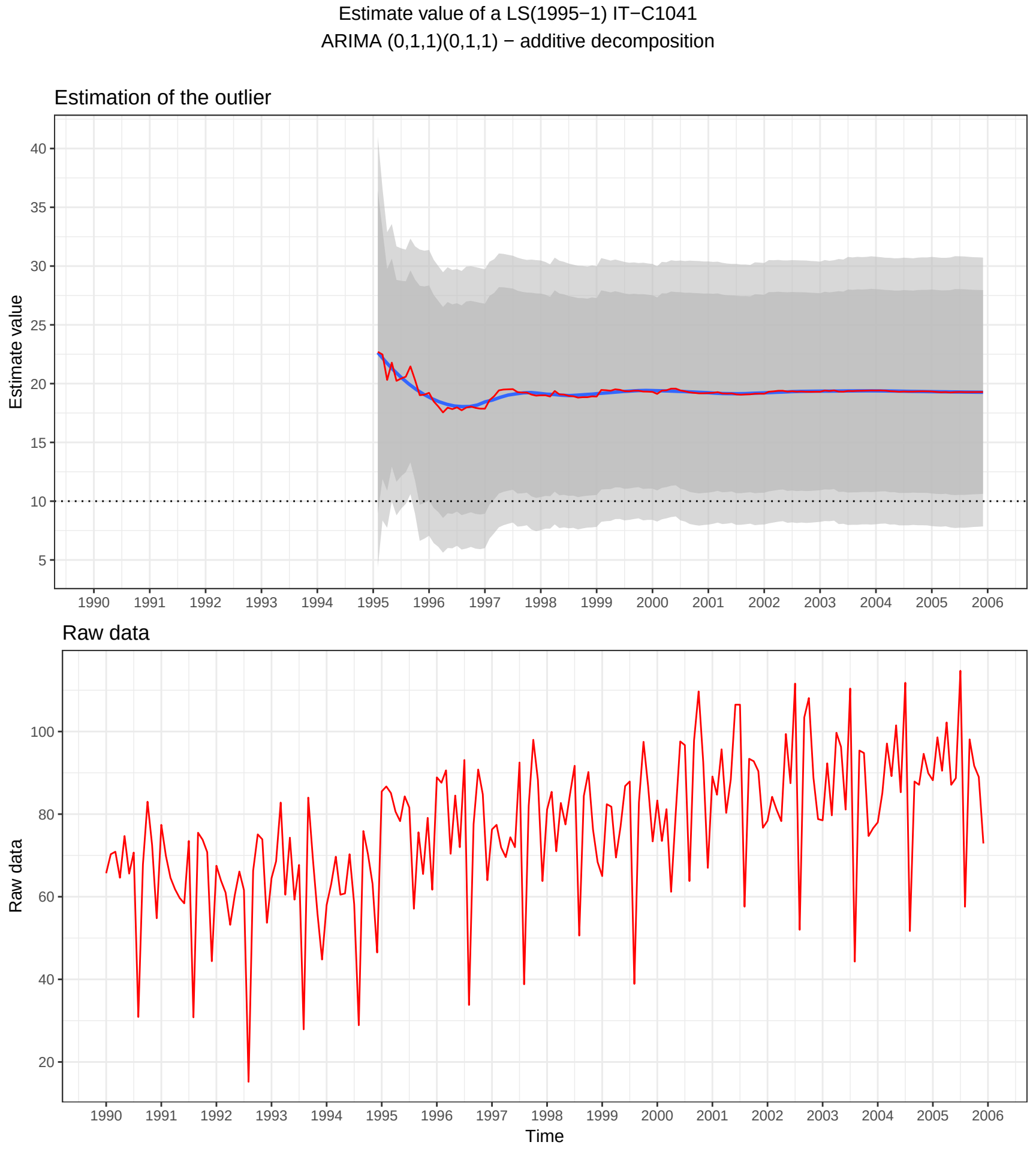

Estimate value of a LS(1995−1) IT−C1039
ARIMA (1,0,0)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
6.0
5.5
5.0
4.5
4.0
Time

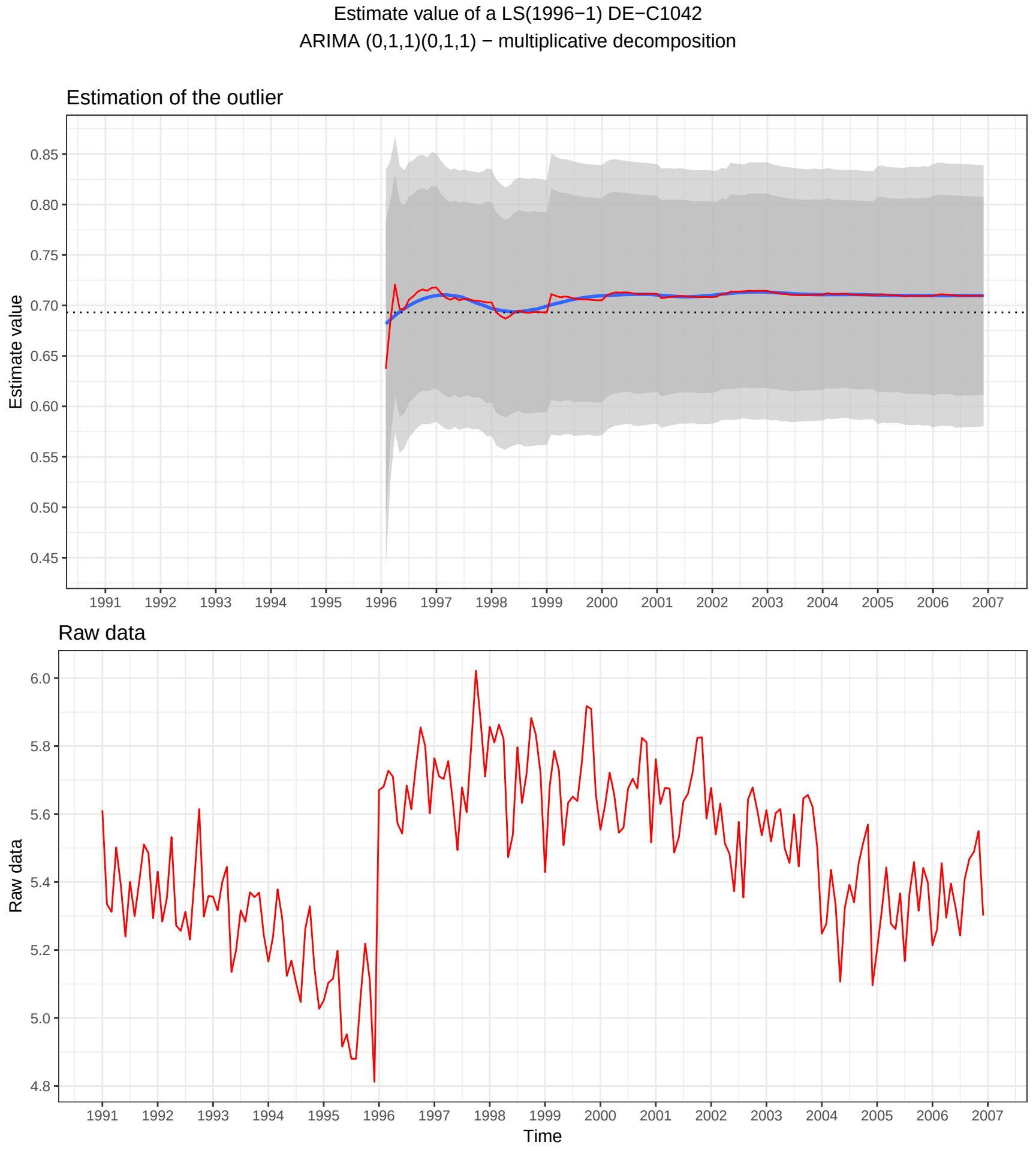

Estimate value of a LS(1996−1) DE−C1041
ARIMA (3,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
35
30
25
20
15
10
5
0
−5
−10
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
140
130
120
110
100
90
80
Time

Estimate value of a LS(1995−1) FR−C1041
ARIMA (0,1,1)(0,1,1) − additive decomposition



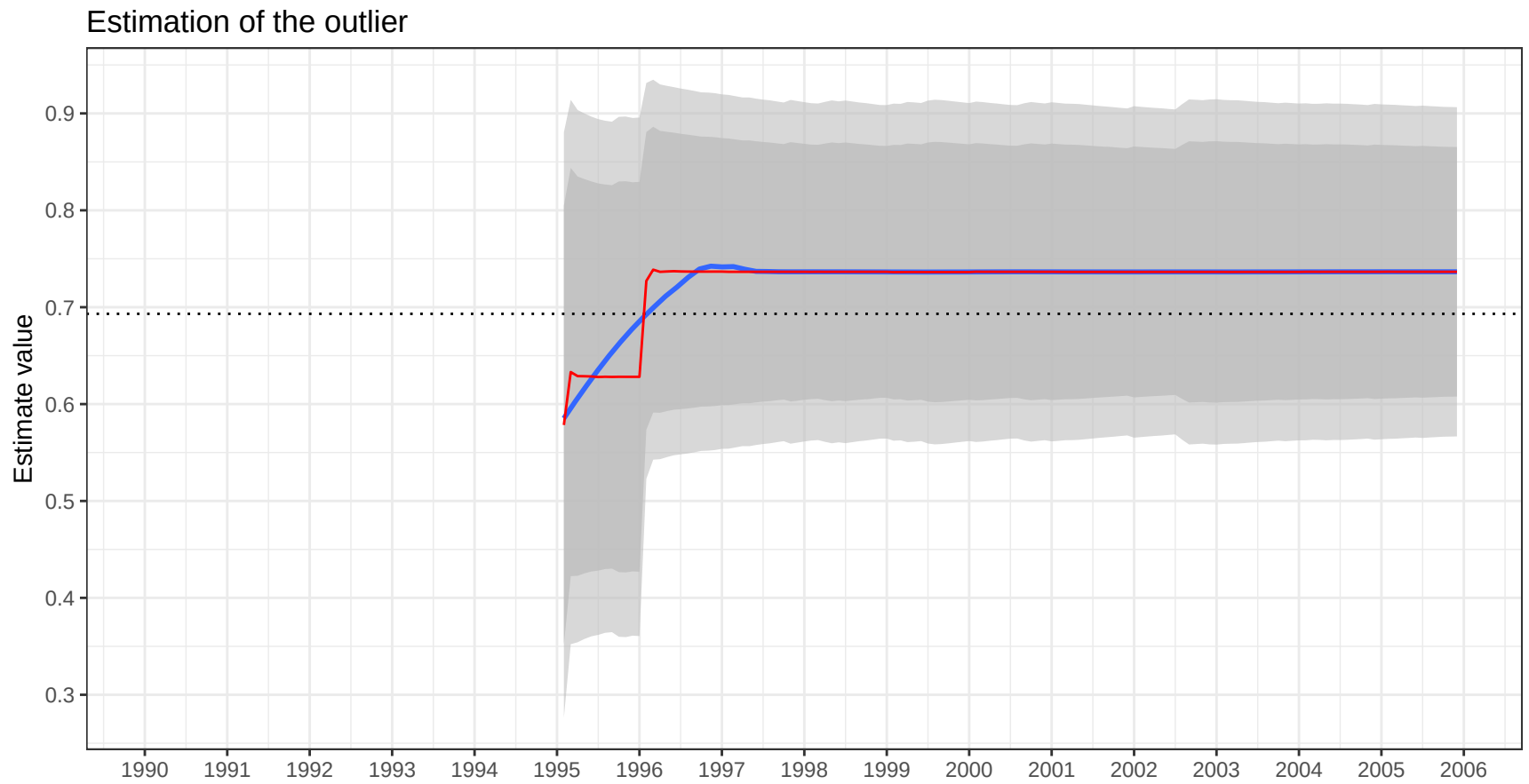


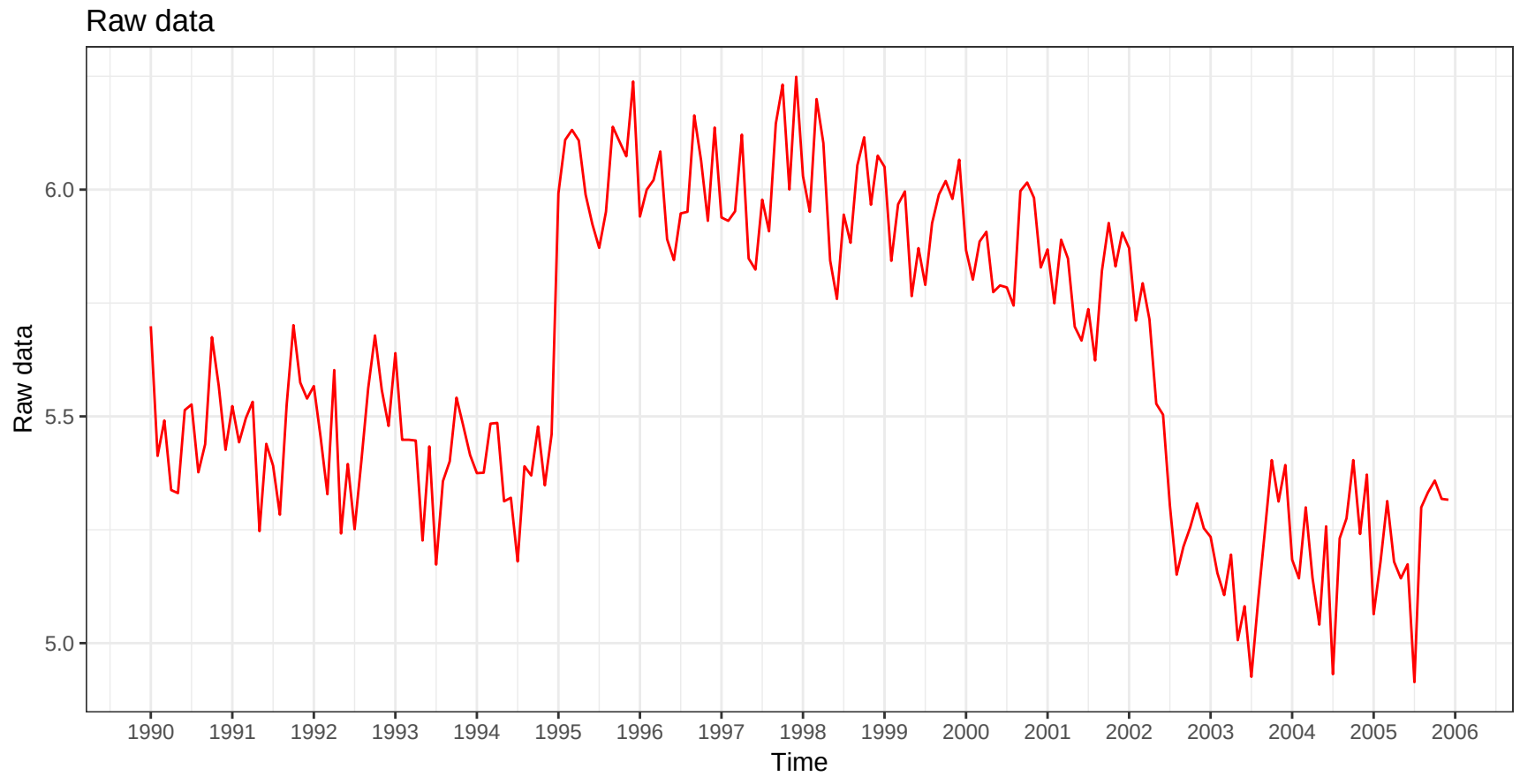

Estimate value of a LS(1995−1) IT−C1041
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
40
35
30
25
20
15
10
5
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
100
80
60
40
20
Time

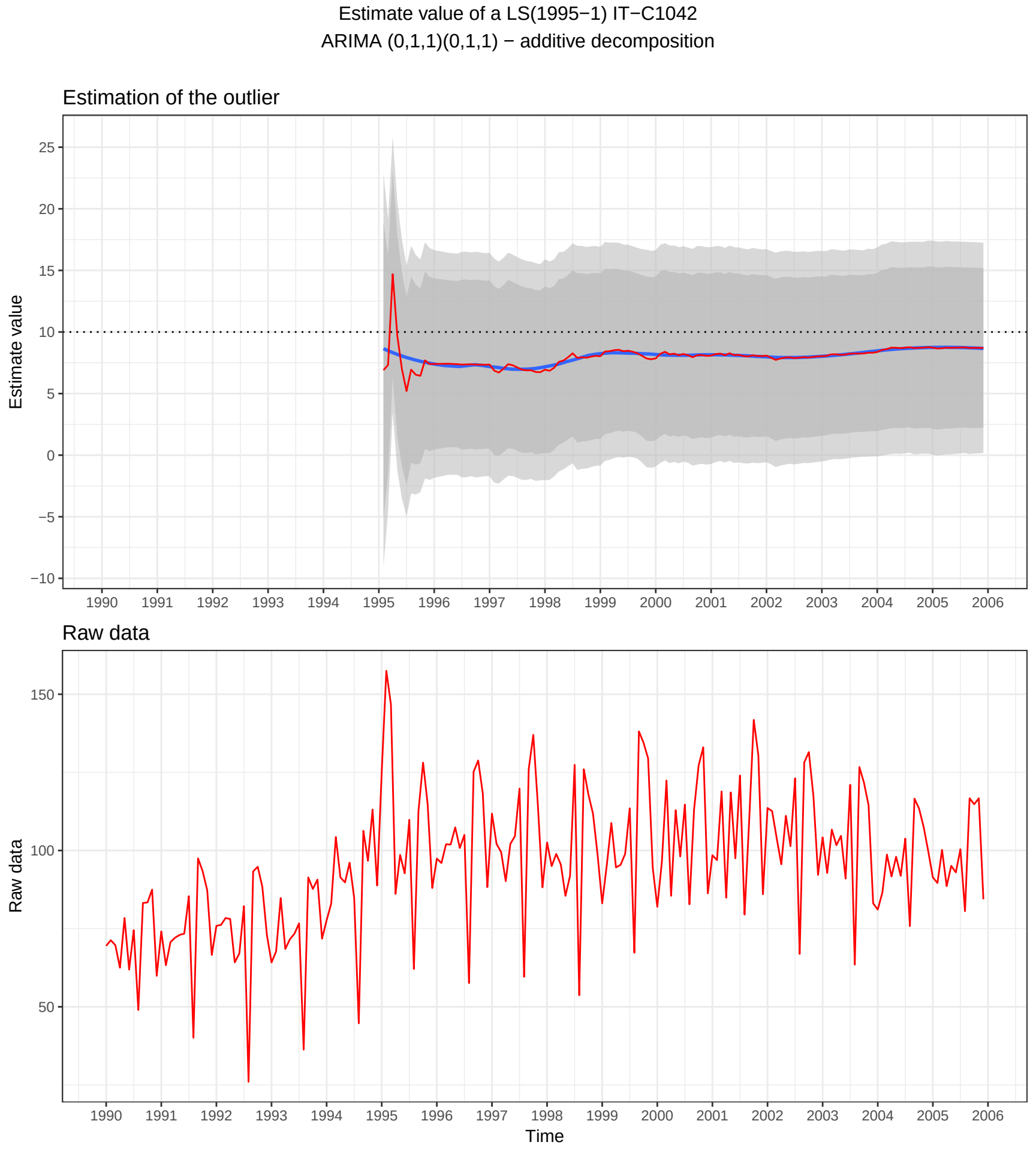

Estimate value of a LS(1996−1) DE−C1042
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
0.45
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
6.0
5.8
5.6
5.4
5.2
5.0
4.8
Time

Estimate value of a LS(1995−1) FR−C1042

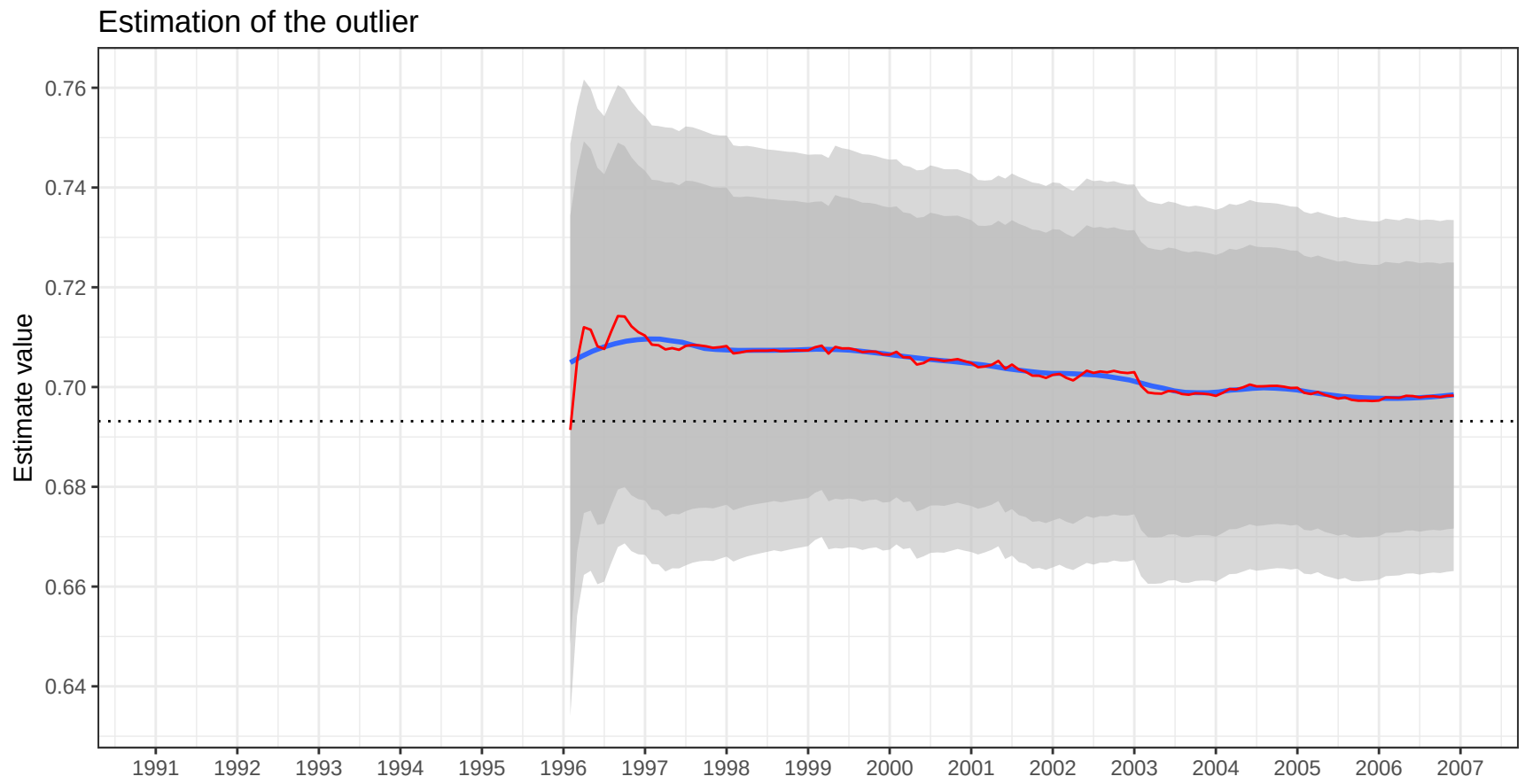
ARIMA (0,1,1)(1,1,1) − multiplicative decomposition

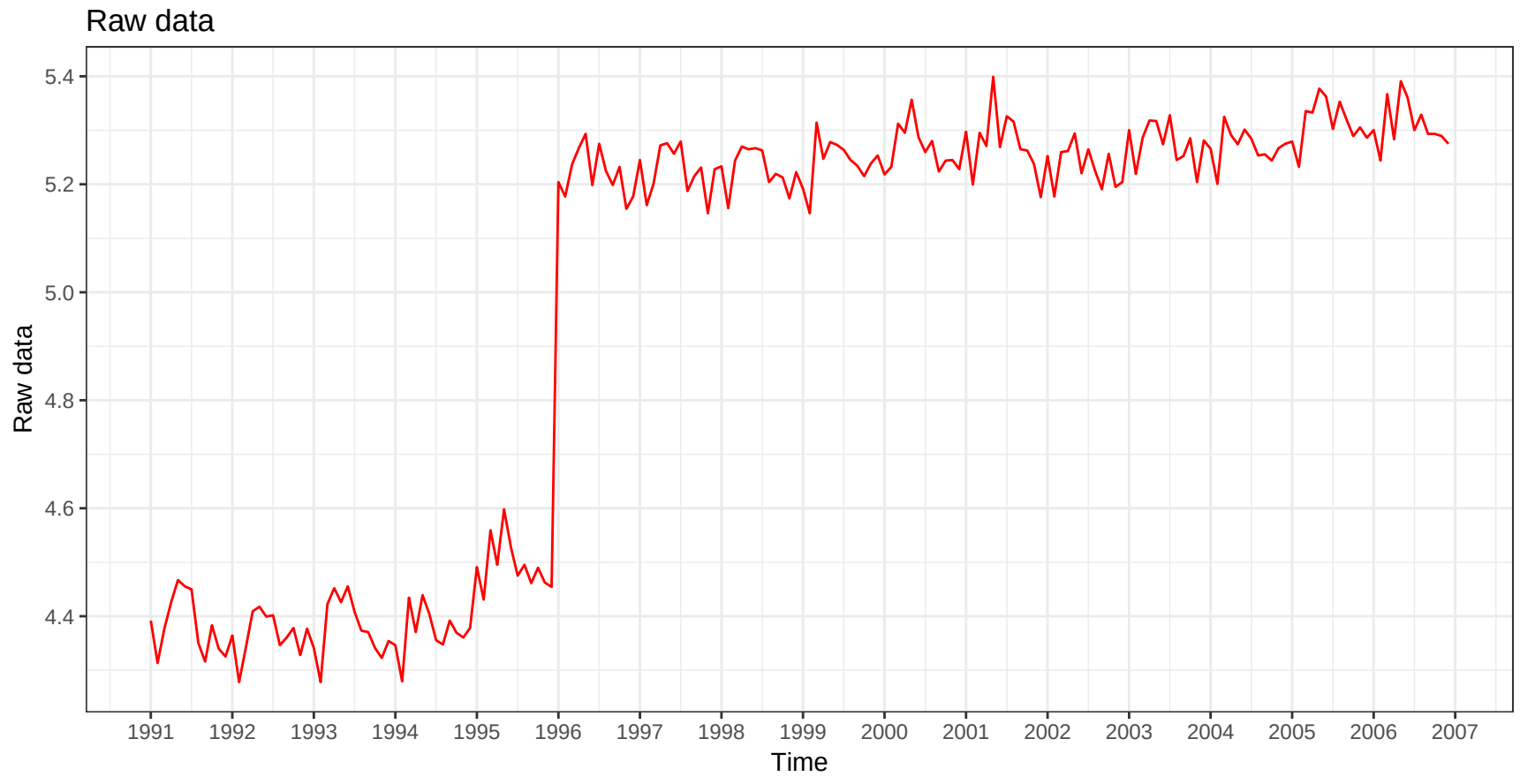


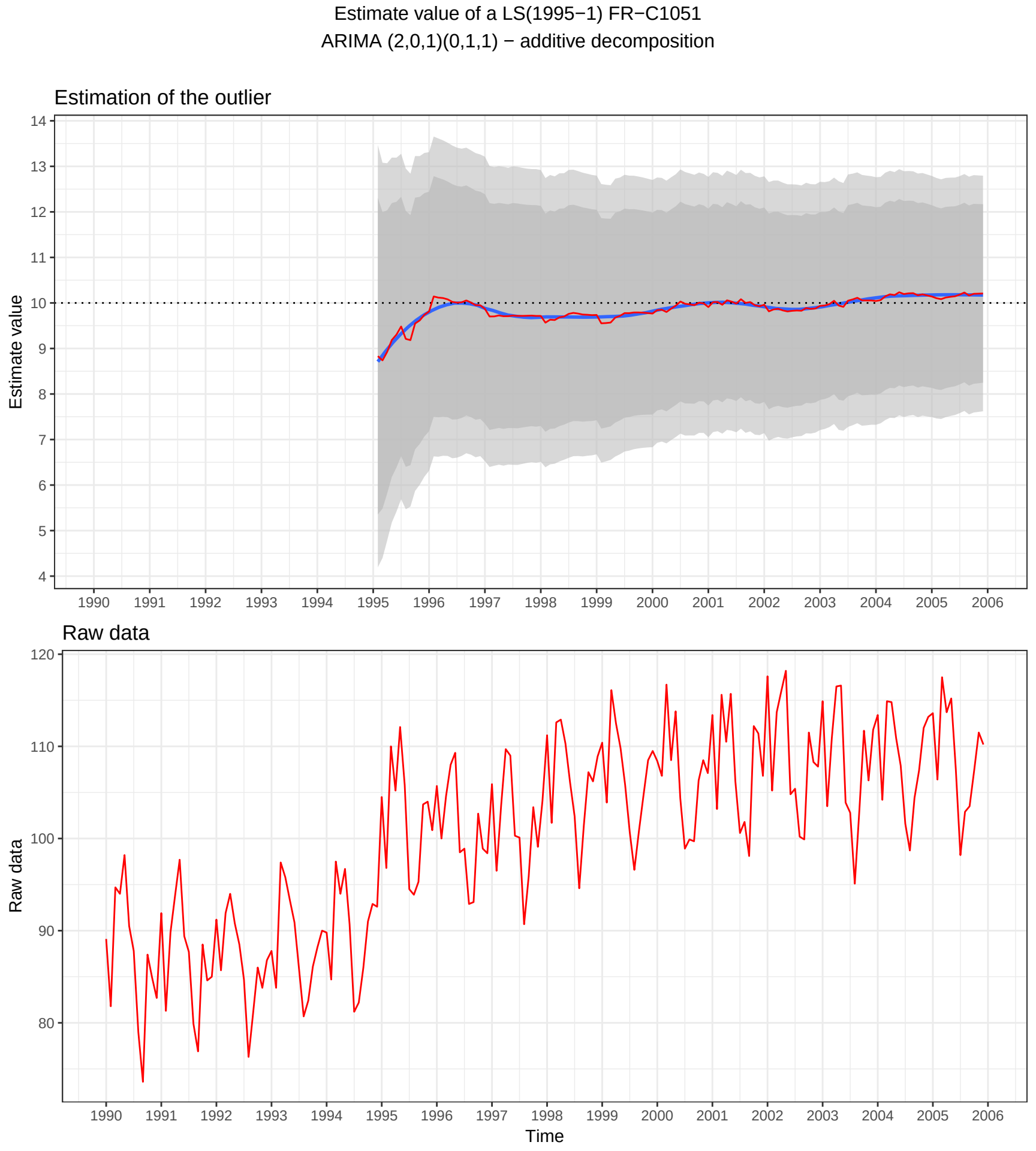



Estimate value of a LS(1995−1) IT−C1042
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
25
20
15
10
5
0
−5
−10
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
150
100
50
Time

Estimate value of a LS(1996−1) DE−C1051
ARIMA (3,1,1)(0,1,1) − multiplicative decomposition

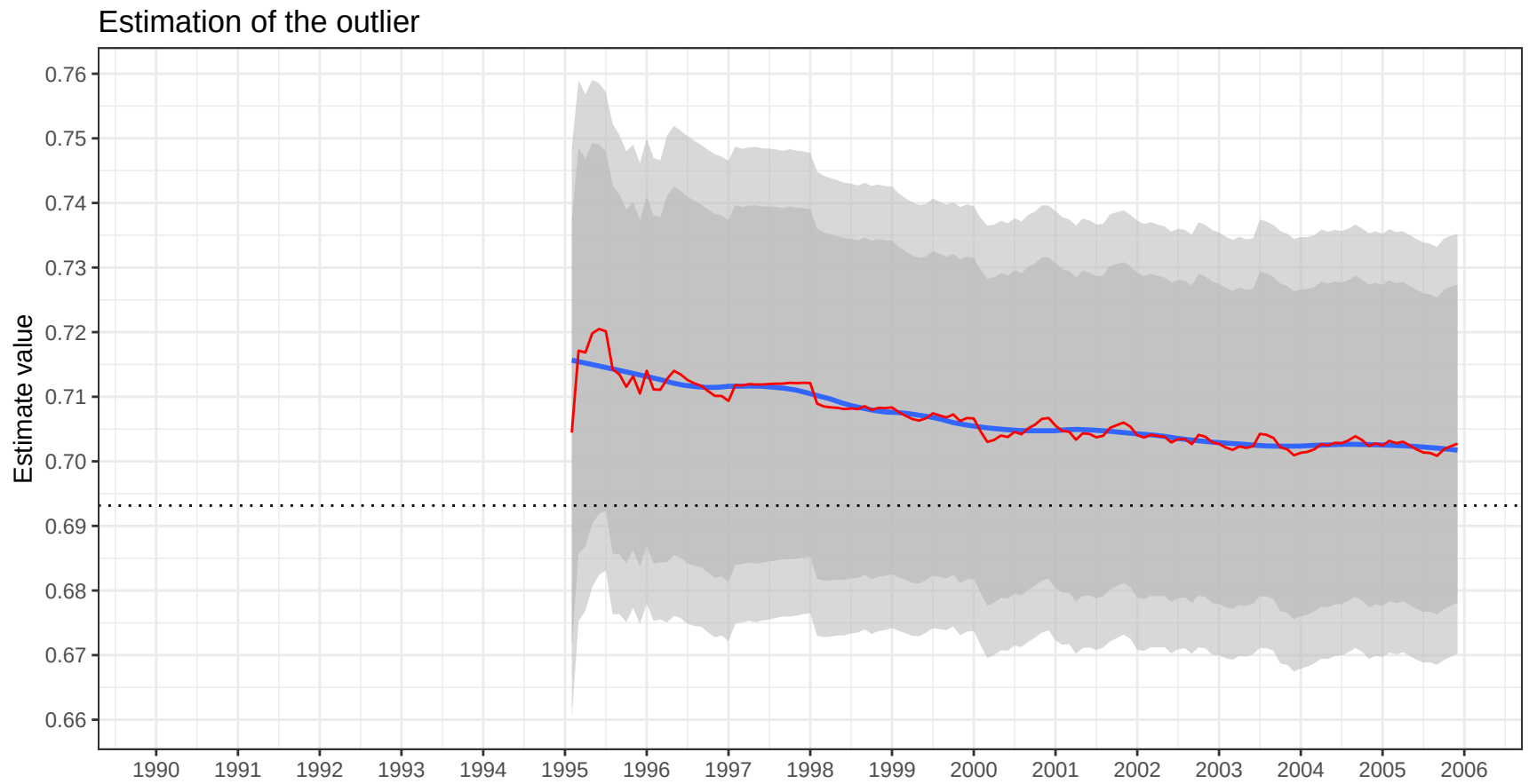


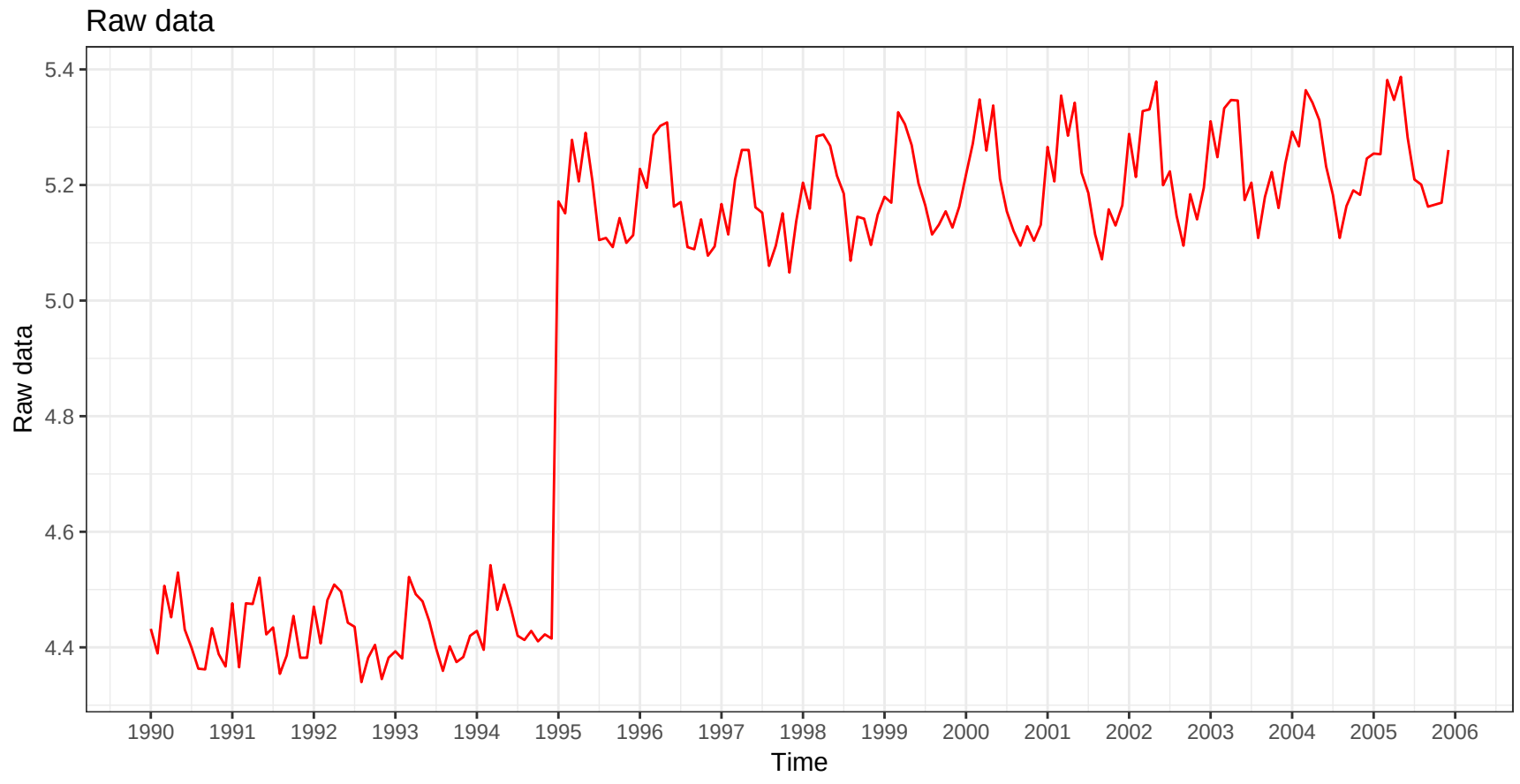



Estimate value of a LS(1995−1) FR−C1051
ARIMA (2,0,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
14
13
12
11
10
9
8
7
6
5
4
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
120
110
100
90
80
Time

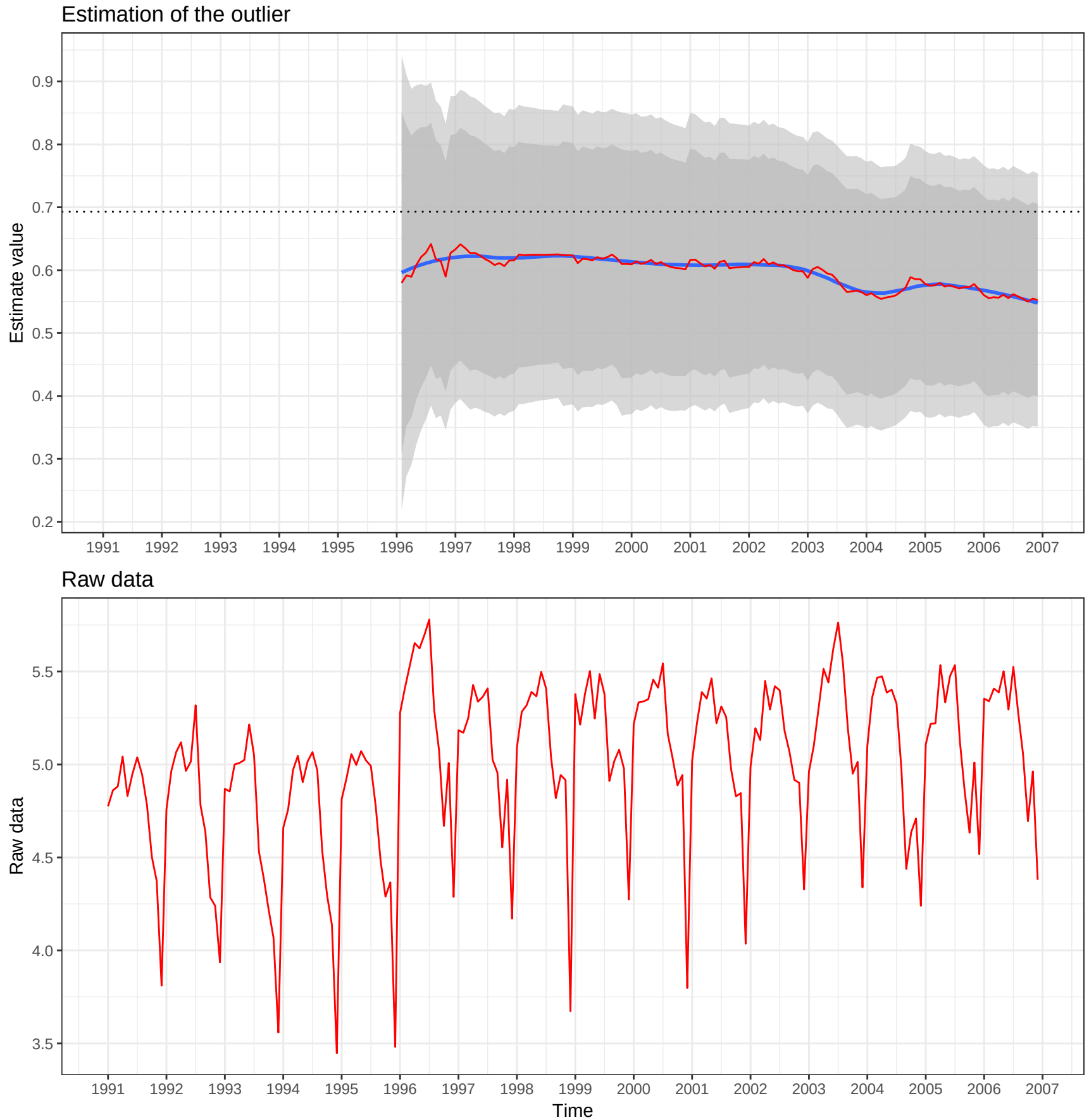
Estimate value of a LS(1995−1) IT−C1051

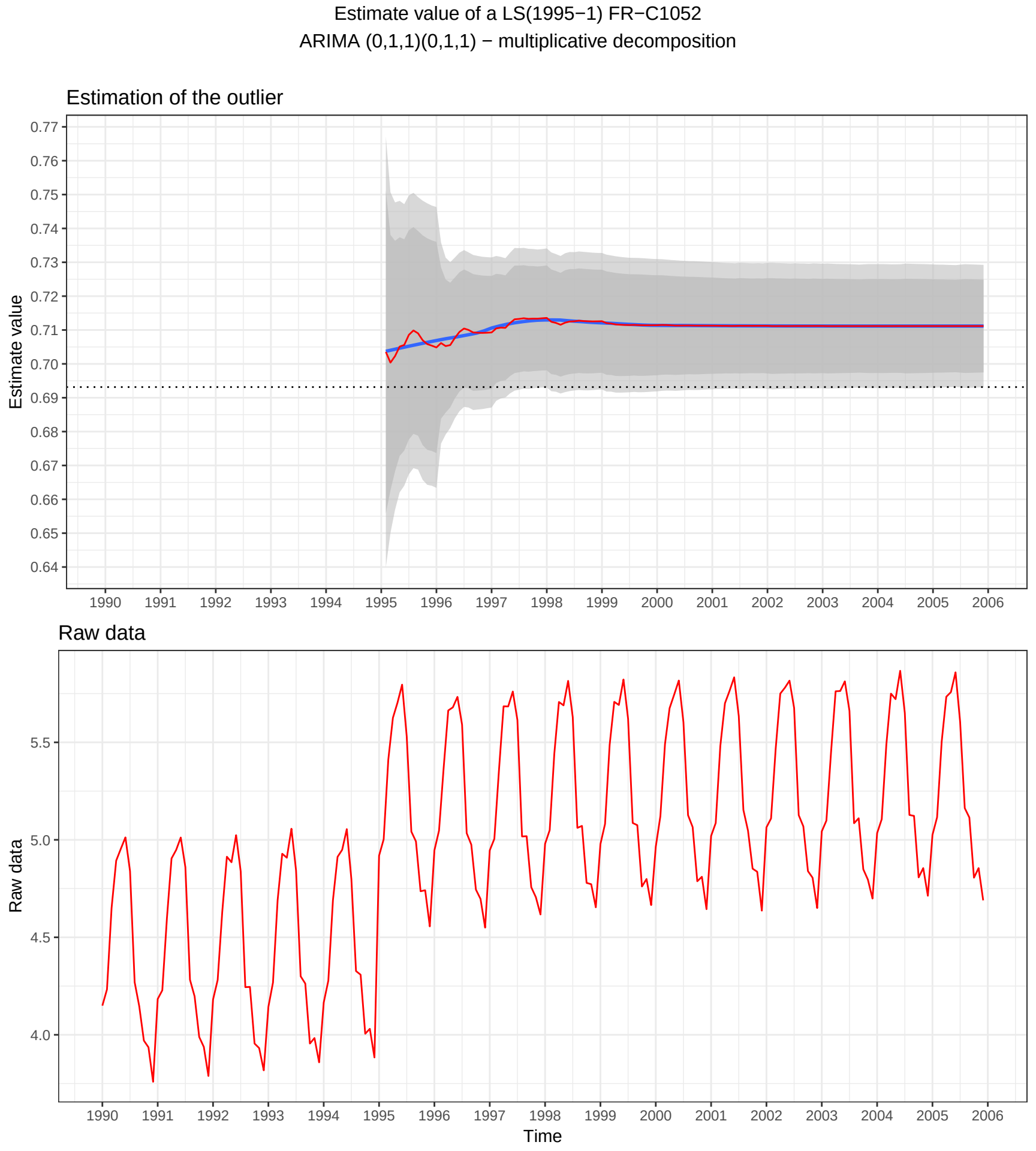
ARIMA (3,0,1)(0,1,1) − multiplicative decomposition

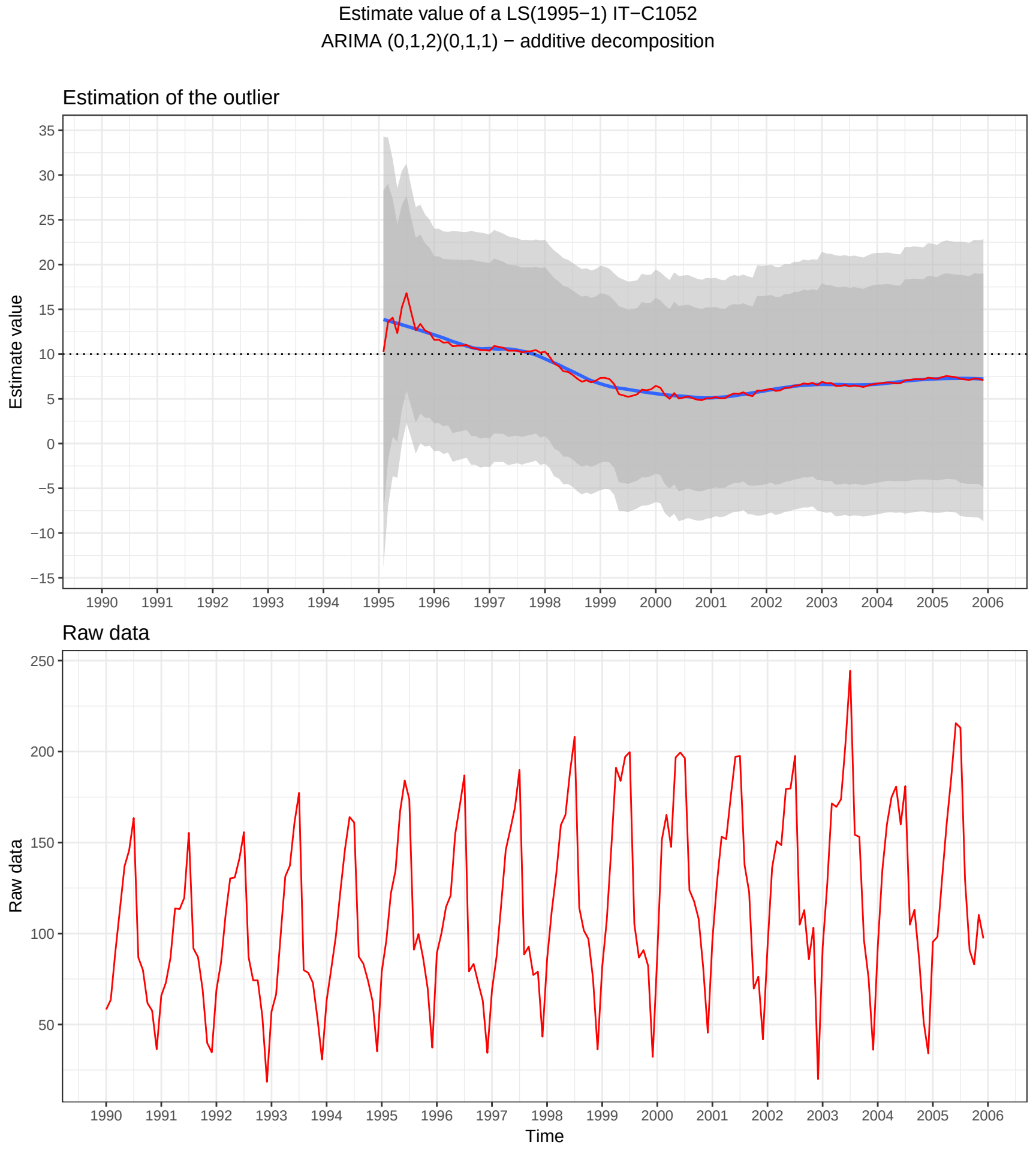


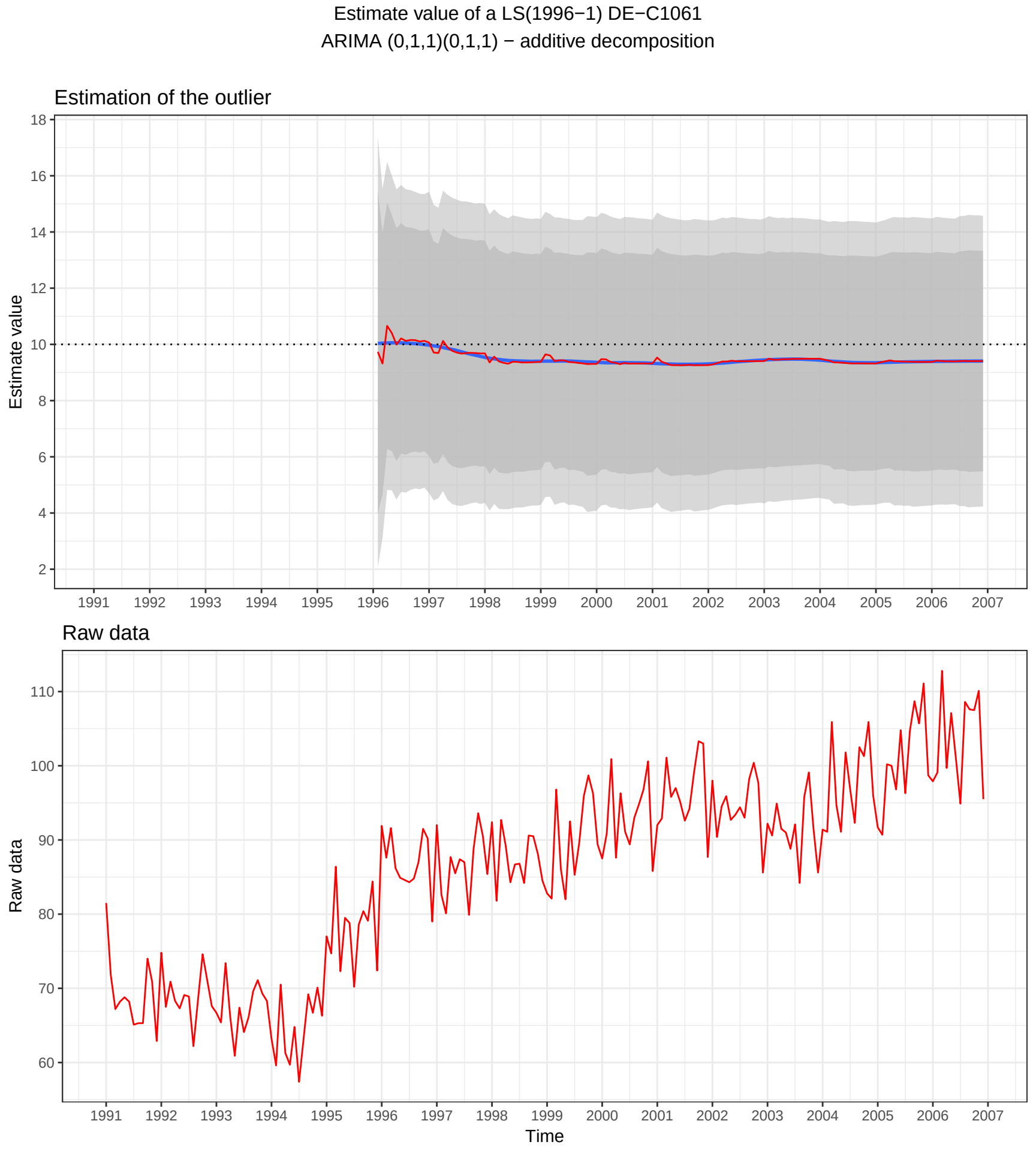


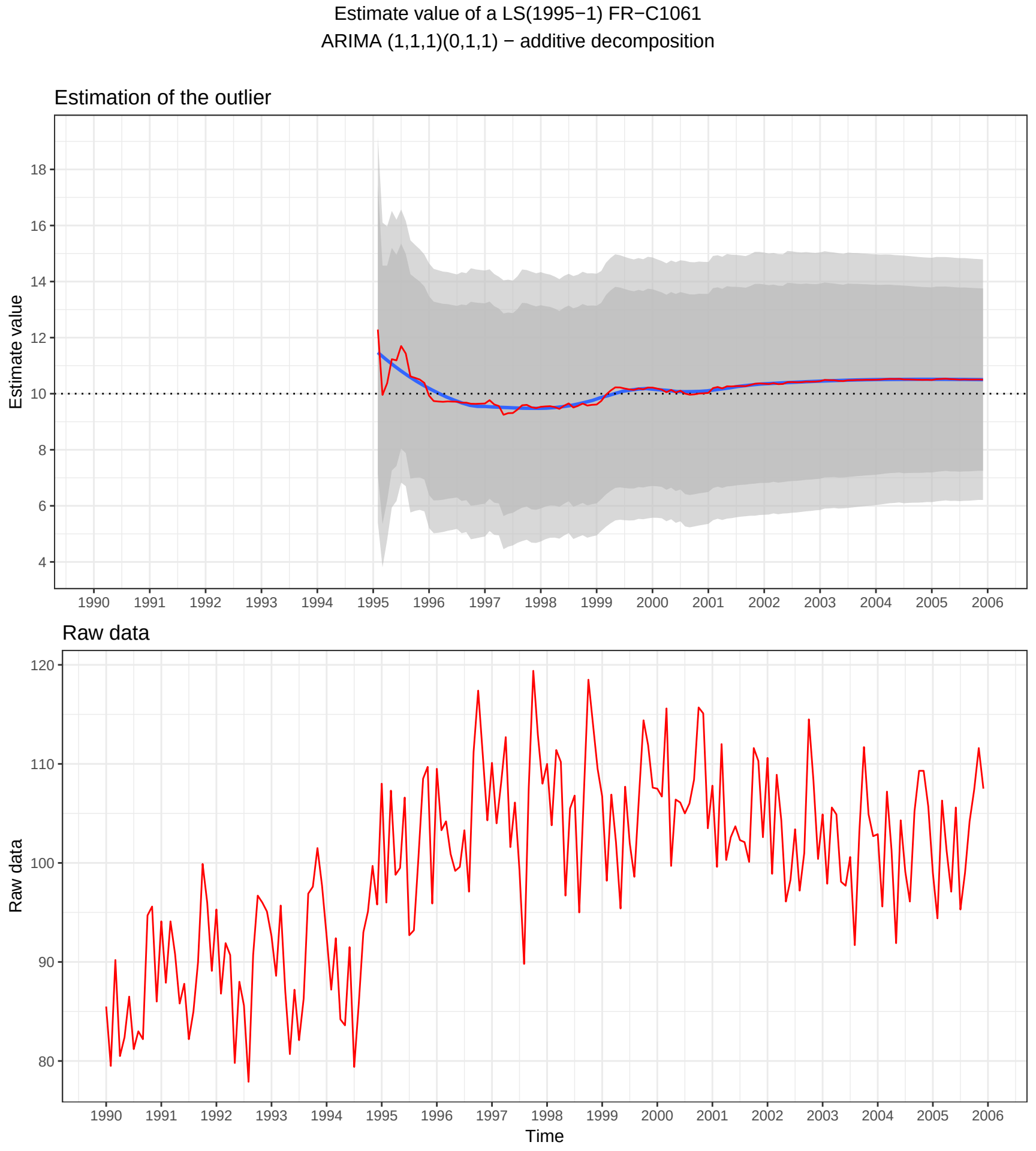
Estimate value of a LS(1996−1) DE−C1052
ARIMA (1,0,1)(0,1,1) − multiplicative decomposition

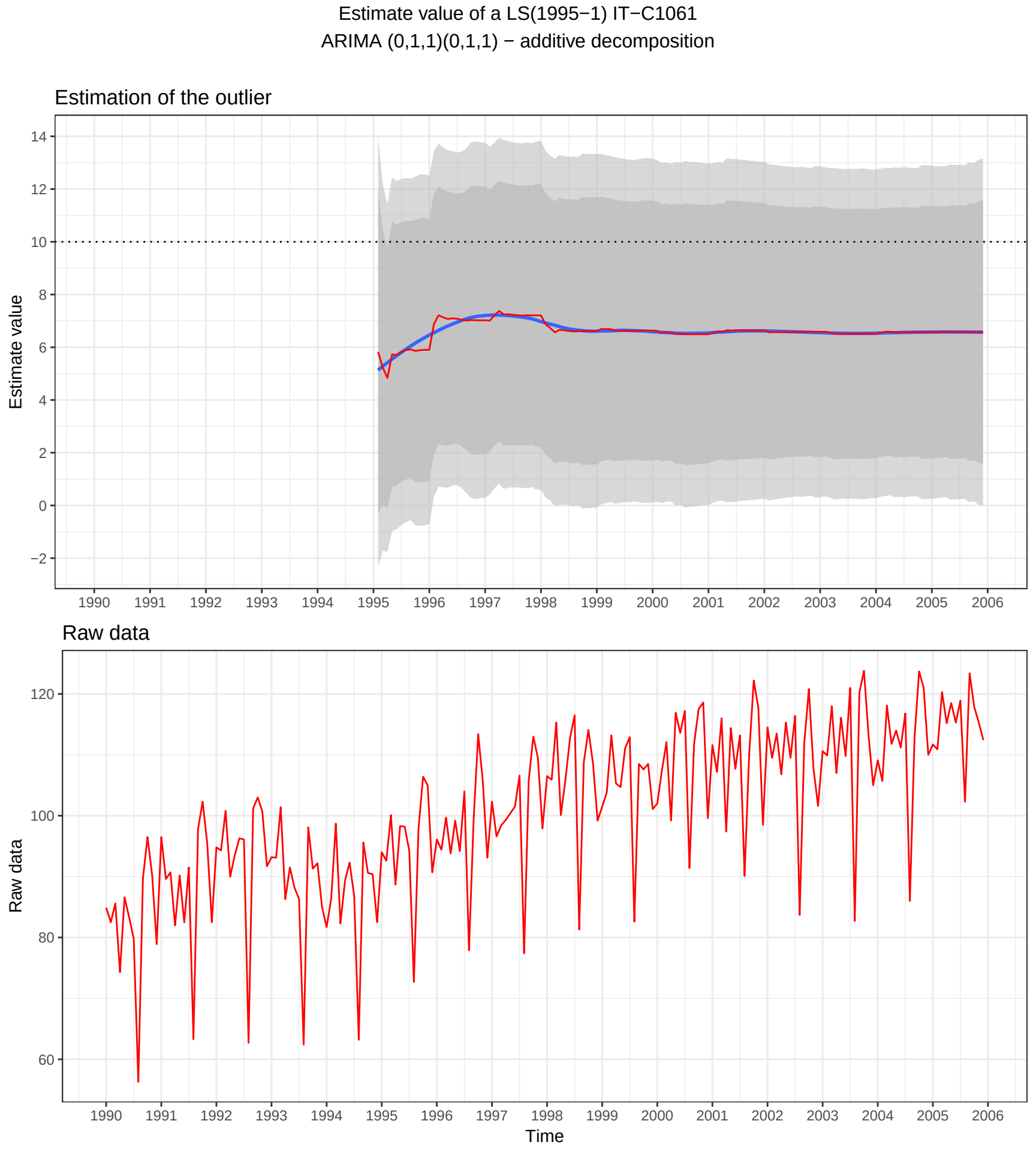



Estimate value of a LS(1995−1) FR−C1052
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.77
0.76
0.75
0.74
0.73
0.72
0.71
0.70
0.69
0.68
0.67
0.66
0.65
0.64
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
5.5
5.0
4.5
4.0
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Time

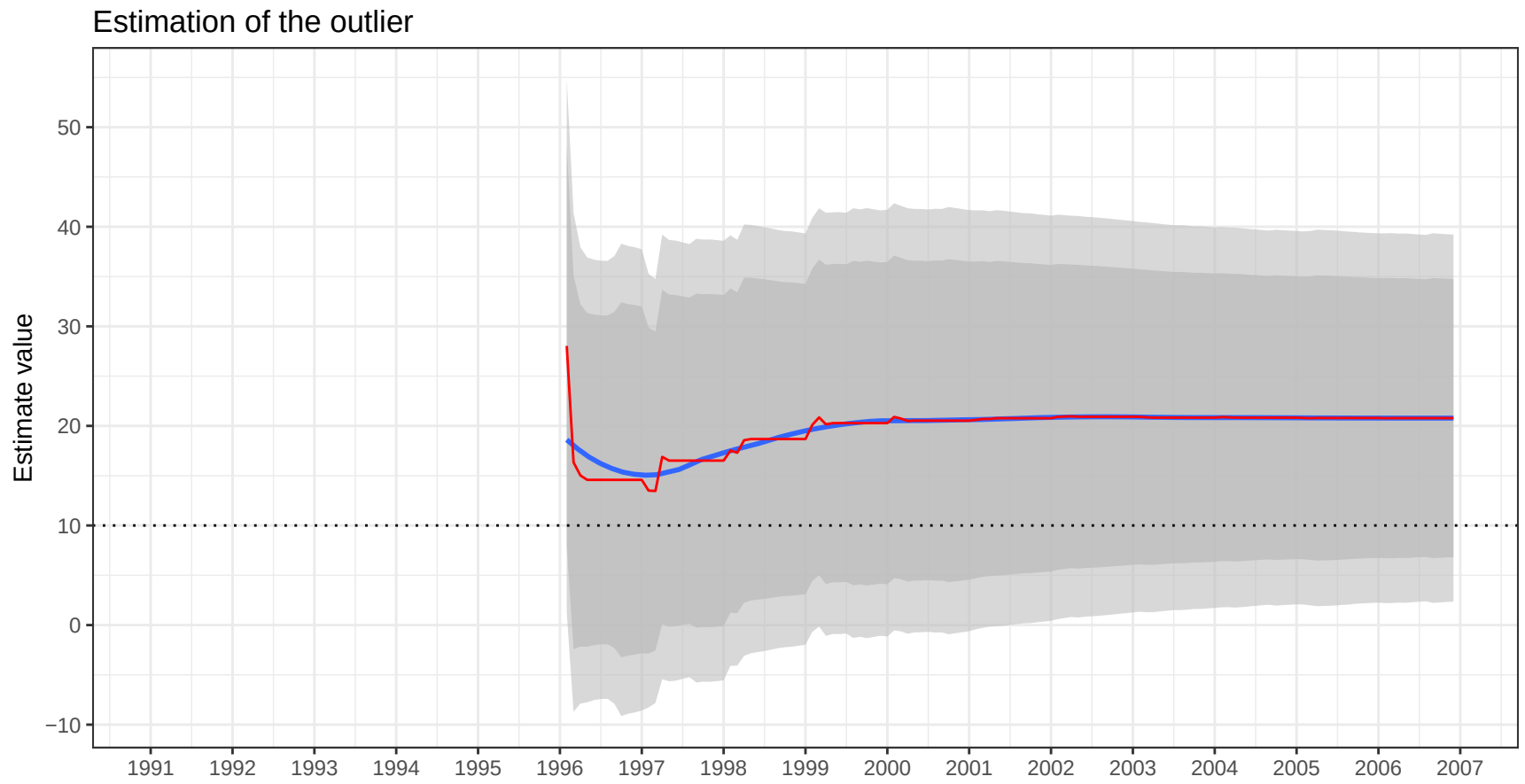

Estimate value of a LS(1995−1) IT−C1052
ARIMA (0,1,2)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
35
30
25
20
15
10
5
0
−5
−10
−15
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
250
200
150
100
50
Time

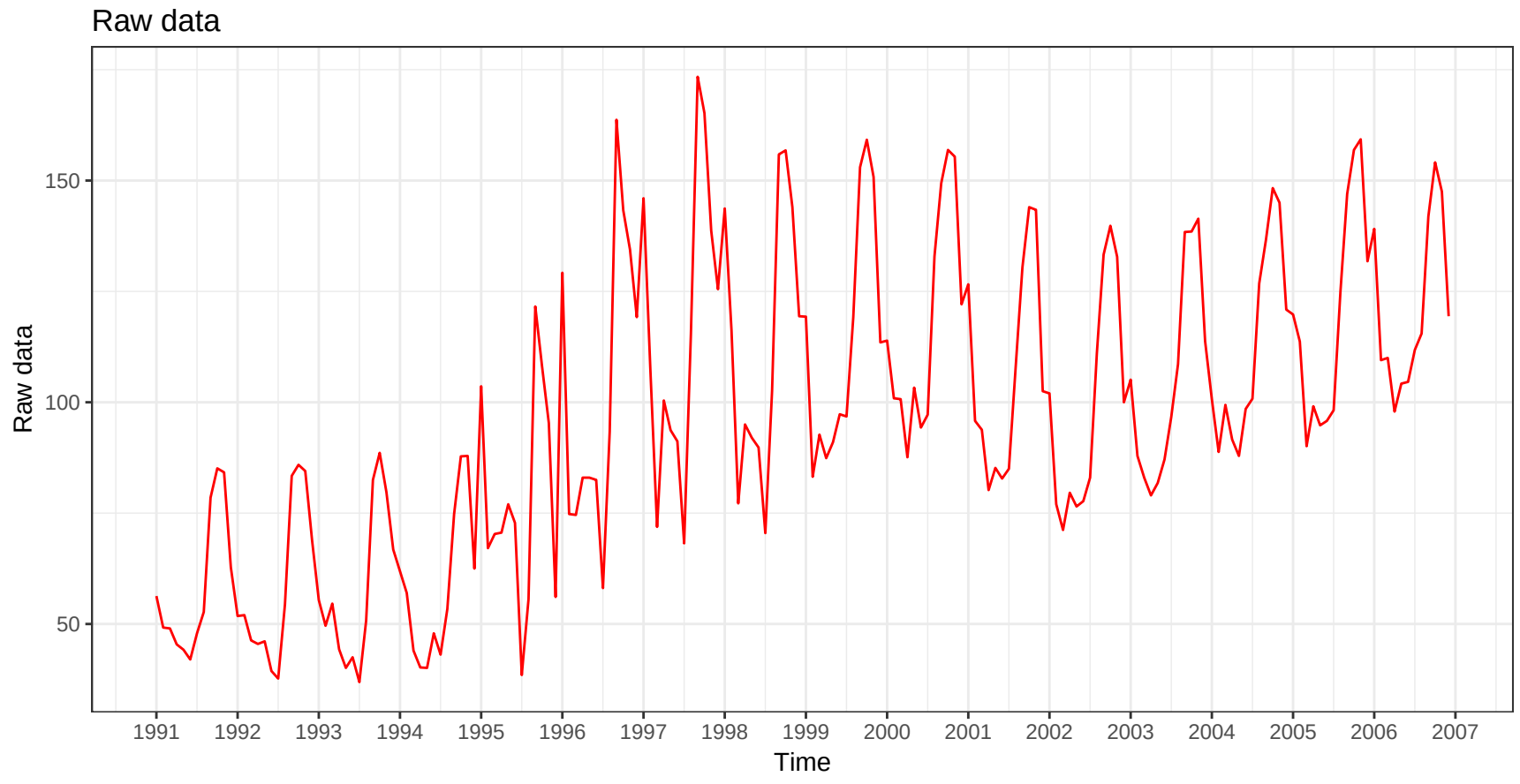

Estimate value of a LS(1996−1) DE−C1061
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
18
16
14
12
10
8
6
4
2
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
110
100
90
80
70
60
Time


Estimate value of a LS(1995−1) FR−C1061
ARIMA (1,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
18
16
14
12
10
8
6
4
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
120
110
100
90
80
Time


Estimate value of a LS(1995−1) IT−C1061
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
14
12
10
8
6
4
2
0
−2
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
120
100
80
60
Time

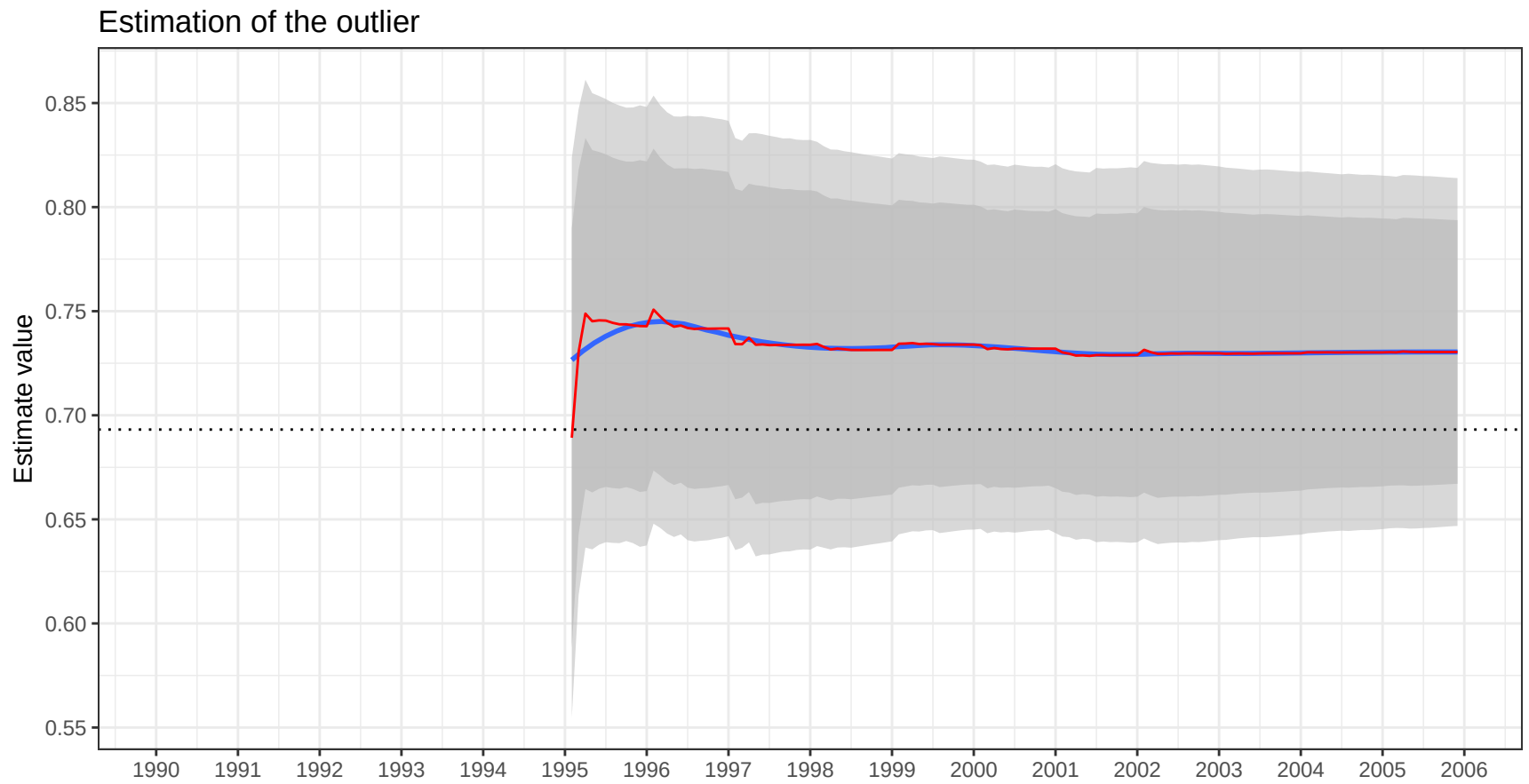
Estimate value of a LS(1996−1) DE−C1062
ARIMA (3,1,0)(0,1,1) − additive decomposition

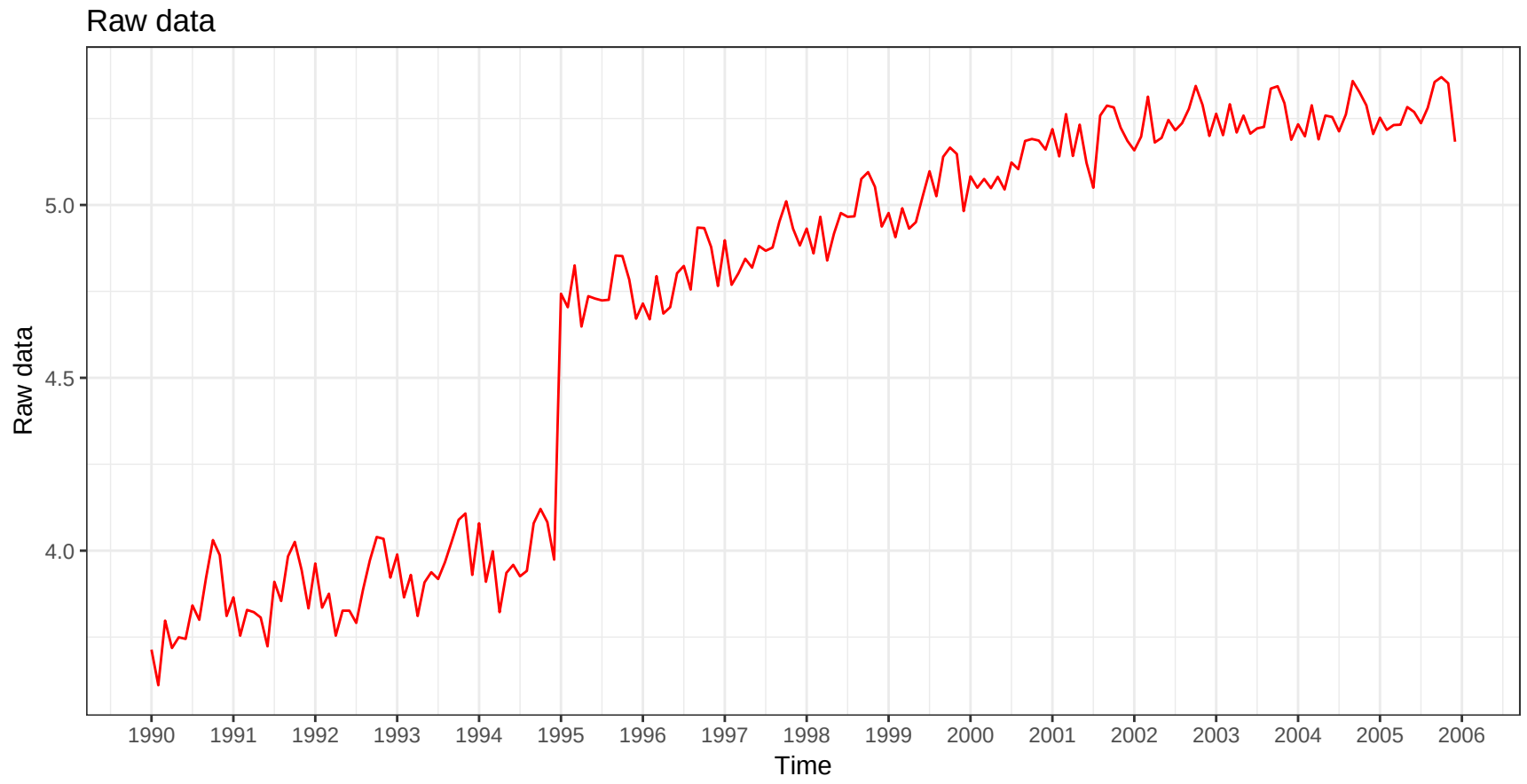


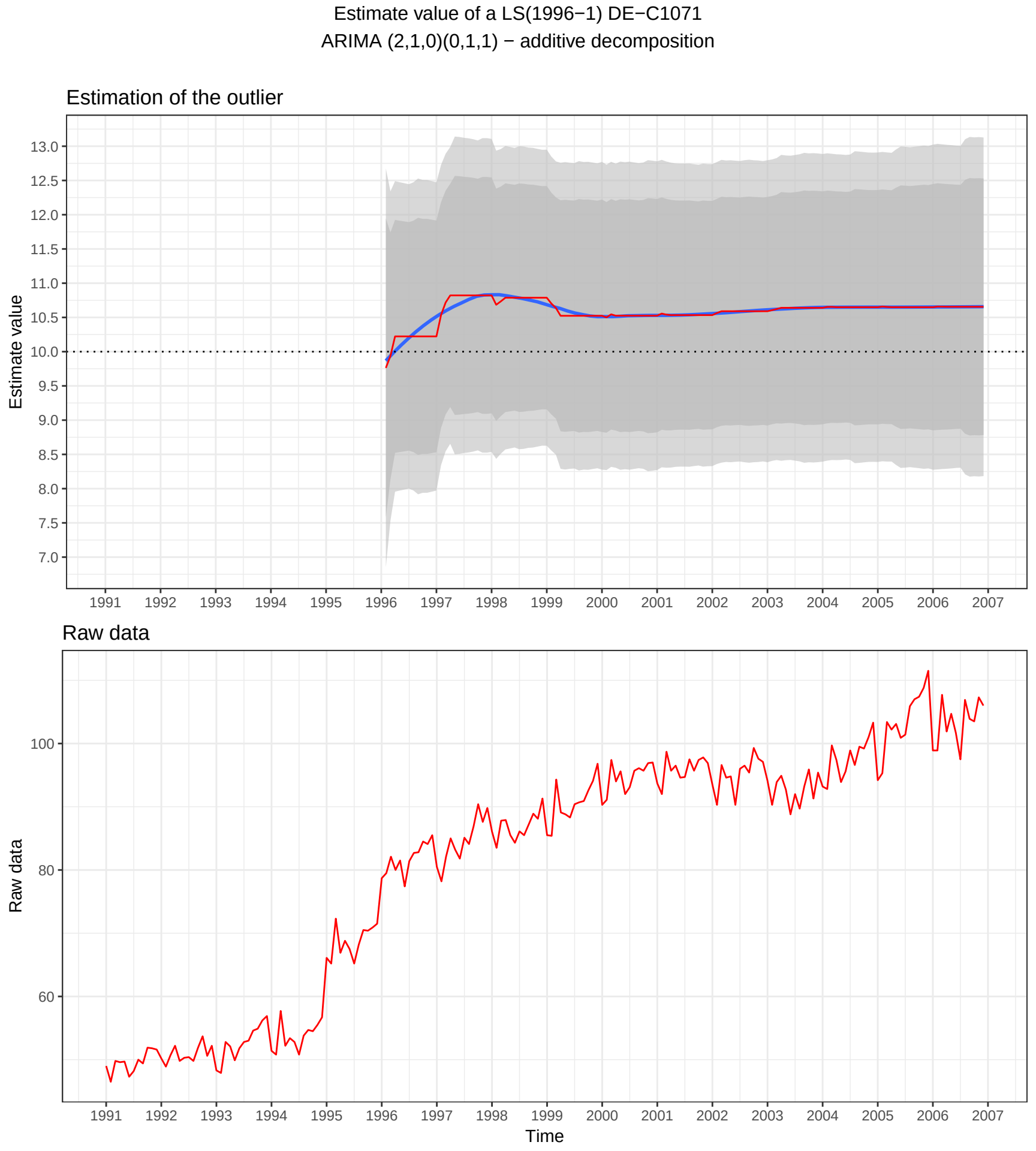


Estimate value of a LS(1995−1) FR−C1062

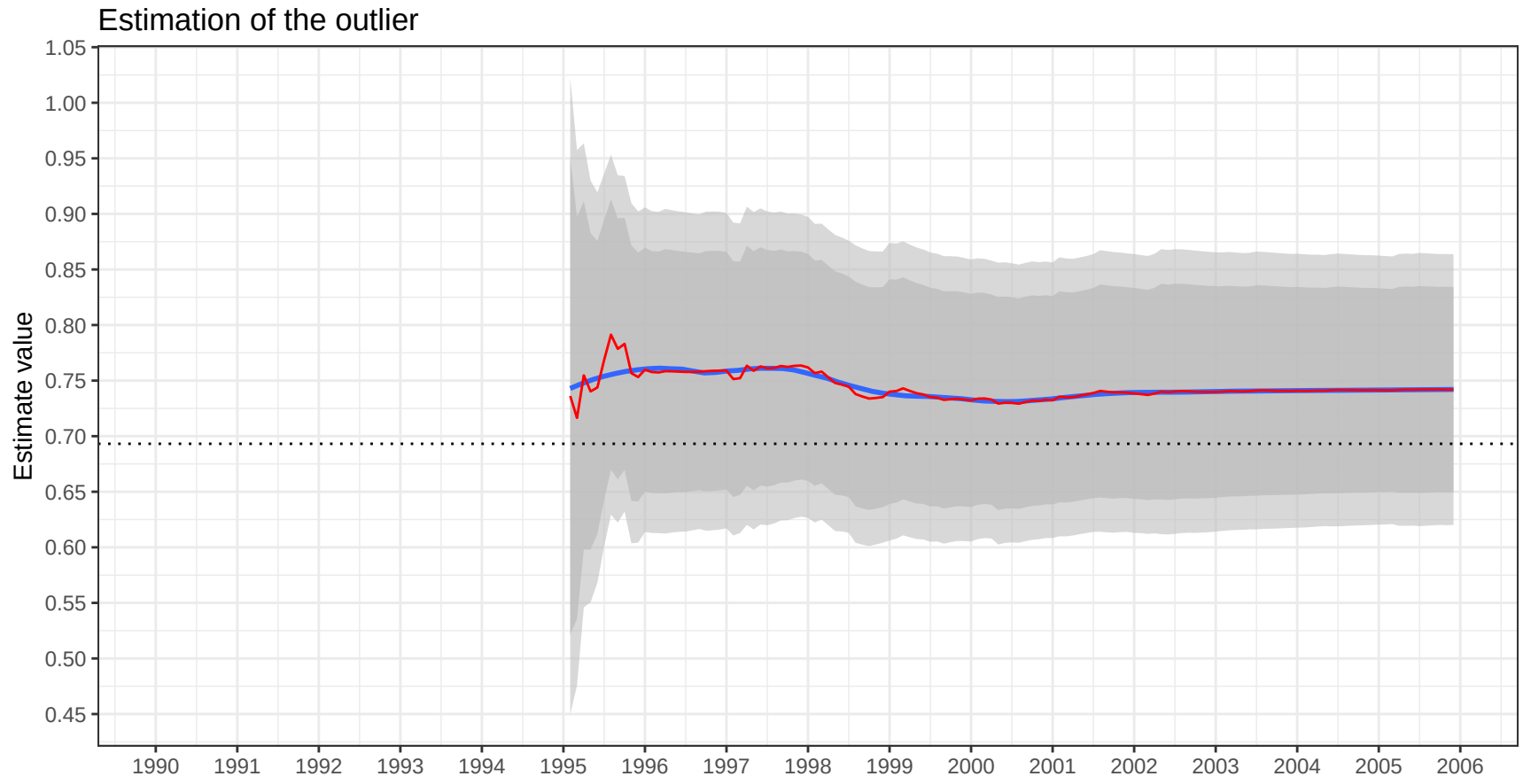
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

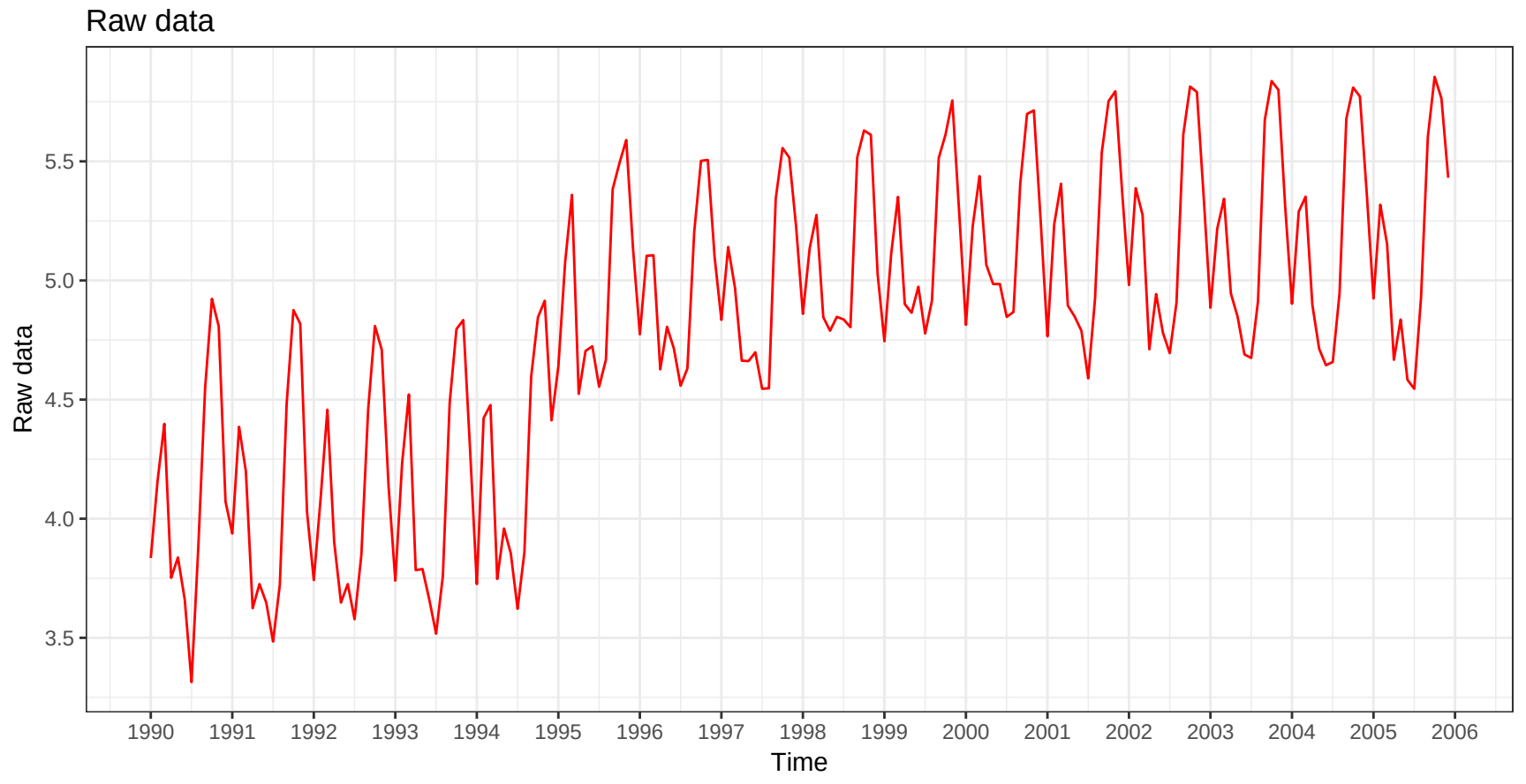





Estimate value of a LS(1996−1) DE−C1071
ARIMA (2,1,0)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
13.0
12.5
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
100
80
60
Time

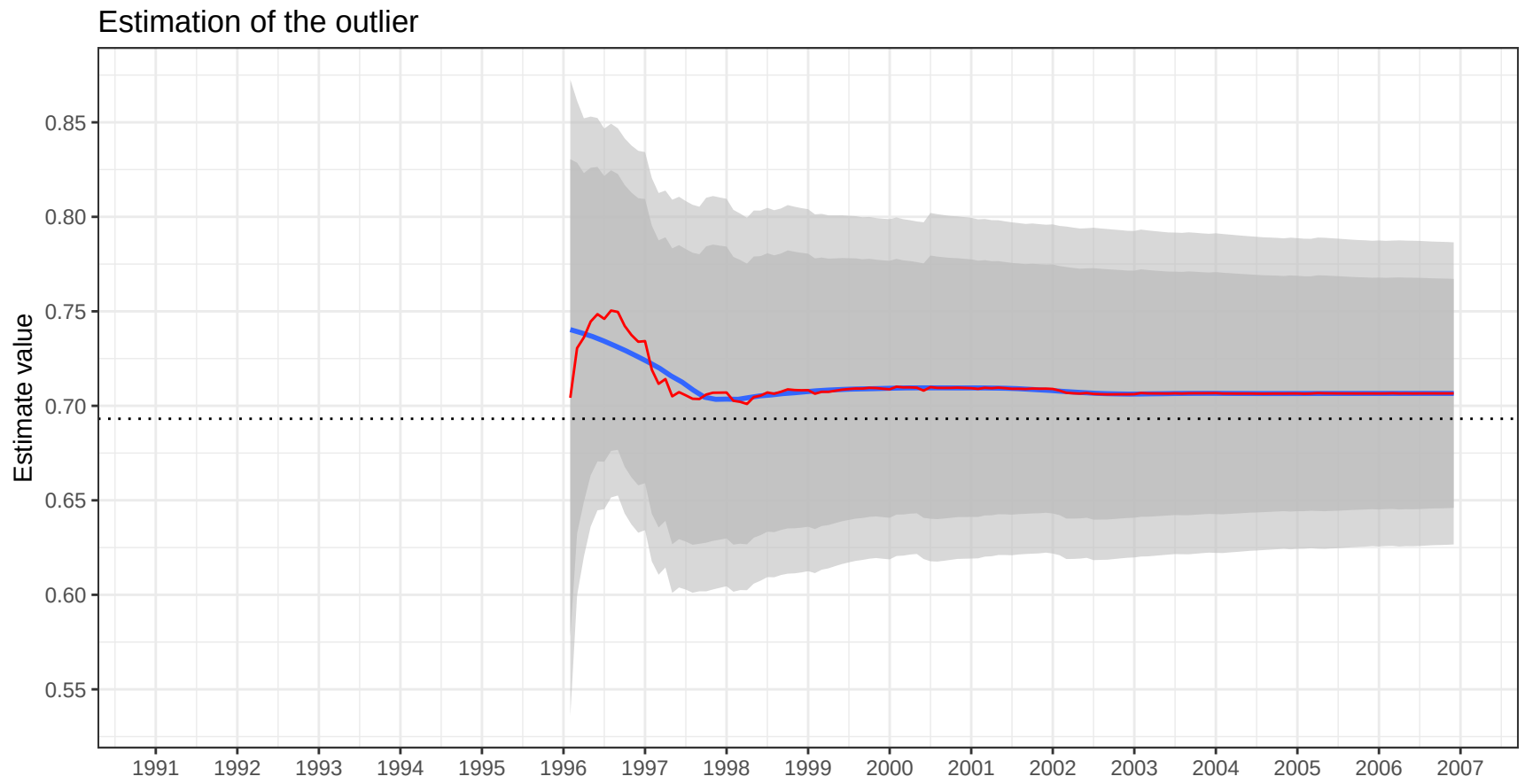
Estimate value of a LS(1995−1) IT−C1071
ARIMA (0,1,2)(0,1,1) − multiplicative decomposition

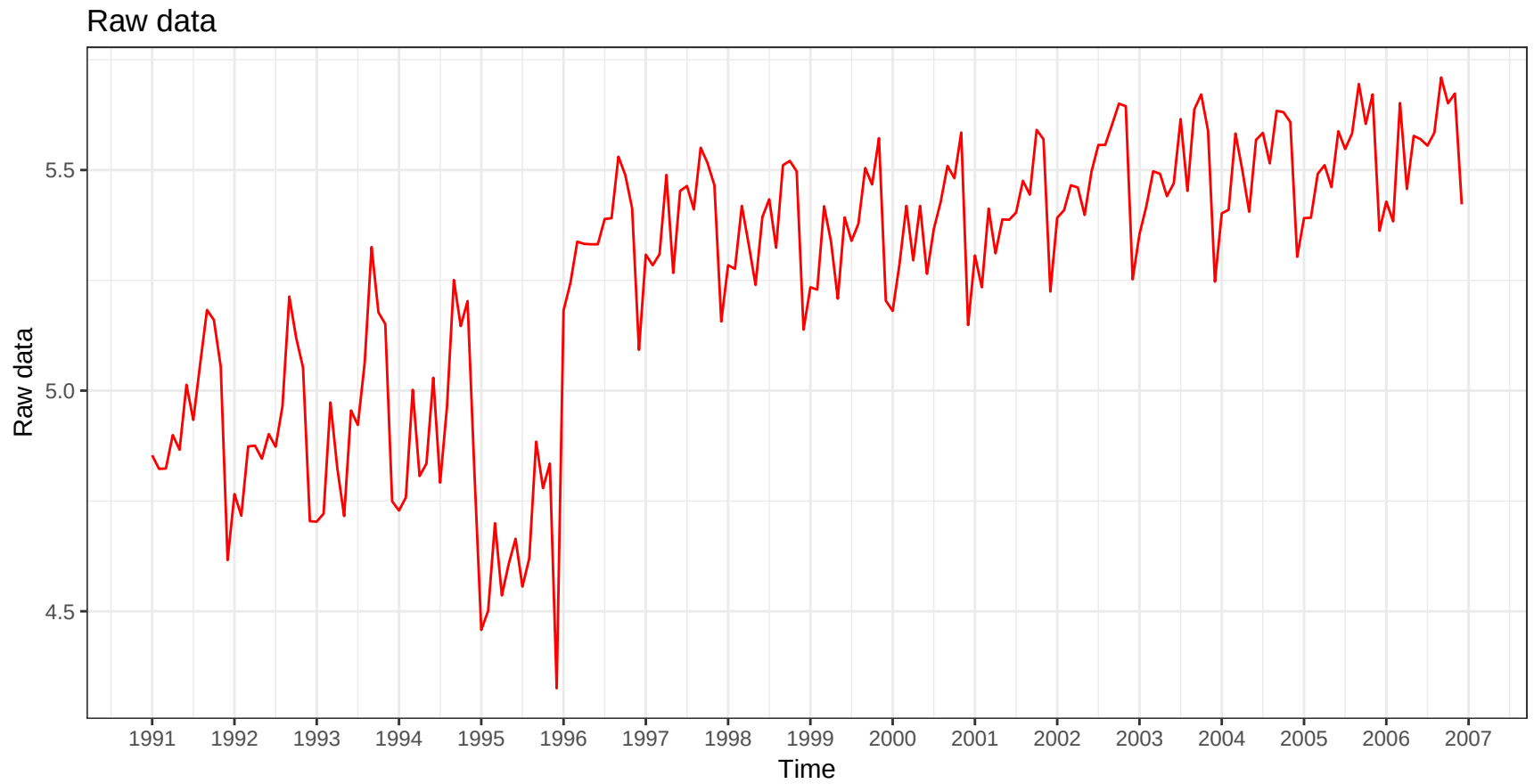


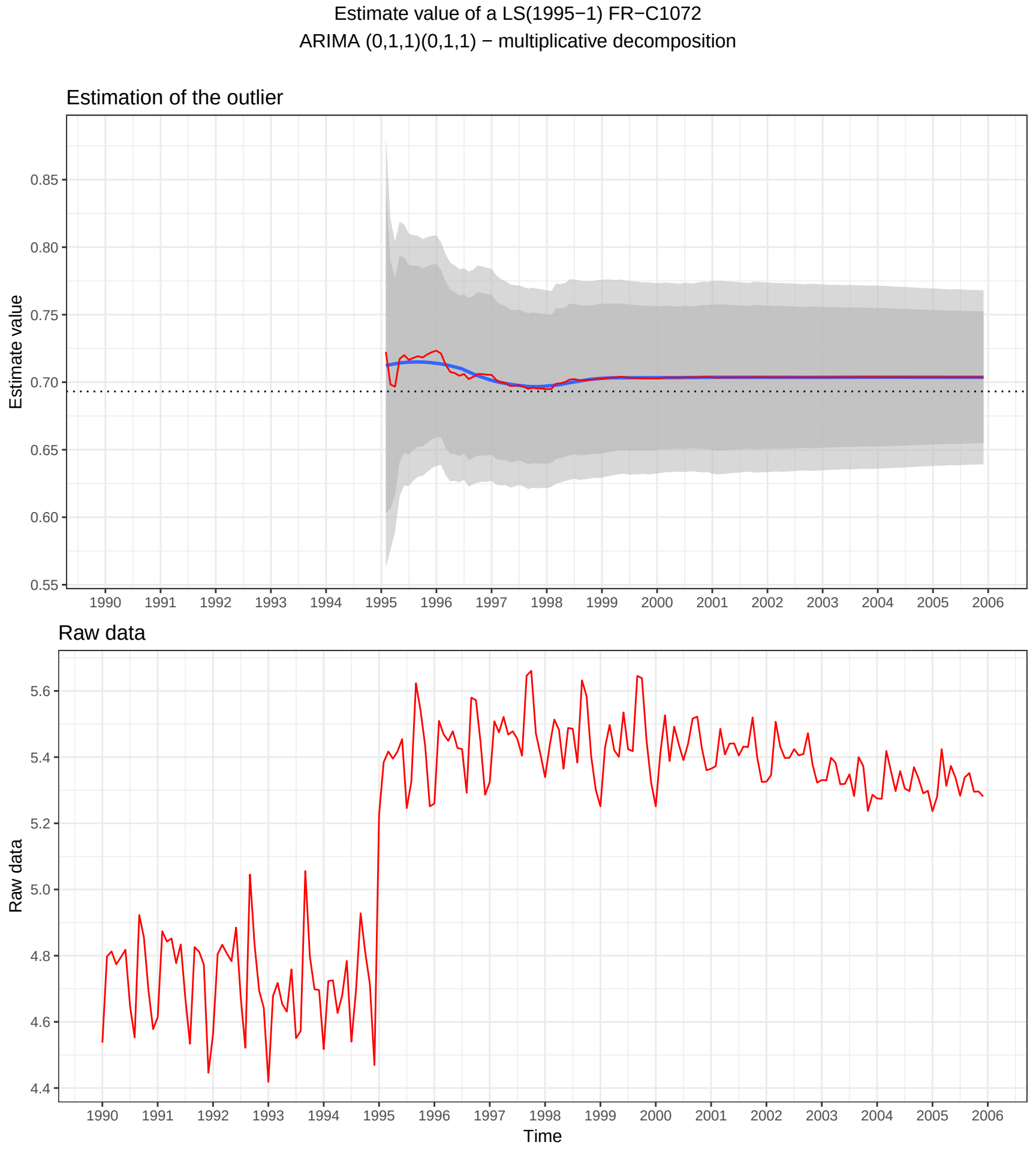


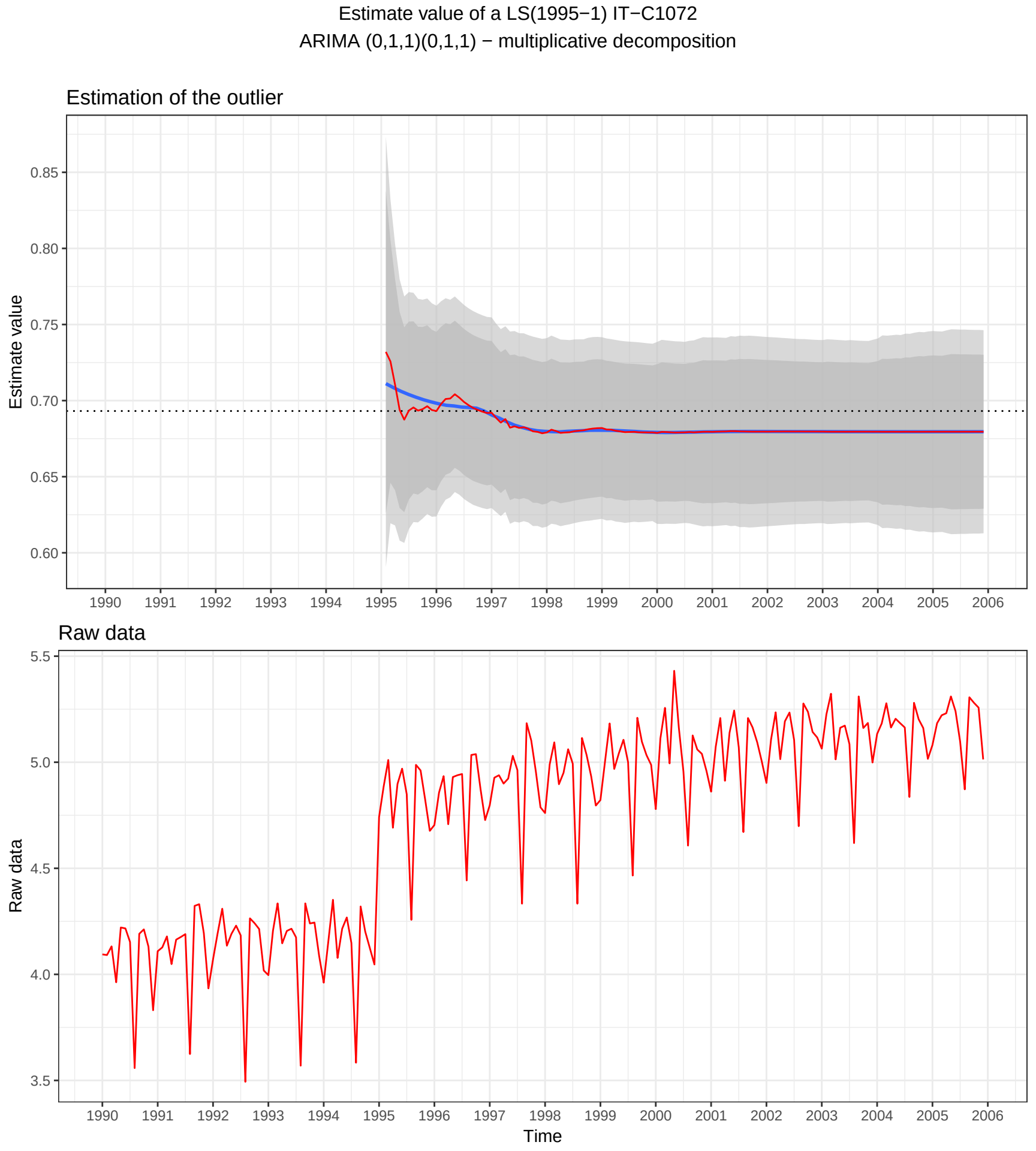
Estimate value of a LS(1996−1) DE−C1072

ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

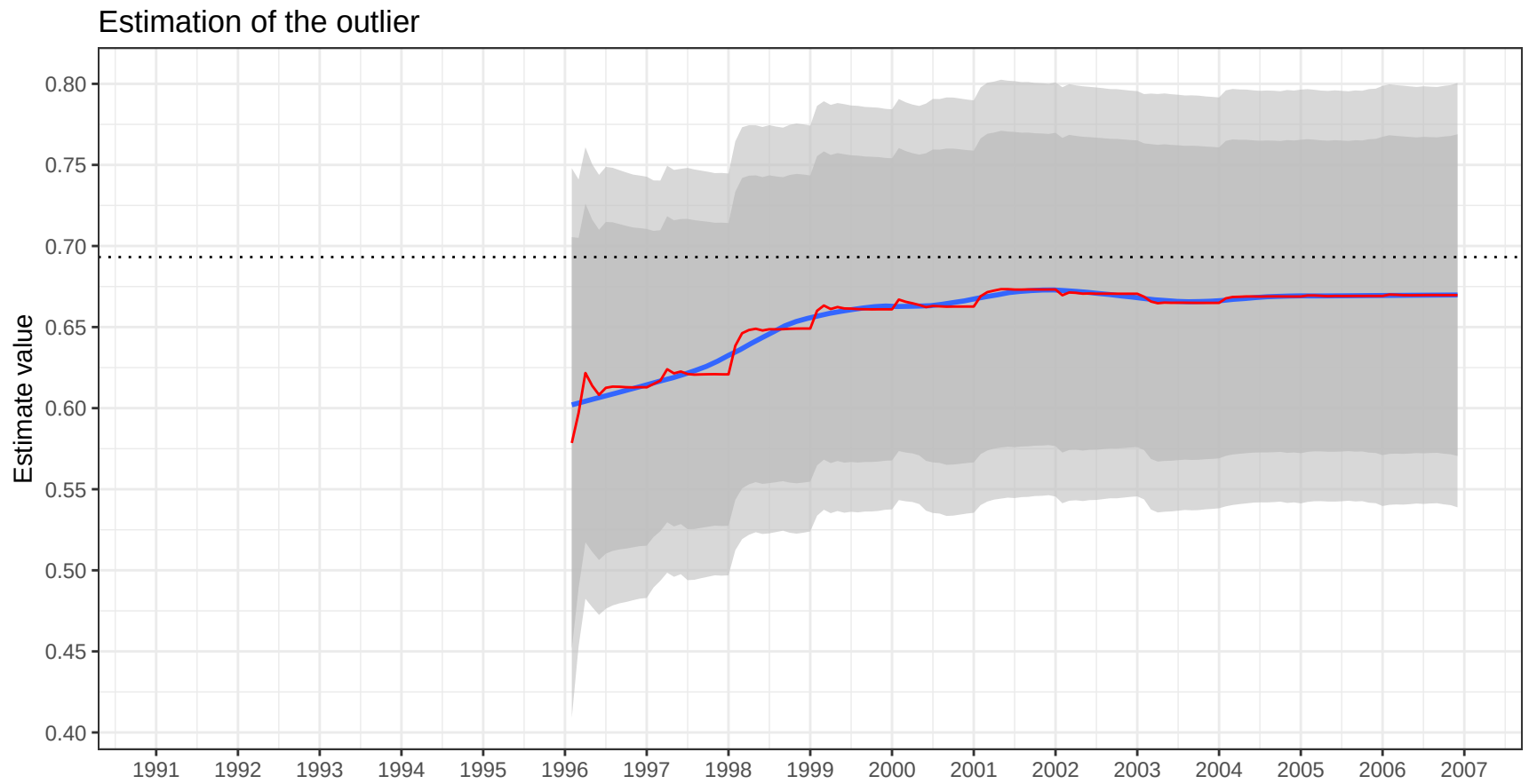


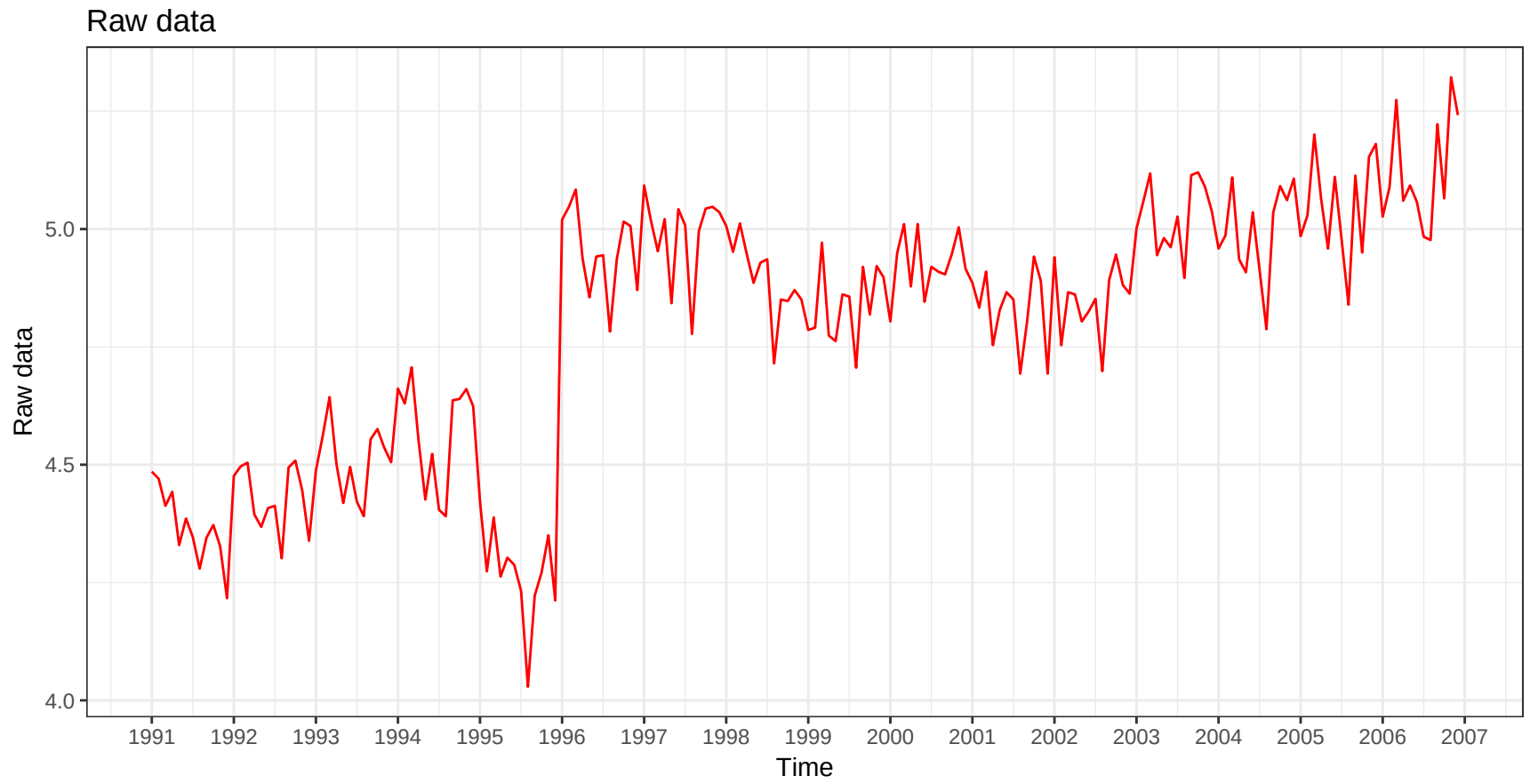


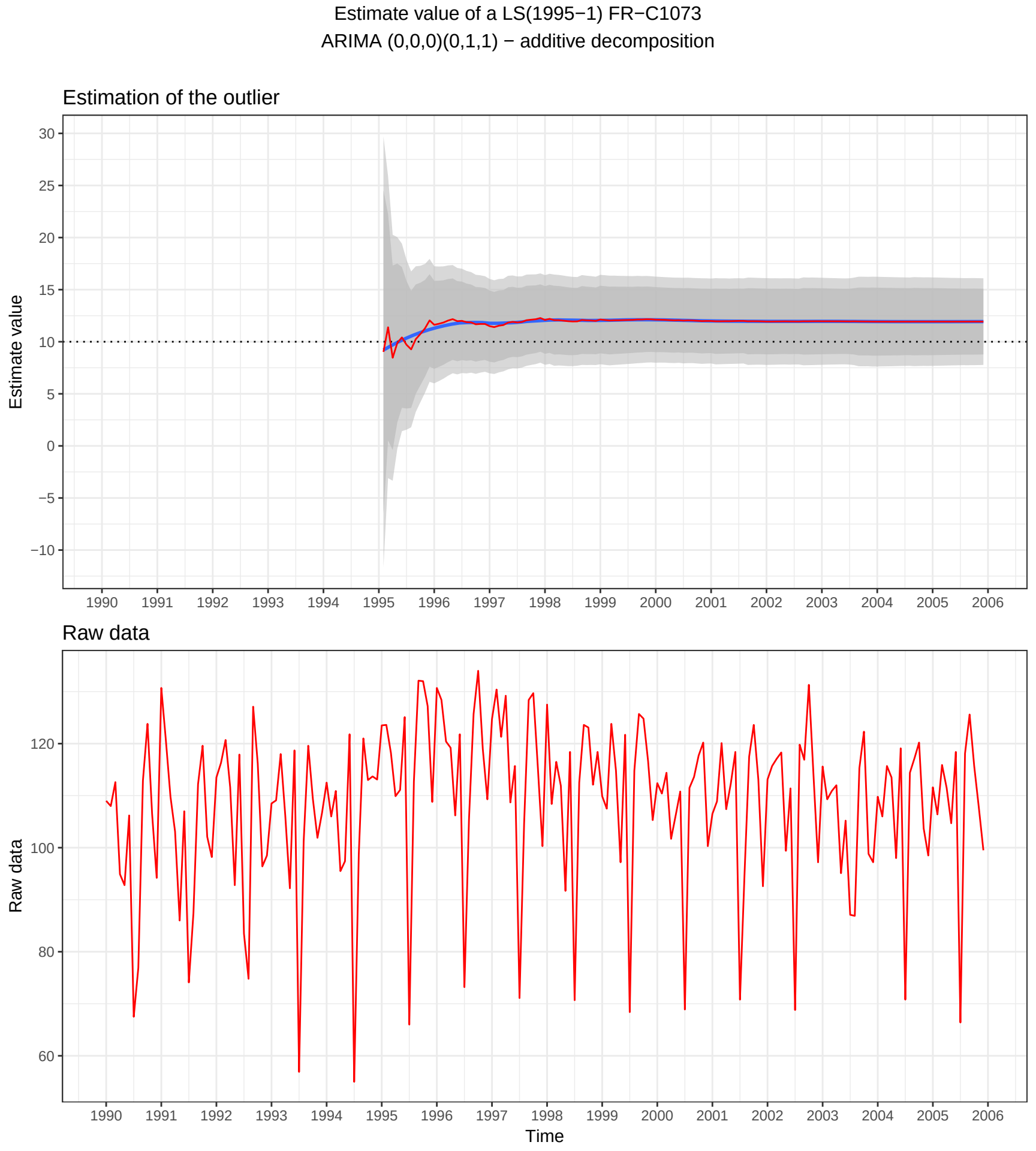

Estimate value of a LS(1995−1) FR−C1072
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.85
0.80
0.75
0.70
0.65
0.60
0.55
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
5.6
5.4
5.2
5.0
4.8
4.6
4.4
Time

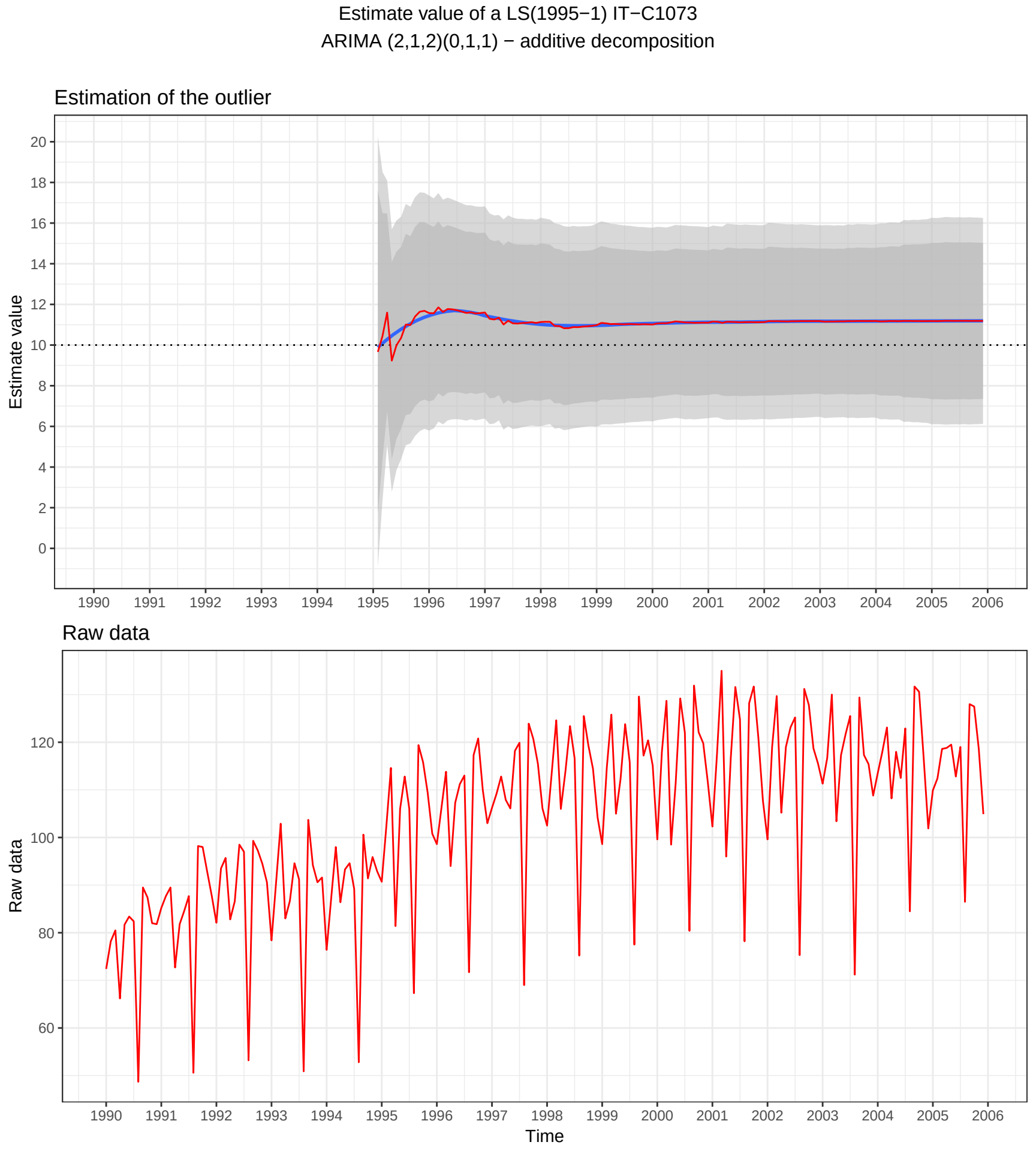

Estimate value of a LS(1995−1) IT−C1072
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.85
0.80
0.75
0.70
0.65
0.60
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
5.5
5.0
4.5
4.0
3.5
Time

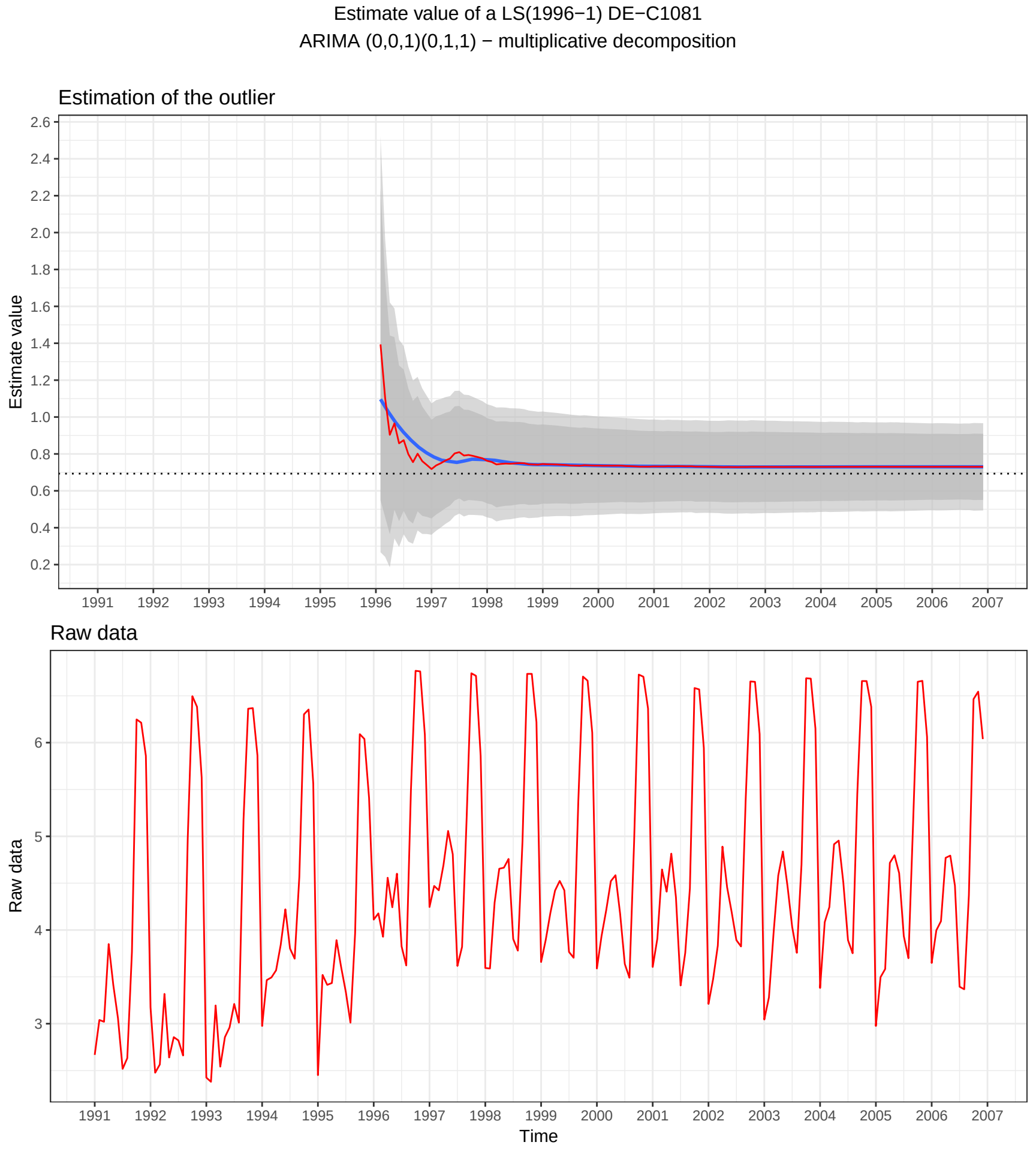
Estimate value of a LS(1996−1) DE−C1073
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition



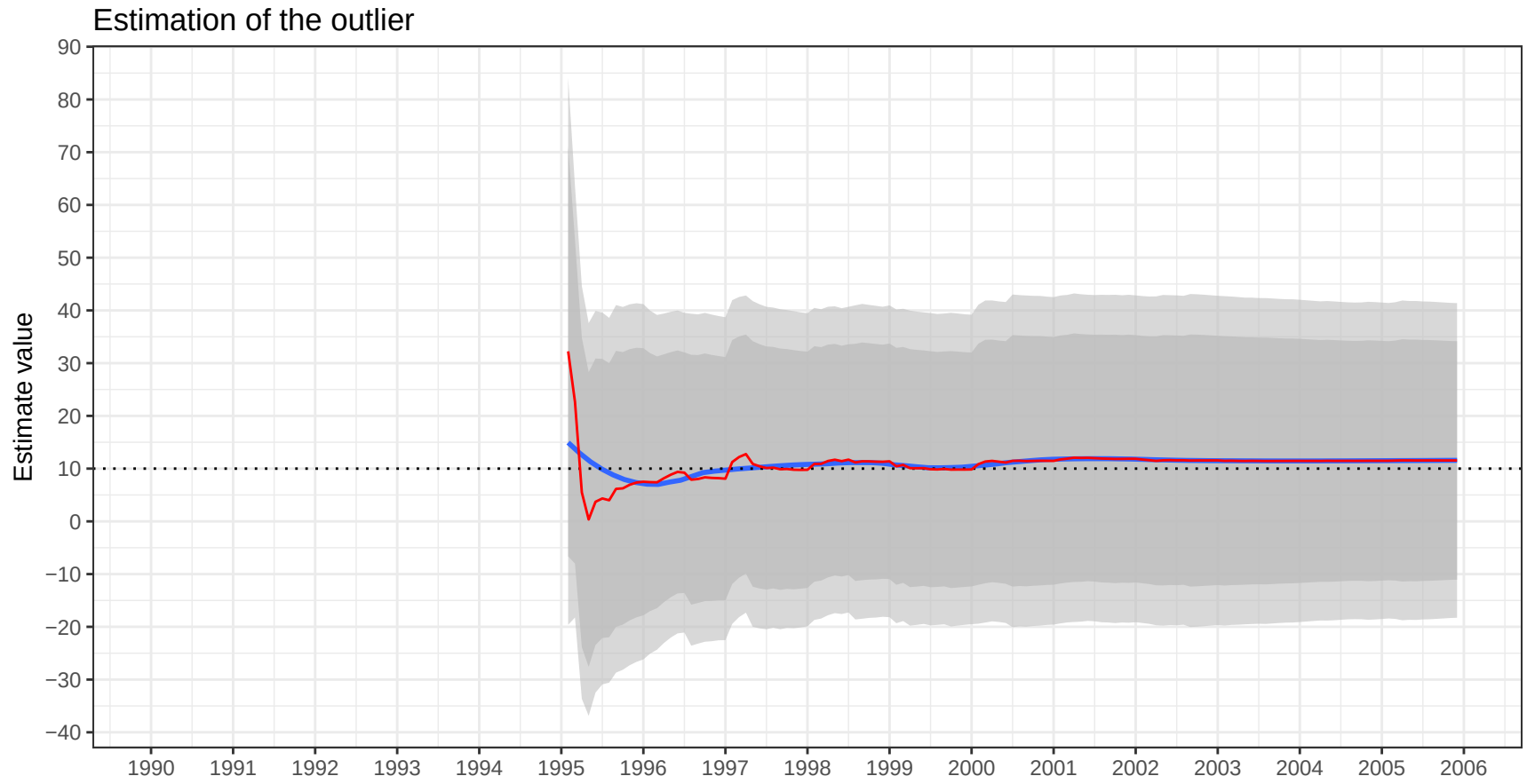


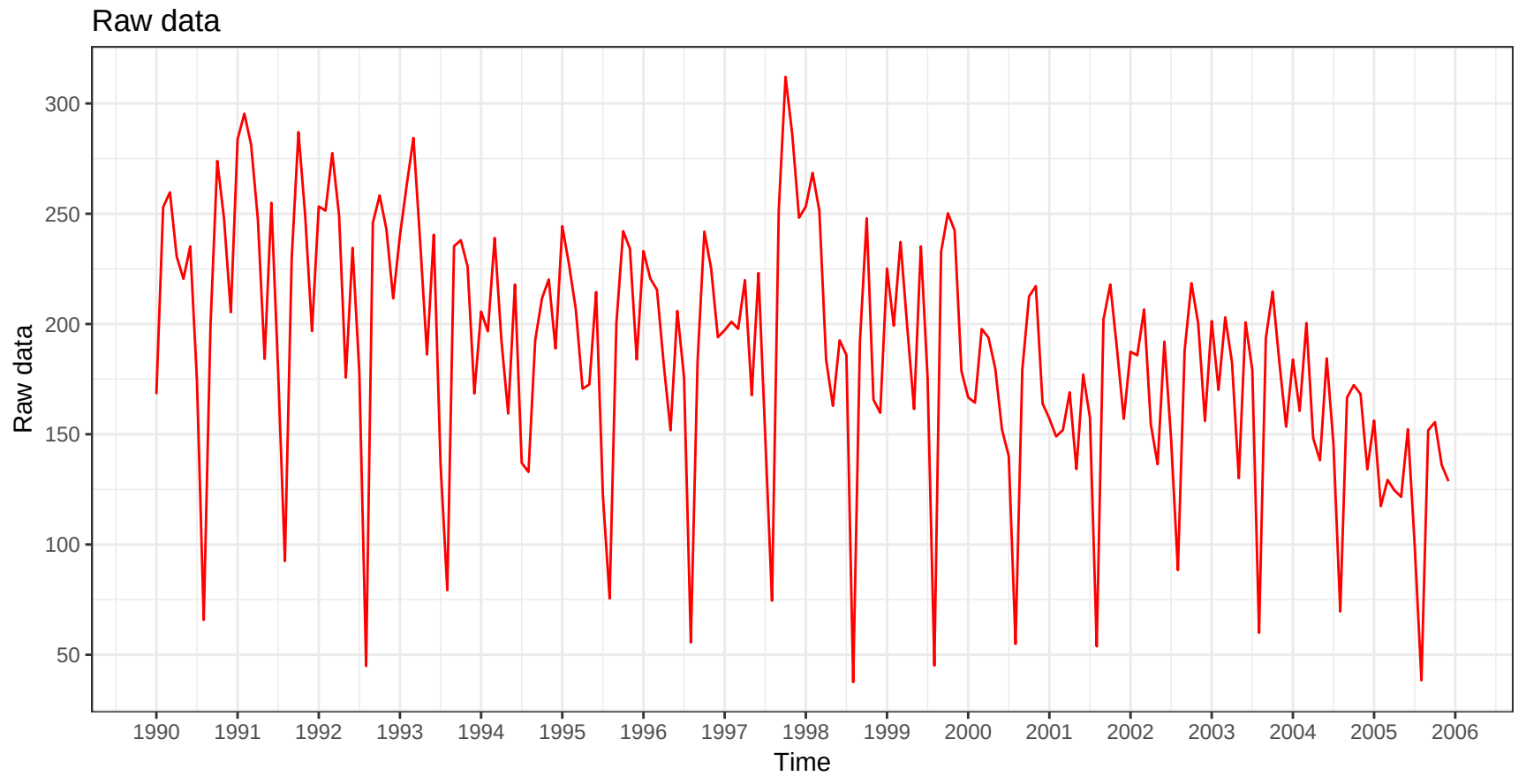

Estimate value of a LS(1995−1) FR−C1073
ARIMA (0,0,0)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
30
25
20
15
10
5
0
−5
−10
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
120
100
80
60
Time

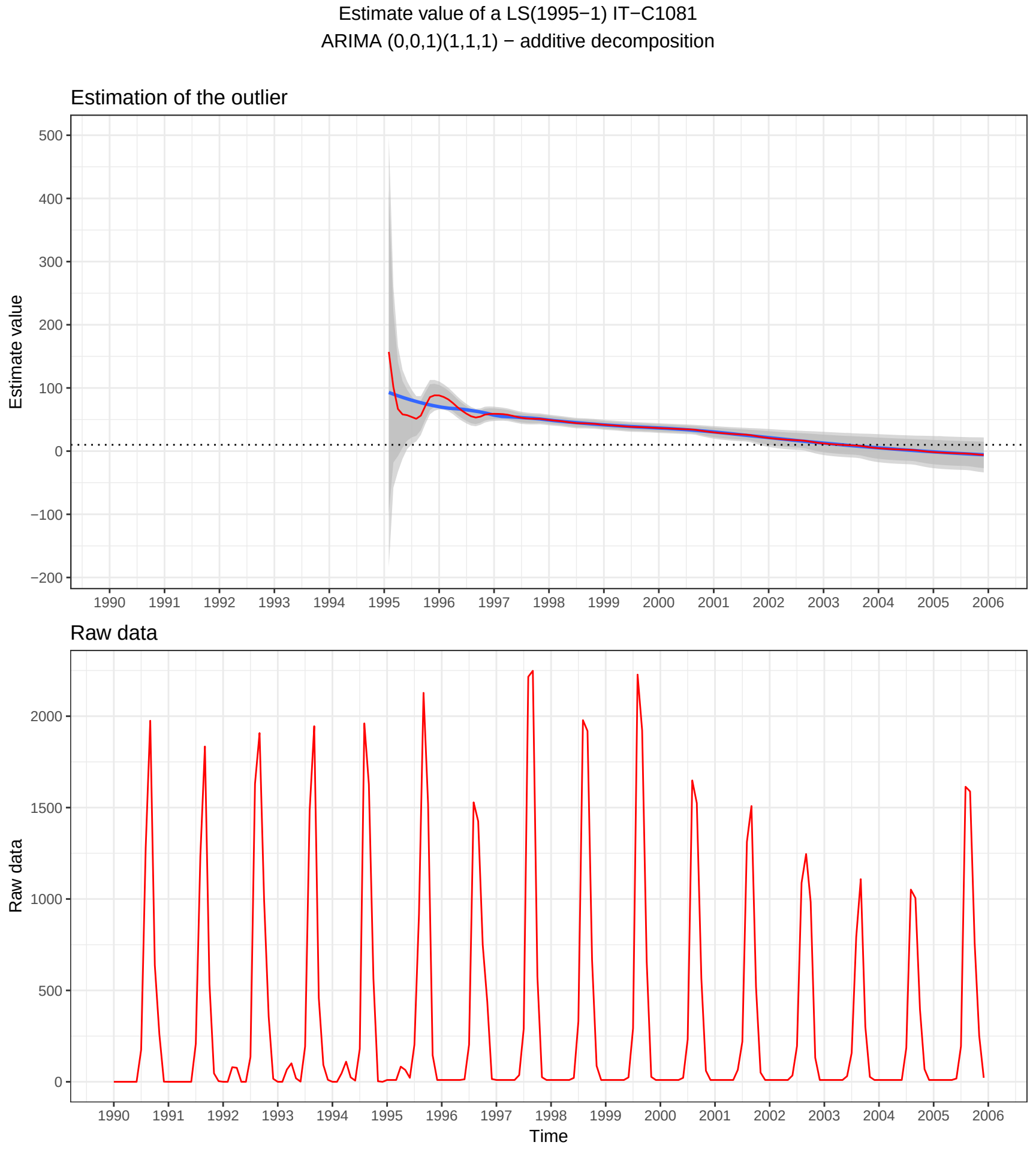

Estimate value of a LS(1995−1) IT−C1073
ARIMA (2,1,2)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
20
18
16
14
12
10
8
6
4
2
0
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
120
100
80
60
Time

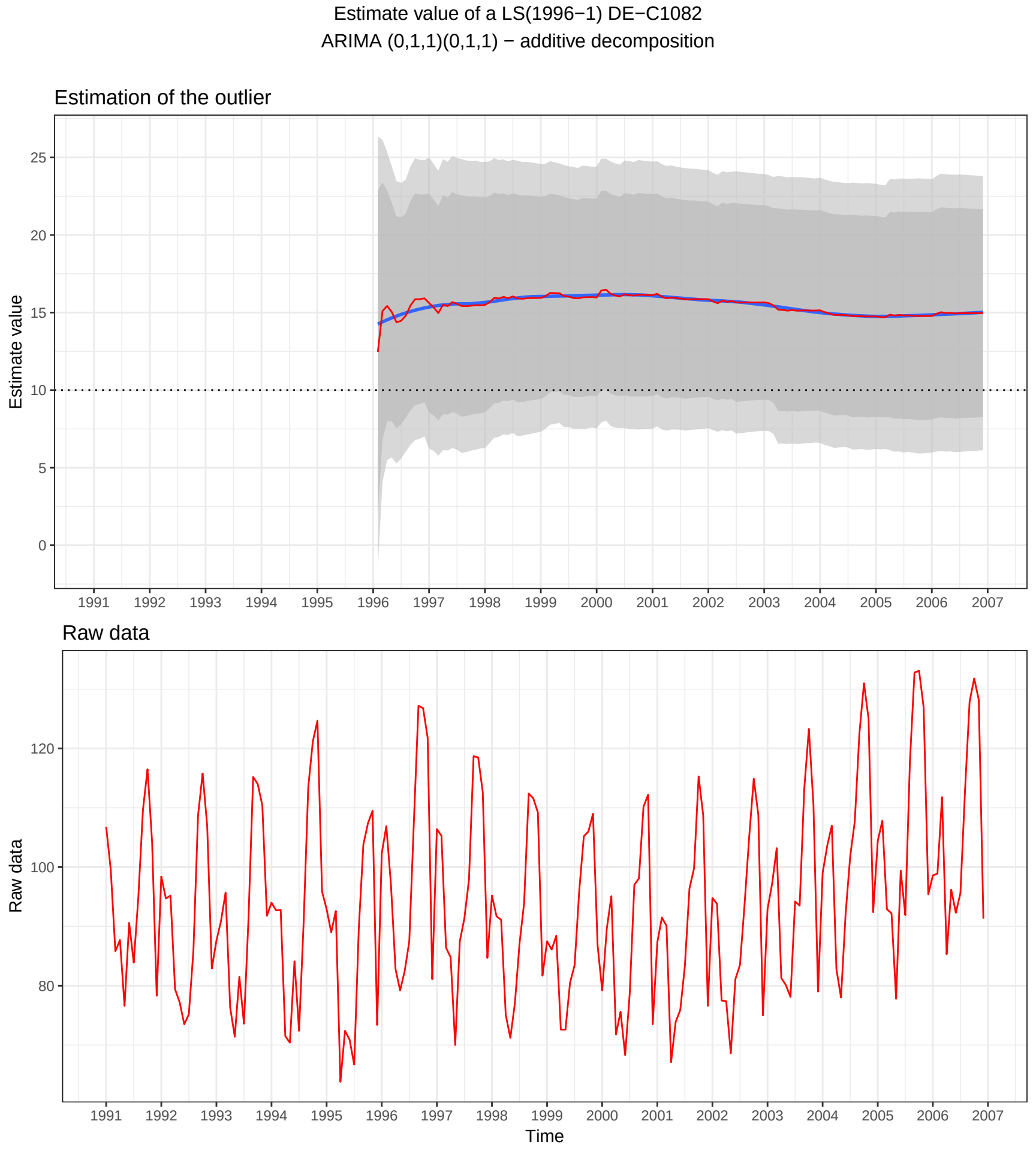

Estimate value of a LS(1996−1) DE−C1081
ARIMA (0,0,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
6
5
4
3
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Time

Estimate value of a LS(1995−1) FR−C1081
ARIMA (0,1,1)(0,1,1) − additive decomposition



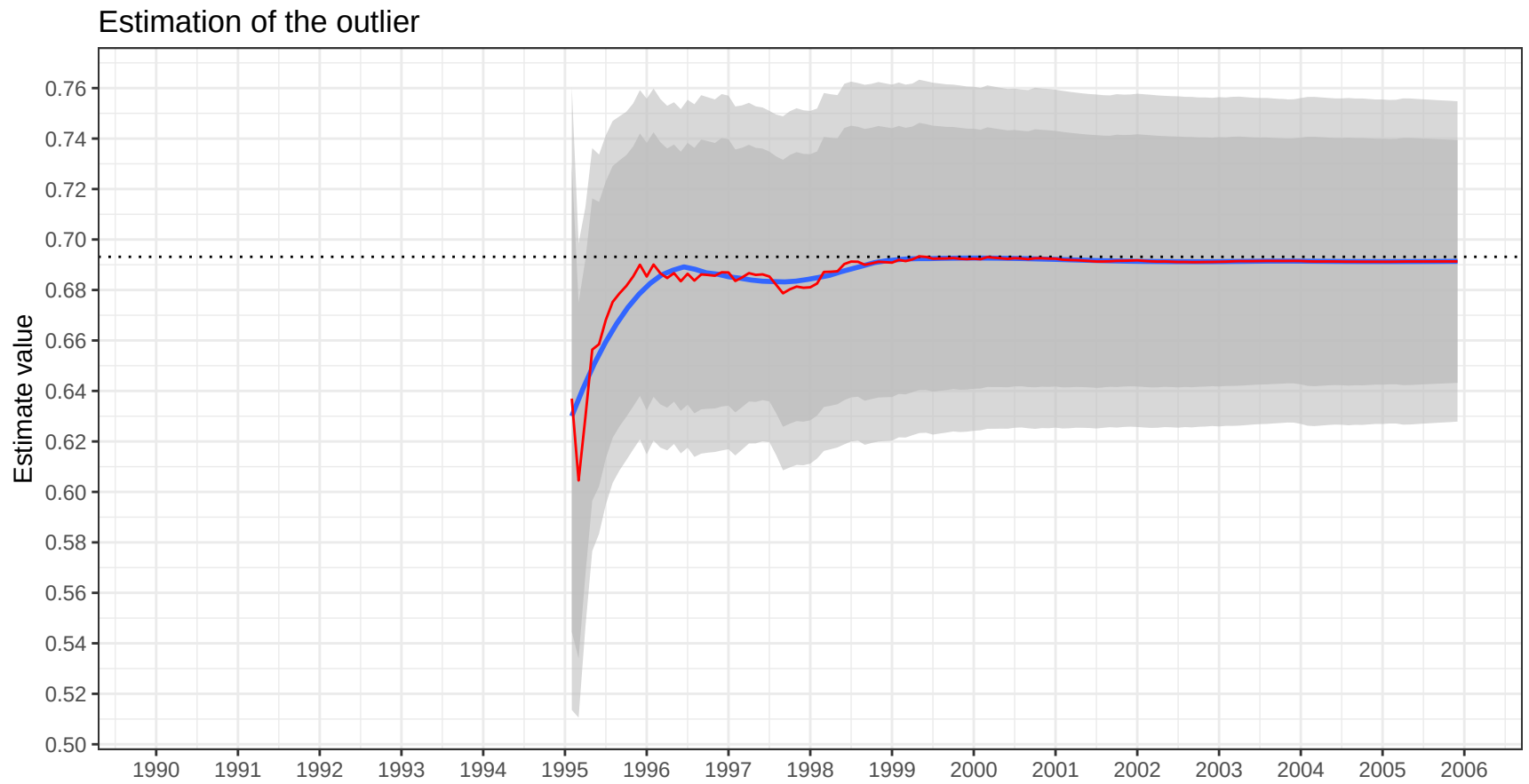


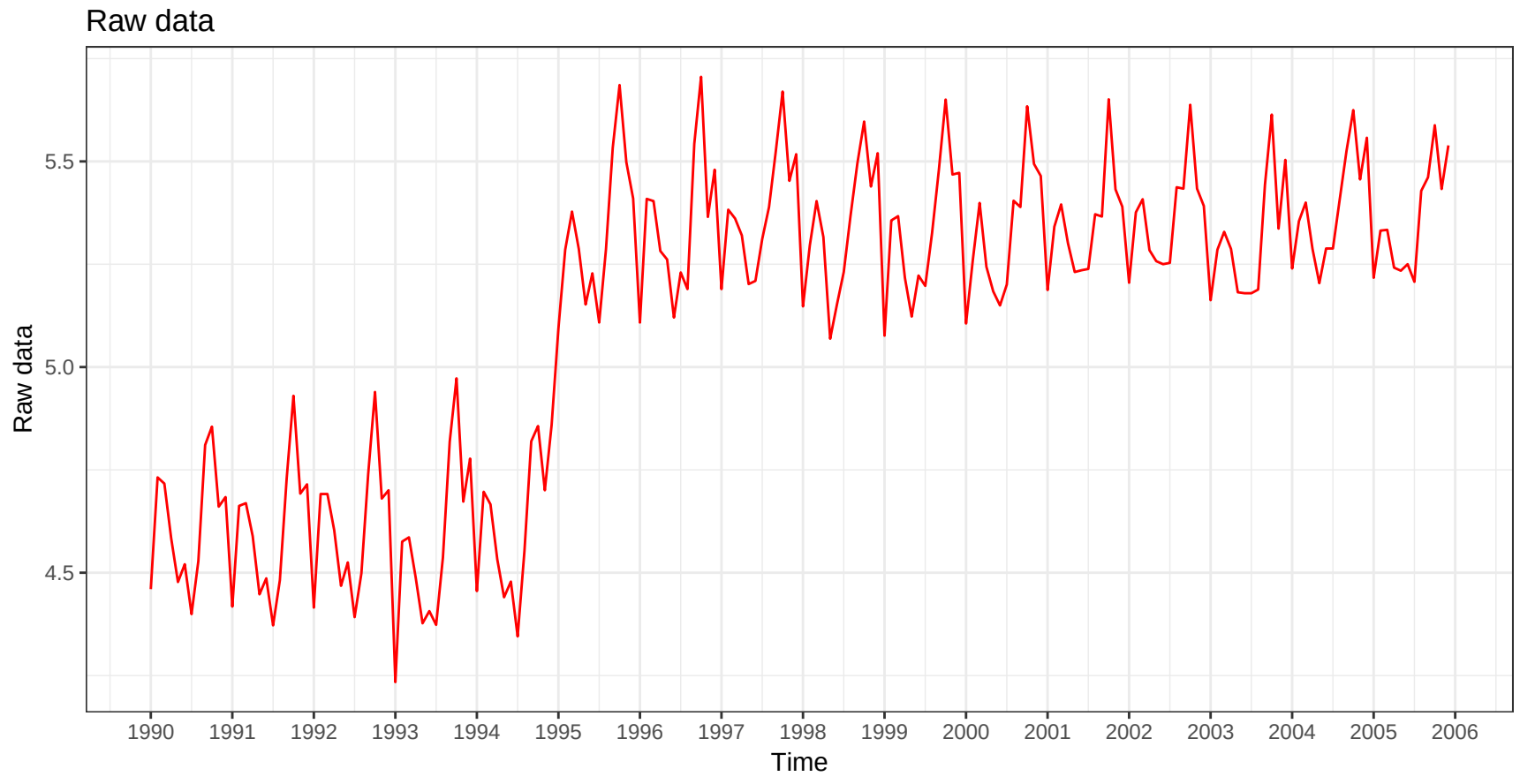

Estimate value of a LS(1995−1) IT−C1081
ARIMA (0,0,1)(1,1,1) − additive decomposition
Estimation of the outlier
Estimate value
500
400
300
200
100
0
−100
−200
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
2000
1500
1000
500
0
Time

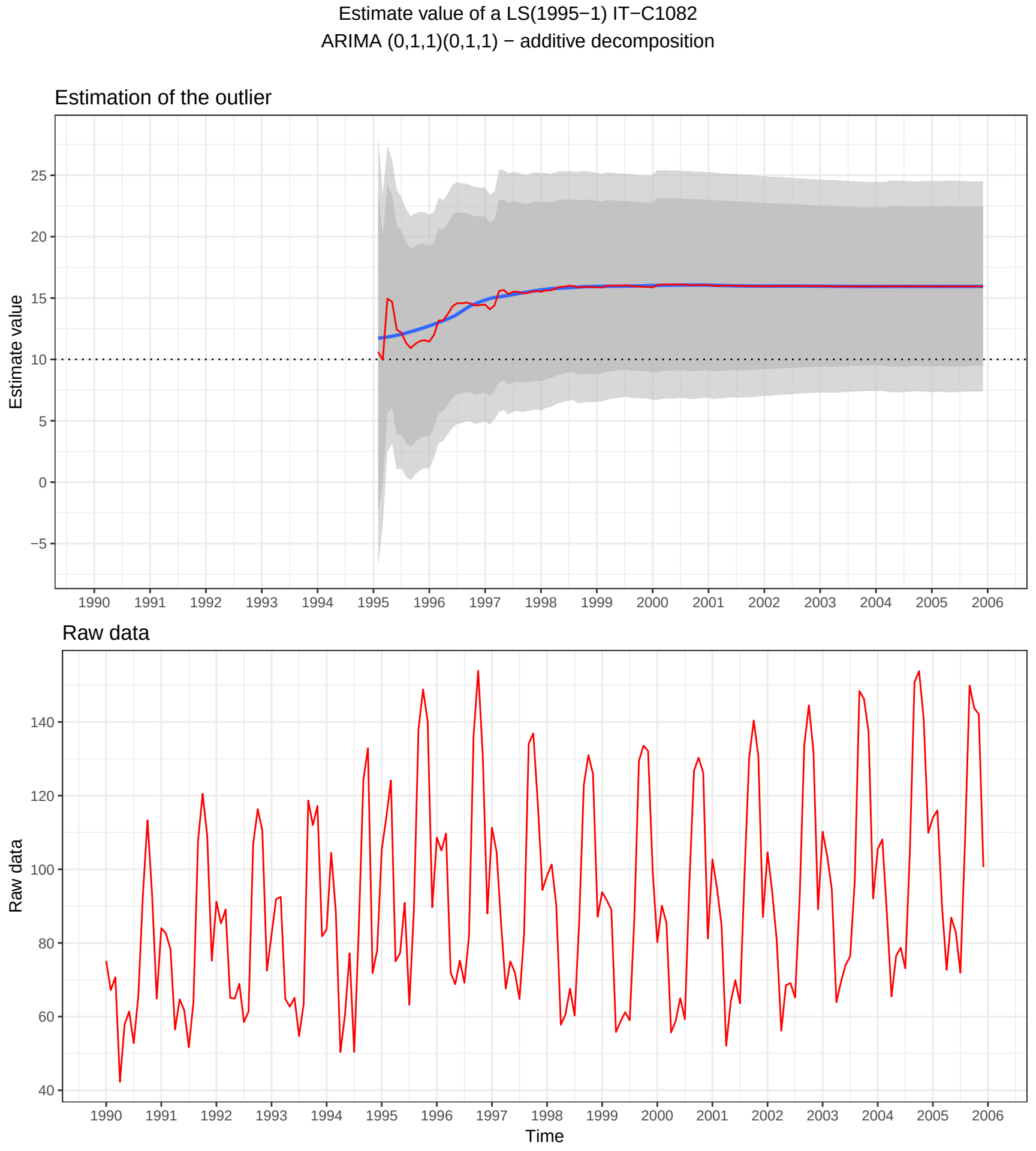

Estimate value of a LS(1996−1) DE−C1082
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
25
20
15
10
5
0
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
120
100
80
Time

Estimate value of a LS(1995−1) FR−C1082

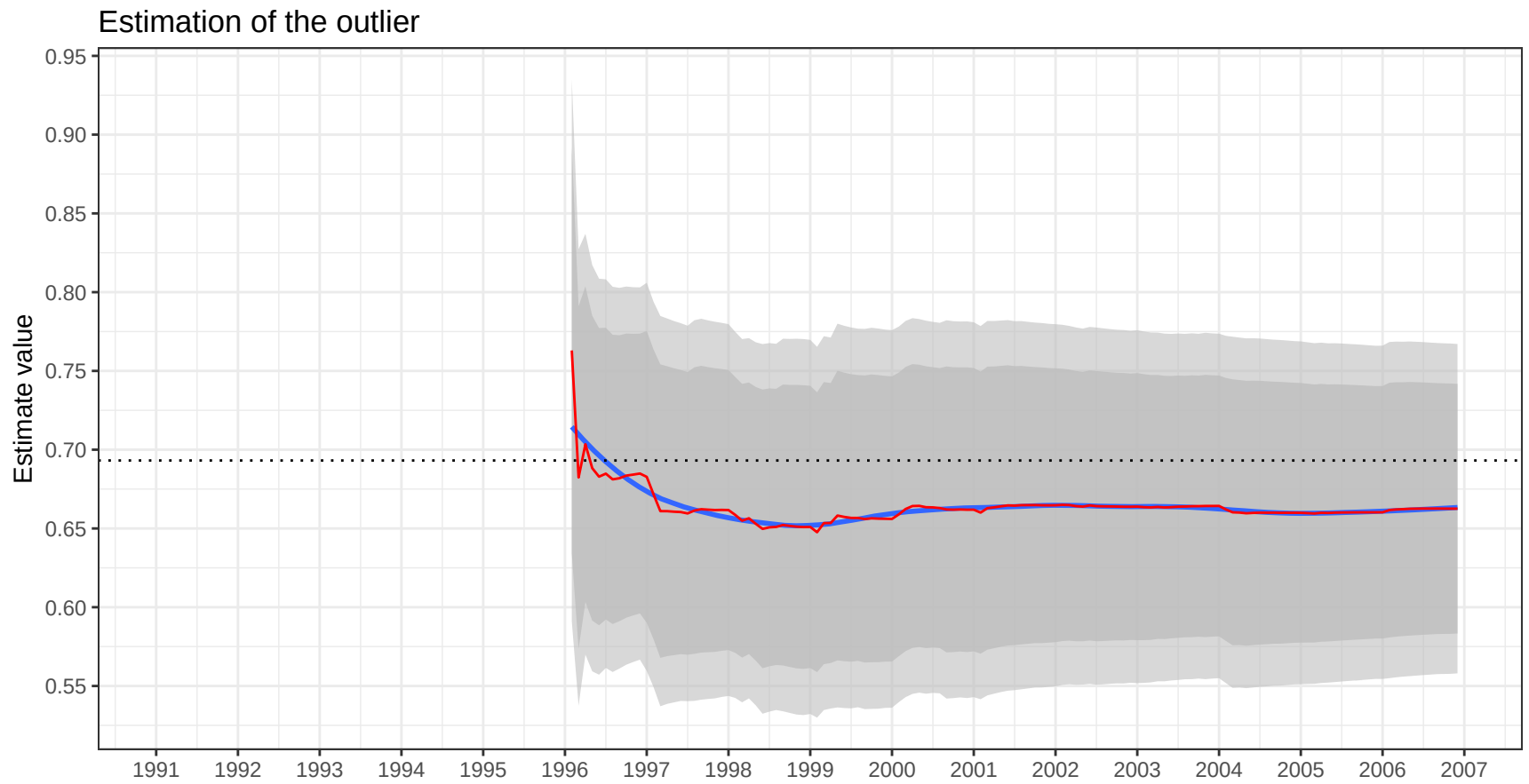
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

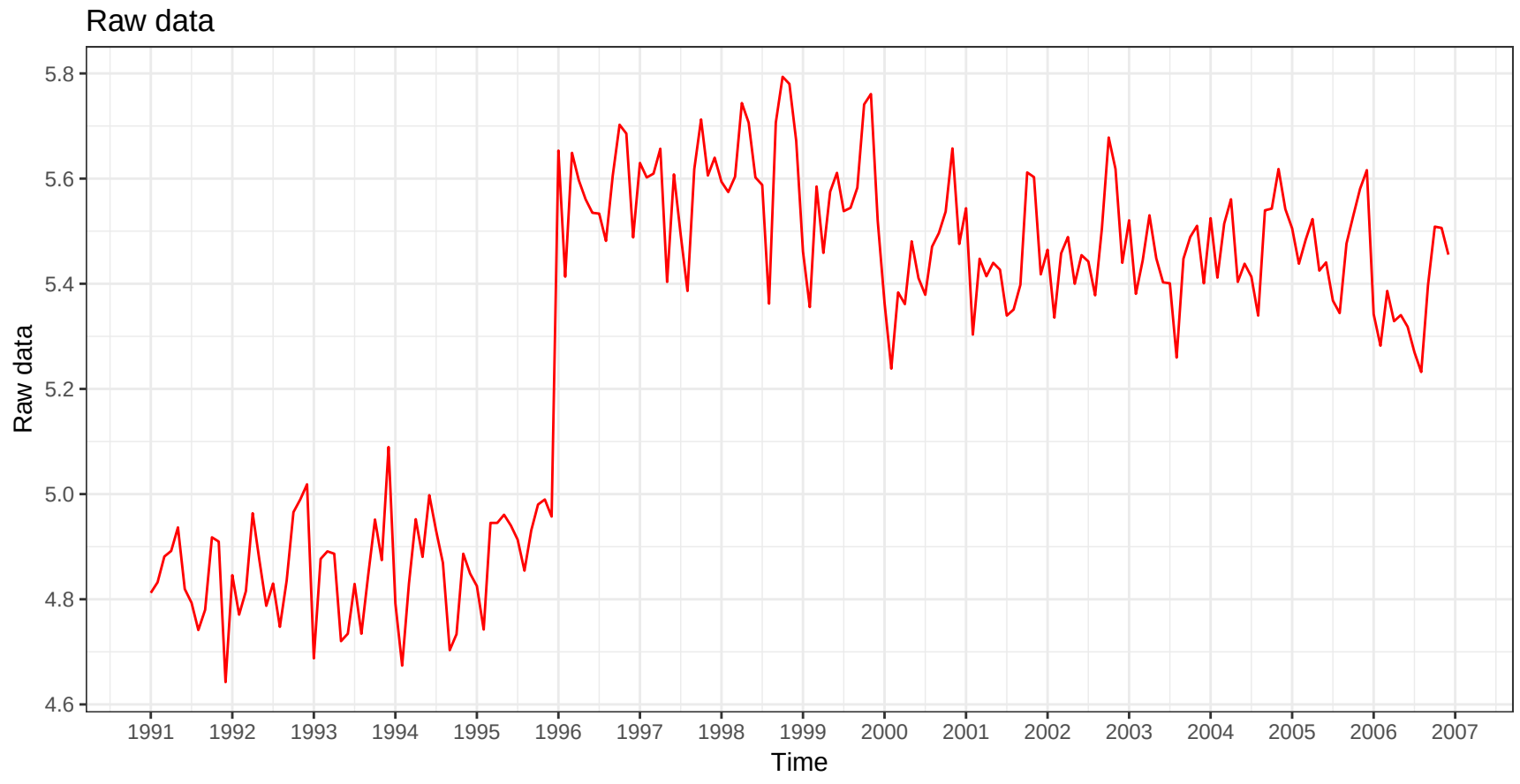




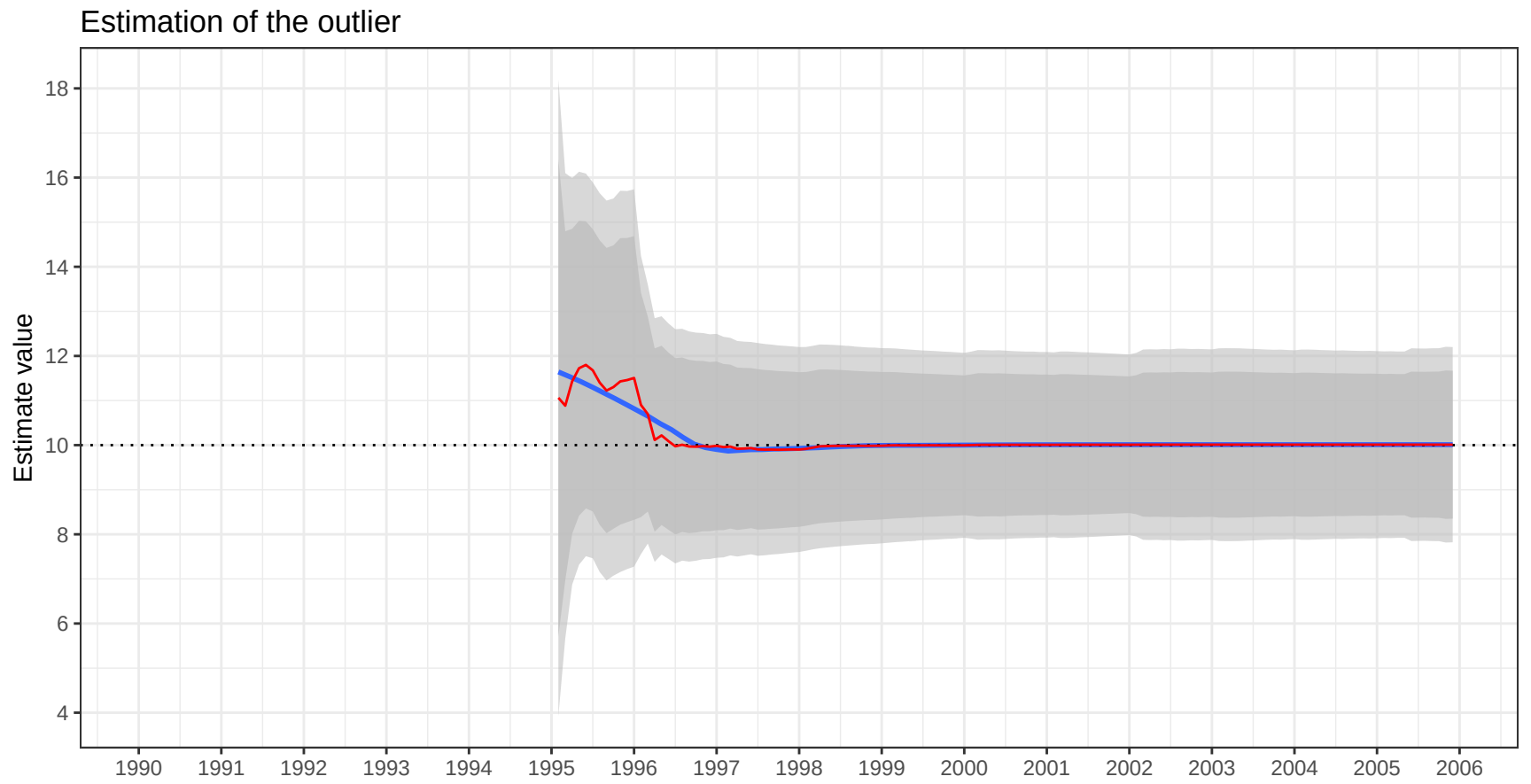

Estimate value of a LS(1995−1) IT−C1082
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
25
20
15
10
5
0
−5
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
140
120
100
80
60
40
Time

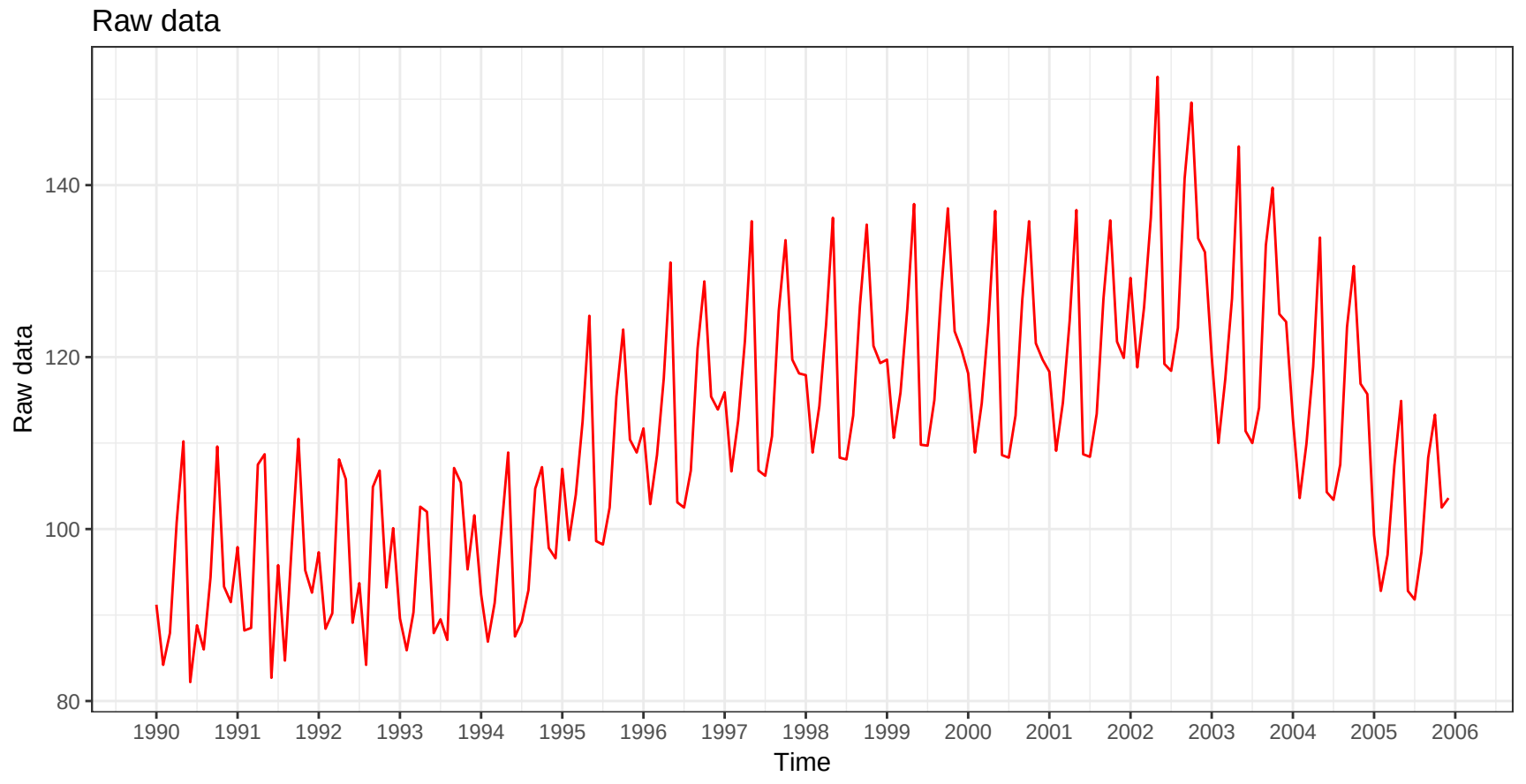
Estimate value of a LS(1996−1) DE−C1083
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition



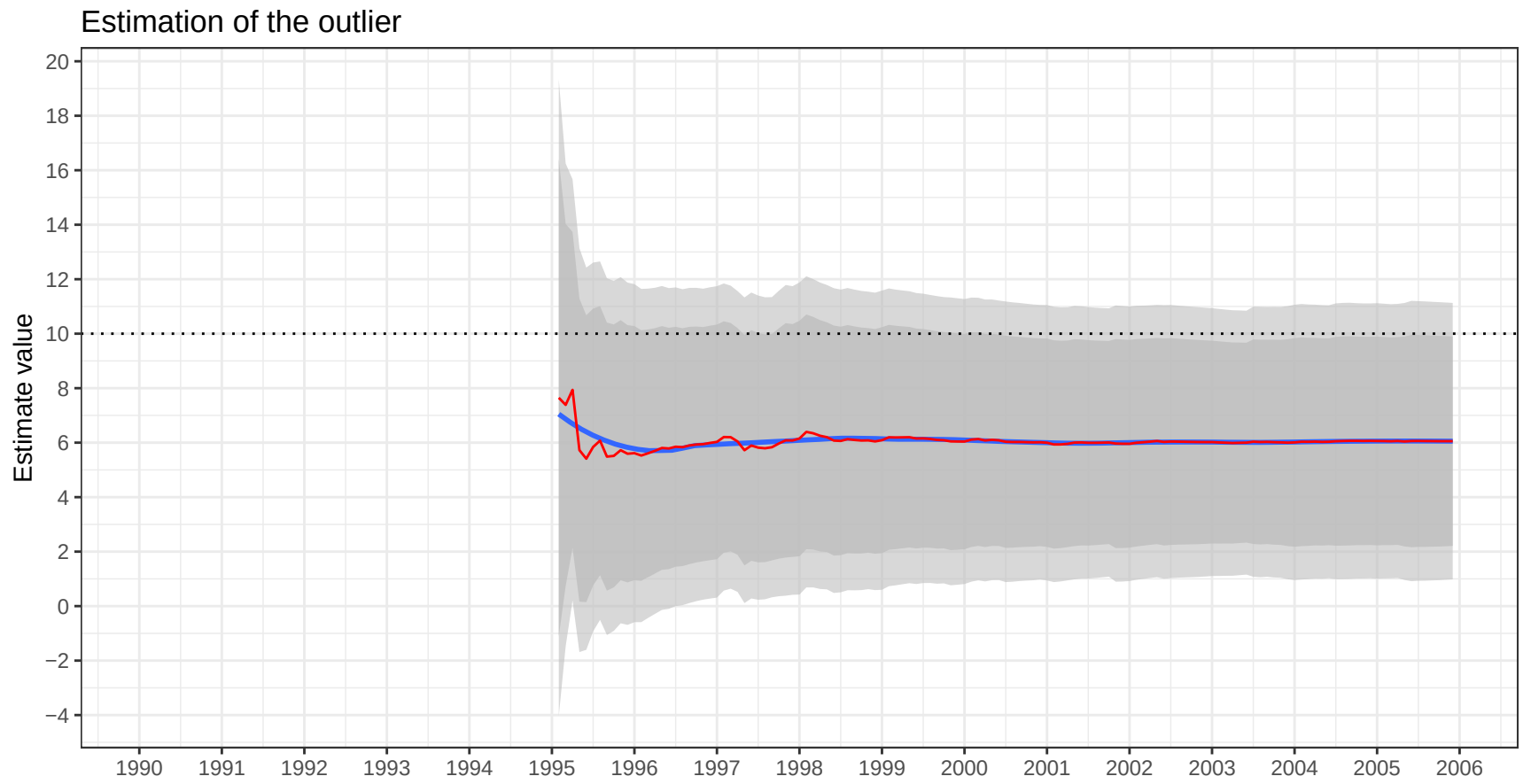


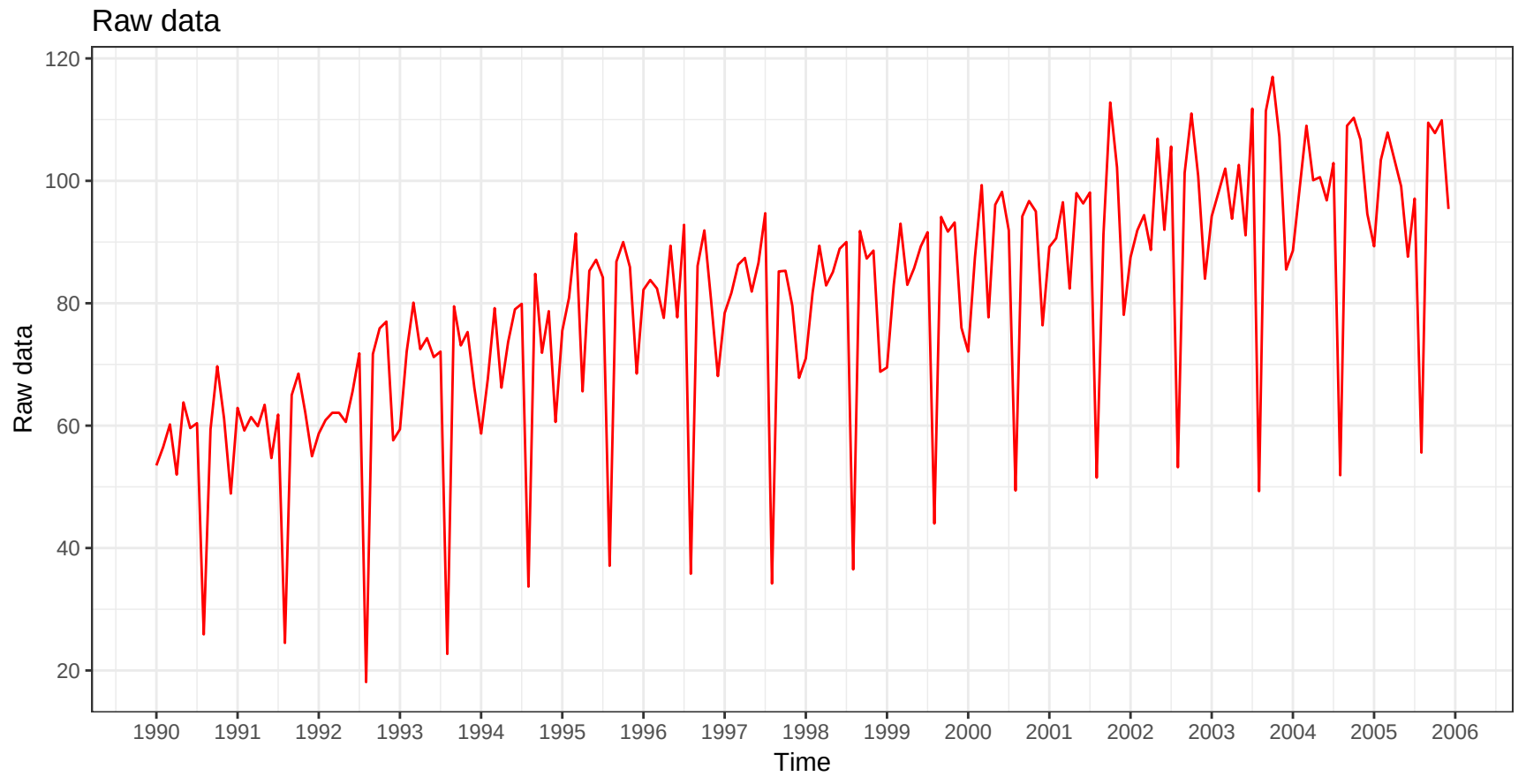
Estimate value of a LS(1995−1) FR−C1083
ARIMA (3,1,1)(0,1,1) − additive decomposition

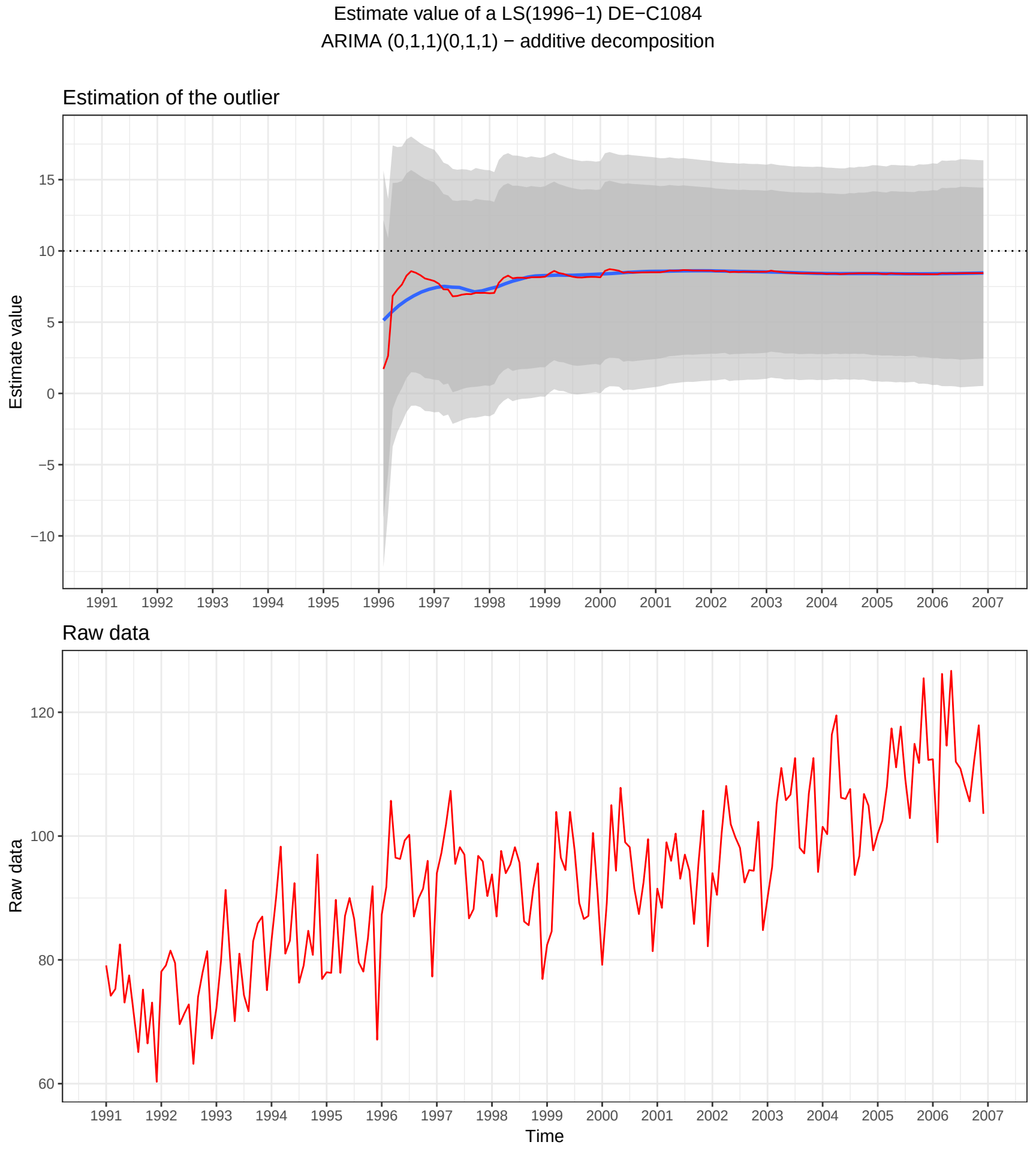




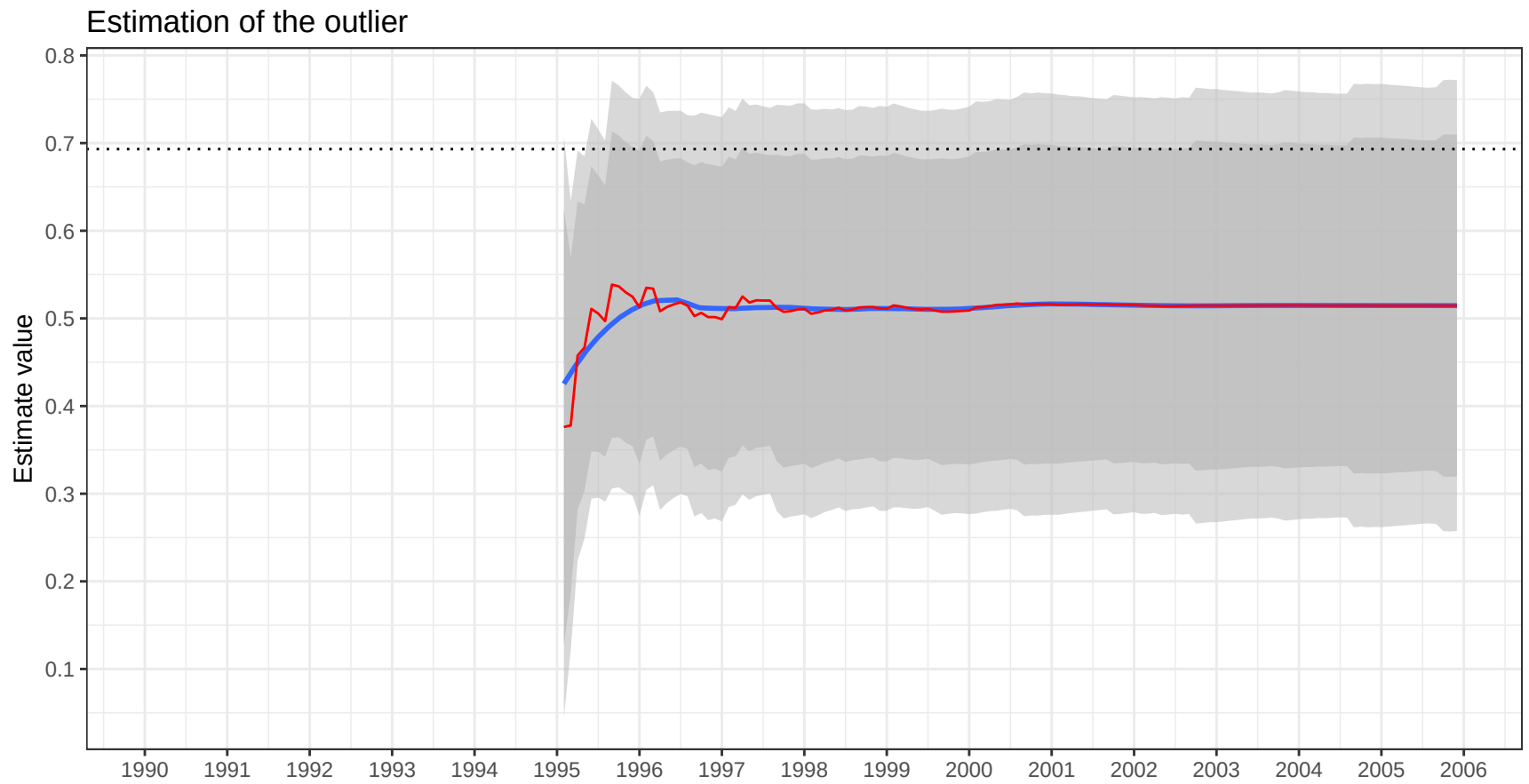
Estimate value of a LS(1995−1) IT−C1083
ARIMA (0,1,1)(0,1,1) − additive decomposition

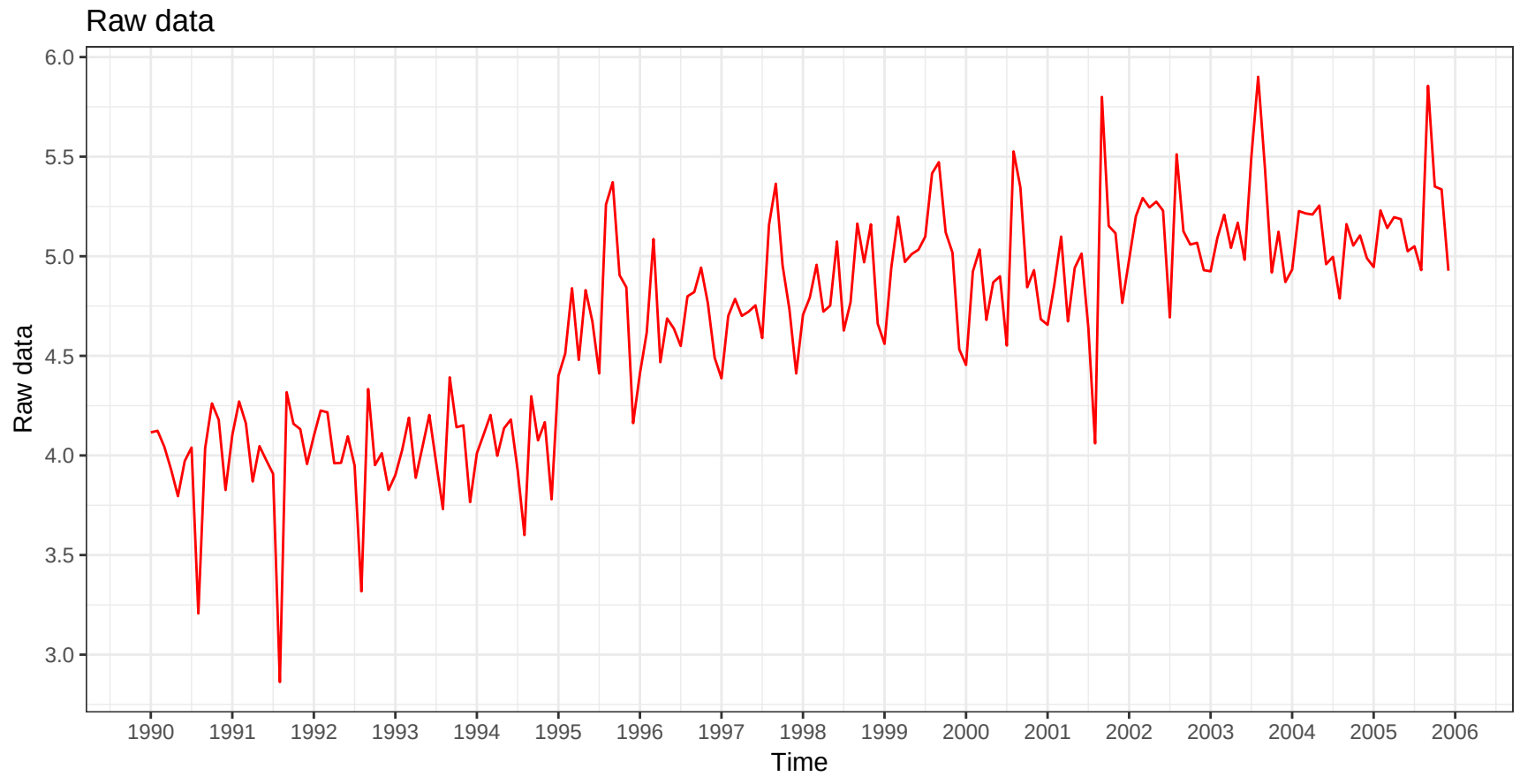


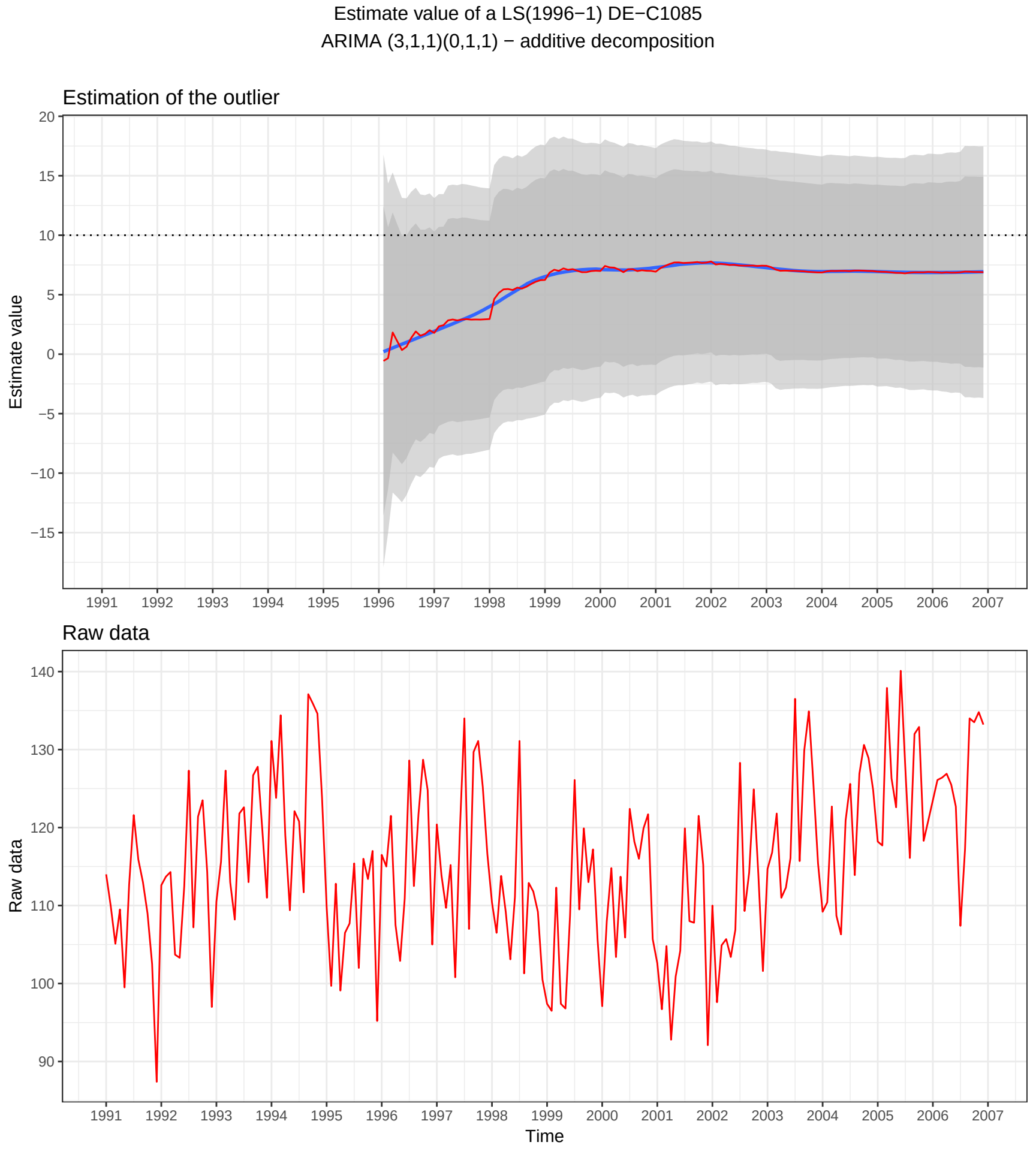


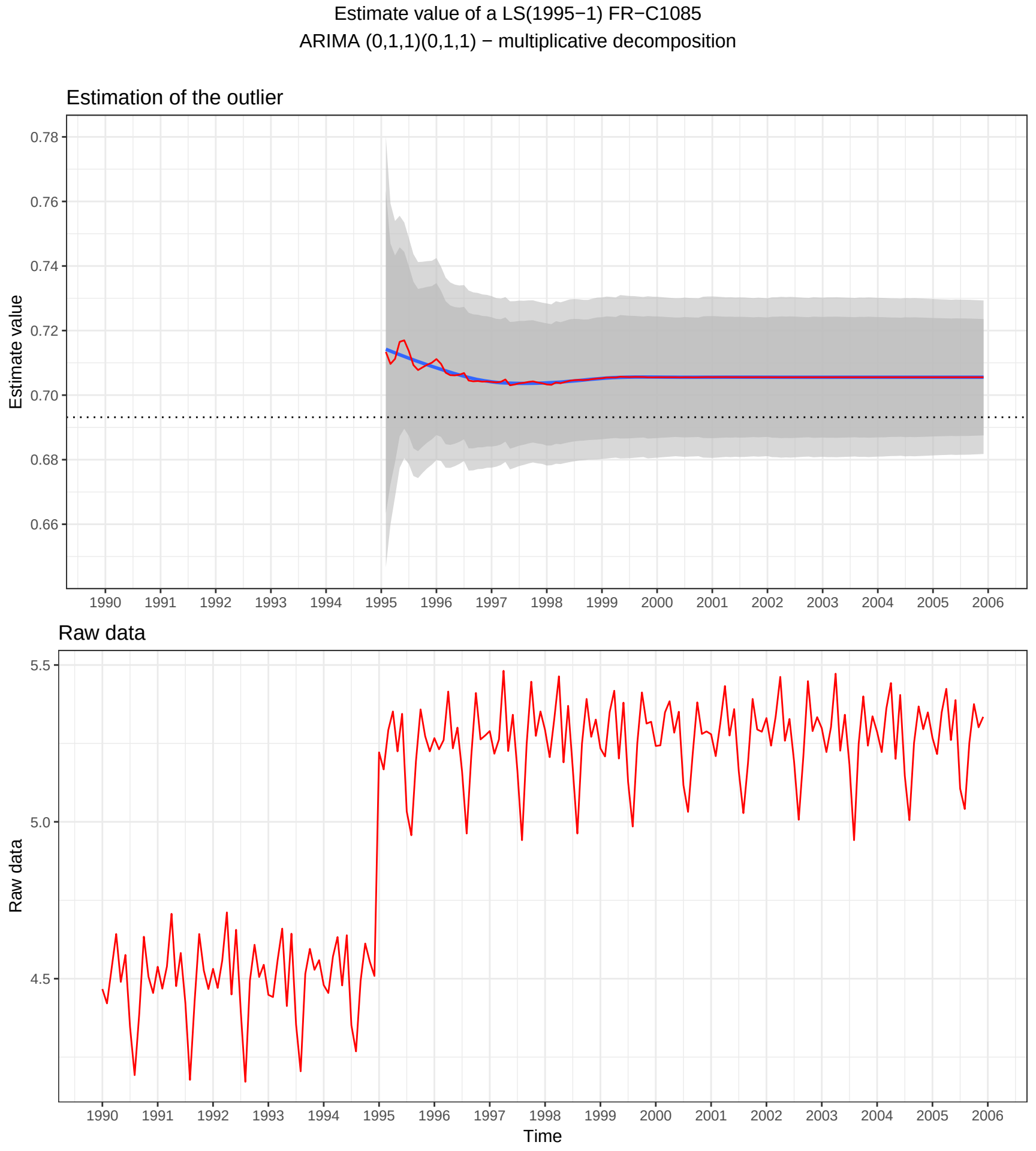

Estimate value of a LS(1996−1) DE−C1084
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
15
10
5
0
−5
−10
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
120
100
80
60
Time

Estimate value of a LS(1995−1) IT−C1084
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

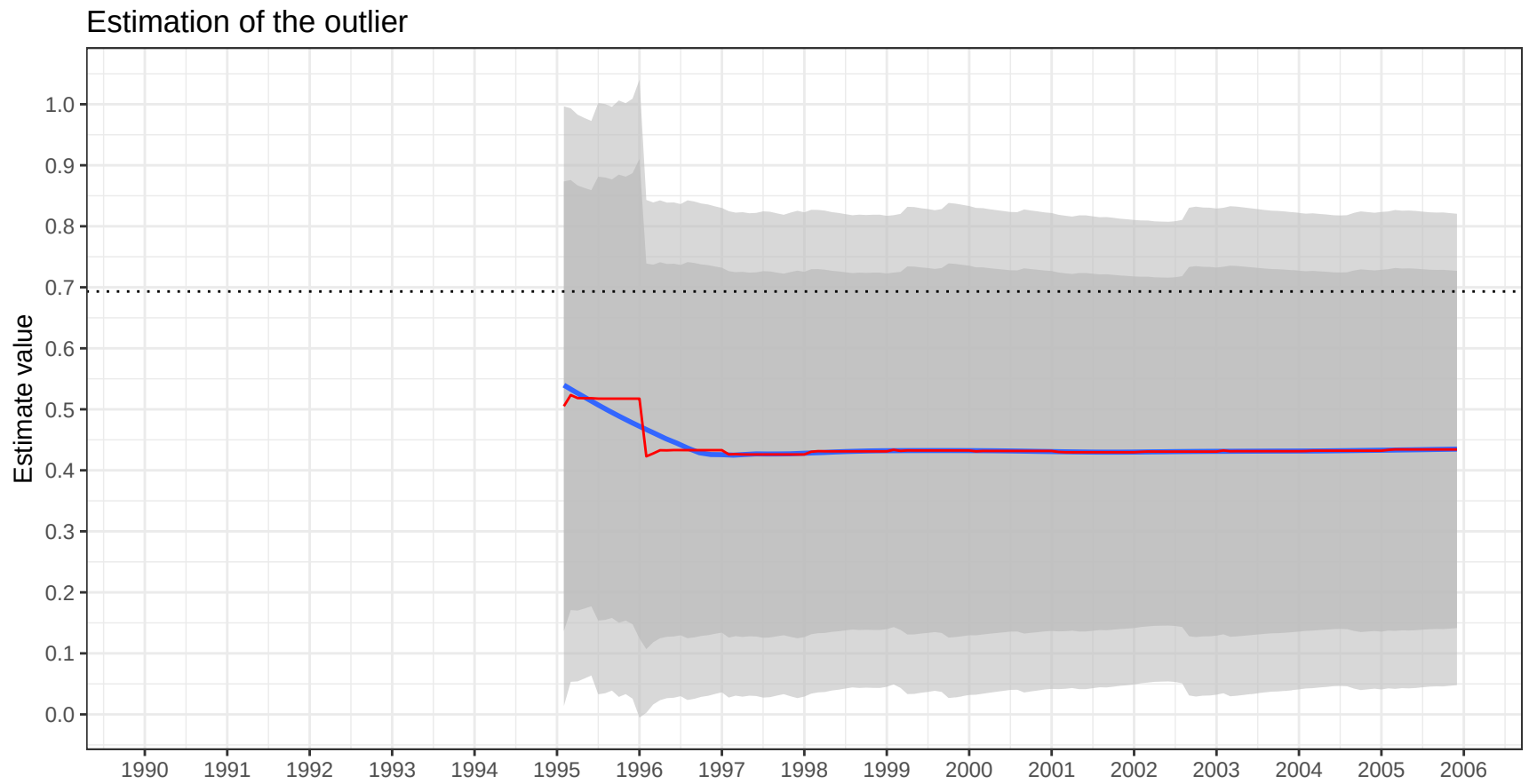


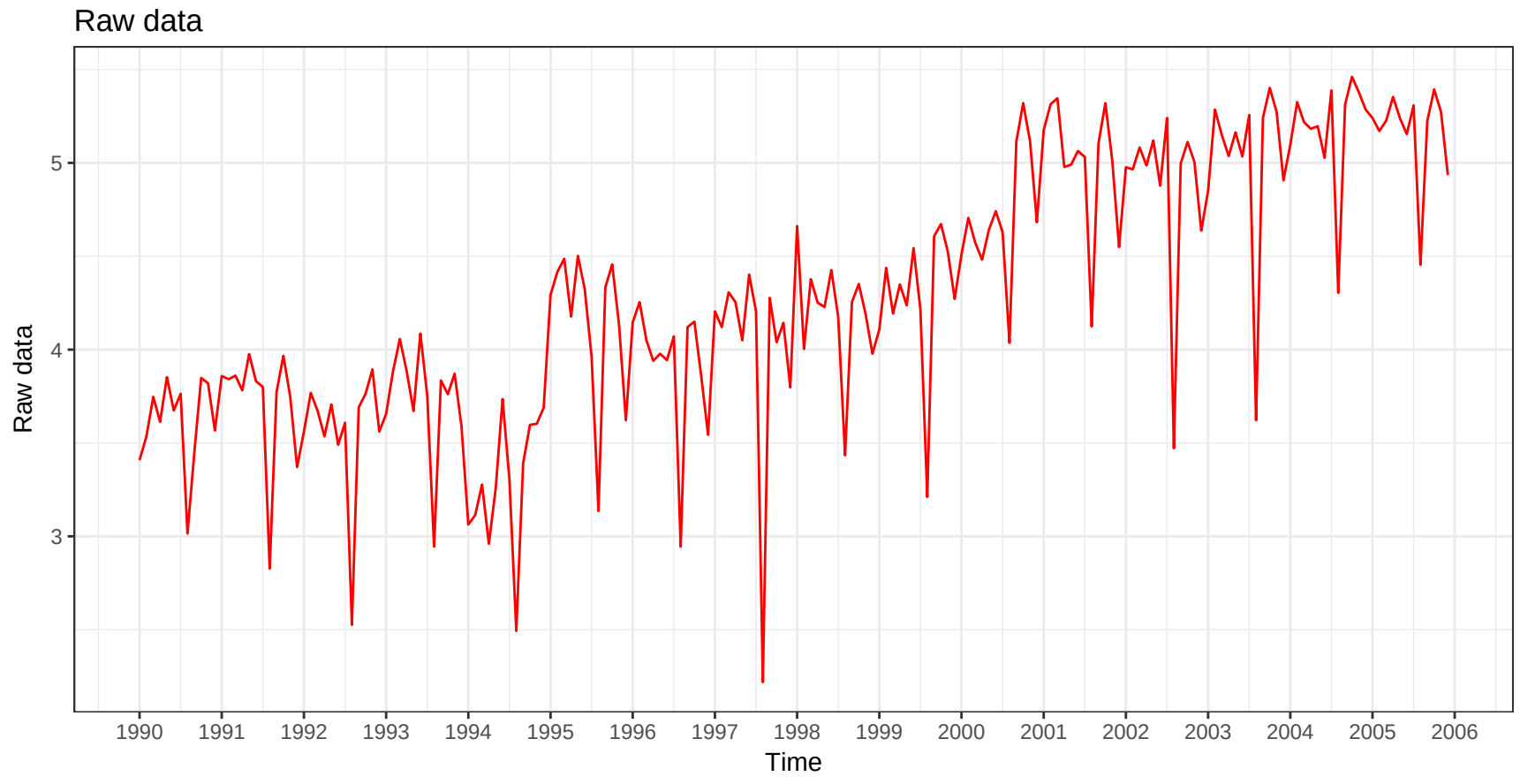



Estimate value of a LS(1996−1) DE−C1085
ARIMA (3,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
20
15
10
5
0
−5
−10
−15
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
140
130
120
110
100
90
Time

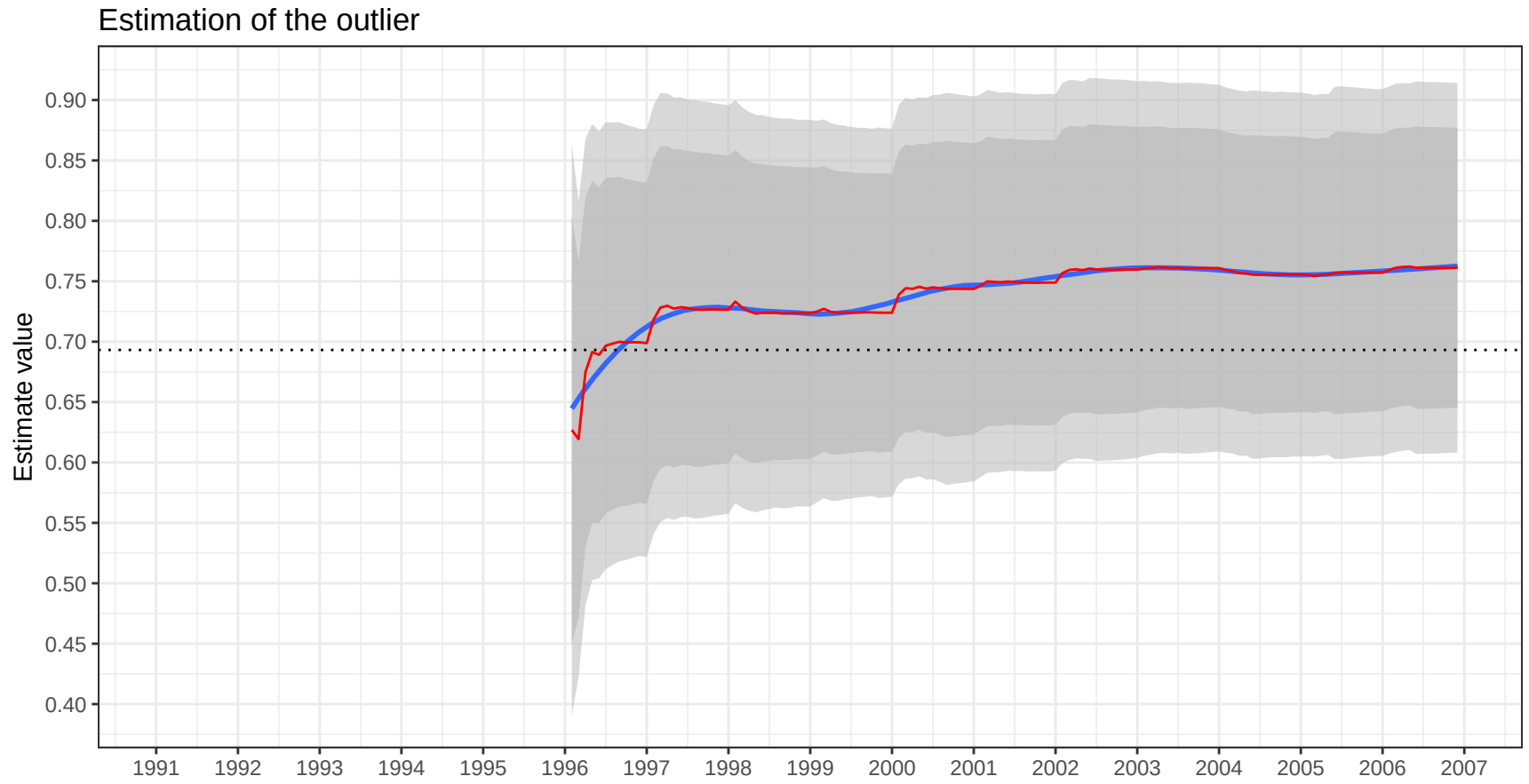

Estimate value of a LS(1995−1) FR−C1085
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.78
0.76
0.74
0.72
0.70
0.68
0.66
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
5.5
5.0
4.5
Time

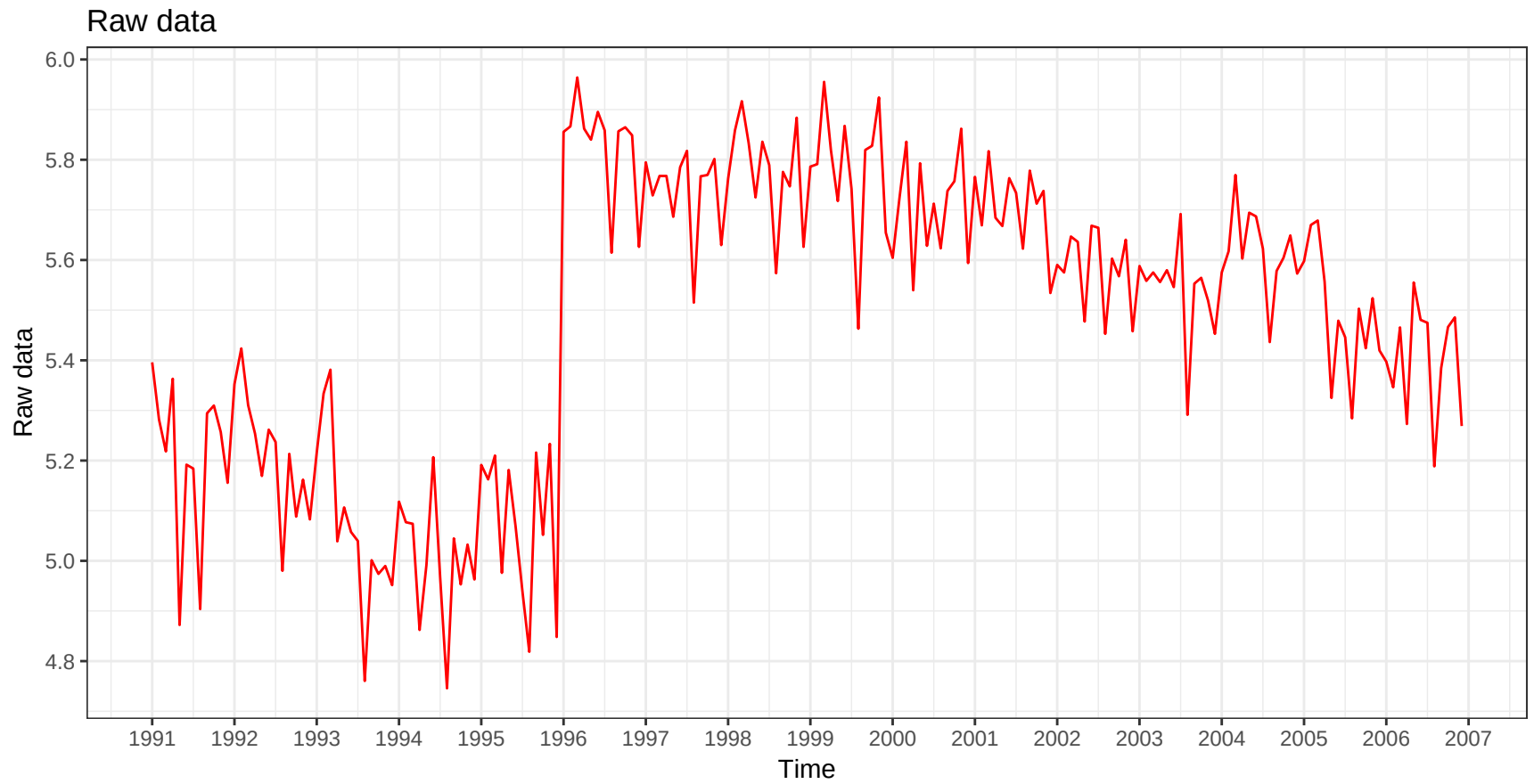
Estimate value of a LS(1995−1) IT−C1085
ARIMA (0,1,1)(1,1,1) − multiplicative decomposition

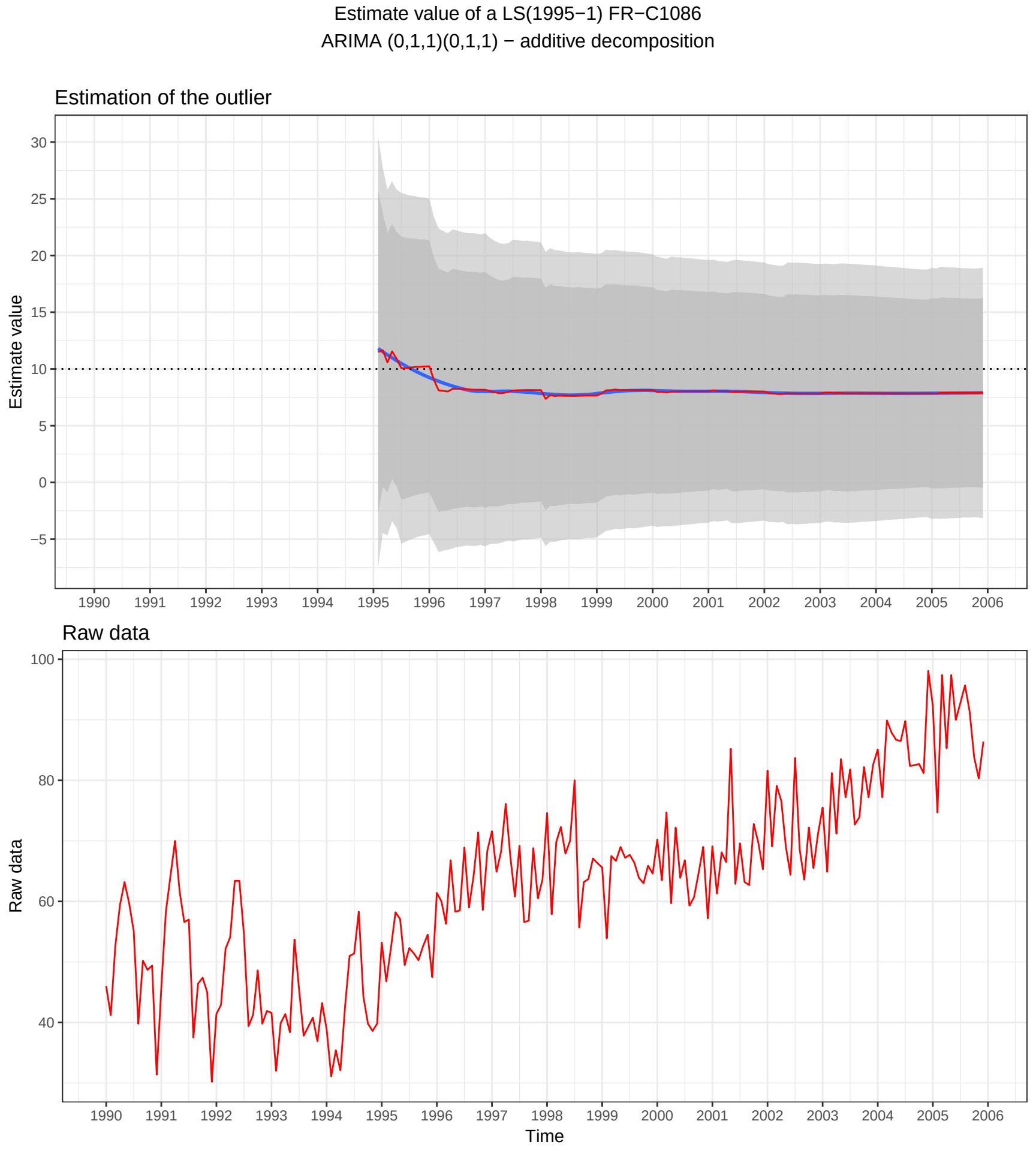


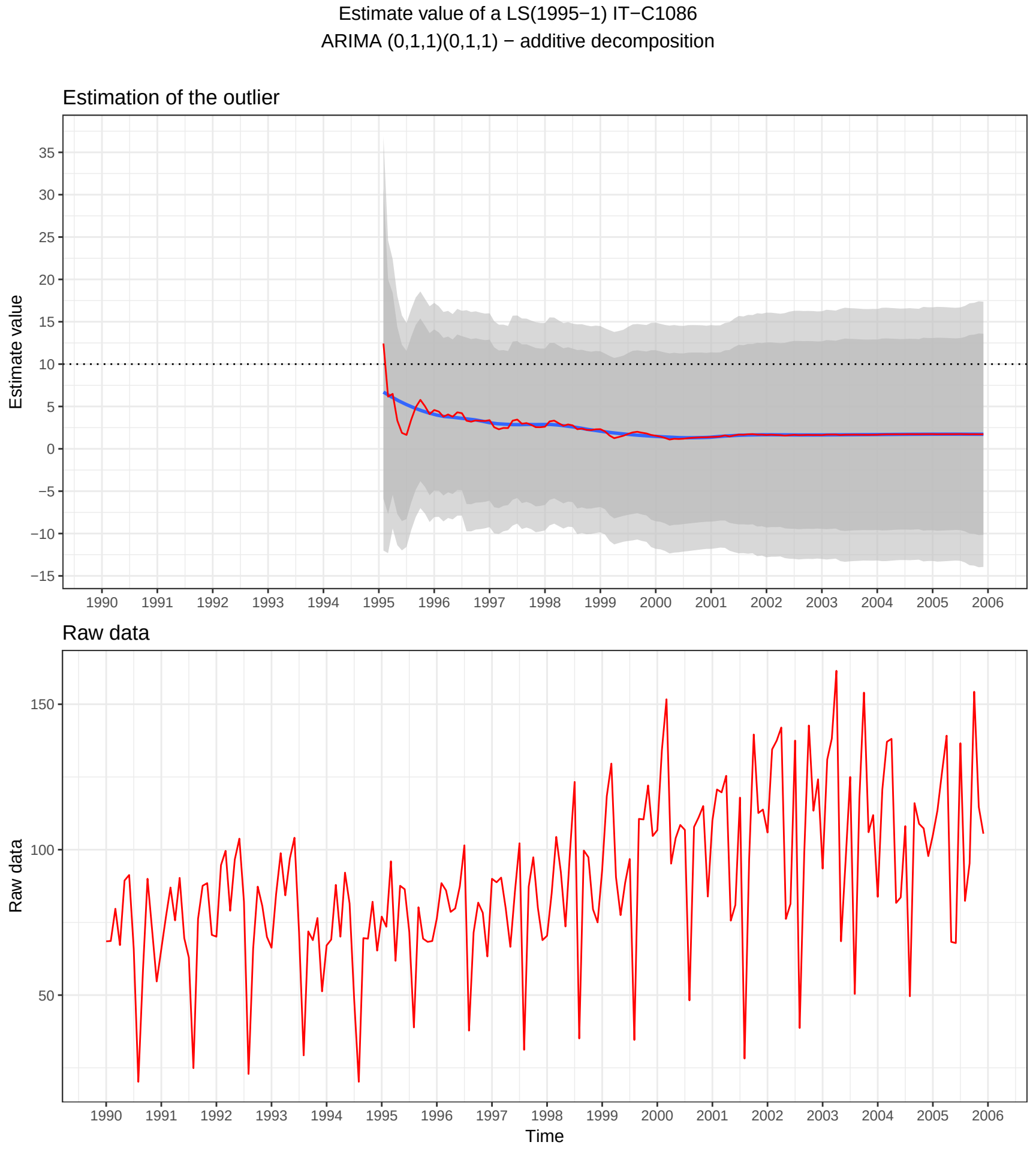


Estimate value of a LS(1996−1) DE−C1086
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

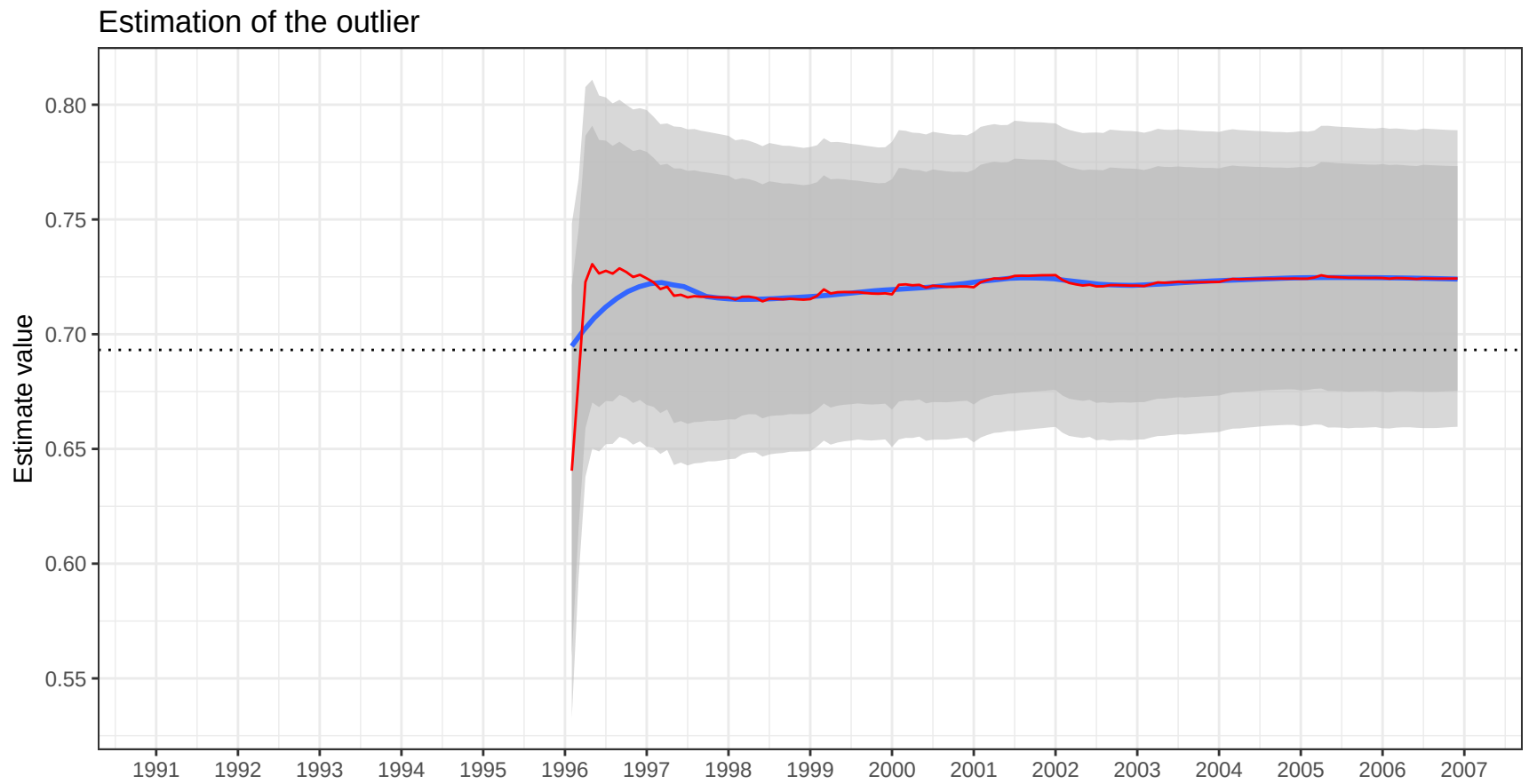


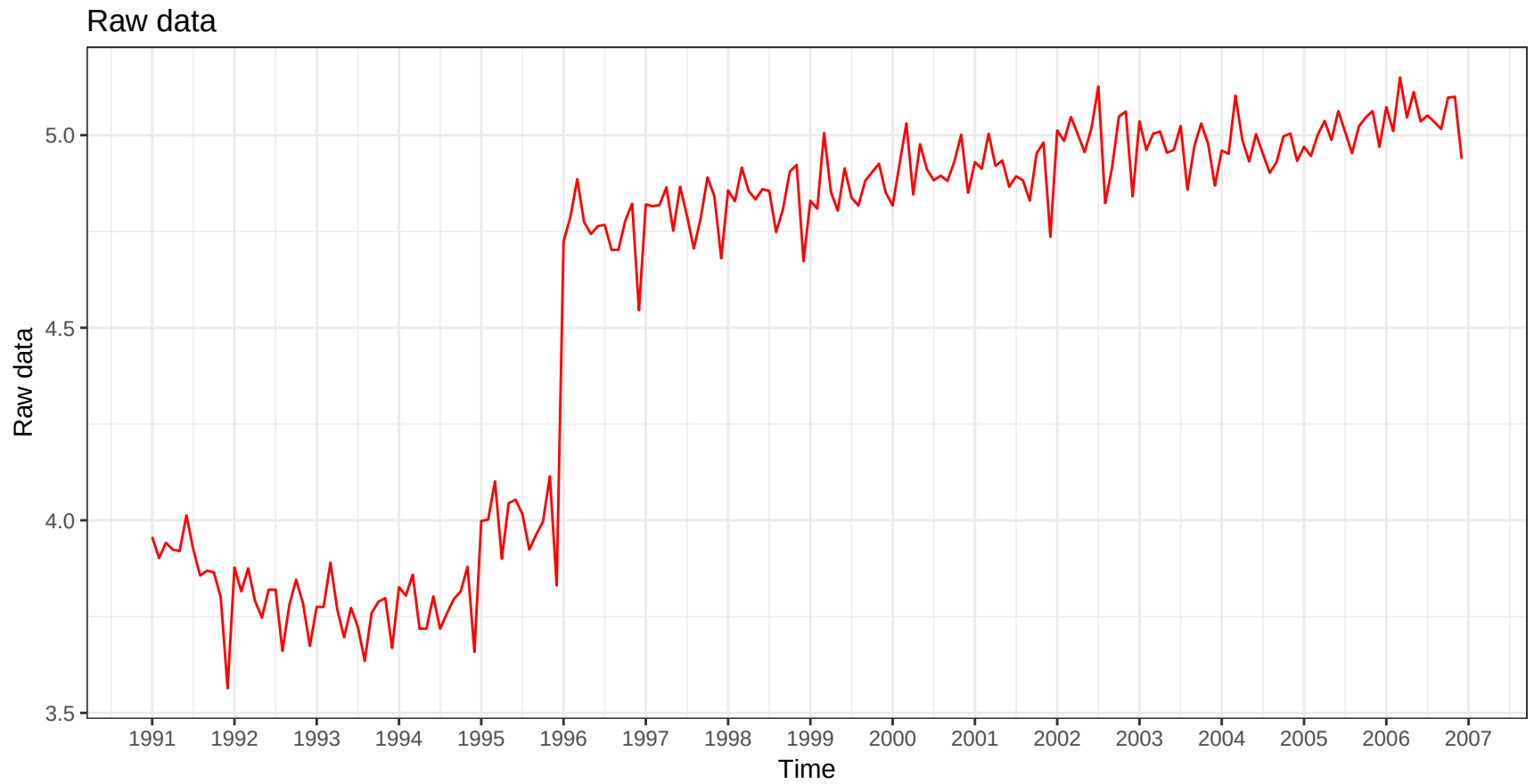


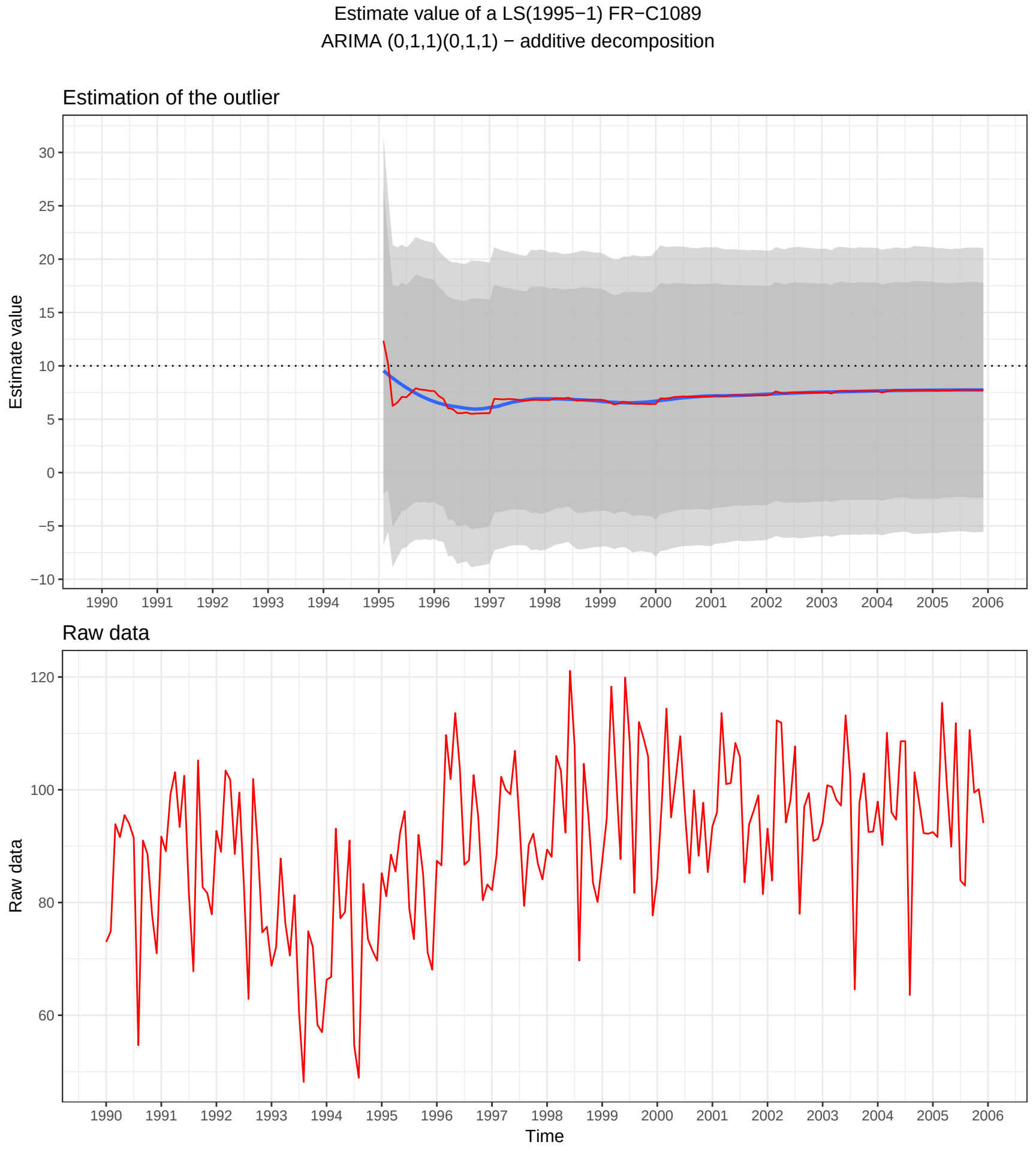

Estimate value of a LS(1995−1) FR−C1086
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
30
25
20
15
10
5
0
−5
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
100
80
60
40
Time

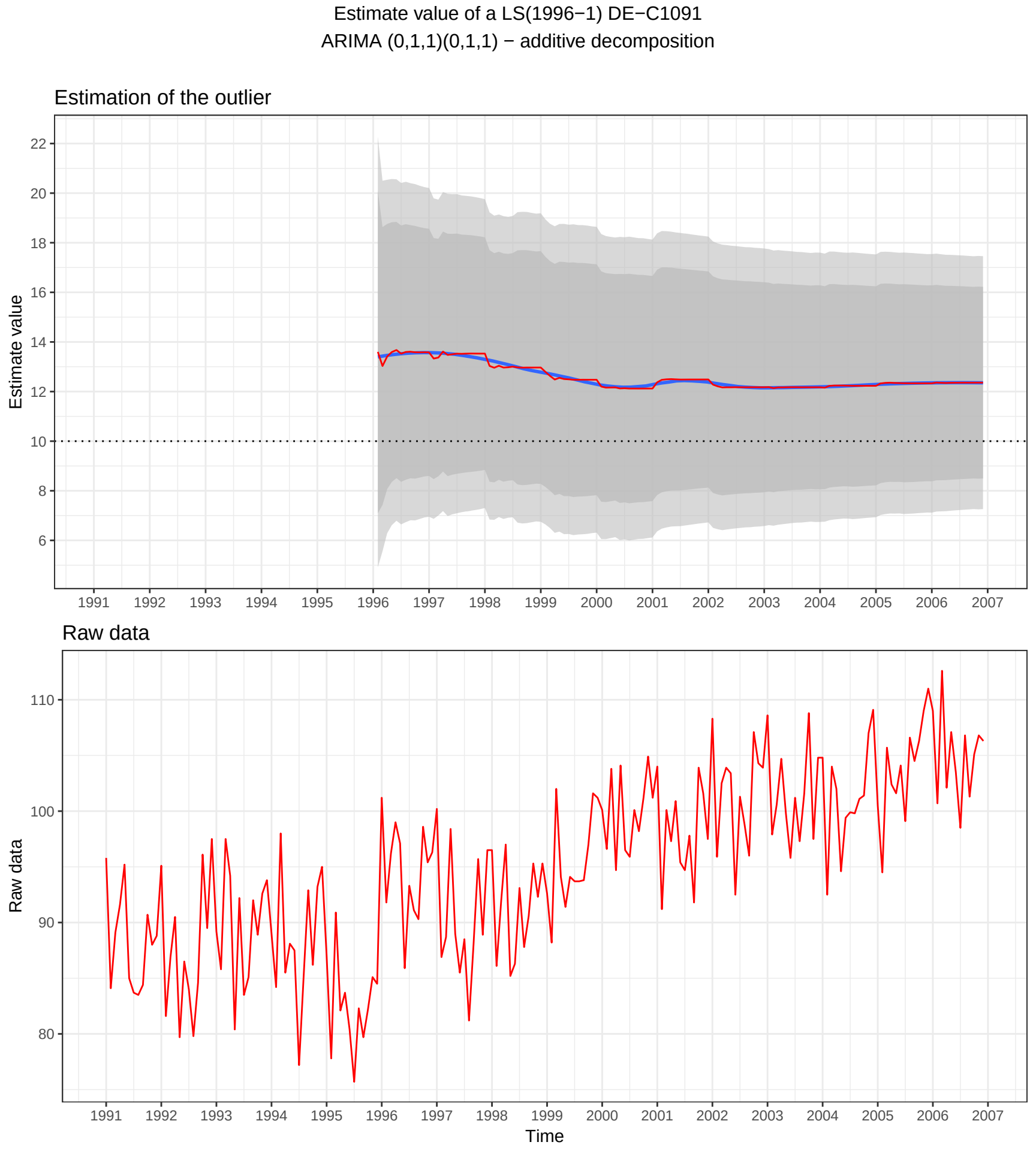

Estimate value of a LS(1995−1) IT−C1086
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
35
30
25
20
15
10
5
0
−5
−10
−15
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
150
100
50
Time

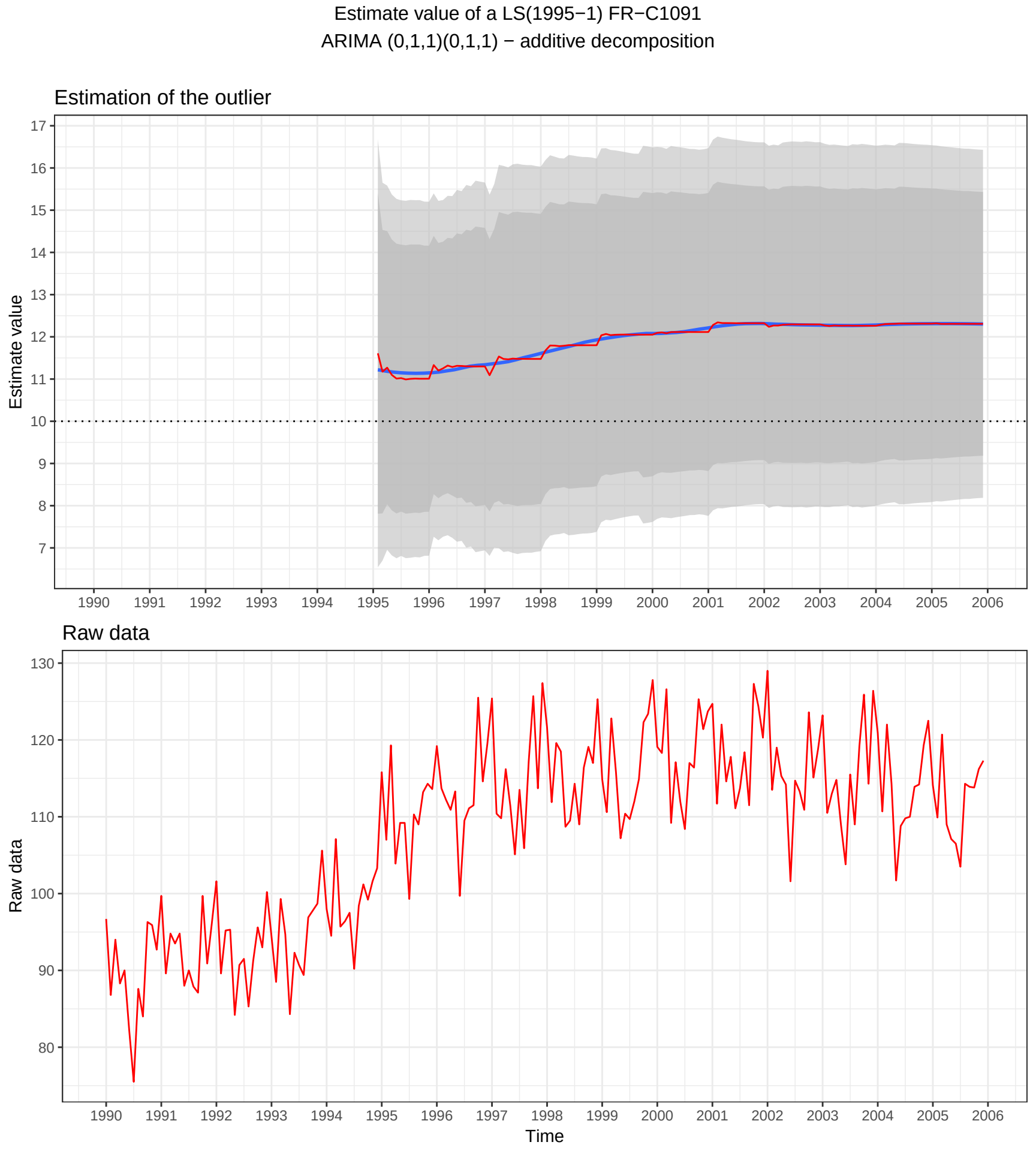
Estimate value of a LS(1996−1) DE−C1089
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition



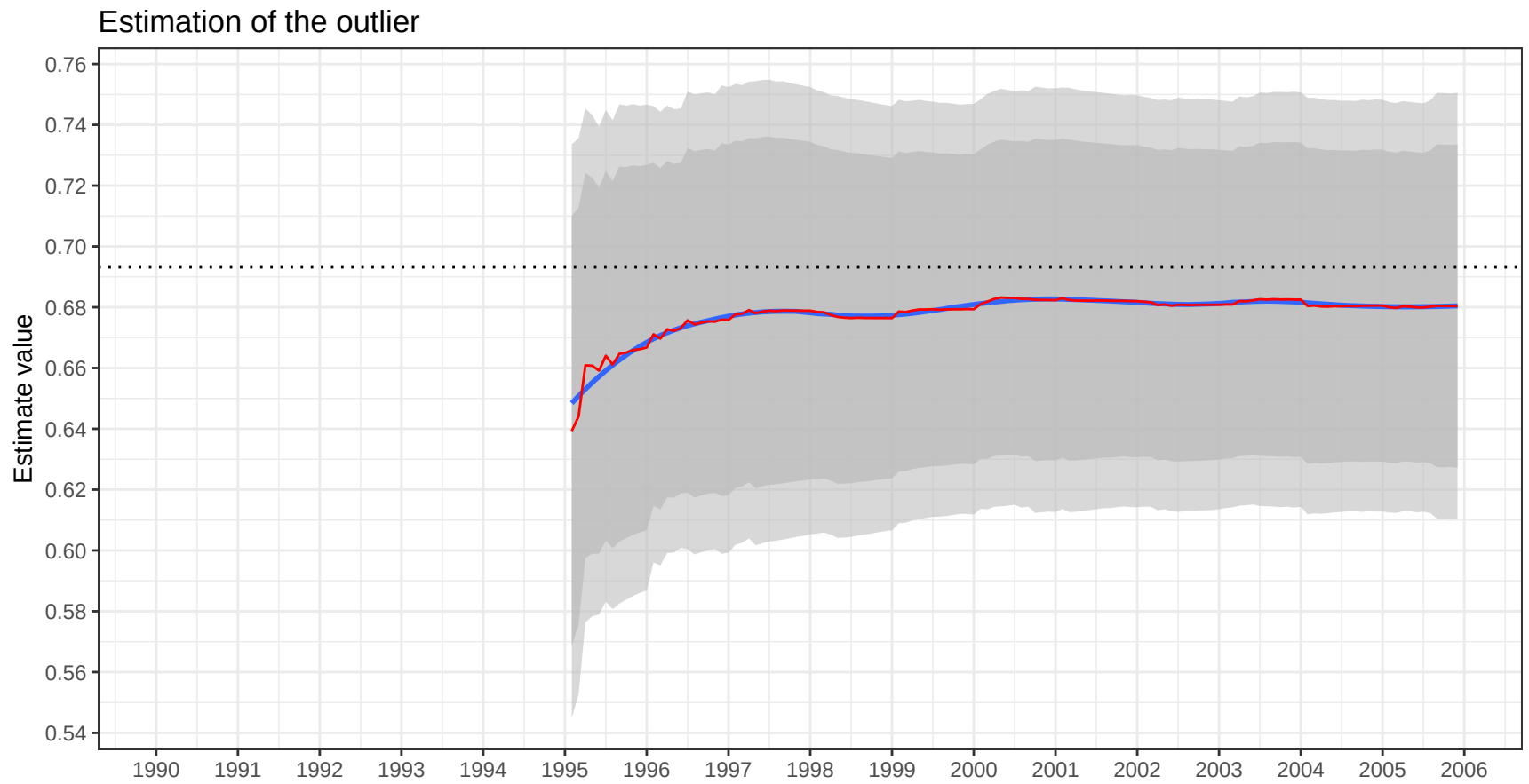


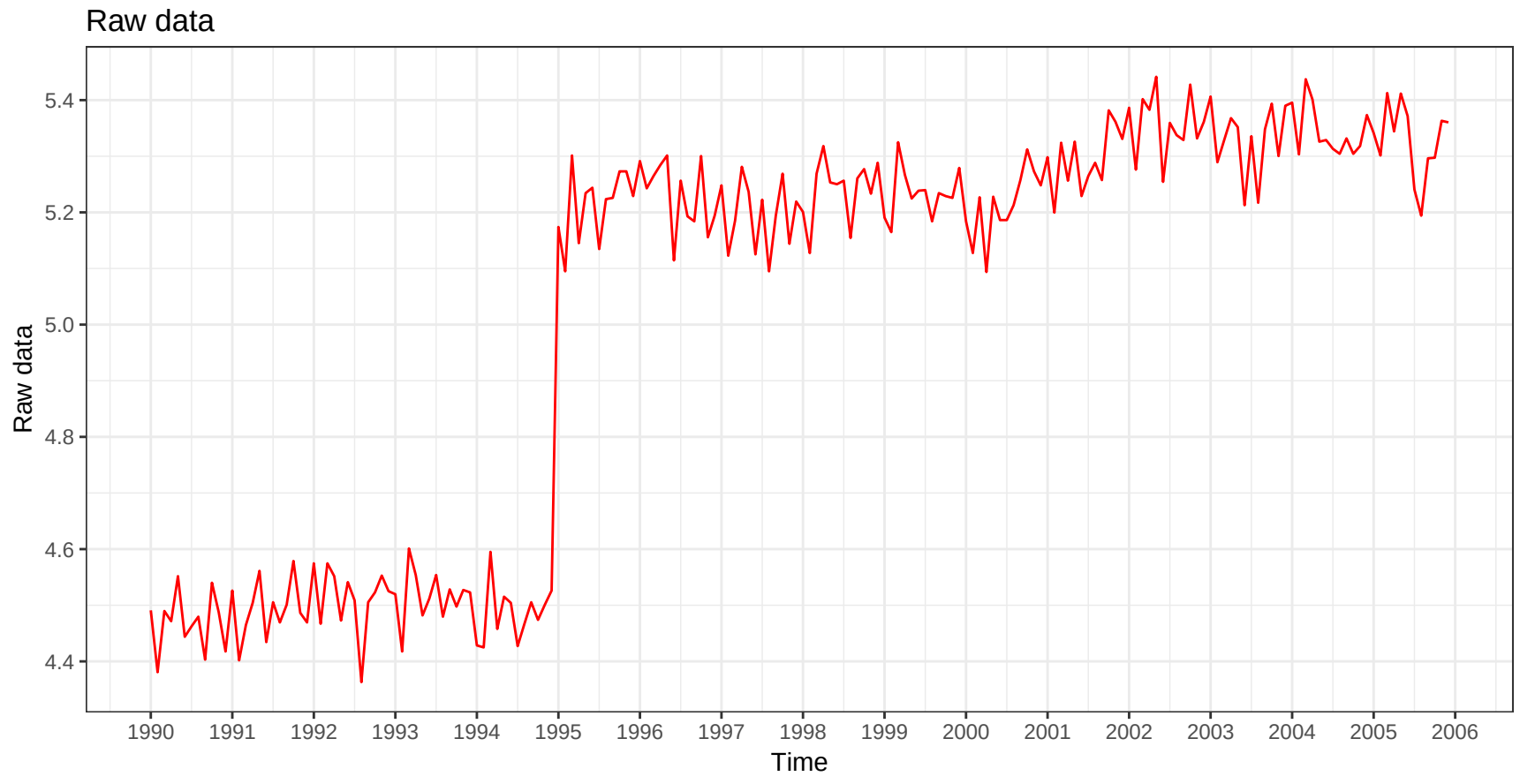

Estimate value of a LS(1995−1) FR−C1089
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
30
25
20
15
10
5
0
−5
−10
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
120
100
80
60
Time

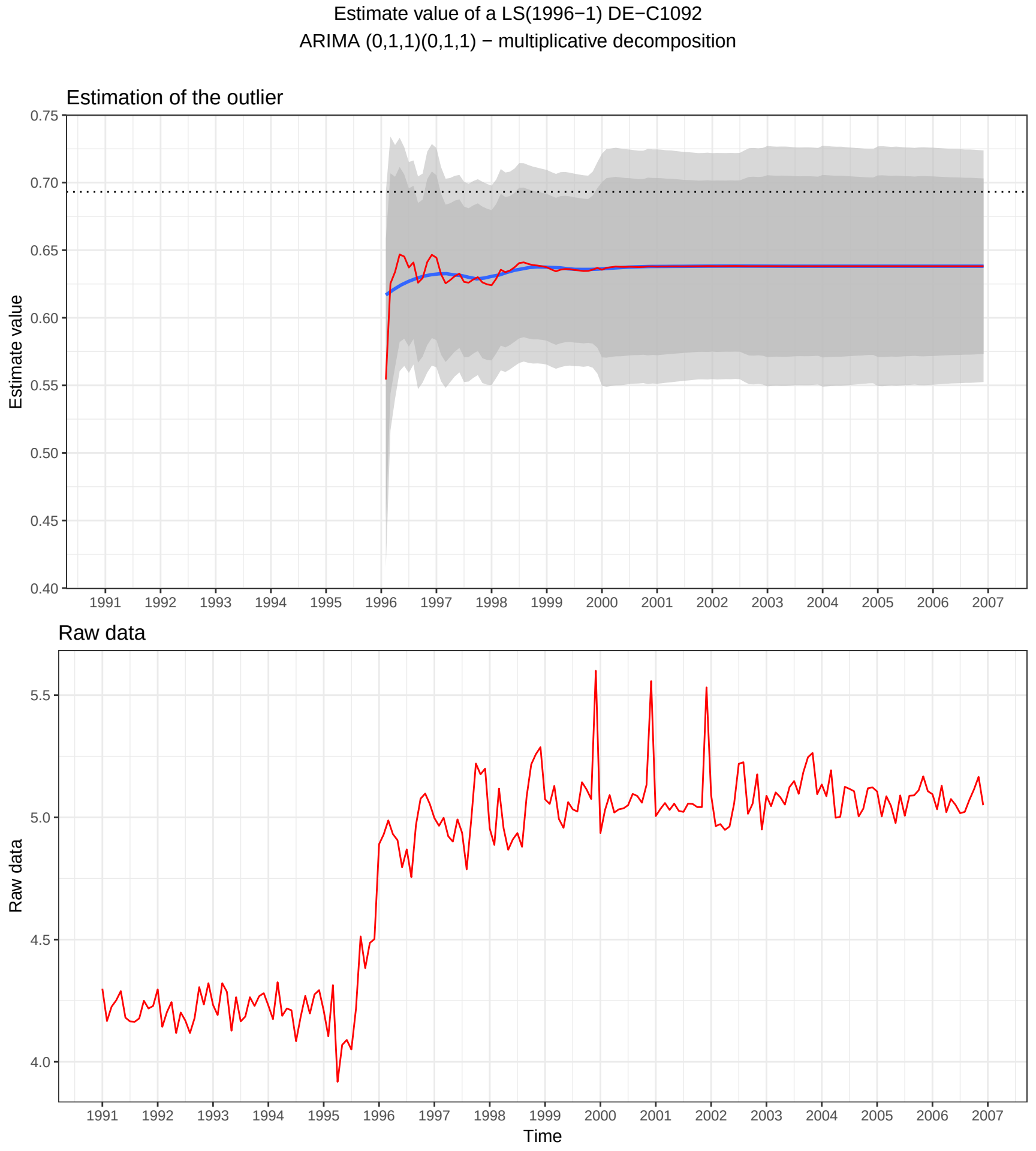

Estimate value of a LS(1996−1) DE−C1091
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
22
20
18
16
14
12
10
8
6
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
110
100
90
80
Time


Estimate value of a LS(1995−1) FR−C1091
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
17
16
15
14
13
12
11
10
9
8
7
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
130
120
110
100
90
80
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Time

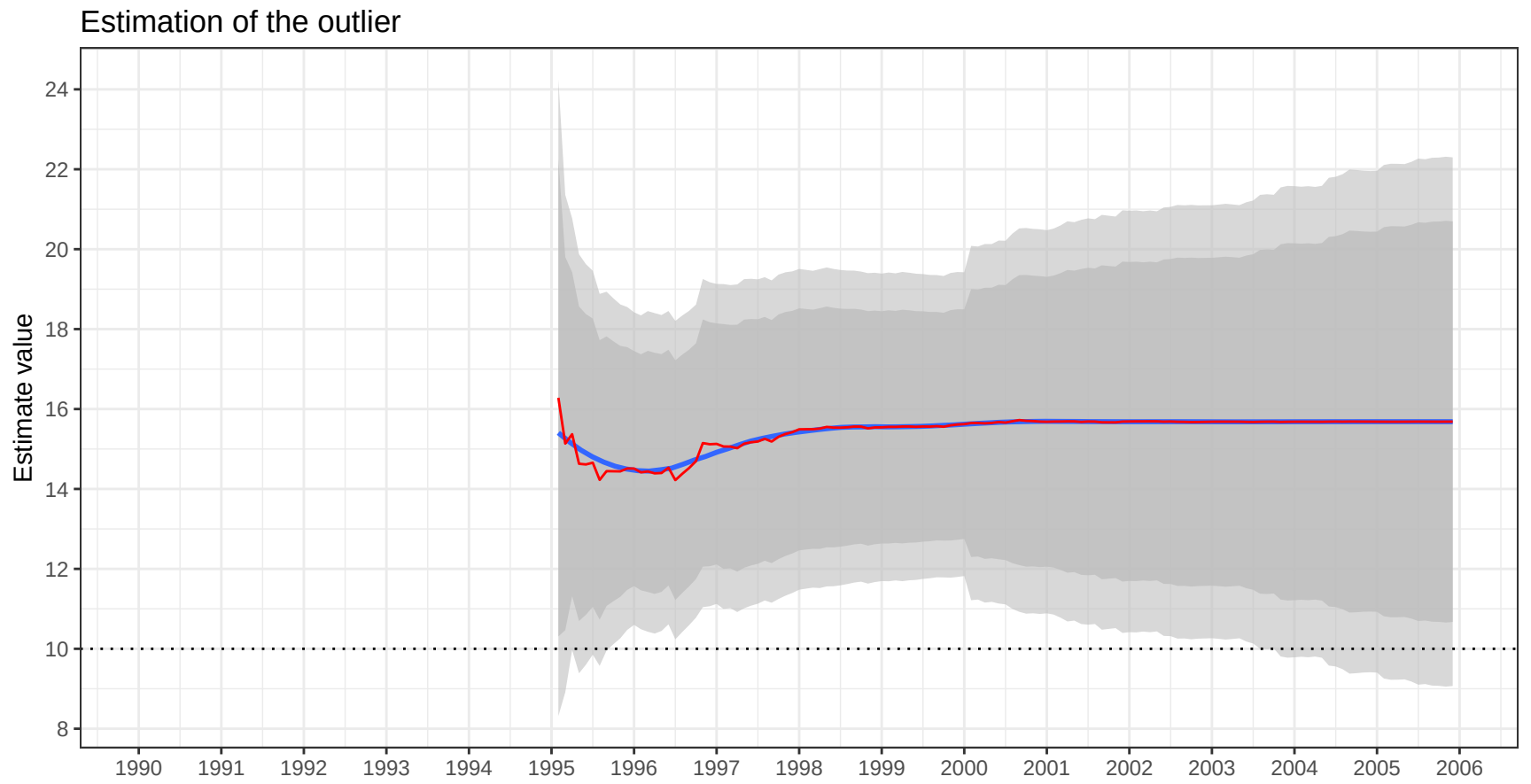
Estimate value of a LS(1995−1) IT−C1091
ARIMA (0,1,2)(1,1,1) − multiplicative decomposition

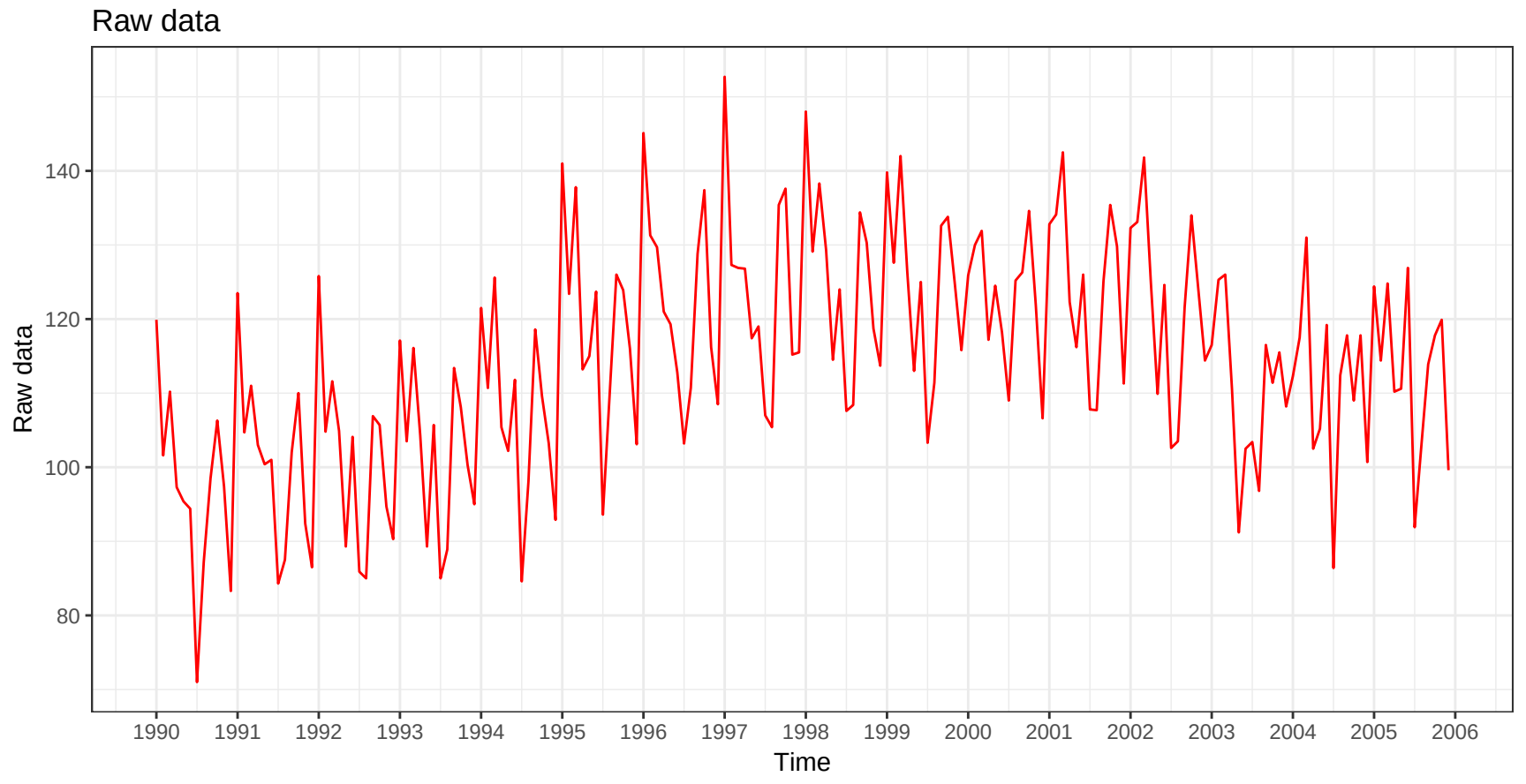





Estimate value of a LS(1996−1) DE−C1092
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.75
0.70
0.65
0.60
0.55
0.50
0.45
0.40
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
5.5
5.0
4.5
4.0
Time

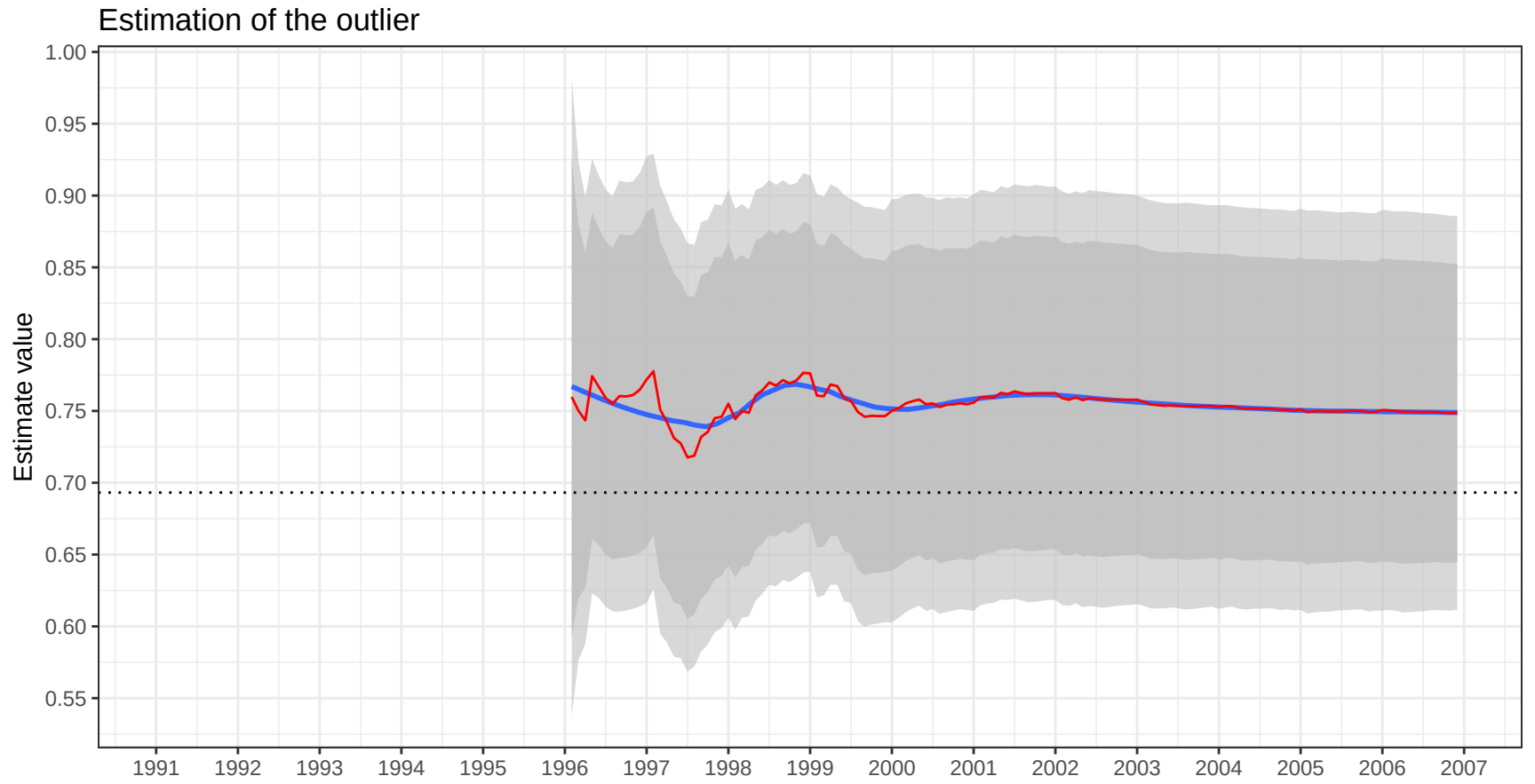
Estimate value of a LS(1995−1) FR−C1092
ARIMA (3,0,0)(0,1,1) − additive decomposition

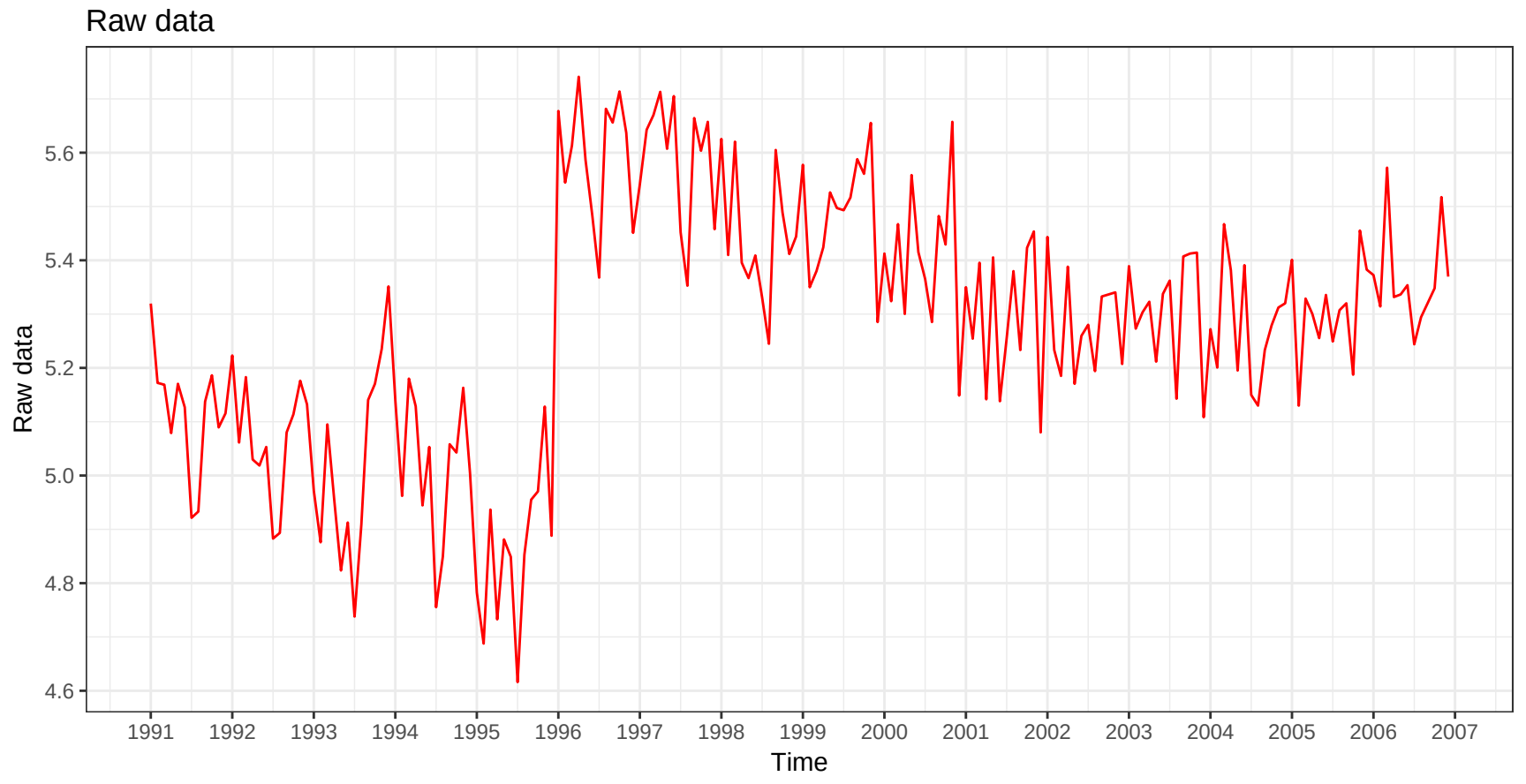


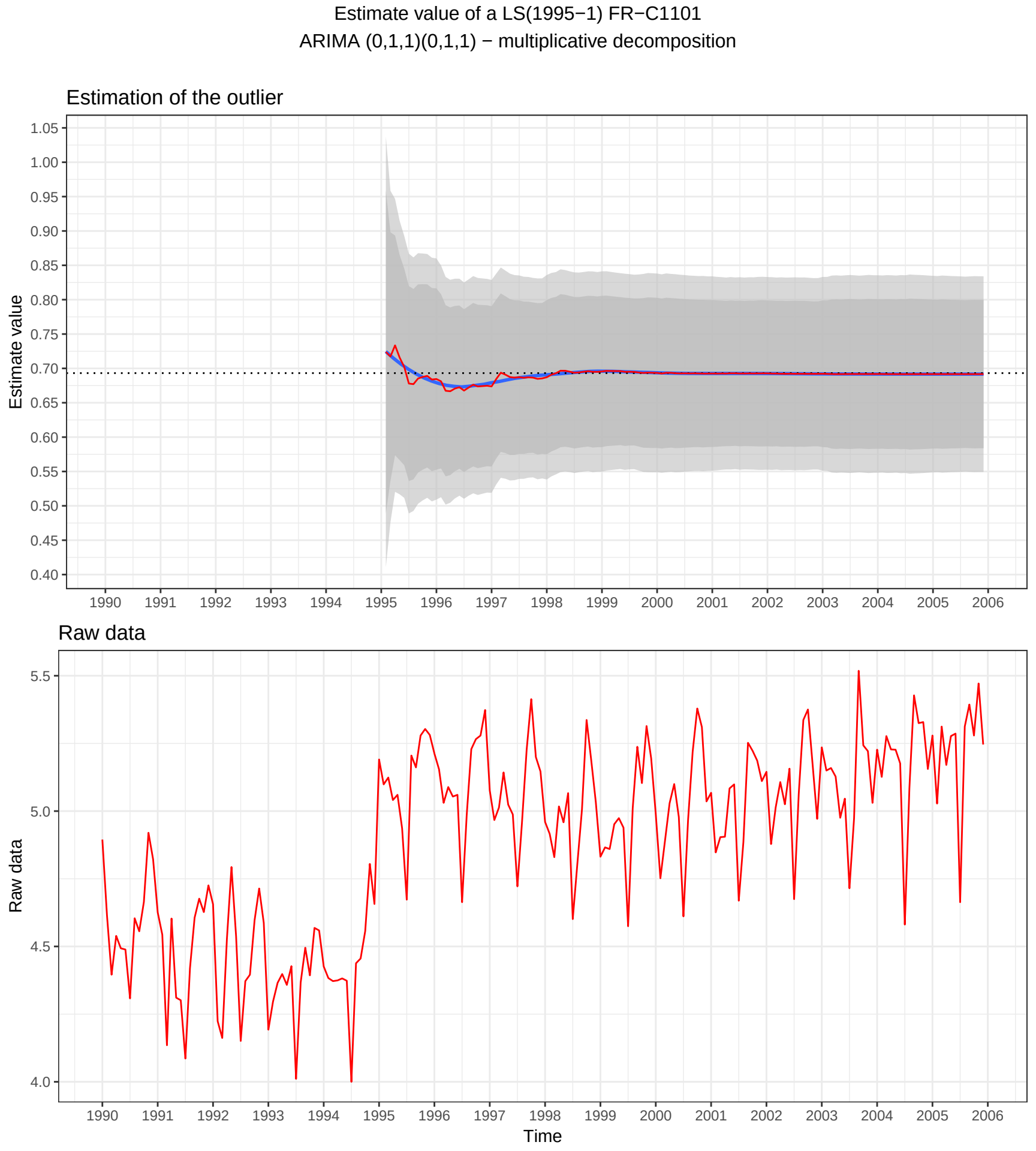


Estimate value of a LS(1996−1) DE−C1101

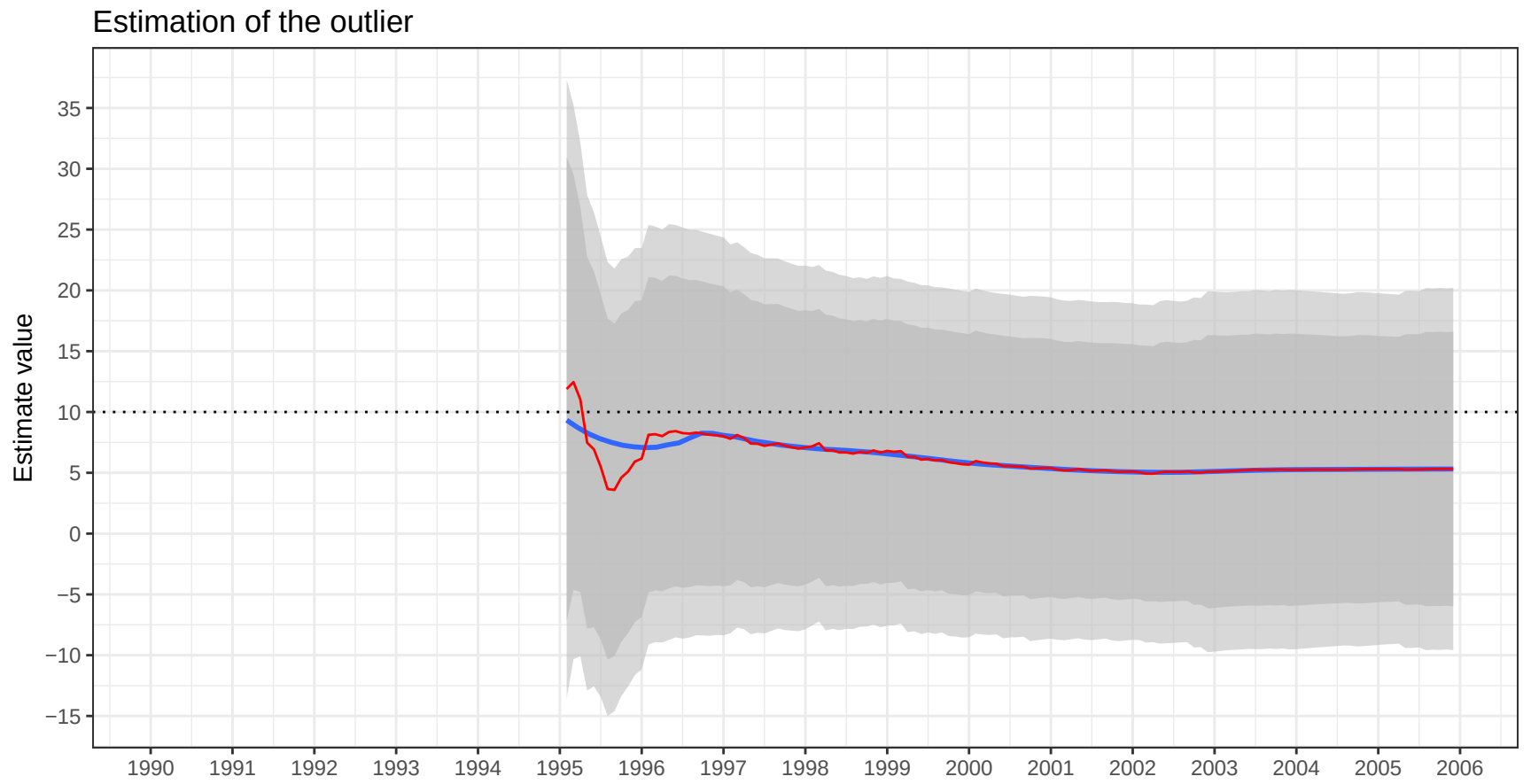
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

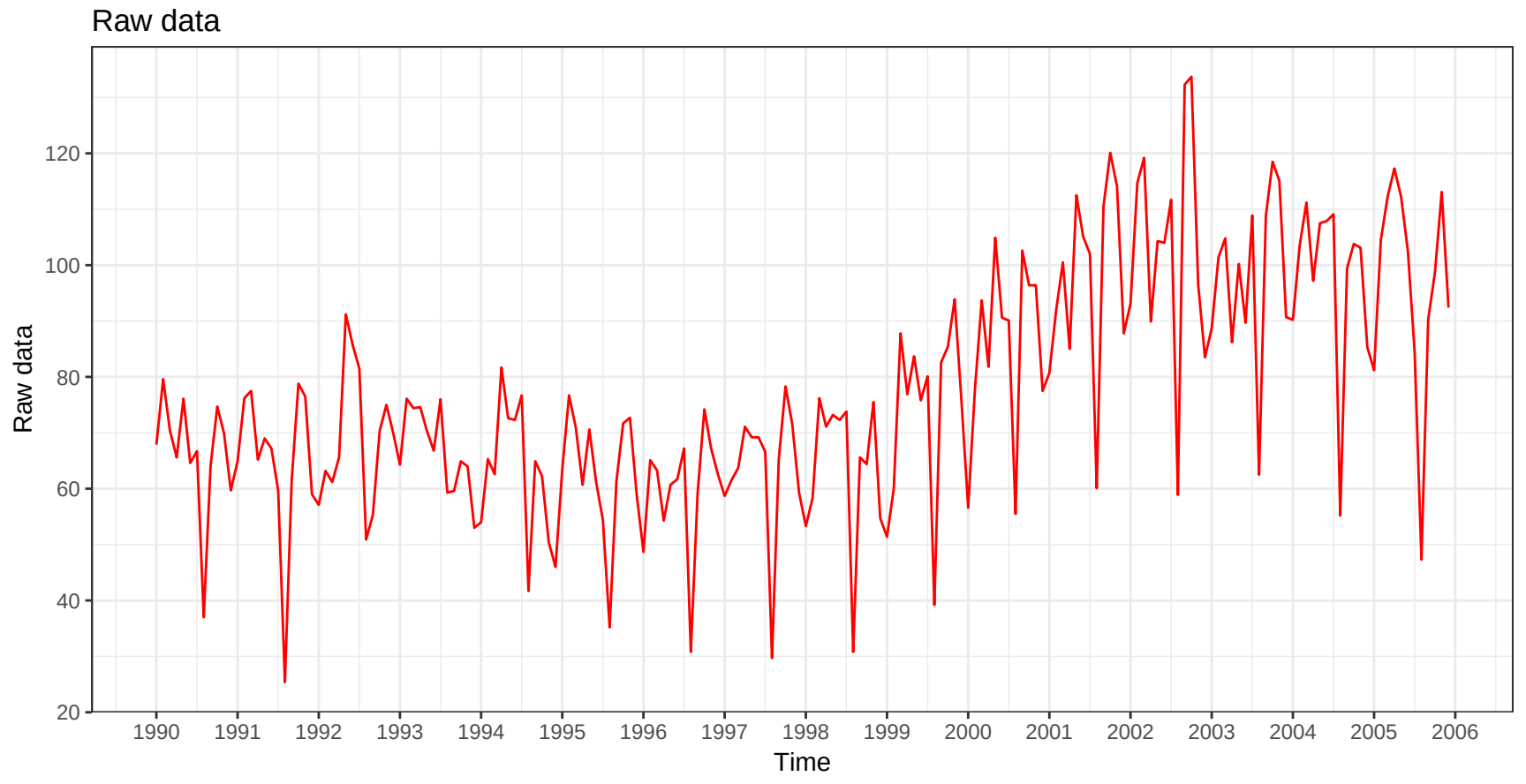




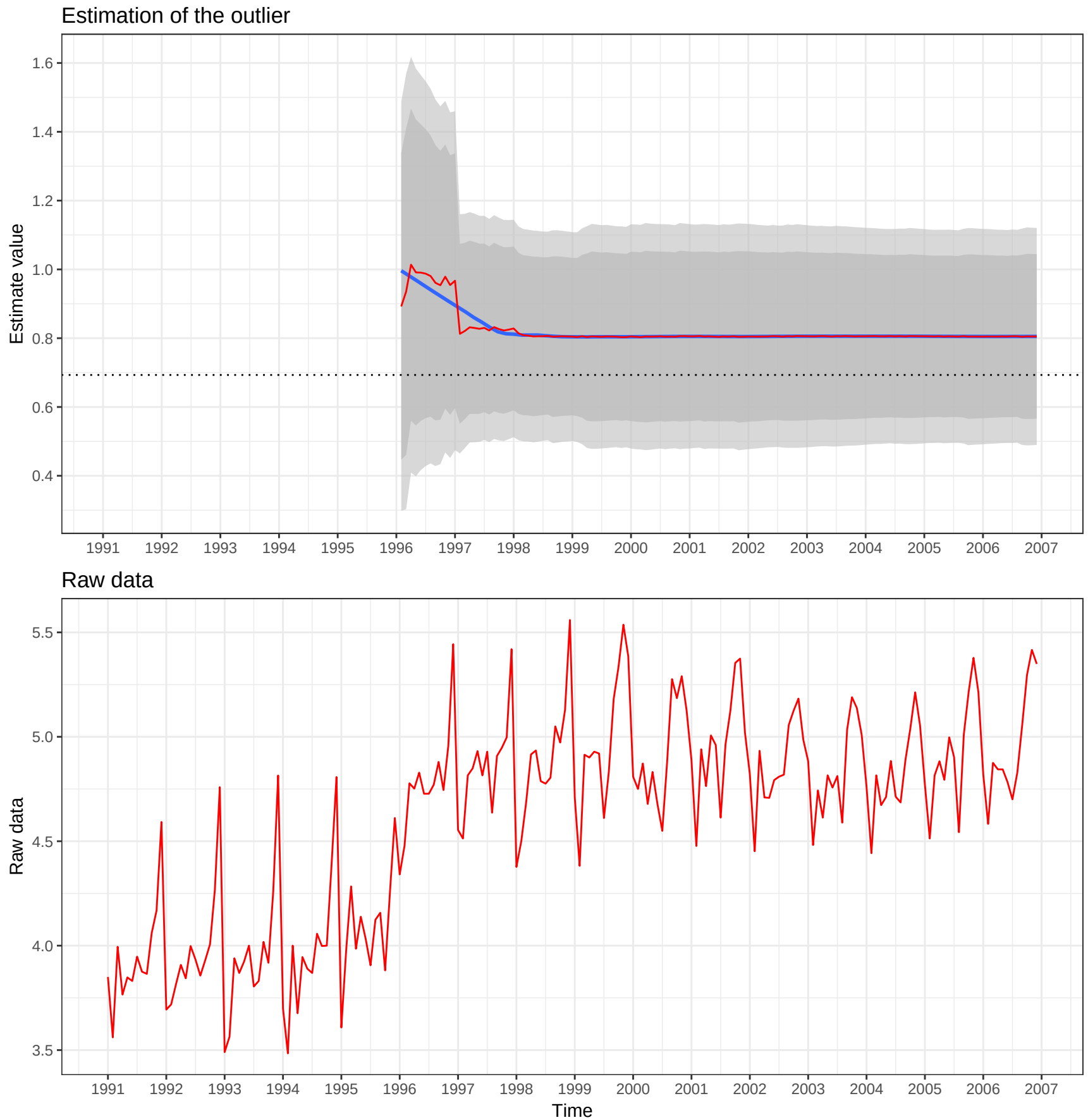

Estimate value of a LS(1995−1) FR−C1101
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
1.05
1.00
0.95
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
0.45
0.40
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
5.5
5.0
4.5
4.0
Time

Estimate value of a LS(1995−1) IT−C1101
ARIMA (1,1,1)(0,1,1) − additive decomposition



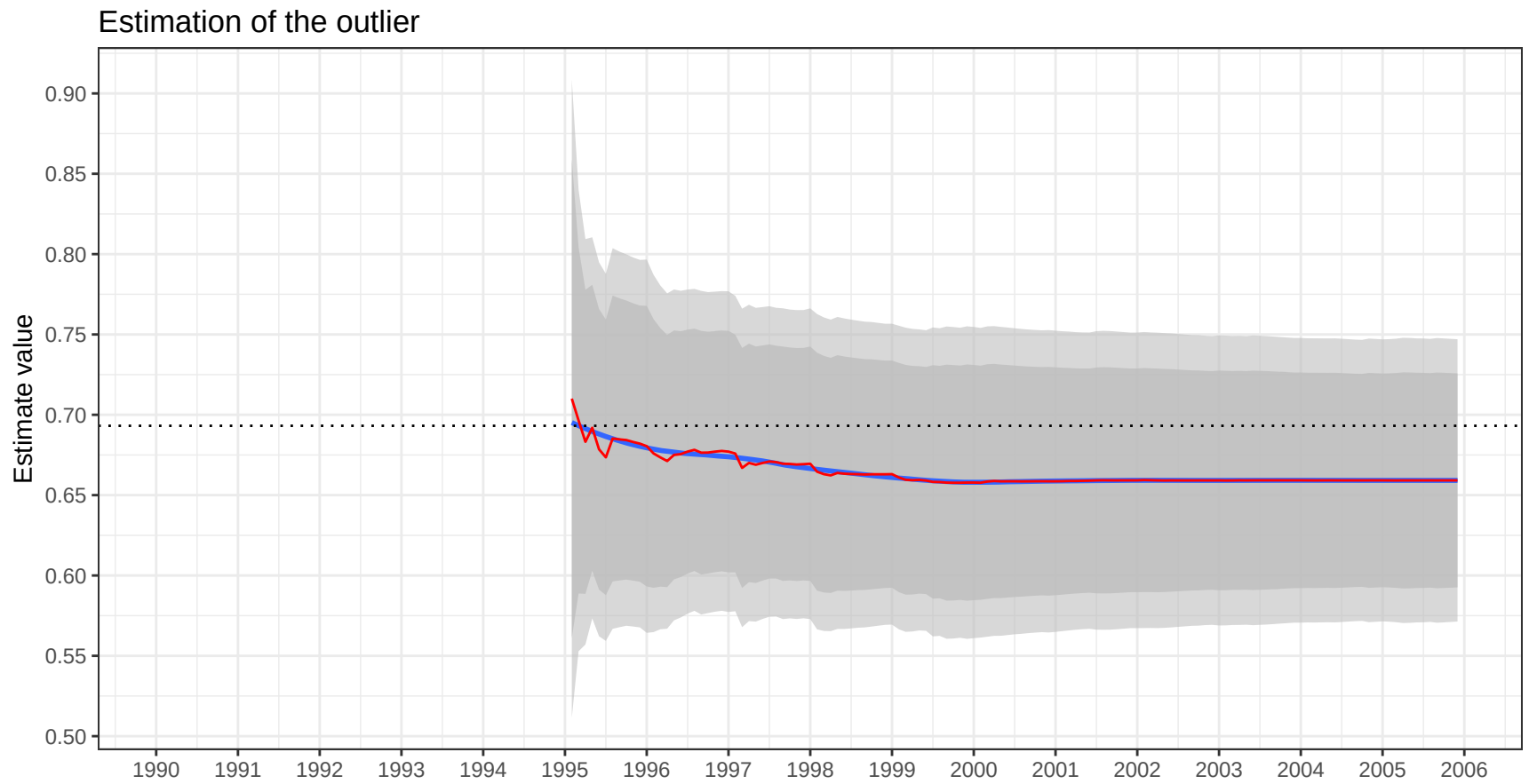


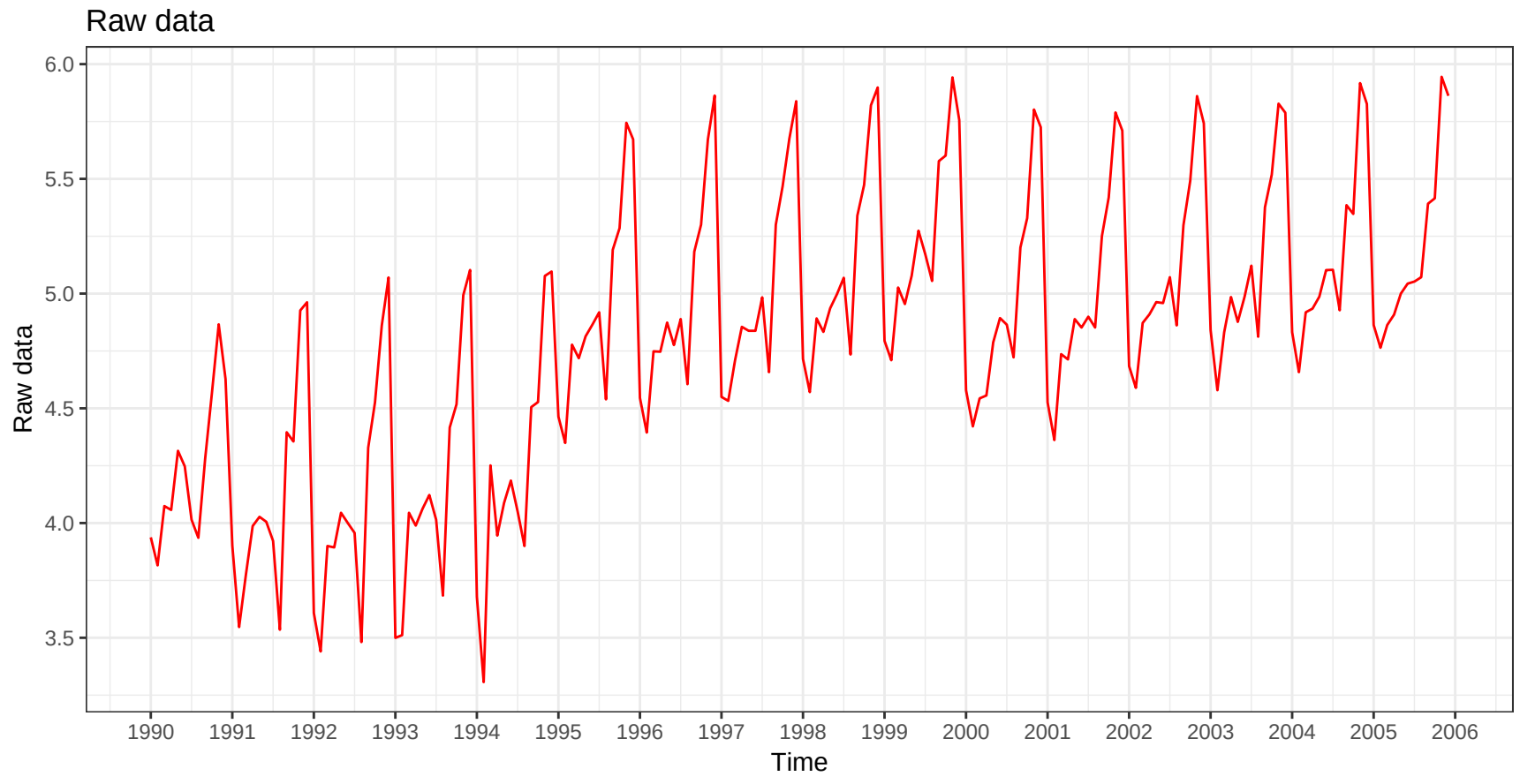
Estimate value of a LS(1996−1) DE−C1102
ARIMA (1,0,1)(1,1,0) − multiplicative decomposition



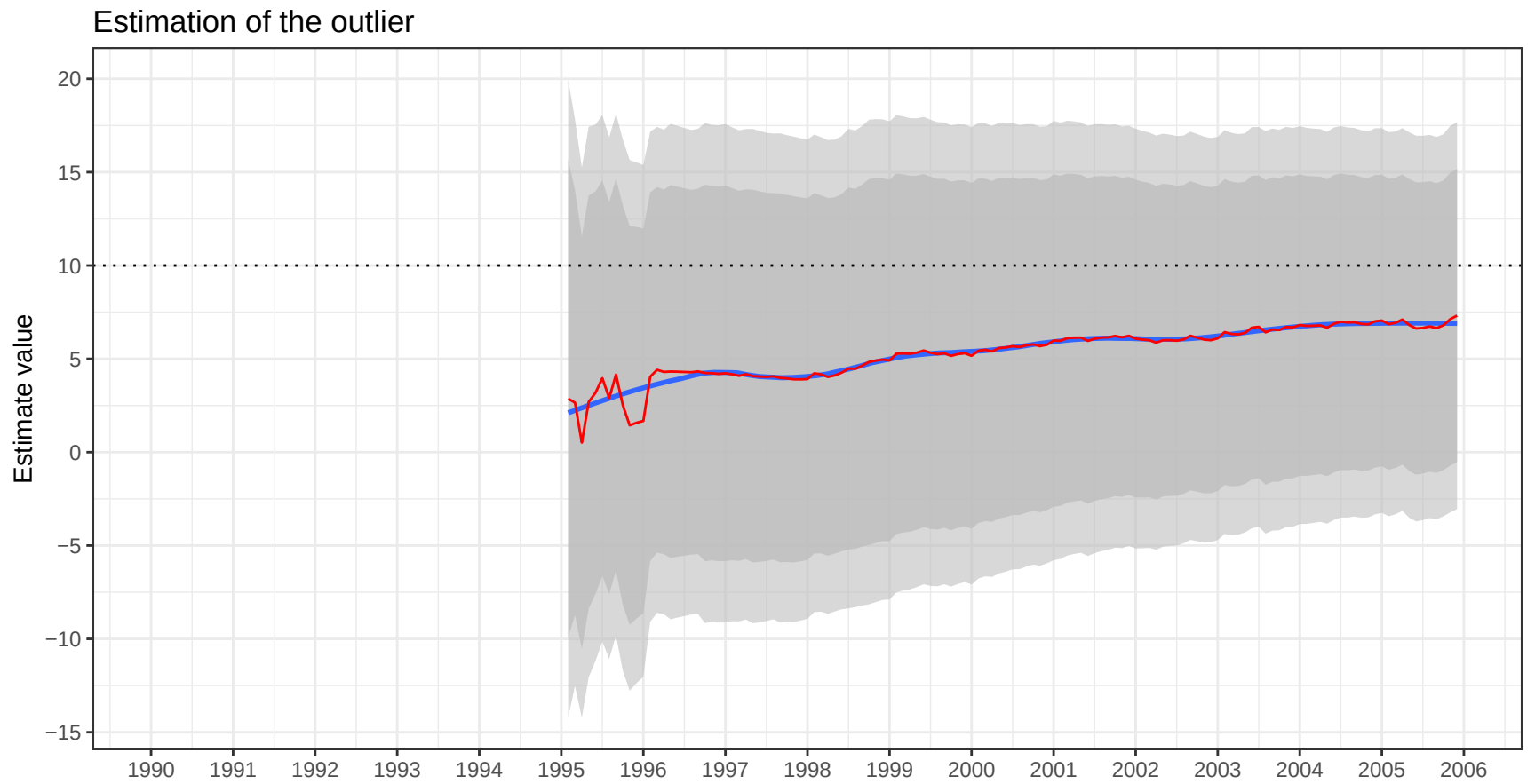
Estimate value of a LS(1995−1) FR−C1102

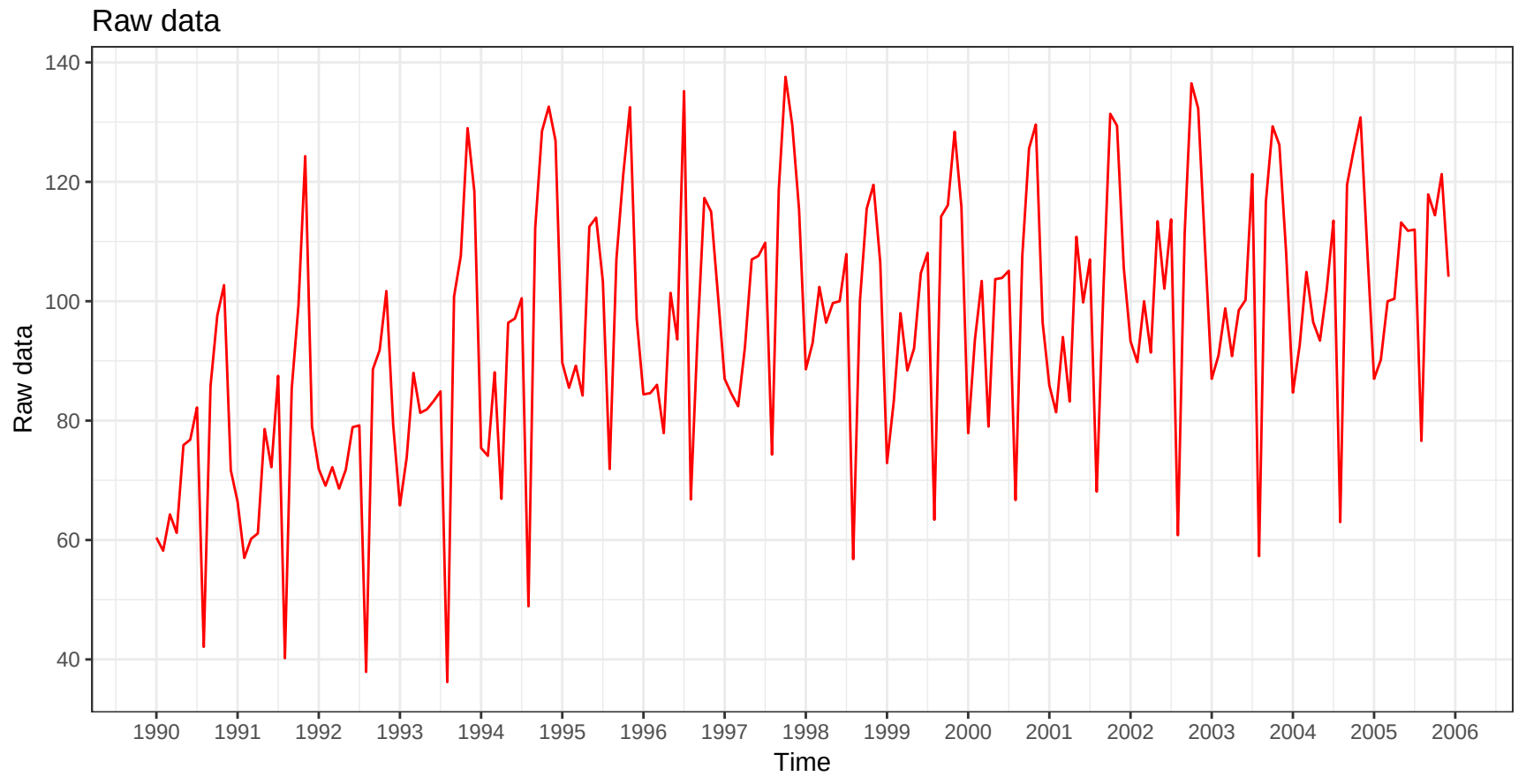
ARIMA (0,1,2)(0,1,1) − multiplicative decomposition



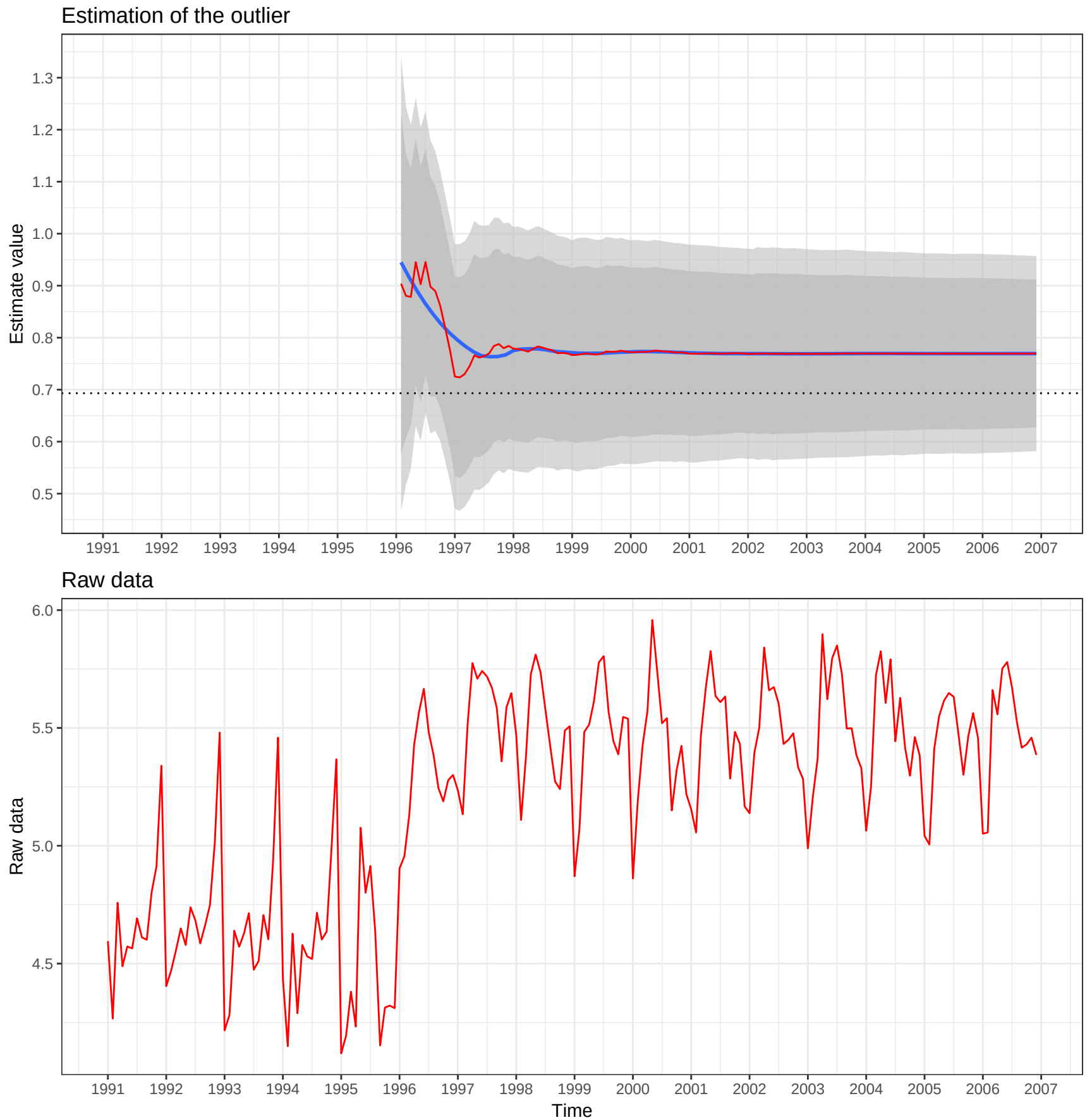


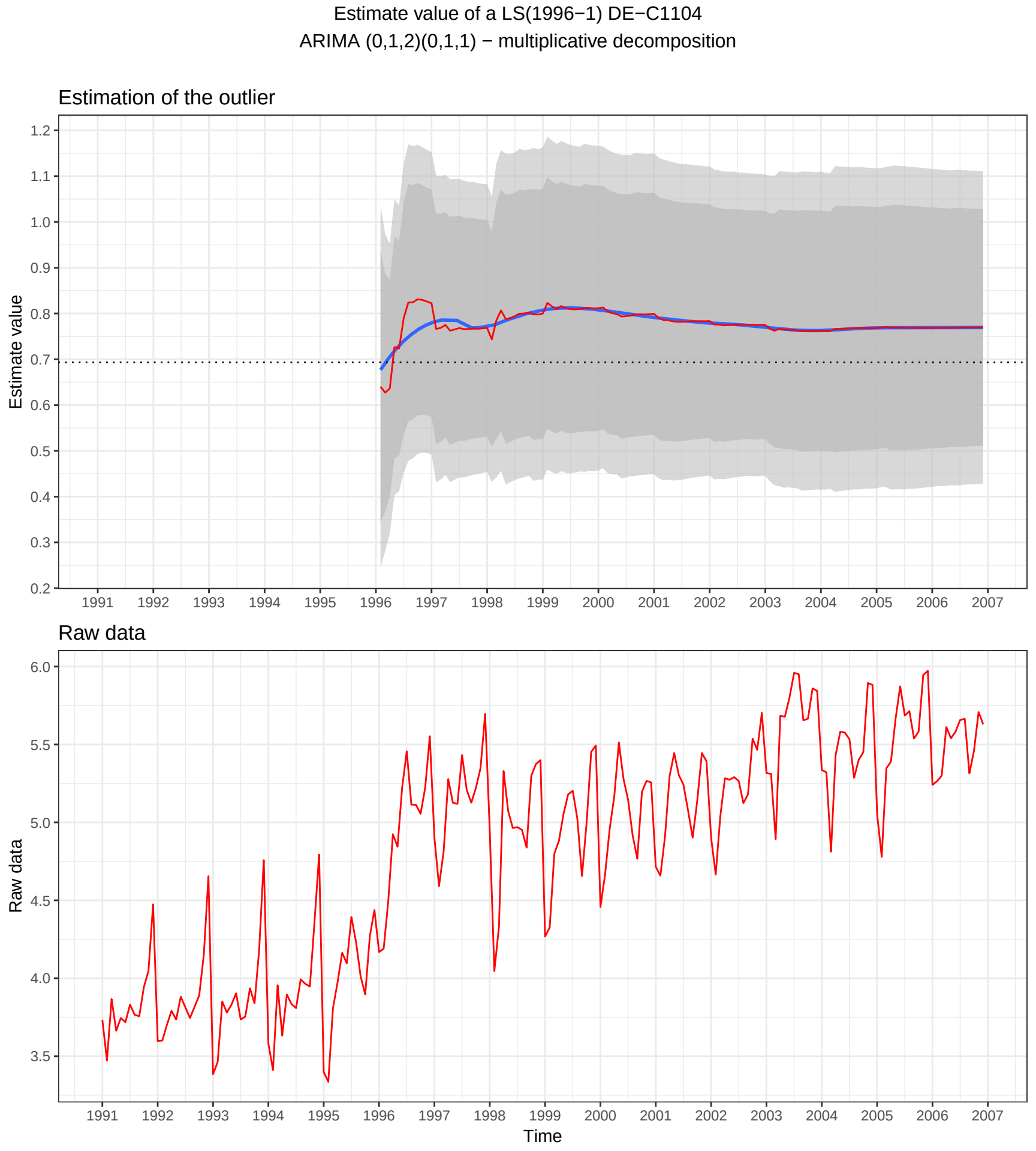
Estimate value of a LS(1995−1) IT−C1102
ARIMA (1,0,1)(1,1,1) − additive decomposition

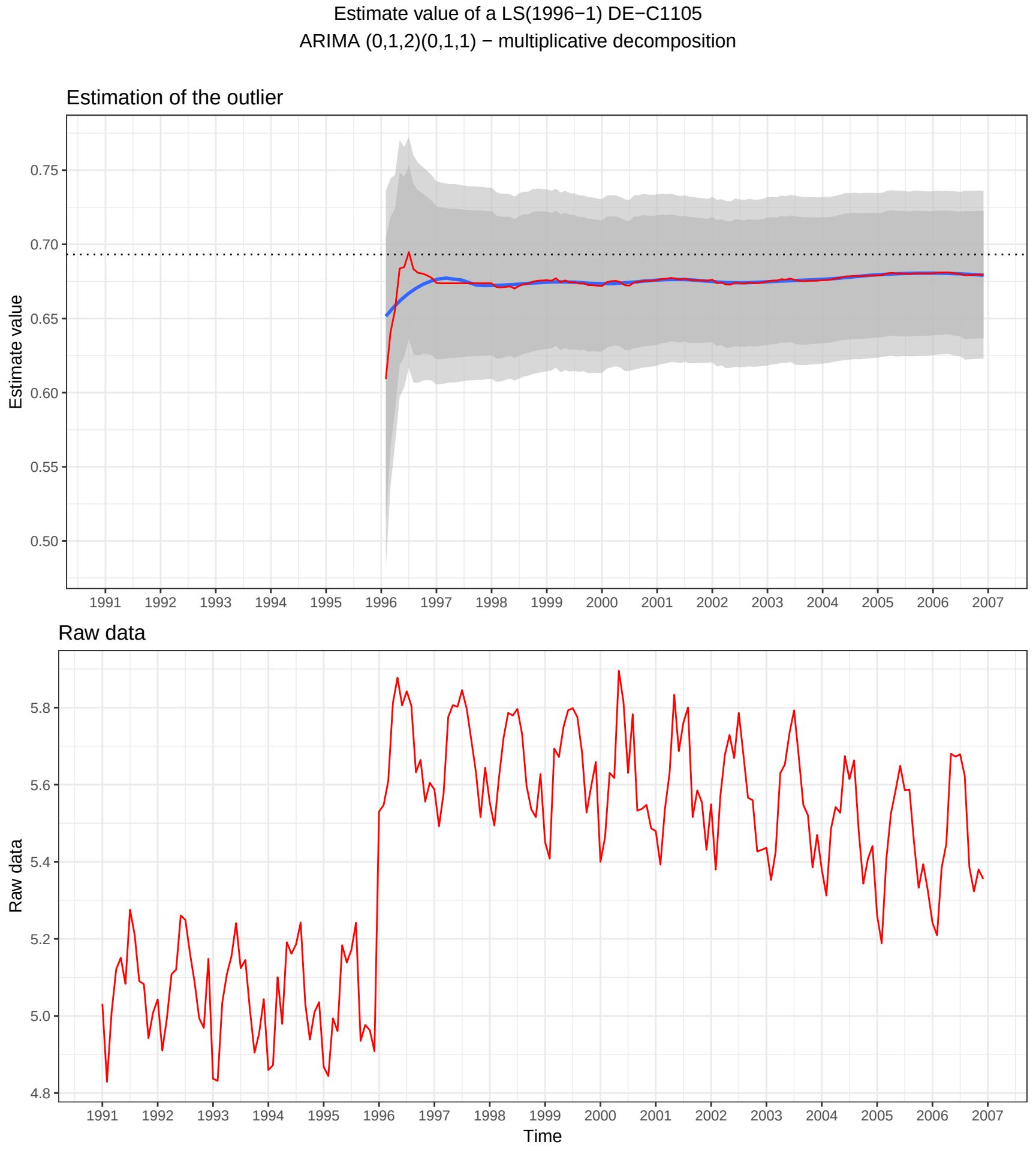




Estimate value of a LS(1996−1) DE−C1103
ARIMA (1,0,1)(0,1,1) − multiplicative decomposition

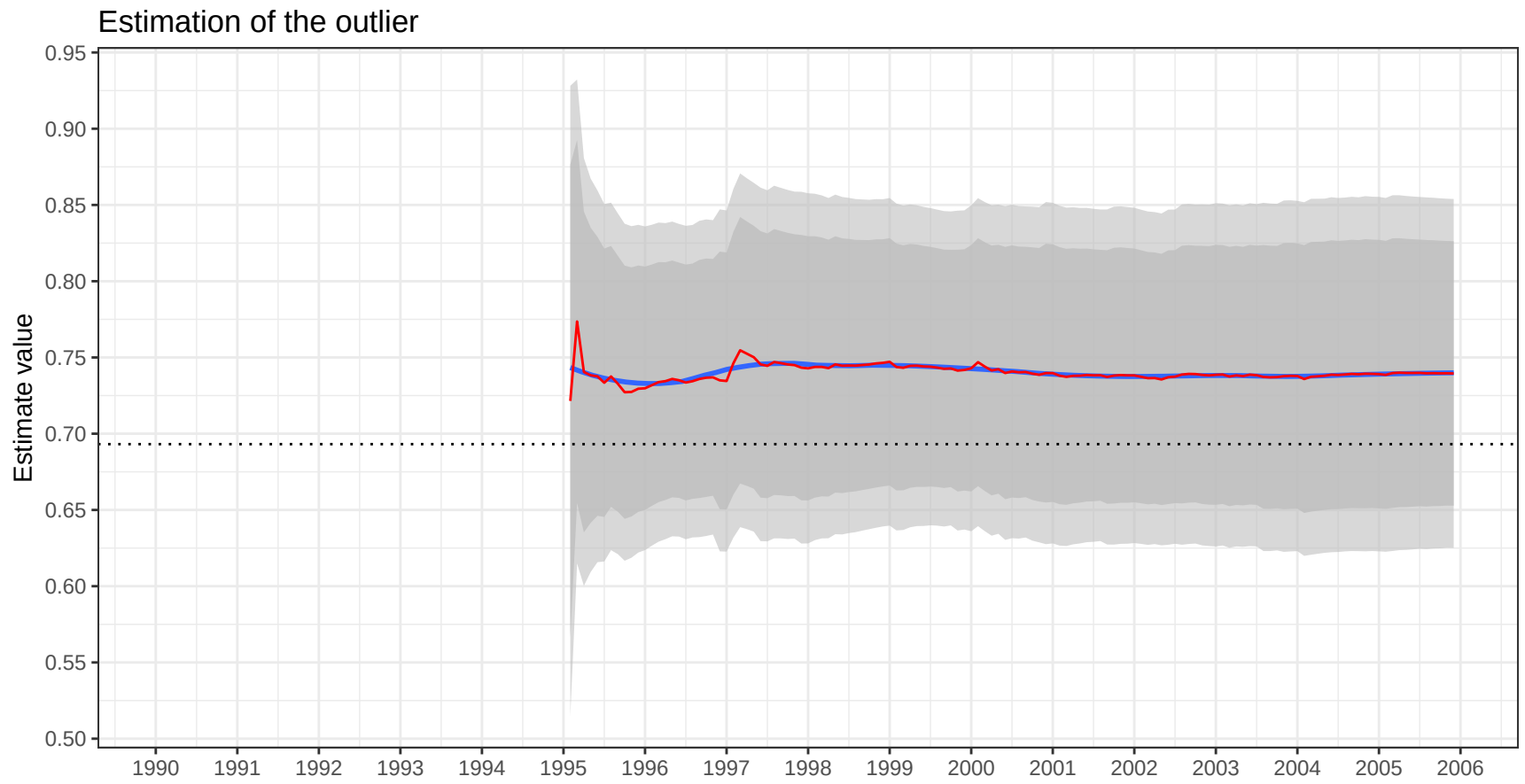


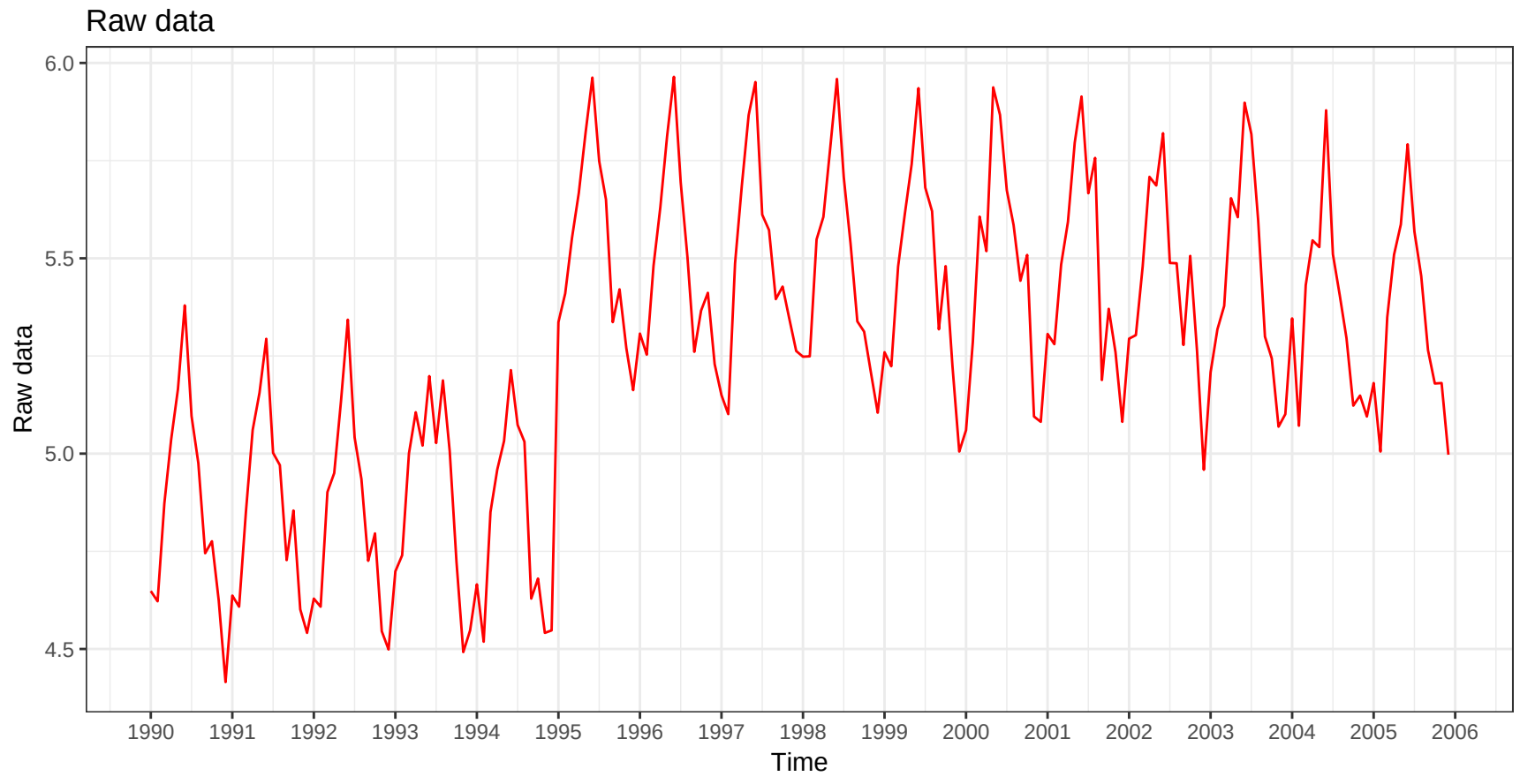

Estimate value of a LS(1996−1) DE−C1104
ARIMA (0,1,2)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
6.0
5.5
5.0
4.5
4.0
3.5
Time


Estimate value of a LS(1996−1) DE−C1105
ARIMA (0,1,2)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.75
0.70
0.65
0.60
0.55
0.50
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
5.8
5.6
5.4
5.2
5.0
4.8
Time

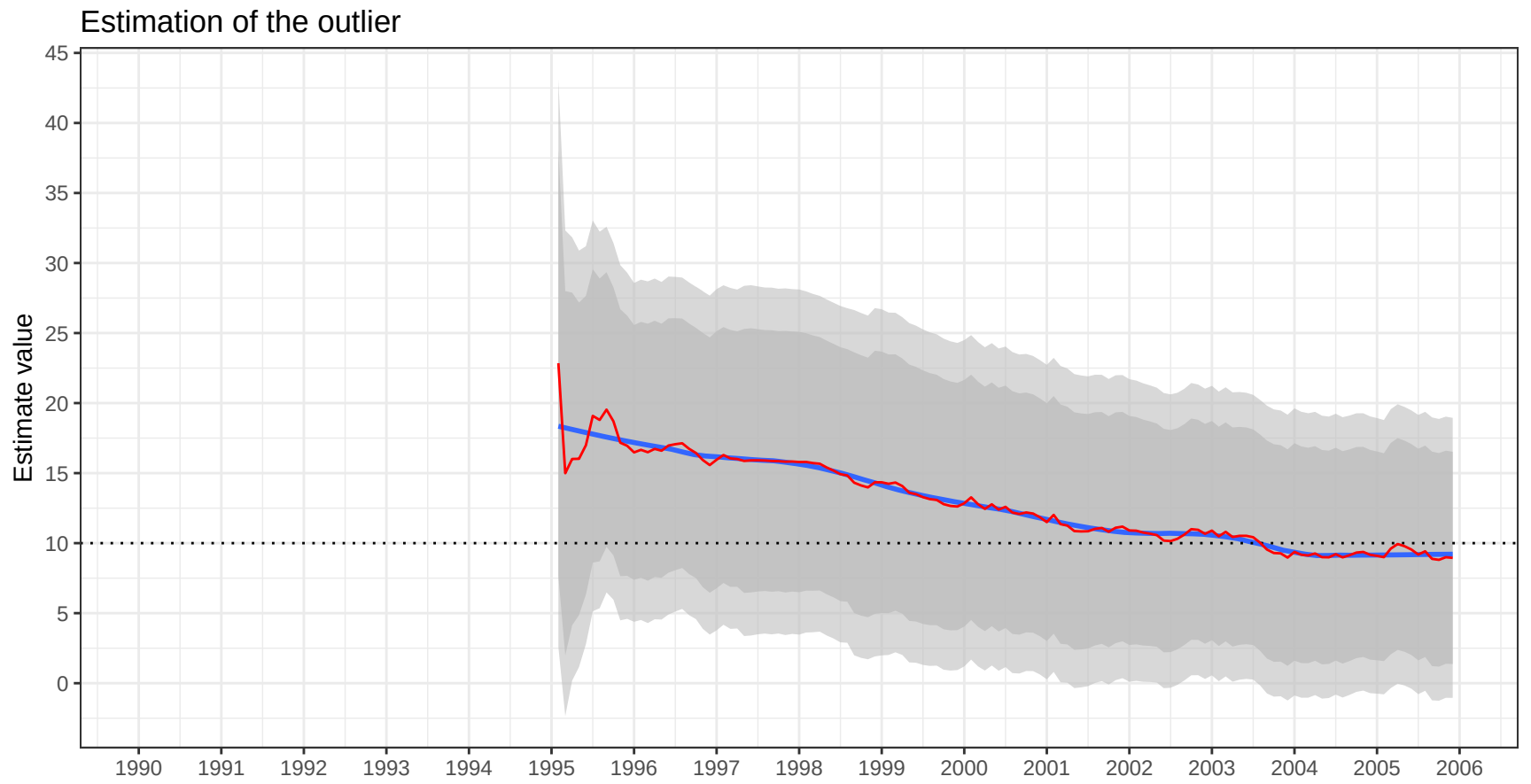
Estimate value of a LS(1995−1) FR−C1105

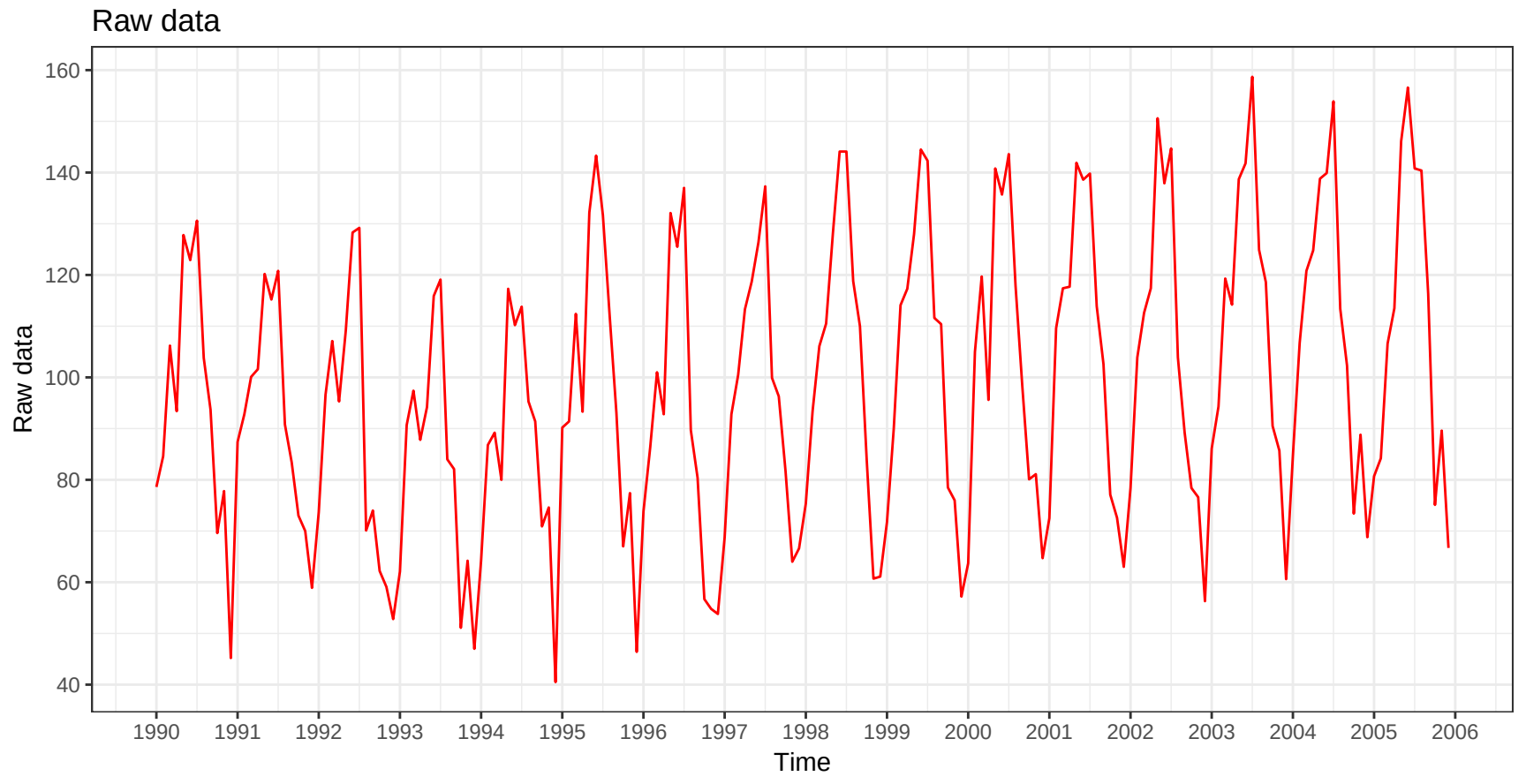
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition



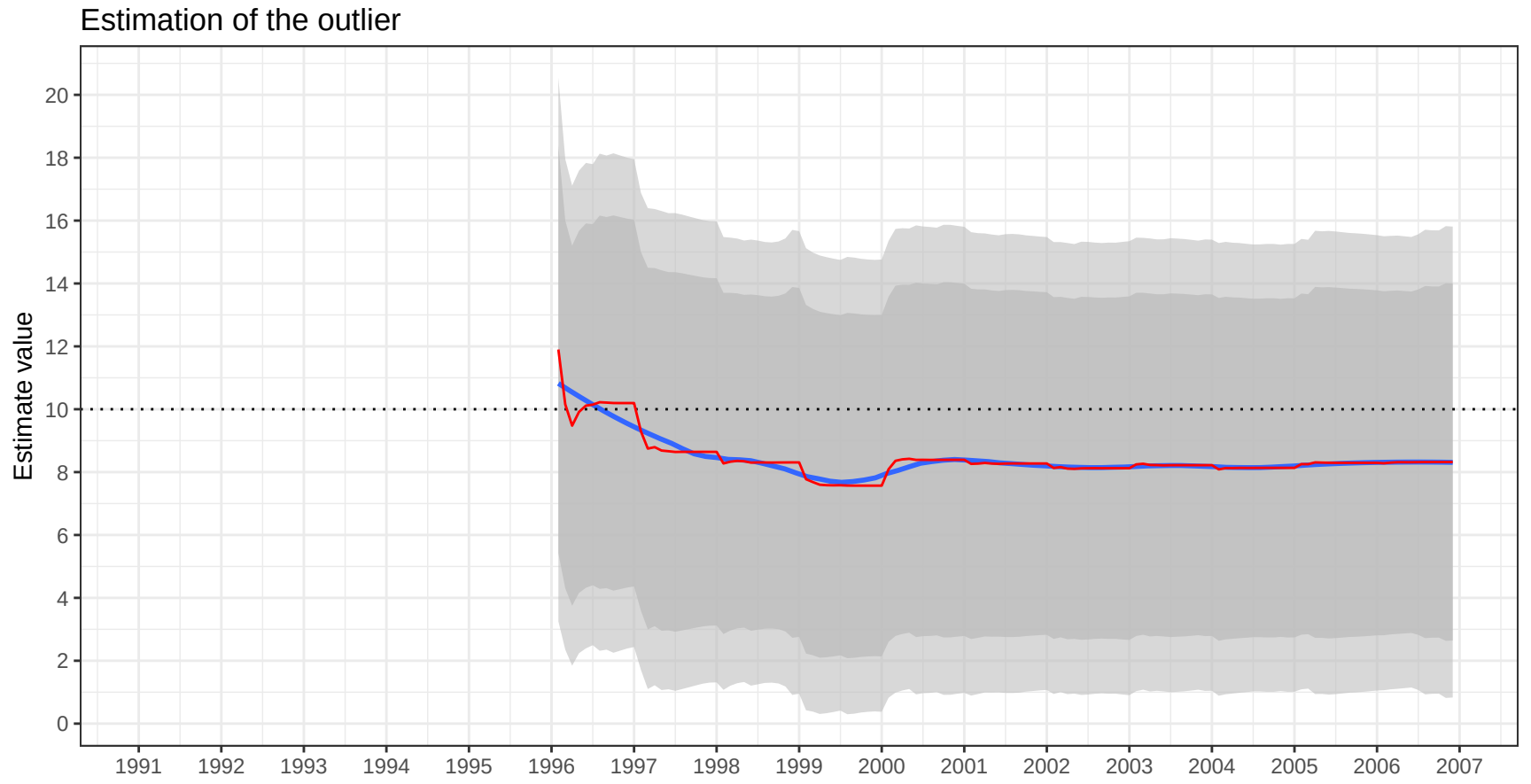


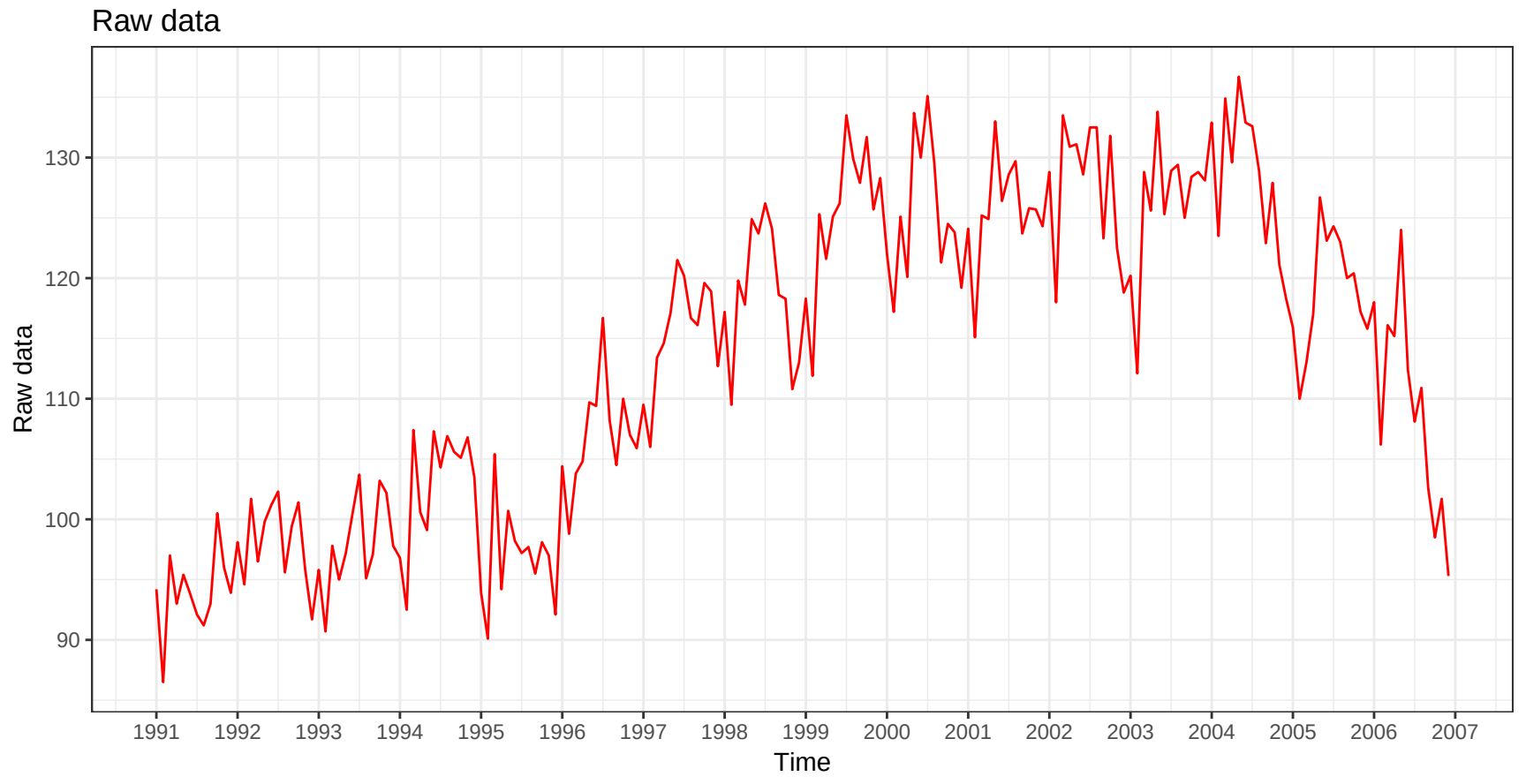
Estimate value of a LS(1995−1) IT−C1105
ARIMA (1,0,1)(0,1,1) − additive decomposition

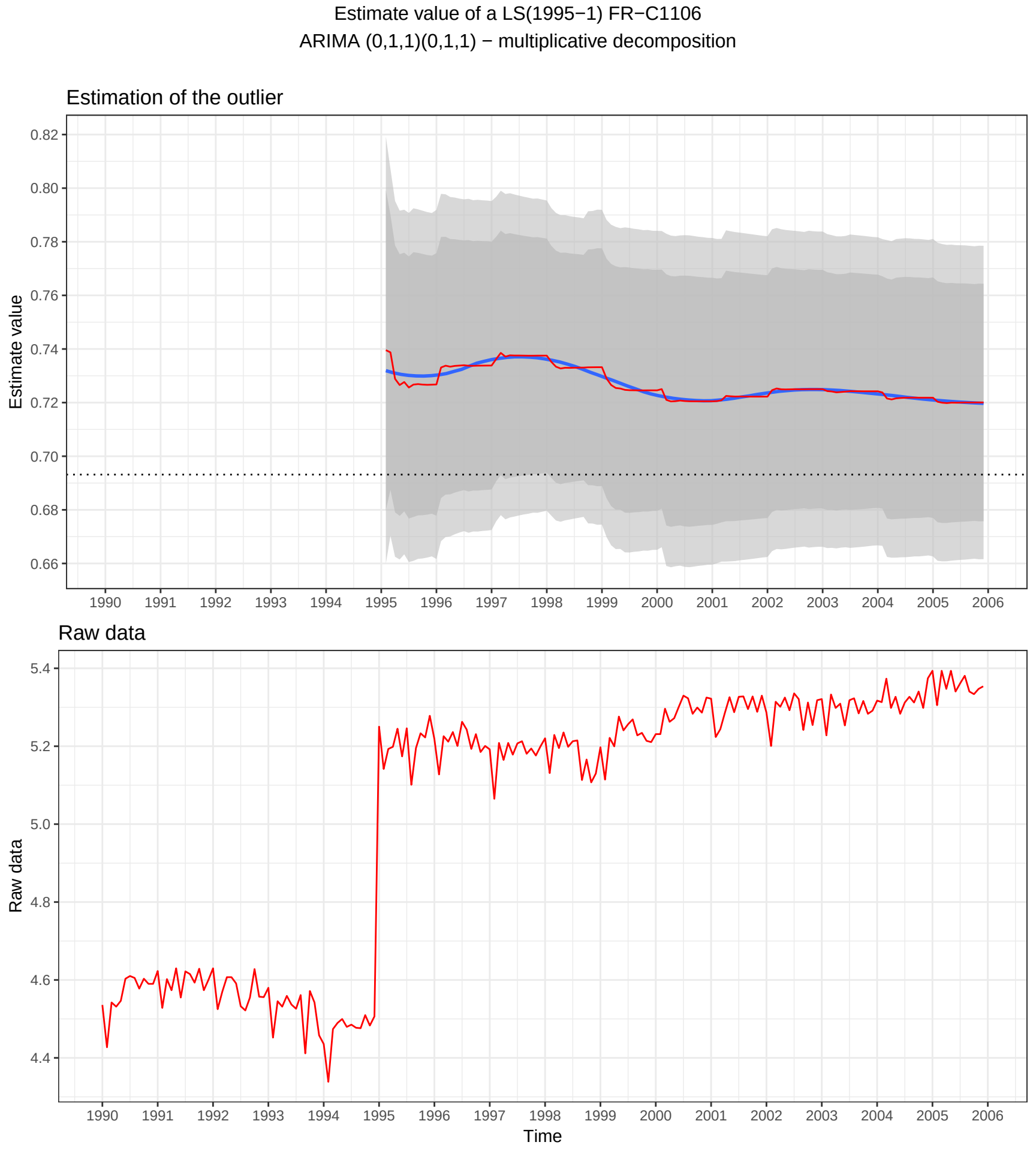




Estimate value of a LS(1996−1) DE−C1106
ARIMA (0,1,1)(0,1,1) − additive decomposition

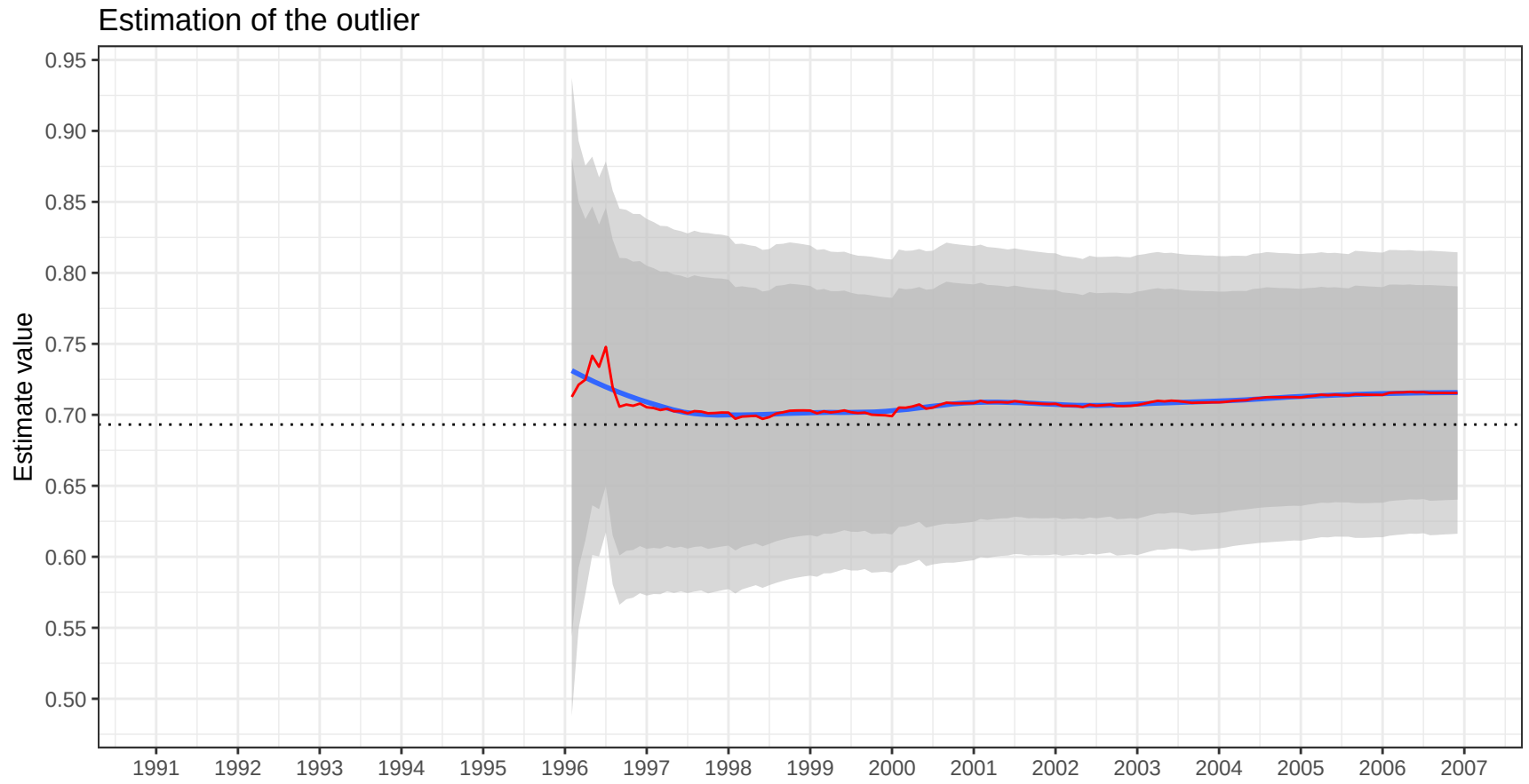


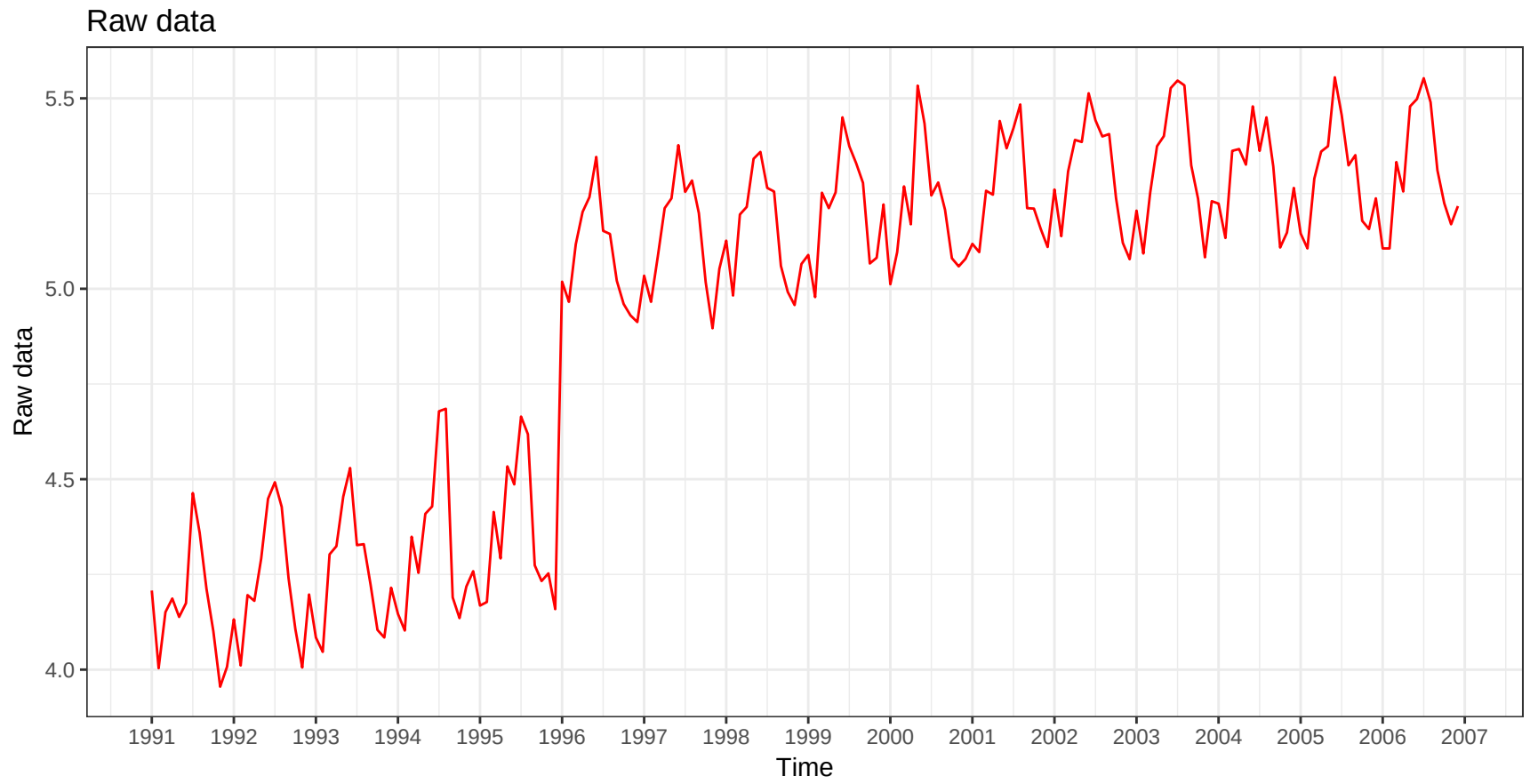



Estimate value of a LS(1995−1) FR−C1106
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.82
0.80
0.78
0.76
0.74
0.72
0.70
0.68
0.66
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
5.4
5.2
5.0
4.8
4.6
4.4
Time

Estimate value of a LS(1996−1) DE−C1107

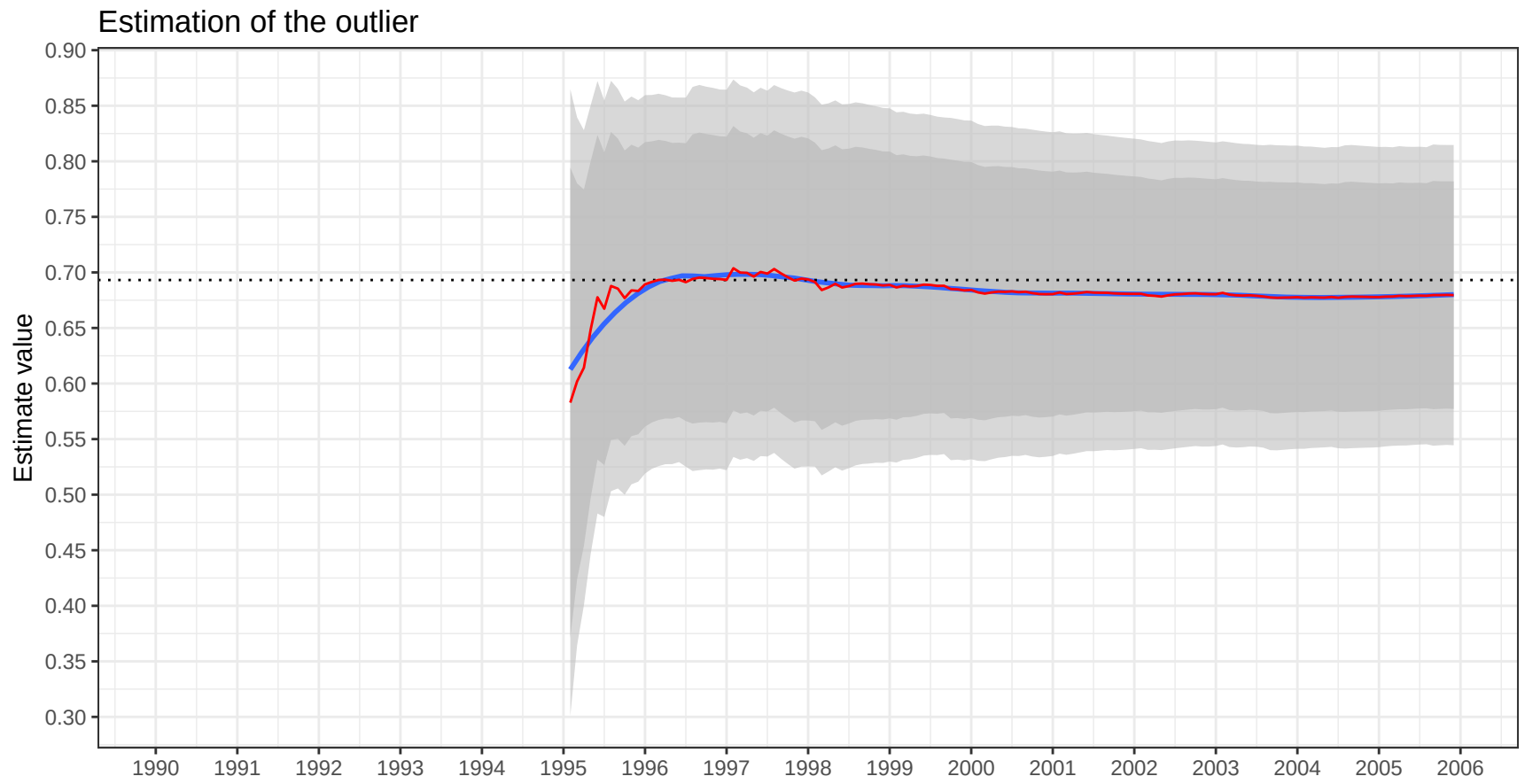
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

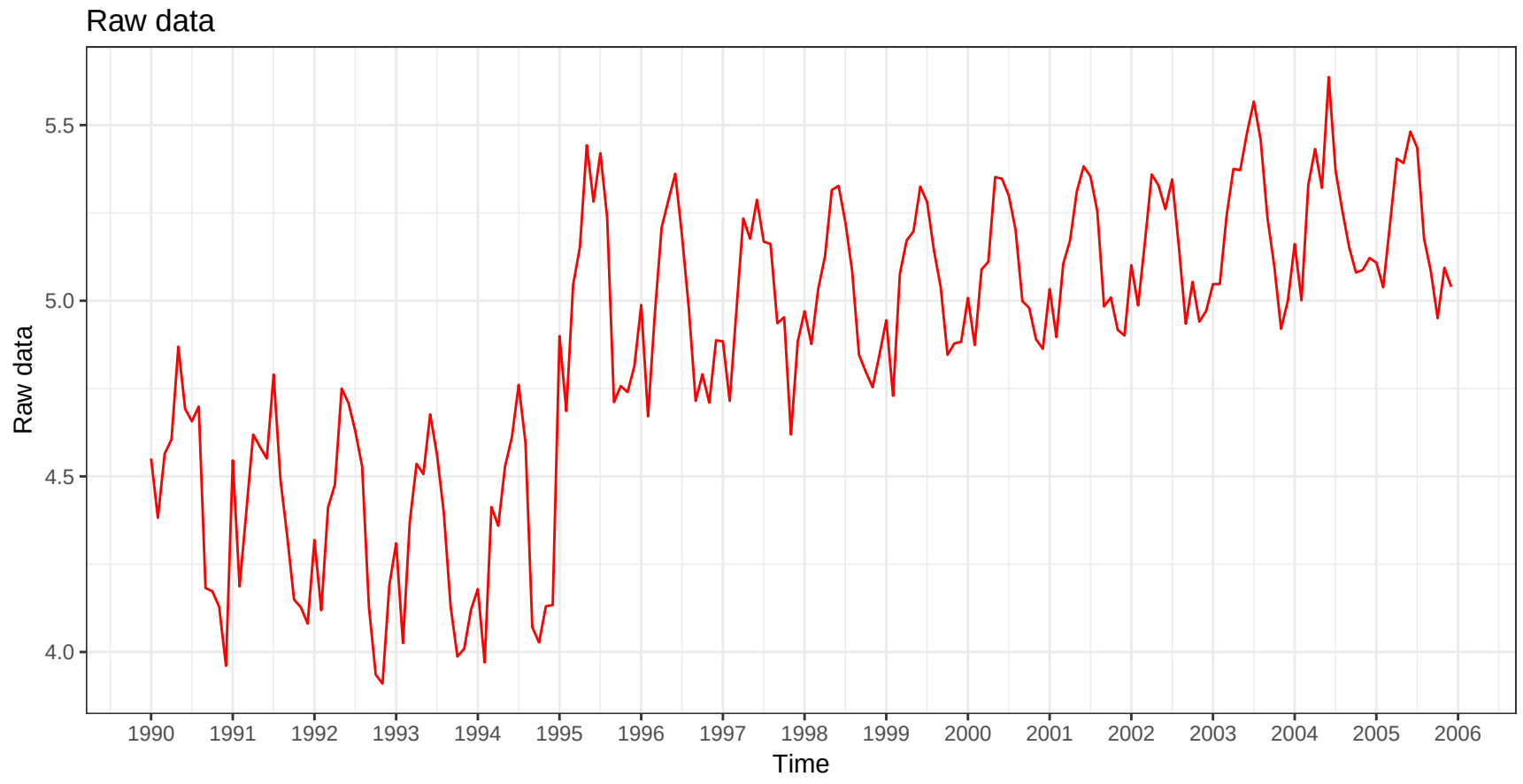




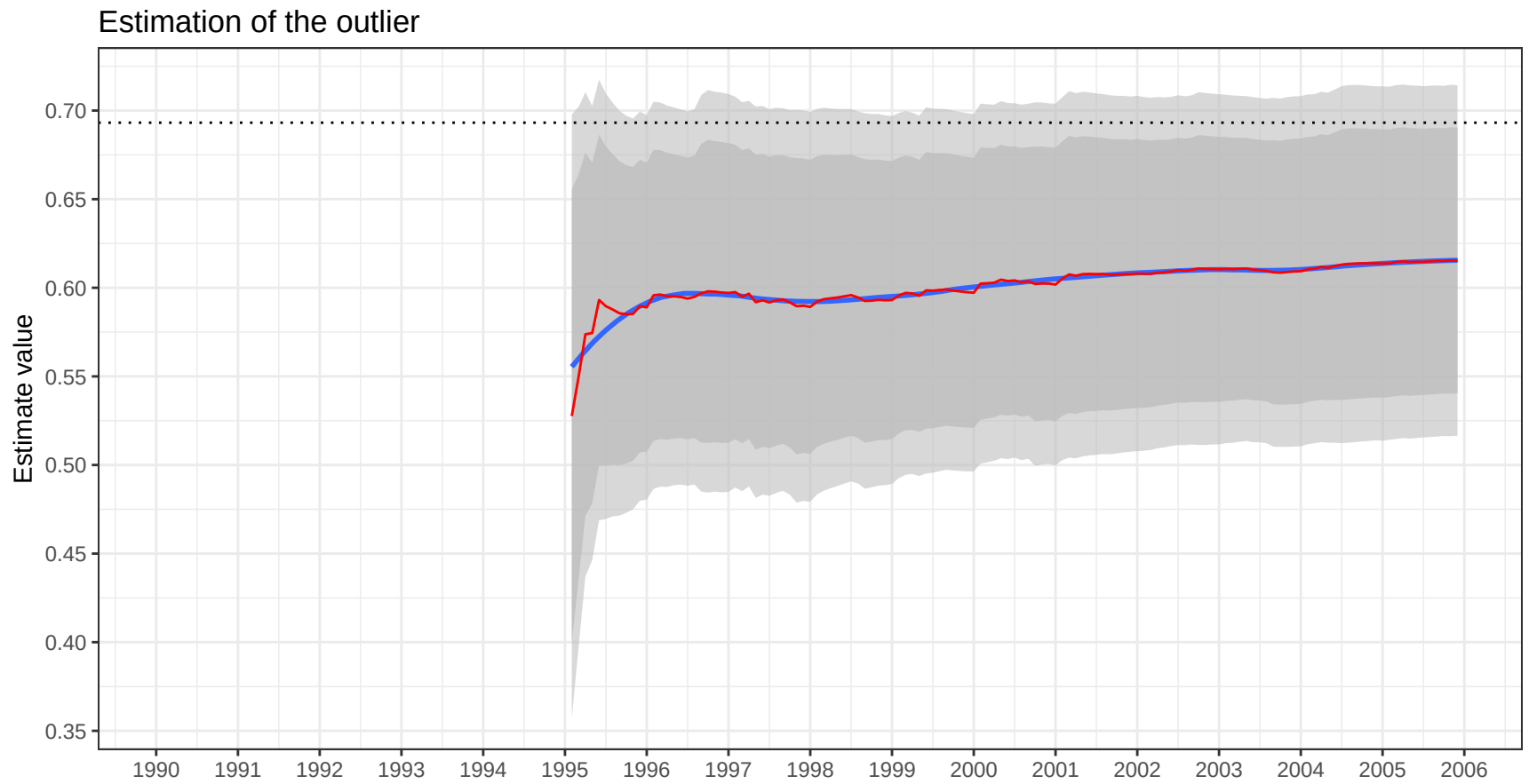
Estimate value of a LS(1995−1) FR−C1107

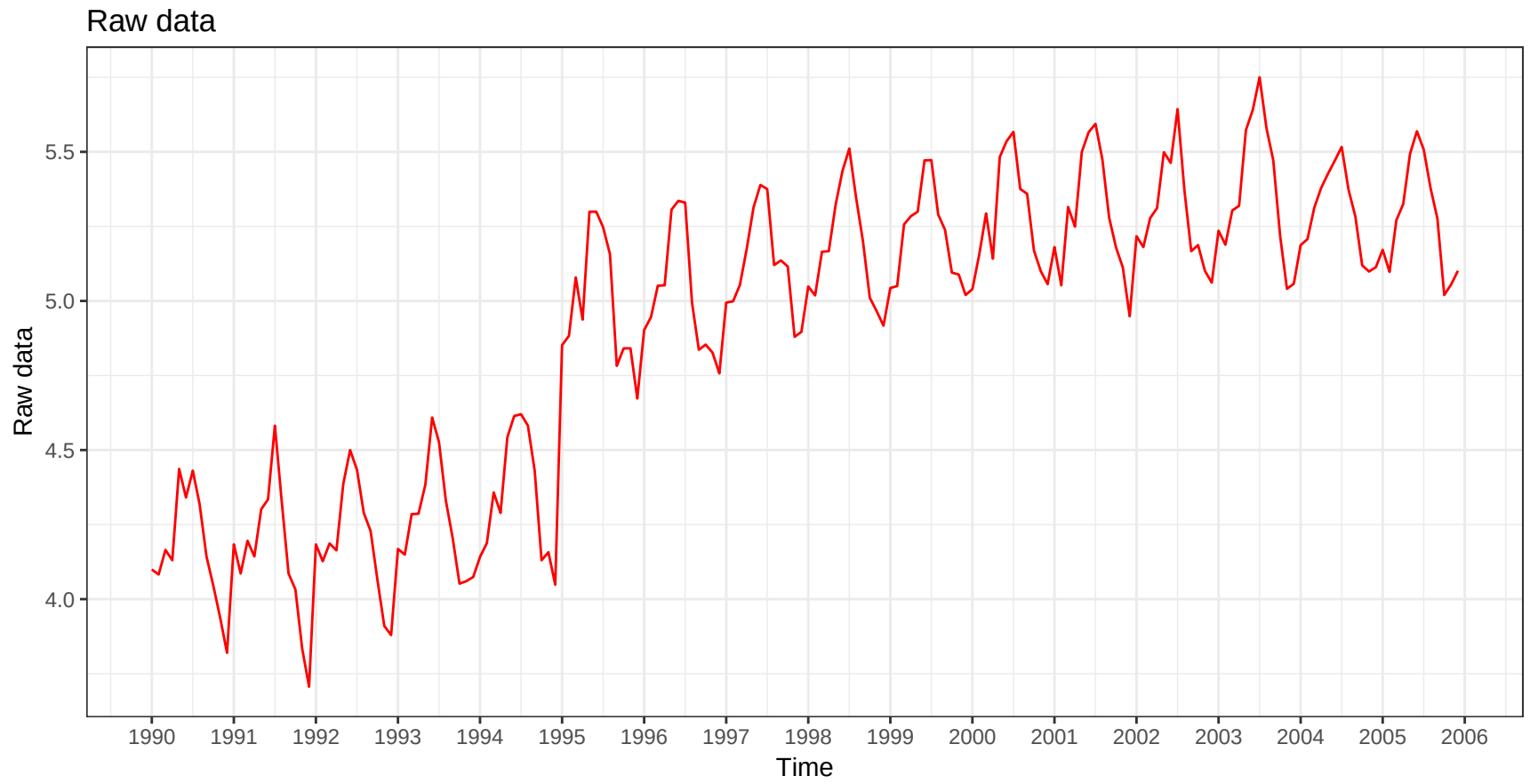
ARIMA (1,1,1)(0,1,1) − multiplicative decomposition

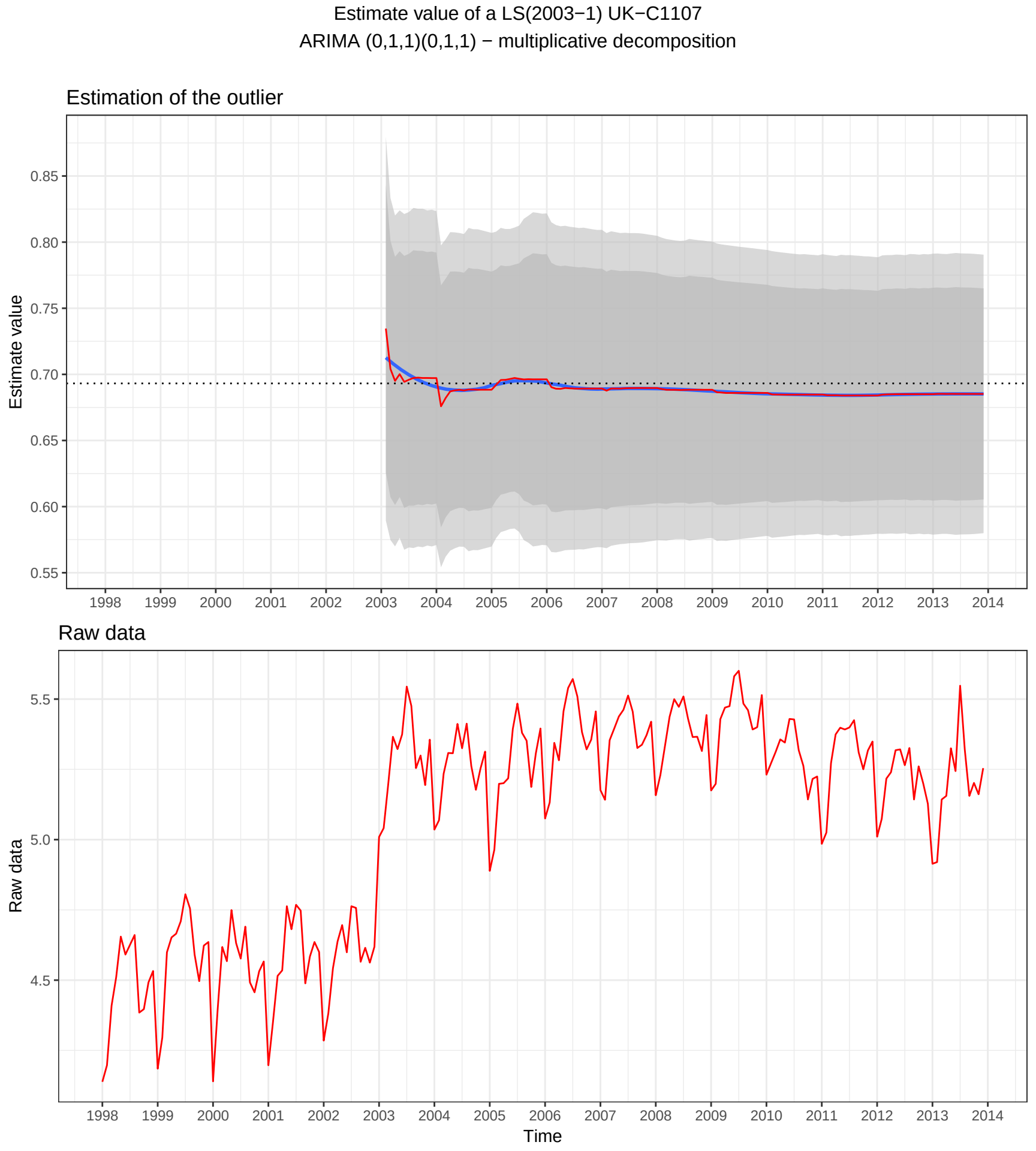




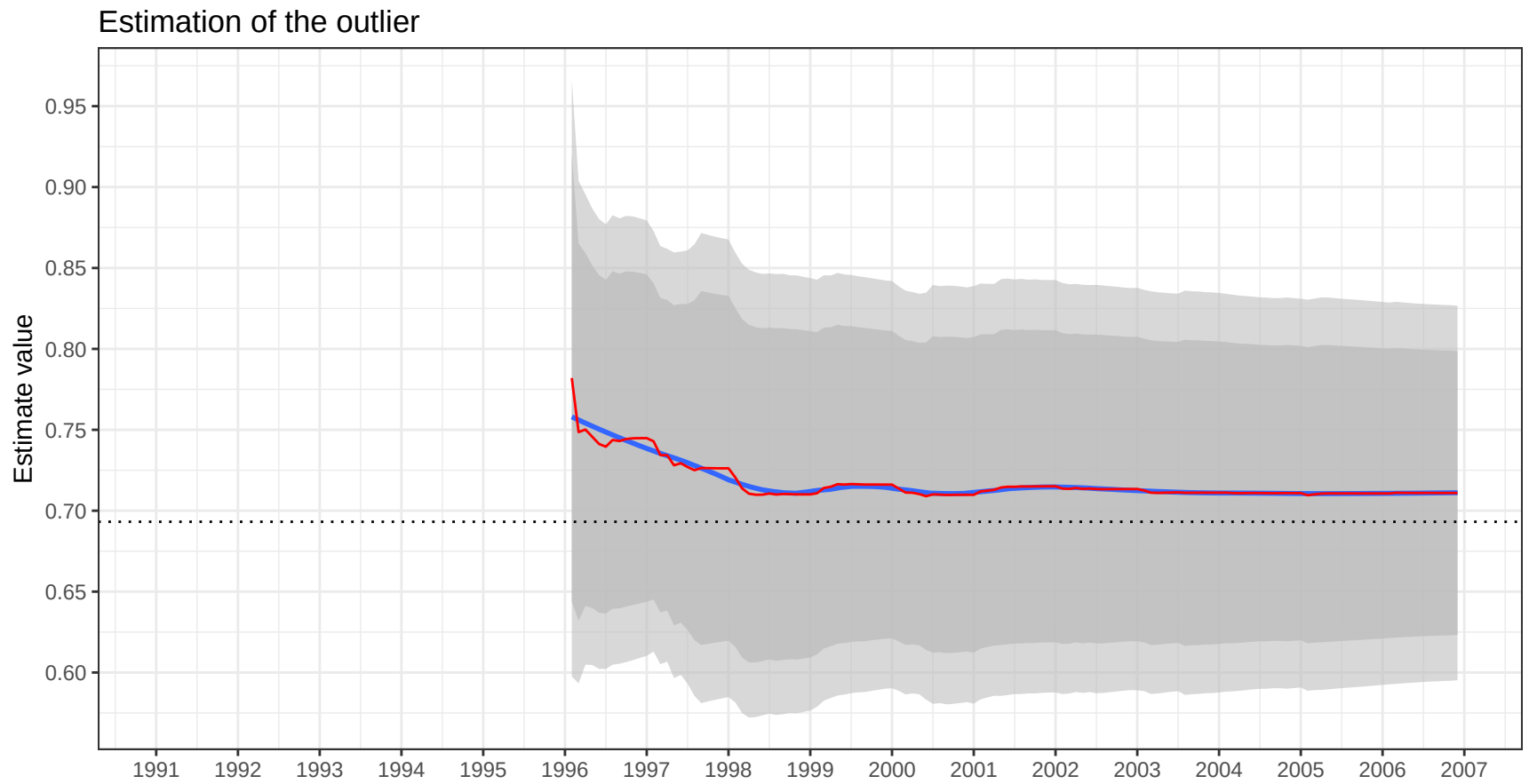
Estimate value of a LS(1995−1) IT−C1107
ARIMA (0,1,2)(0,1,1) − multiplicative decomposition

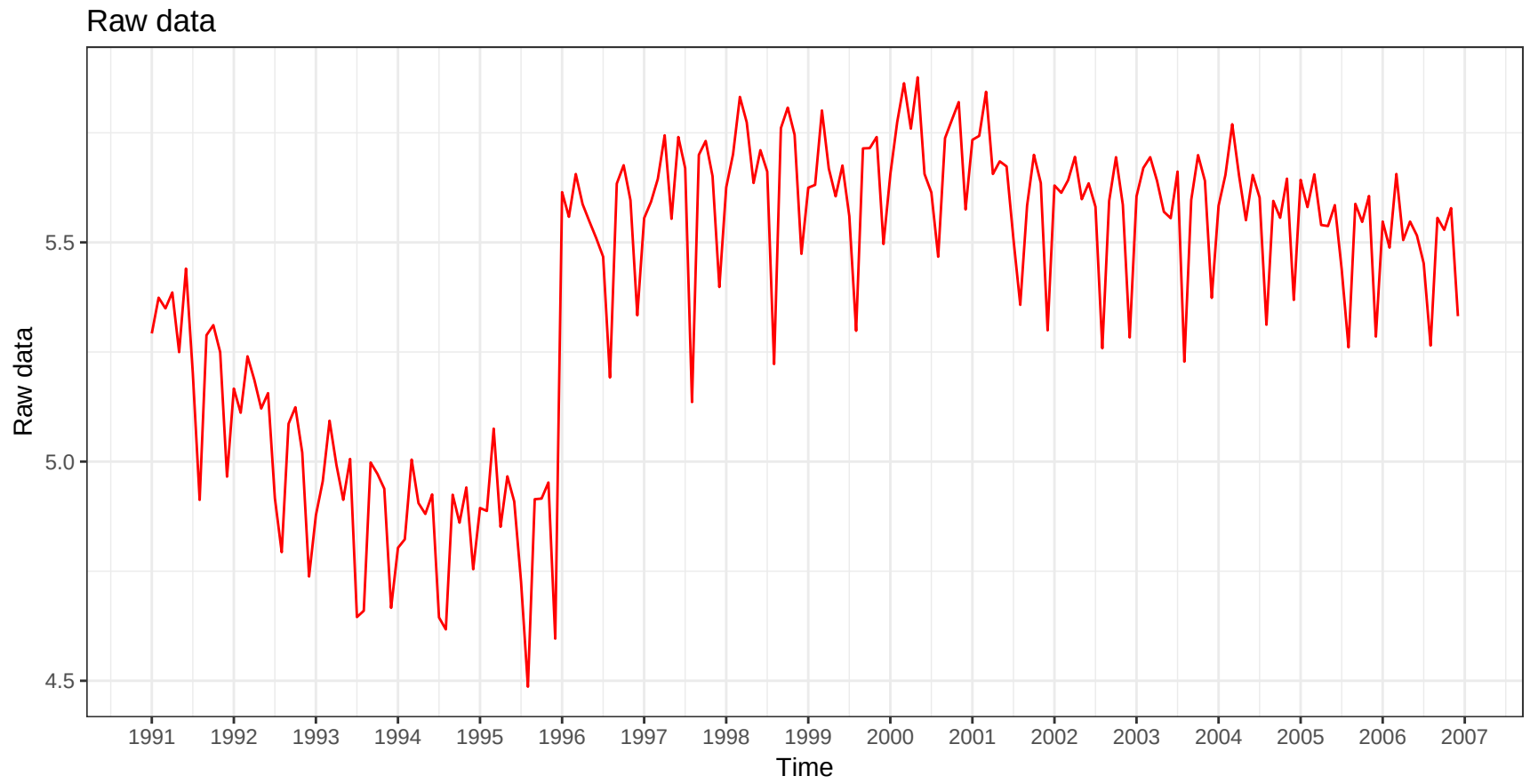


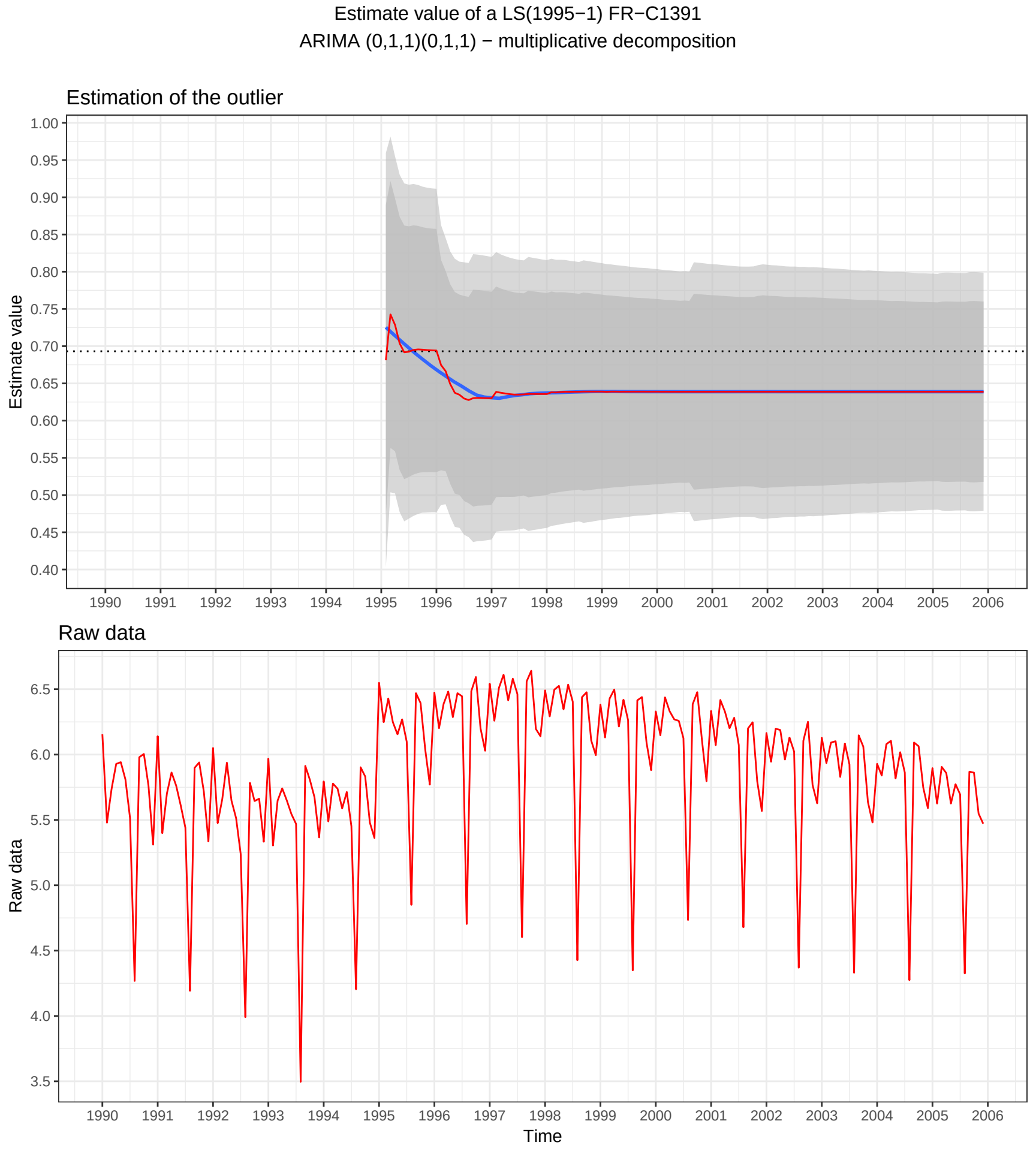


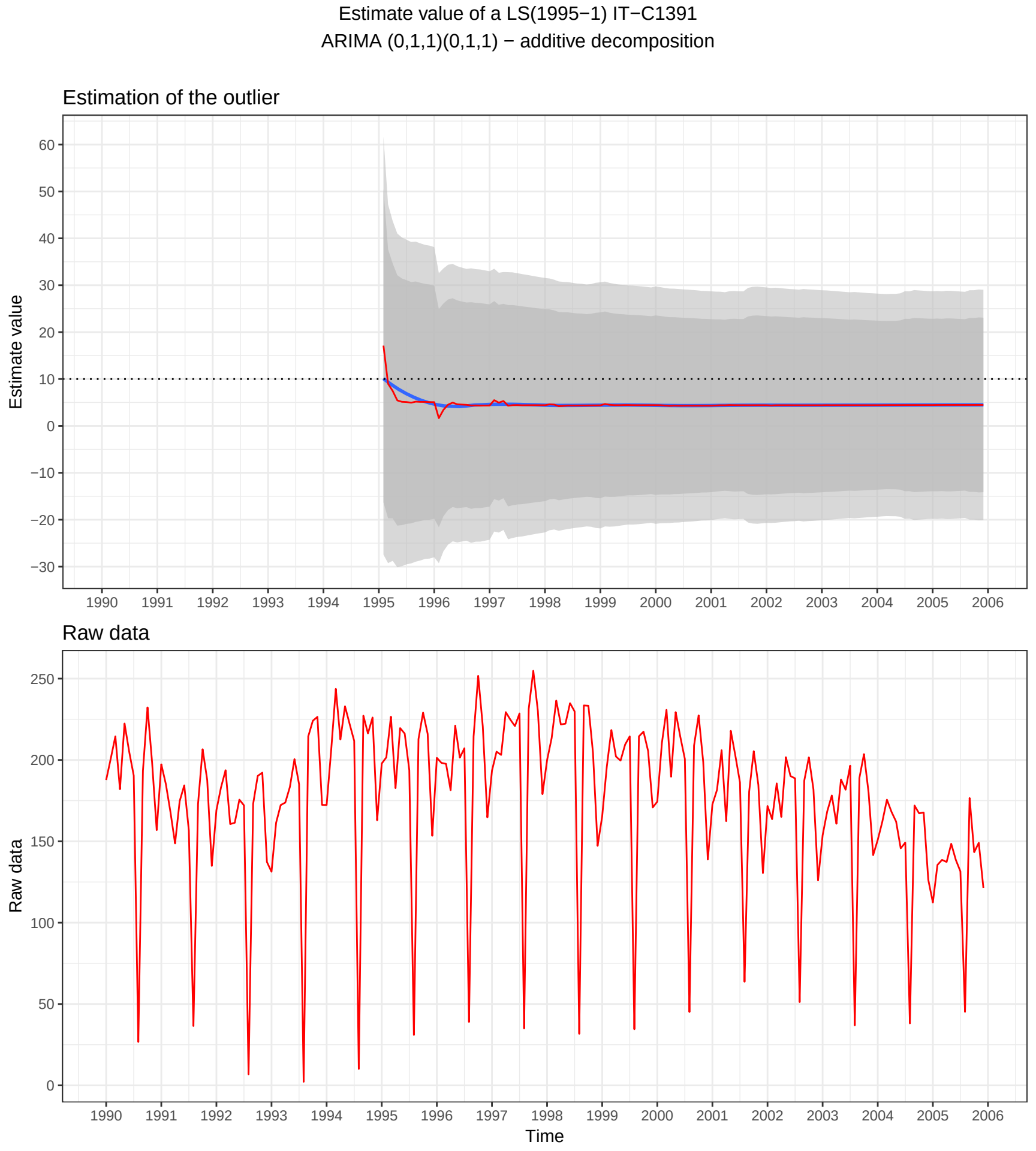

Estimate value of a LS(2003−1) UK−C1107
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.85
0.80
0.75
0.70
0.65
0.60
0.55
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Raw data
Raw data
5.5
5.0
4.5
Time

Estimate value of a LS(1996−1) DE−C1391
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition



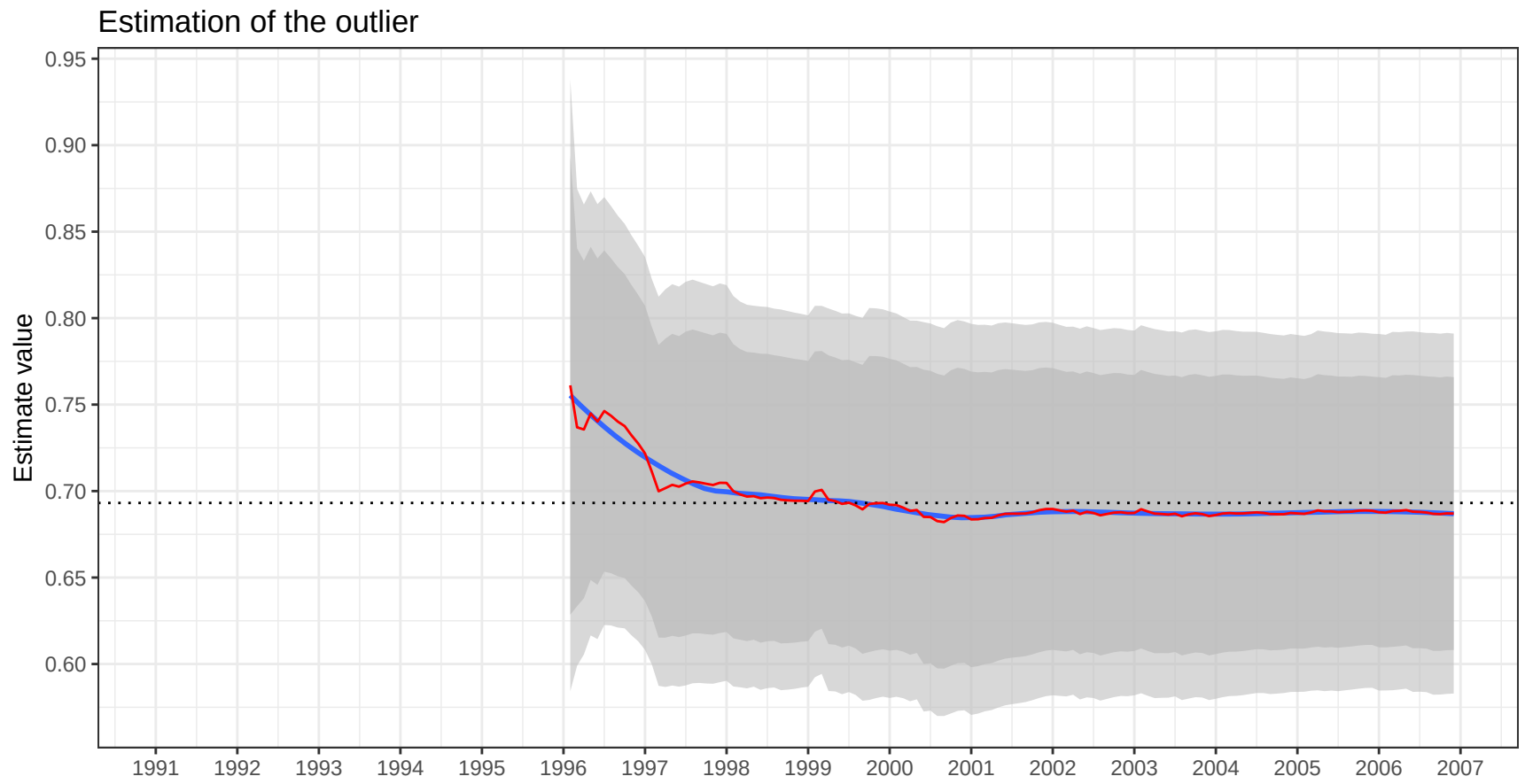


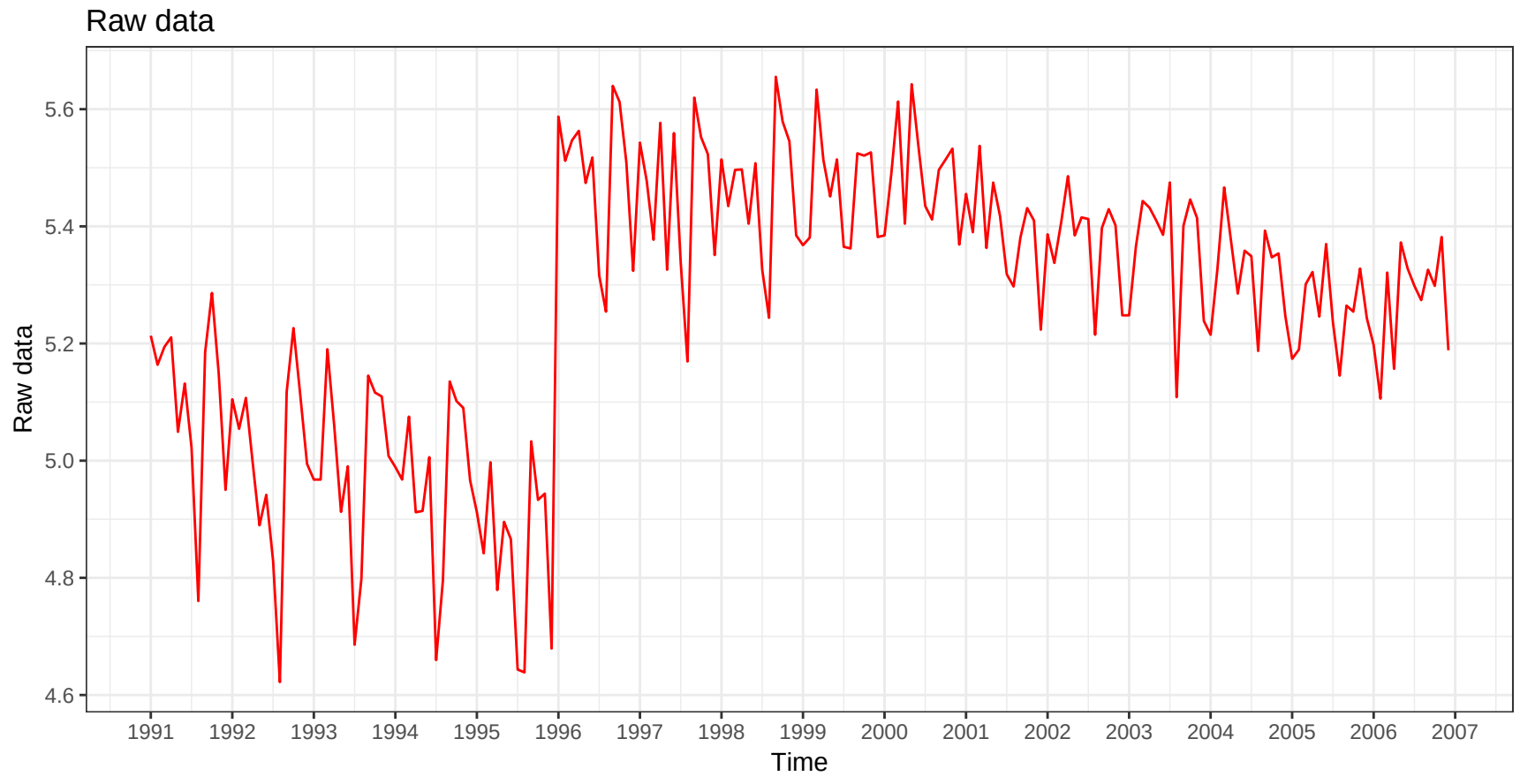

Estimate value of a LS(1995−1) FR−C1391
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
1.00
0.95
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
0.45
0.40
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
6.5
6.0
5.5
5.0
4.5
4.0
3.5
Time


Estimate value of a LS(1995−1) IT−C1391
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
60
50
40
30
20
10
0
−10
−20
−30
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
250
200
150
100
50
0
Time

Estimate value of a LS(1996−1) DE−C1392

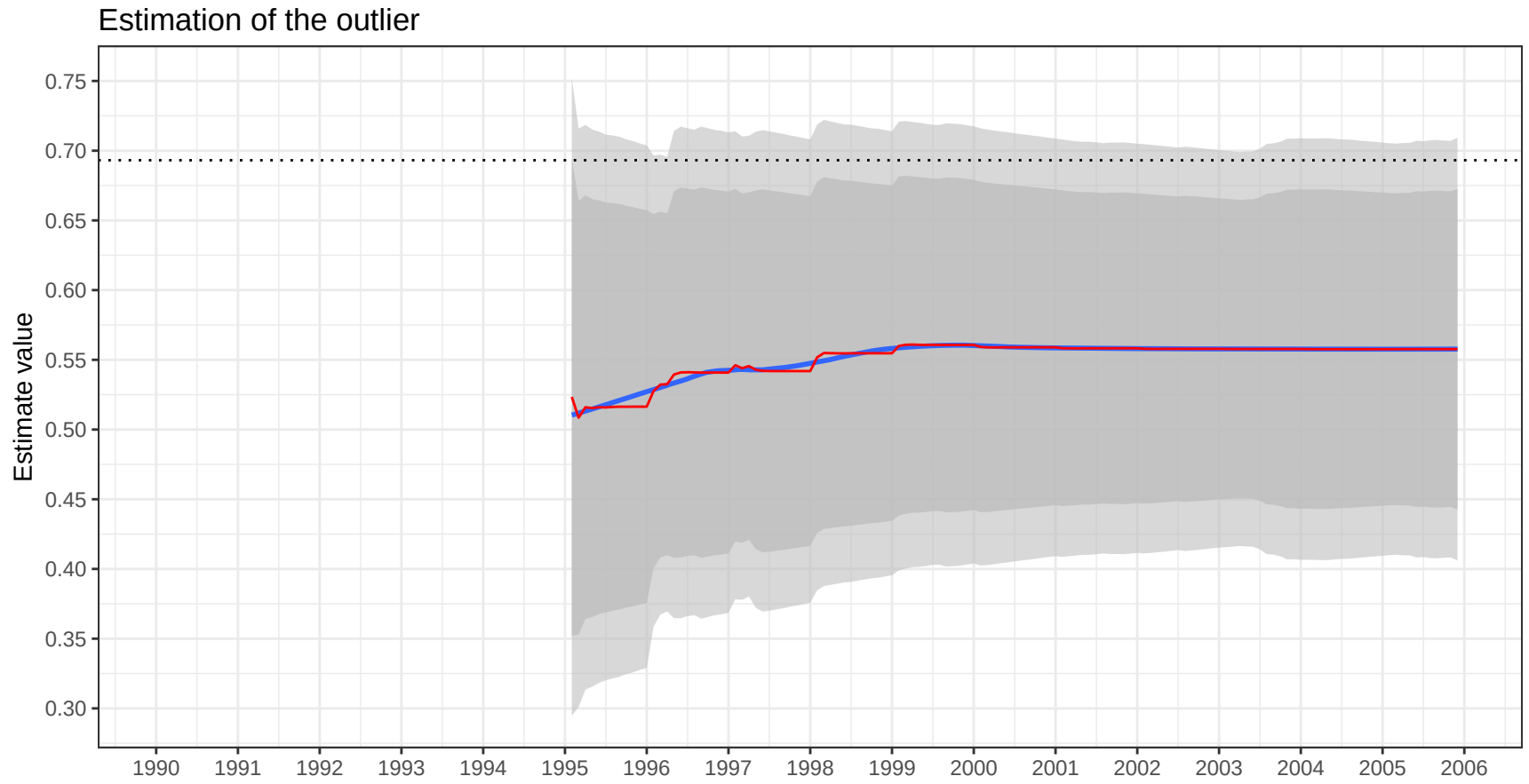
ARIMA (3,1,1)(0,1,1) − multiplicative decomposition

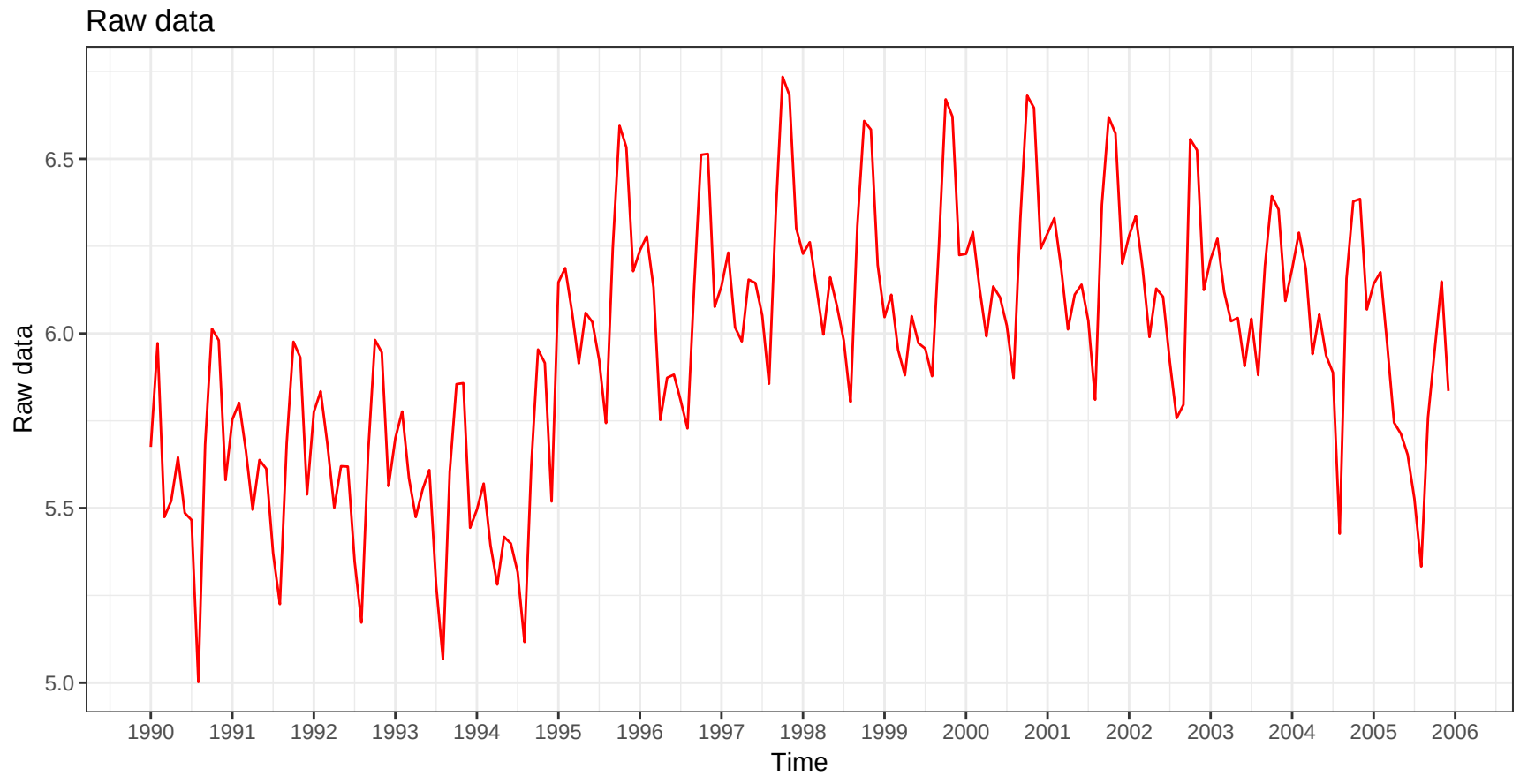




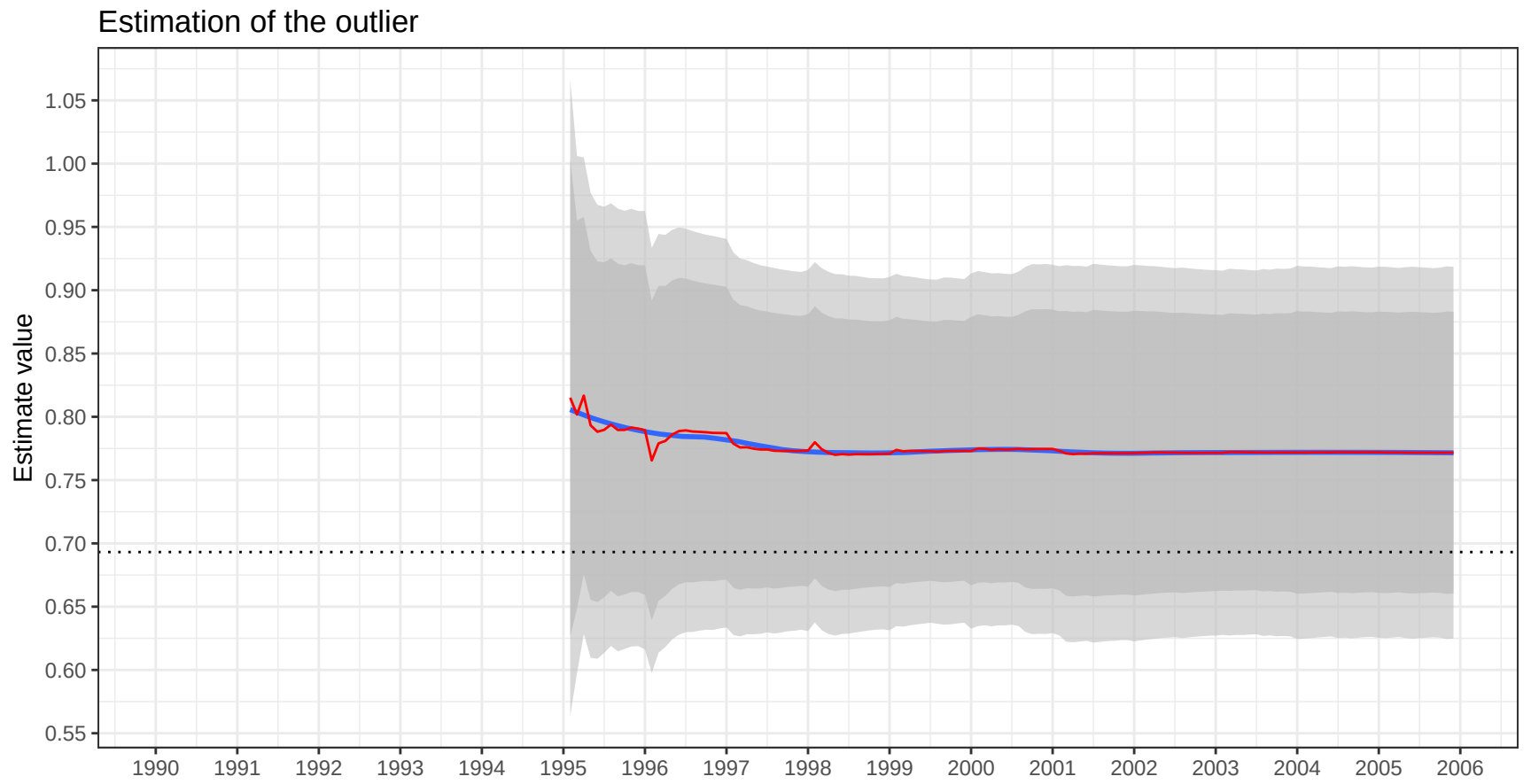
Estimate value of a LS(1995−1) FR−C1392

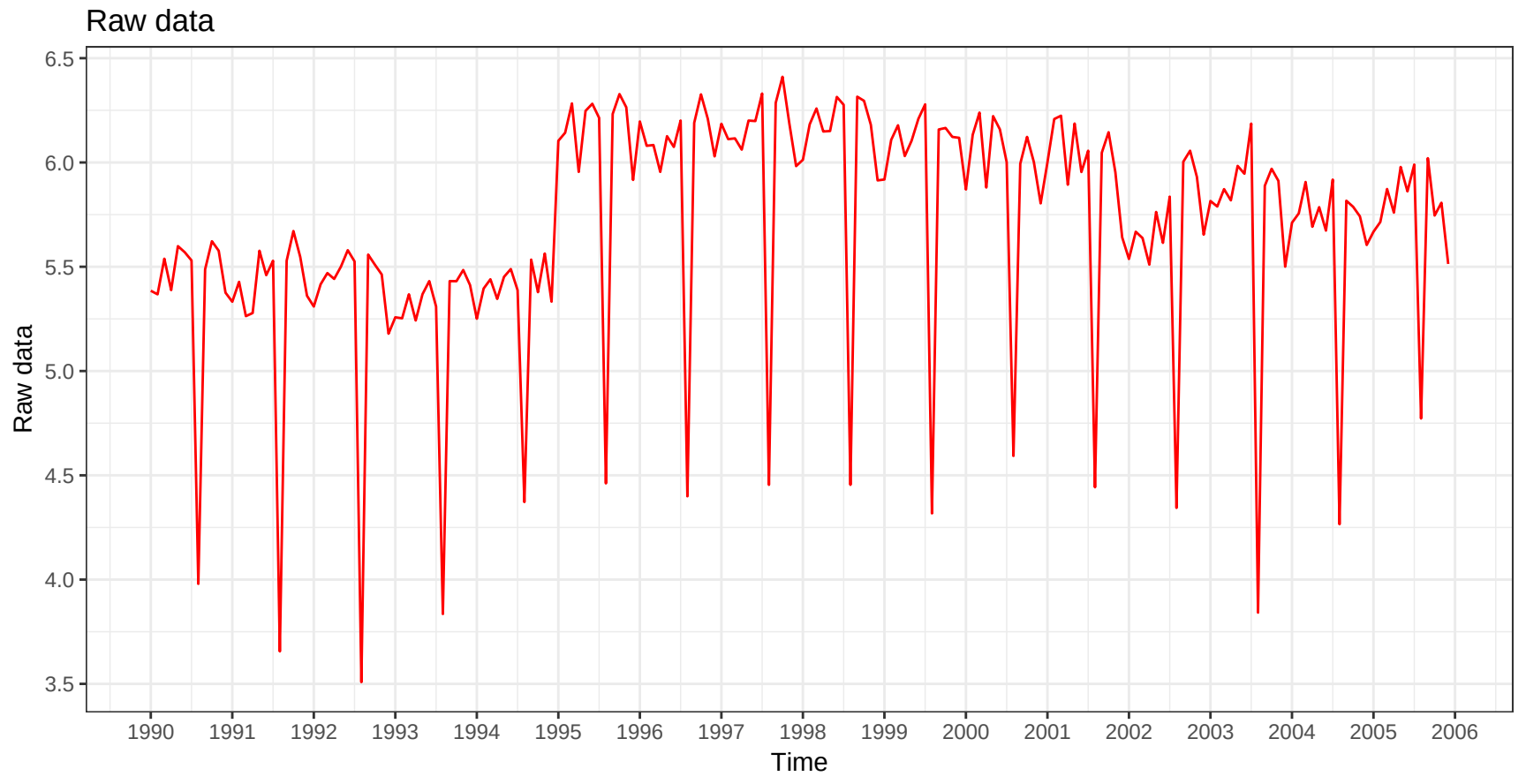
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition



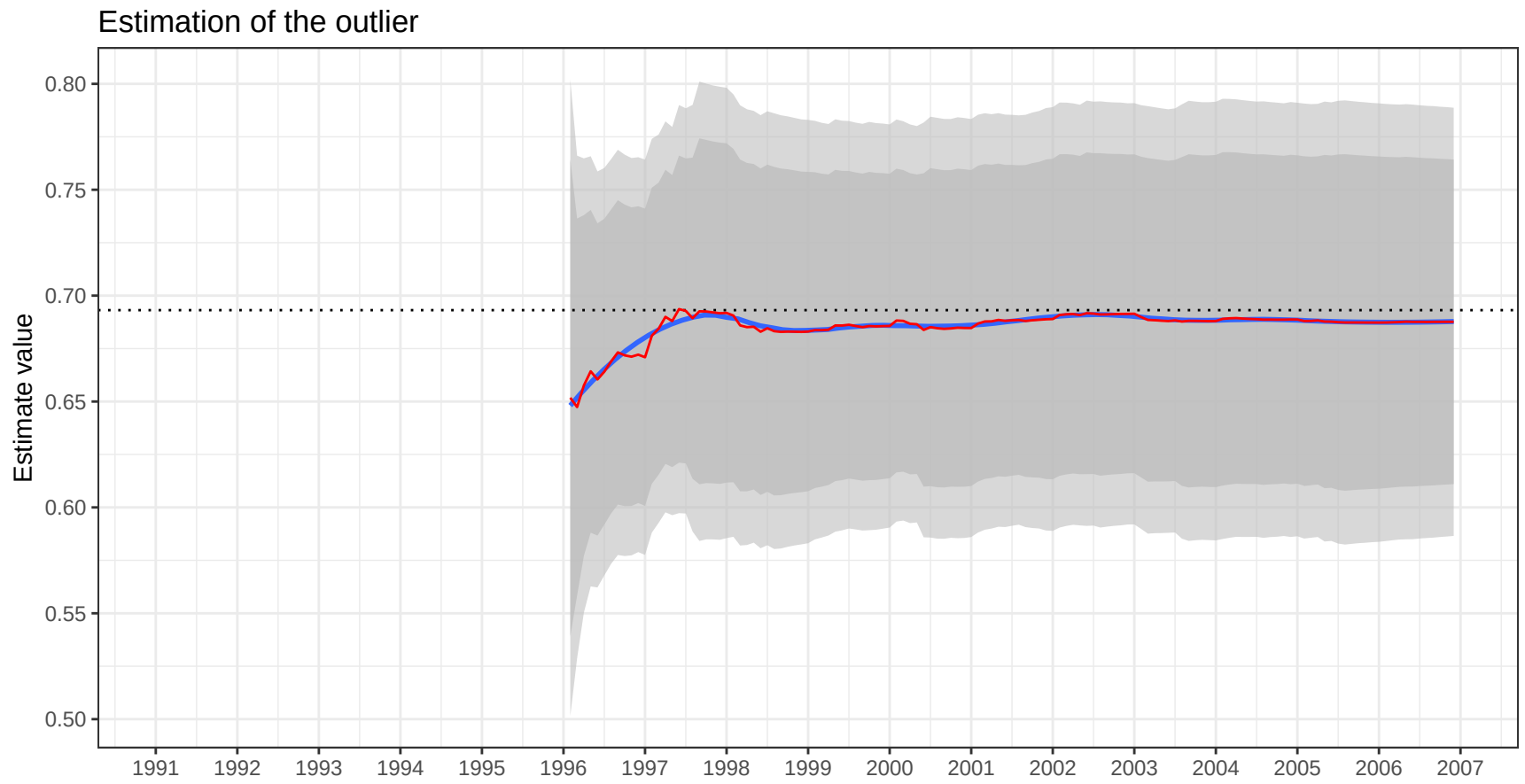


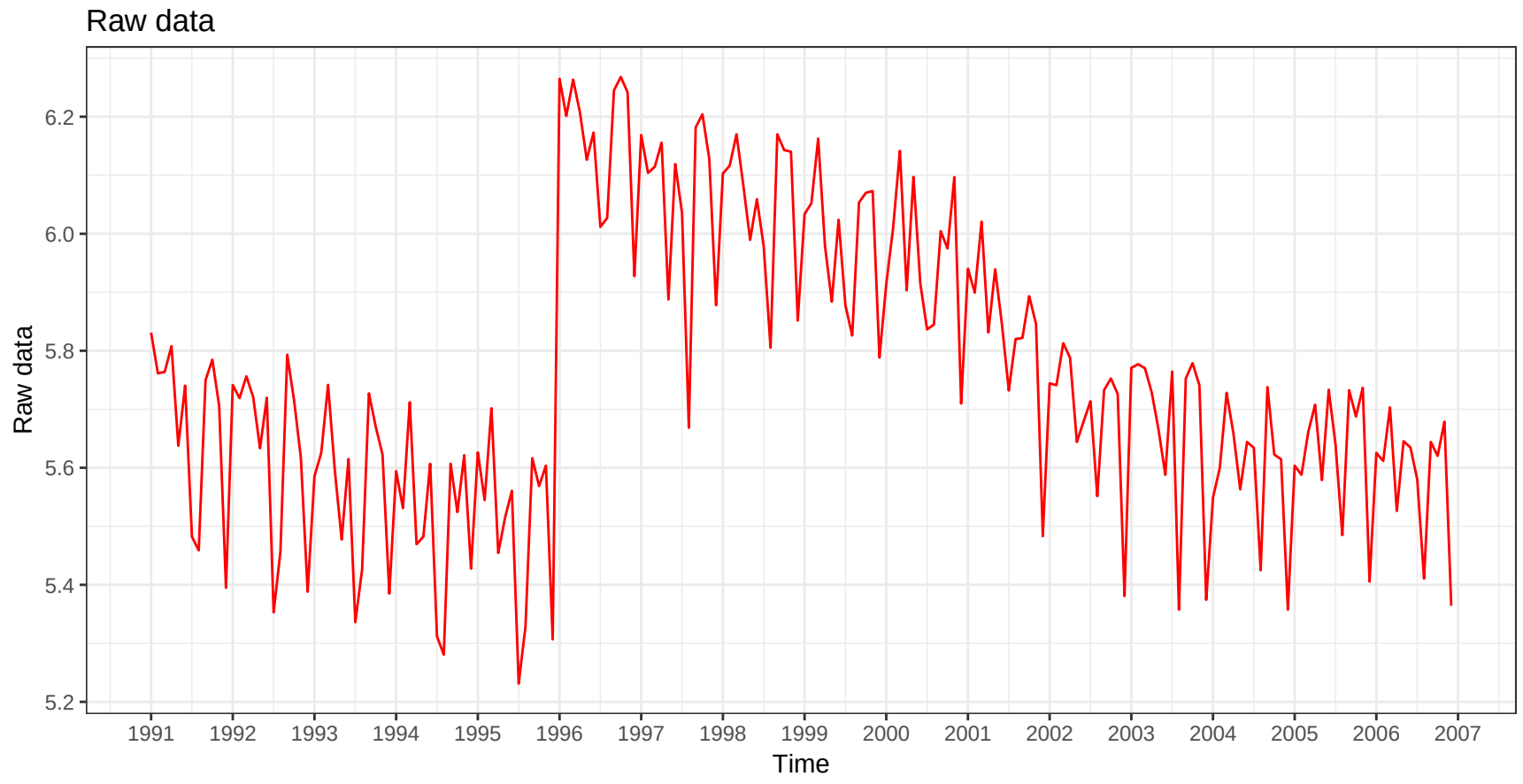
Estimate value of a LS(1995−1) IT−C1392
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

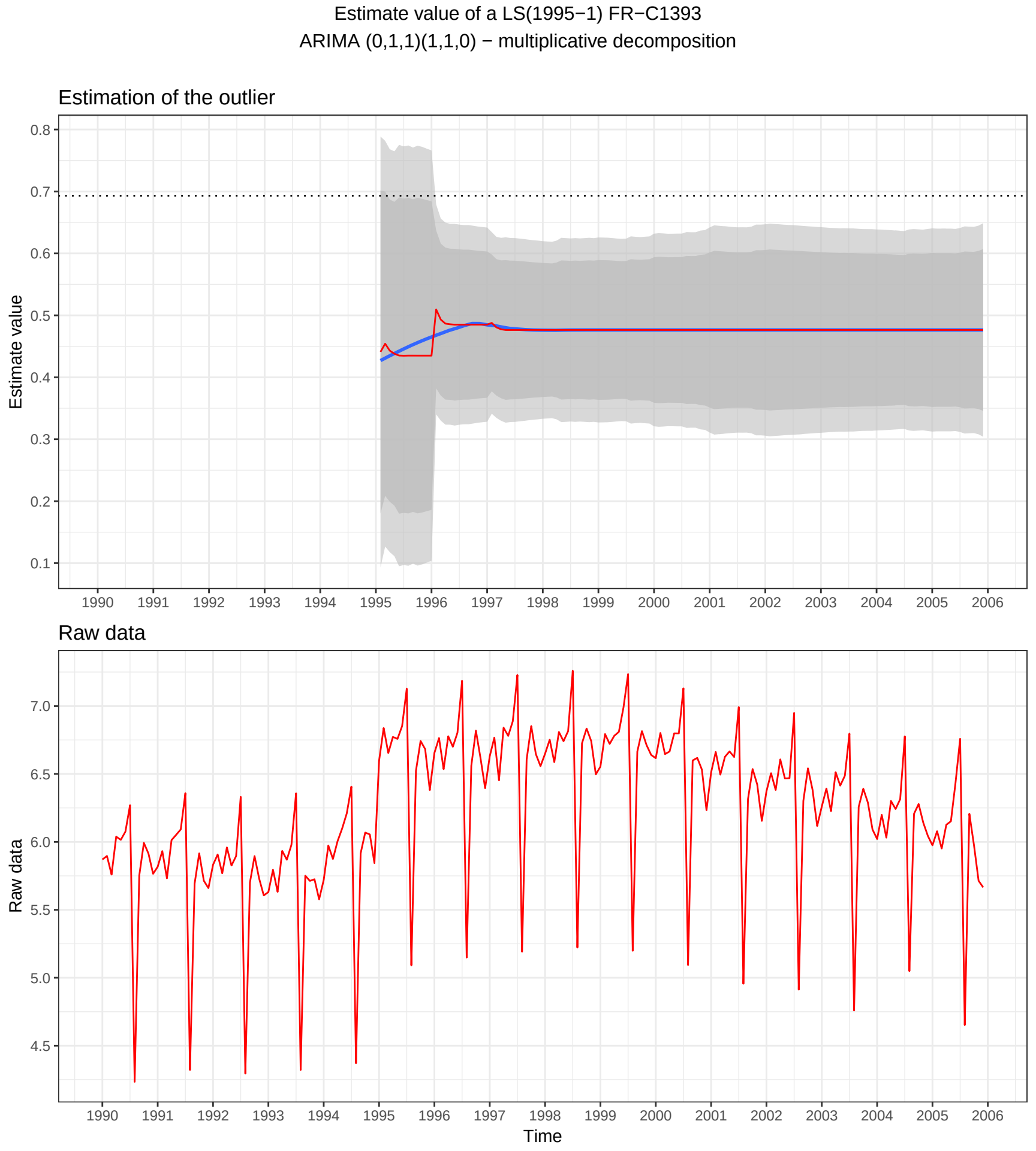




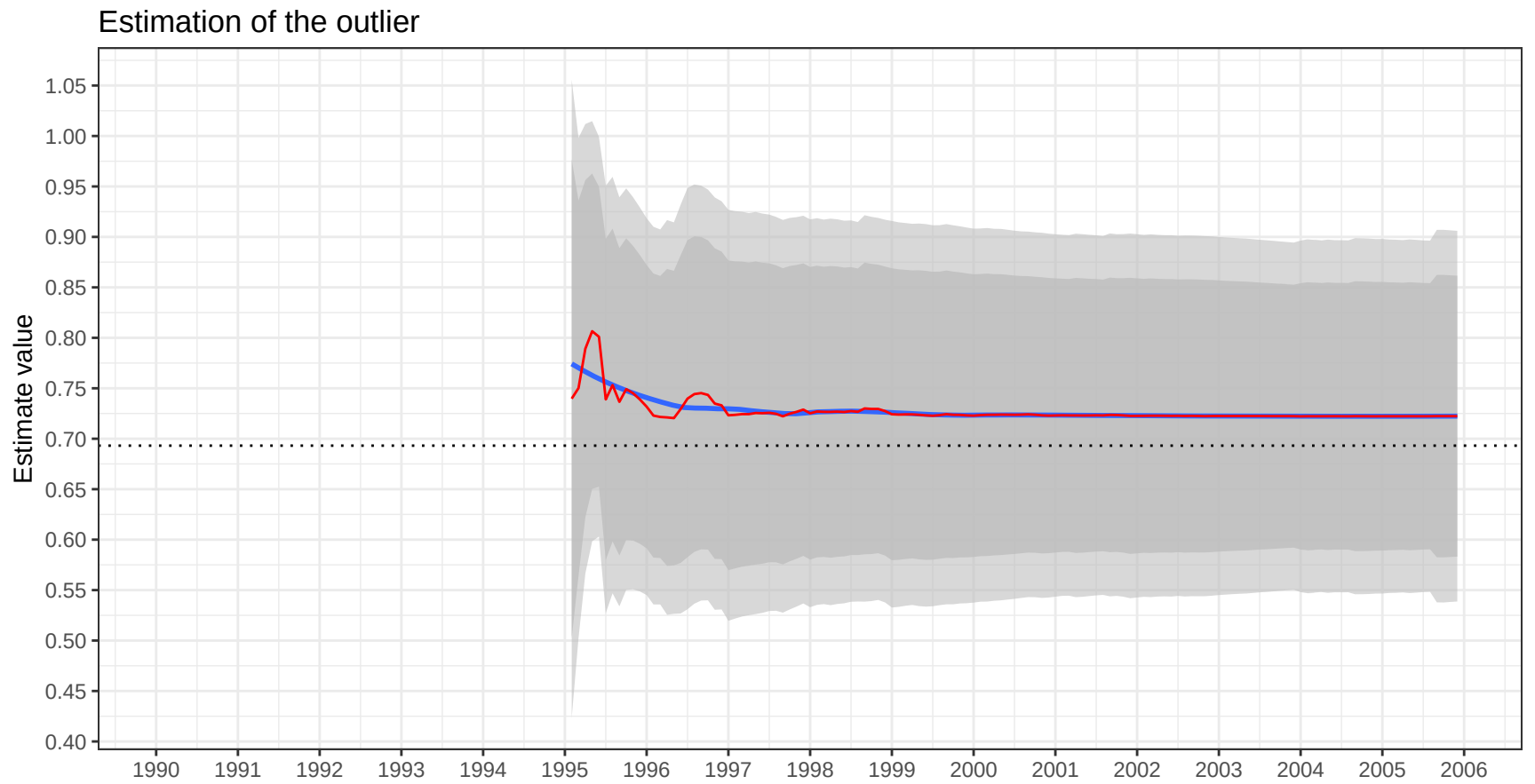
Estimate value of a LS(1996−1) DE−C1393
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

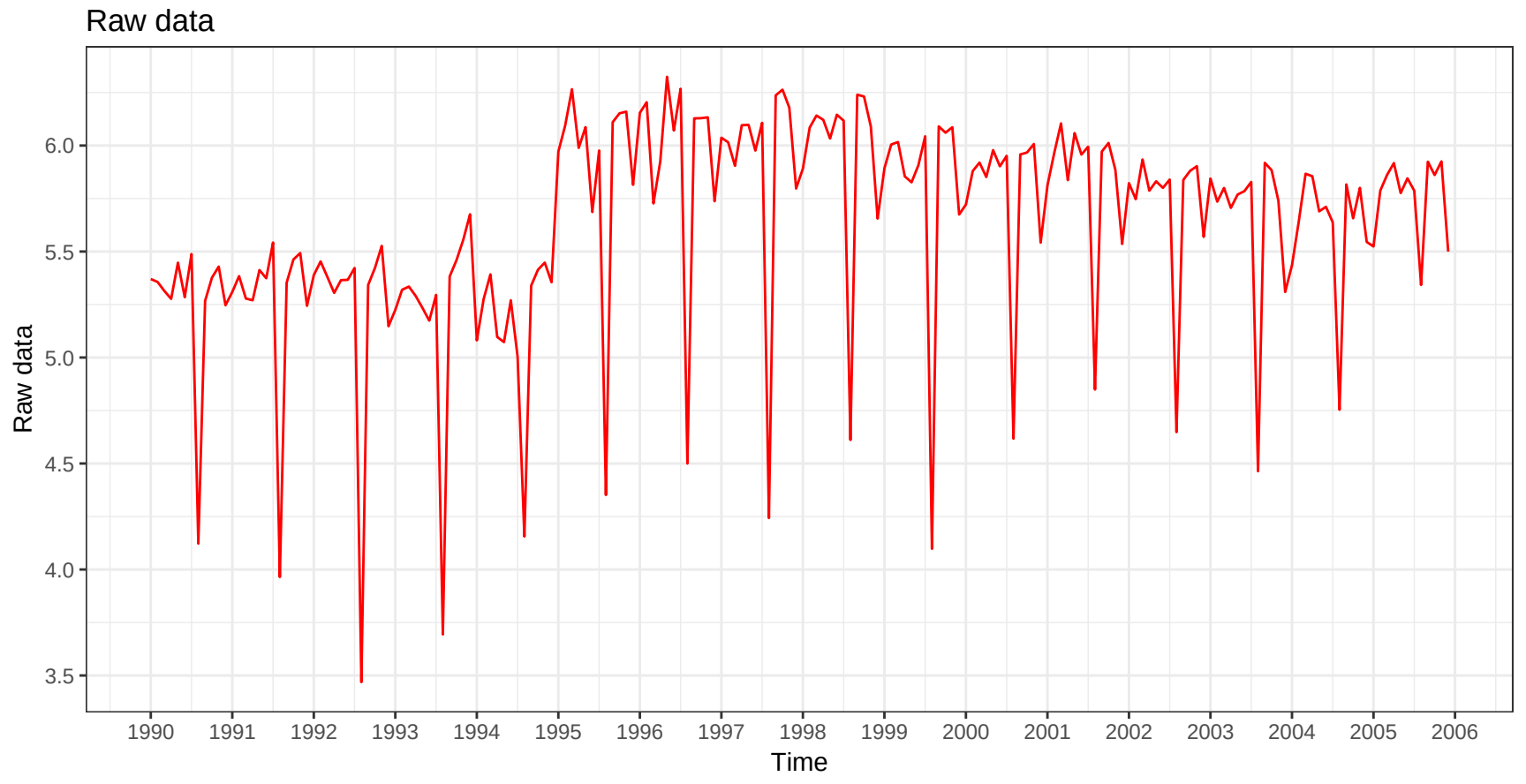





Estimate value of a LS(1995−1) FR−C1393
ARIMA (0,1,1)(1,1,0) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
7.0
6.5
6.0
5.5
5.0
4.5
Time

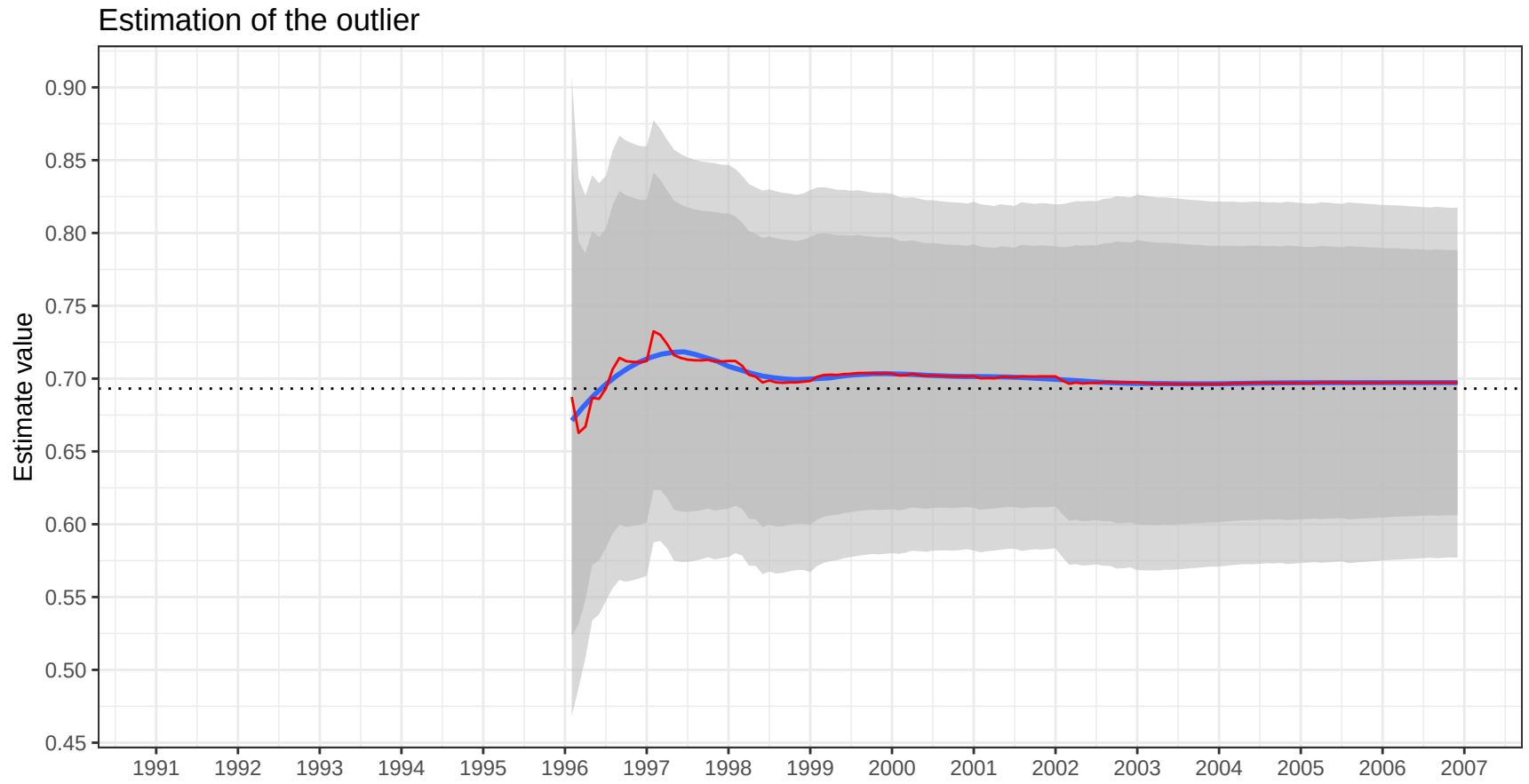
Estimate value of a LS(1995−1) IT−C1393
ARIMA (1,0,1)(0,1,1) − multiplicative decomposition

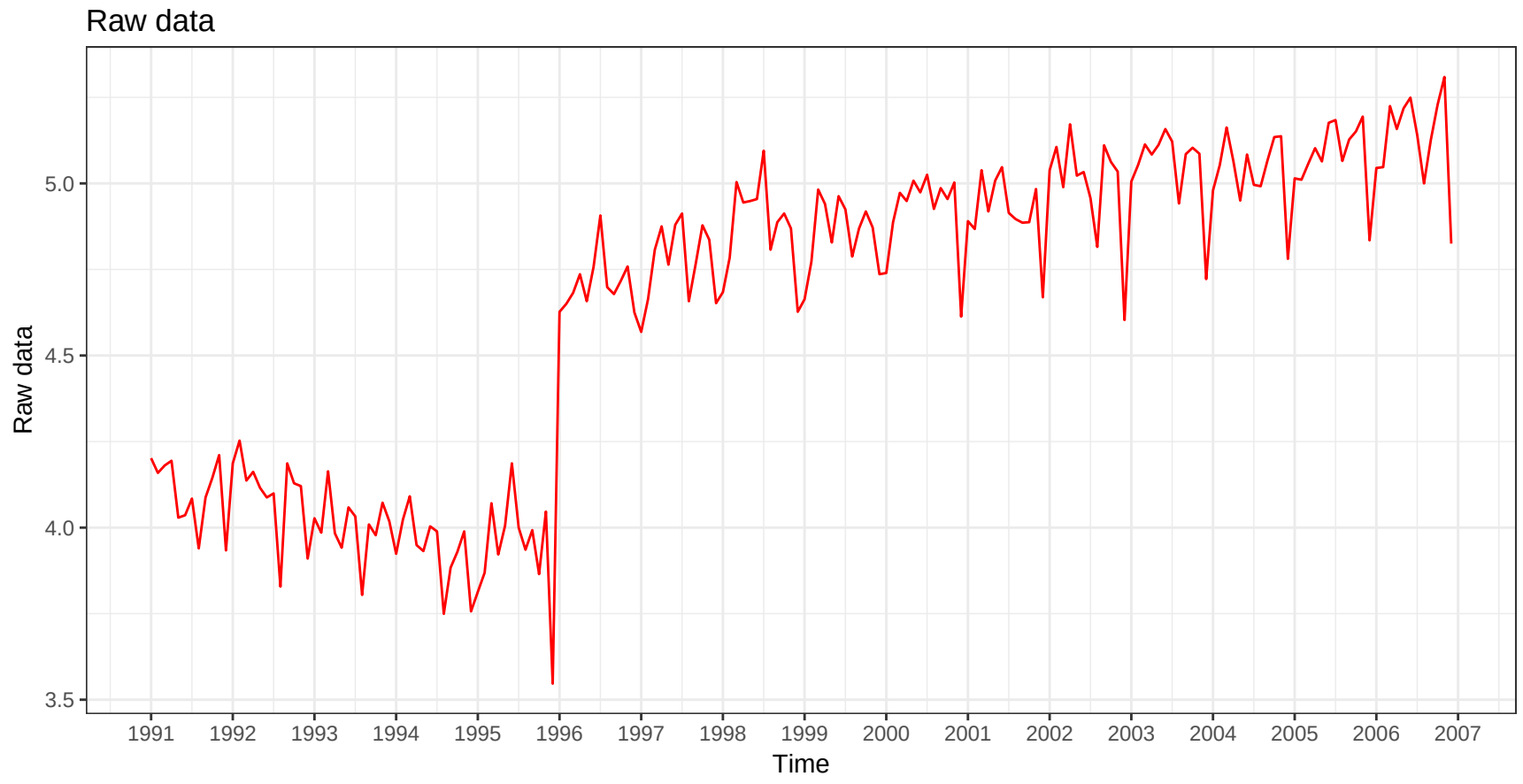


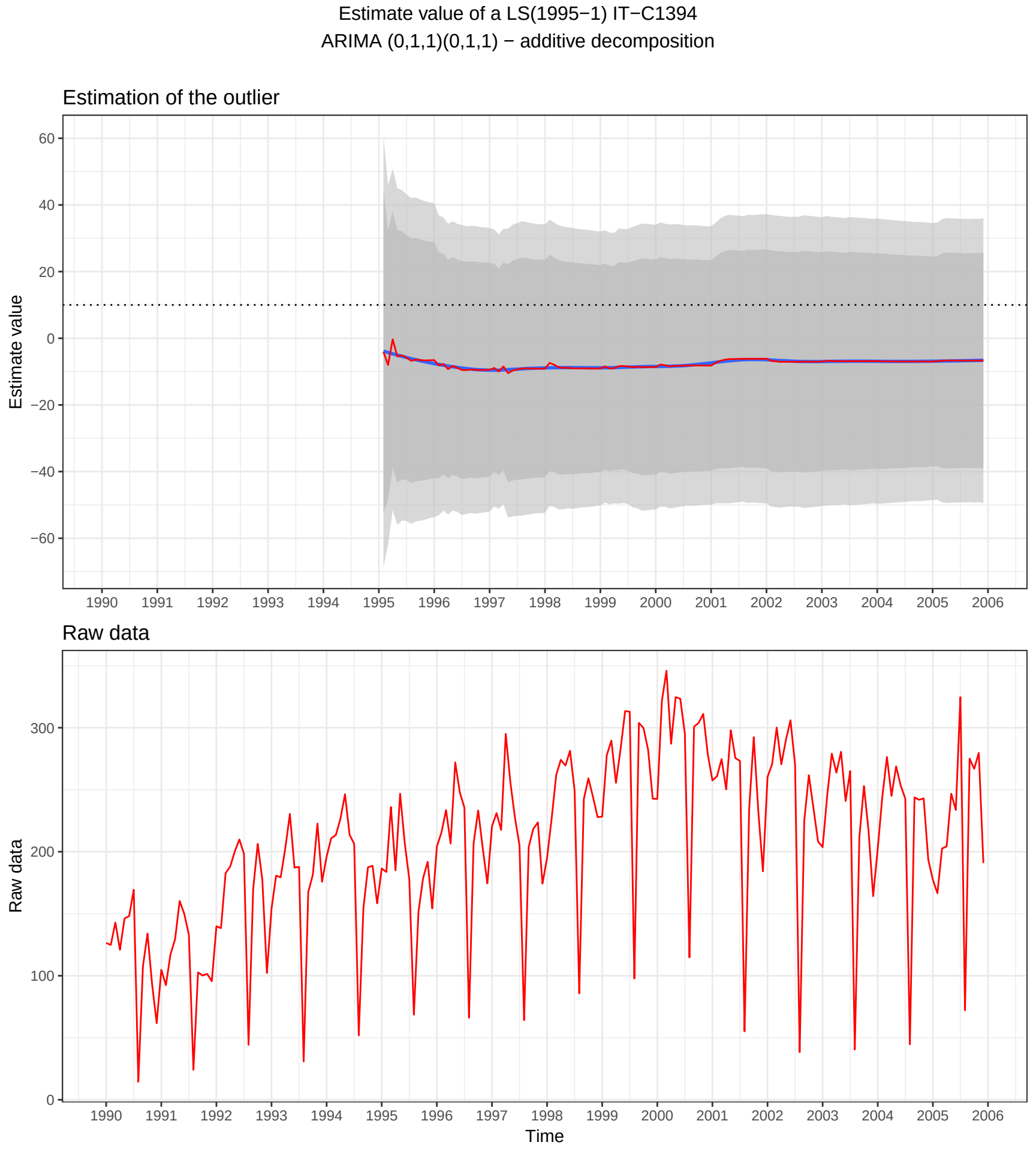


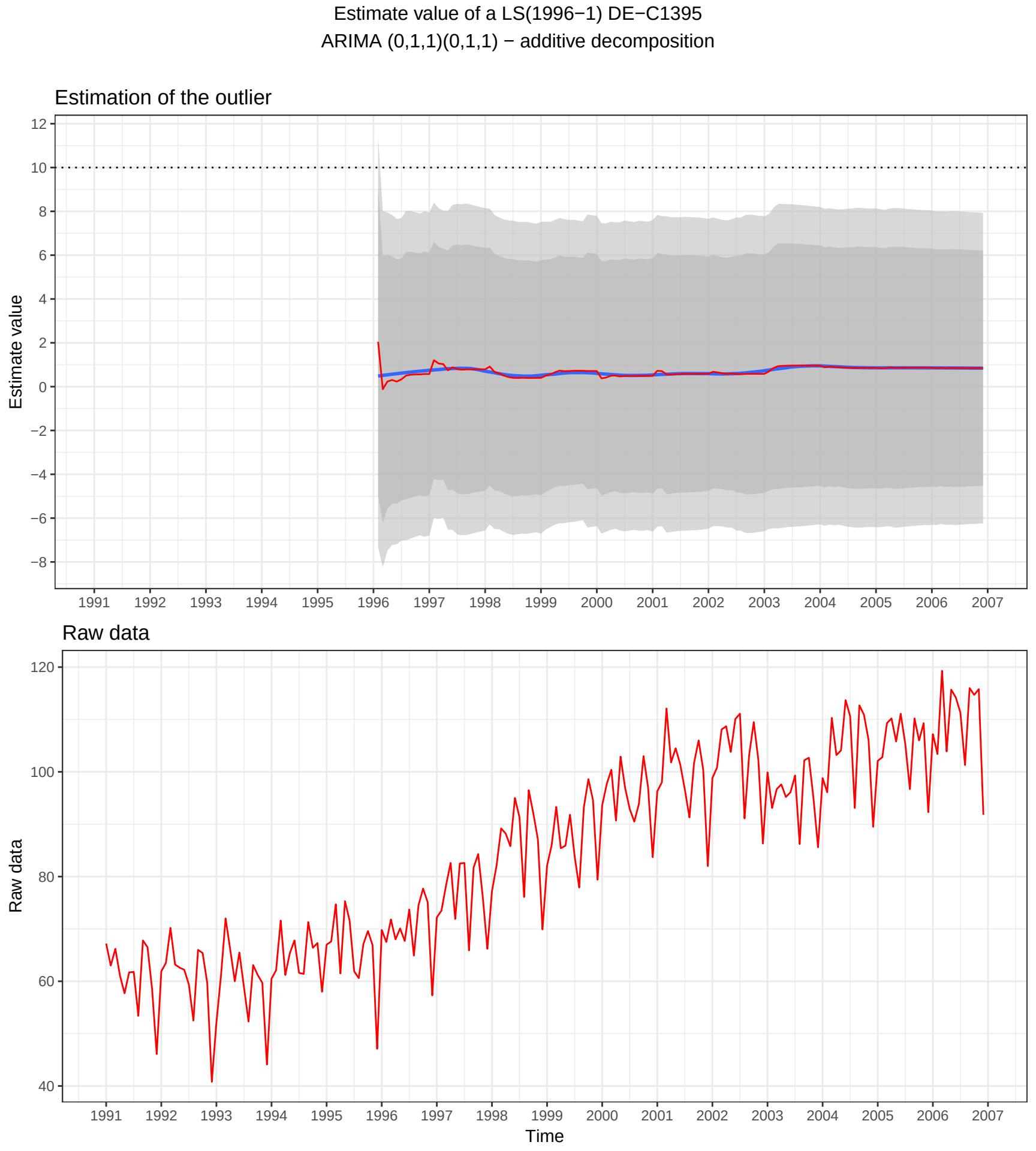
Estimate value of a LS(1996−1) DE−C1394

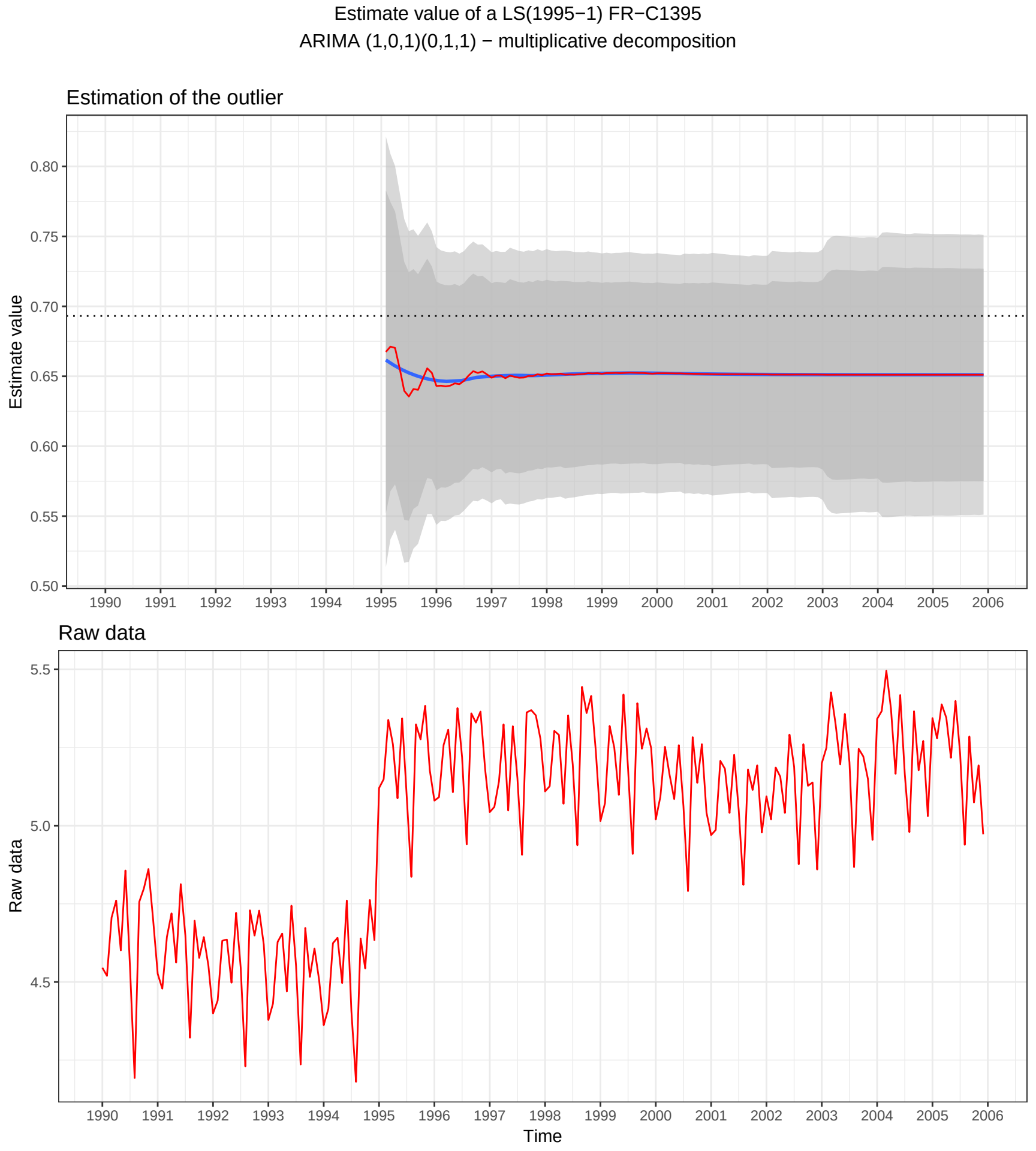
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition





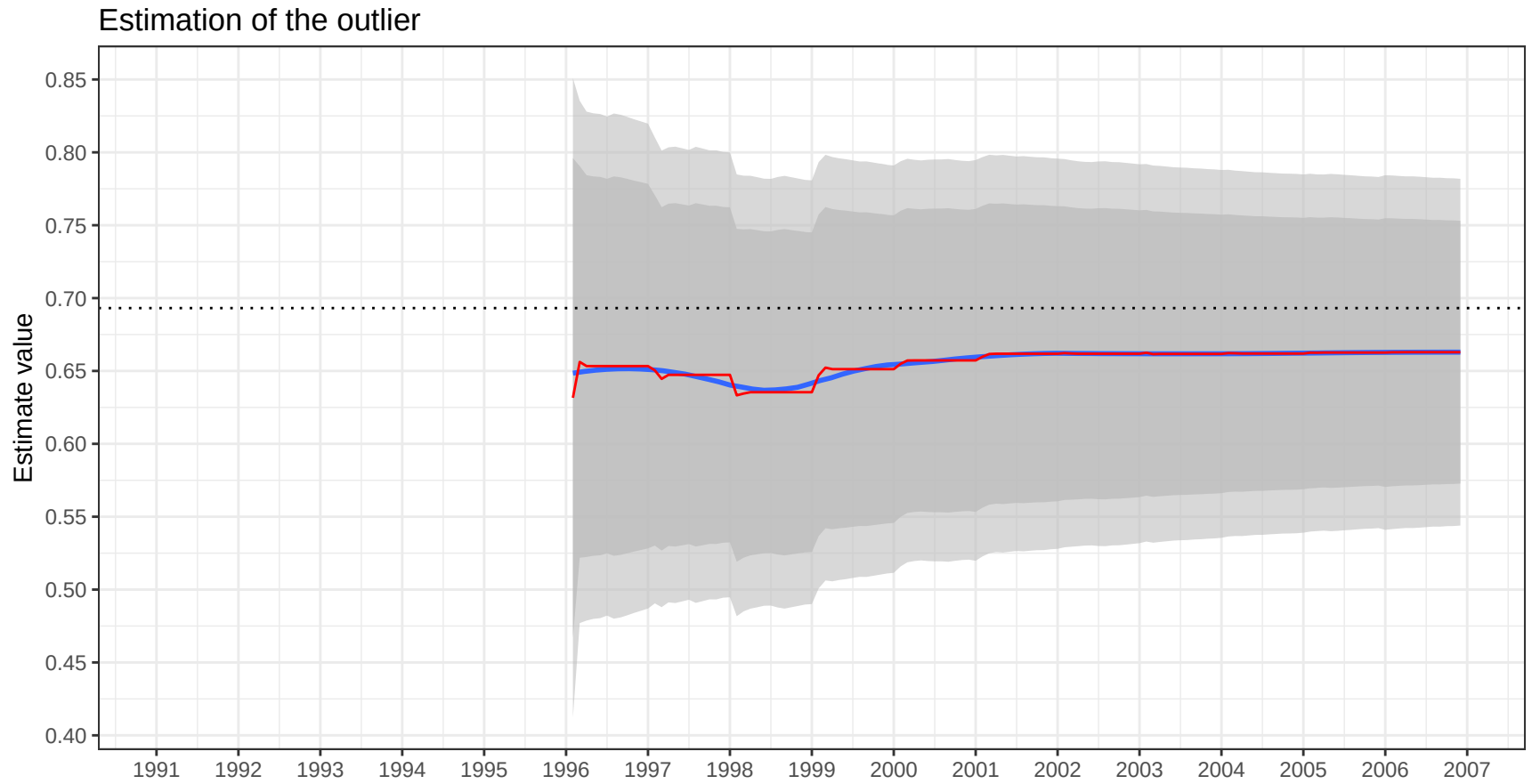

Estimate value of a LS(1995−1) IT−C1394
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
60
40
20
0
−20
−40
−60
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
300
200
100
0
Time

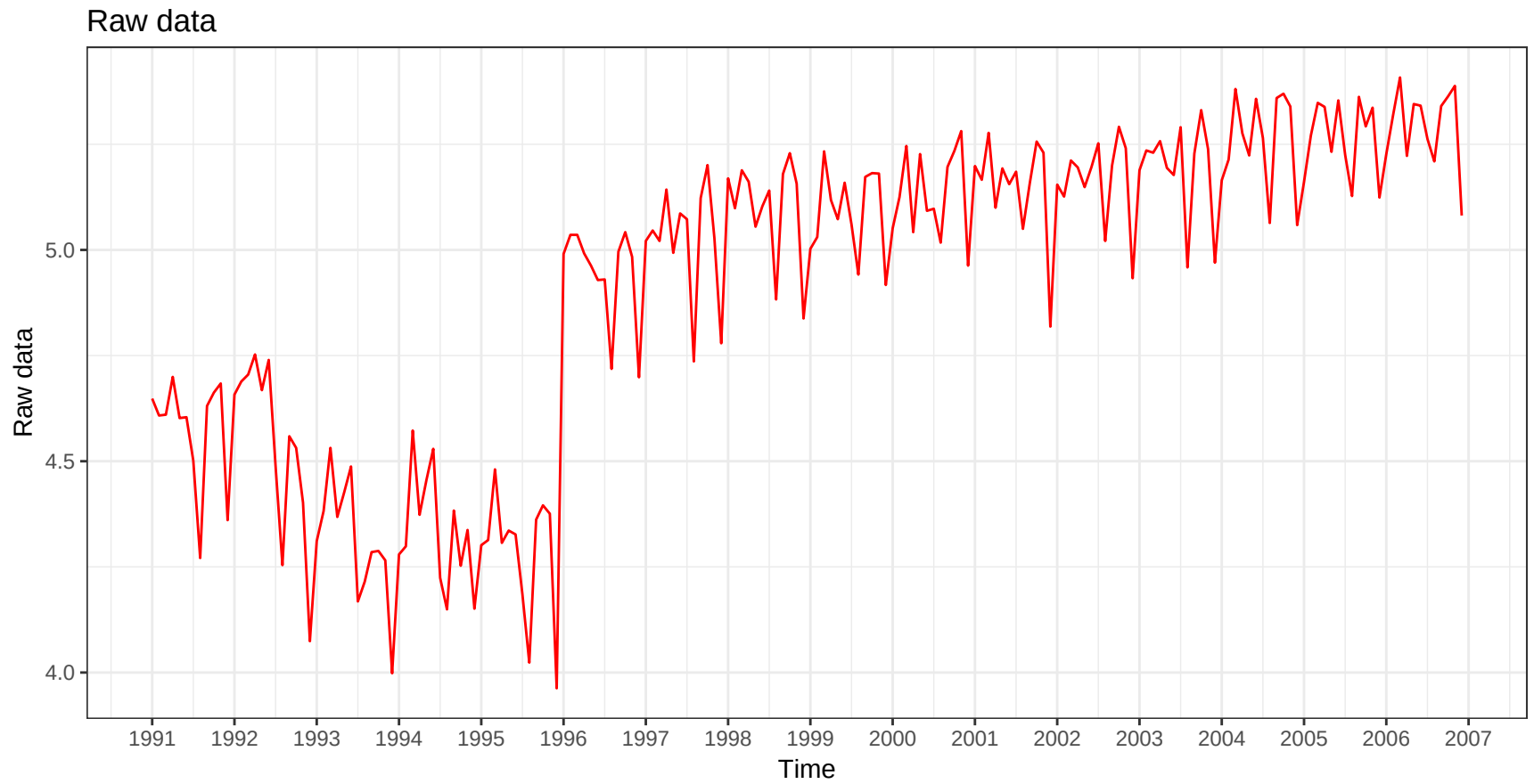

Estimate value of a LS(1996−1) DE−C1395
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
12
10
8
6
4
2
0
−2
−4
−6
−8
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
120
100
80
60
40
Time

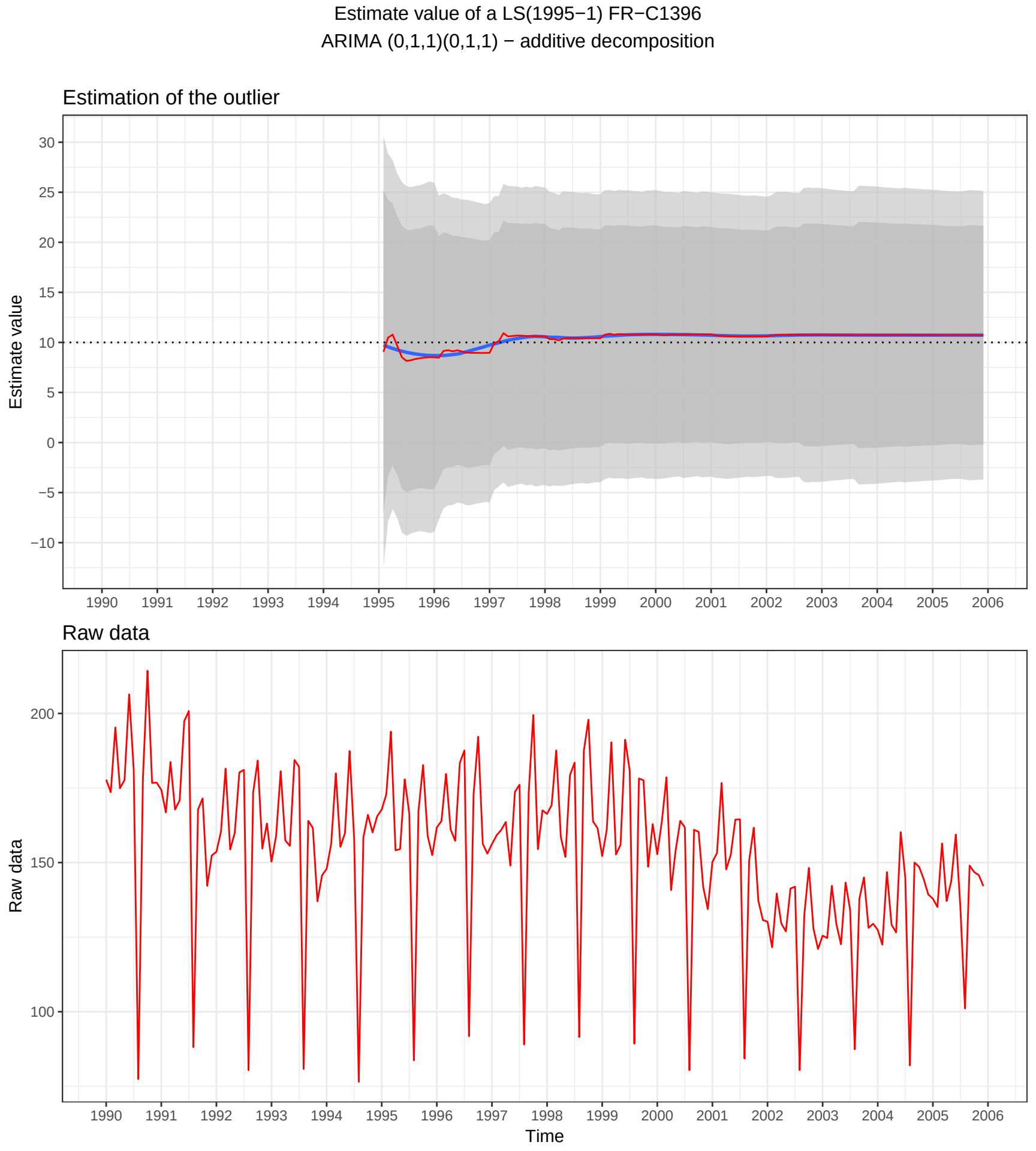

Estimate value of a LS(1995−1) FR−C1395
ARIMA (1,0,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.80
0.75
0.70
0.65
0.60
0.55
0.50
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
5.5
5.0
4.5
Time

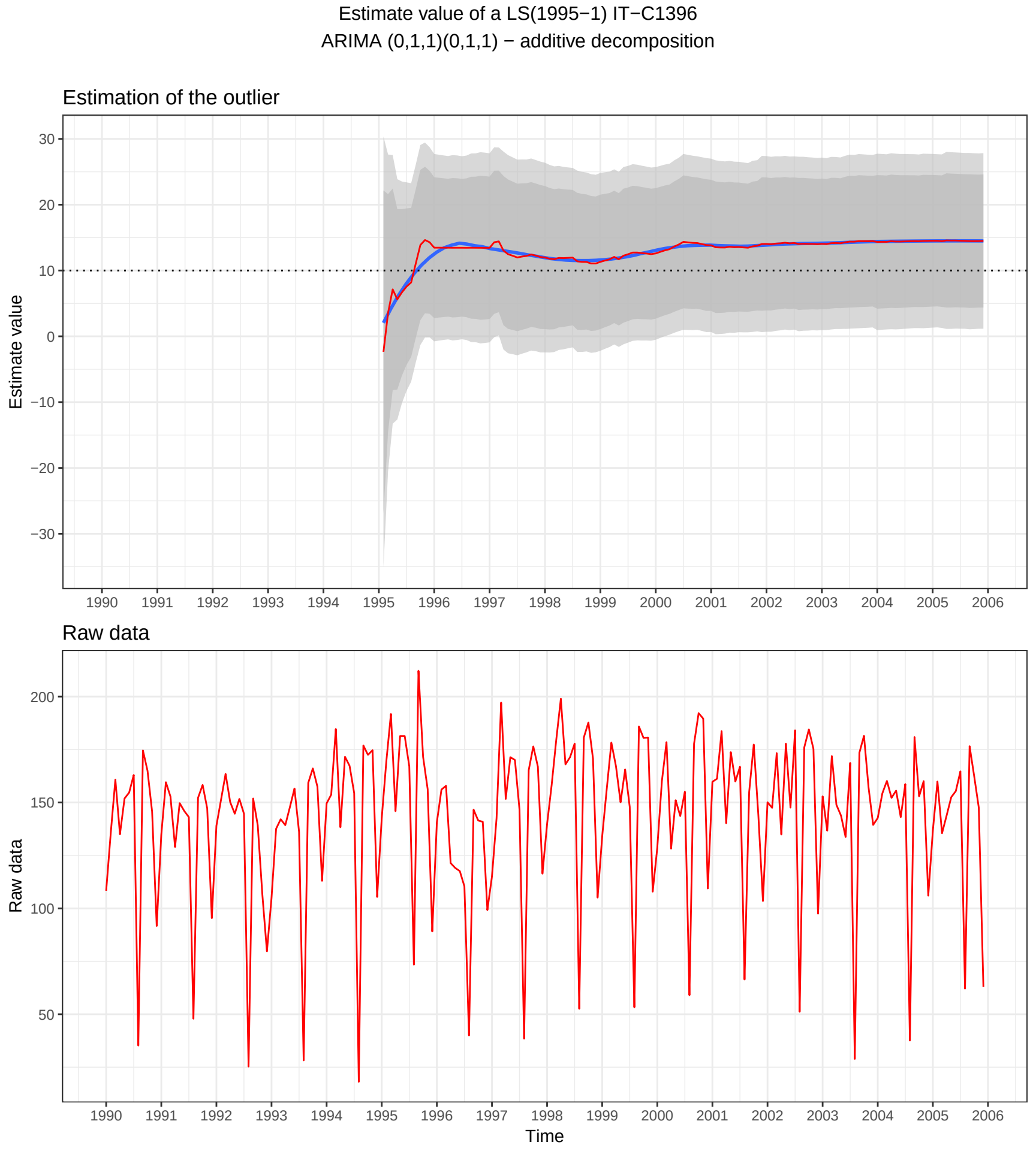
Estimate value of a LS(1996−1) DE−C1396

ARIMA (2,1,0)(0,1,1) − multiplicative decomposition

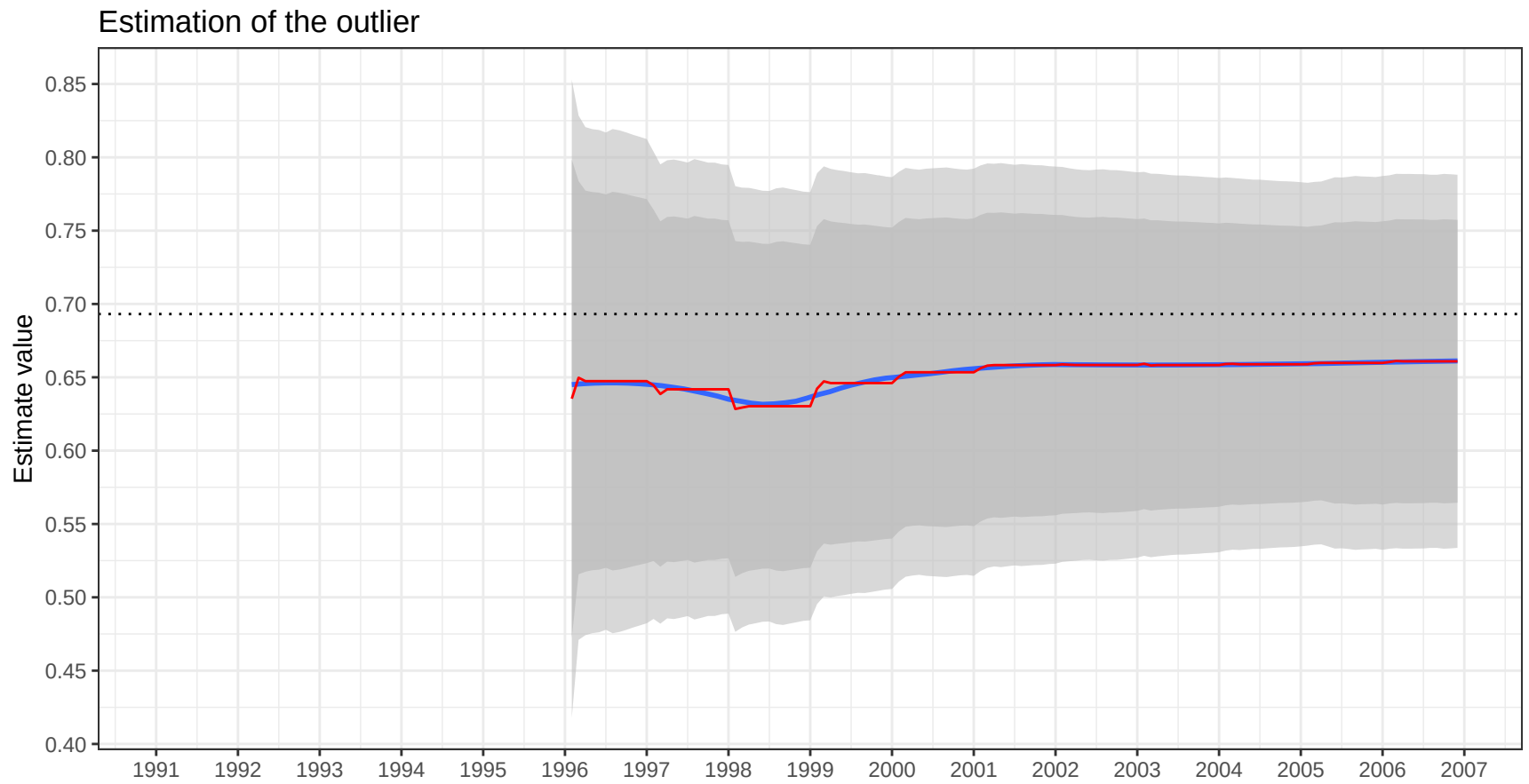


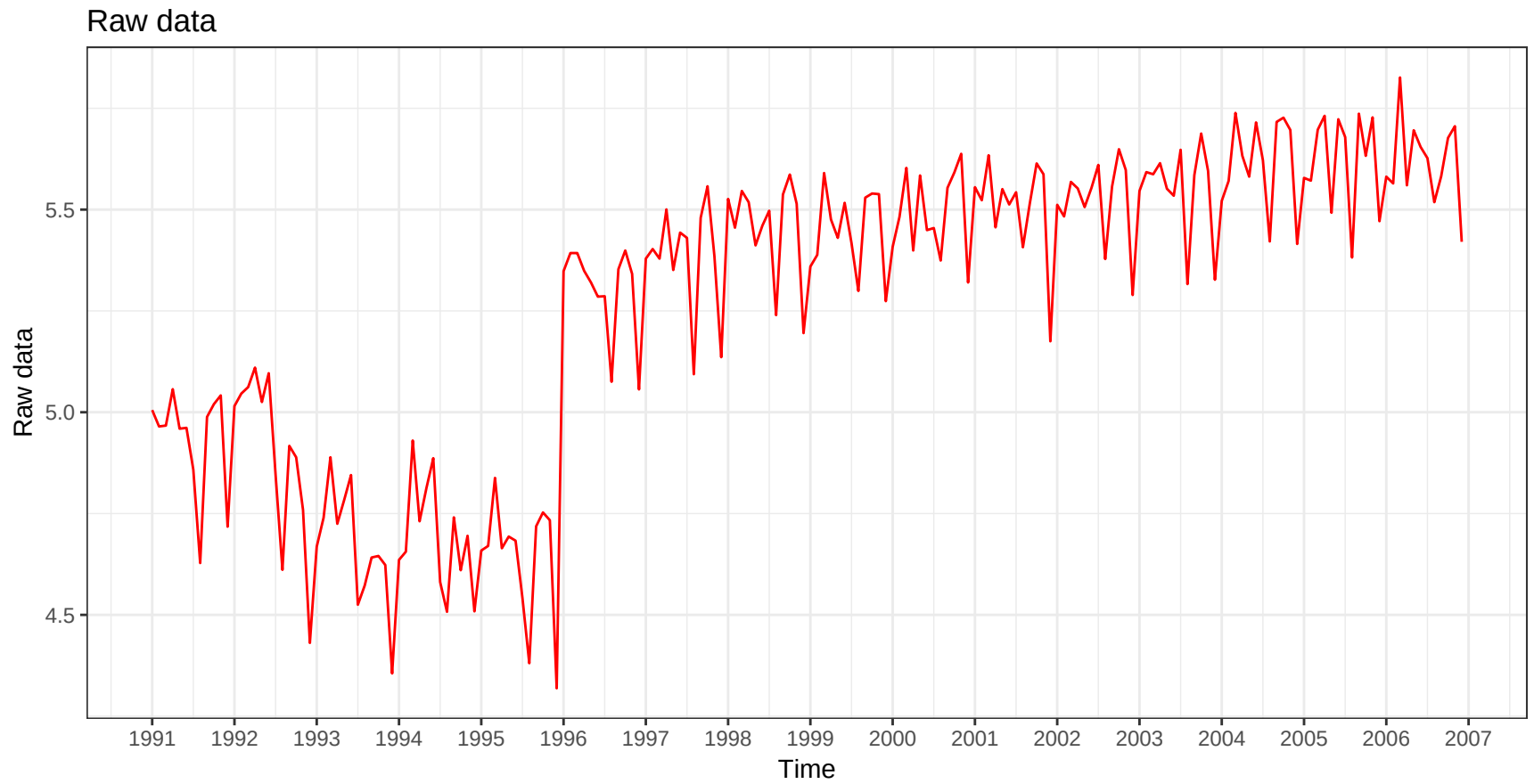


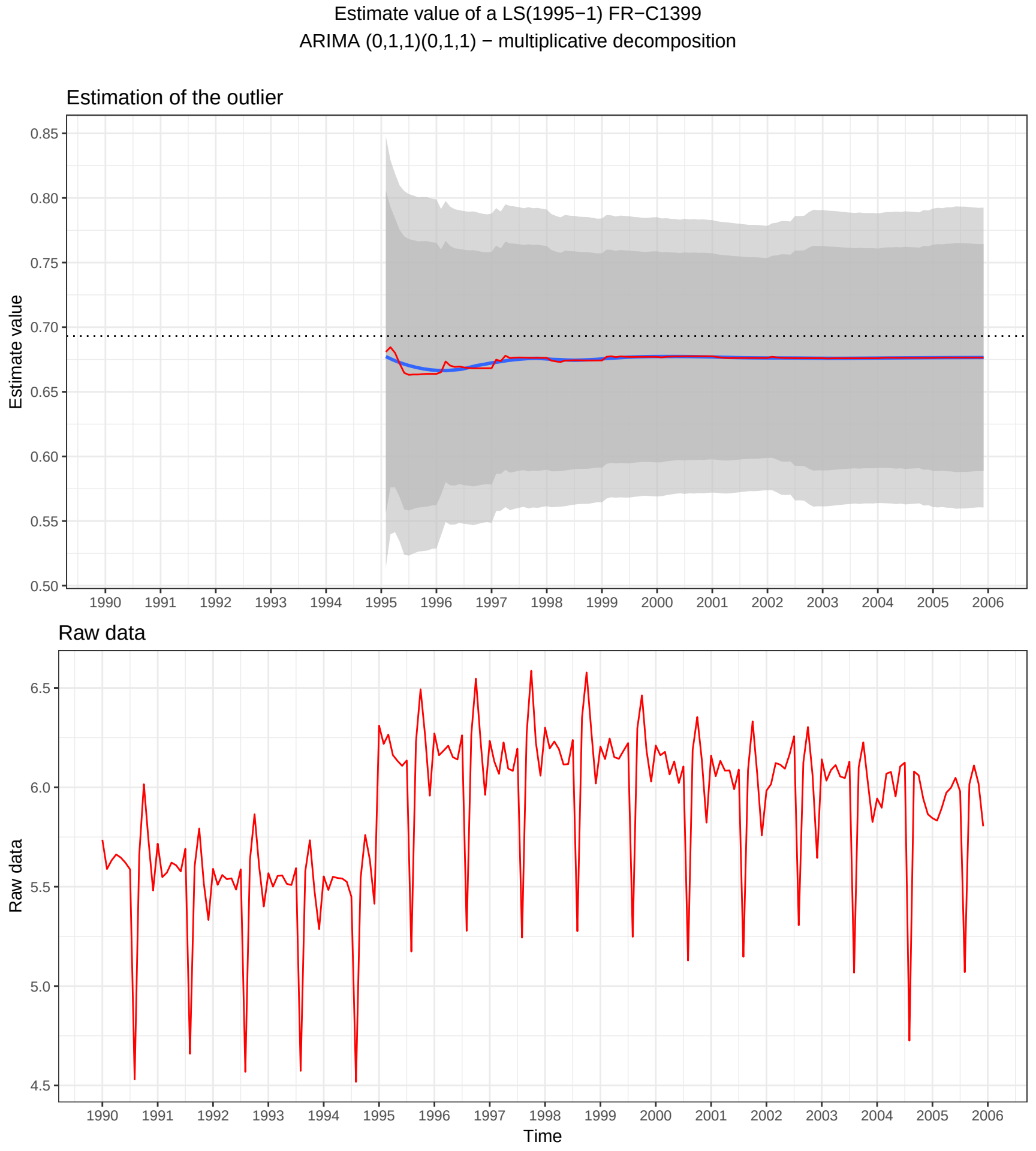

Estimate value of a LS(1995−1) FR−C1396
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
30
25
20
15
10
5
0
−5
−10
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
200
150
100
Time

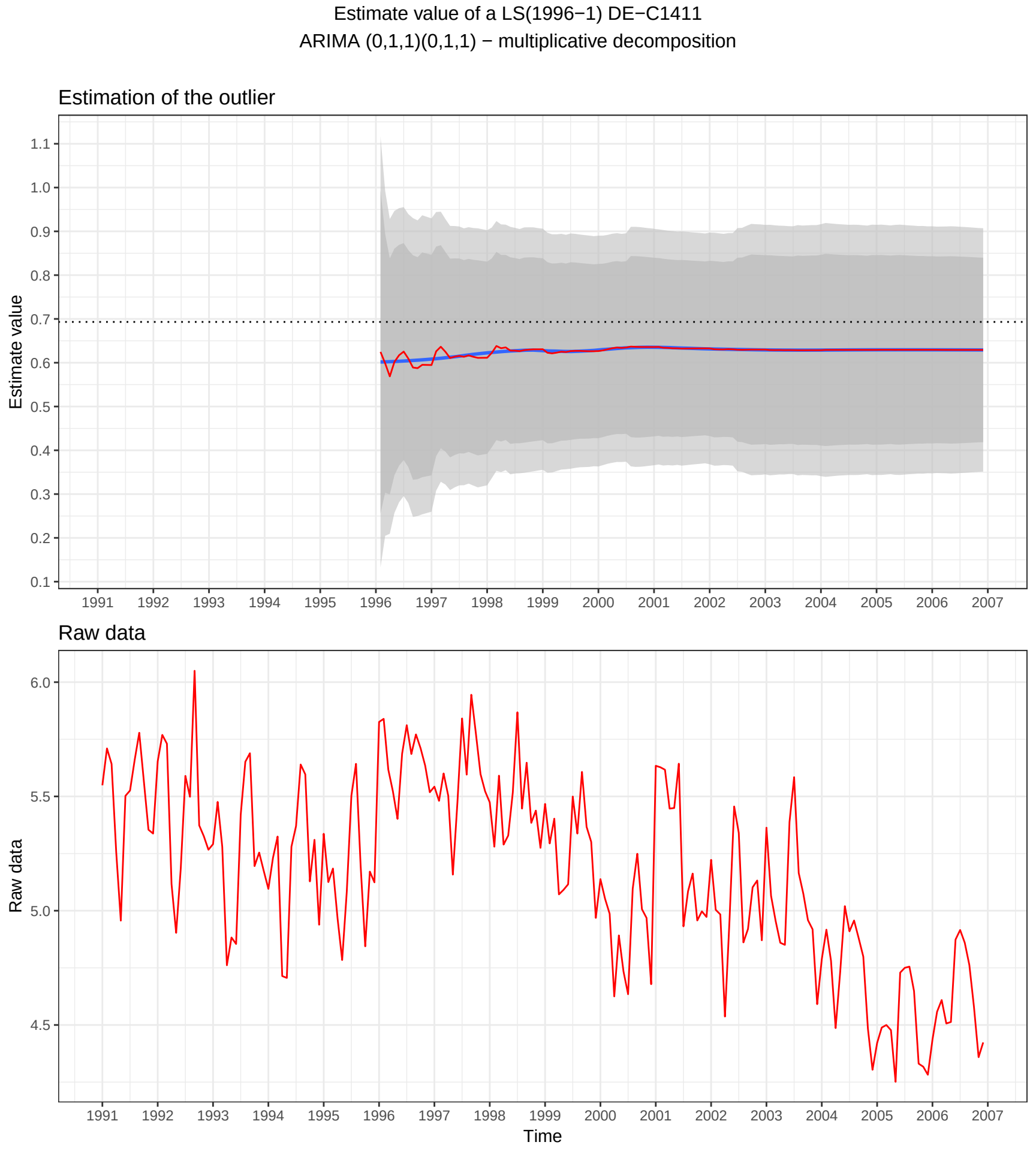

Estimate value of a LS(1995−1) IT−C1396
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
30
20
10
0
−10
−20
−30
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
200
150
100
50
Time

Estimate value of a LS(1996−1) DE−C1399
ARIMA (2,1,0)(0,1,1) − multiplicative decomposition



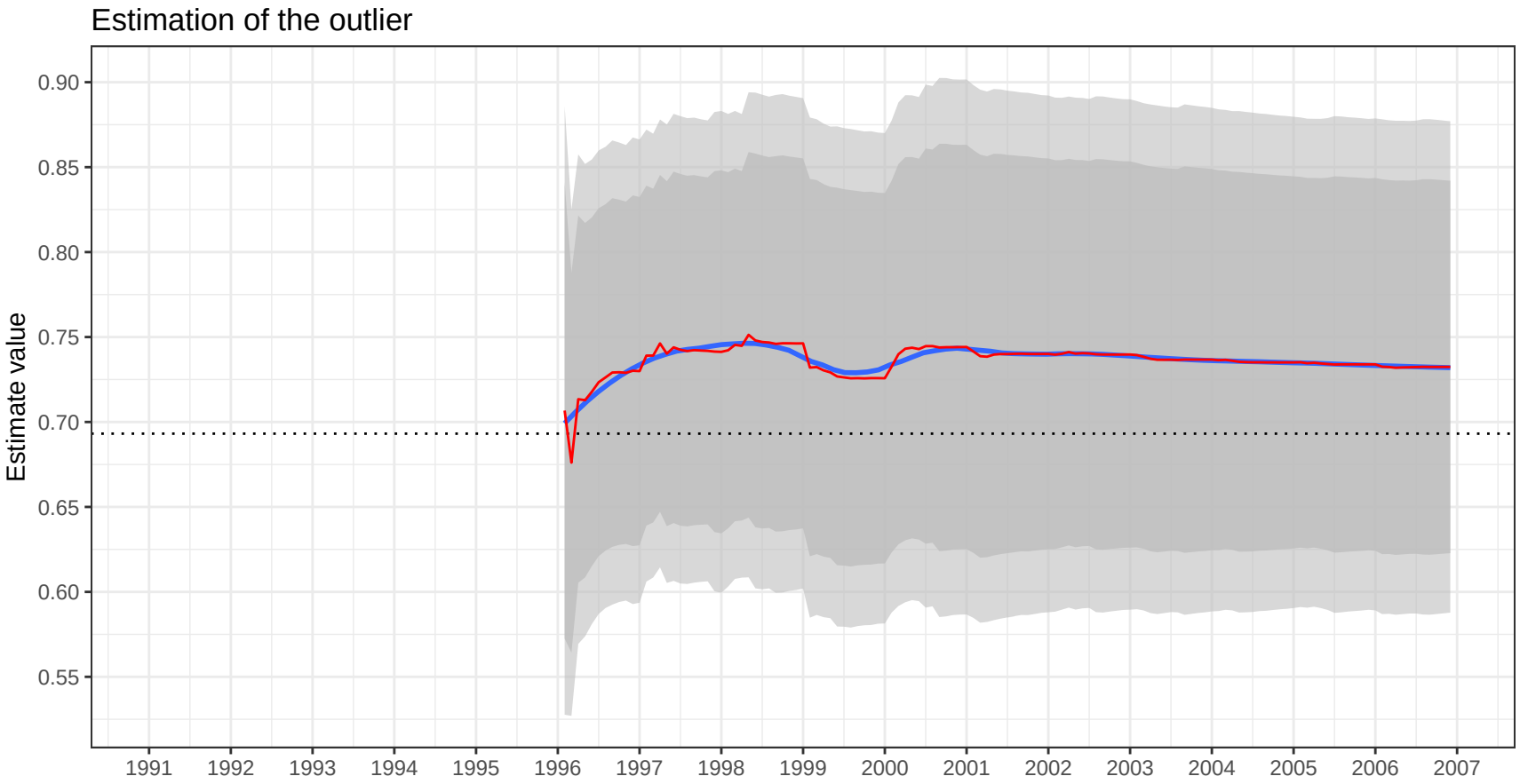


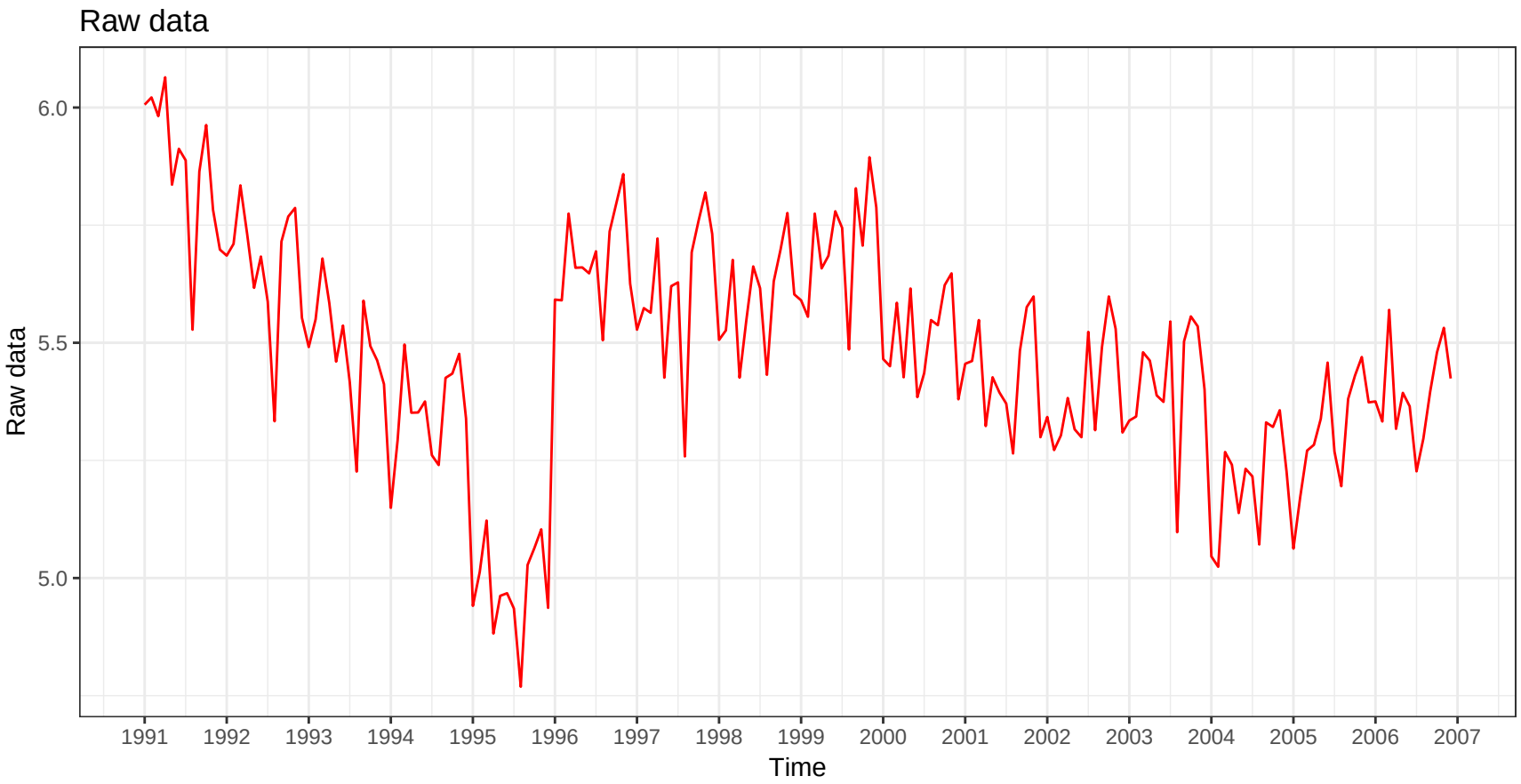

Estimate value of a LS(1995−1) FR−C1399
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
6.5
6.0
5.5
5.0
4.5
Time

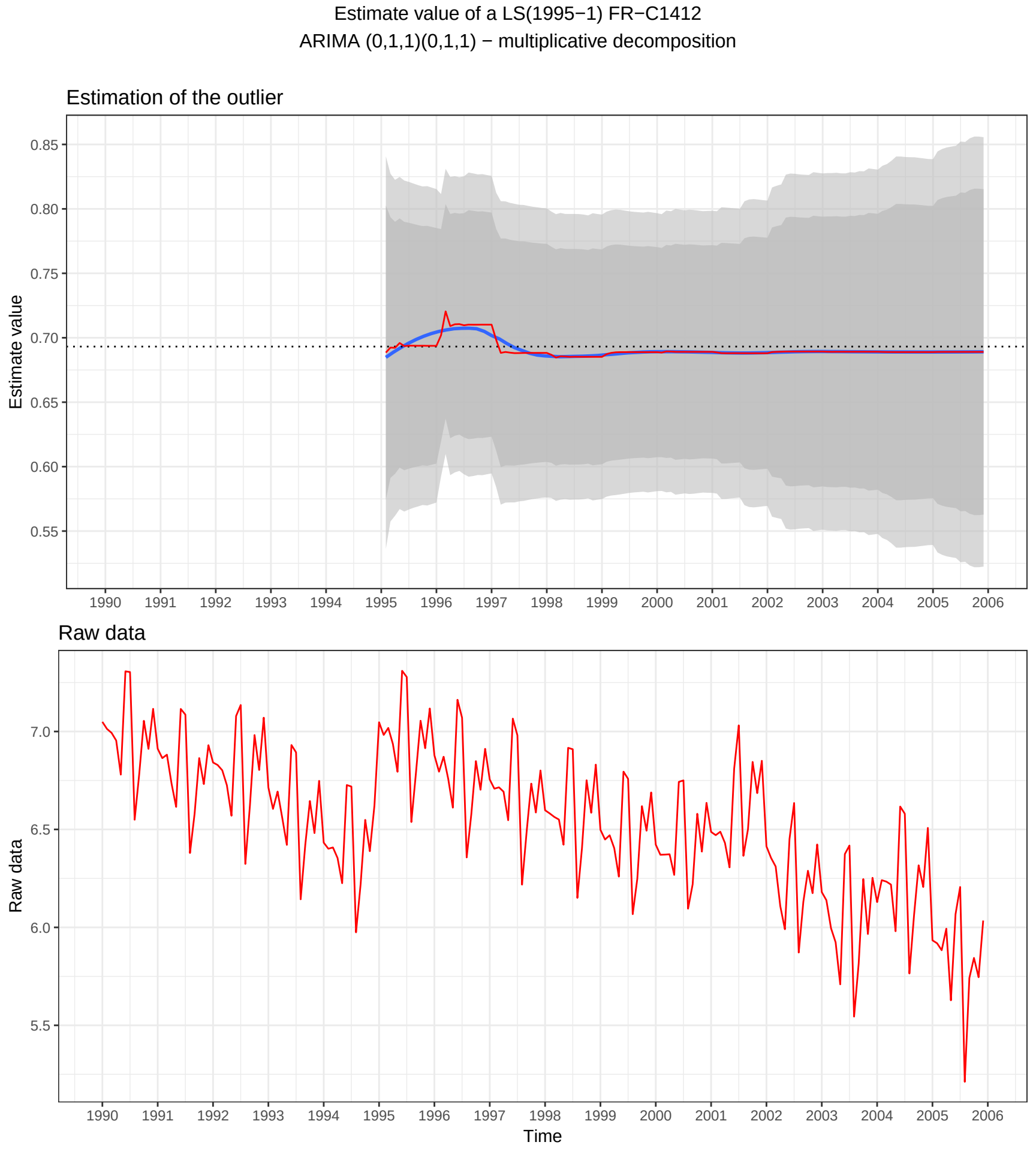

Estimate value of a LS(1996−1) DE−C1411
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
6.0
5.5
5.0
4.5
Time

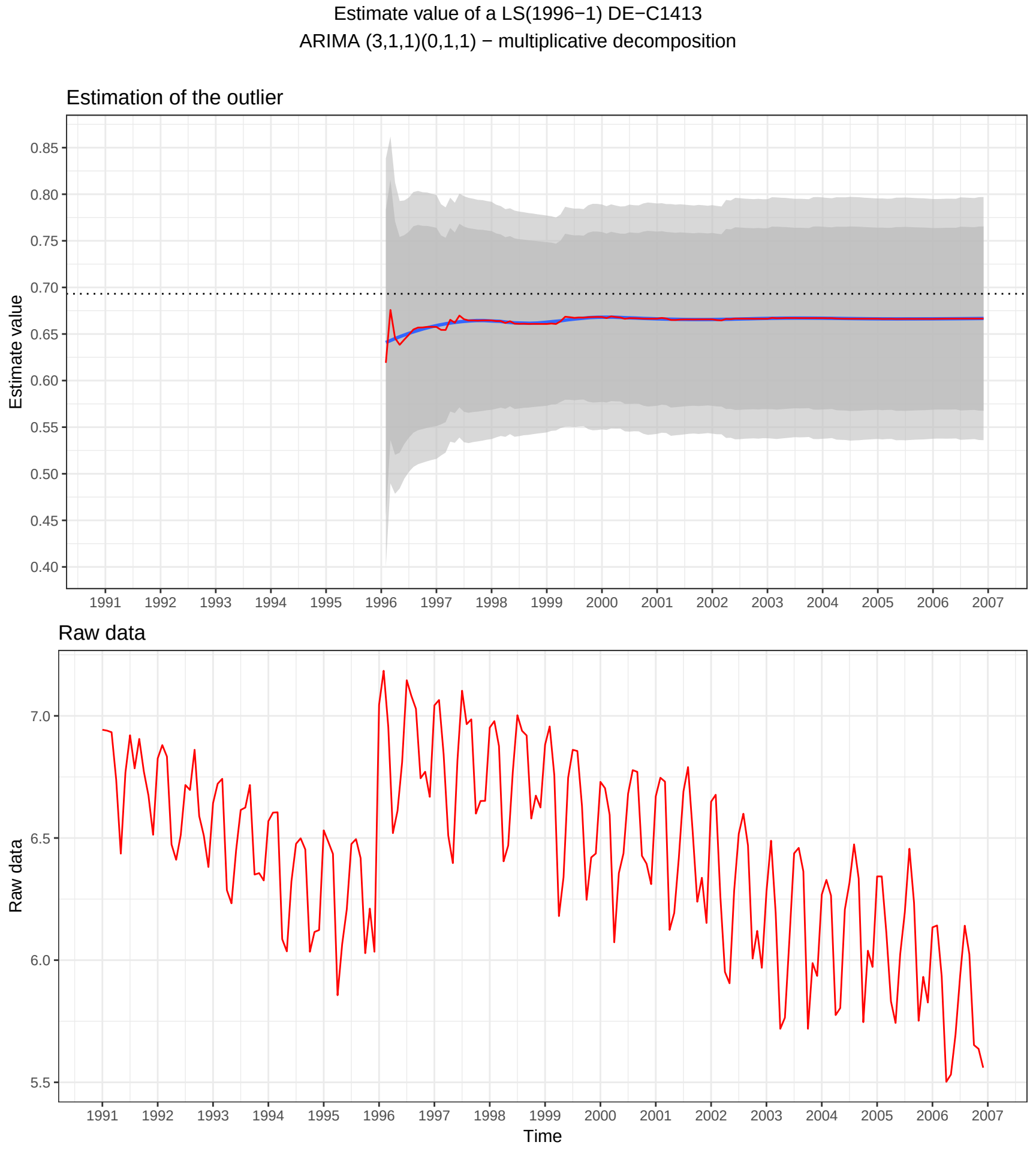
Estimate value of a LS(1996−1) DE−C1412

ARIMA (0,1,1)(0,1,1) − multiplicative decomposition



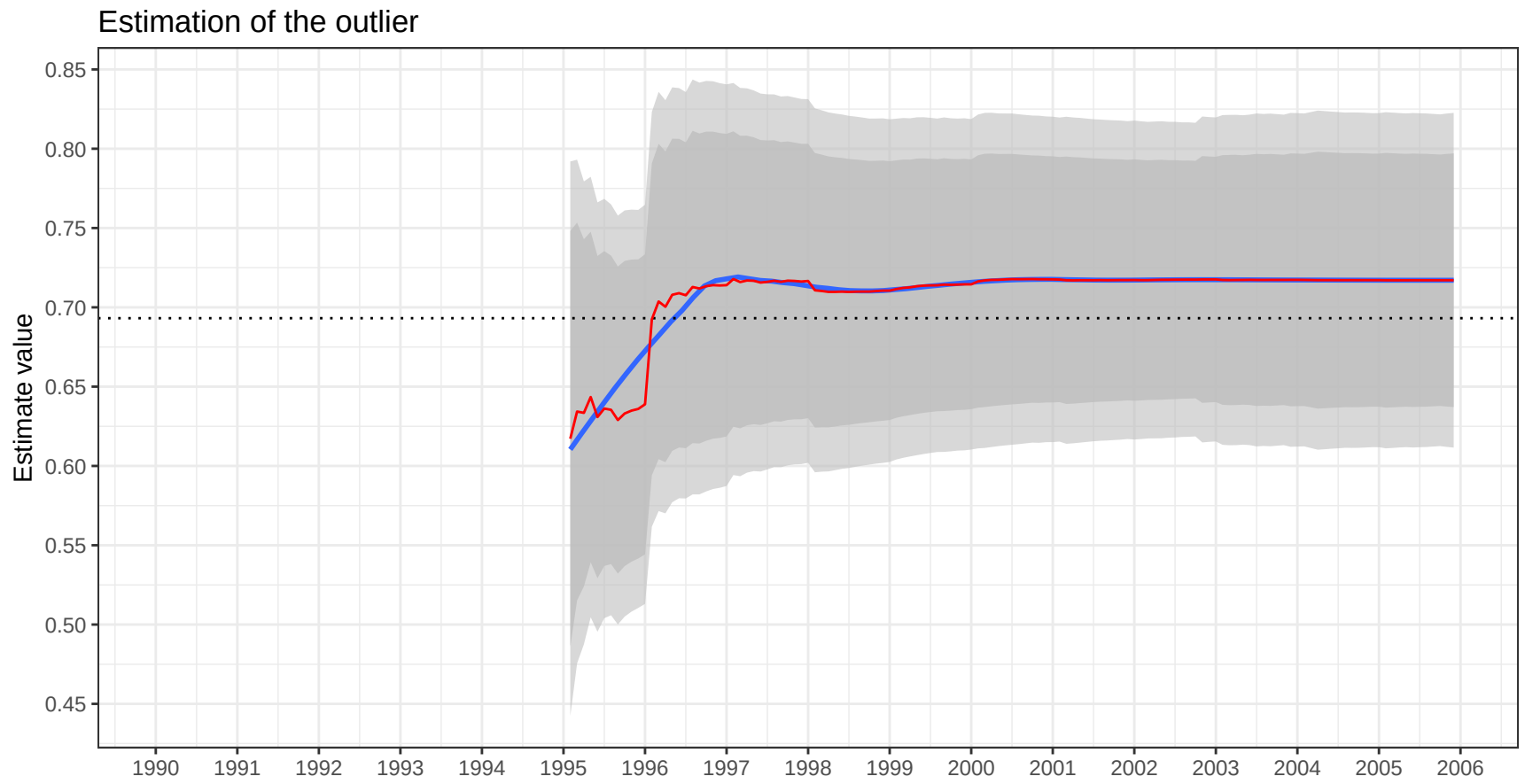


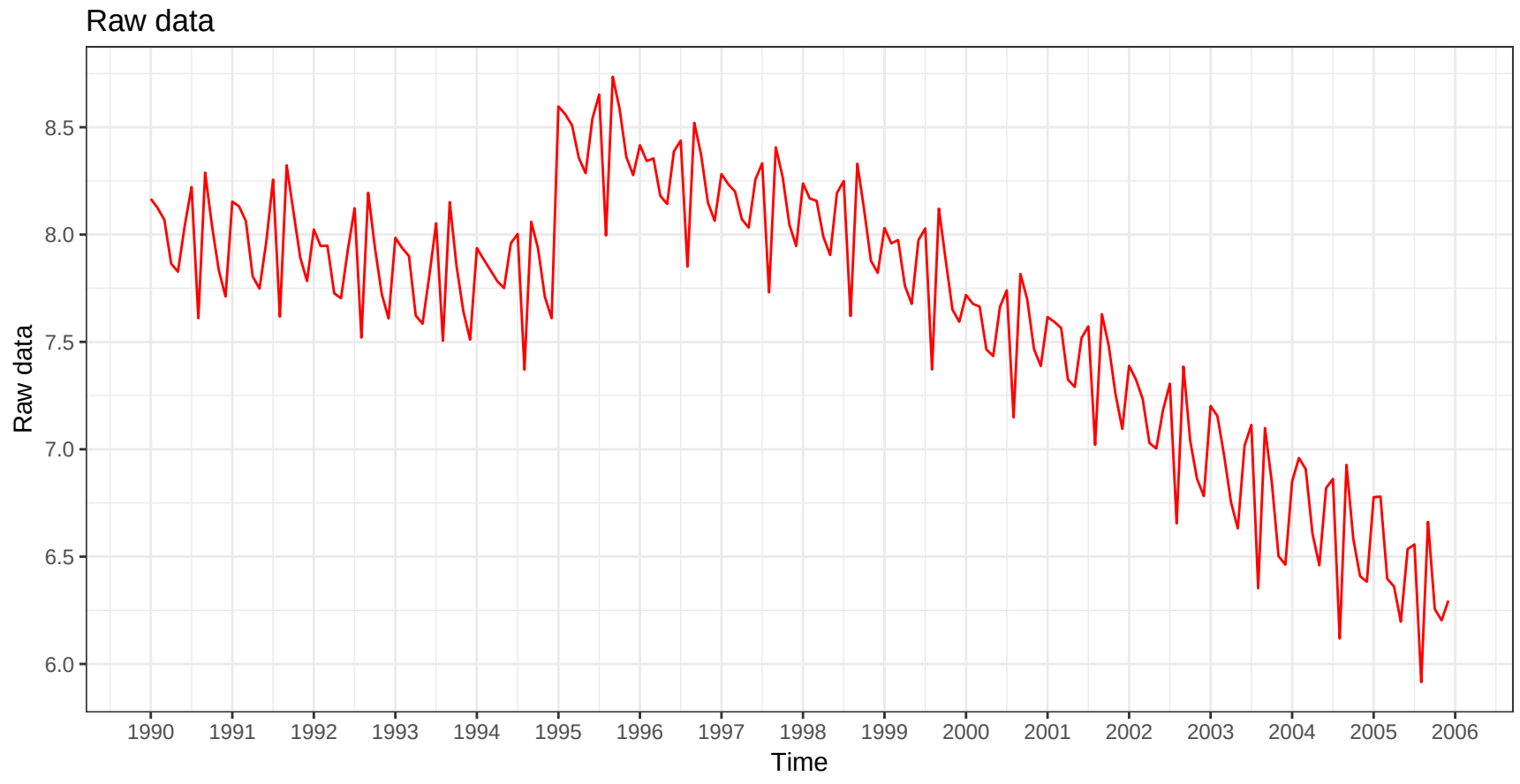

Estimate value of a LS(1995−1) FR−C1412
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.85
0.80
0.75
0.70
0.65
0.60
0.55
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
7.0
6.5
6.0
5.5
Time

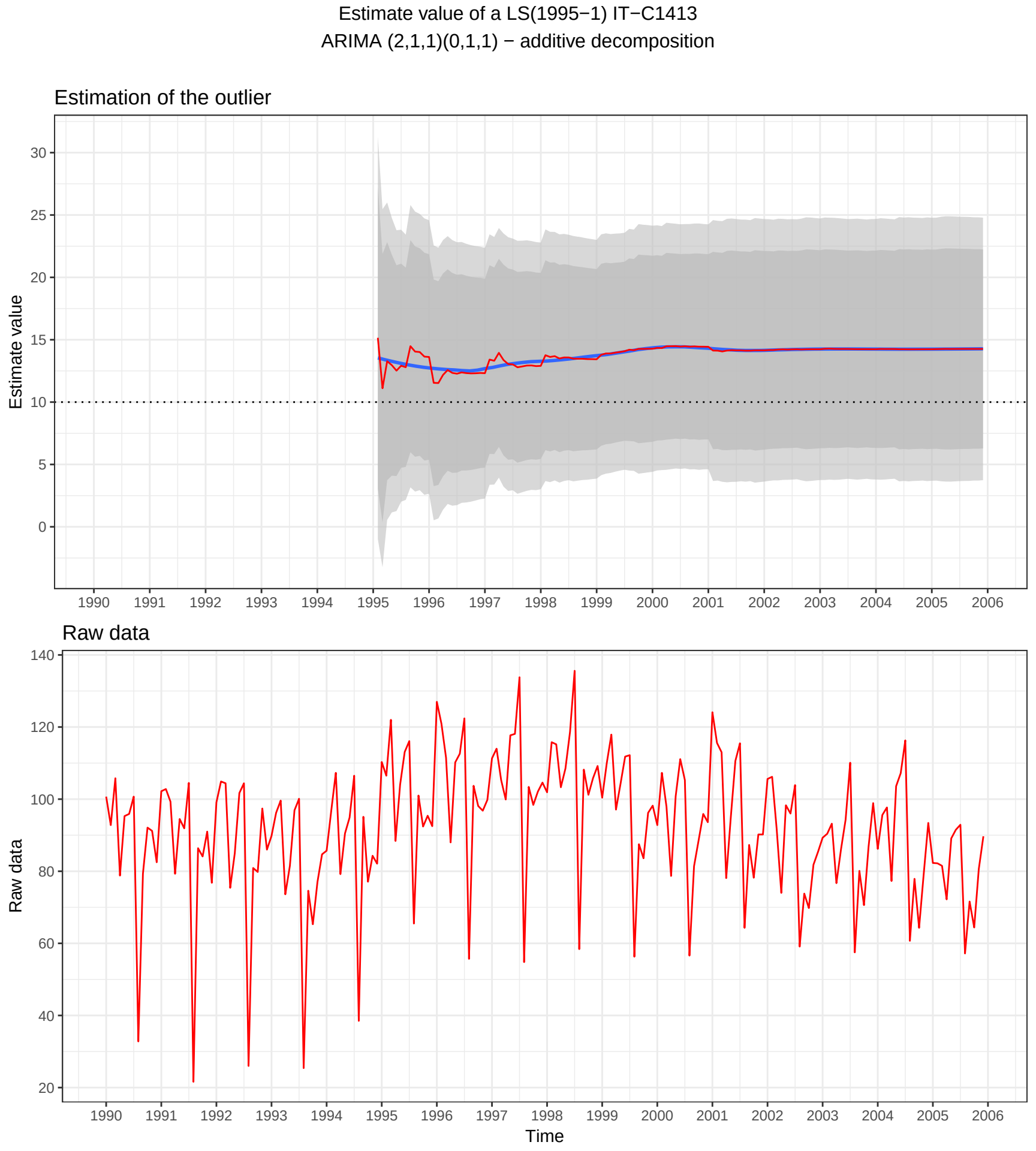

Estimate value of a LS(1996−1) DE−C1413
ARIMA (3,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
0.45
0.40
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
7.0
6.5
6.0
5.5
Time

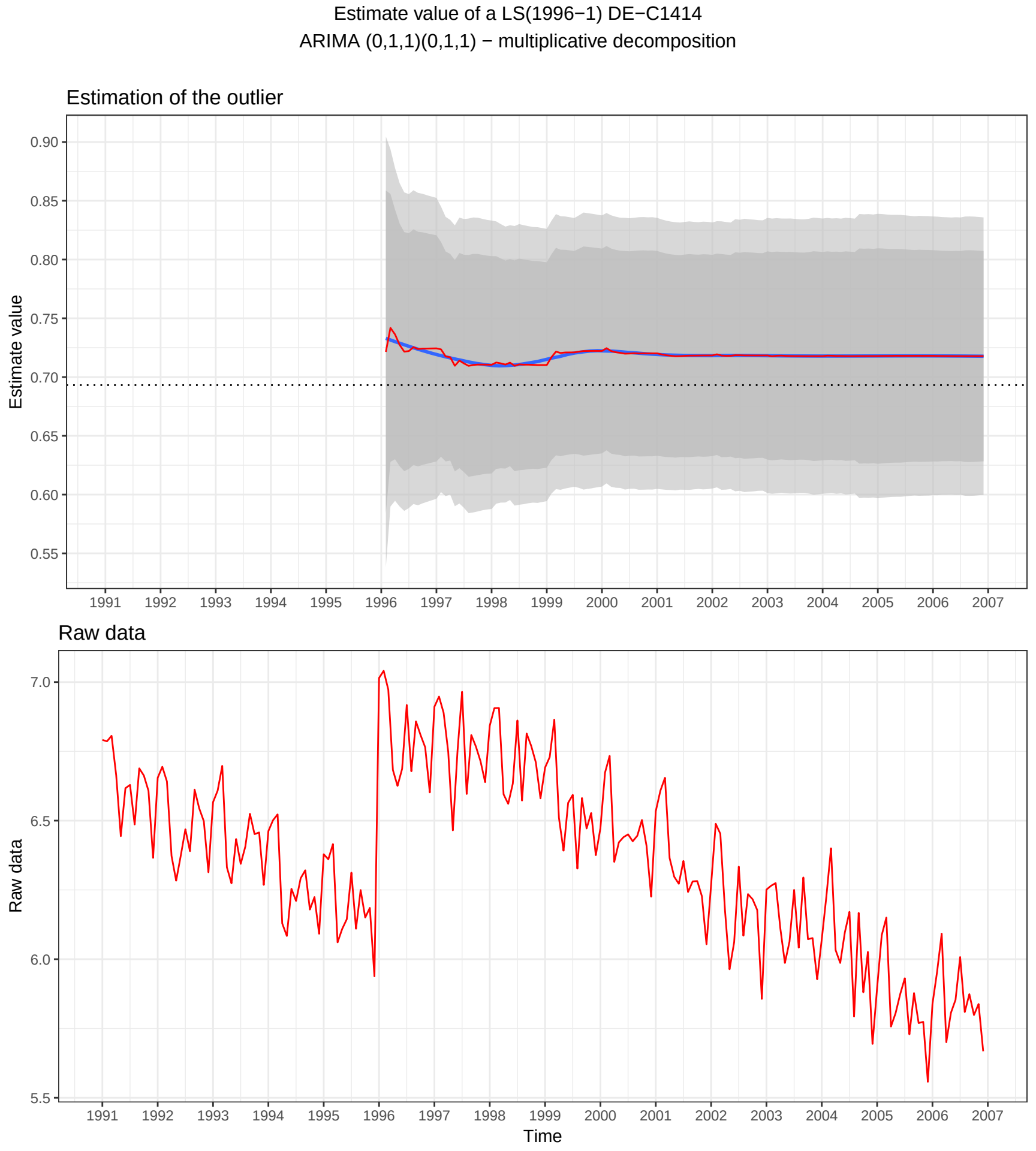
Estimate value of a LS(1995−1) FR−C1413

ARIMA (2,1,1)(0,1,1) − multiplicative decomposition

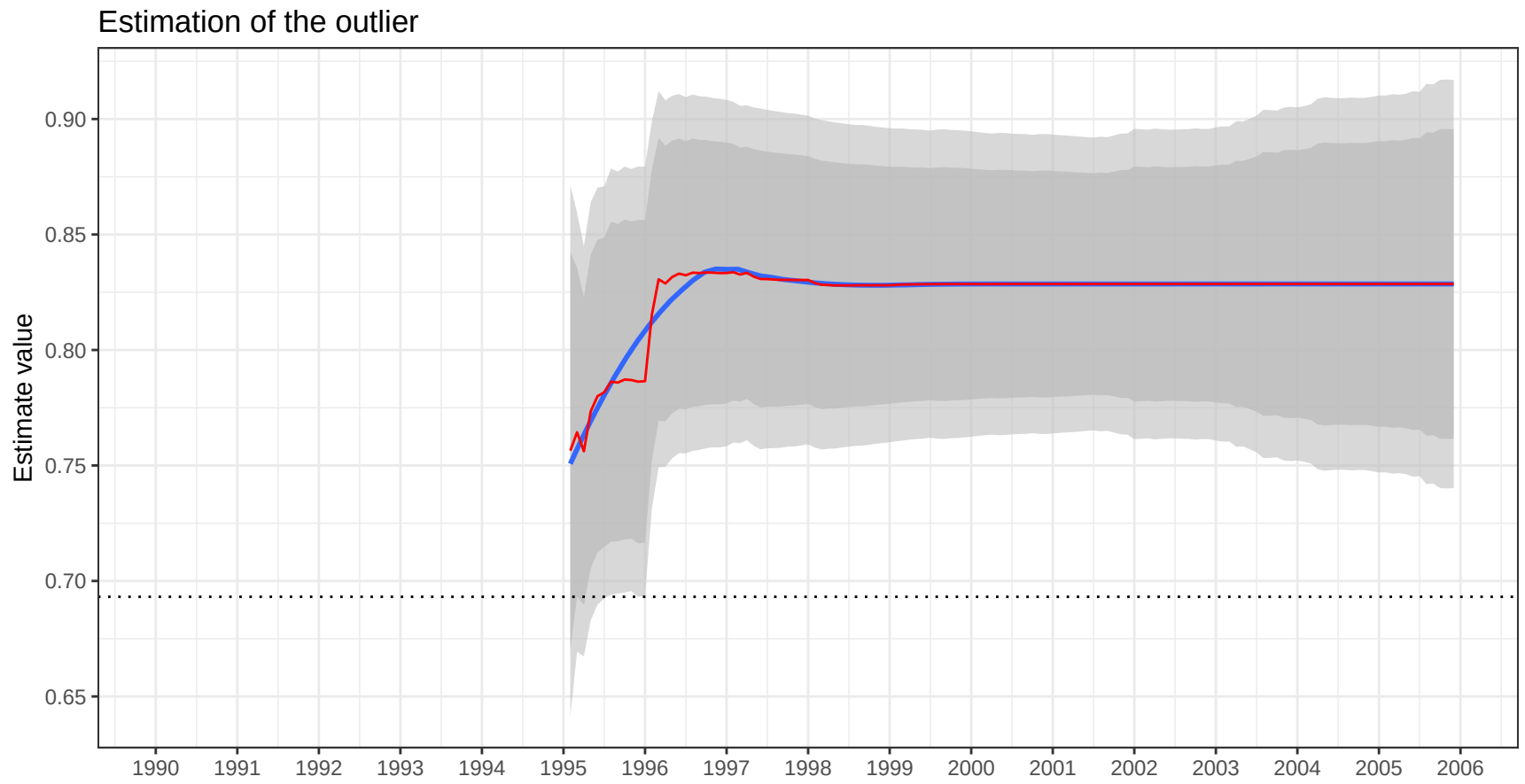


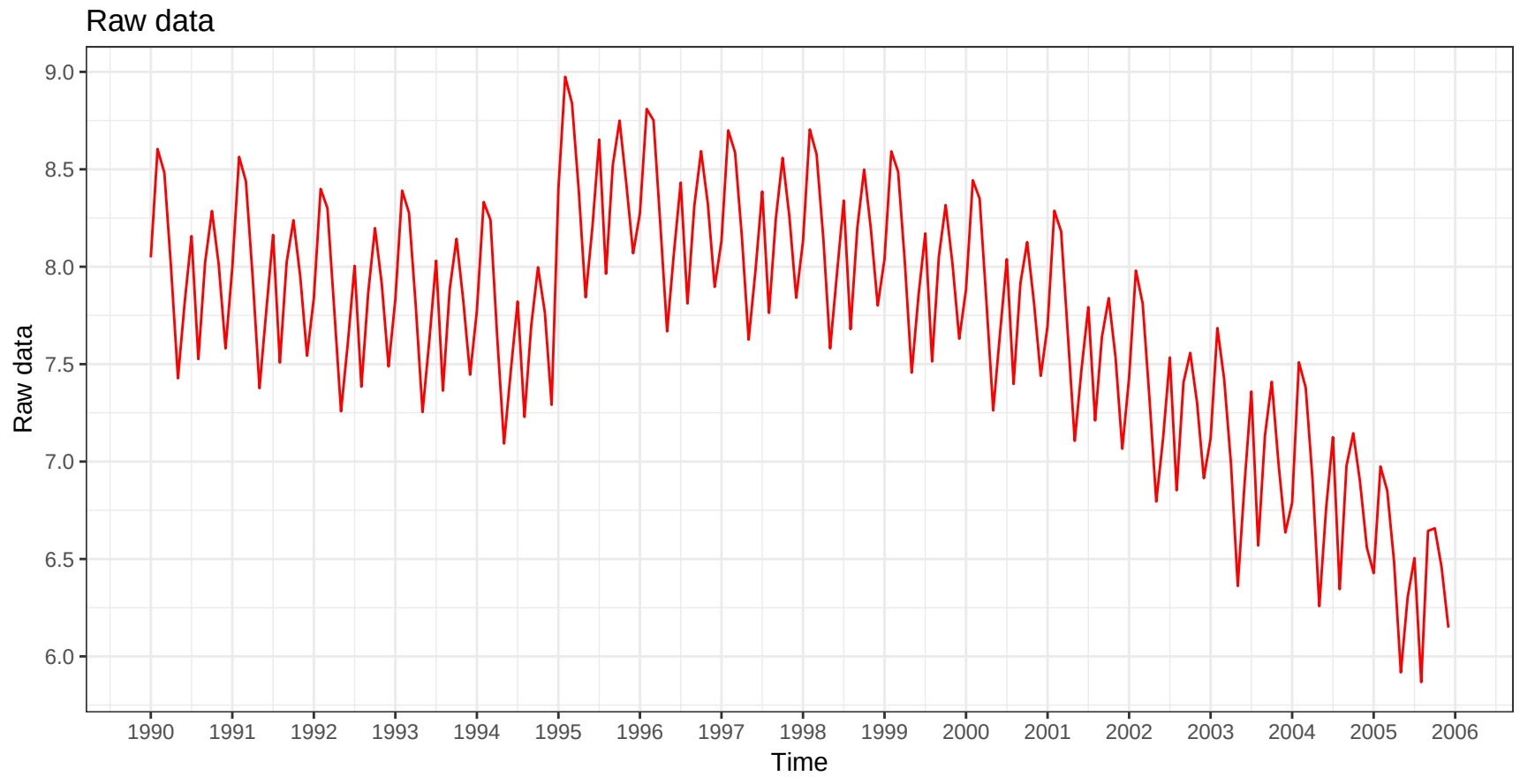


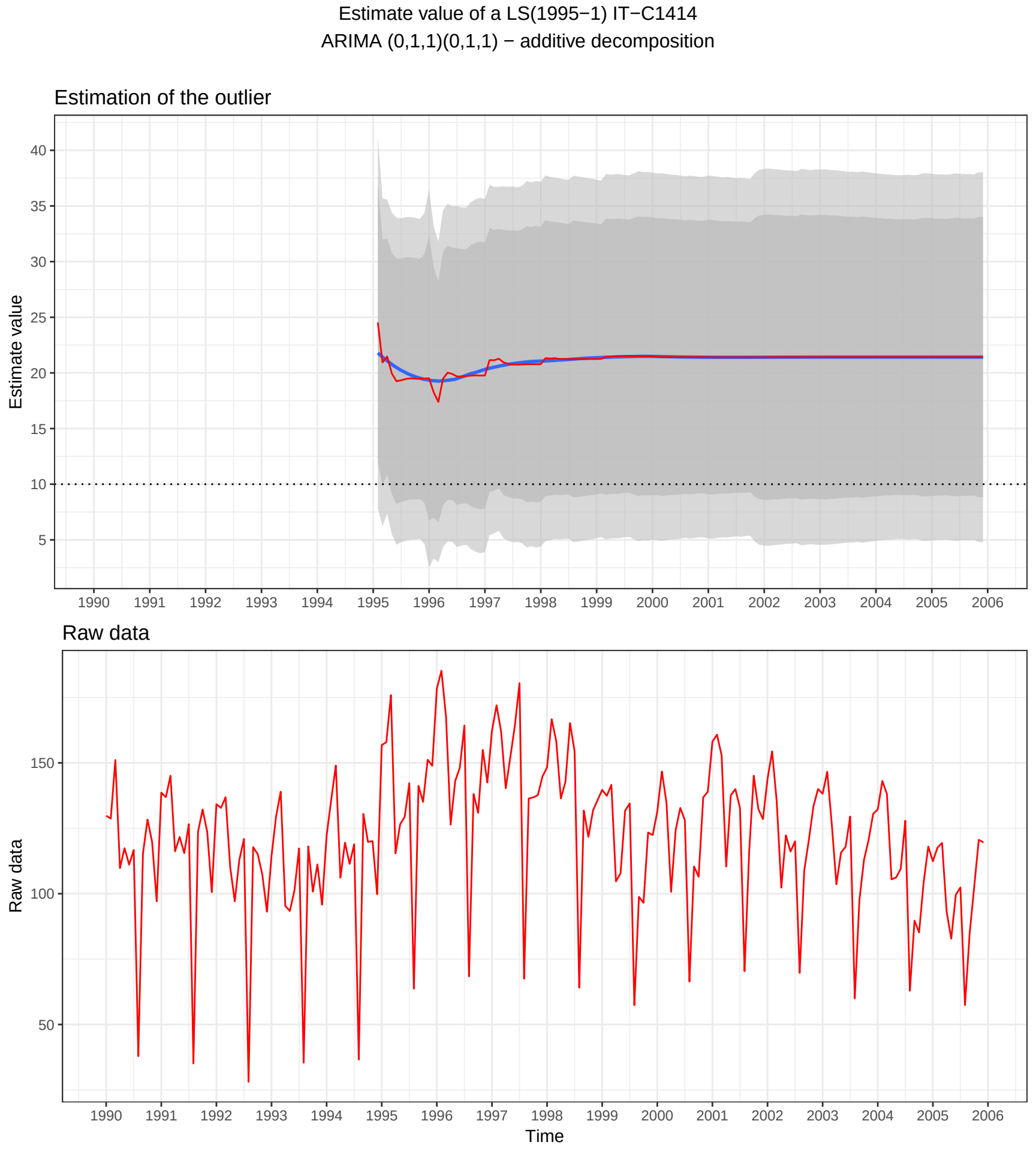

Estimate value of a LS(1995−1) IT−C1413
ARIMA (2,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
30
25
20
15
10
5
0
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
140
120
100
80
60
40
20
Time


Estimate value of a LS(1996−1) DE−C1414
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0.55
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
7.0
6.5
6.0
5.5
Time

Estimate value of a LS(1995−1) FR−C1414
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

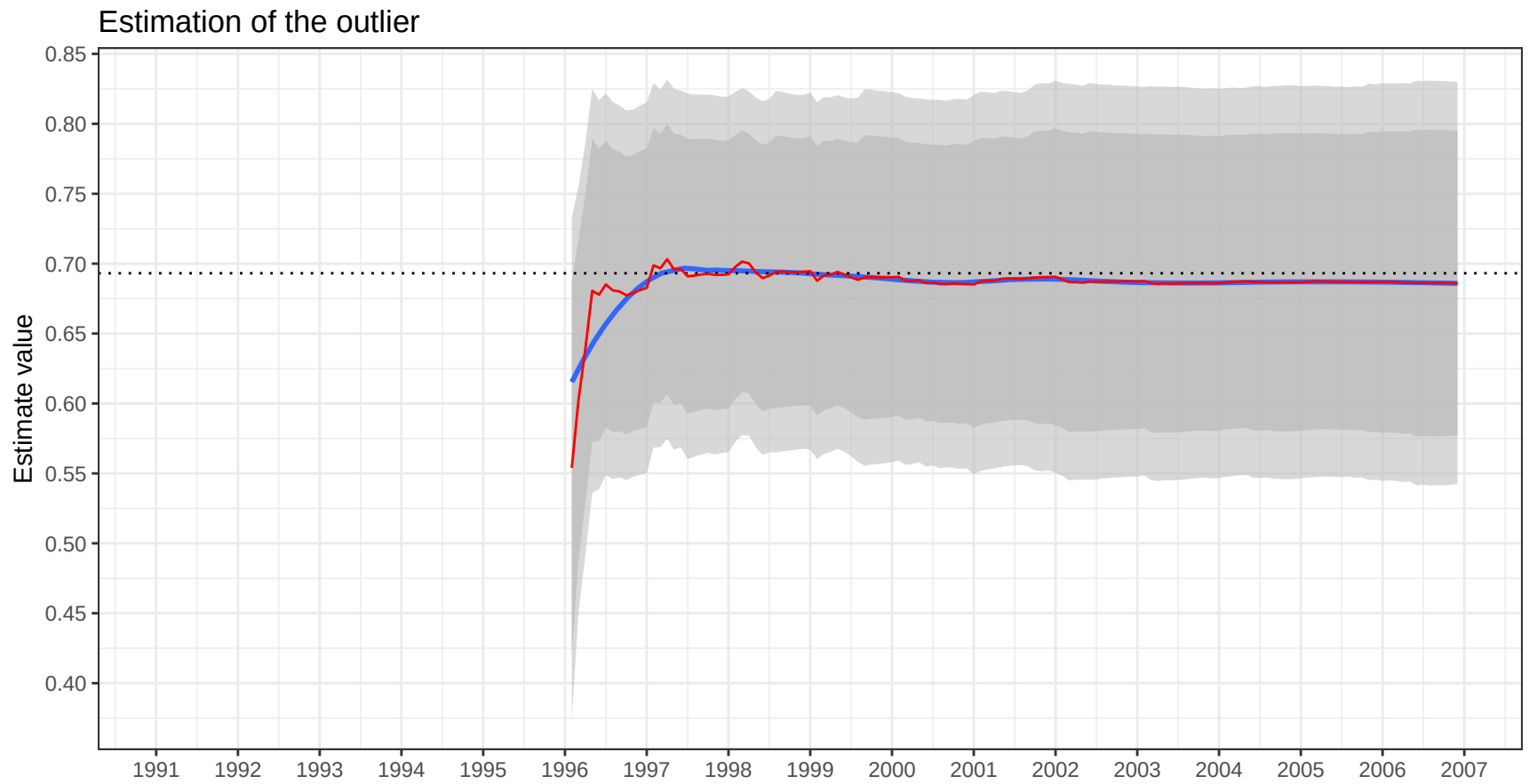


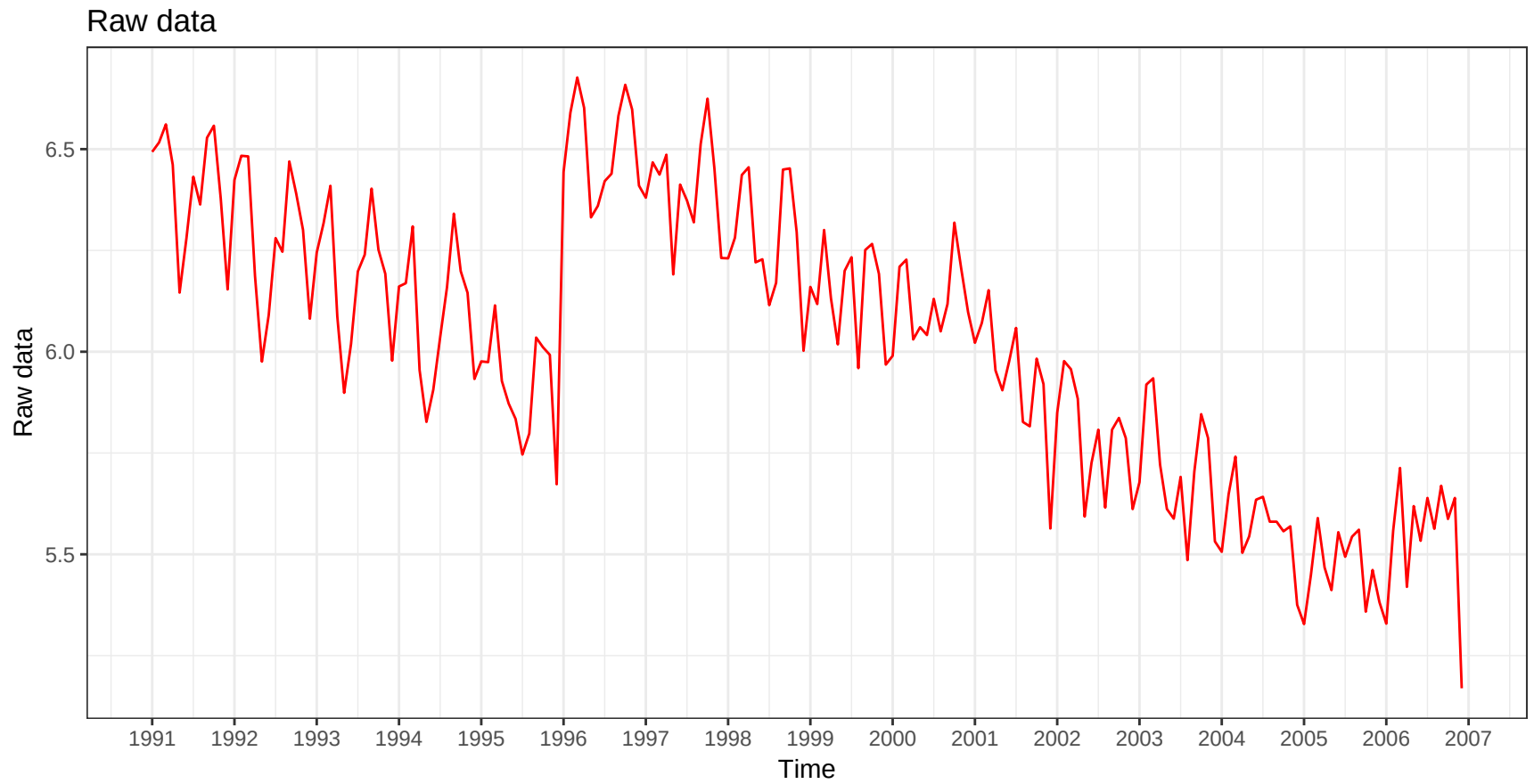



Estimate value of a LS(1995−1) IT−C1414
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
40
35
30
25
20
15
10
5
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
150
100
50
Time

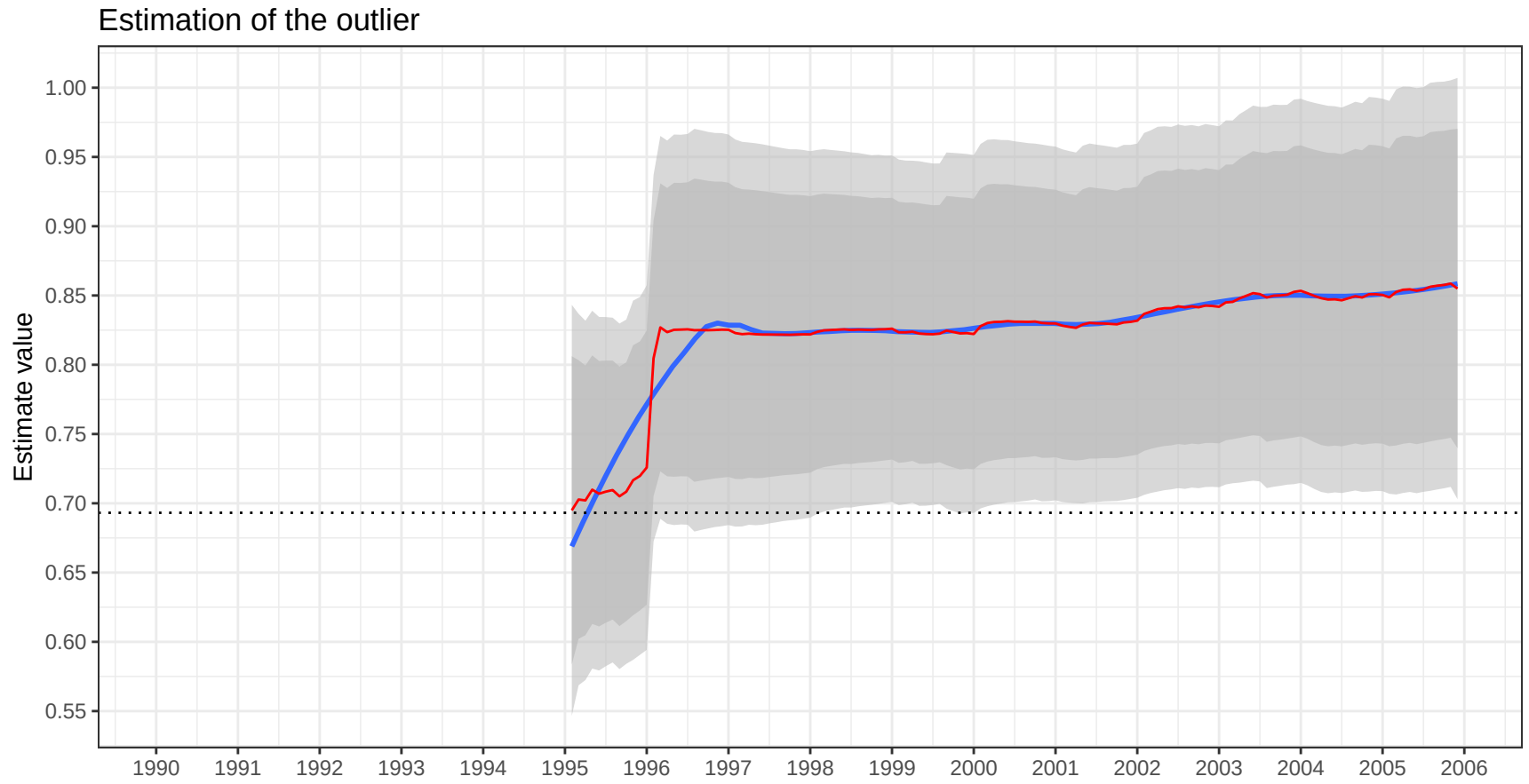
Estimate value of a LS(1996−1) DE−C1419

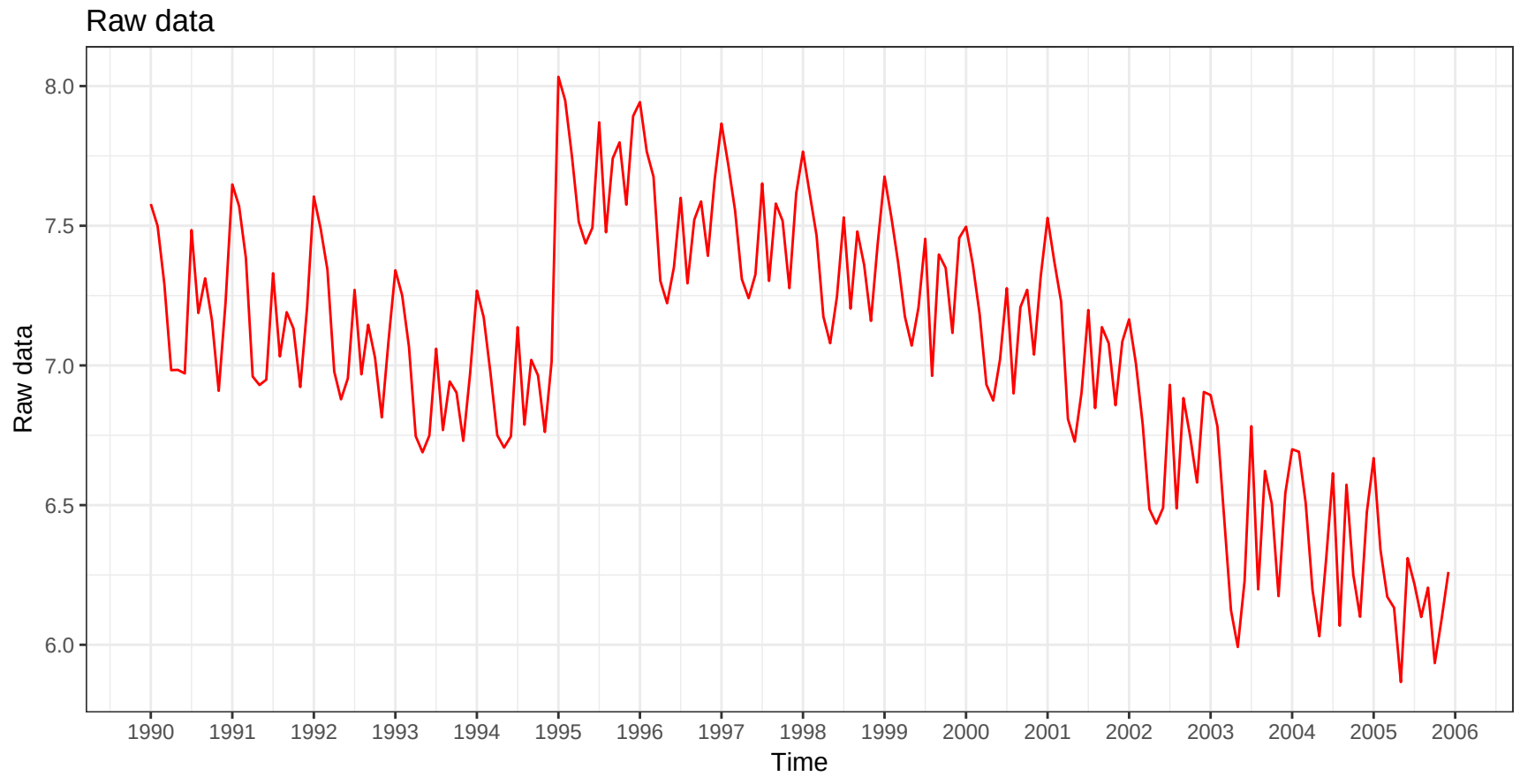
ARIMA (3,1,1)(0,1,1) − multiplicative decomposition



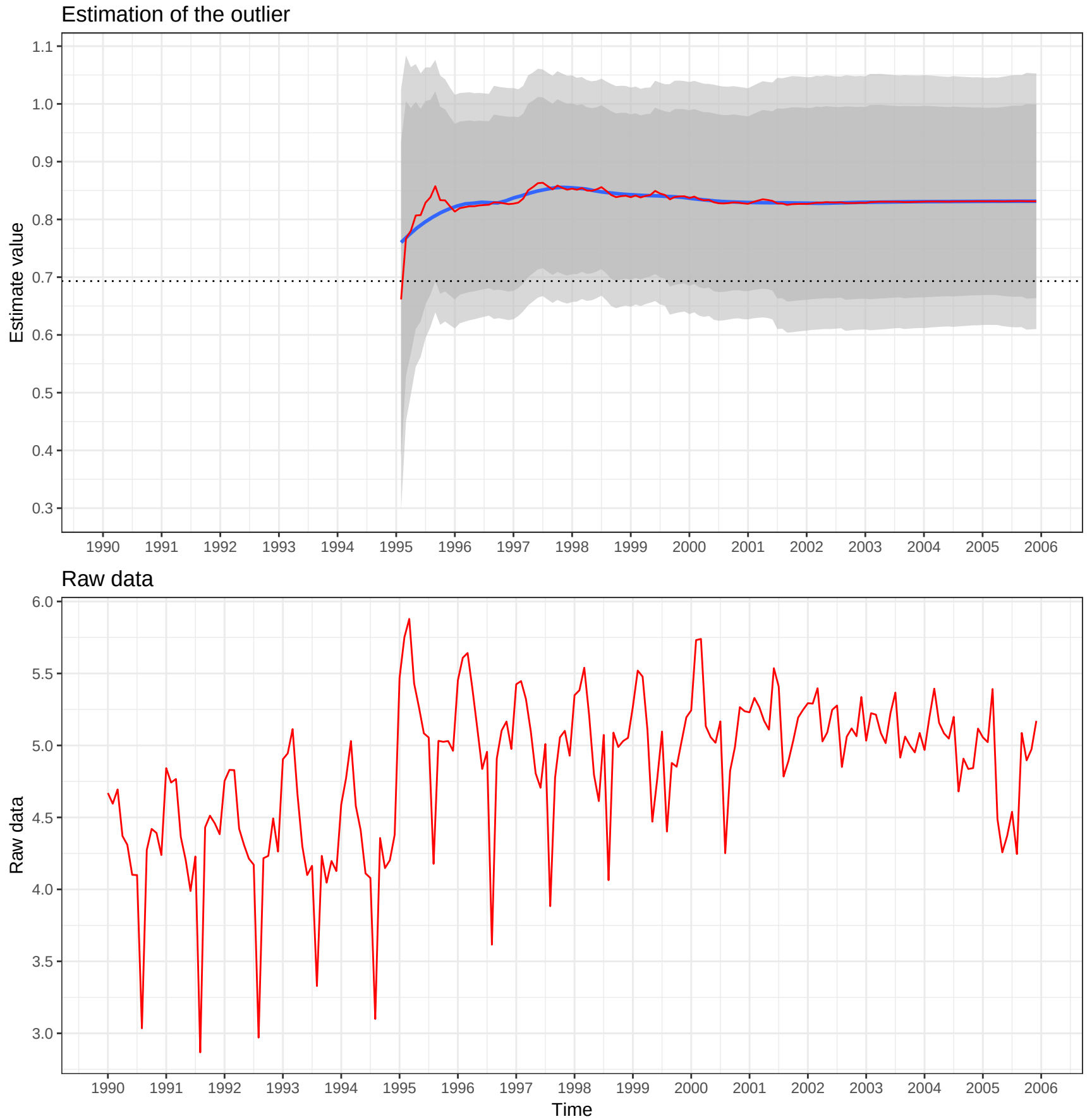


Estimate value of a LS(1995−1) FR−C1419
ARIMA (1,0,1)(1,1,1) − multiplicative decomposition

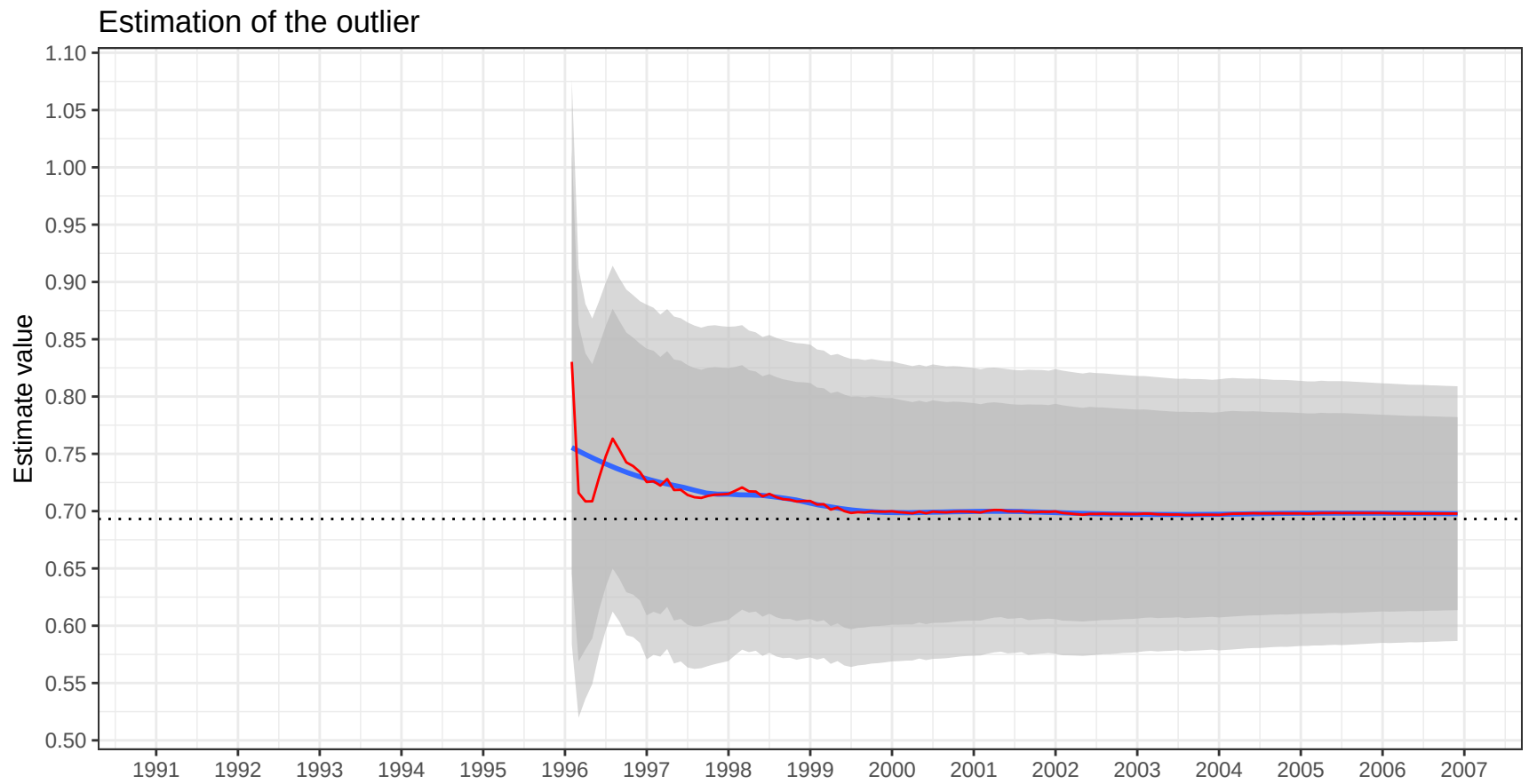


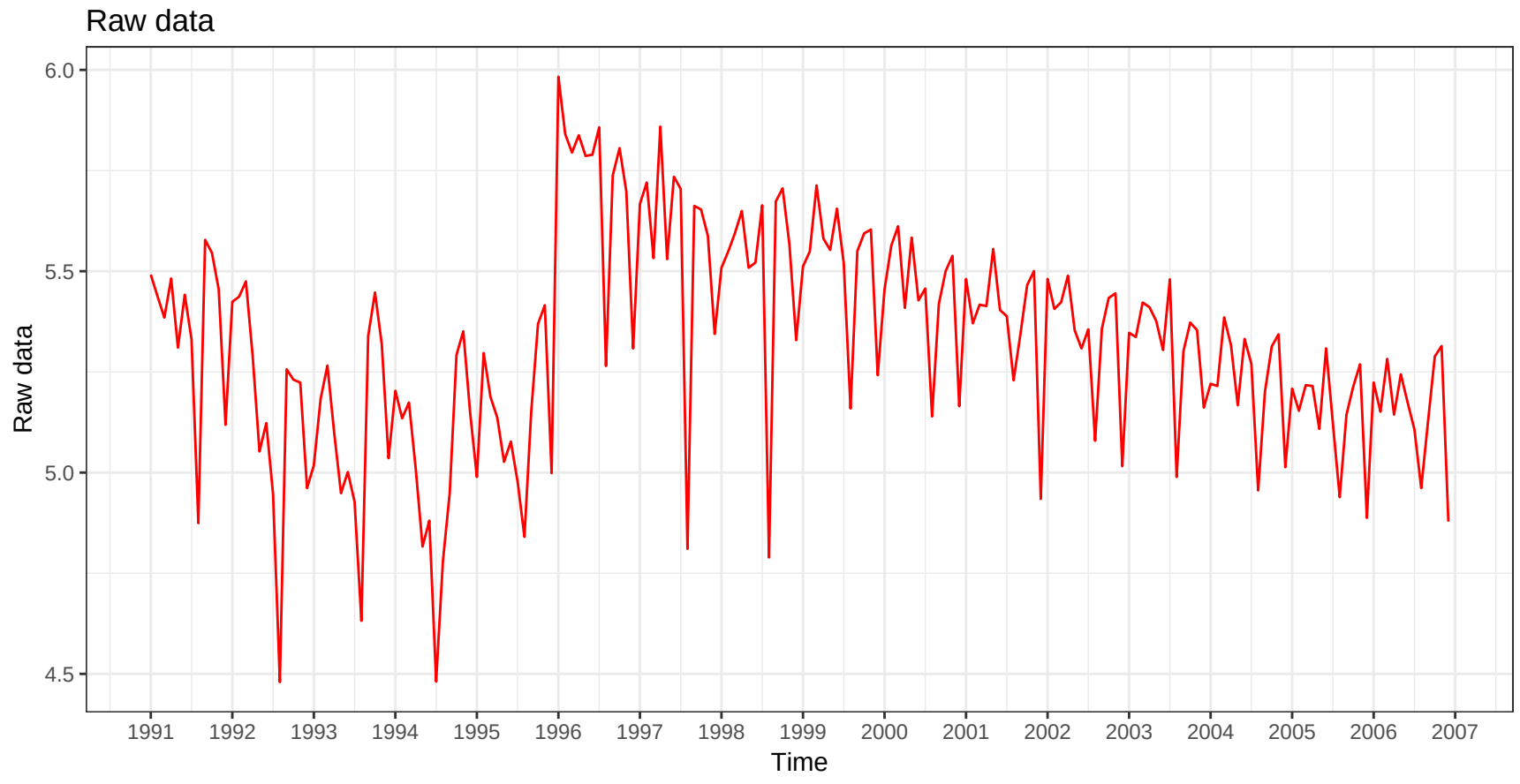


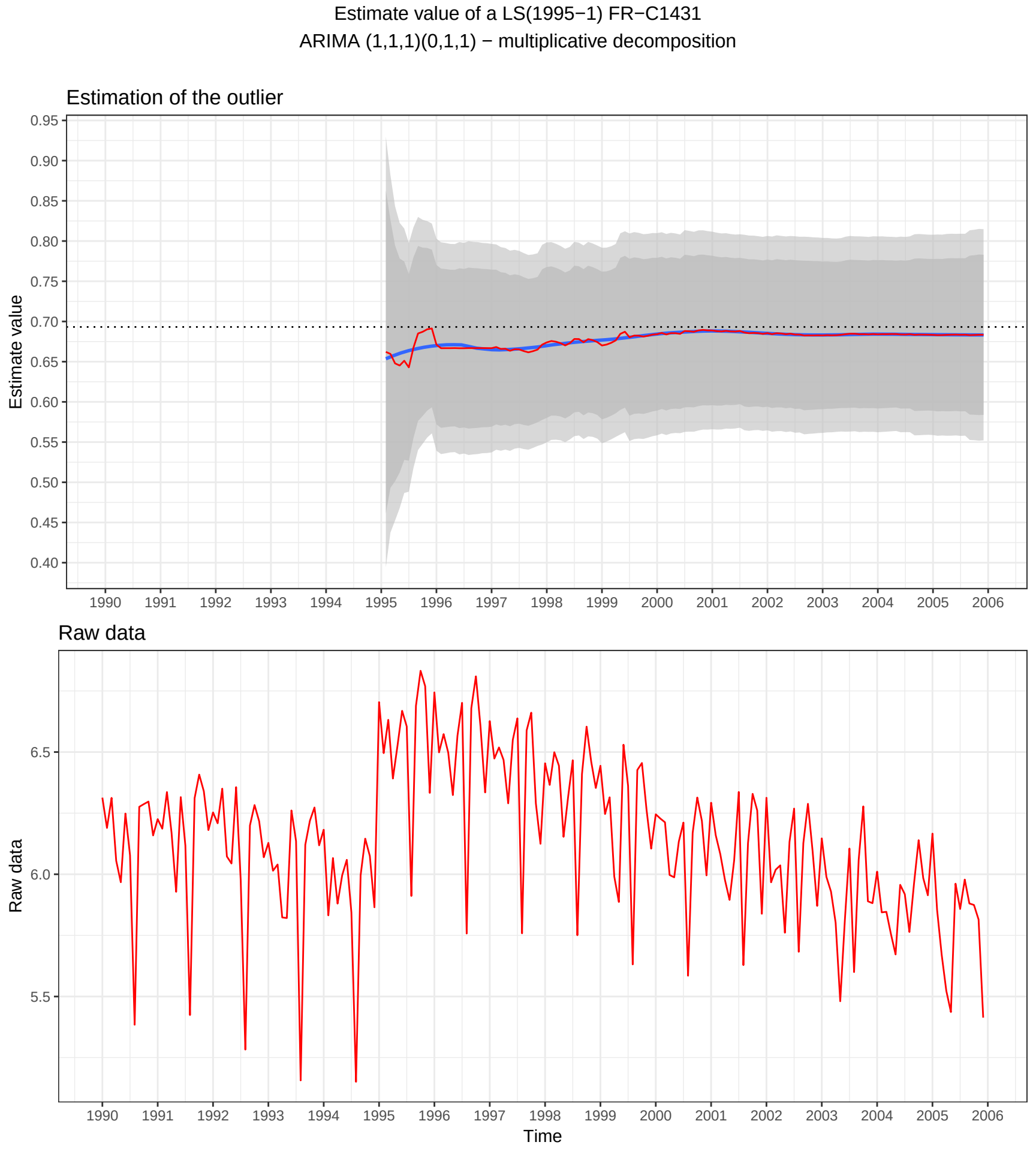
Estimate value of a LS(1995−1) IT−C1419
ARIMA (1,1,1)(0,1,1) − multiplicative decomposition



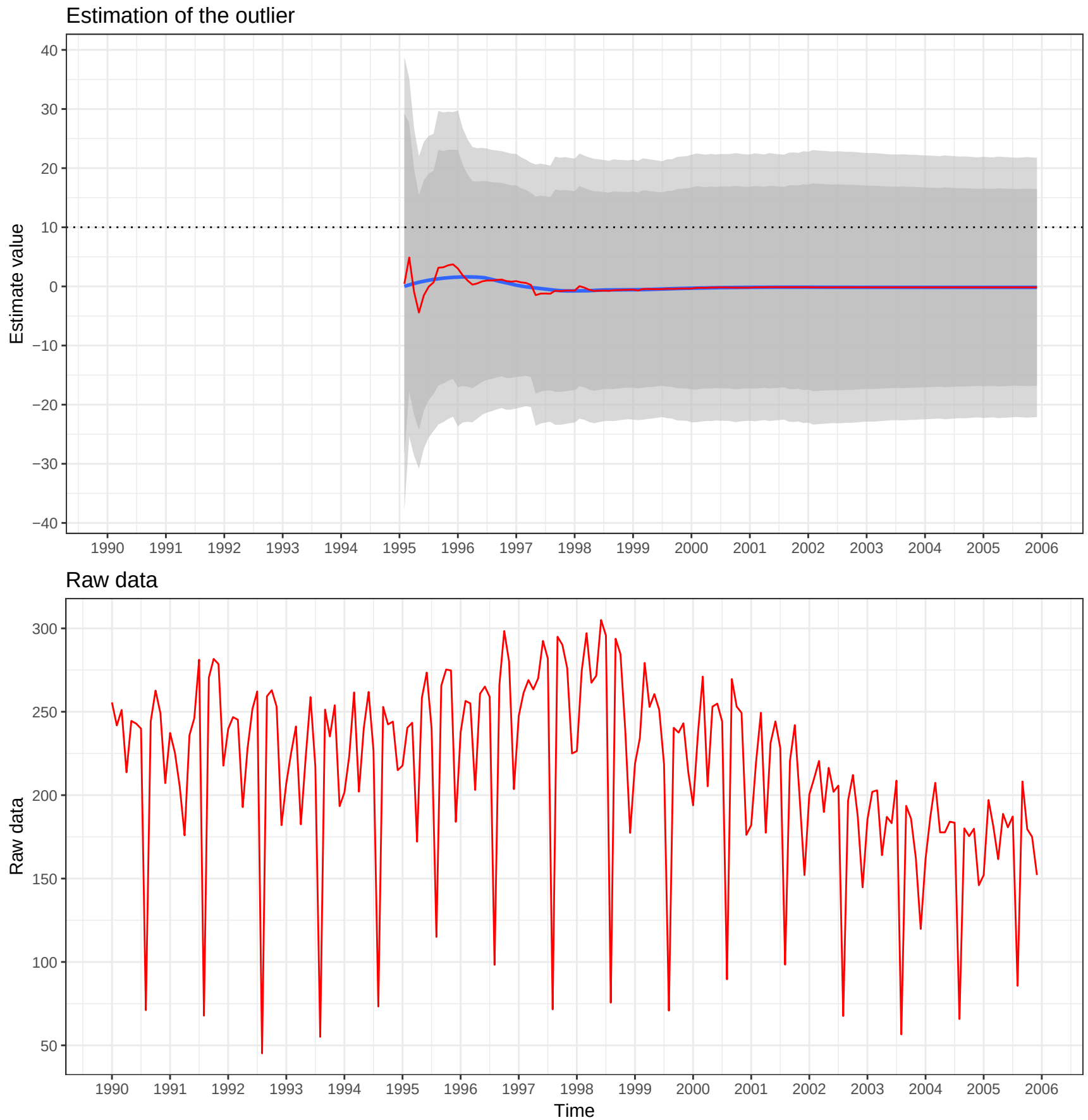
Estimate value of a LS(1996−1) DE−C1431
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition



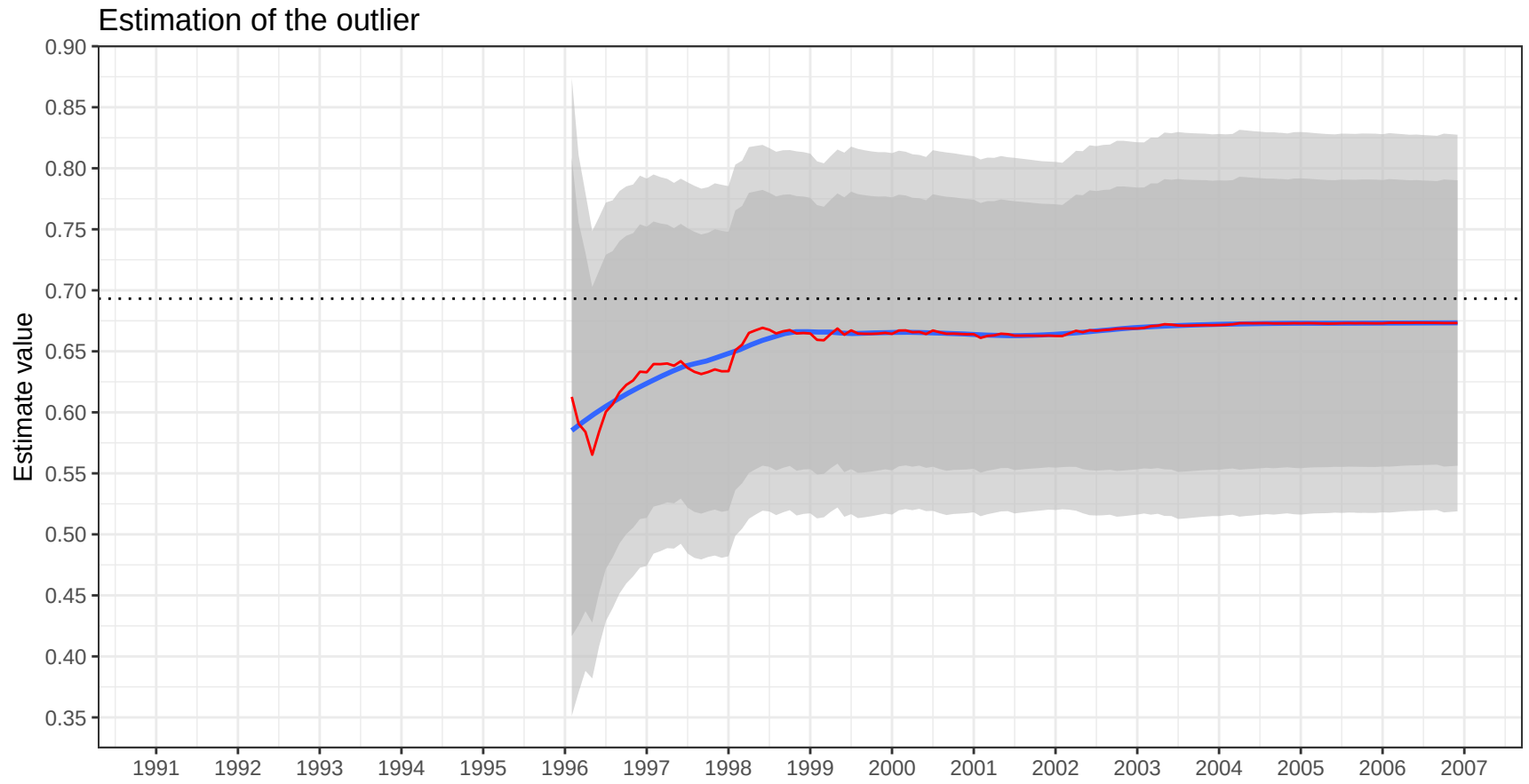


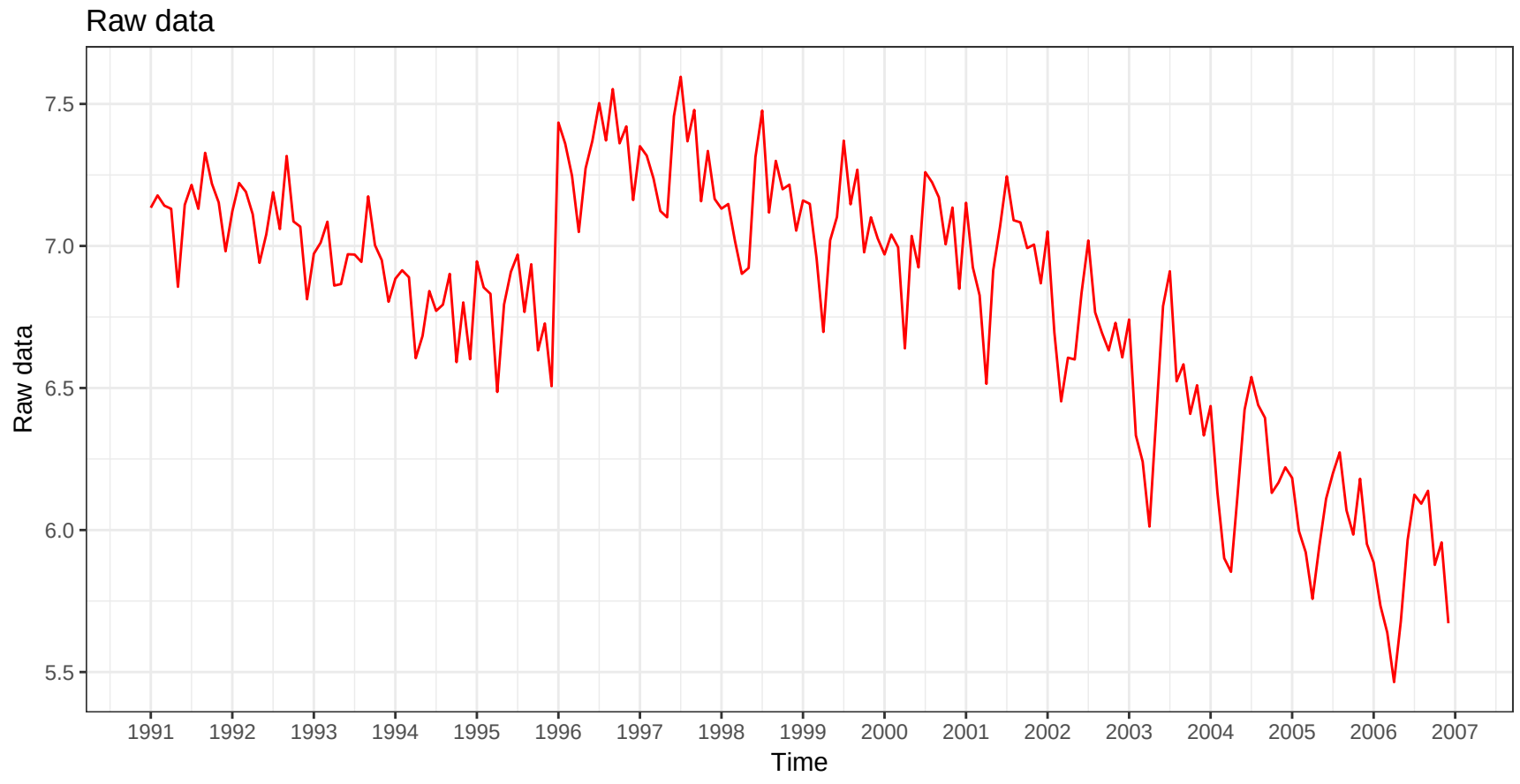

Estimate value of a LS(1995−1) FR−C1431
ARIMA (1,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.95
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
0.45
0.40
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
6.5
6.0
5.5
Time

Estimate value of a LS(1995−1) IT−C1431
ARIMA (0,1,1)(0,1,1) − additive decomposition



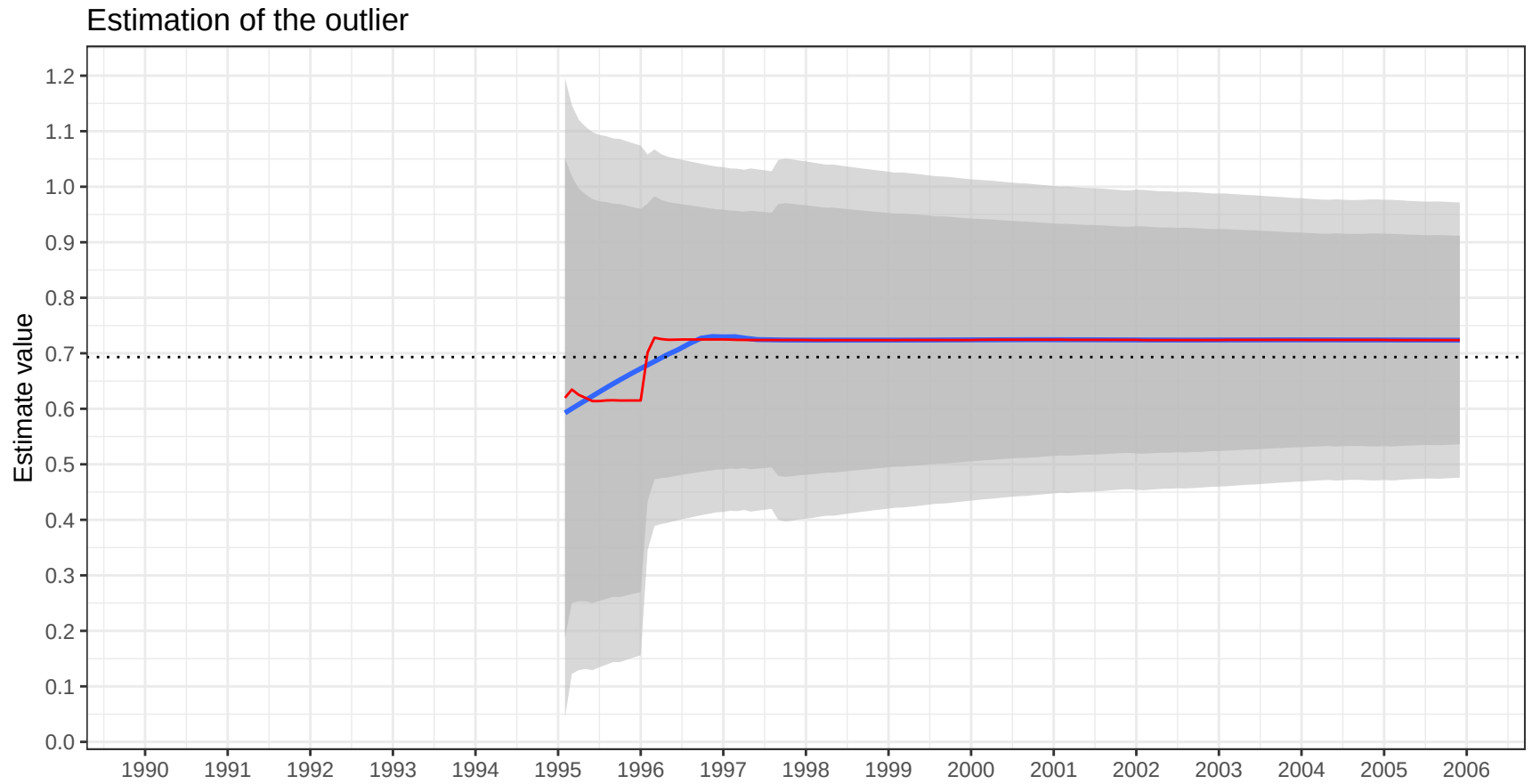
Estimate value of a LS(1996−1) DE−C1439
ARIMA (0,1,2)(0,1,1) − multiplicative decomposition

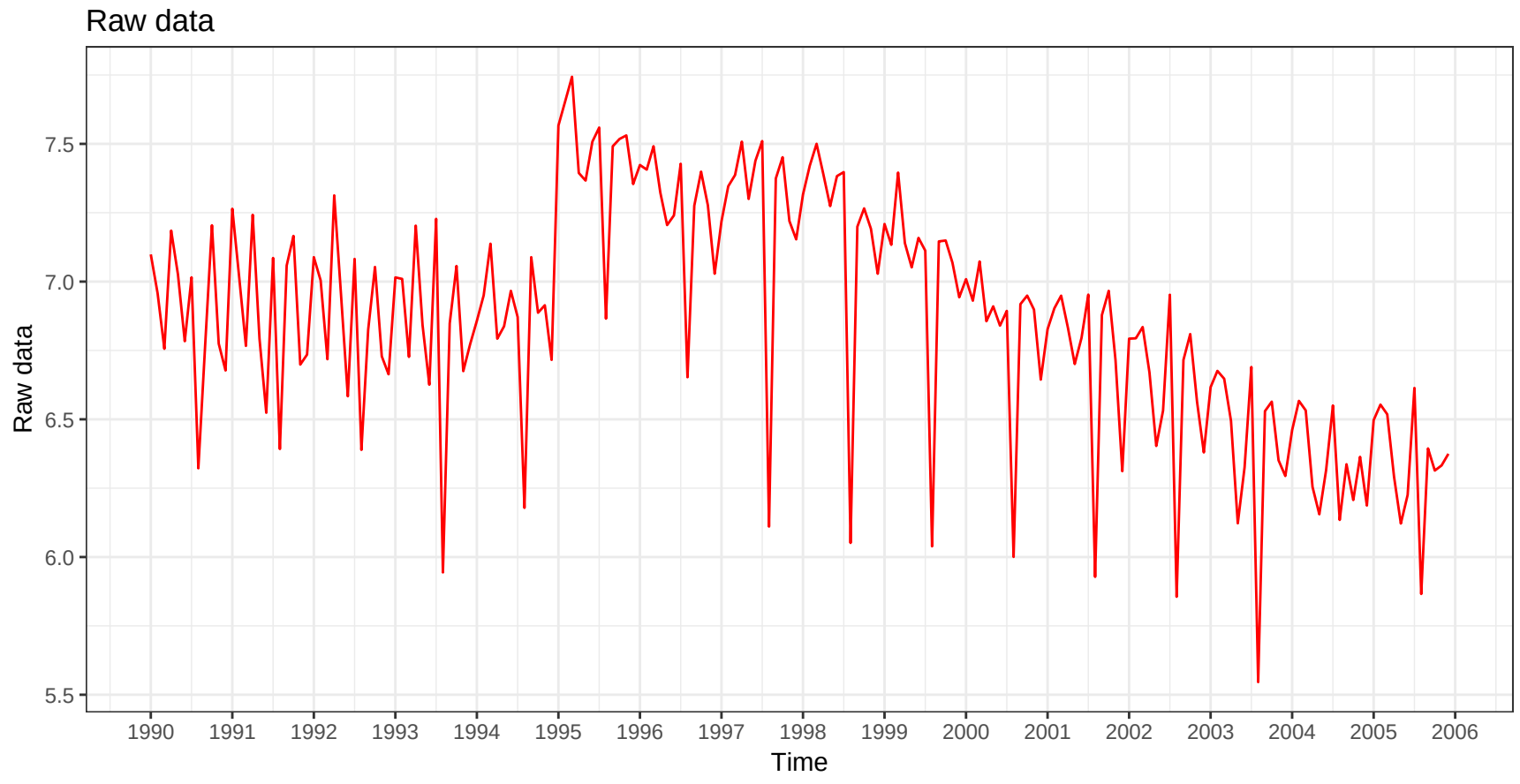




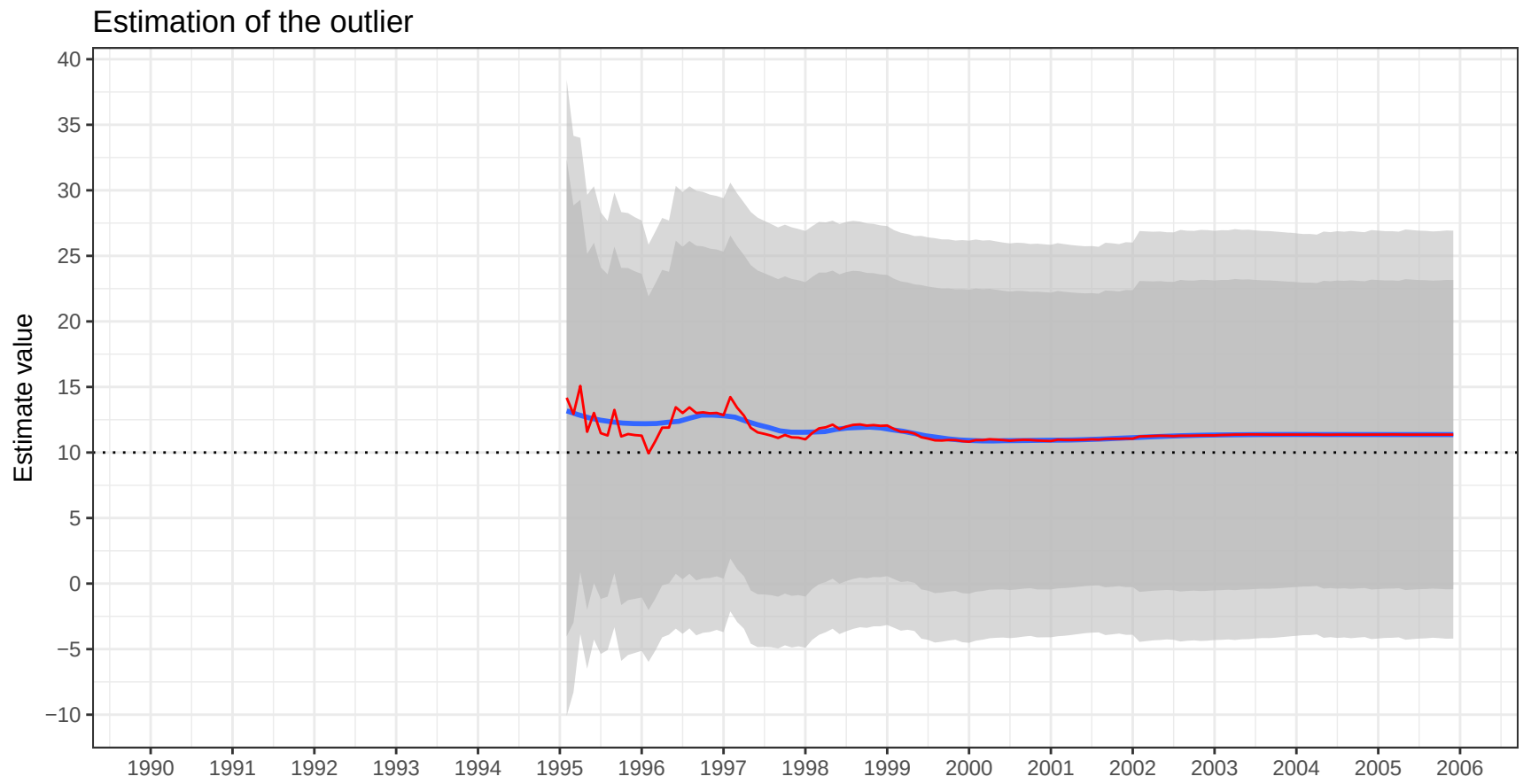
Estimate value of a LS(1995−1) FR−C1439

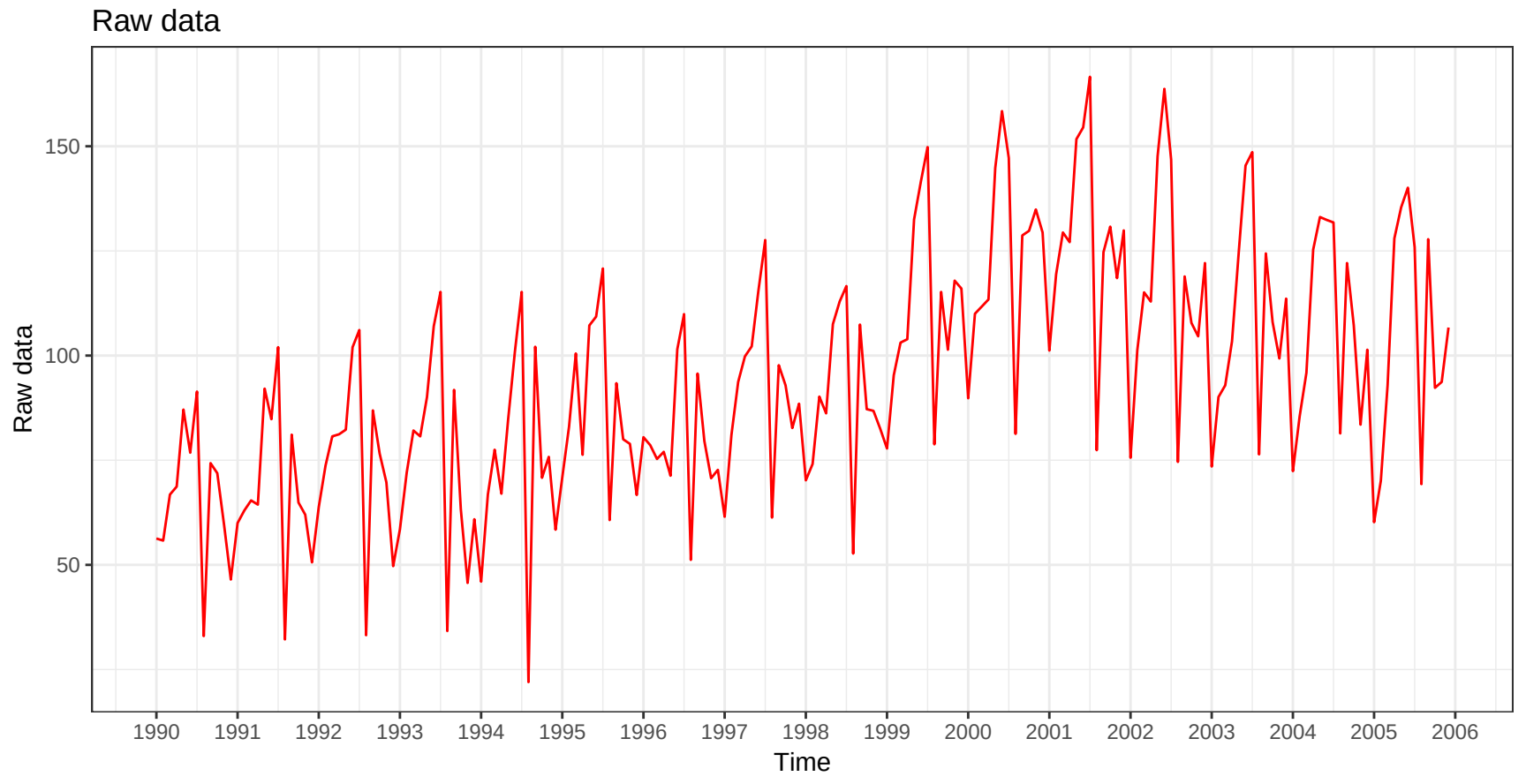
ARIMA (0,1,1)(1,1,1) − multiplicative decomposition

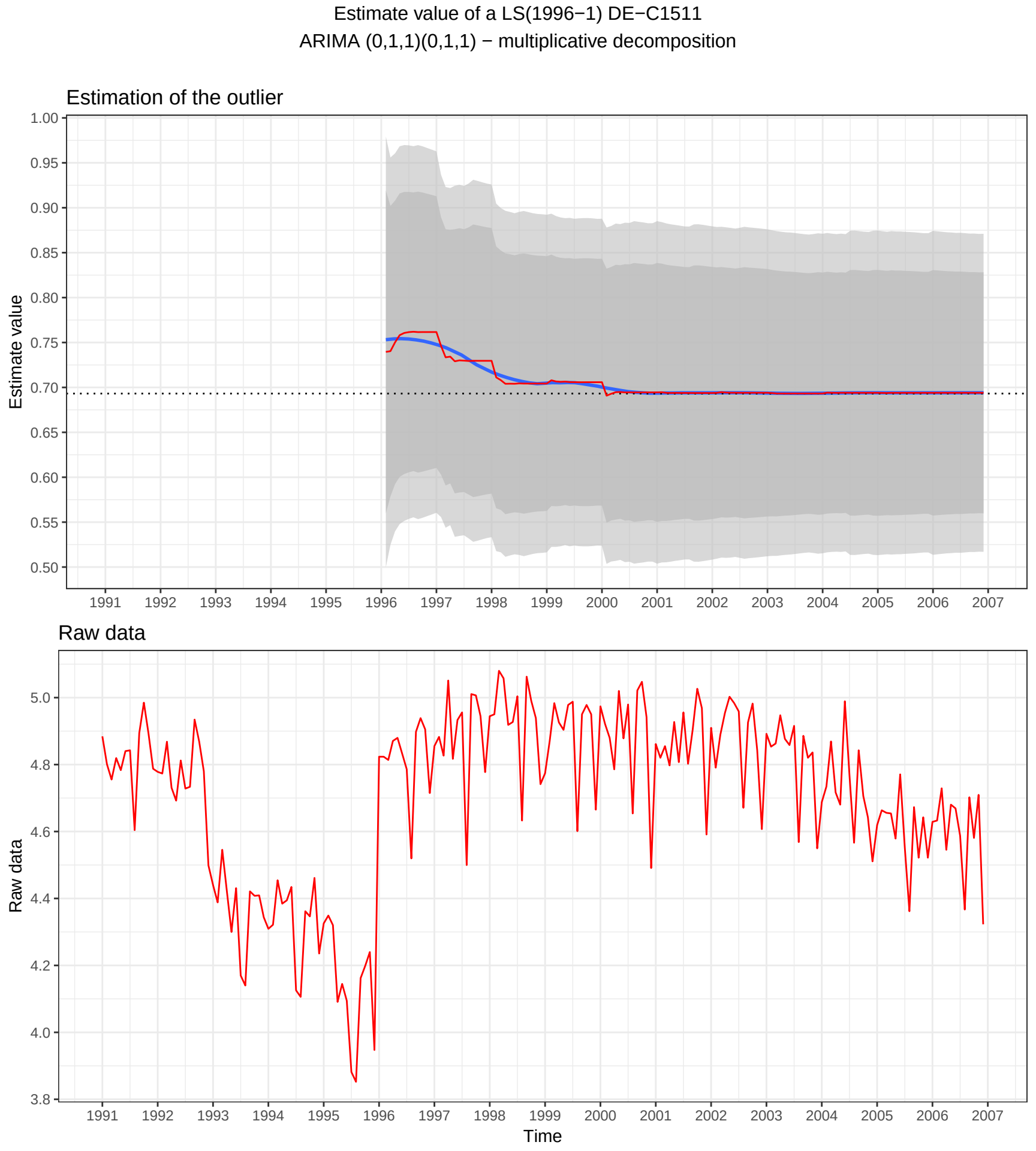




Estimate value of a LS(1995−1) IT−C1439
ARIMA (0,1,2)(0,1,1) − additive decomposition

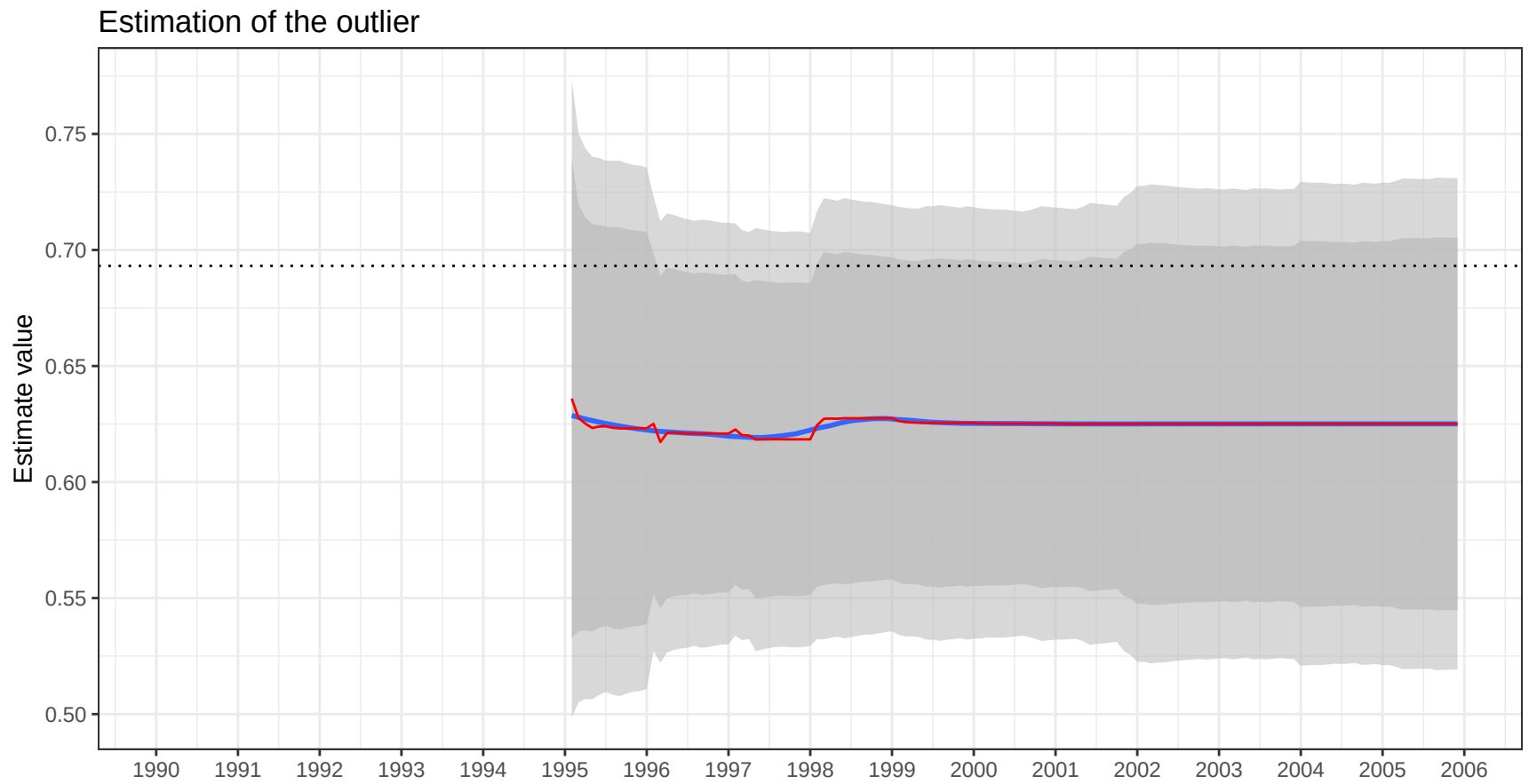


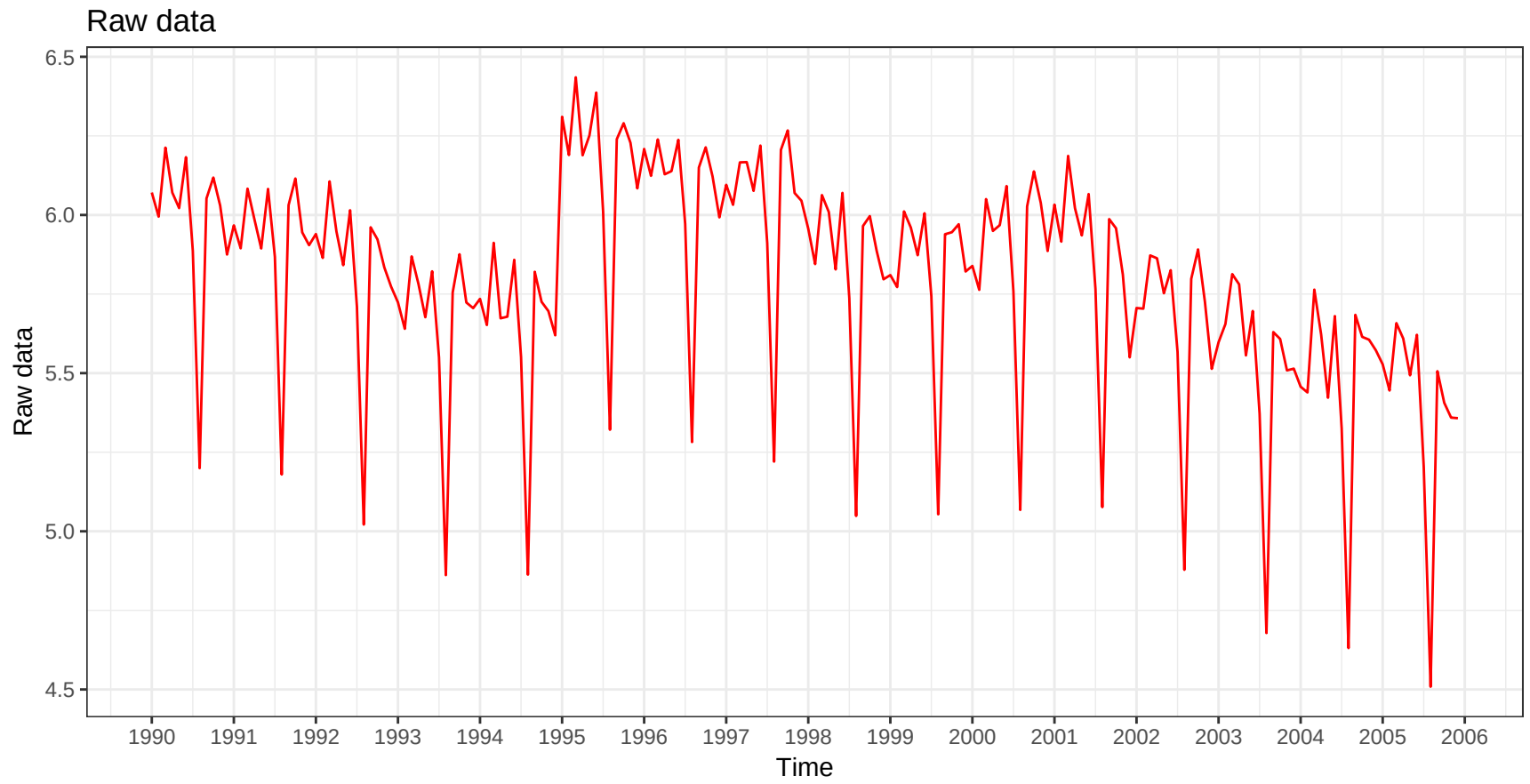


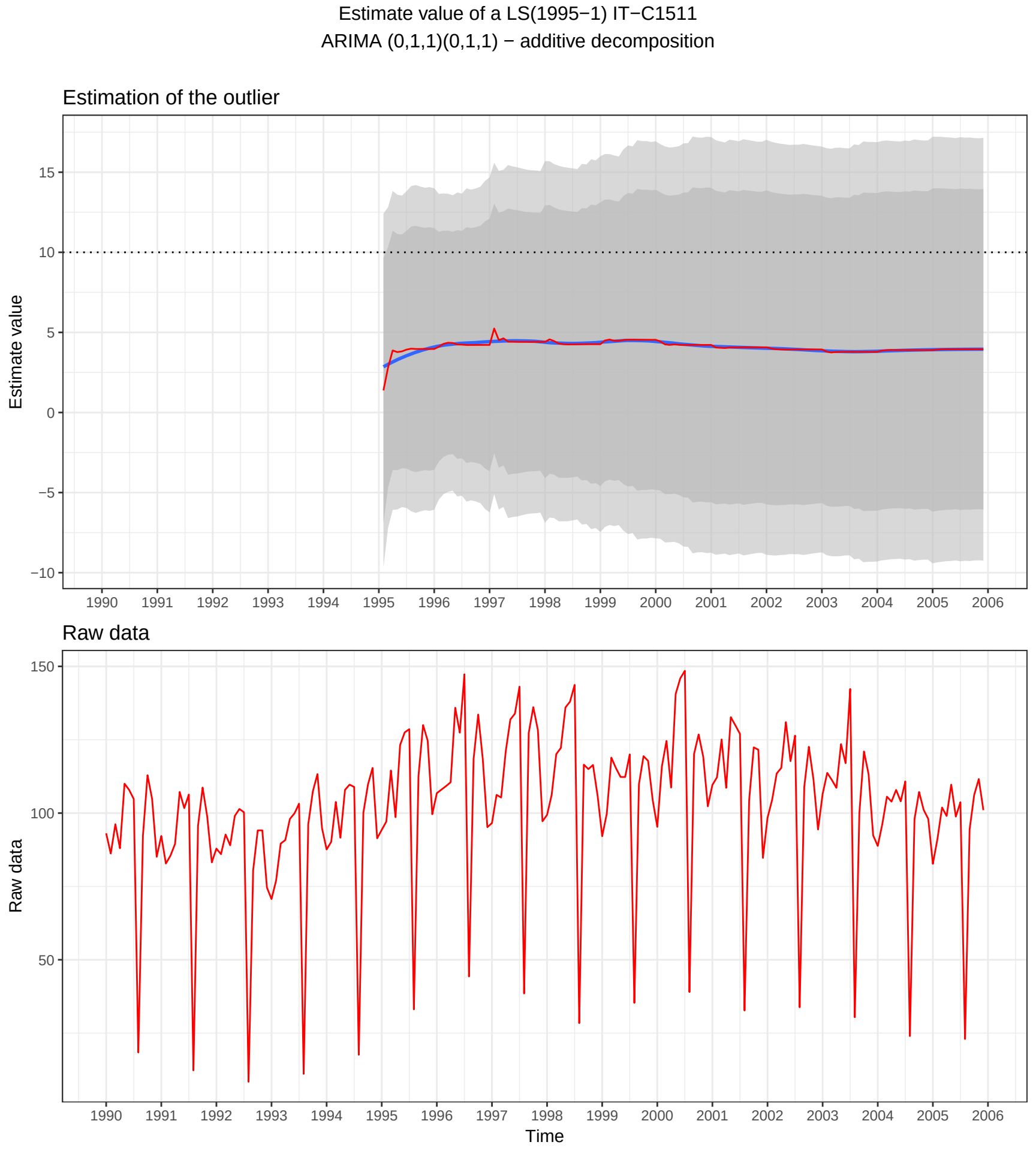

Estimate value of a LS(1996−1) DE−C1511
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
1.00
0.95
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
5.0
4.8
4.6
4.4
4.2
4.0
3.8
Time

Estimate value of a LS(1995−1) FR−C1511

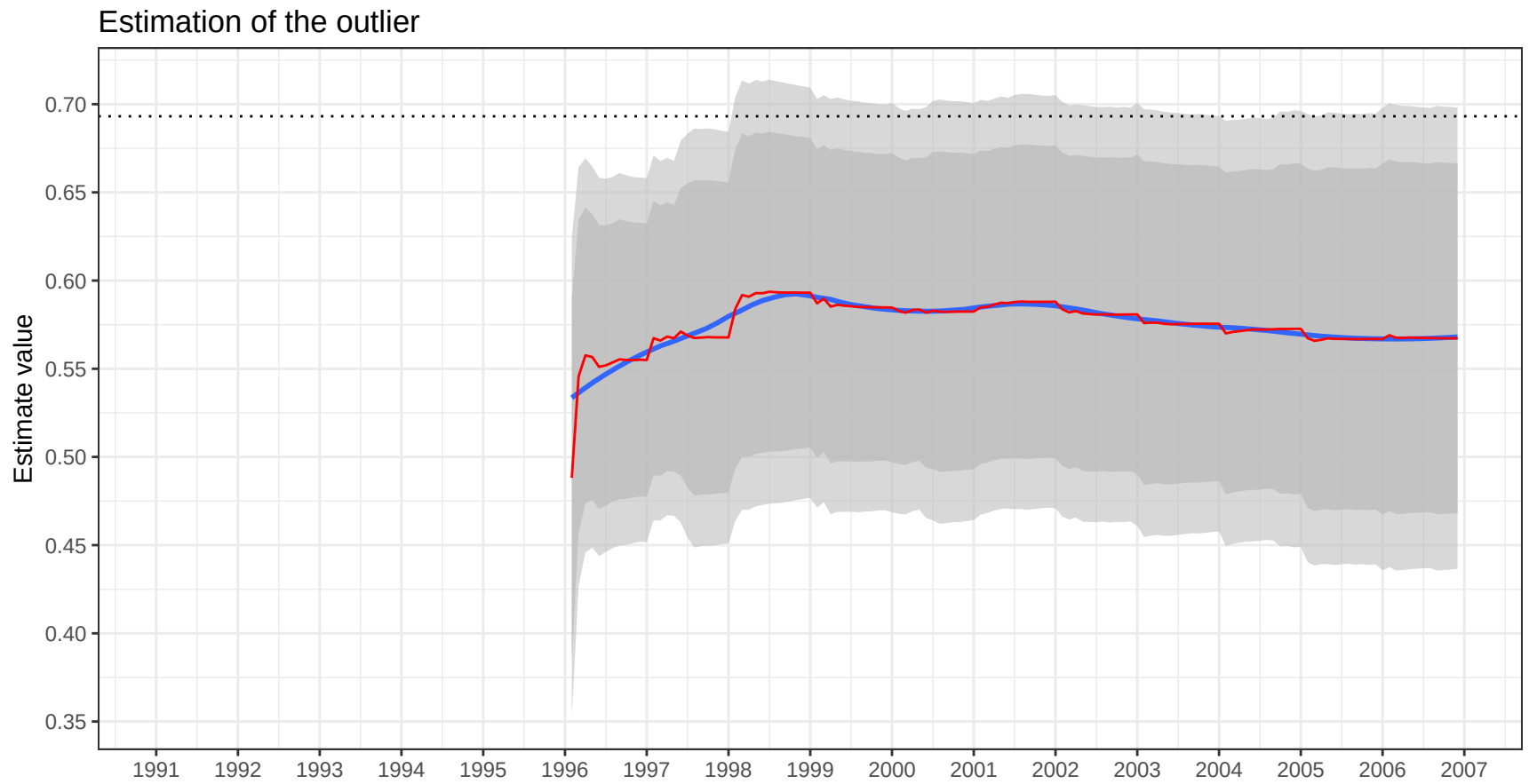
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

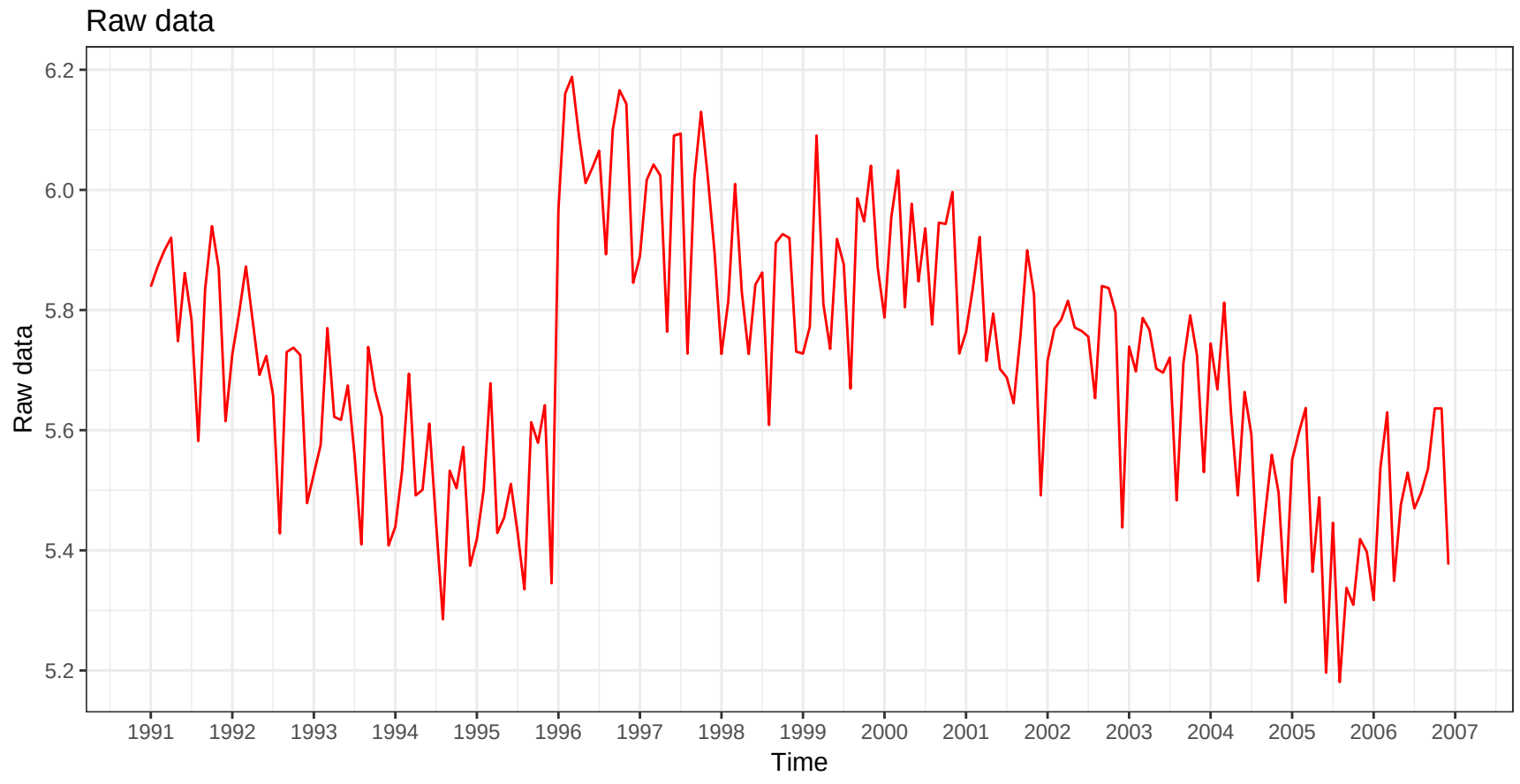




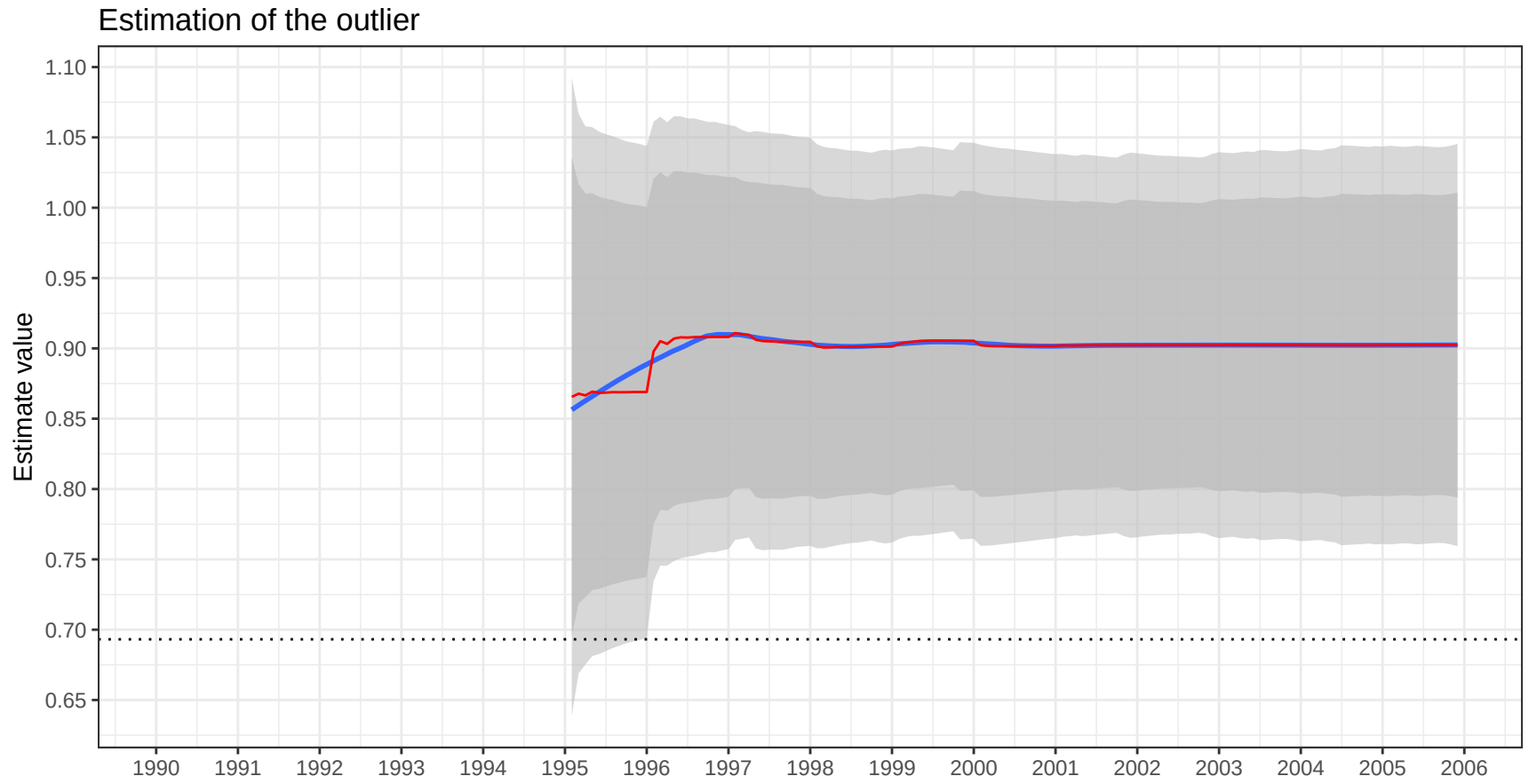

Estimate value of a LS(1995−1) IT−C1511
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
15
10
5
0
−5
−10
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
150
100
50
Time

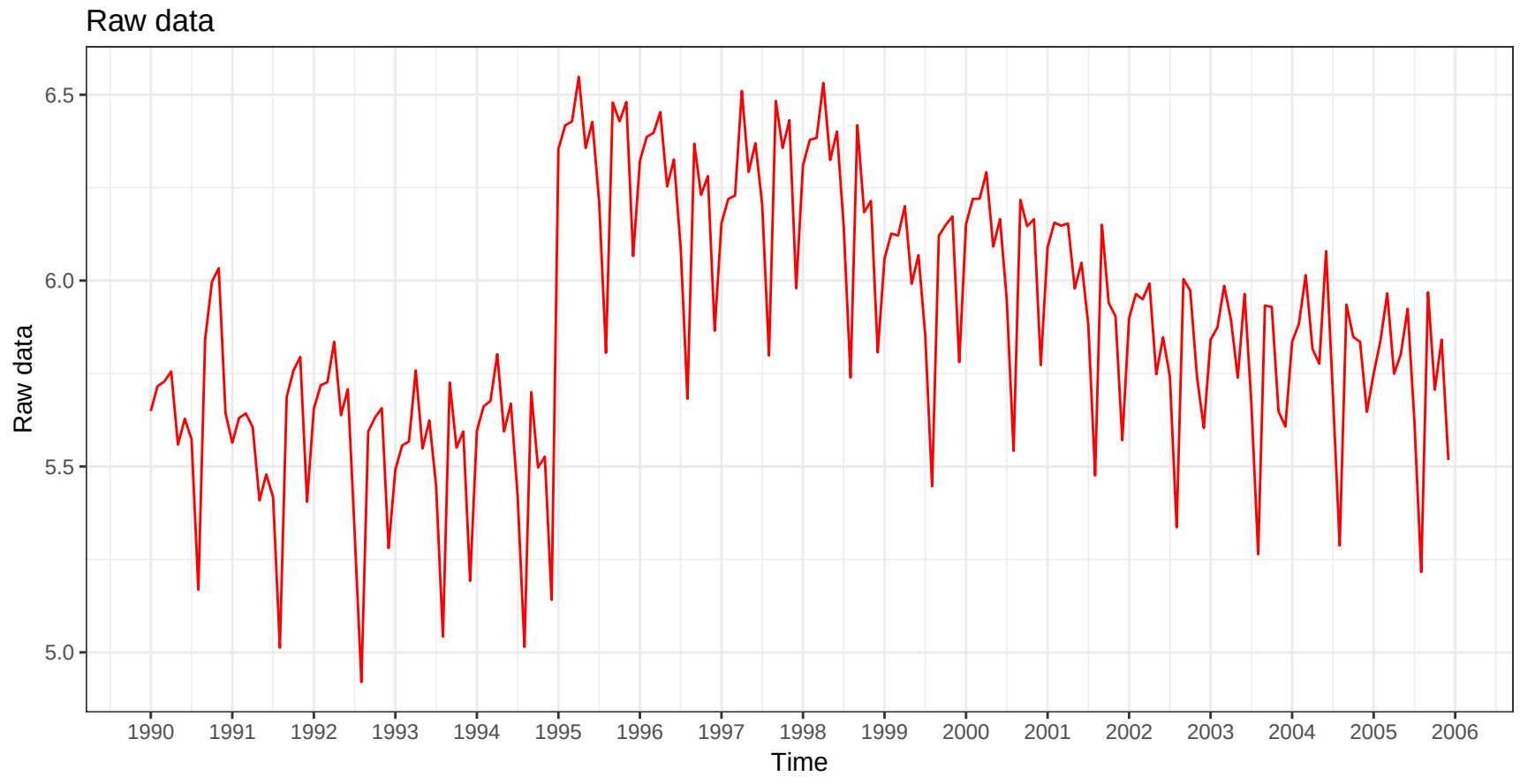
Estimate value of a LS(1996−1) DE−C1512
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

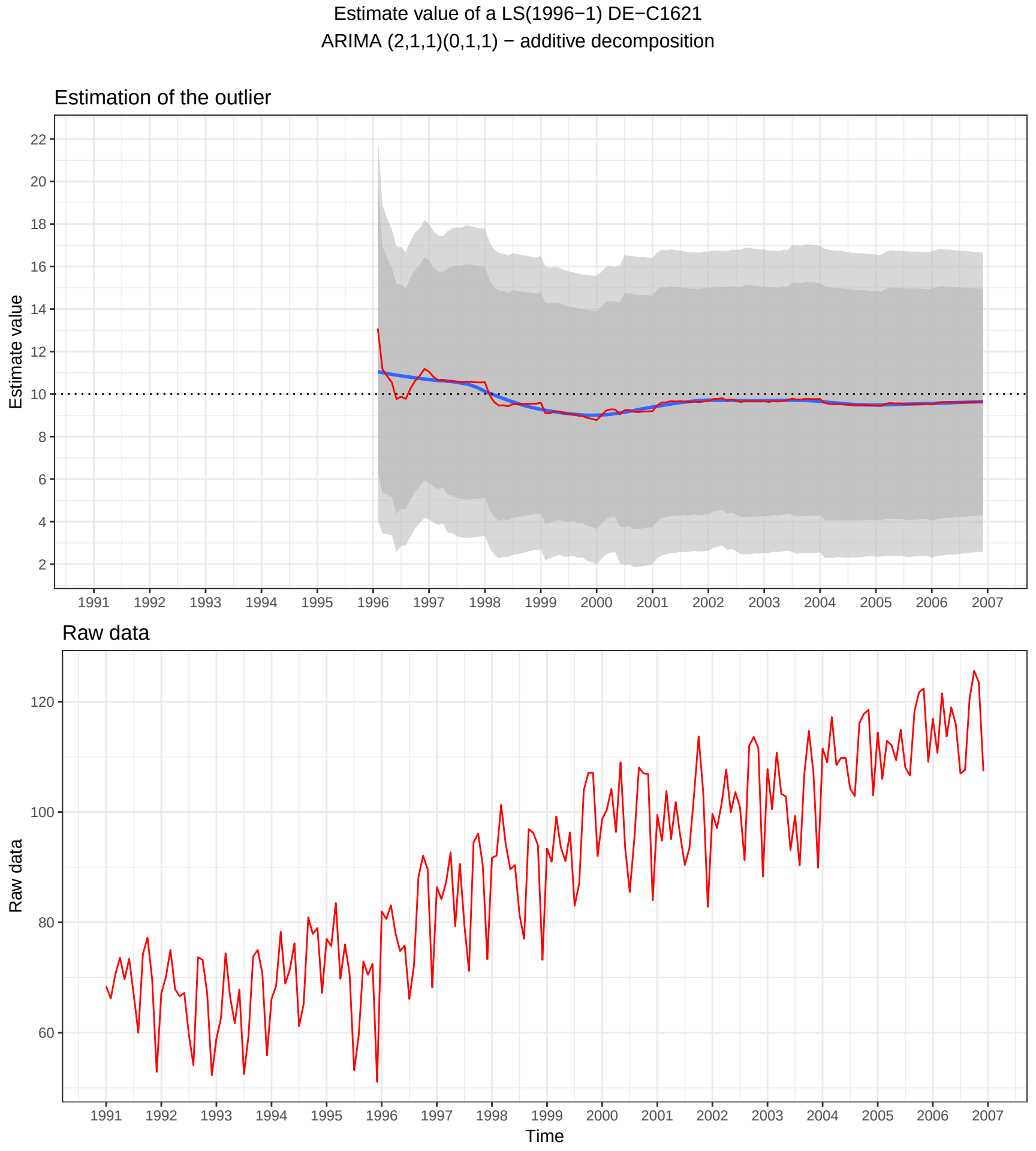


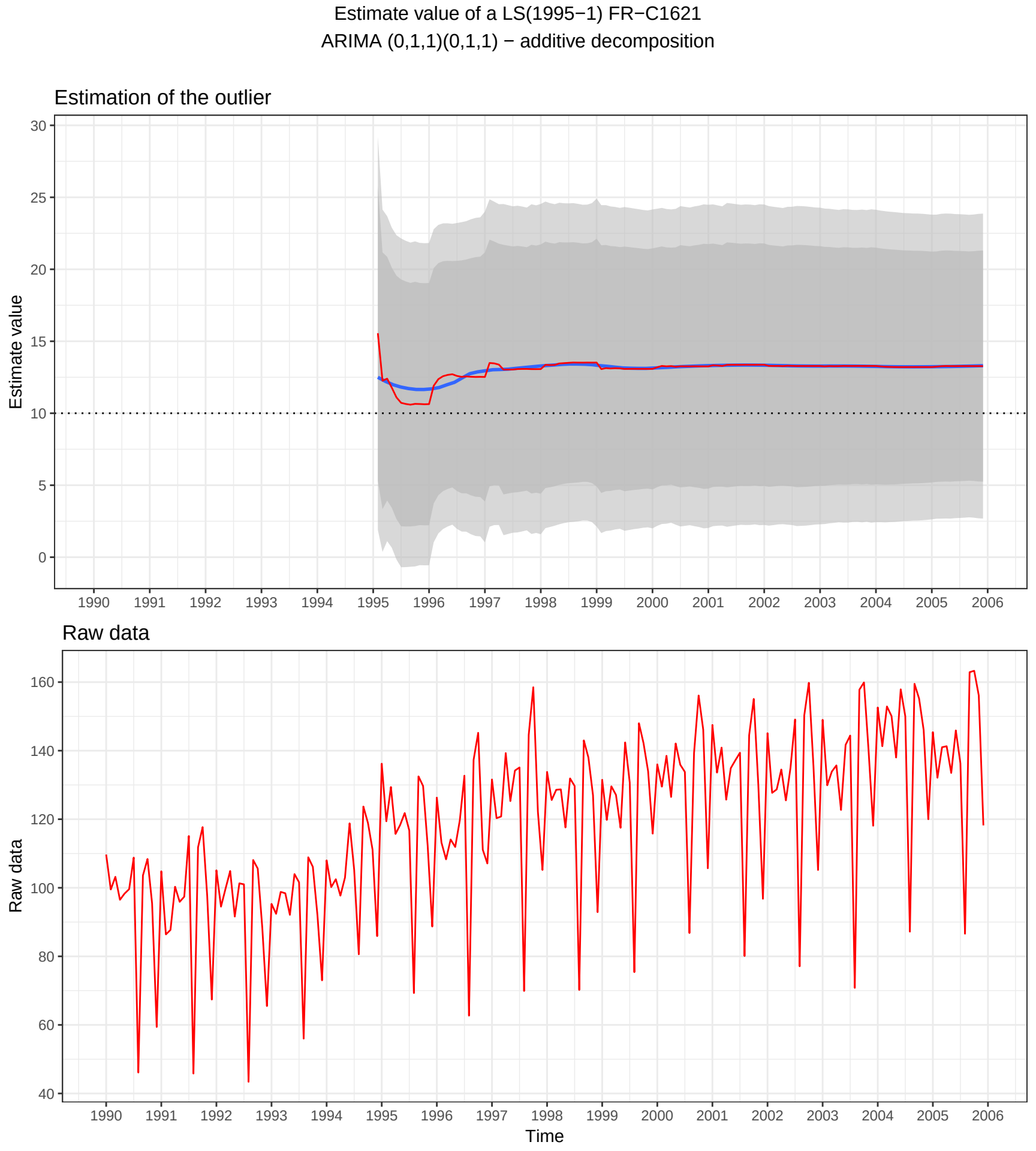


Estimate value of a LS(1995−1) FR−C1512
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

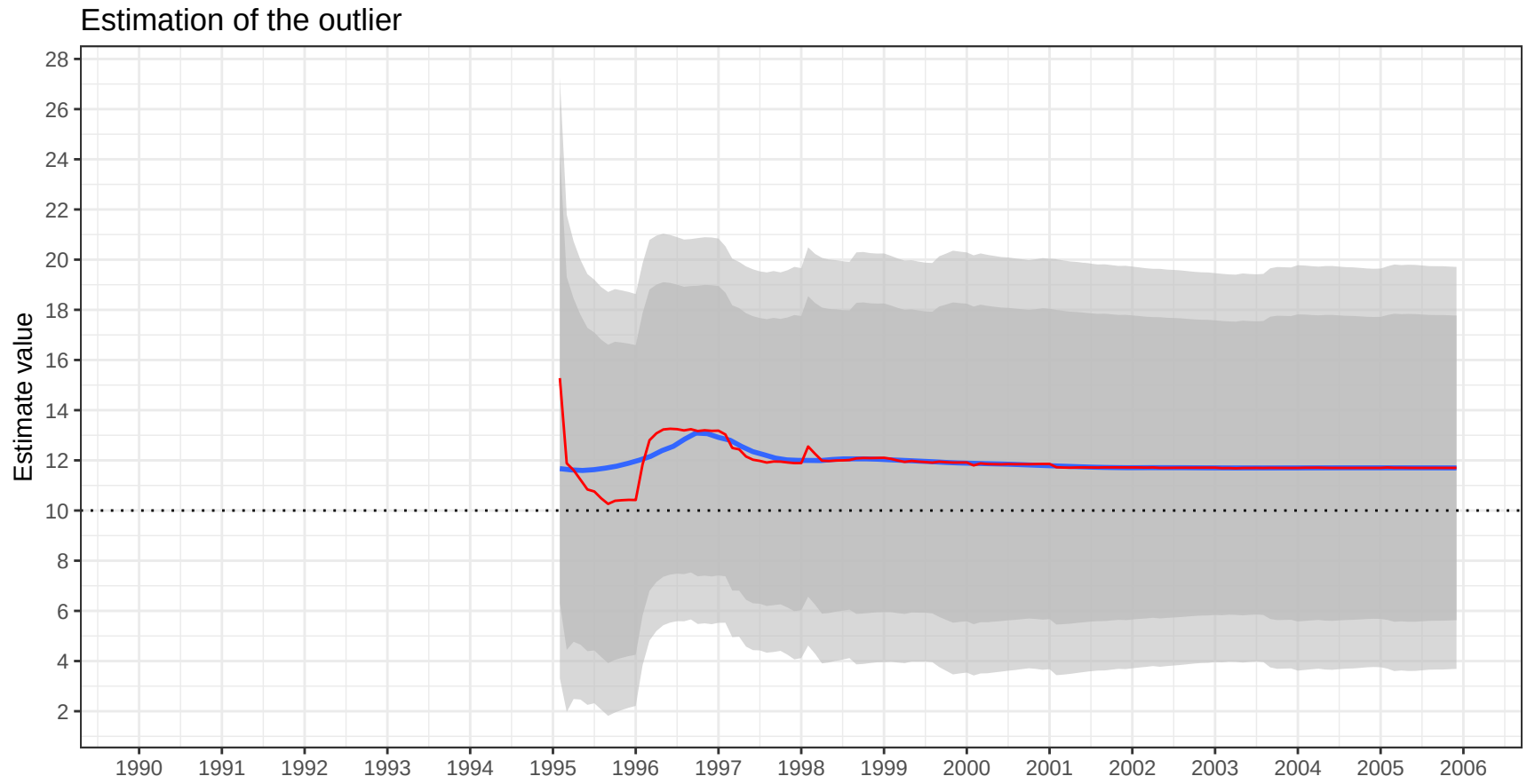


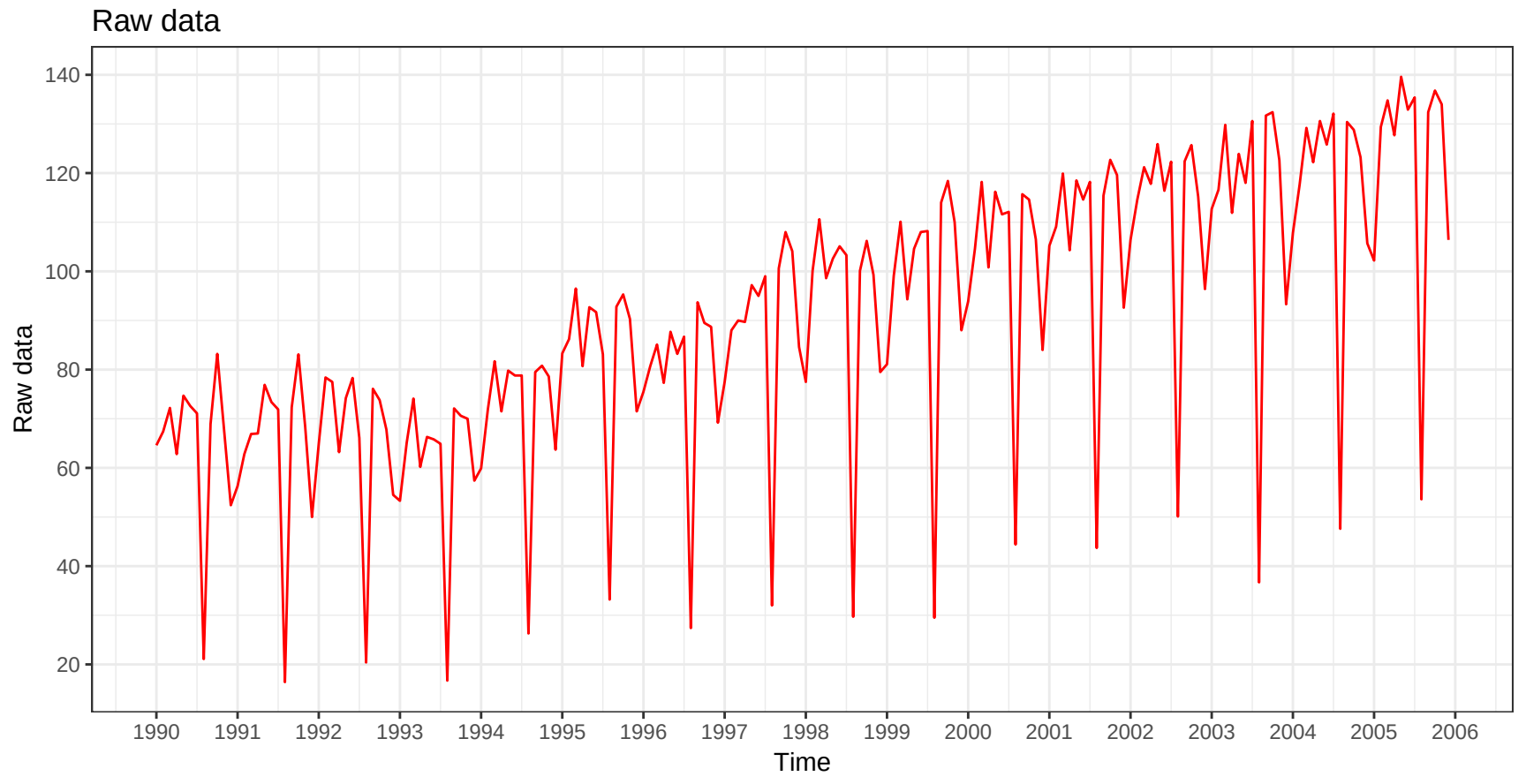


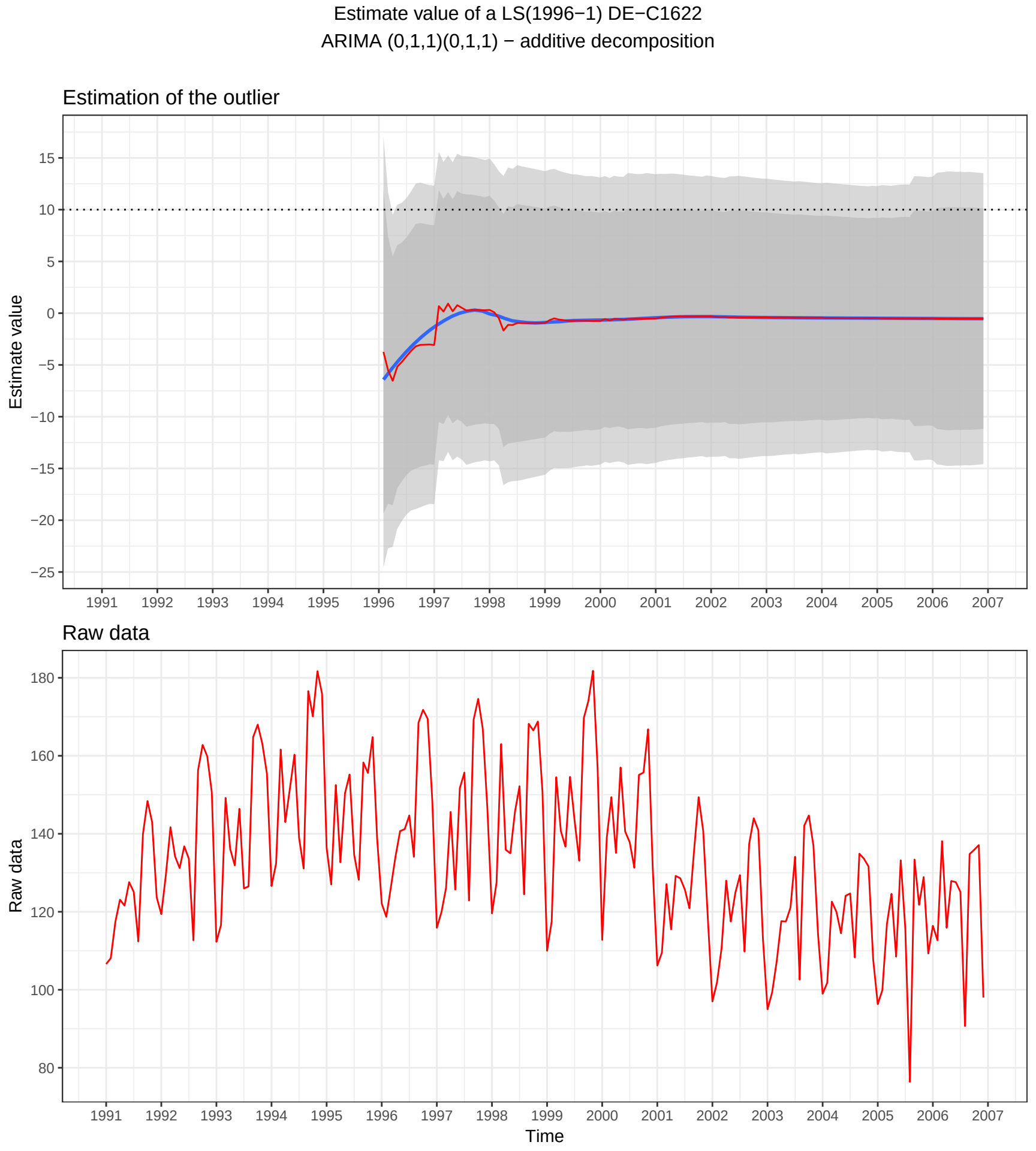

Estimate value of a LS(1996−1) DE−C1621
ARIMA (2,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
22
20
18
16
14
12
10
8
6
4
2
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
120
100
80
60
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Time

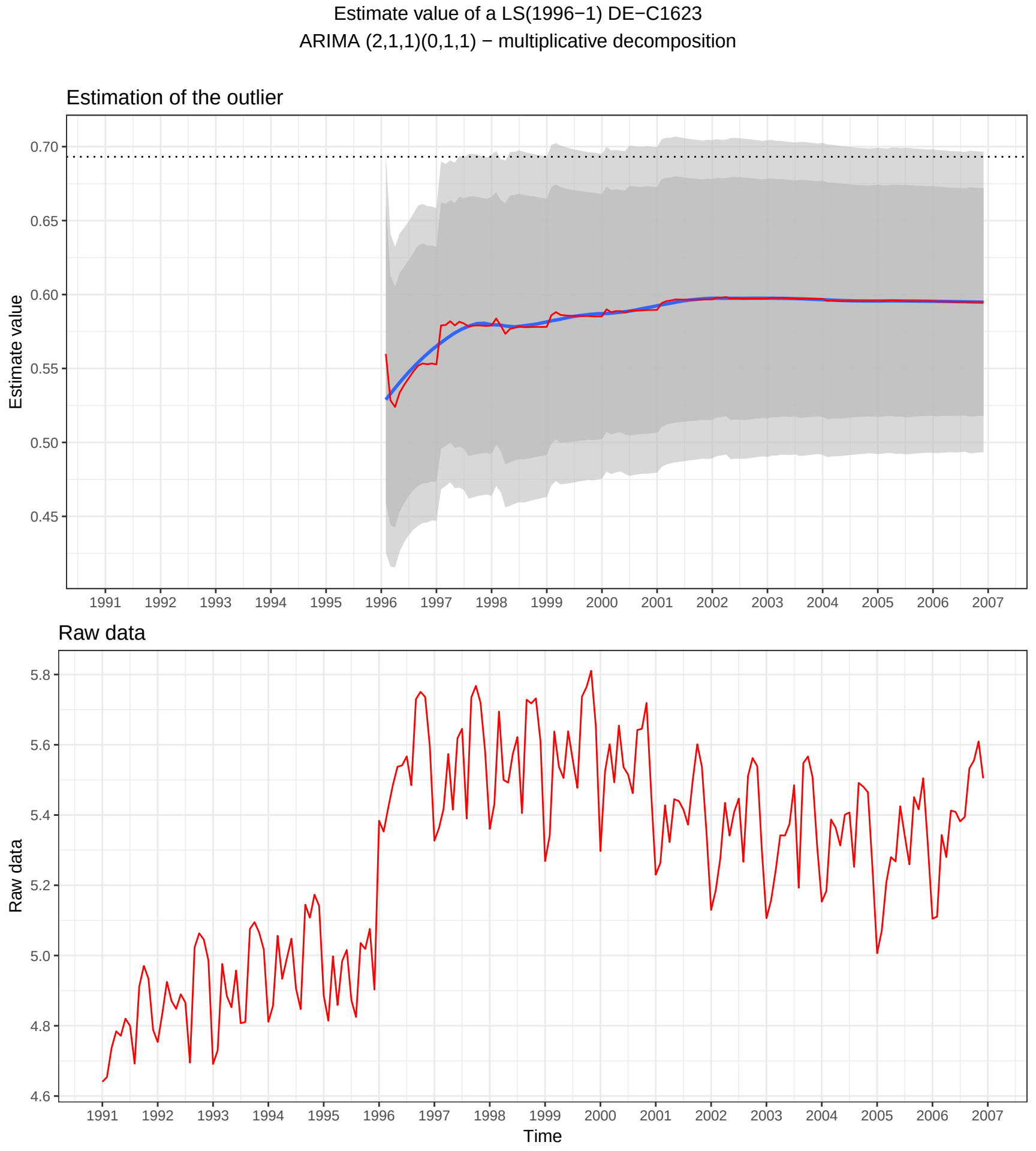

Estimate value of a LS(1995−1) FR−C1621
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
30
25
20
15
10
5
0
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
160
140
120
100
80
60
40
Time

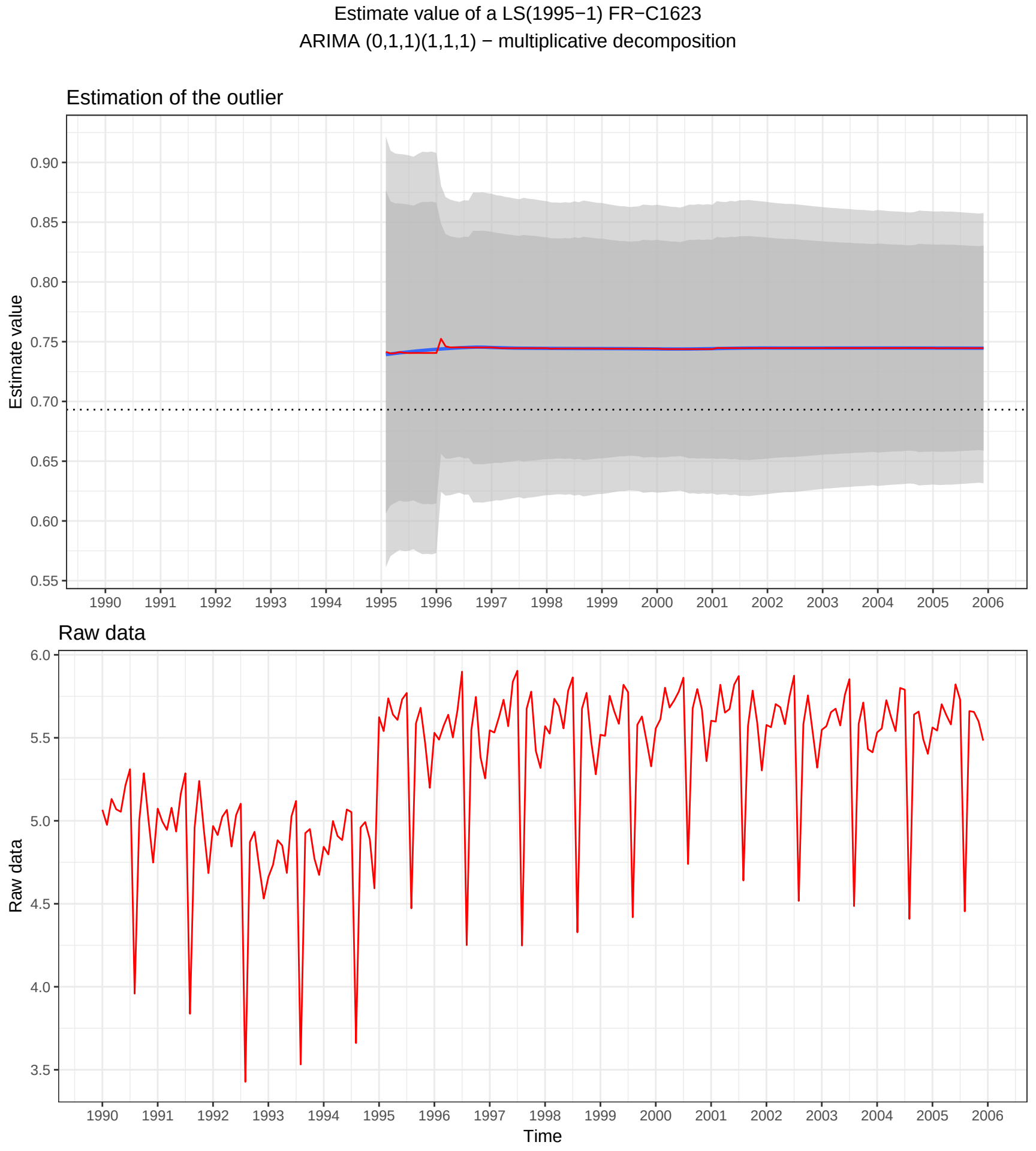
Estimate value of a LS(1995−1) IT−C1621
ARIMA (0,1,1)(0,1,1) − additive decomposition



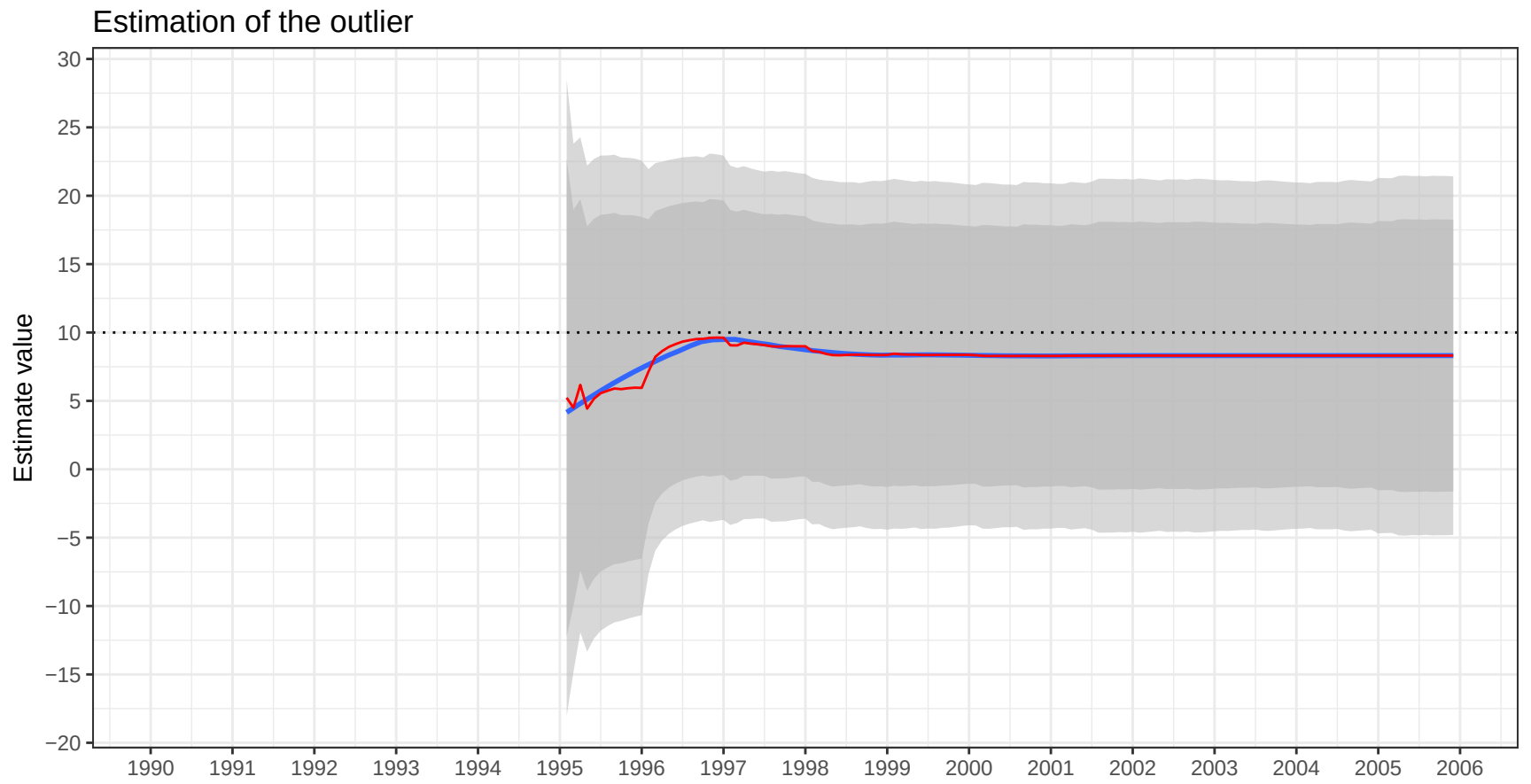


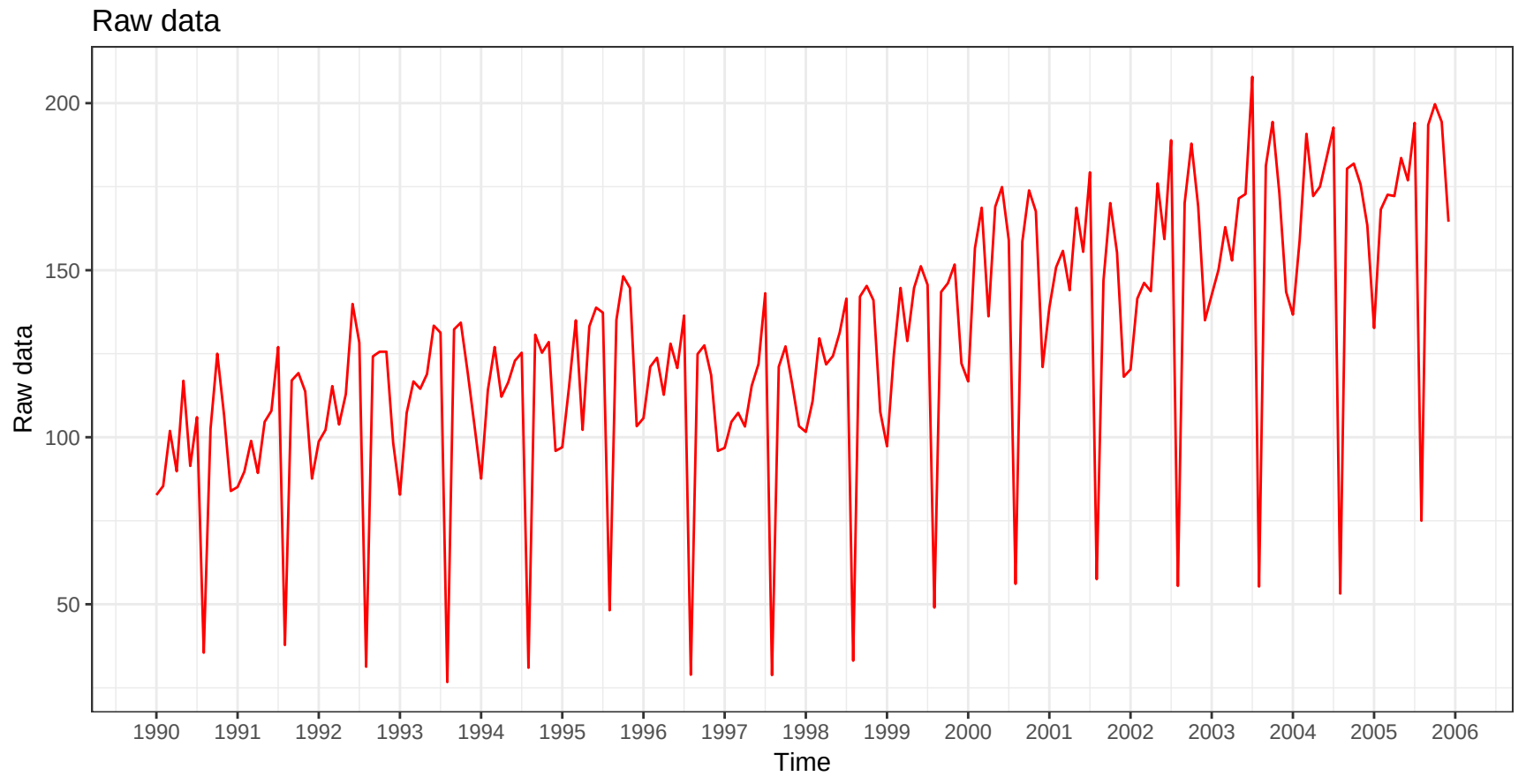

Estimate value of a LS(1996−1) DE−C1622
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
15
10
5
0
−5
−10
−15
−20
−25
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
180
160
140
120
100
80
Time


Estimate value of a LS(1996−1) DE−C1623
ARIMA (2,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.70
0.65
0.60
0.55
0.50
0.45
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
5.8
5.6
5.4
5.2
5.0
4.8
4.6
Time

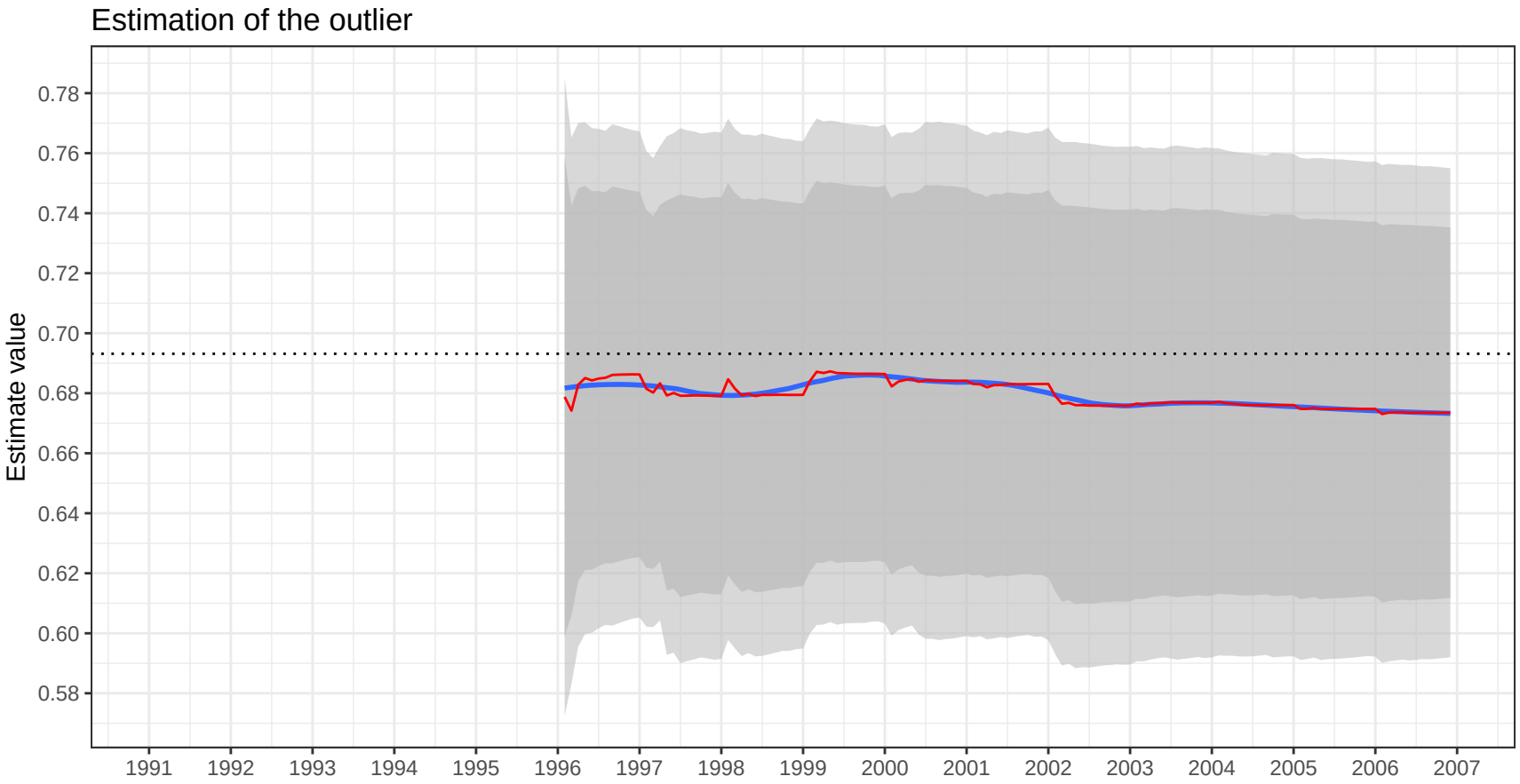

Estimate value of a LS(1995−1) FR−C1623
ARIMA (0,1,1)(1,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0.55
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
6.0
5.5
5.0
4.5
4.0
3.5
Time

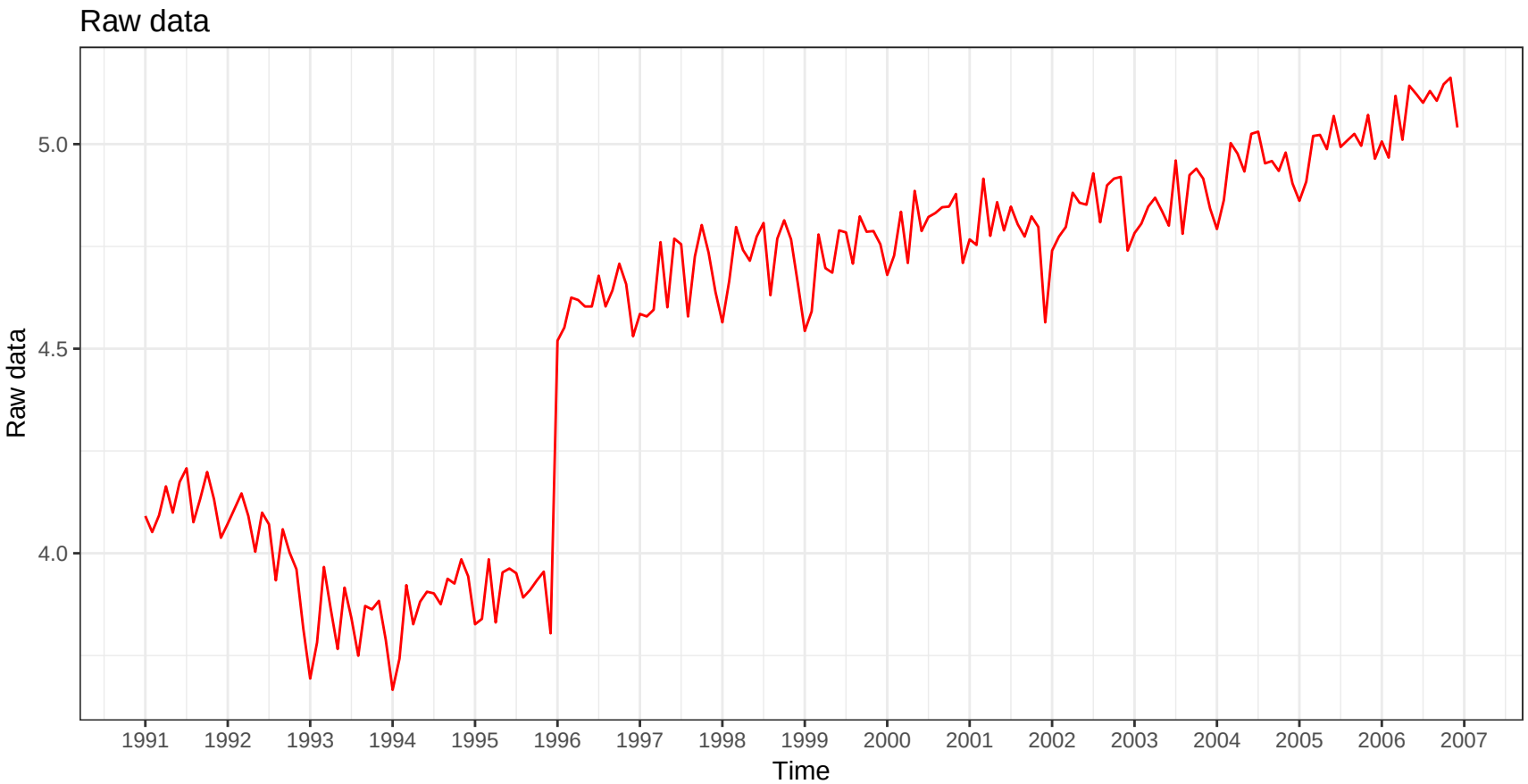
Estimate value of a LS(1995−1) IT−C1623
ARIMA (0,1,1)(0,1,1) − additive decomposition

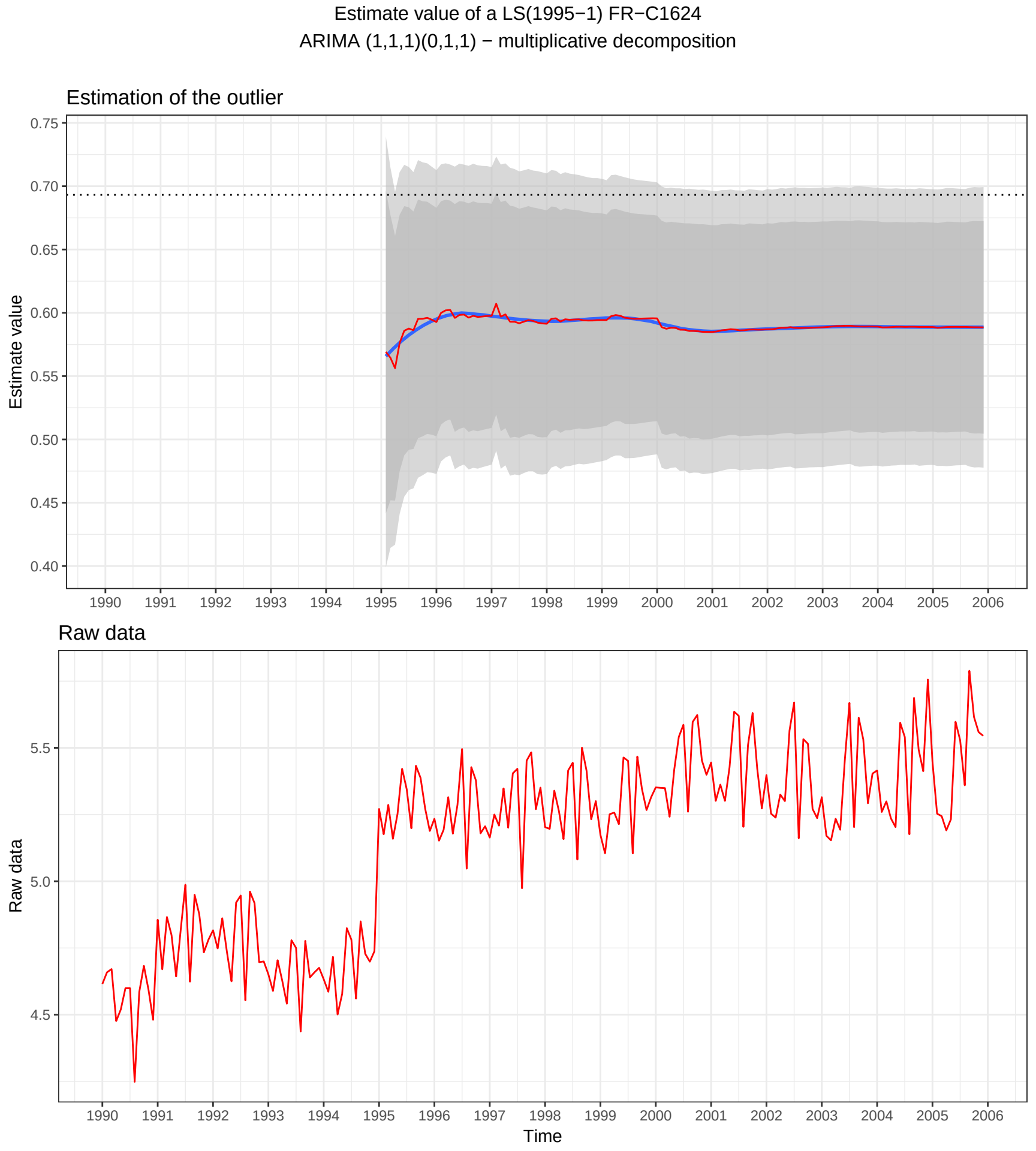


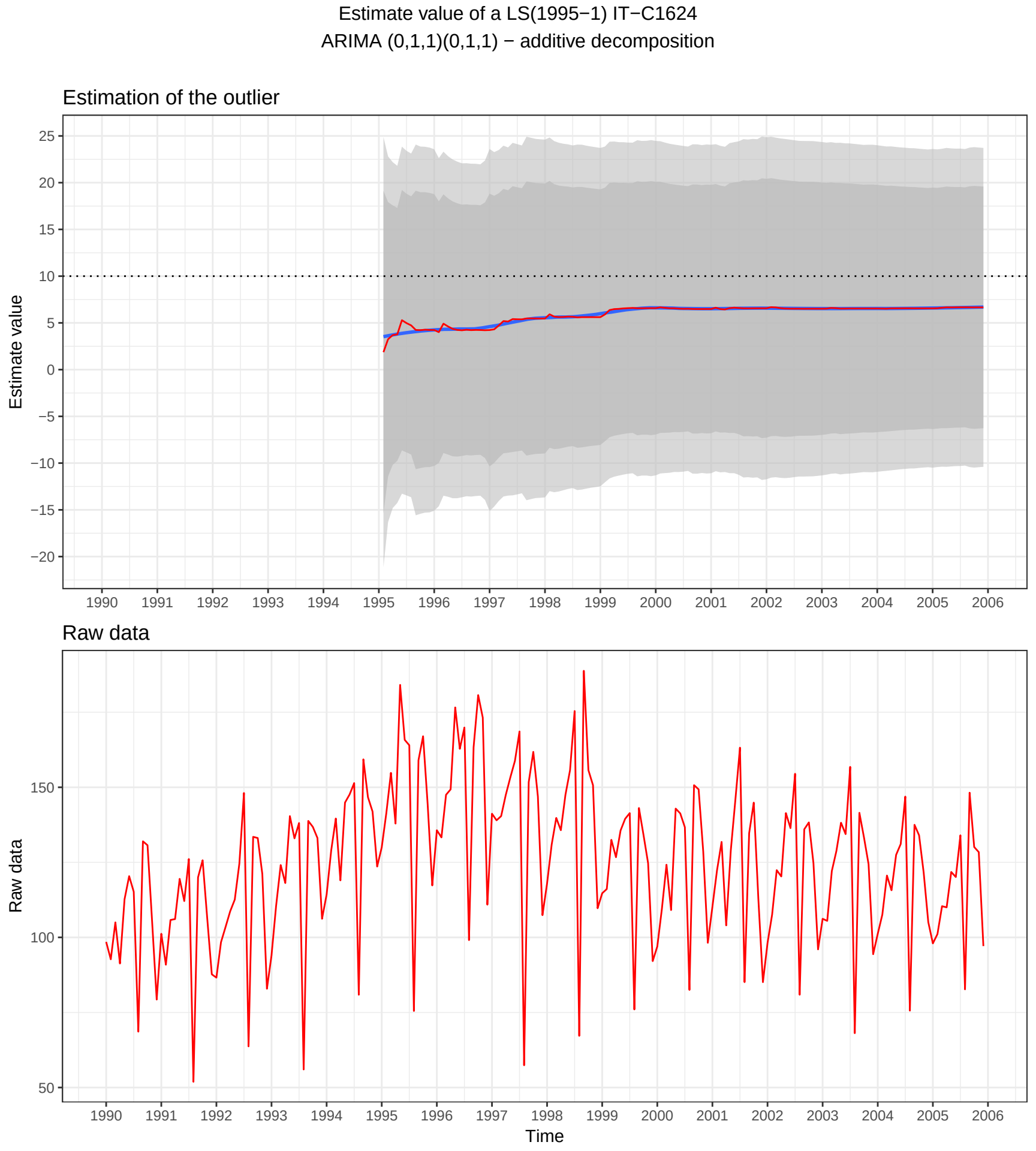


Estimate value of a LS(1996−1) DE−C1624
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

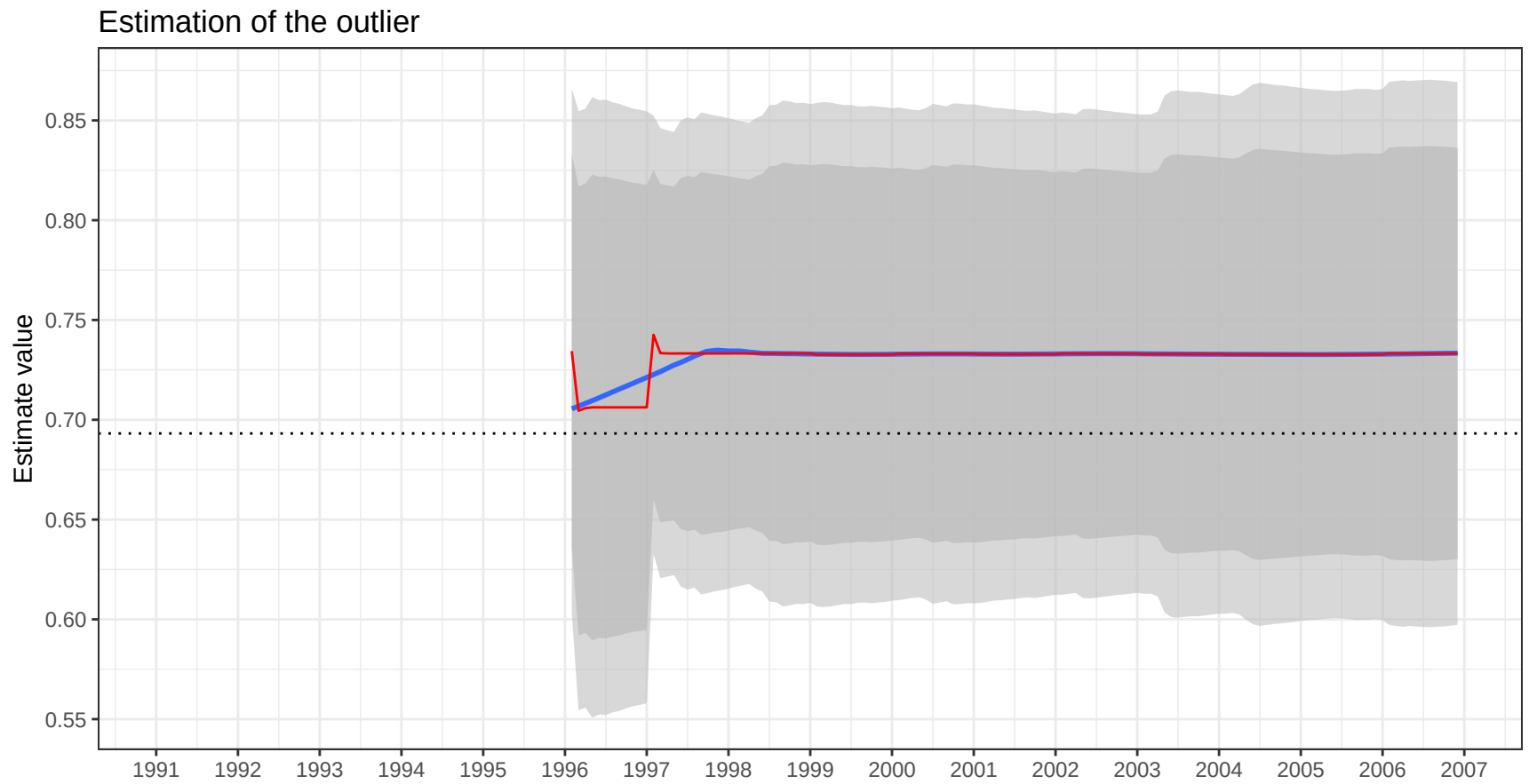


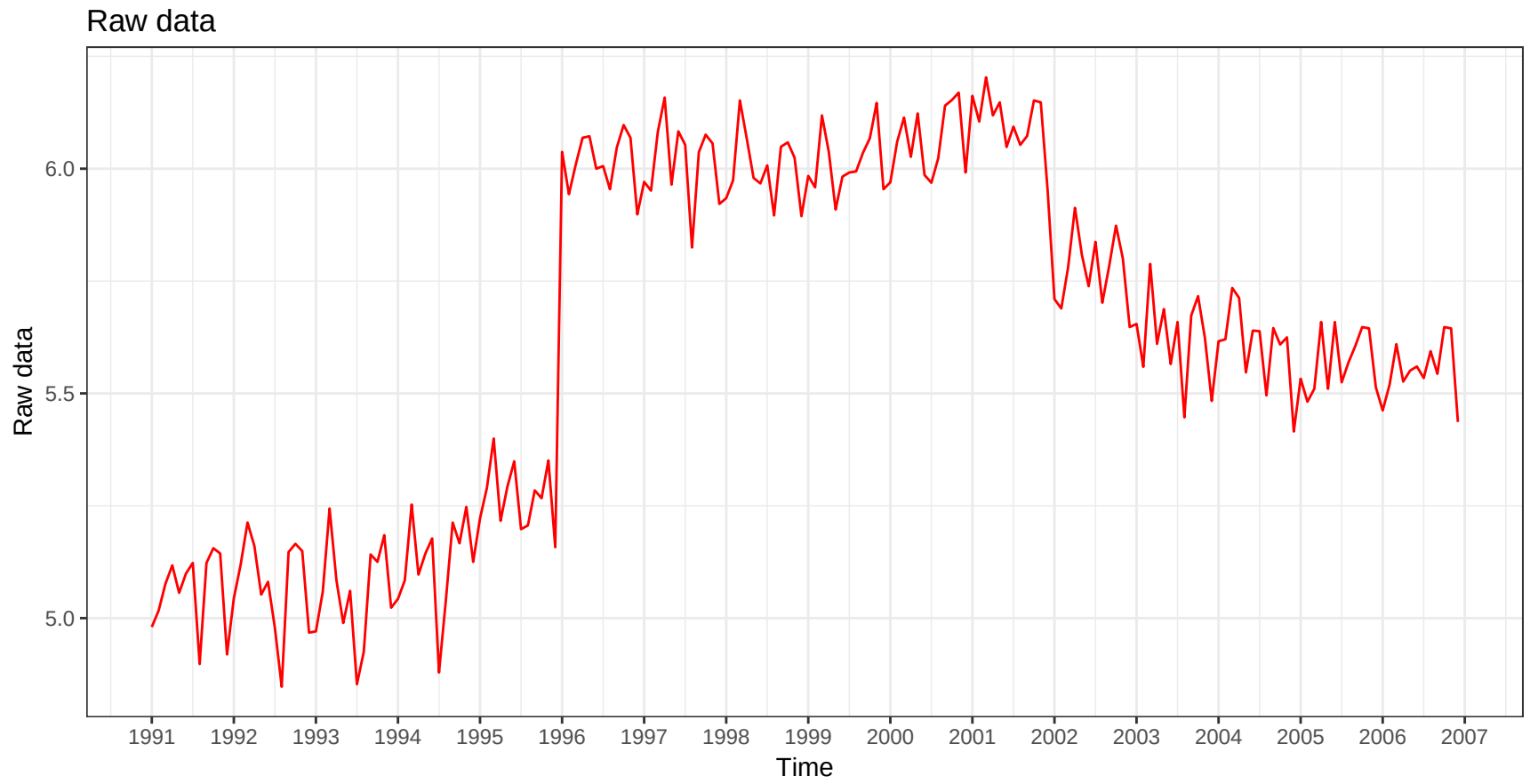



Estimate value of a LS(1995−1) FR−C1624
ARIMA (1,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.75
0.70
0.65
0.60
0.55
0.50
0.45
0.40
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
5.5
5.0
4.5
Time

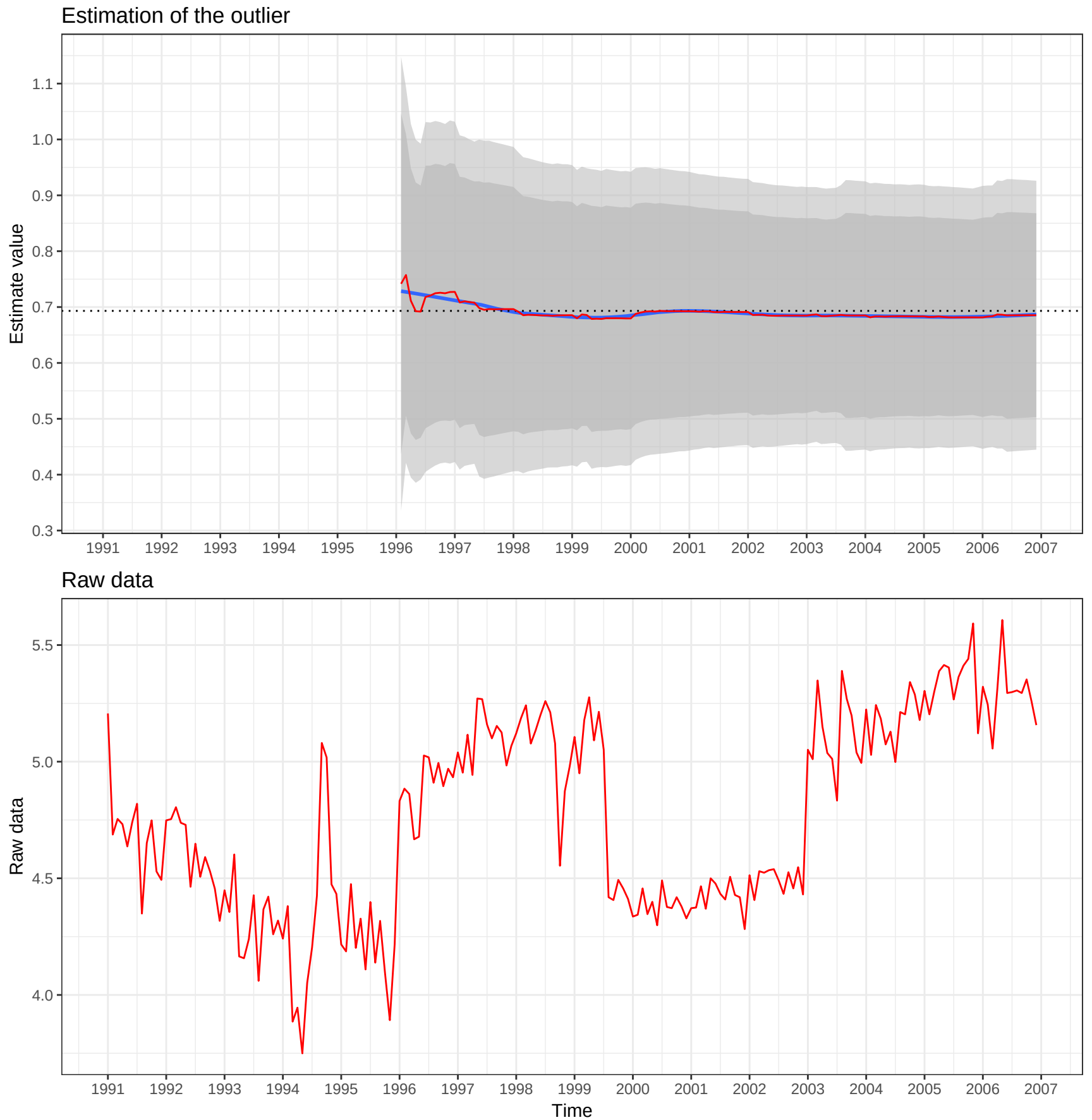

Estimate value of a LS(1995−1) IT−C1624
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
25
20
15
10
5
0
−5
−10
−15
−20
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
150
100
50
Time

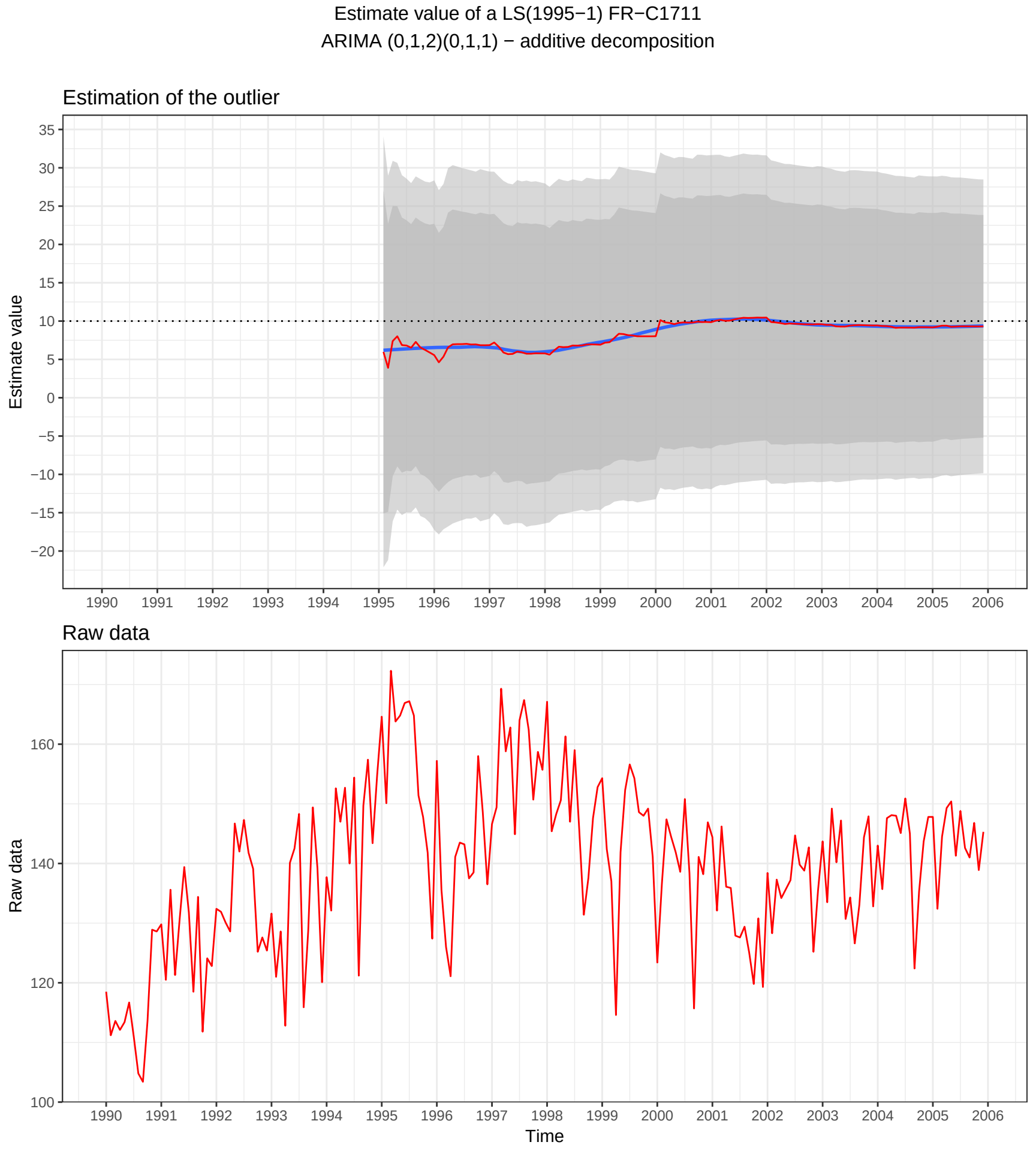
Estimate value of a LS(1996−1) DE−C1629
ARIMA (0,1,1)(1,1,1) − multiplicative decomposition

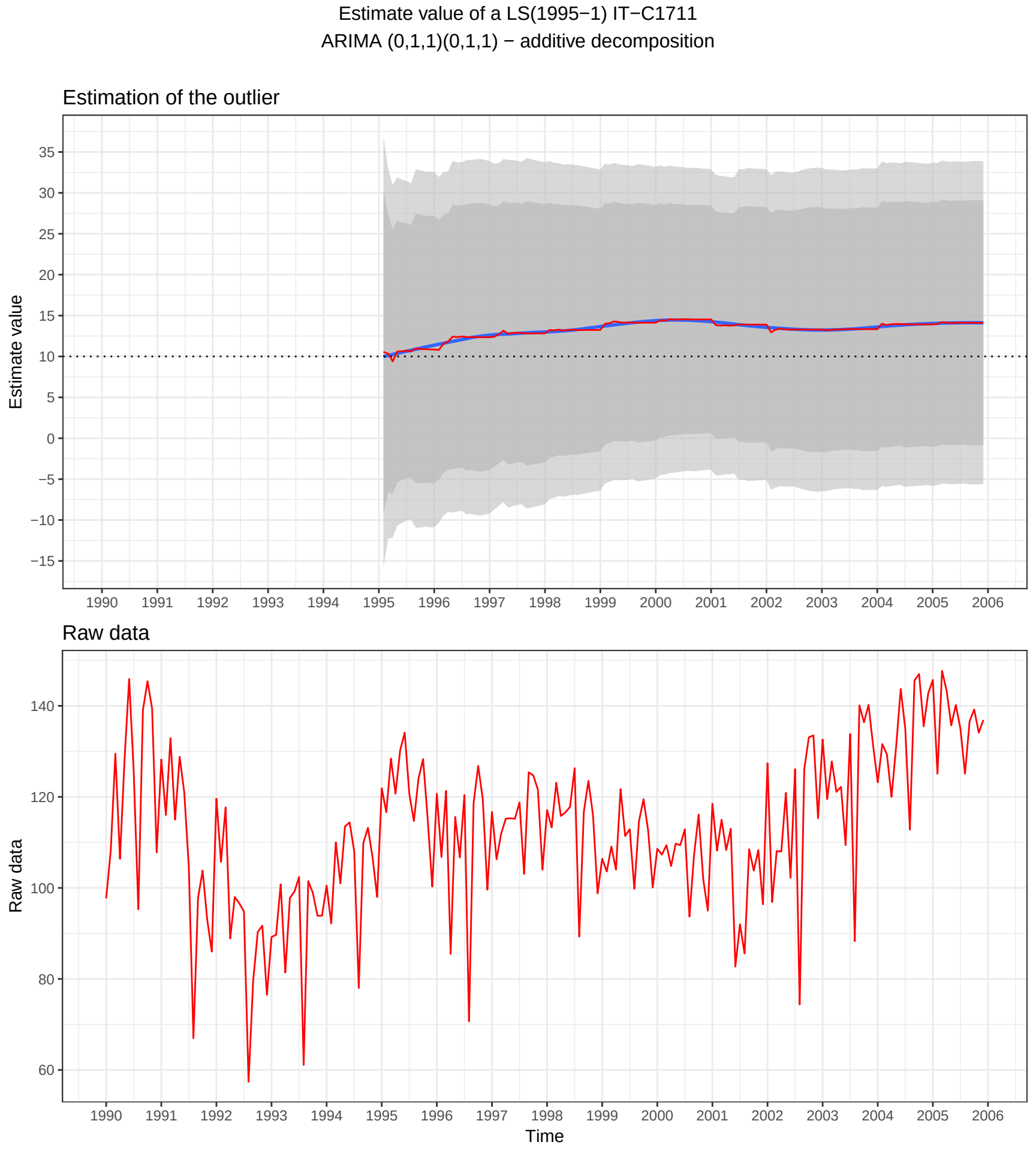




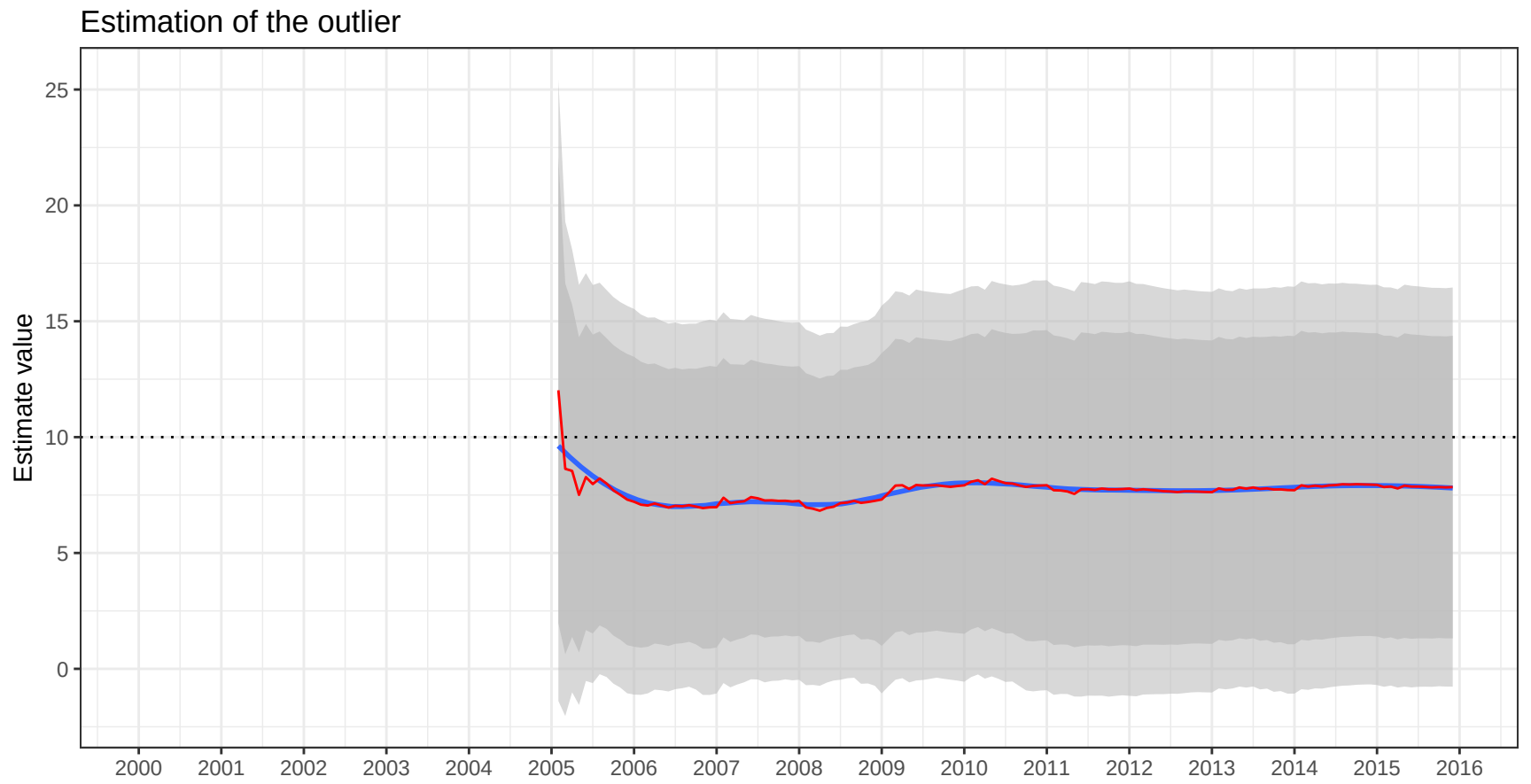
Estimate value of a LS(1996−1) DE−C1711
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

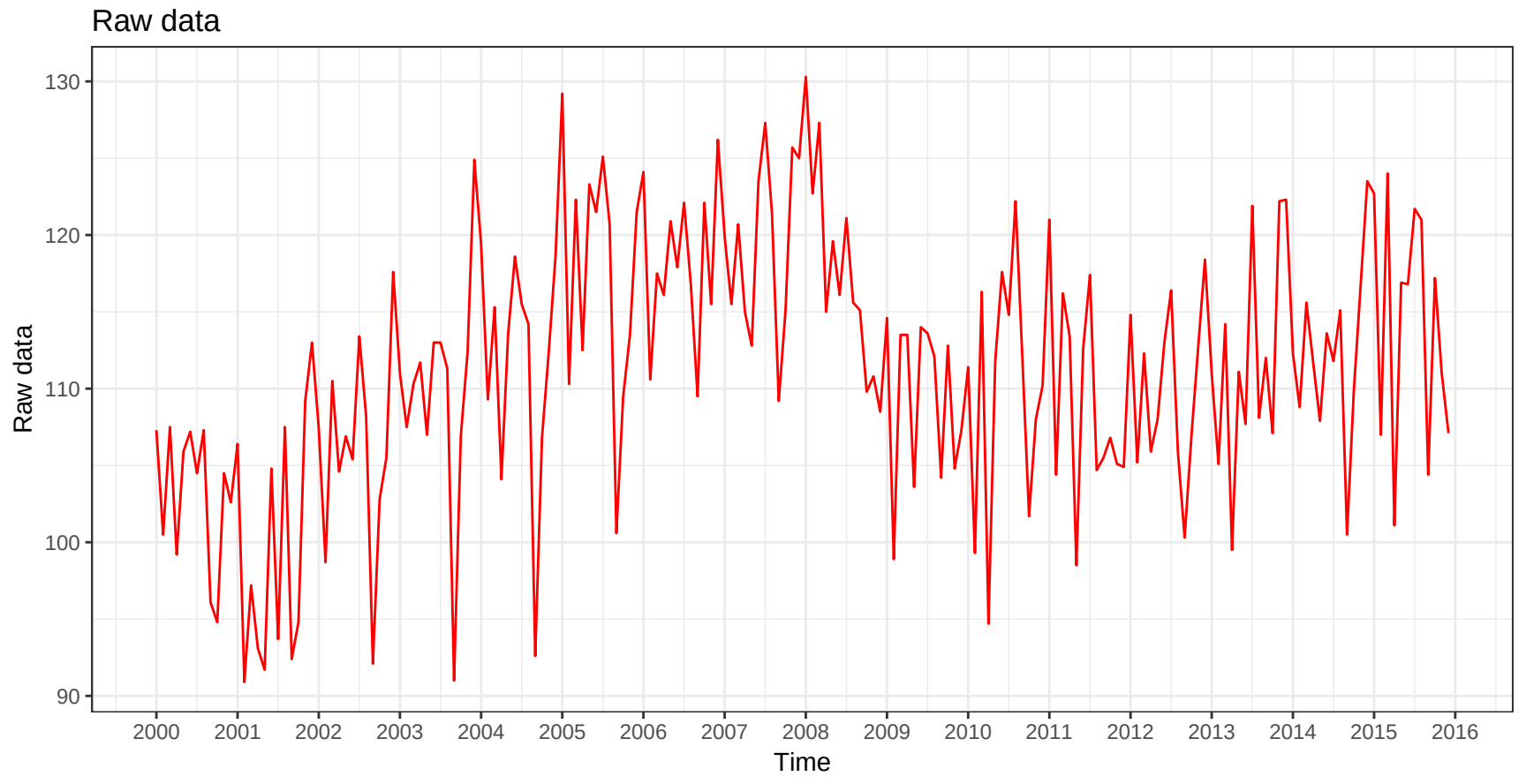



Estimate value of a LS(1995−1) FR−C1711
ARIMA (0,1,2)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
35
30
25
20
15
10
5
0
−5
−10
−15
−20
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
160
140
120
100
Time

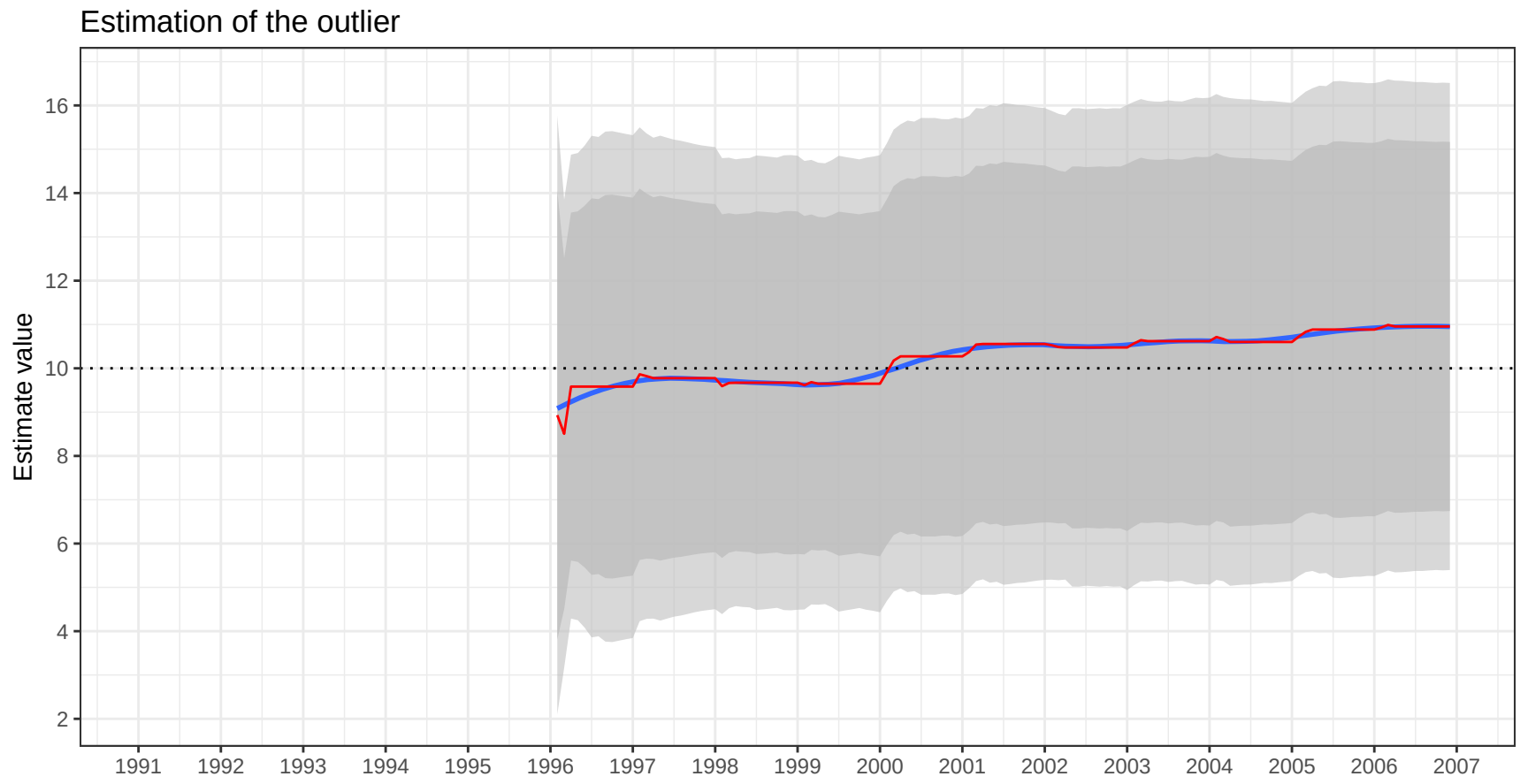

Estimate value of a LS(1995−1) IT−C1711
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
35
30
25
20
15
10
5
0
−5
−10
−15
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
140
120
100
80
60
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Time

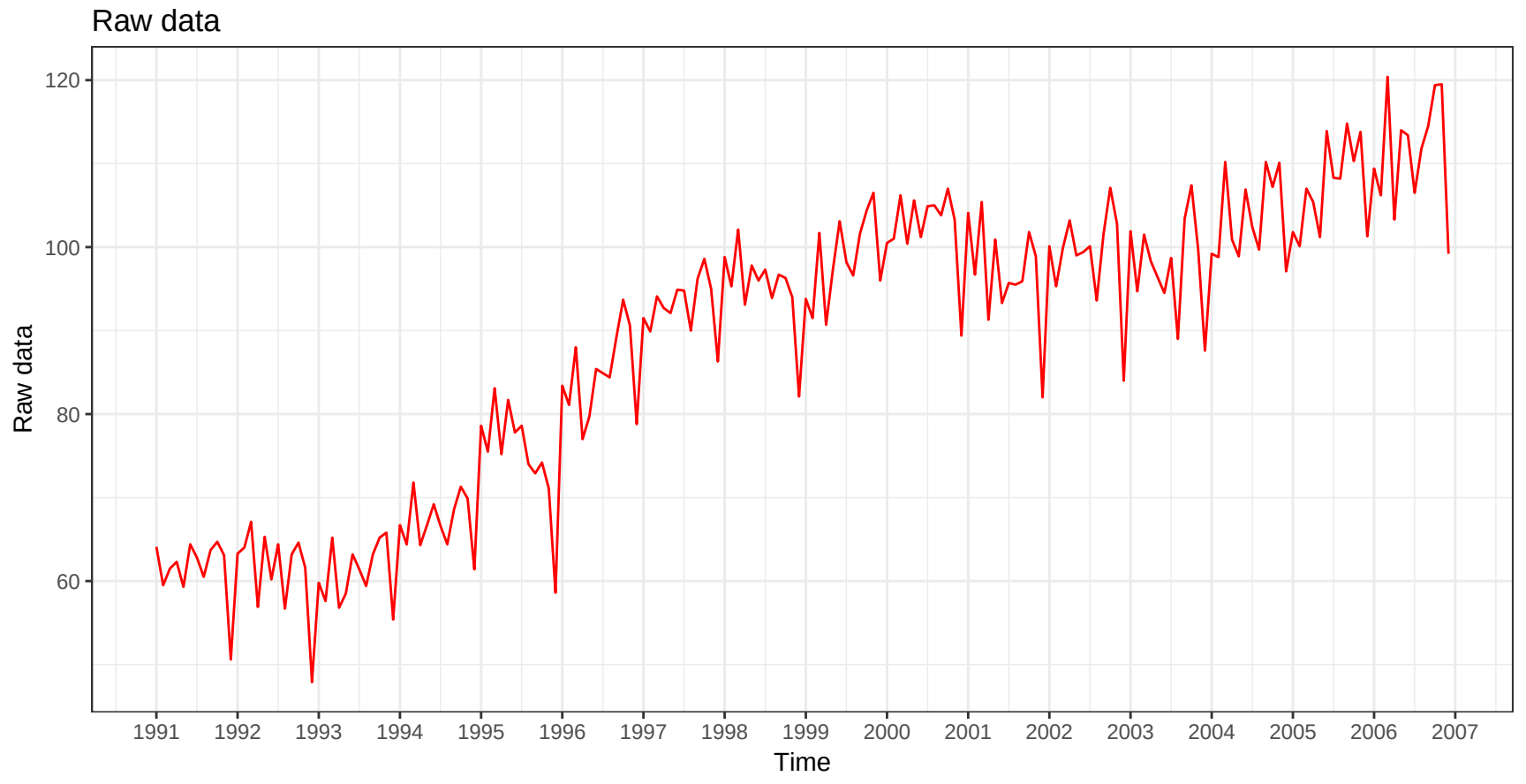
Estimate value of a LS(2005−1) SE−C1711
ARIMA (0,1,1)(0,1,1) − additive decomposition

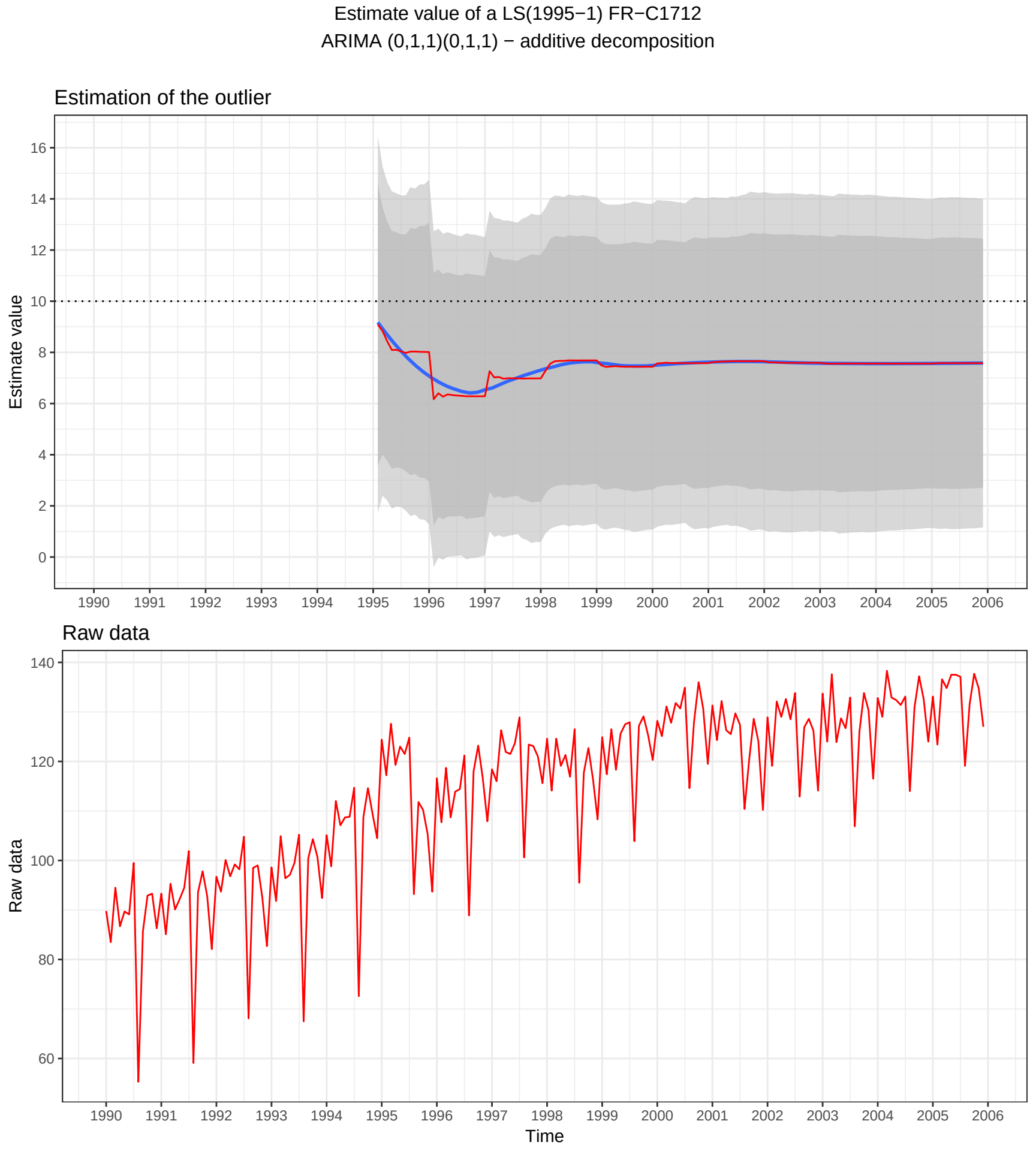


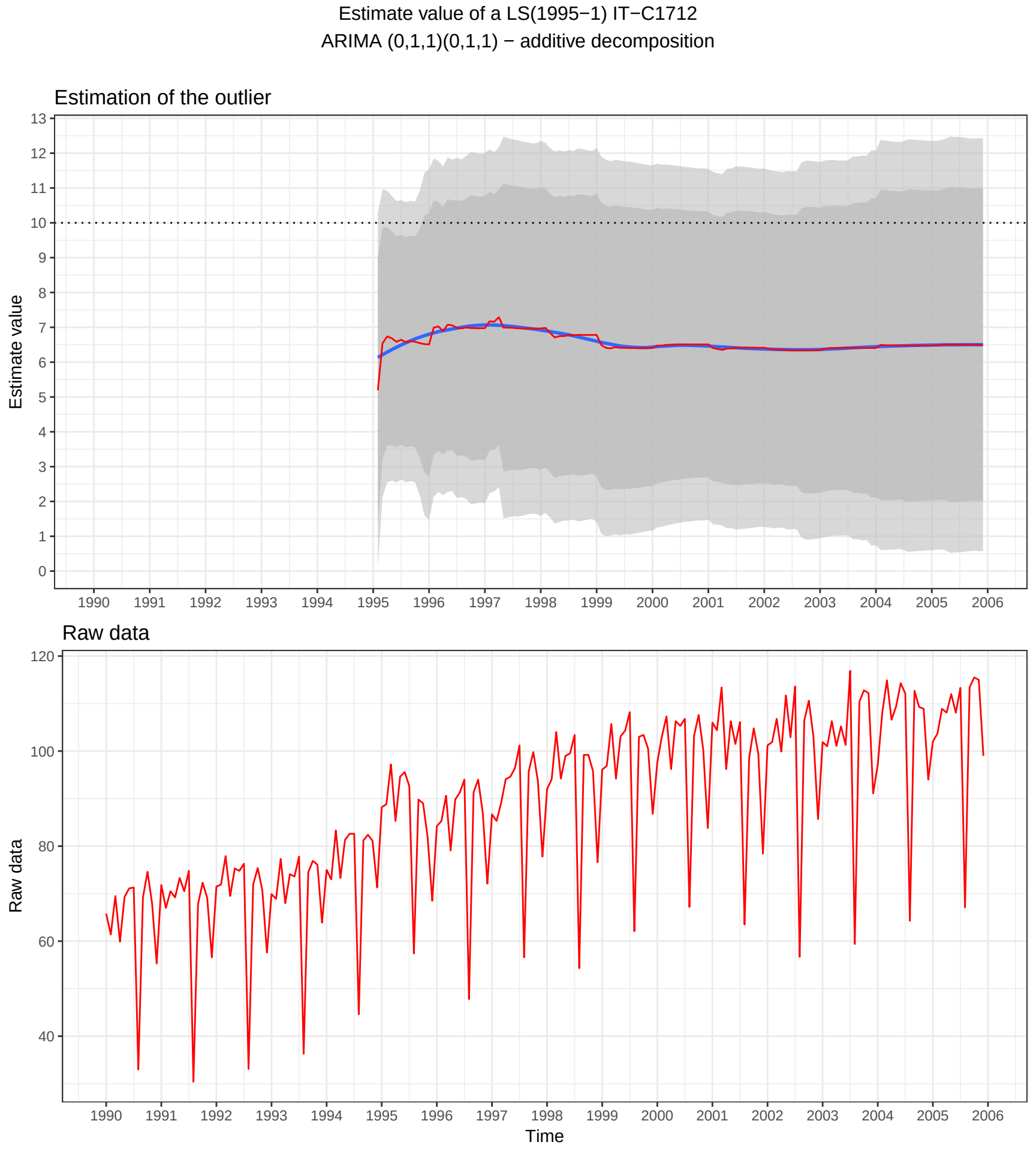


Estimate value of a LS(1996−1) DE−C1712
ARIMA (2,1,0)(0,1,1) − additive decomposition

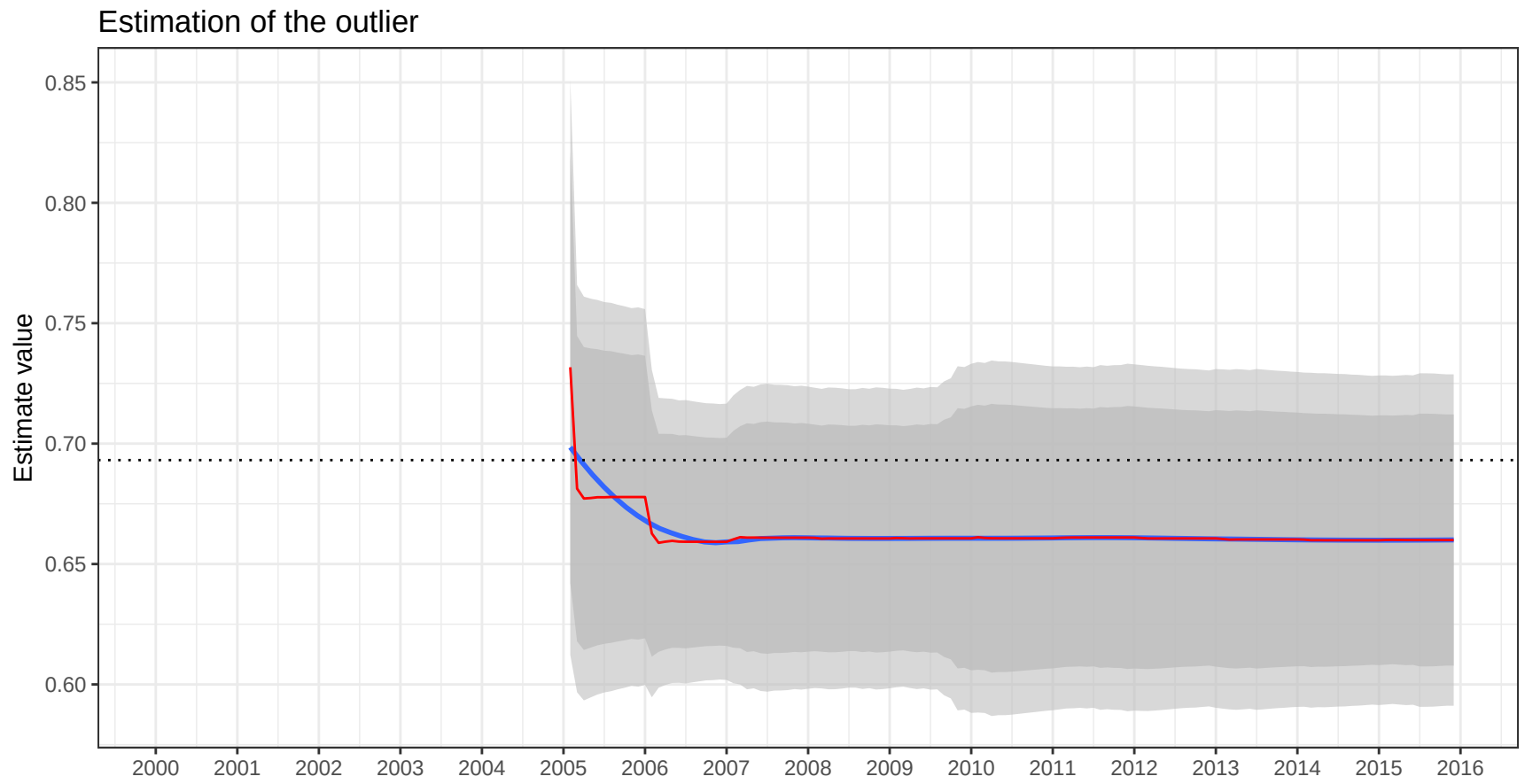


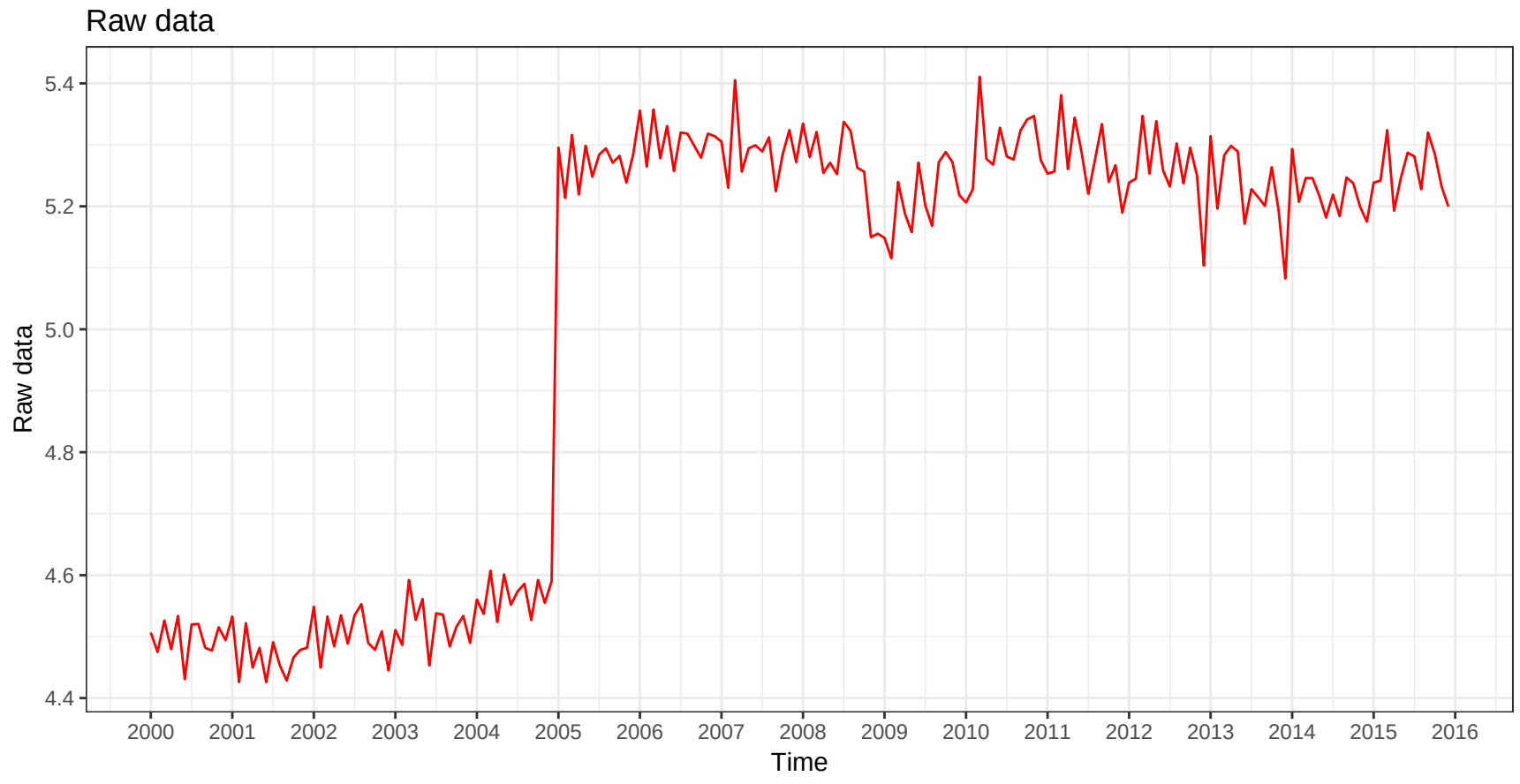


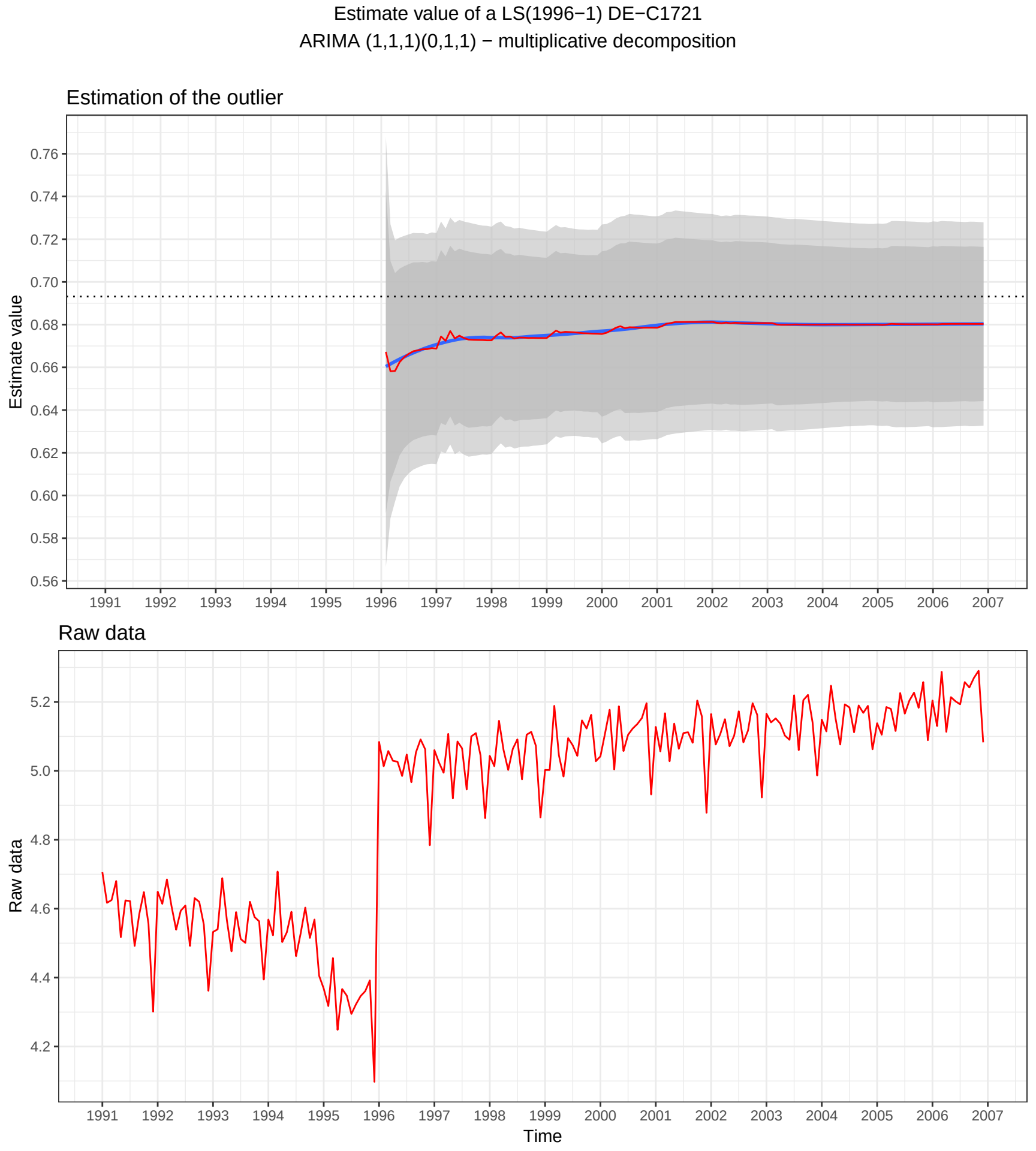

Estimate value of a LS(1995−1) FR−C1712
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
16
14
12
10
8
6
4
2
0
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
140
120
100
80
60
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Time

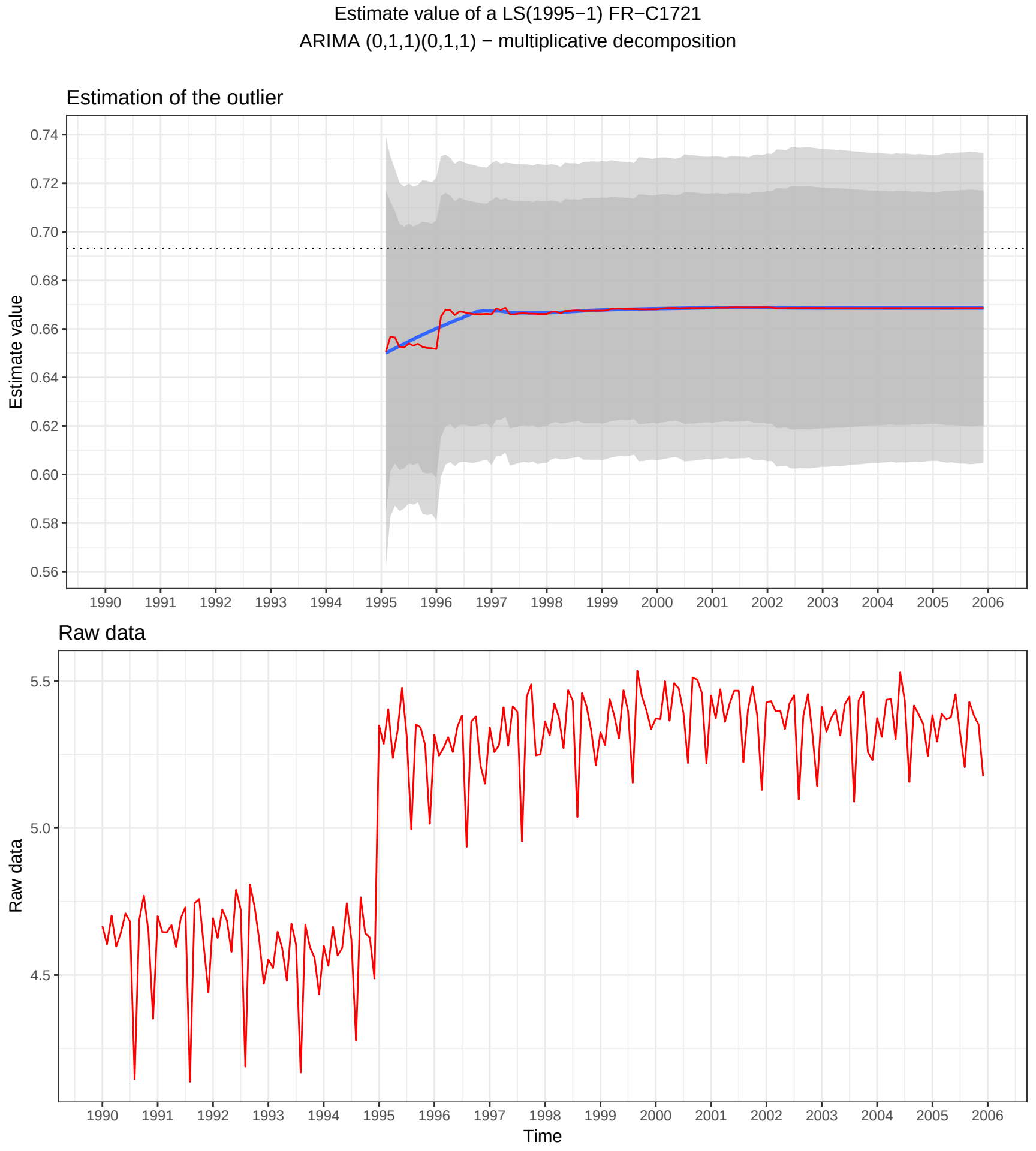

Estimate value of a LS(1995−1) IT−C1712
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
Raw data
Raw data
Time

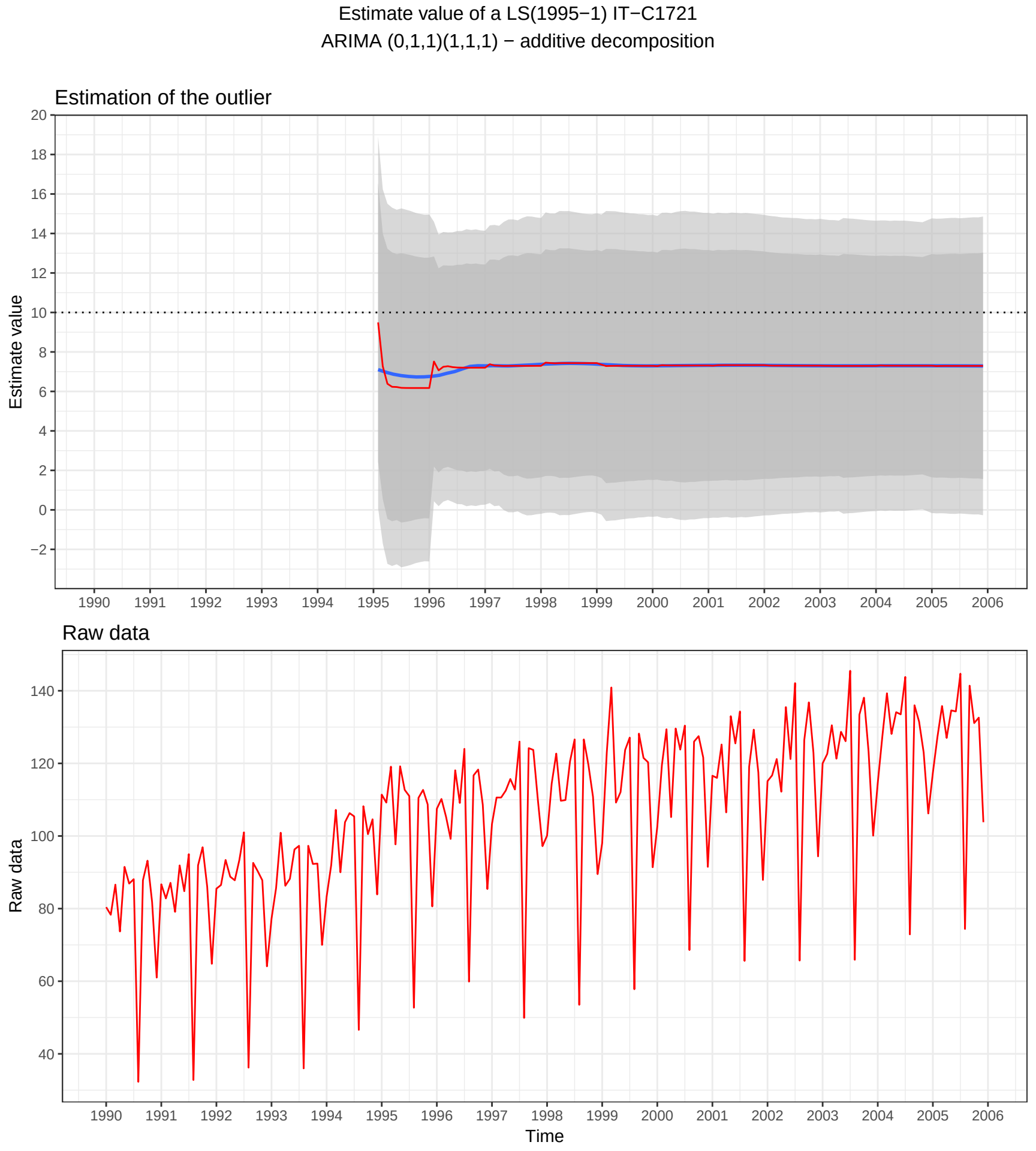
Estimate value of a LS(2005−1) SE−C1712
ARIMA (1,1,2)(1,1,1) − multiplicative decomposition





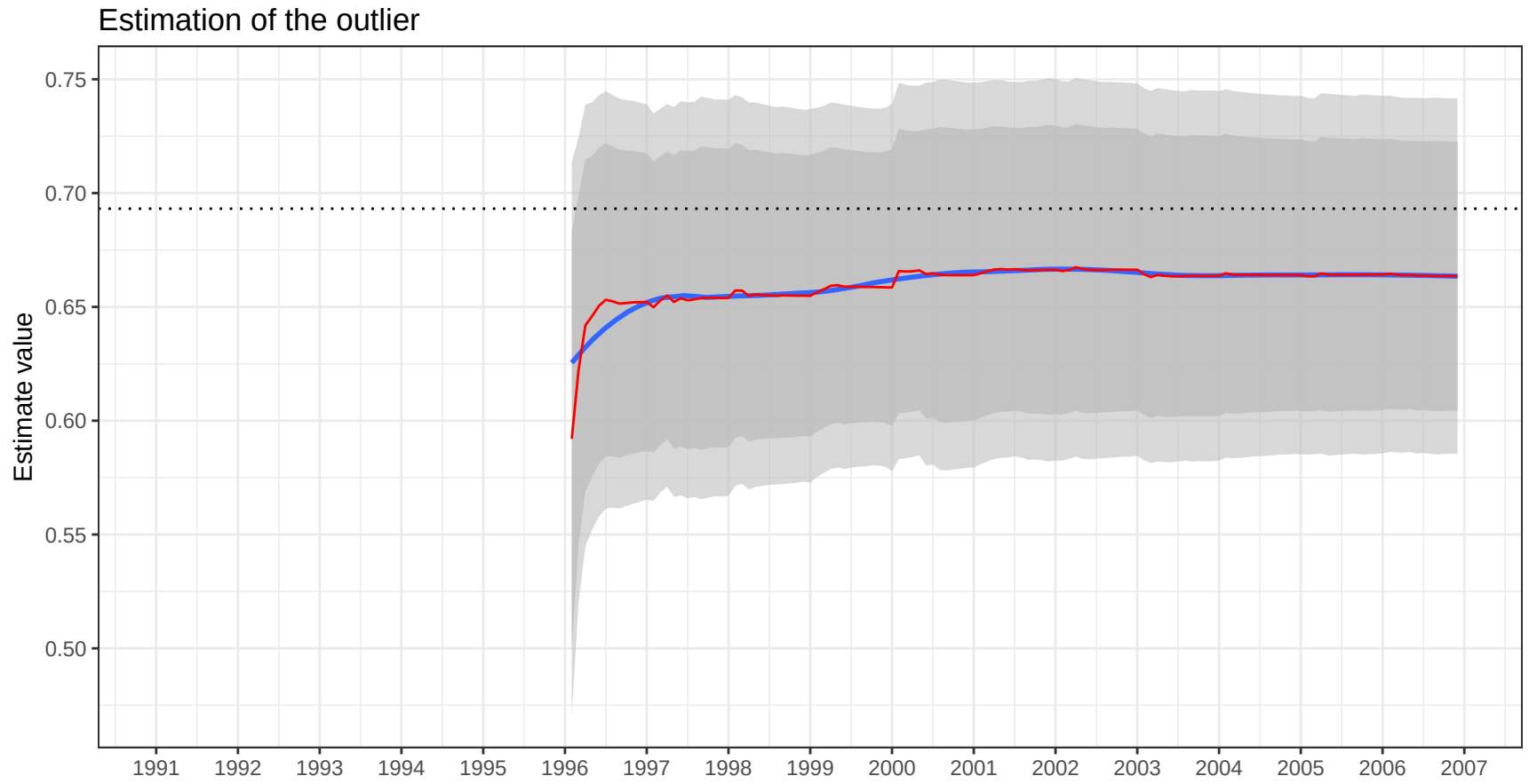

Estimate value of a LS(1996−1) DE−C1721
ARIMA (1,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.76
0.74
0.72
0.70
0.68
0.66
0.64
0.62
0.60
0.58
0.56
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
5.2
5.0
4.8
4.6
4.4
4.2
Time

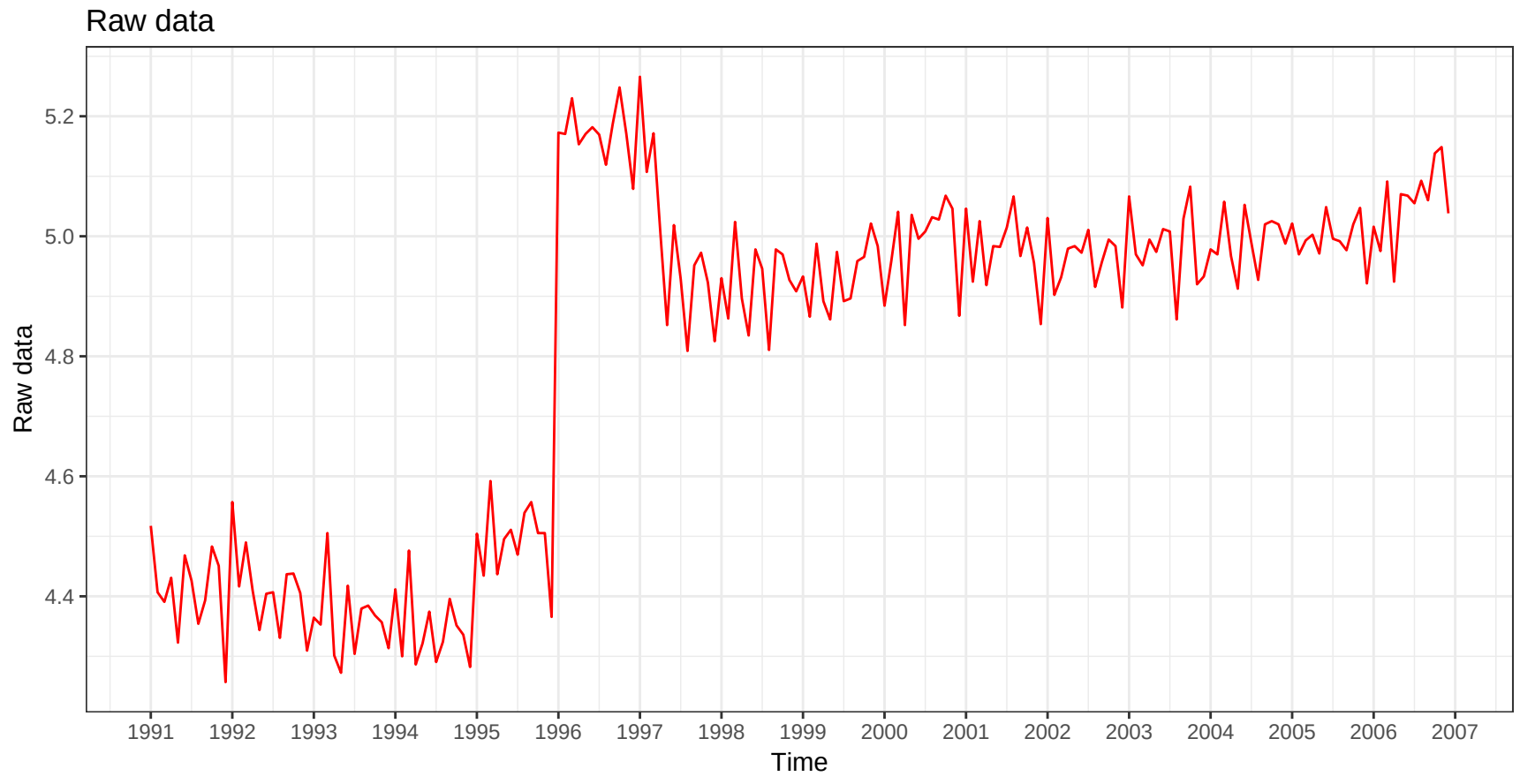

Estimate value of a LS(1995−1) FR−C1721
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.74
0.72
0.70
0.68
0.66
0.64
0.62
0.60
0.58
0.56
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
5.5
5.0
4.5
Time

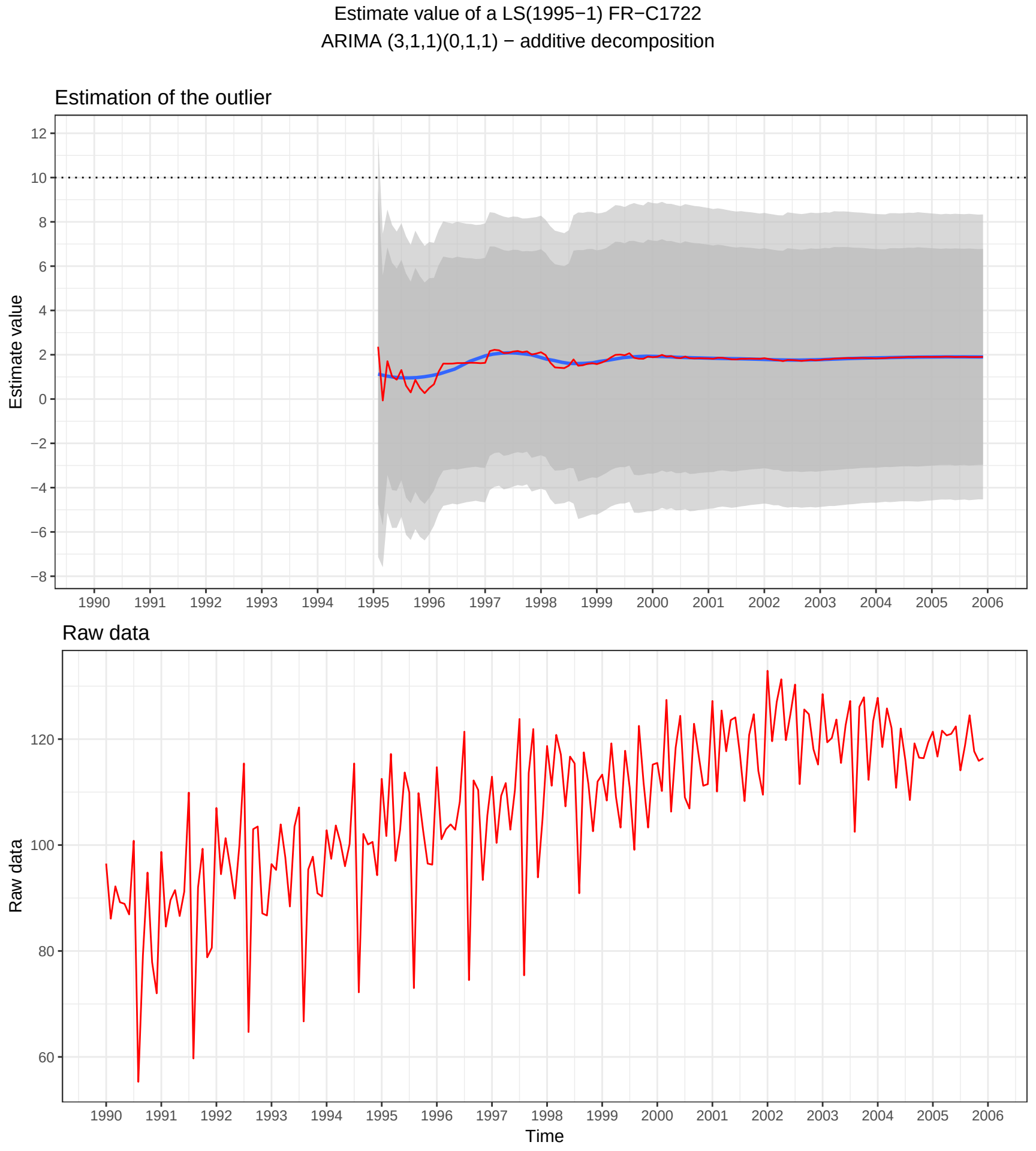

Estimate value of a LS(1995−1) IT−C1721
ARIMA (0,1,1)(1,1,1) − additive decomposition
Estimation of the outlier
Estimate value
20
18
16
14
12
10
8
6
4
2
0
−2
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
140
120
100
80
60
40
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Time

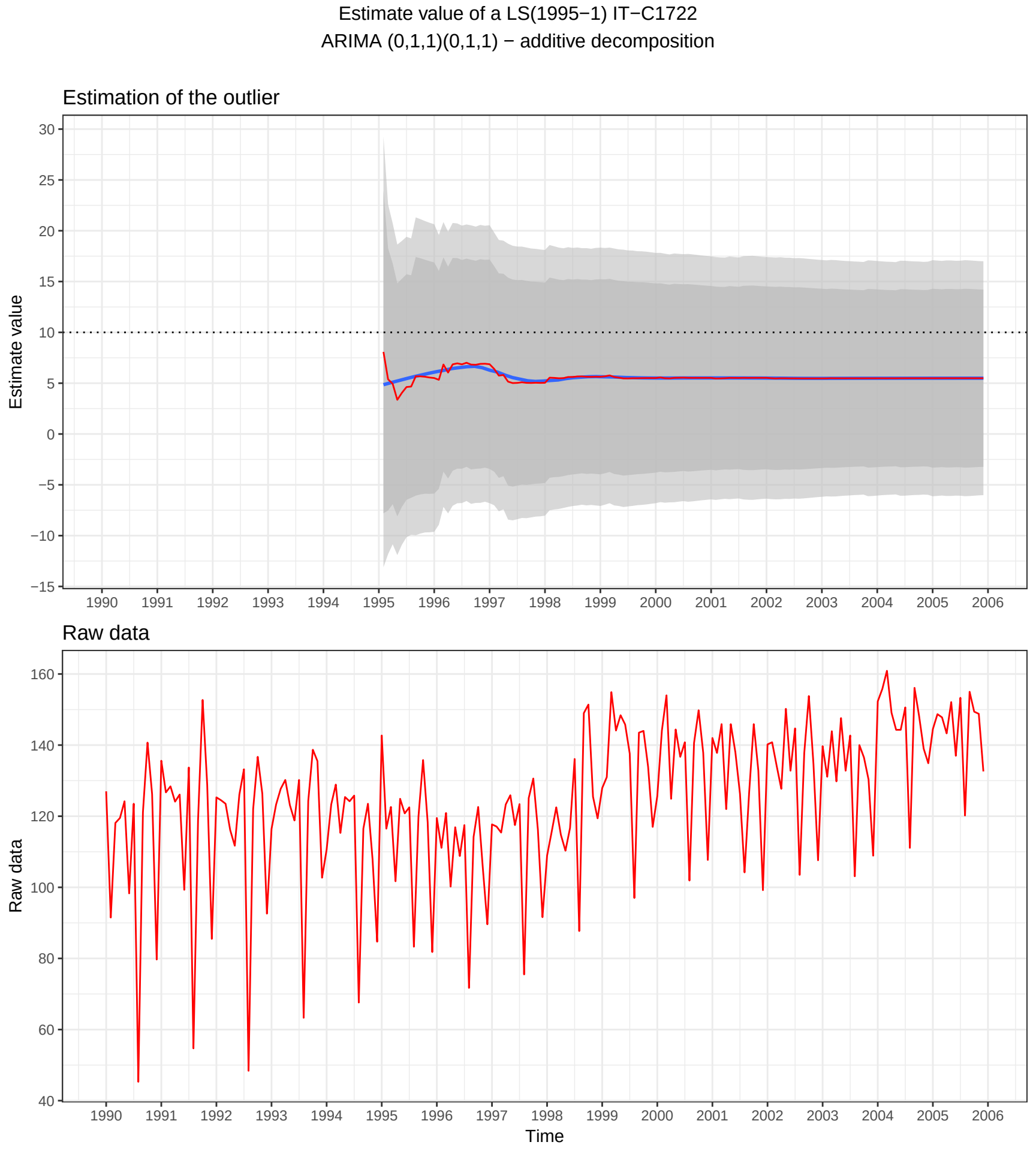
Estimate value of a LS(1996−1) DE−C1722

ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

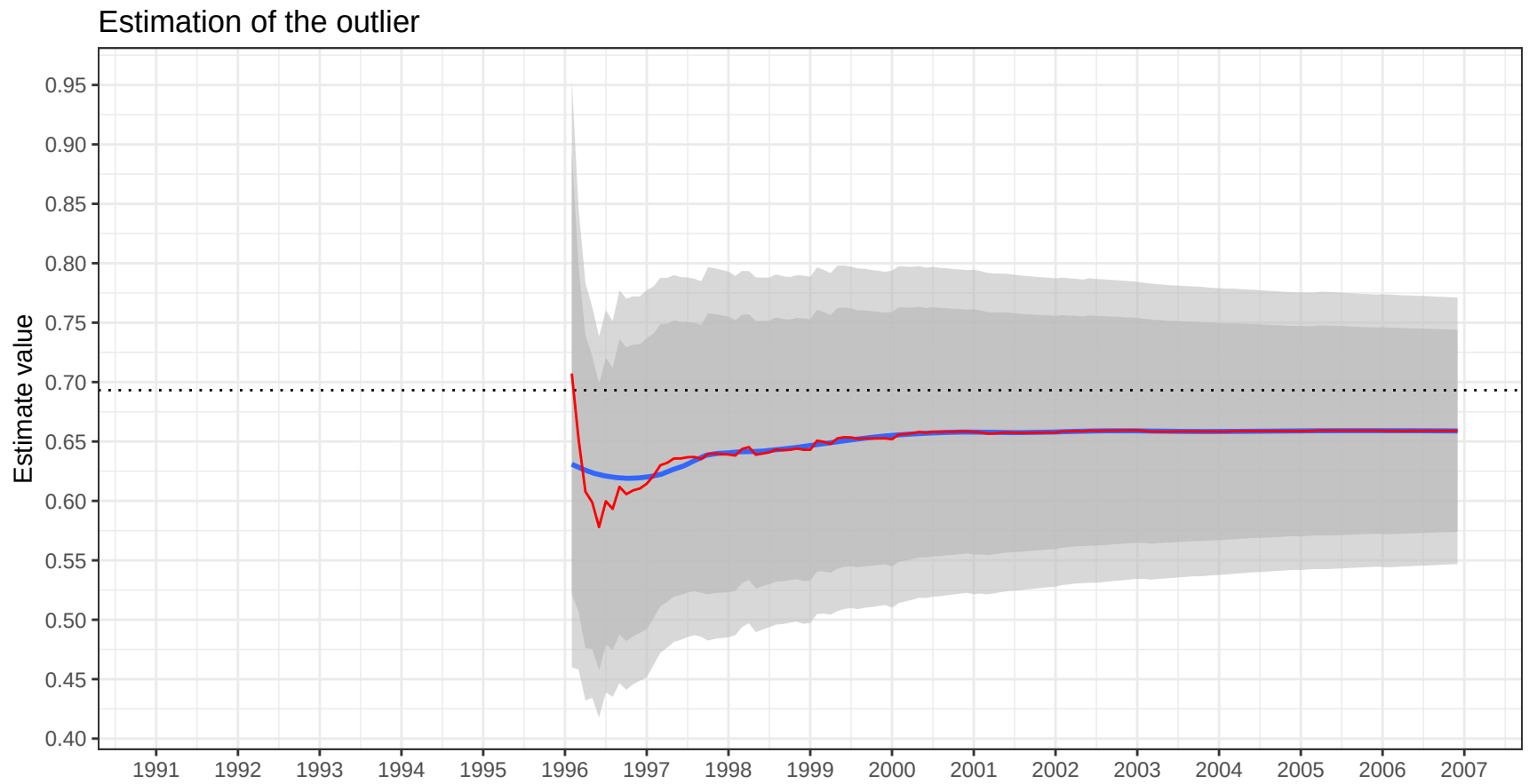


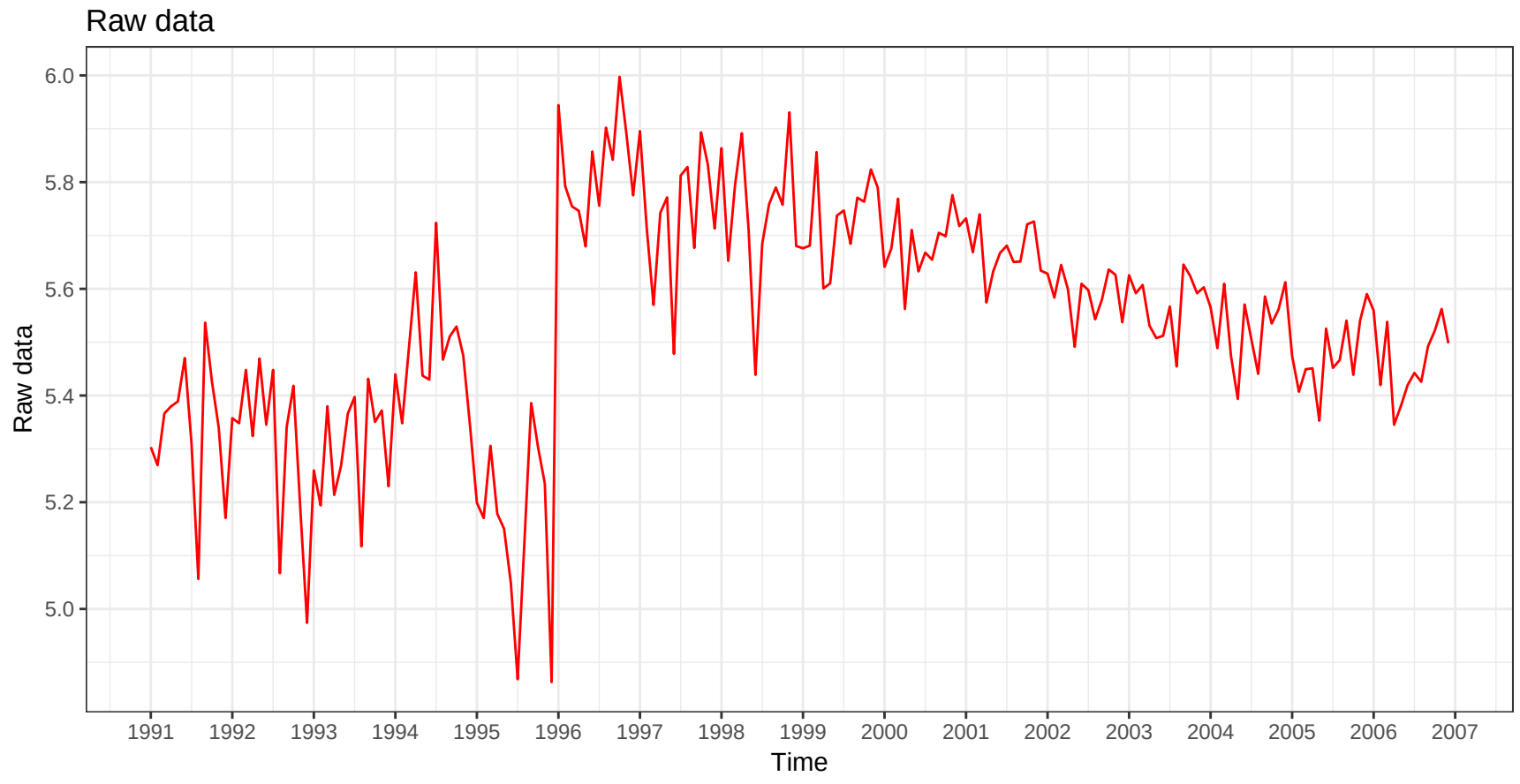


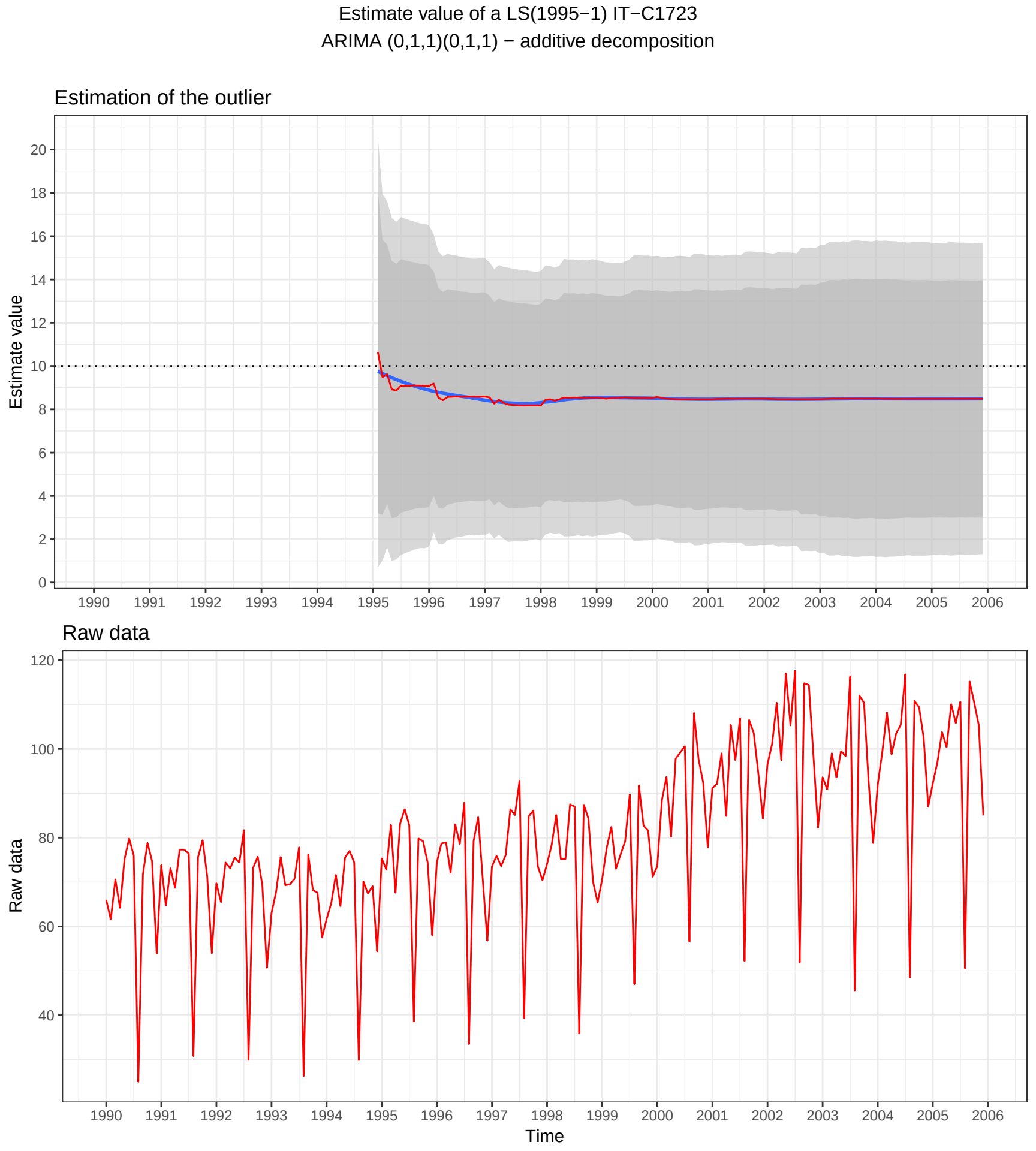

Estimate value of a LS(1995−1) FR−C1722
ARIMA (3,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
12
10
8
6
4
2
0
−2
−4
−6
−8
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
120
100
80
60
Time

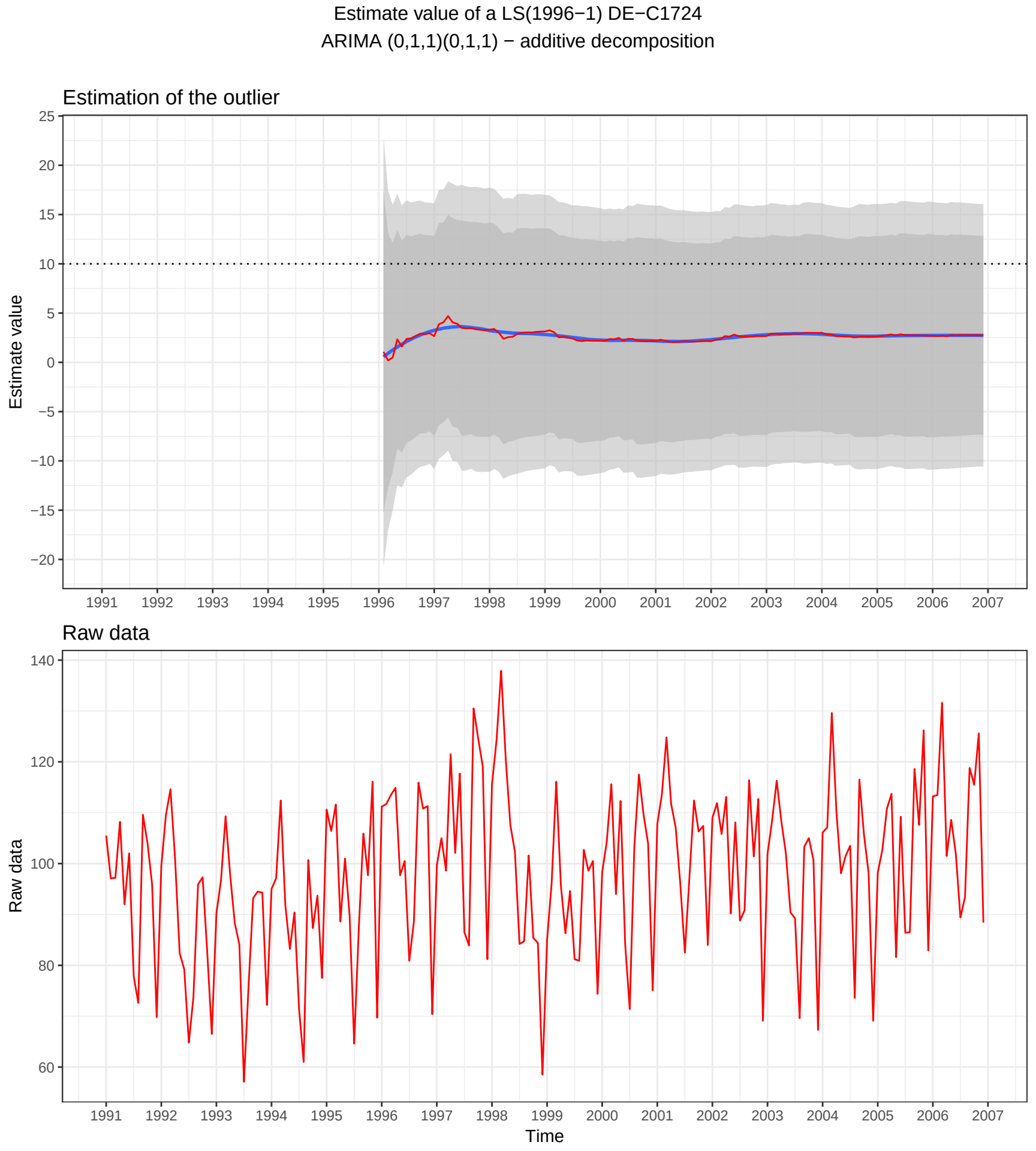

Estimate value of a LS(1995−1) IT−C1722
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
30
25
20
15
10
5
0
−5
−10
−15
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
160
140
120
100
80
60
40
Time

Estimate value of a LS(1996−1) DE−C1723
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

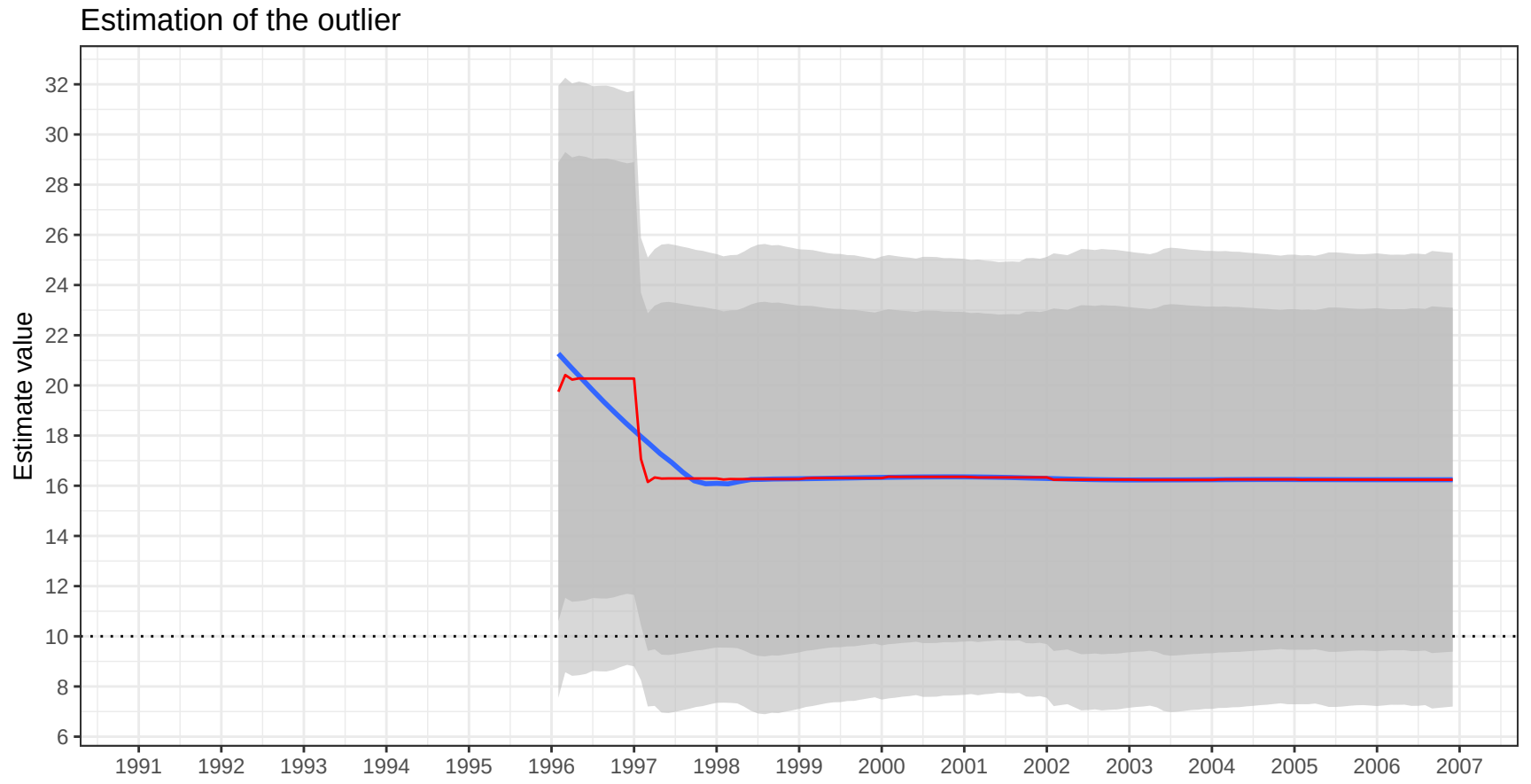


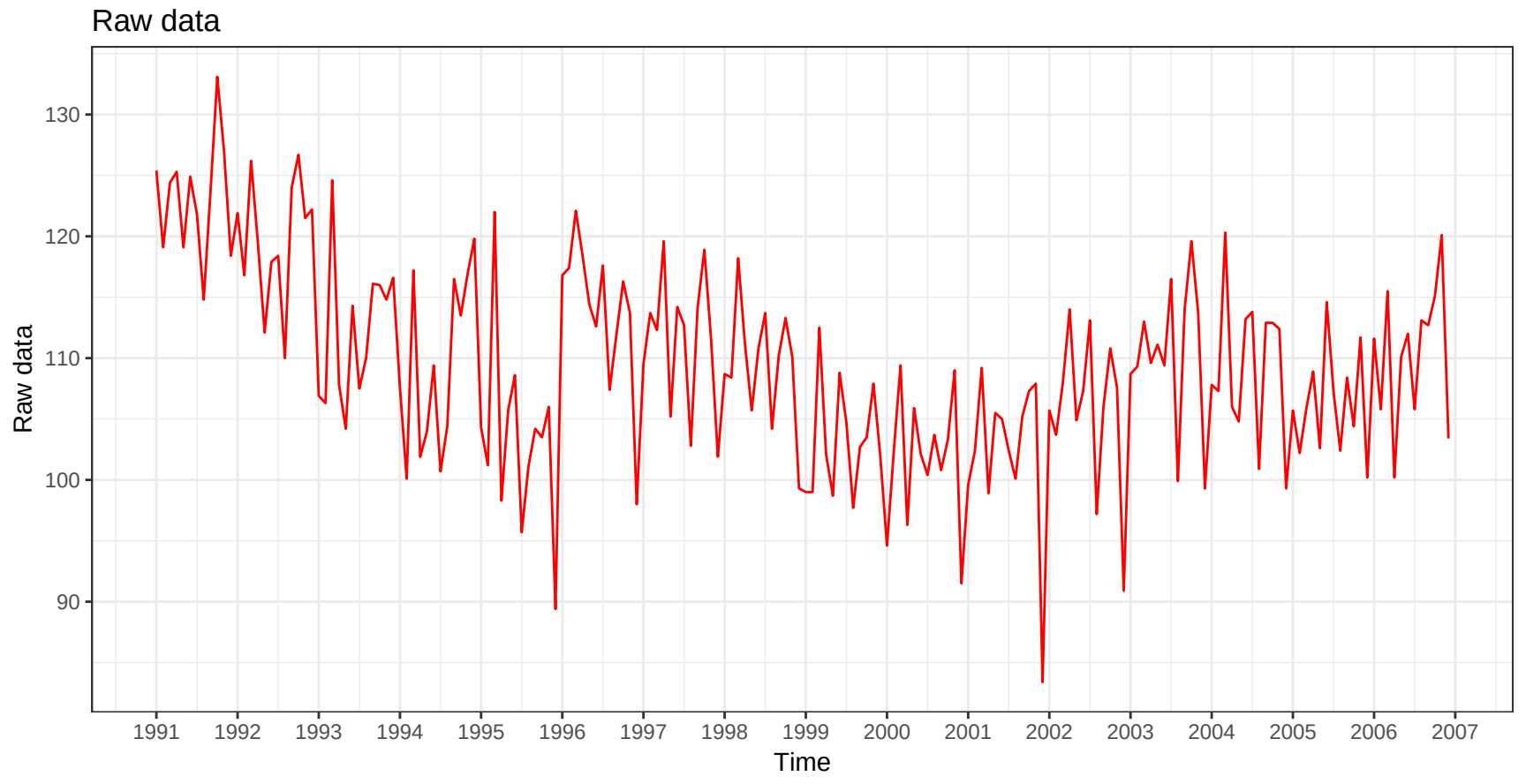



Estimate value of a LS(1995−1) IT−C1723
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
Raw data
Raw data
Time

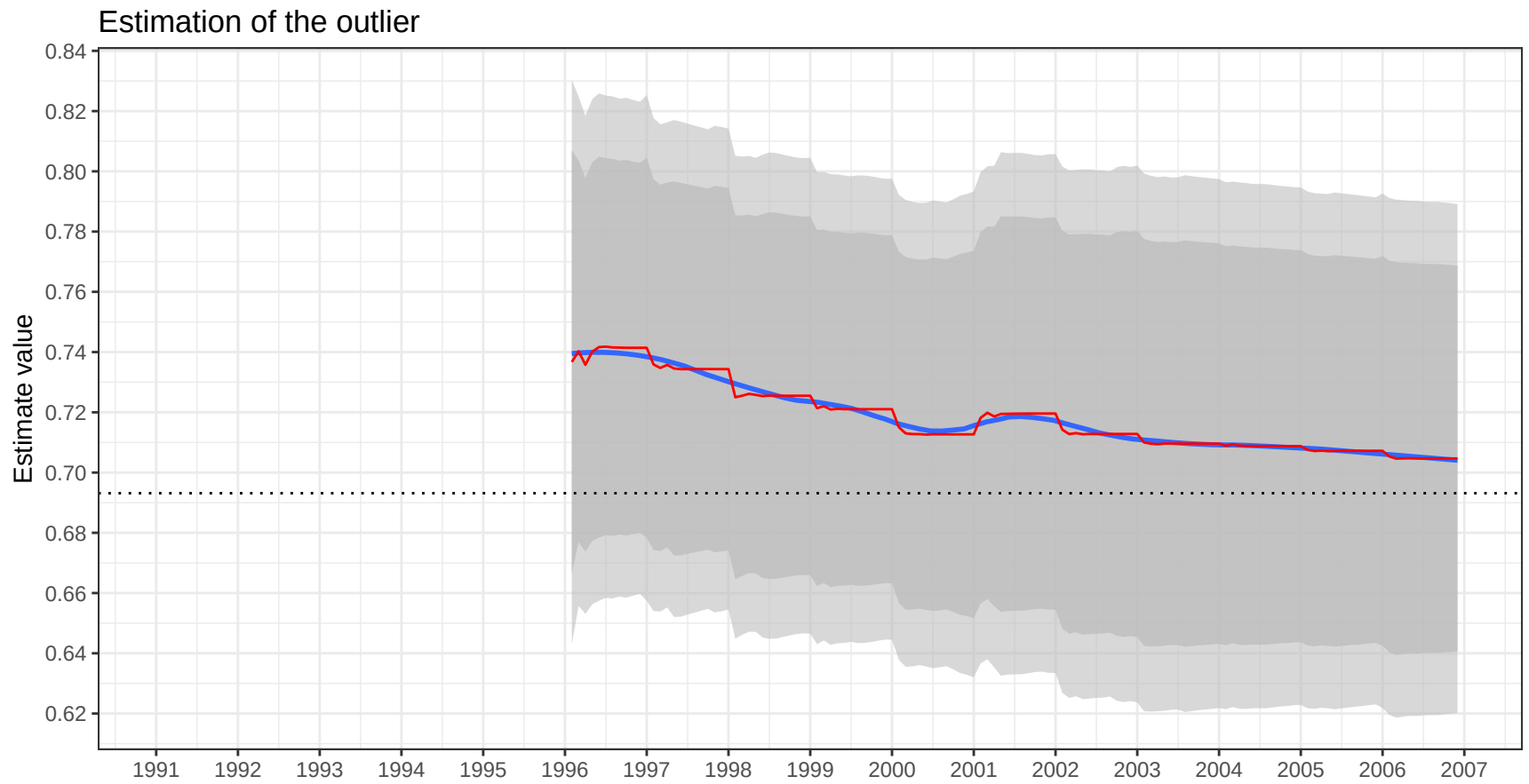

Estimate value of a LS(1996−1) DE−C1724
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
25
20
15
10
5
0
−5
−10
−15
−20
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
140
120
100
80
60
Time

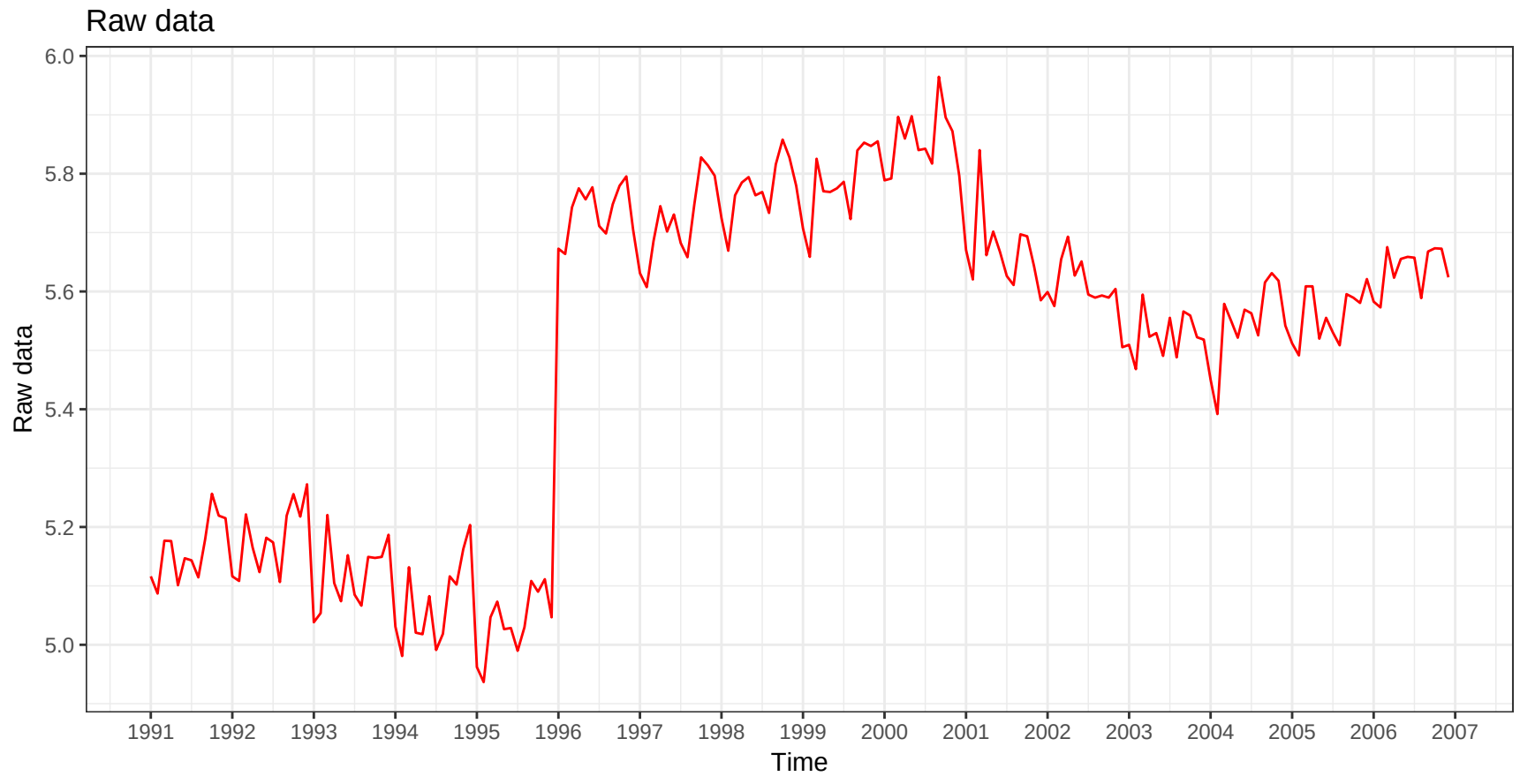
Estimate value of a LS(1996−1) DE−C1729
ARIMA (0,1,1)(1,1,1) − additive decomposition





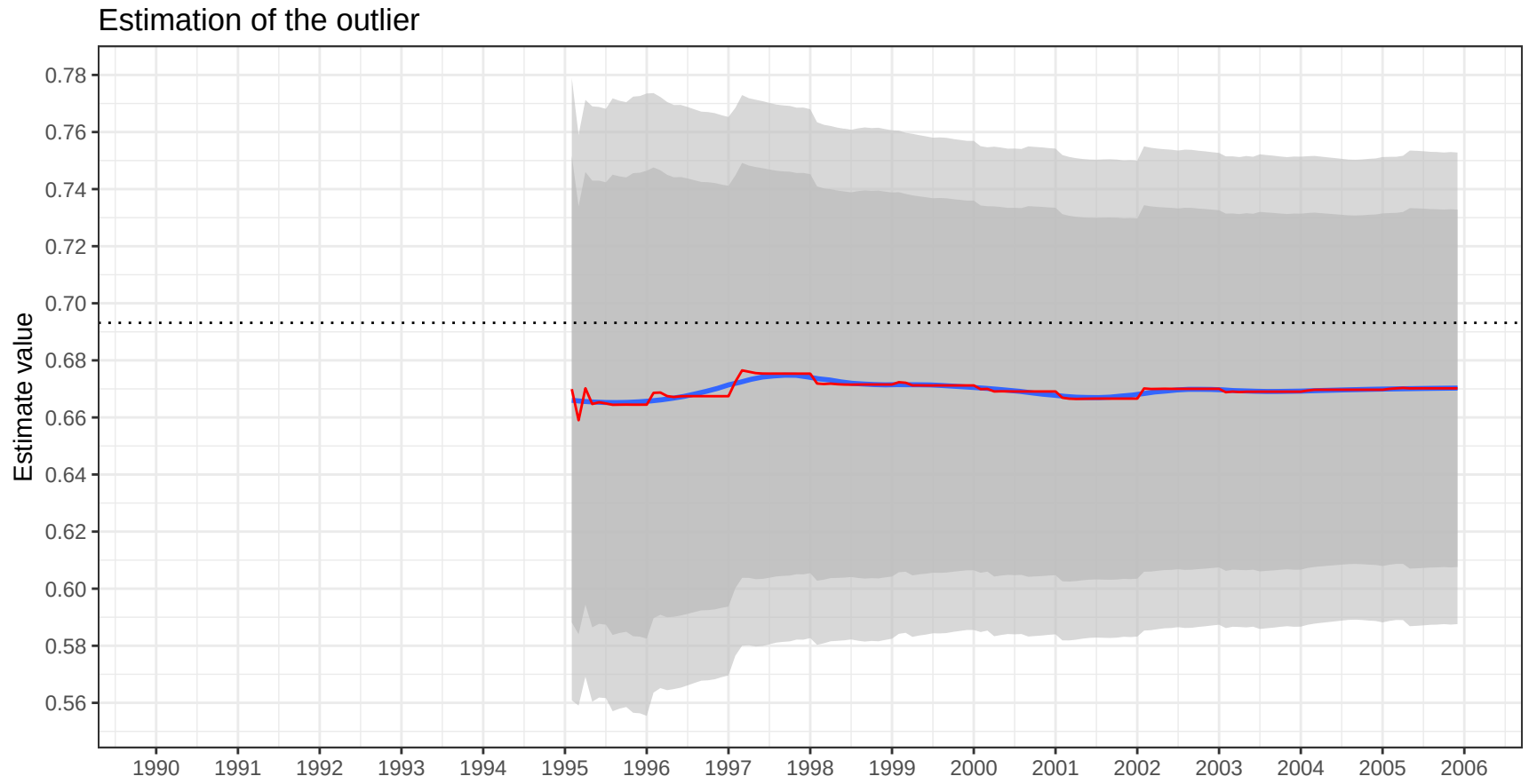
Estimate value of a LS(1996−1) DE−C1811
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

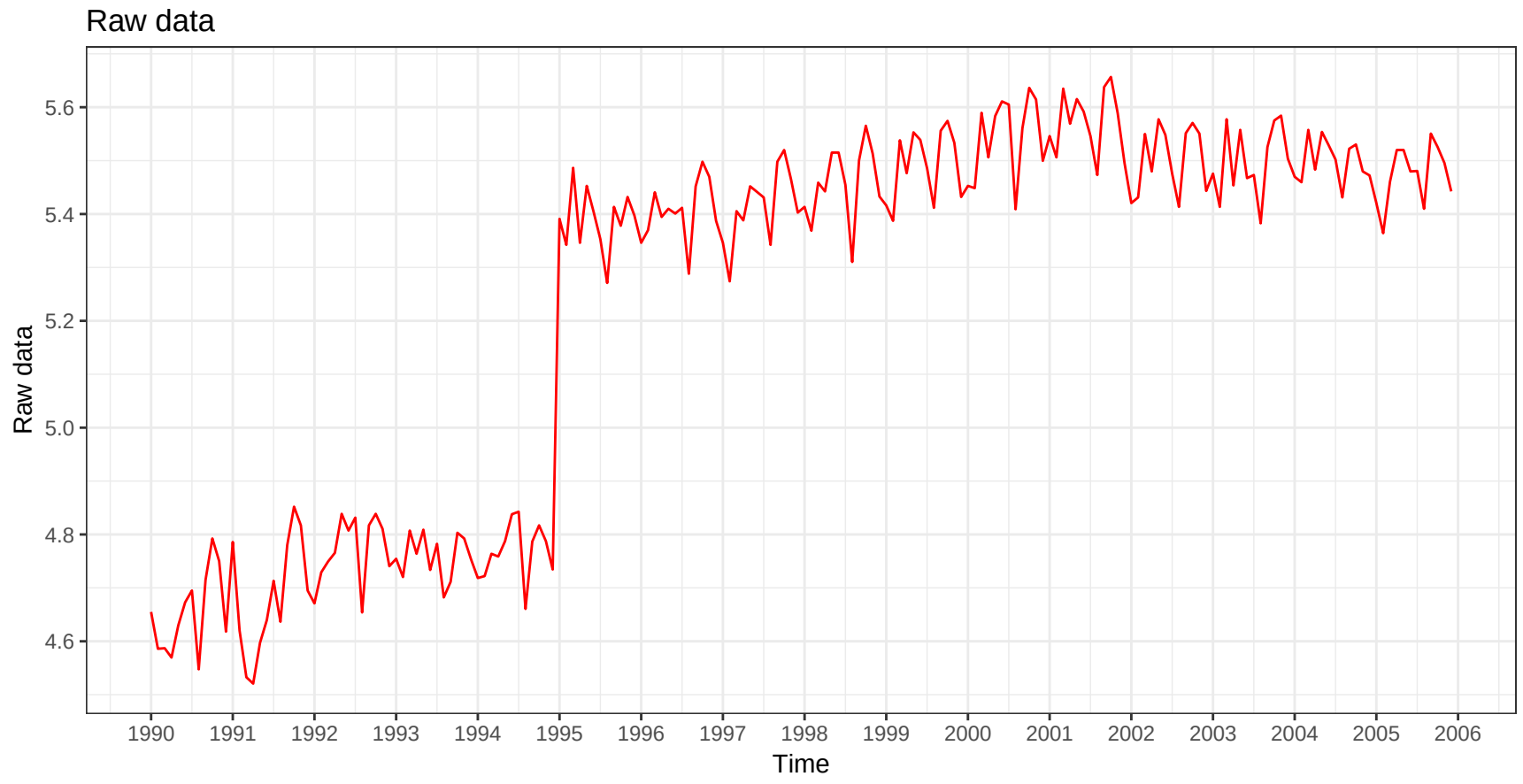




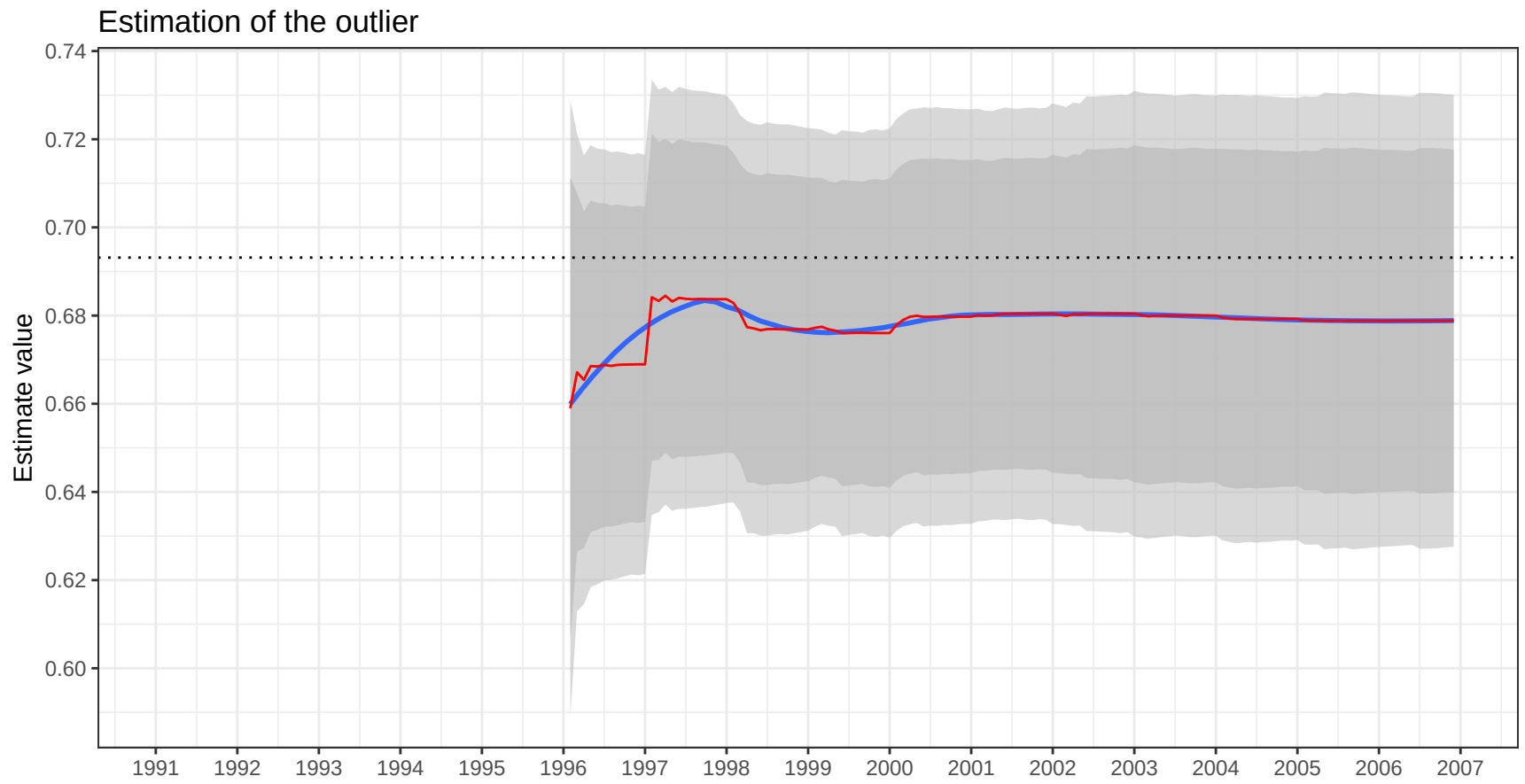
Estimate value of a LS(1995−1) IT−C1811

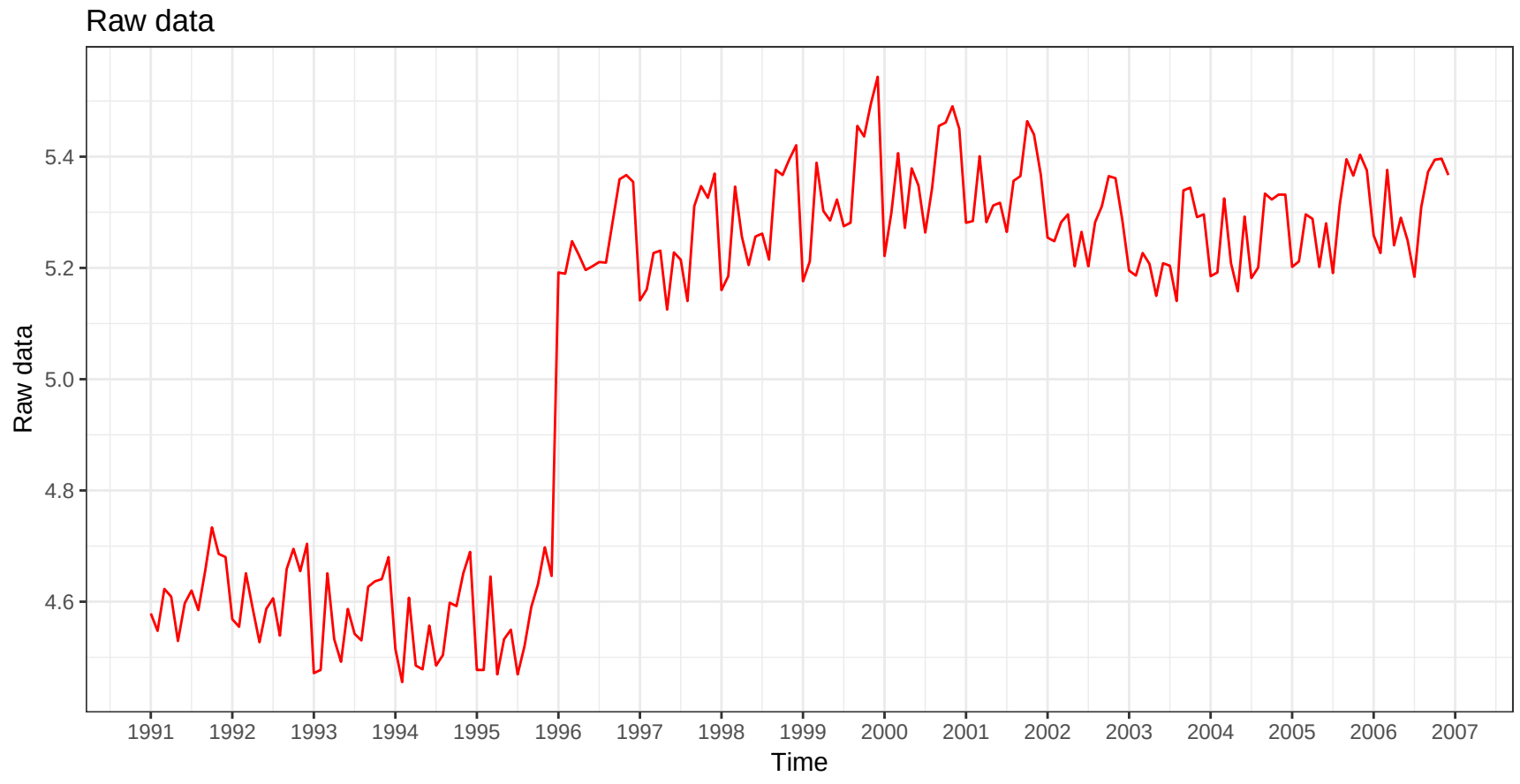
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition





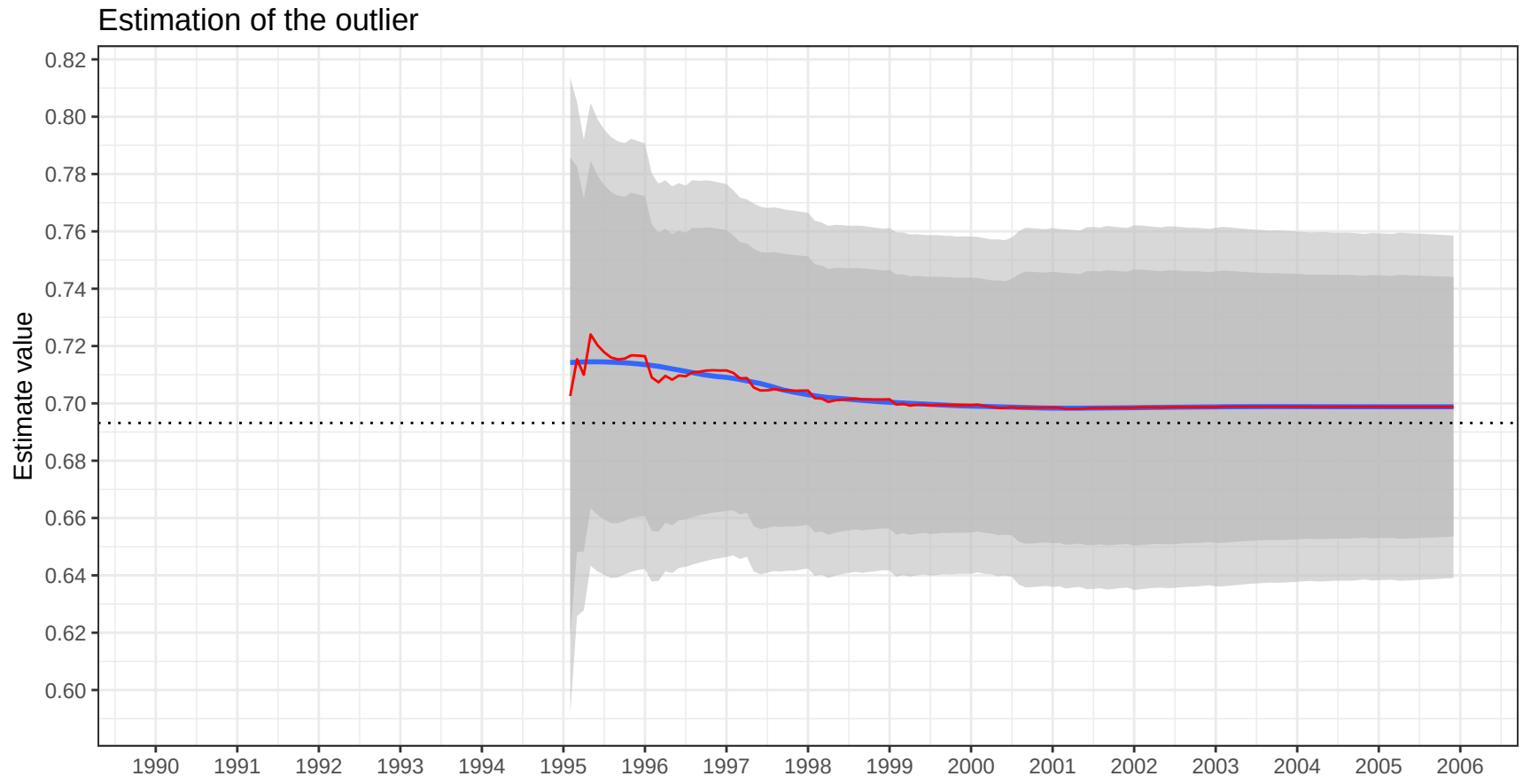
Estimate value of a LS(1996−1) DE−C1812
ARIMA (1,1,1)(0,1,1) − multiplicative decomposition

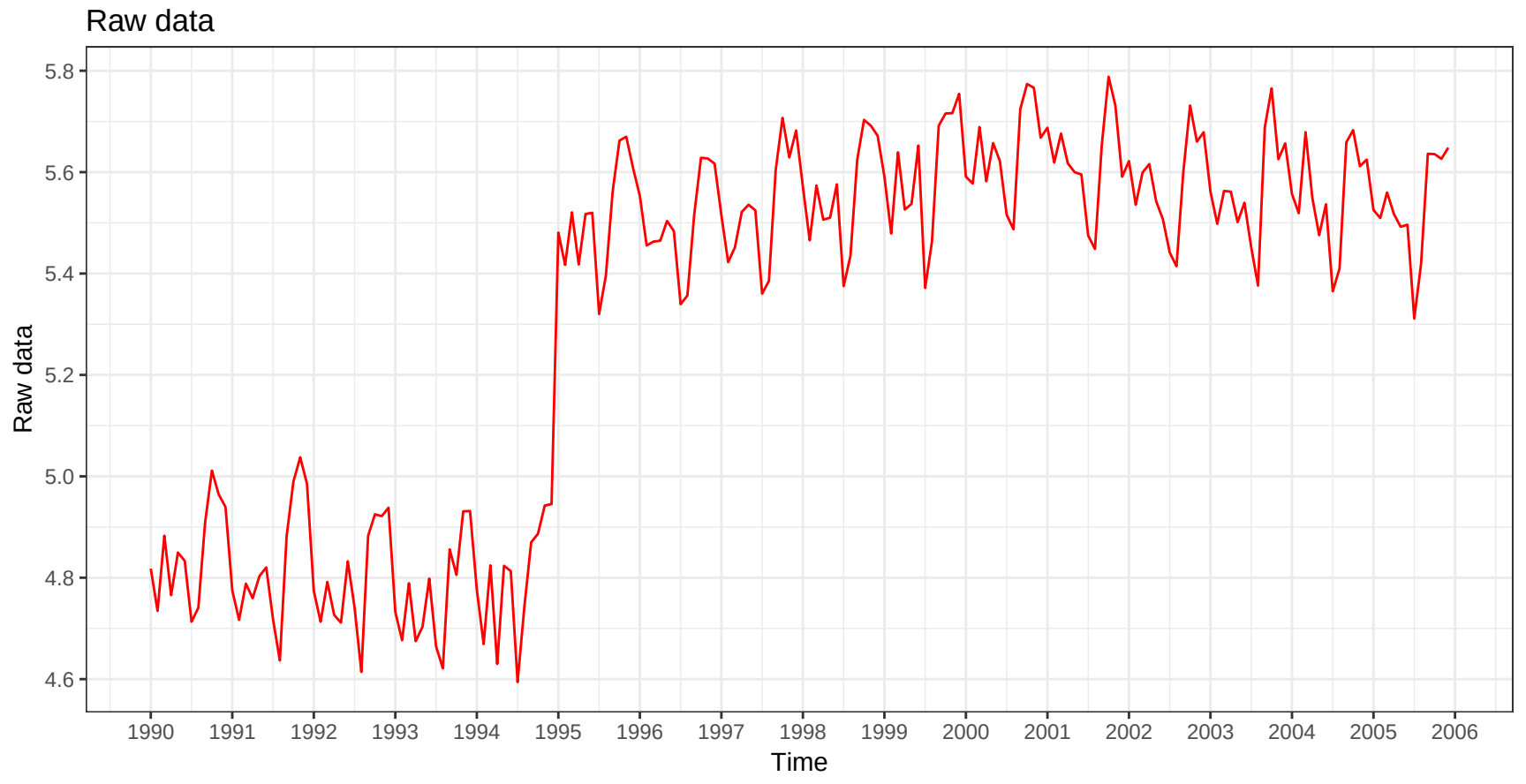


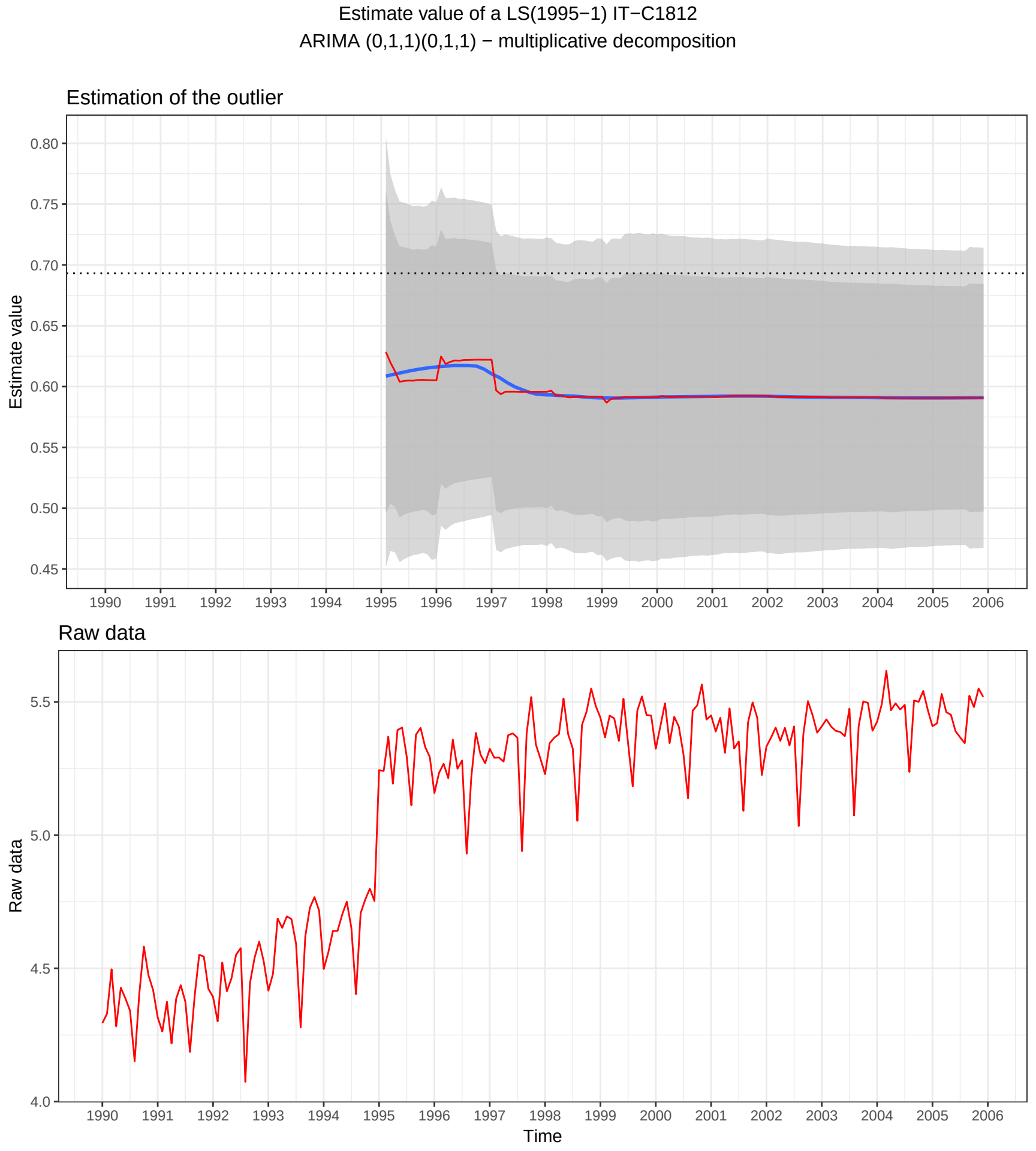


Estimate value of a LS(1995−1) FR−C1812

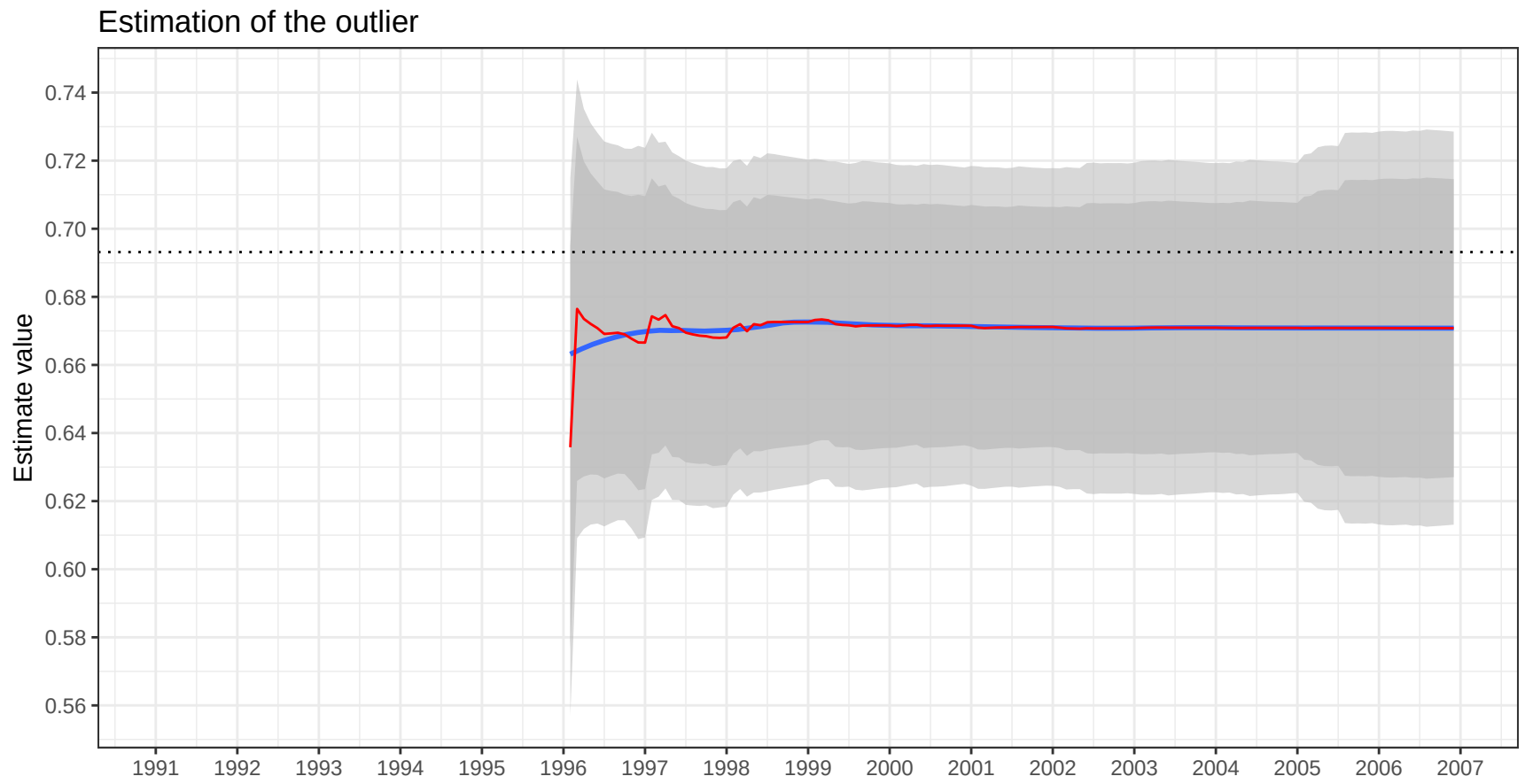
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

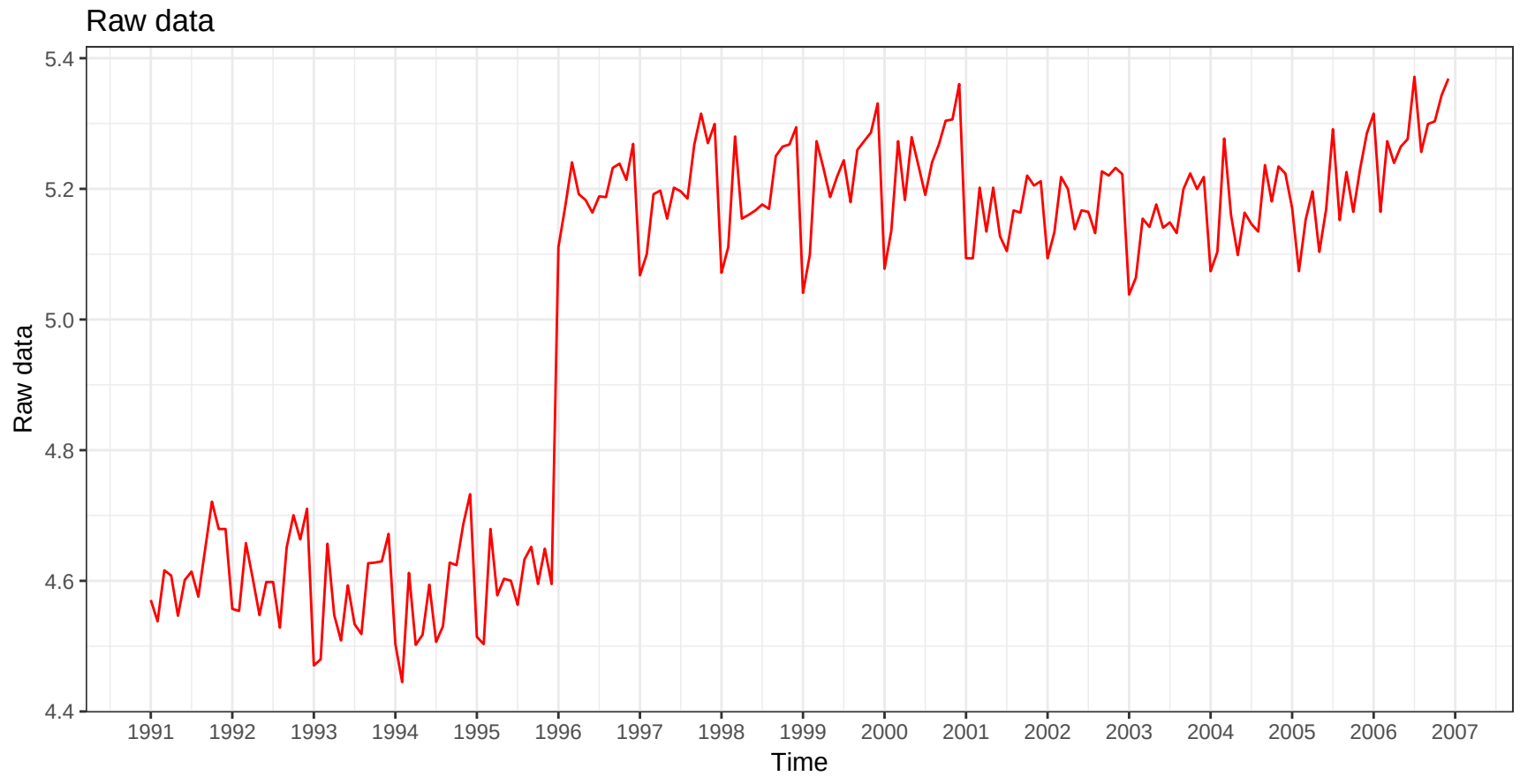


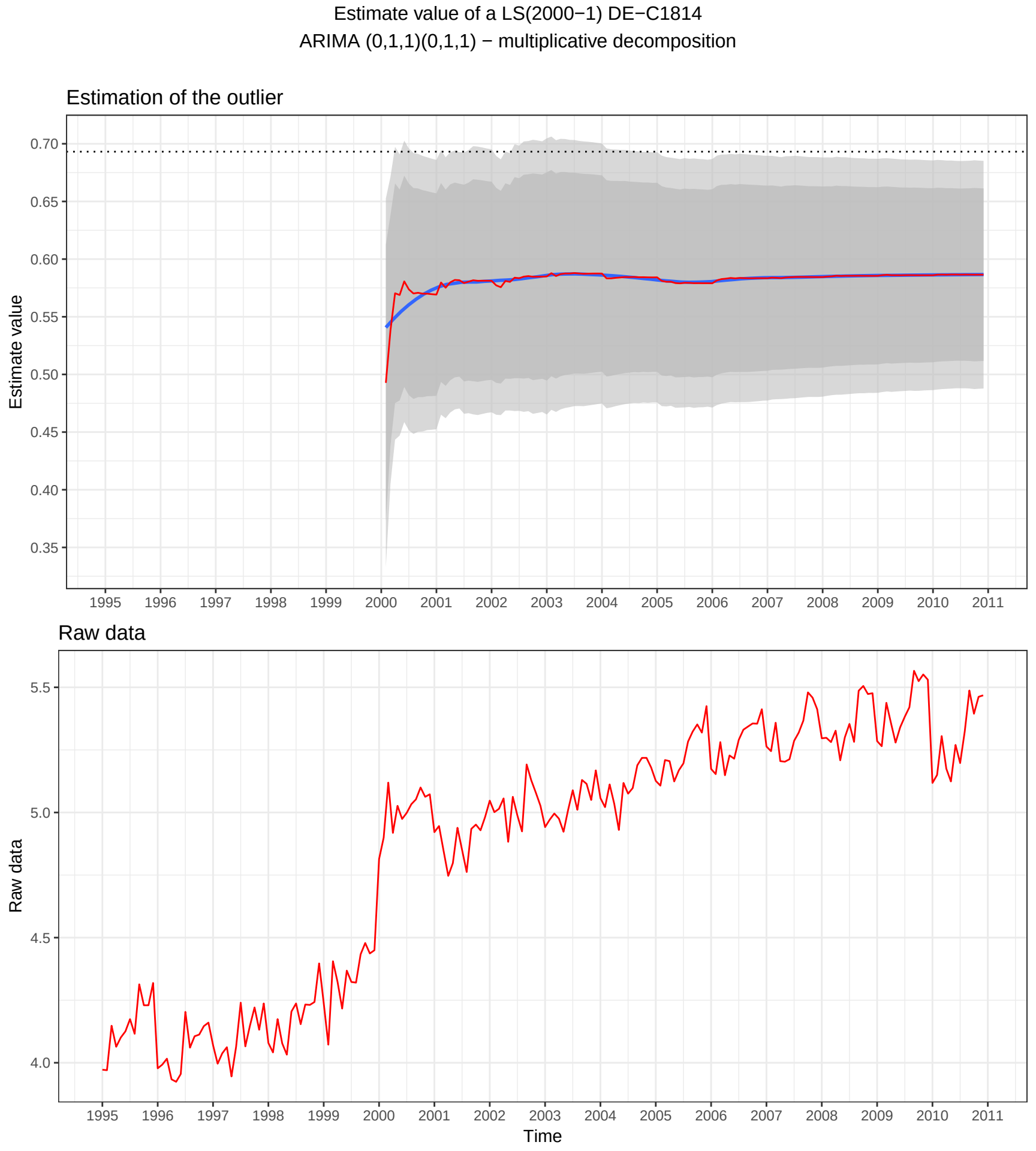


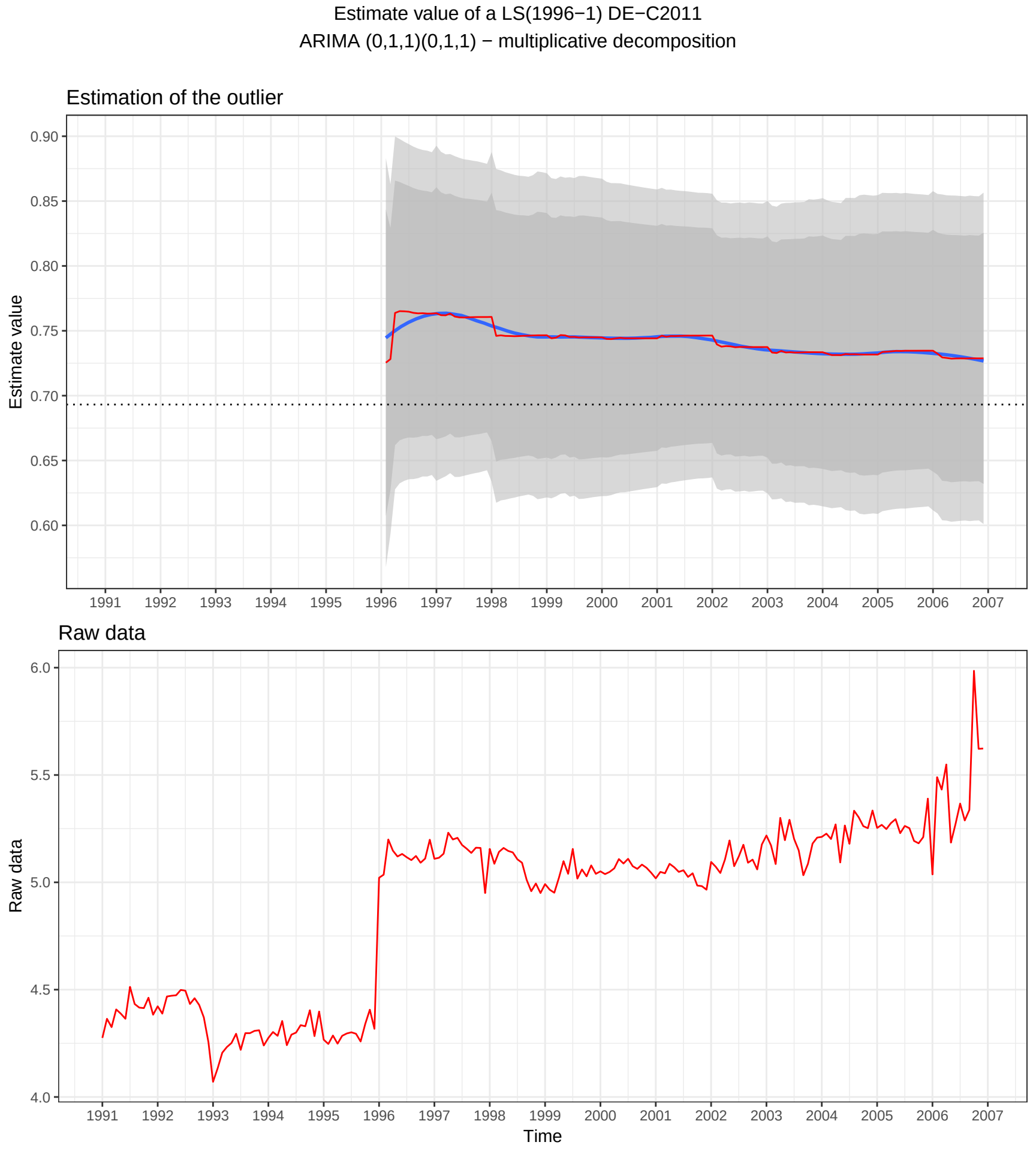

Estimate value of a LS(1995−1) IT−C1812
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.80
0.75
0.70
0.65
0.60
0.55
0.50
0.45
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
5.5
5.0
4.5
4.0
Time

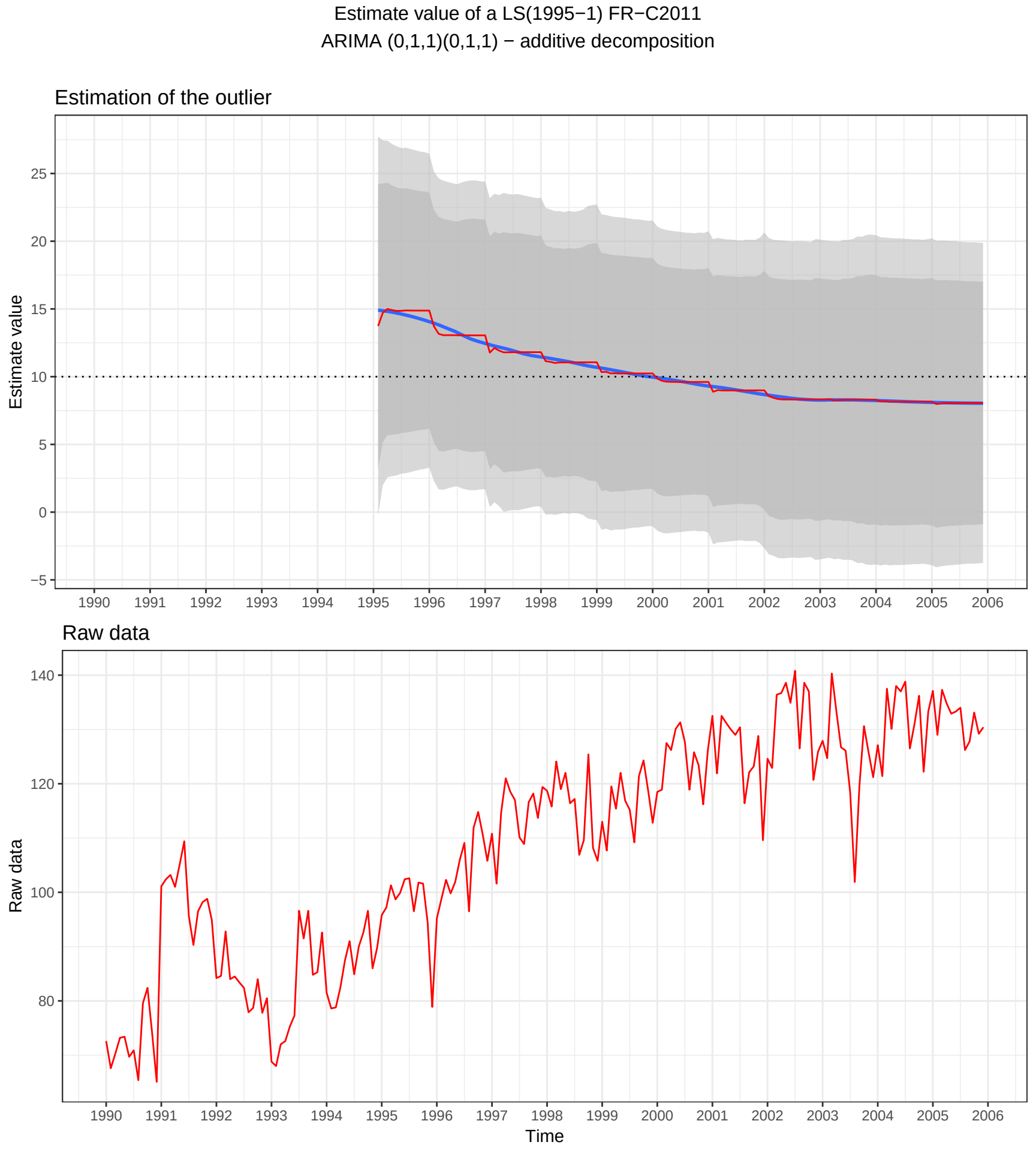
Estimate value of a LS(1996−1) DE−C1813
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

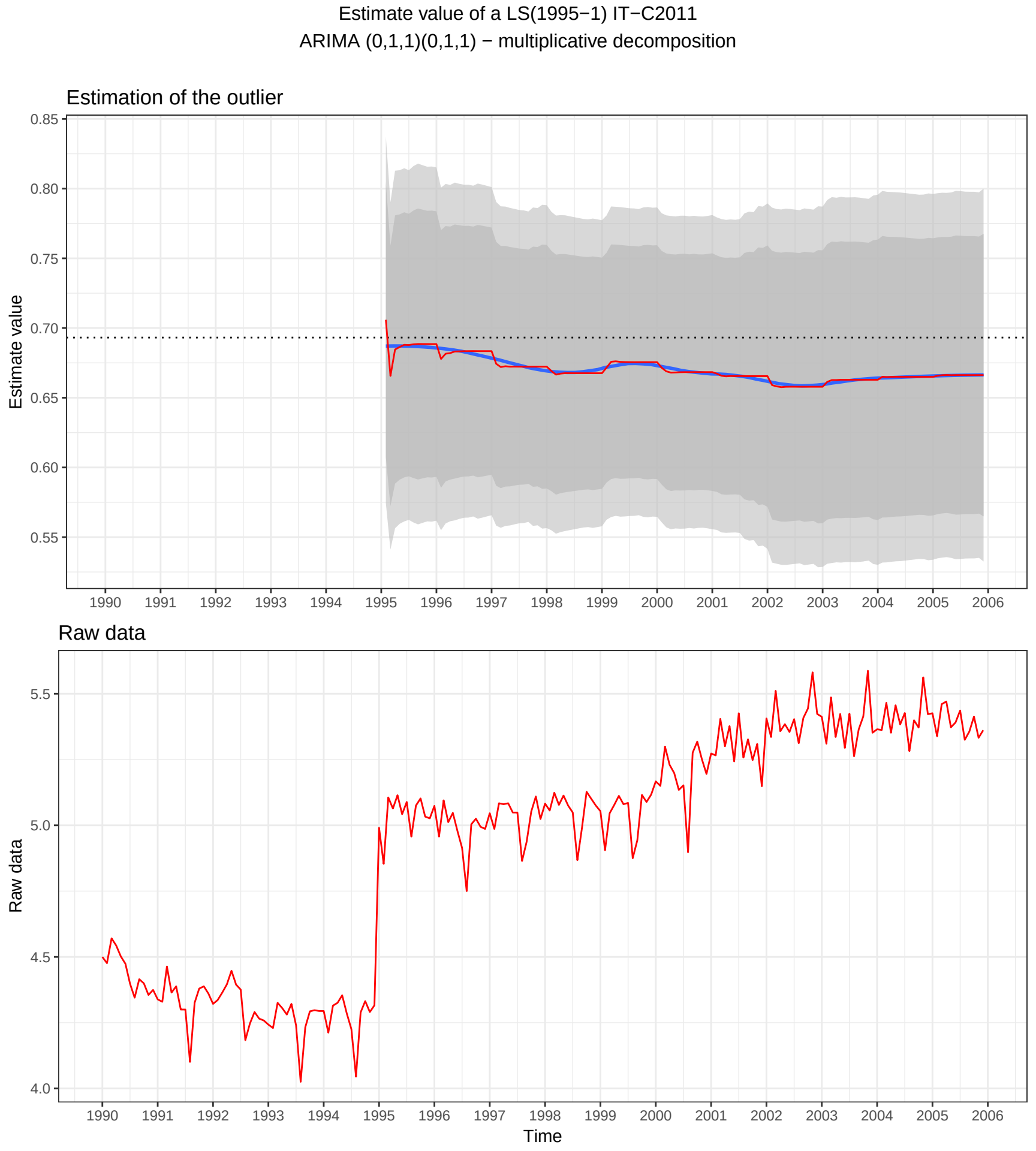


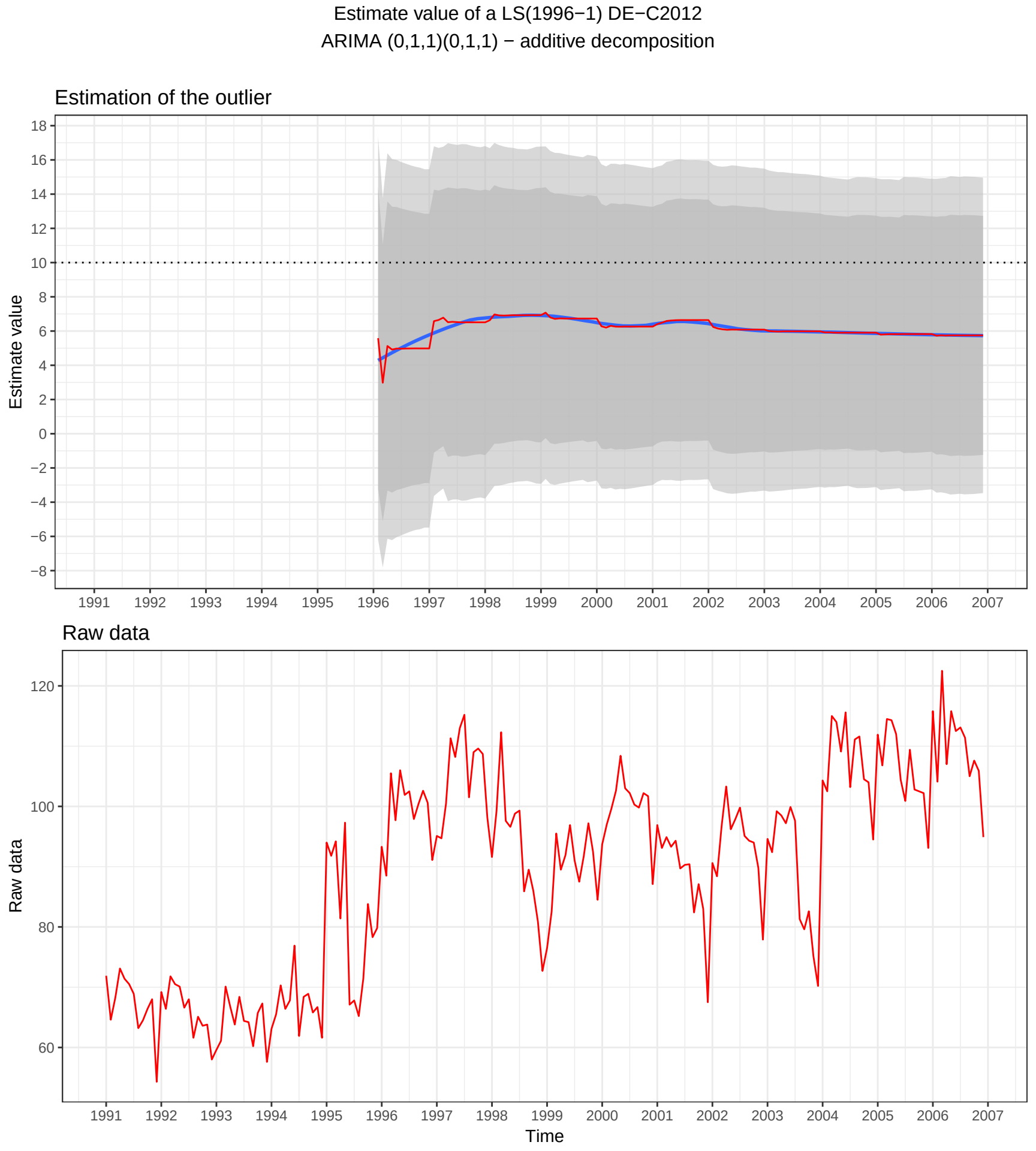


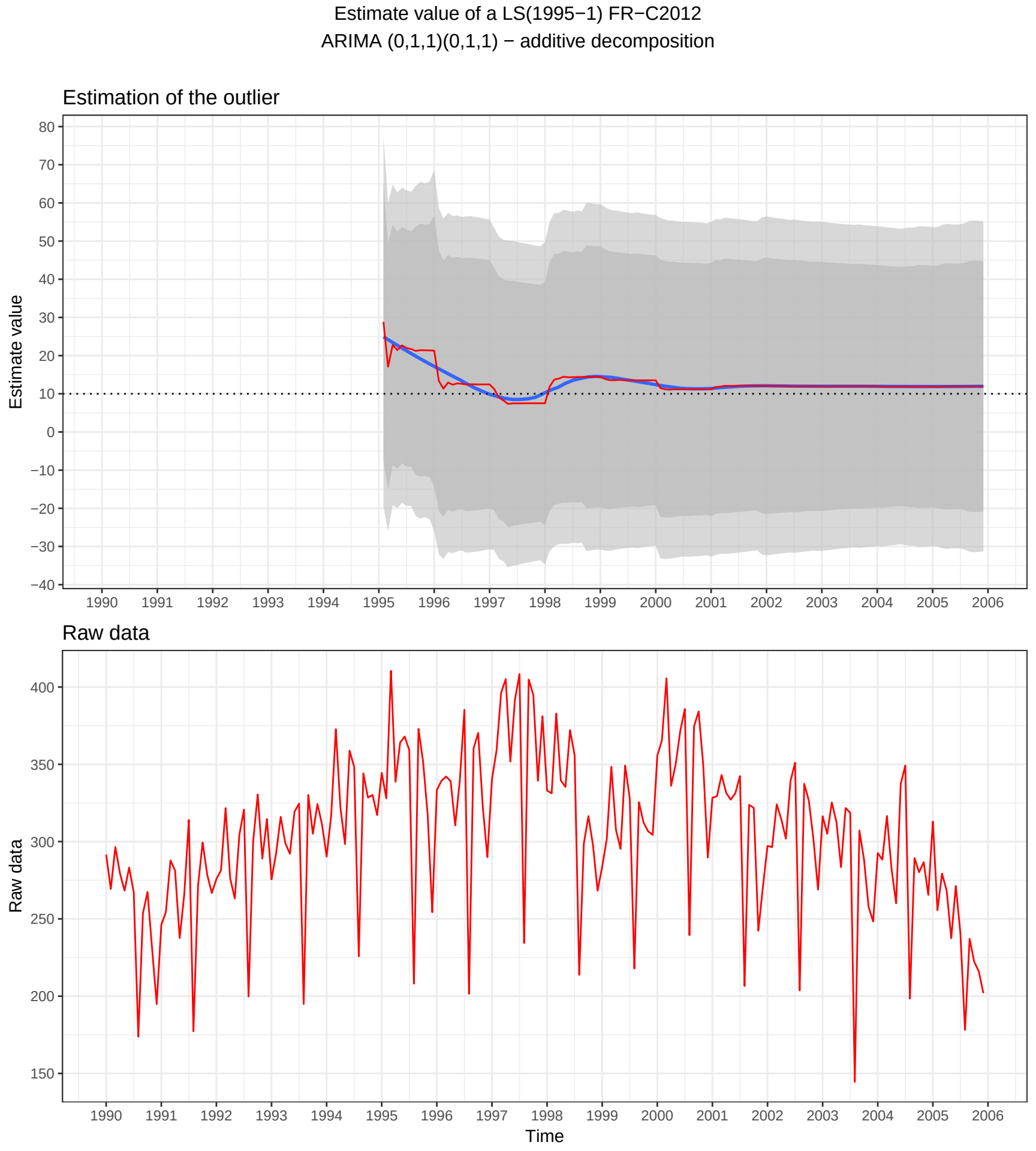

Estimate value of a LS(2000−1) DE−C1814
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.70
0.65
0.60
0.55
0.50
0.45
0.40
0.35
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Raw data
Raw data
5.5
5.0
4.5
4.0
Time

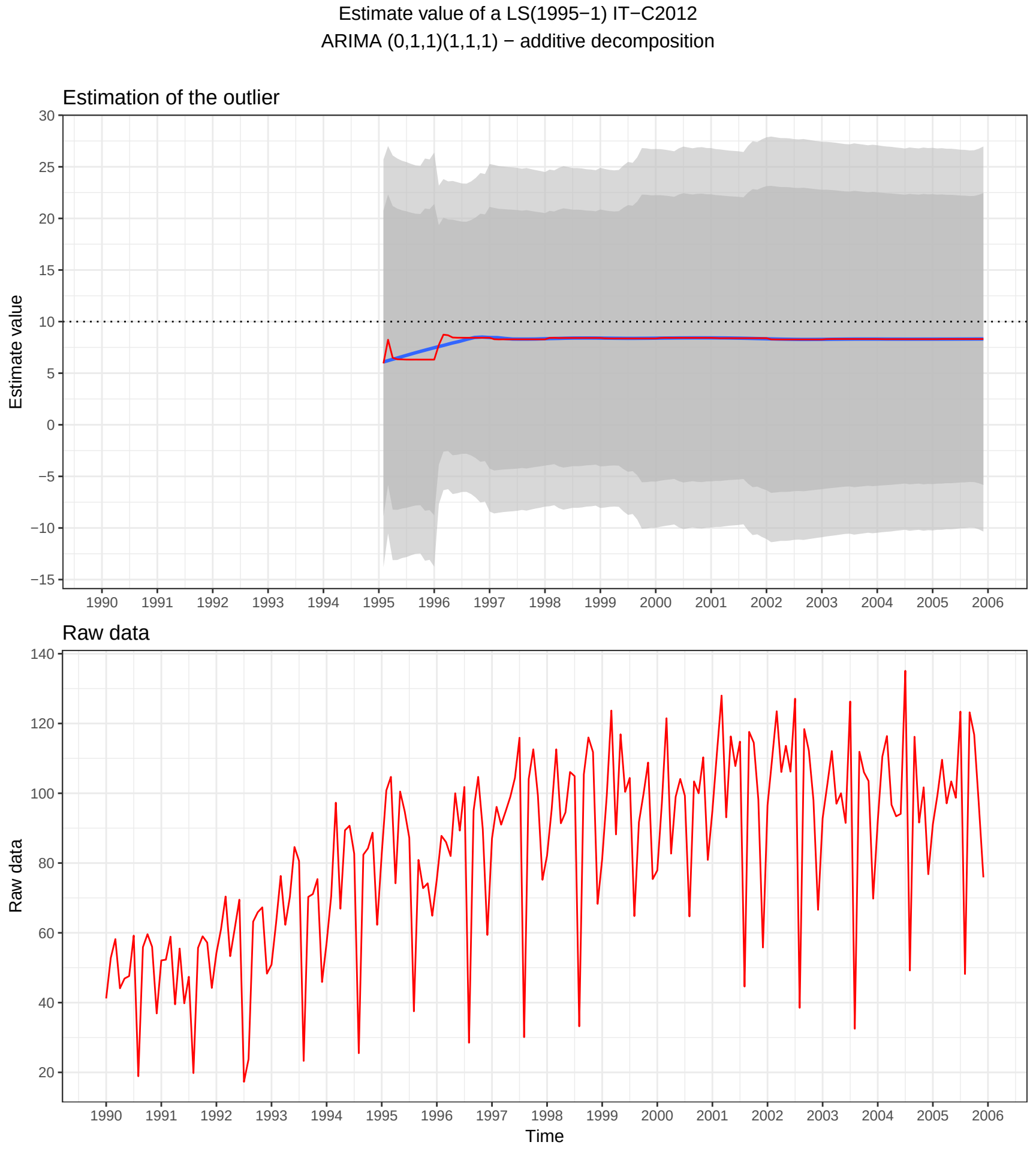

Estimate value of a LS(1996−1) DE−C2011
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.90
0.85
0.80
0.75
0.70
0.65
0.60
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
6.0
5.5
5.0
4.5
4.0
Time


Estimate value of a LS(1995−1) FR−C2011
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
25
20
15
10
5
0
−5
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
140
120
100
80
Time

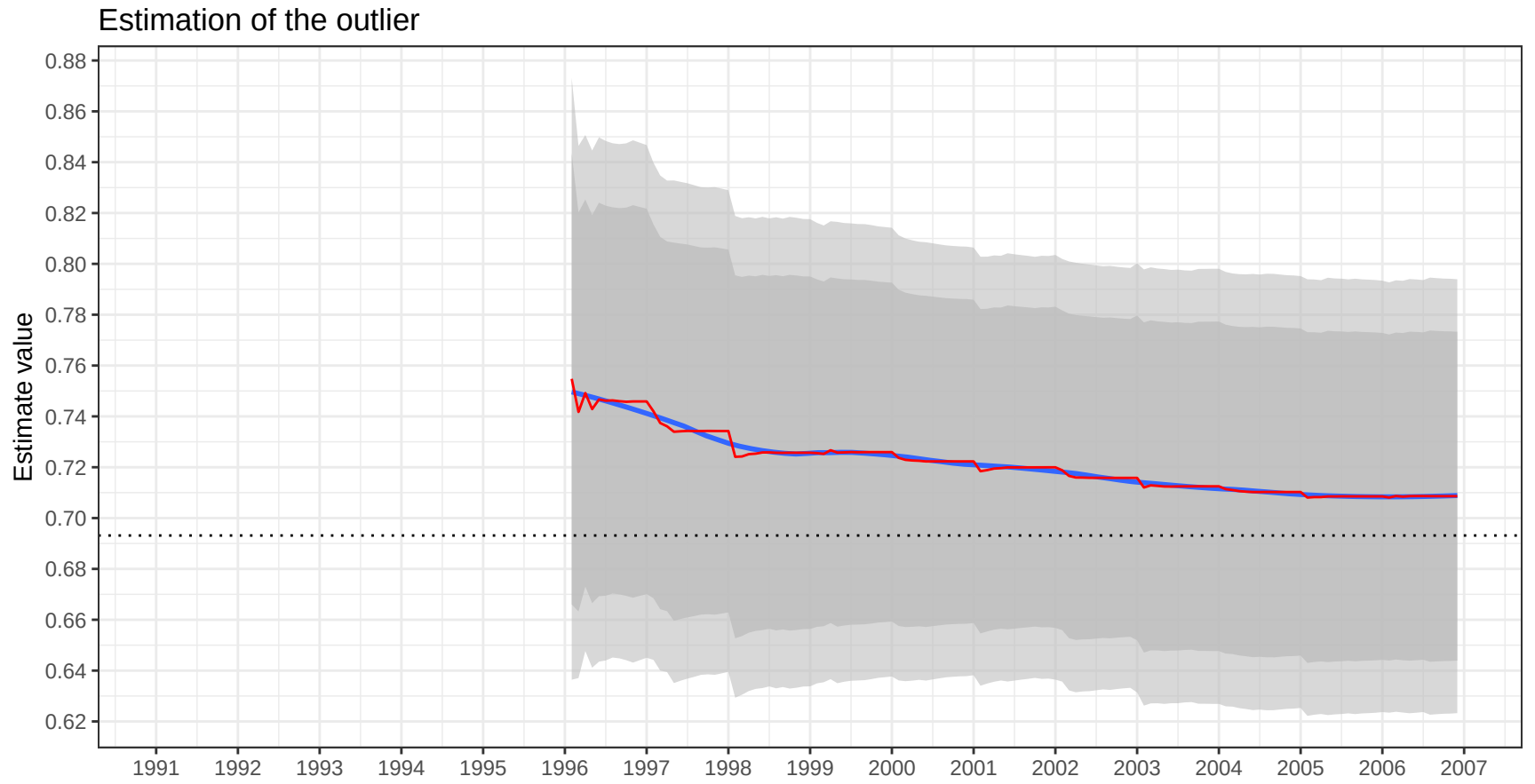

Estimate value of a LS(1995−1) IT−C2011
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.85
0.80
0.75
0.70
0.65
0.60
0.55
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
5.5
5.0
4.5
4.0
Time

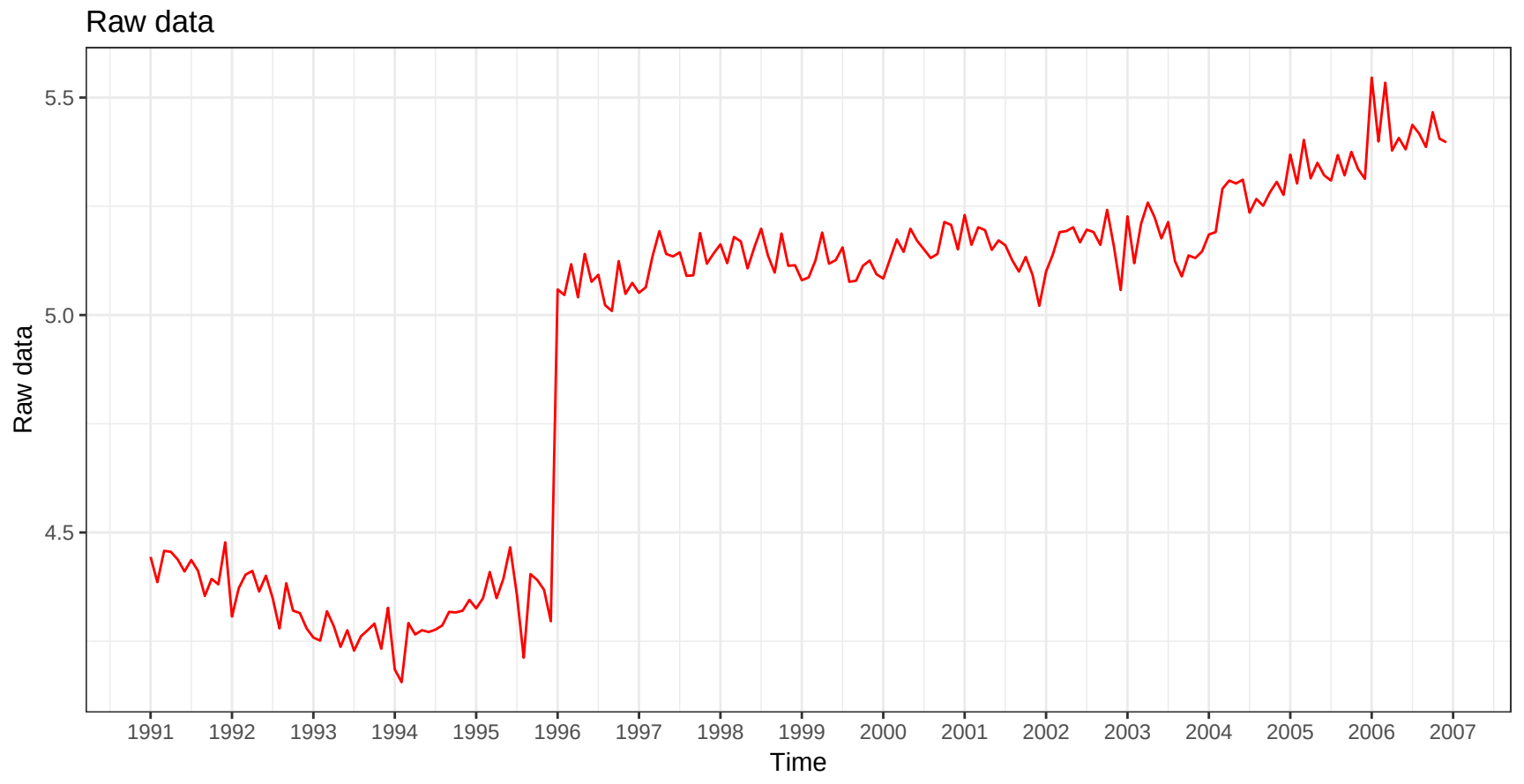

Estimate value of a LS(1996−1) DE−C2012
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
18
16
14
12
10
8
6
4
2
0
−2
−4
−6
−8
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
120
100
80
60
Time

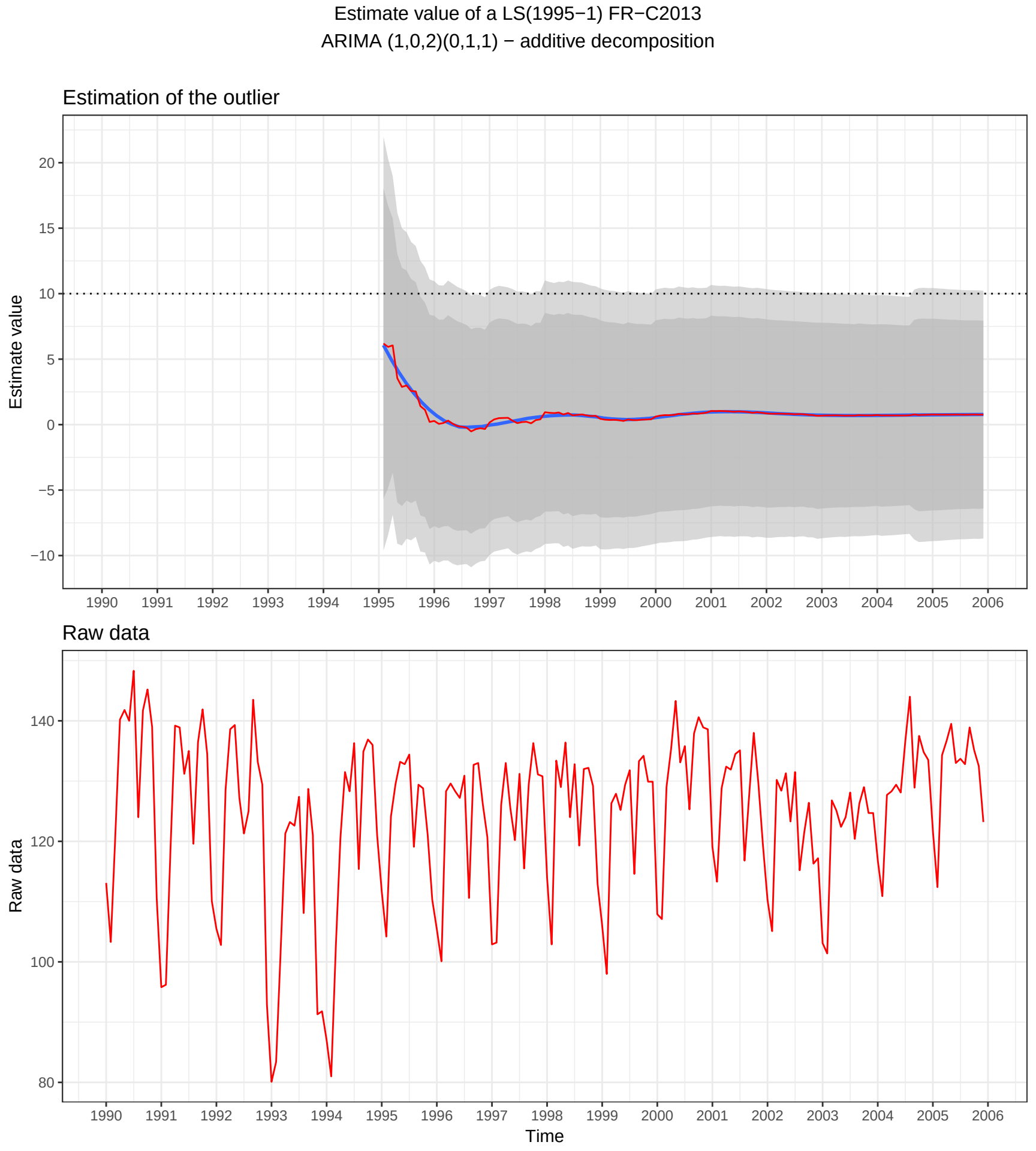

Estimate value of a LS(1995−1) FR−C2012
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
80
70
60
50
40
30
20
10
0
−10
−20
−30
−40
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
400
350
300
250
200
150
Time


Estimate value of a LS(1995−1) IT−C2012
ARIMA (0,1,1)(1,1,1) − additive decomposition
Estimation of the outlier
Estimate value
30
25
20
15
10
5
0
−5
−10
−15
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
140
120
100
80
60
40
20
Time

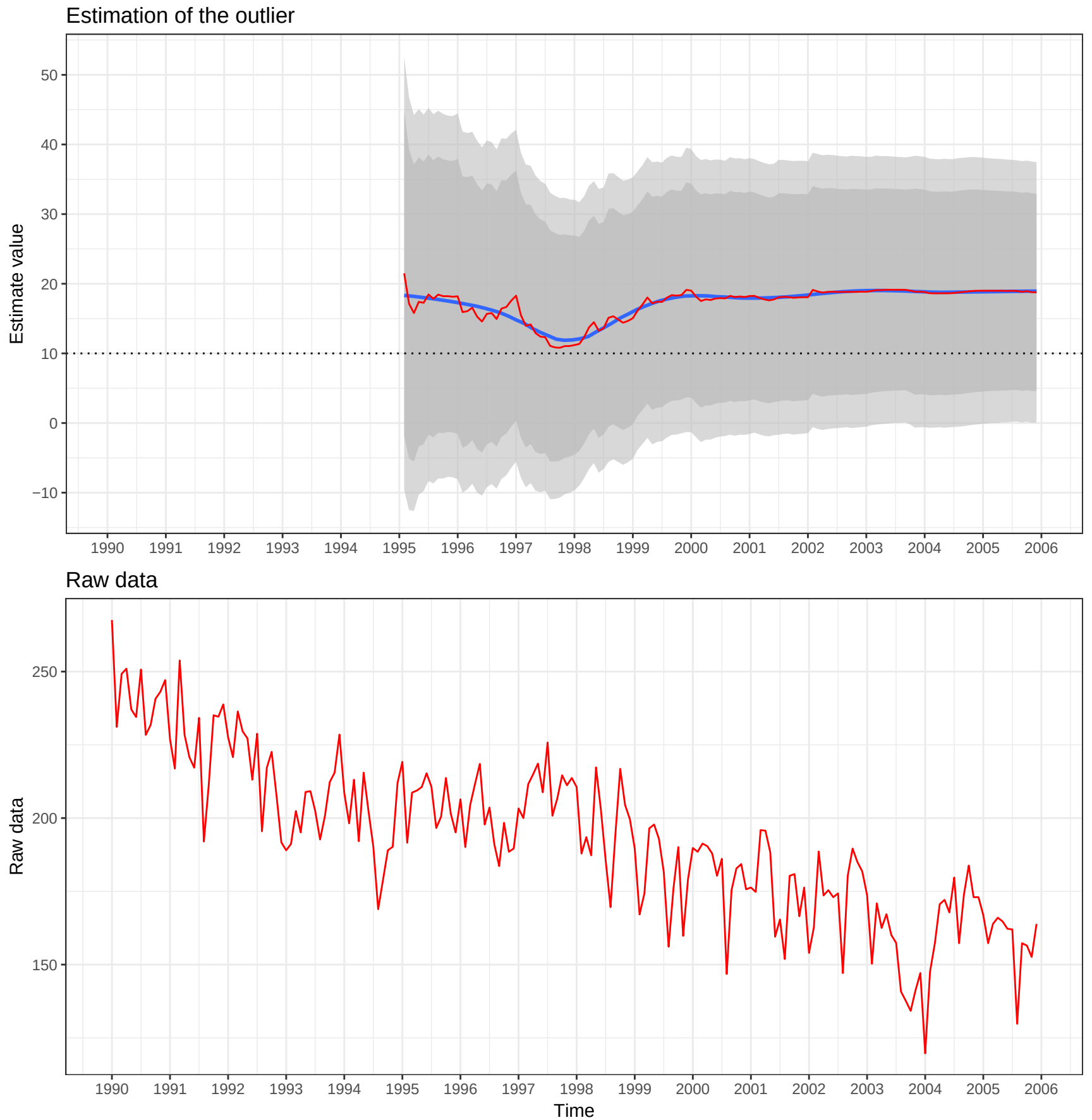
Estimate value of a LS(1996−1) DE−C2013
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

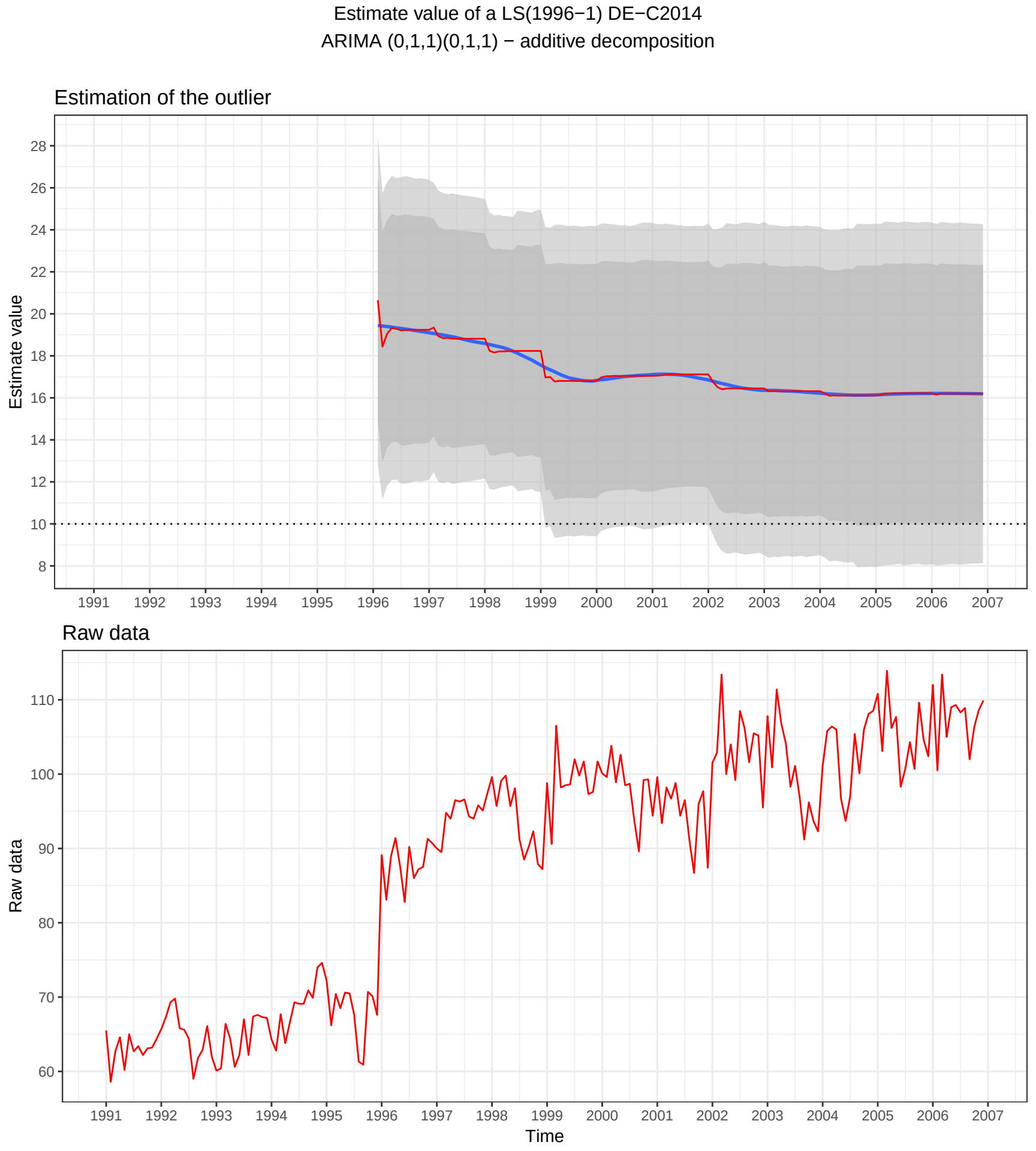


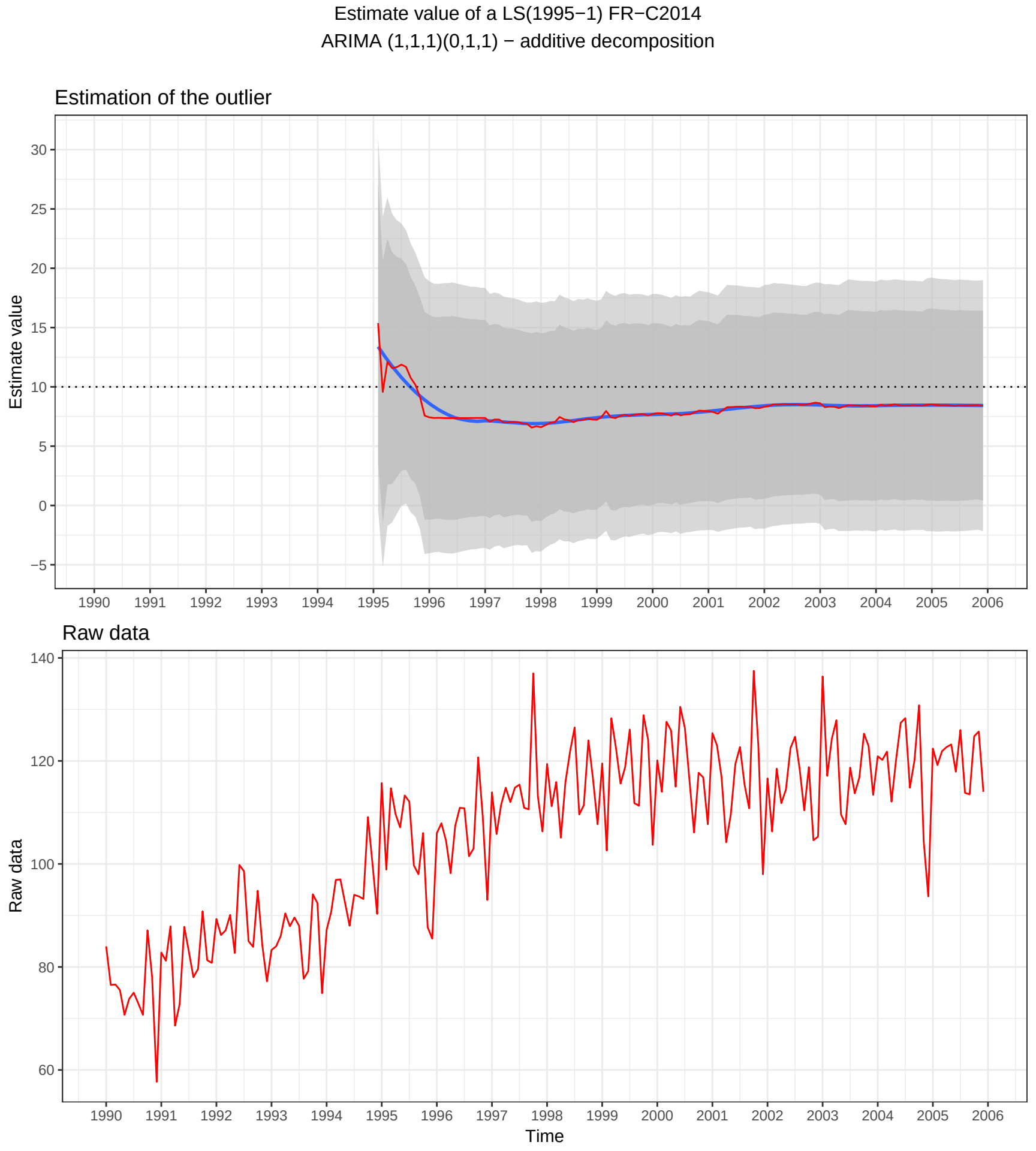



Estimate value of a LS(1995−1) FR−C2013
ARIMA (1,0,2)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
20
15
10
5
0
−5
−10
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
140
120
100
80
Time

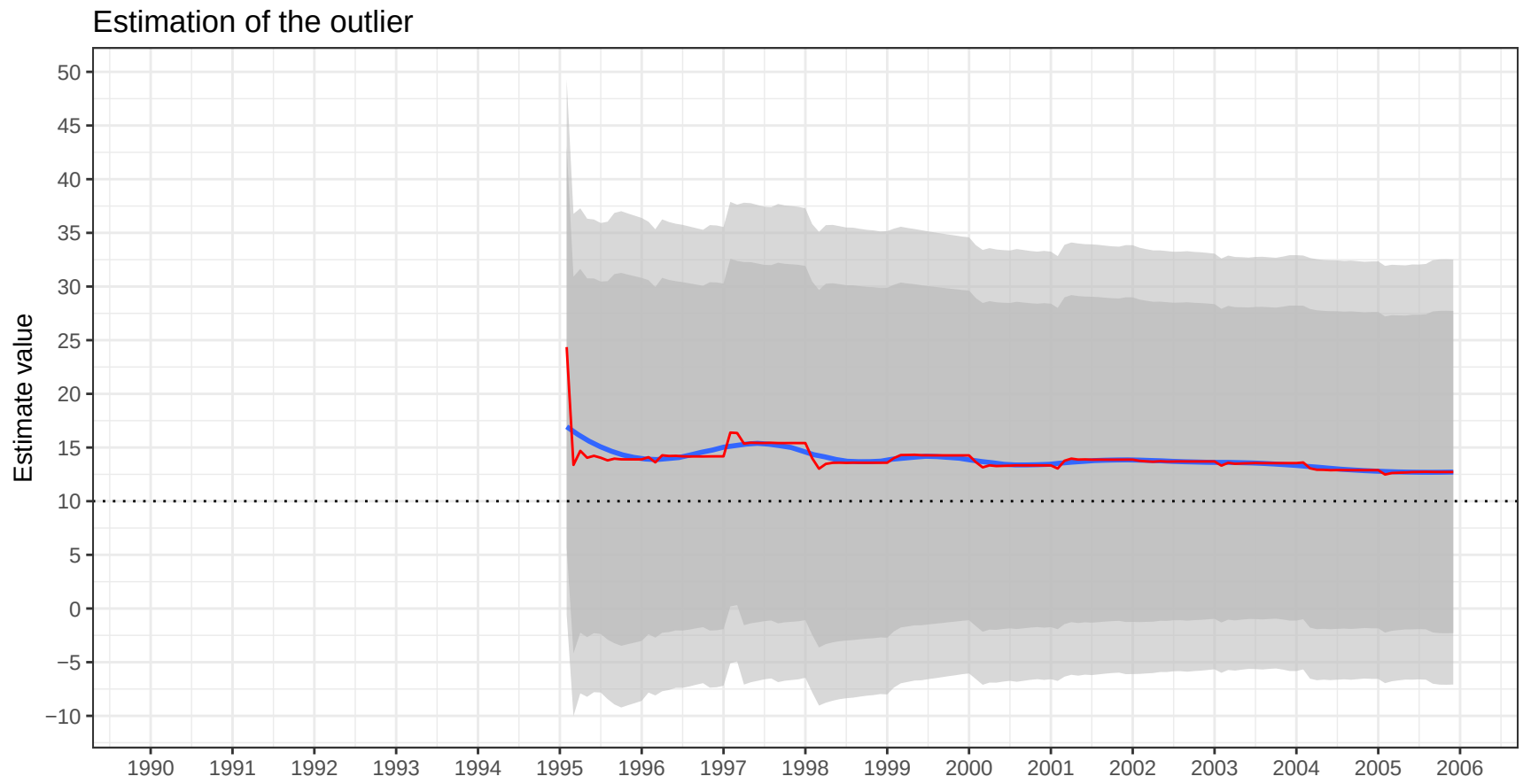
Estimate value of a LS(1995−1) IT−C2013
ARIMA (1,1,1)(0,1,1) − additive decomposition

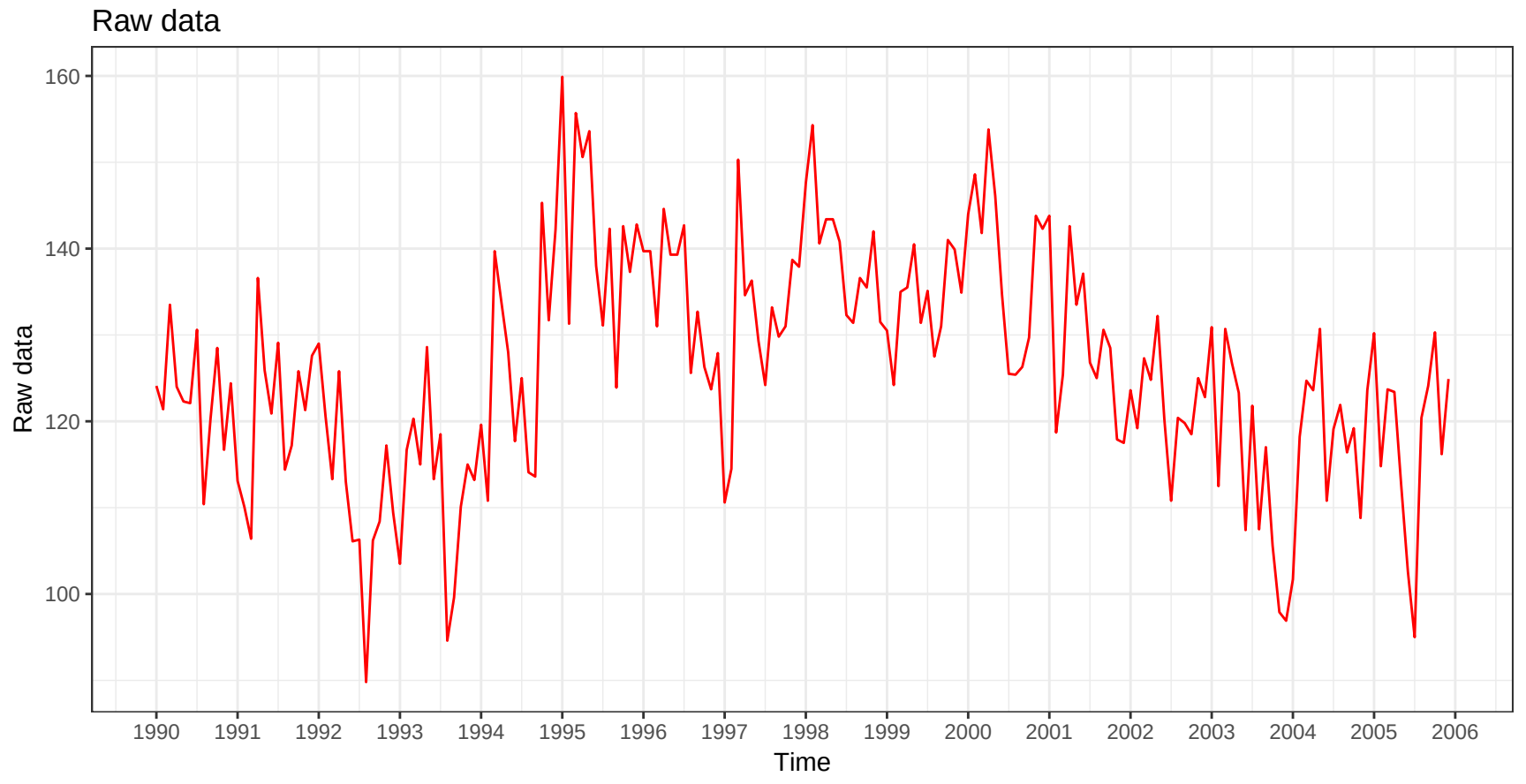


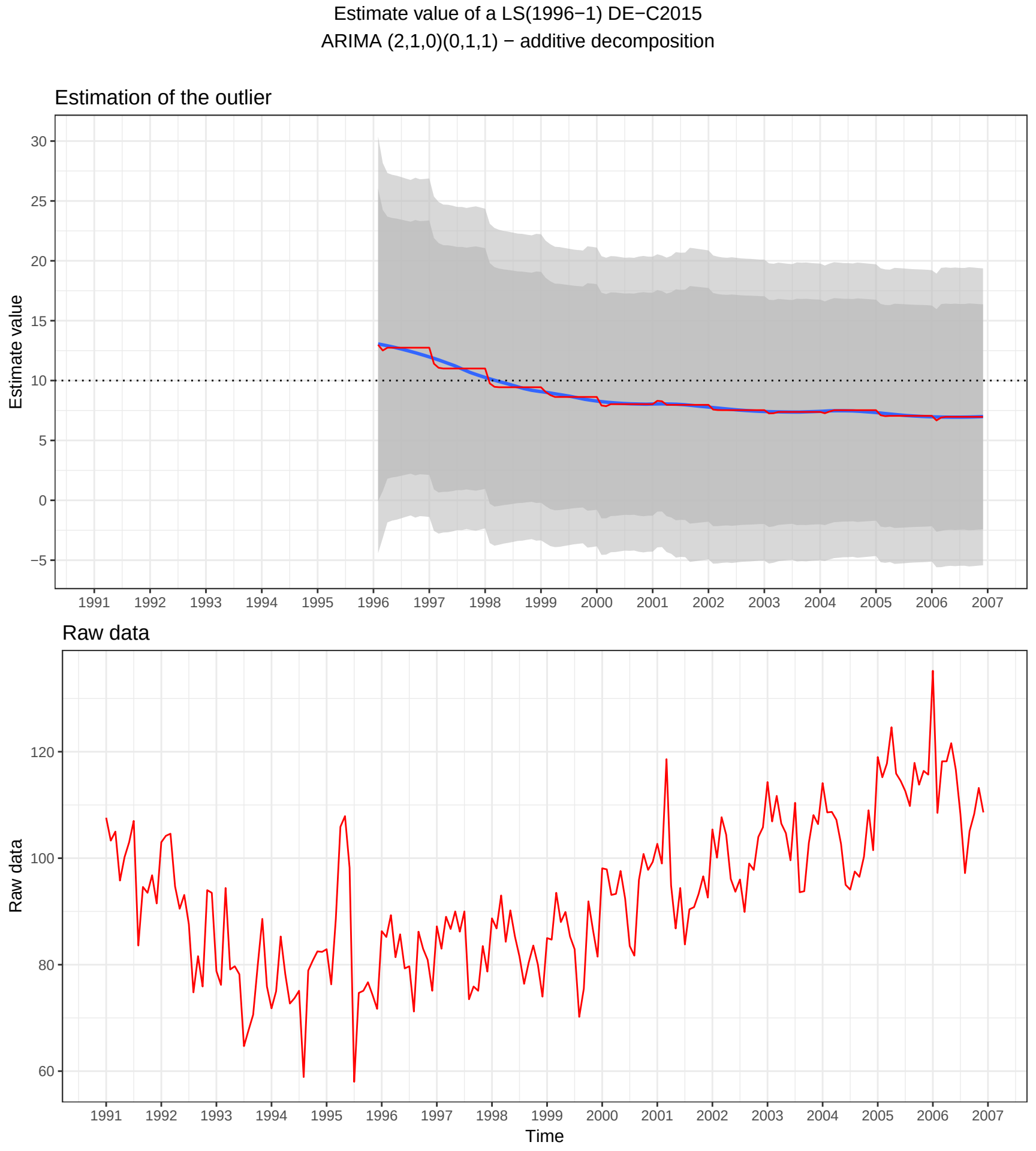

Estimate value of a LS(1996−1) DE−C2014
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
28
26
24
22
20
18
16
14
12
10
8
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
110
100
90
80
70
60
Time

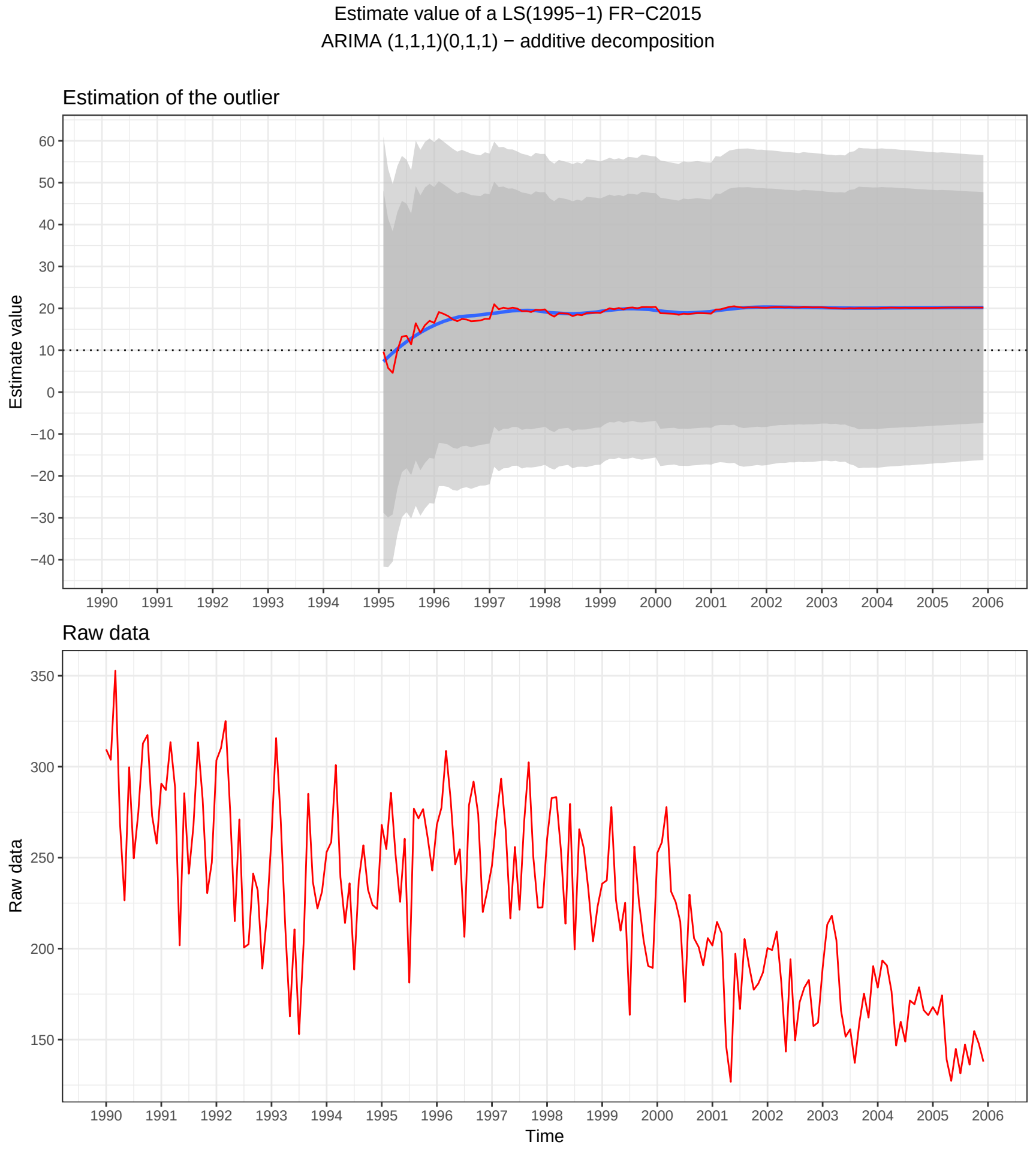

Estimate value of a LS(1995−1) FR−C2014
ARIMA (1,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
30
25
20
15
10
5
0
−5
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
140
120
100
80
60
Time

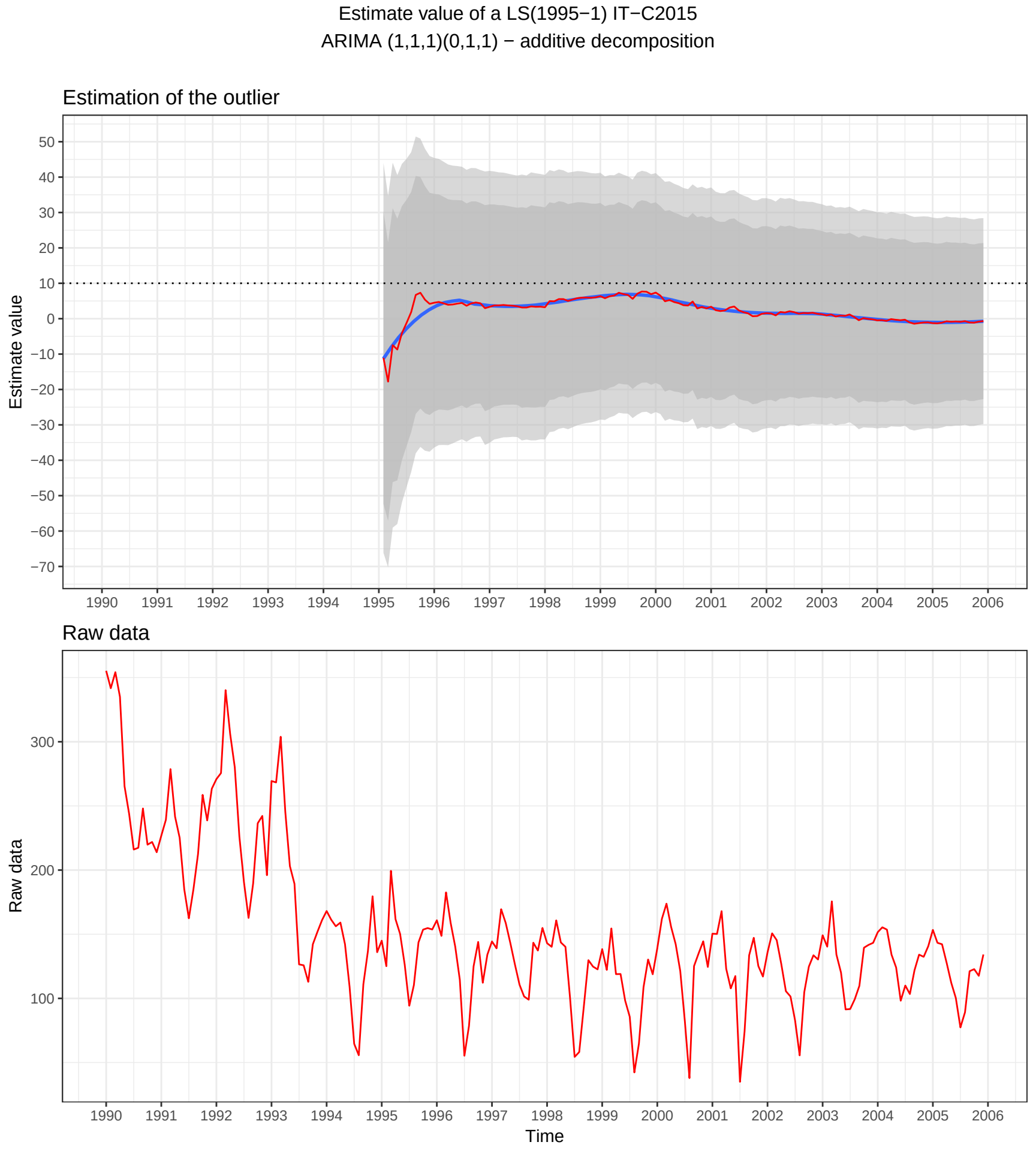
Estimate value of a LS(1995−1) IT−C2014
ARIMA (0,1,1)(0,1,1) − additive decomposition



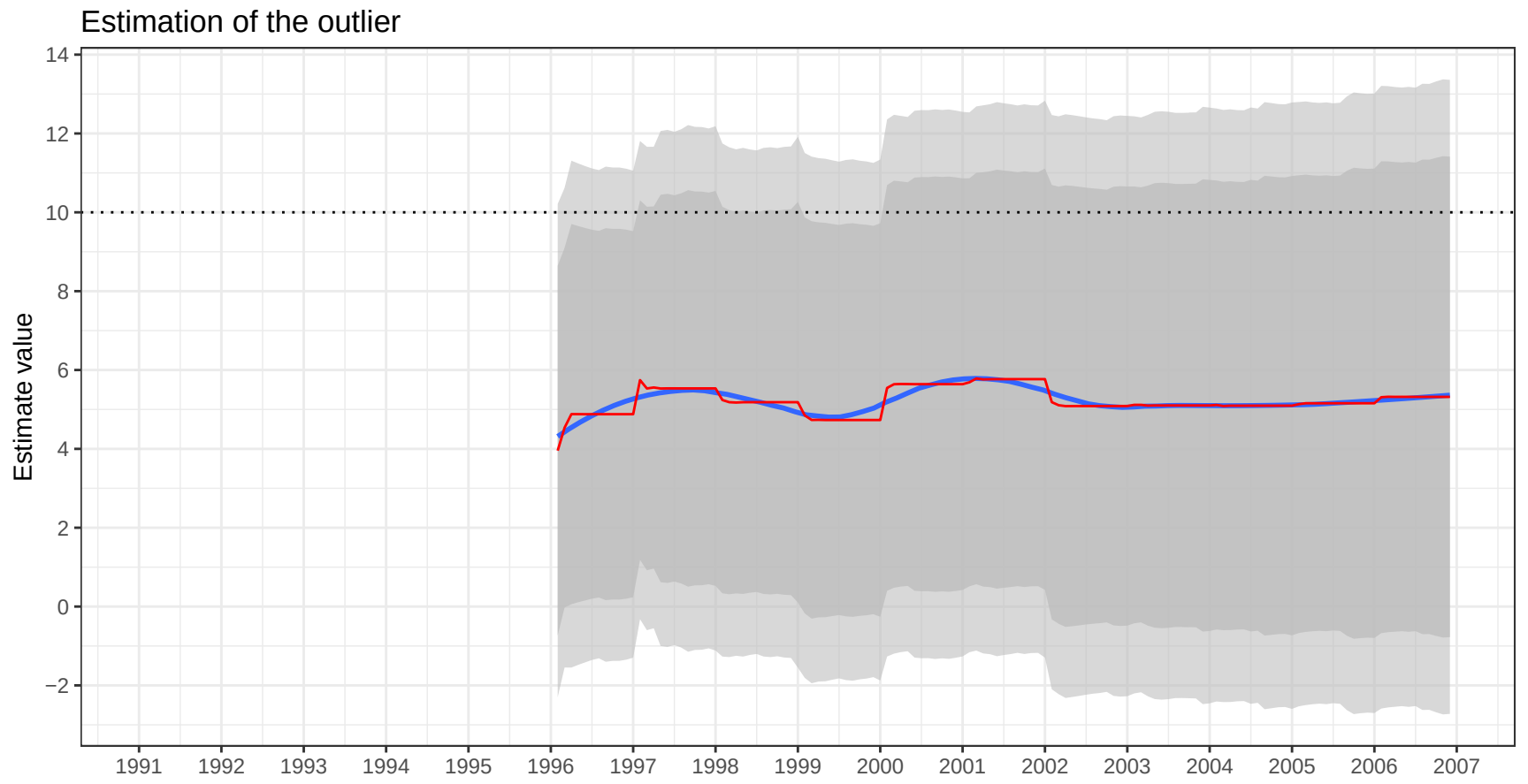


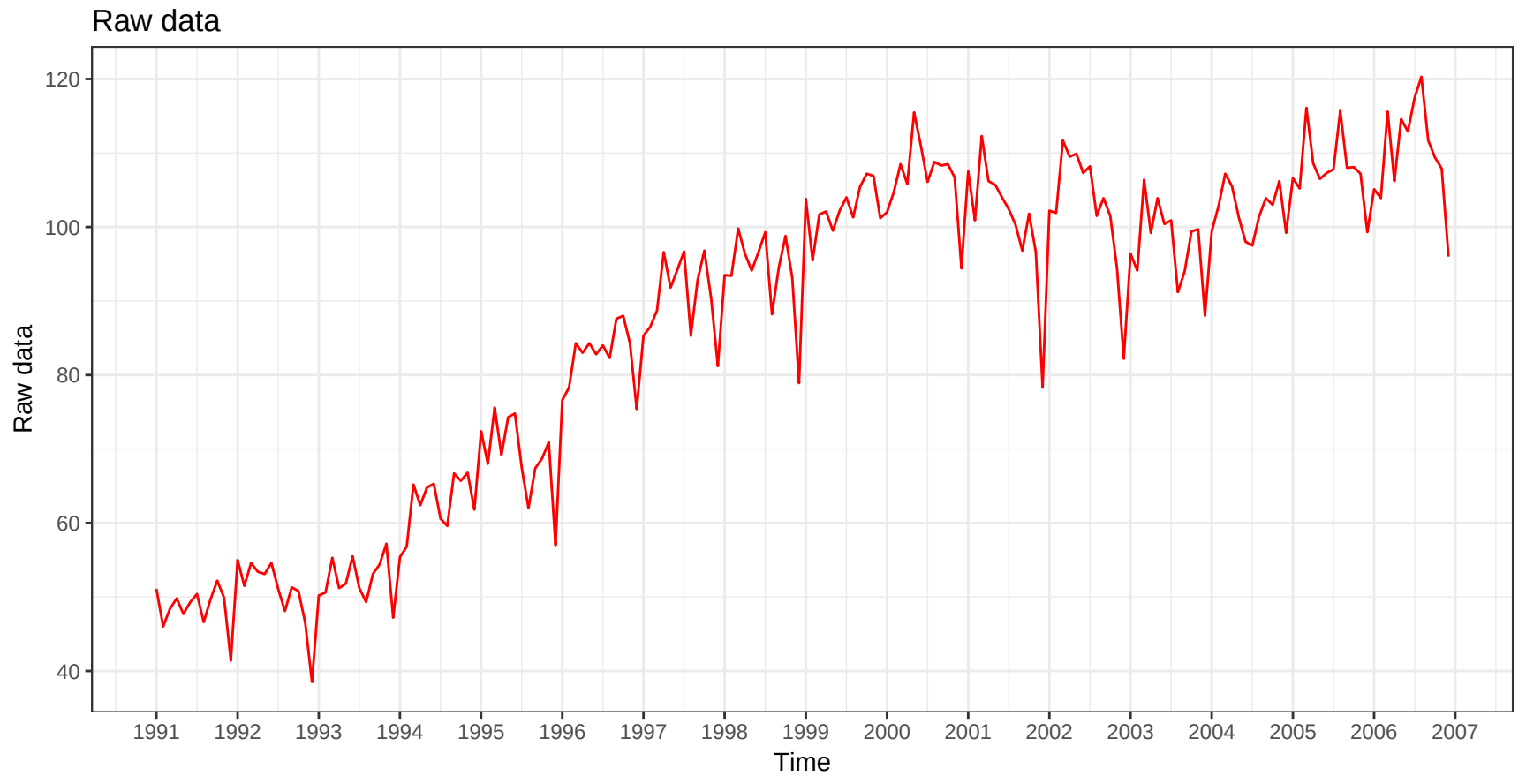

Estimate value of a LS(1996−1) DE−C2015
ARIMA (2,1,0)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
30
25
20
15
10
5
0
−5
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
120
100
80
60
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Time


Estimate value of a LS(1995−1) FR−C2015
ARIMA (1,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
60
50
40
30
20
10
0
−10
−20
−30
−40
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
350
300
250
200
150
Time

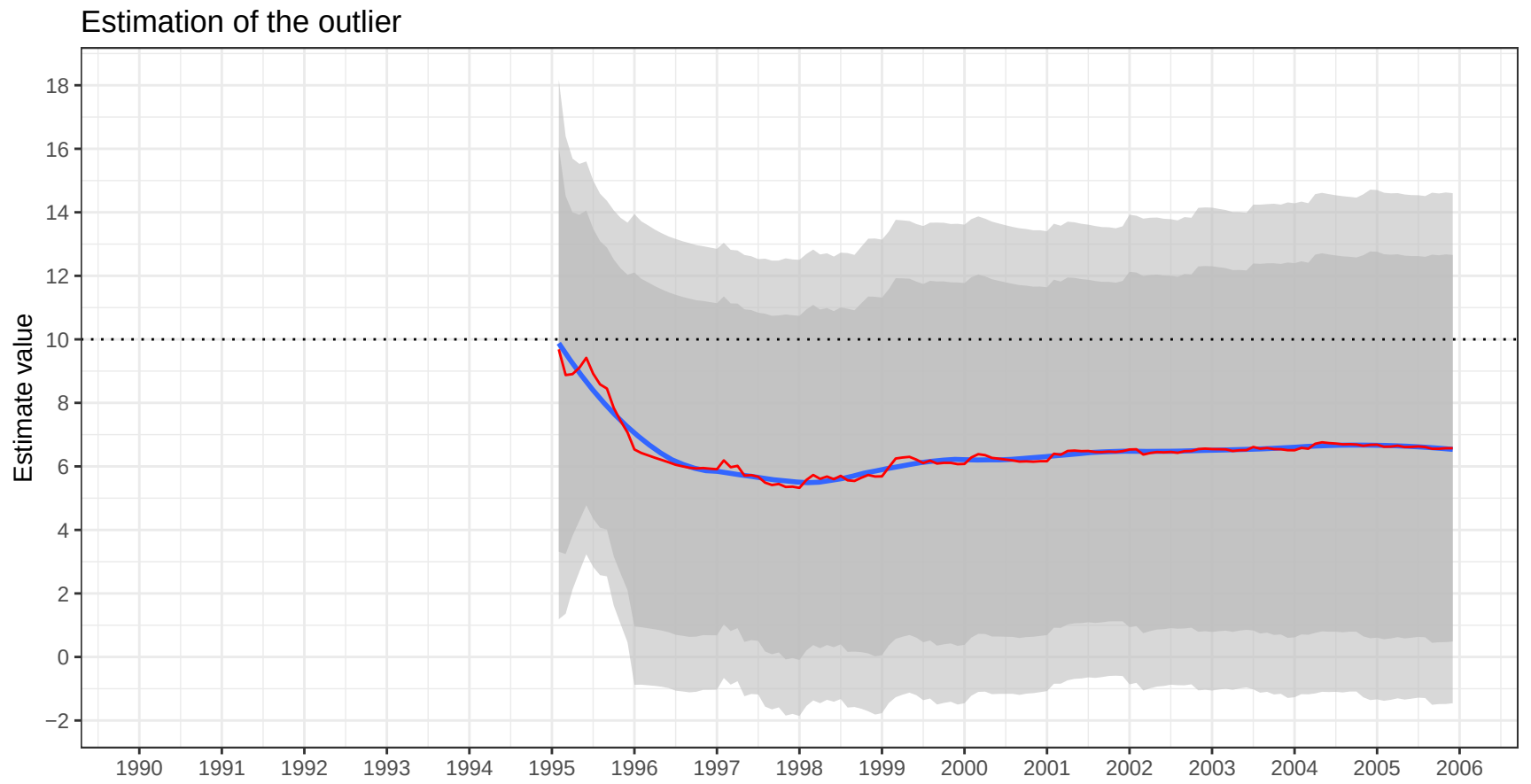

Estimate value of a LS(1995−1) IT−C2015
ARIMA (1,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
50
40
30
20
10
0
−10
−20
−30
−40
−50
−60
−70
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
300
200
100
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Time

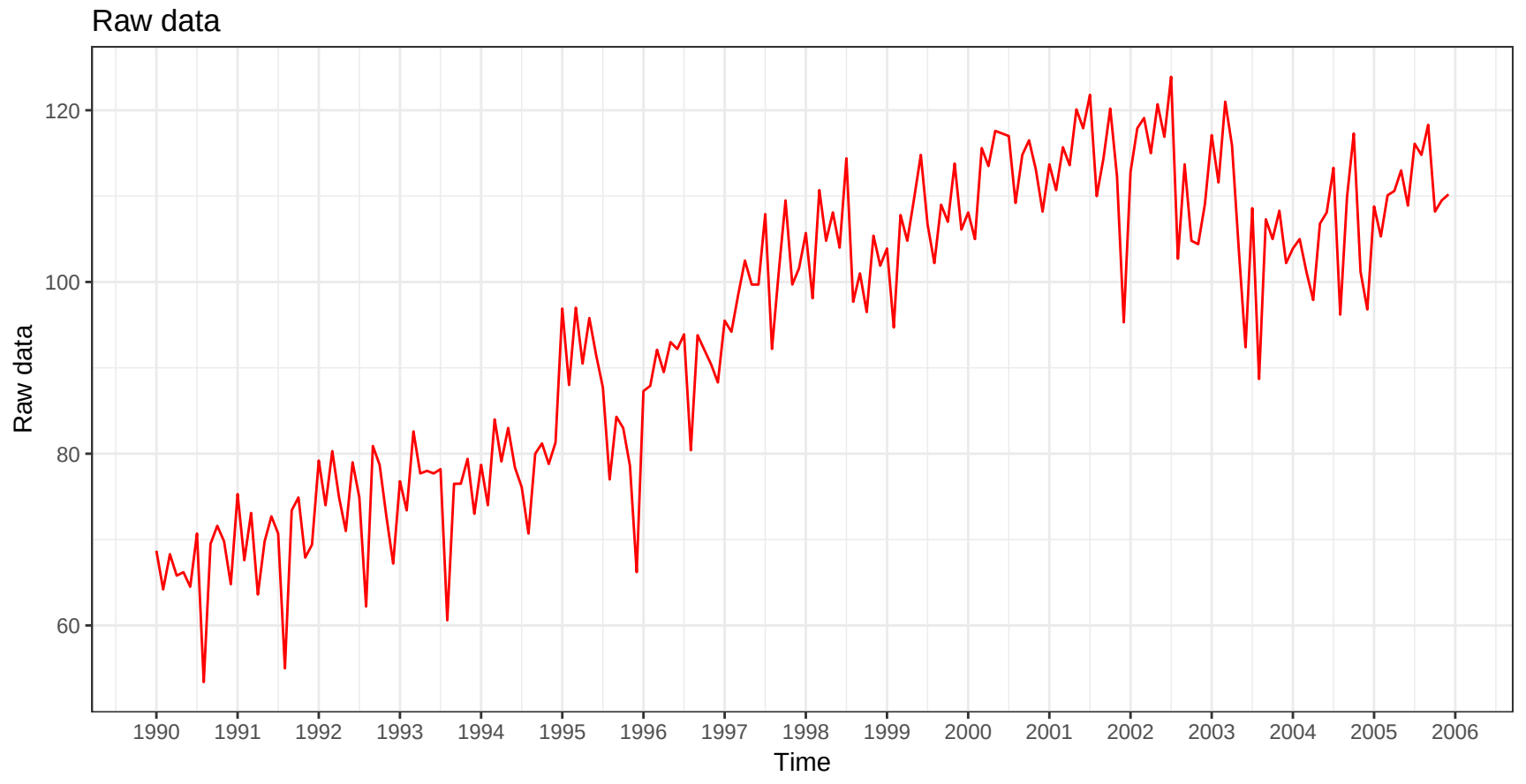
Estimate value of a LS(1996−1) DE−C2016
ARIMA (0,1,1)(0,1,1) − additive decomposition



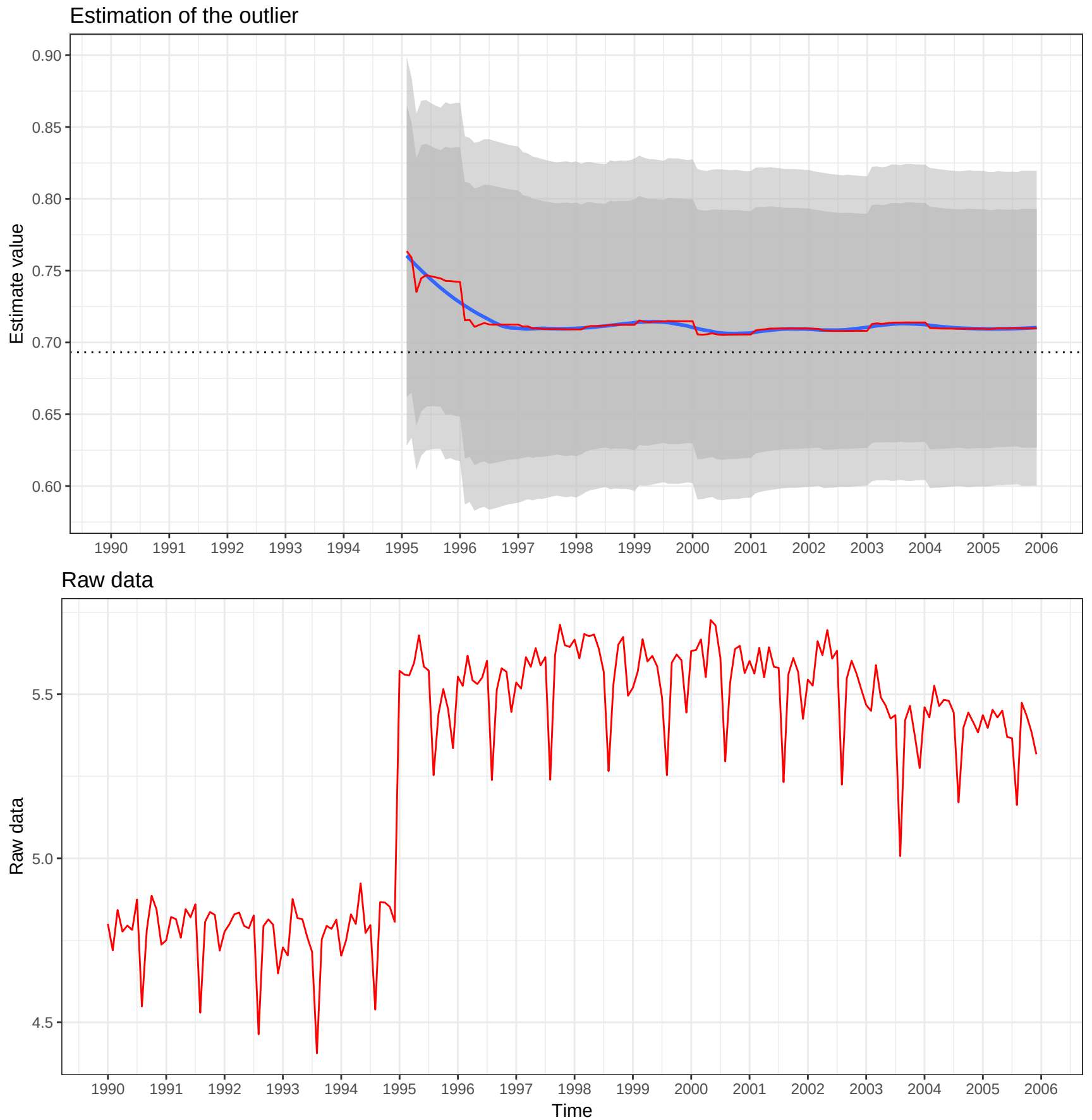


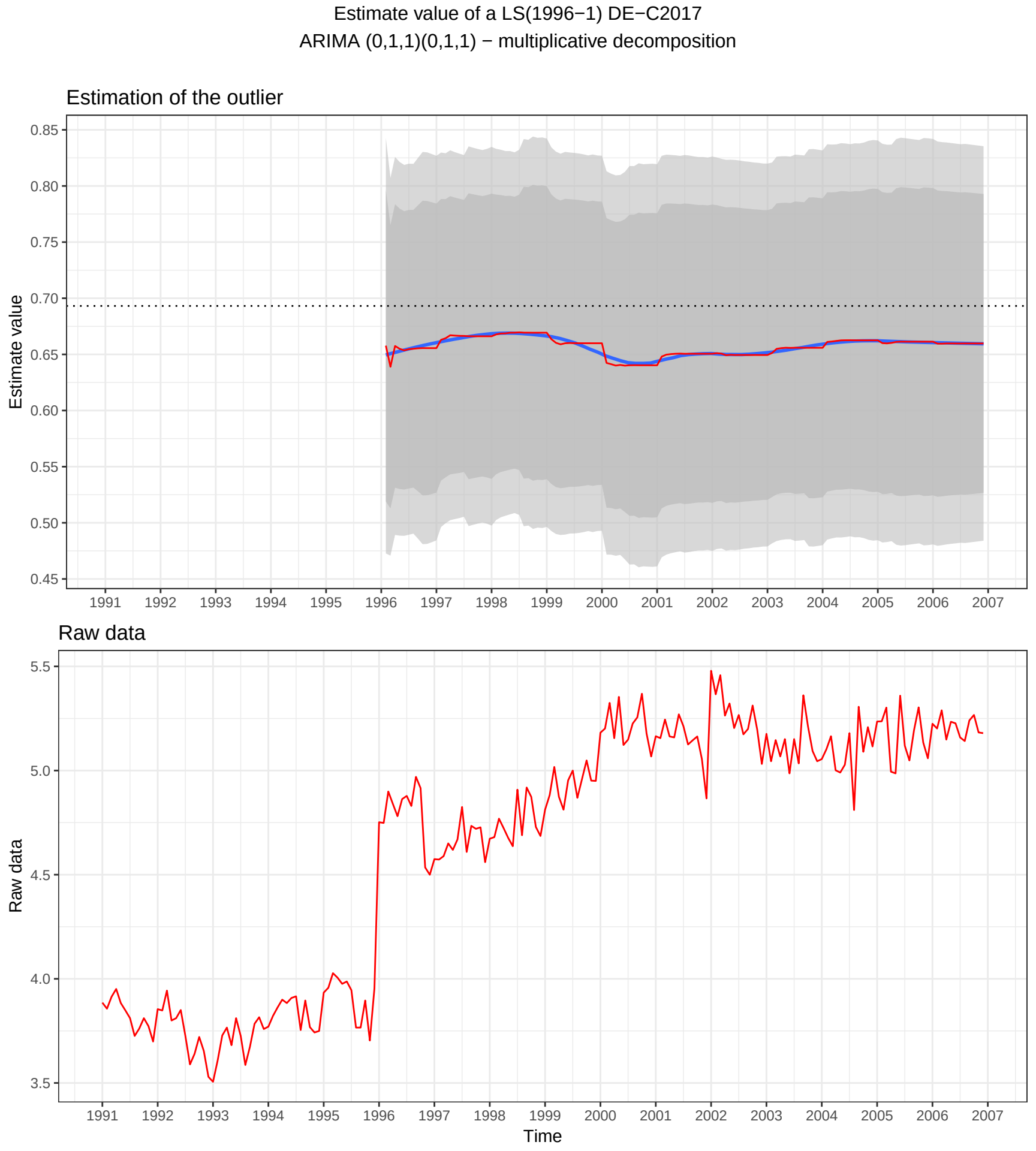
Estimate value of a LS(1995−1) FR−C2016
ARIMA (0,1,2)(0,1,1) − additive decomposition

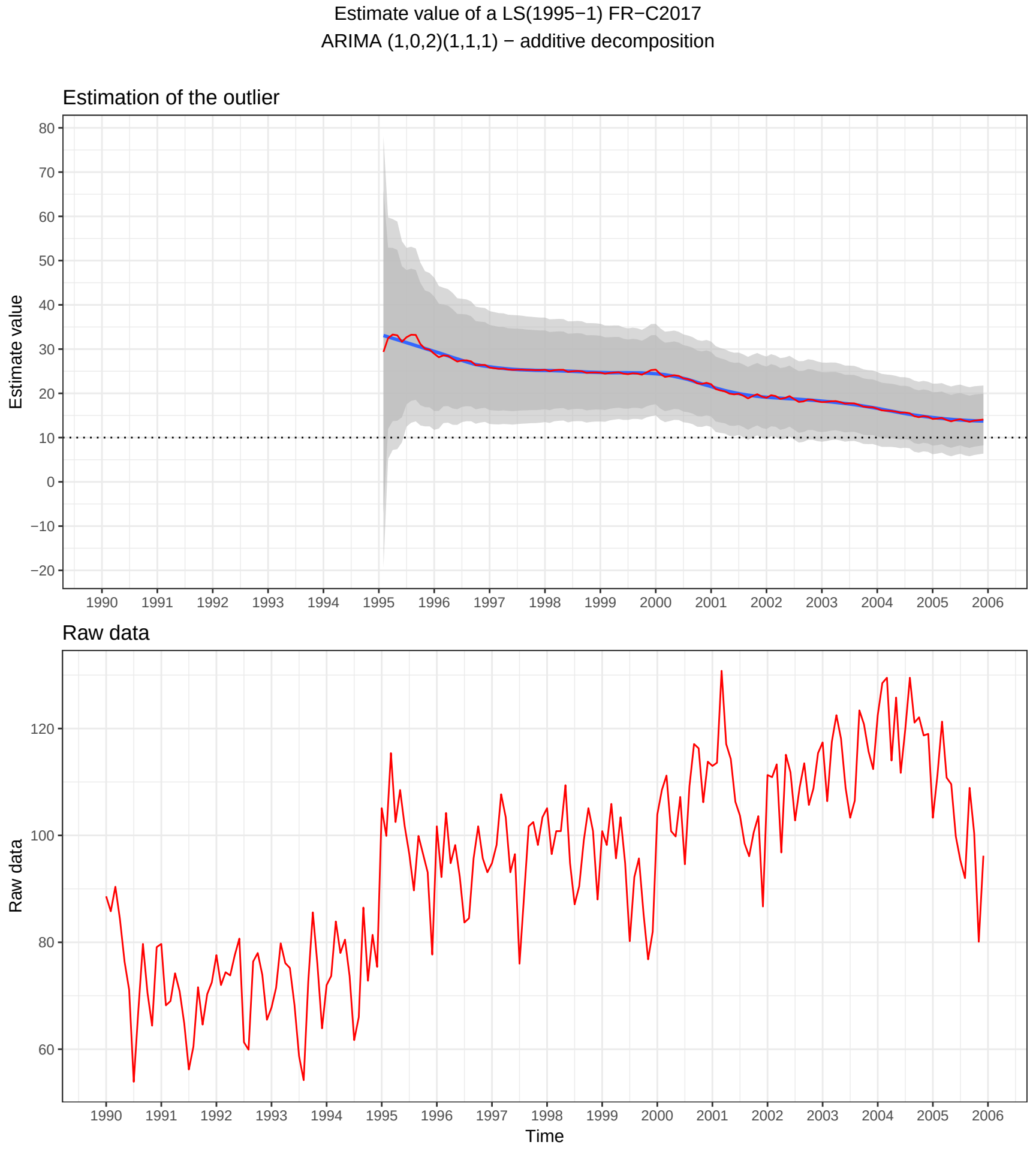


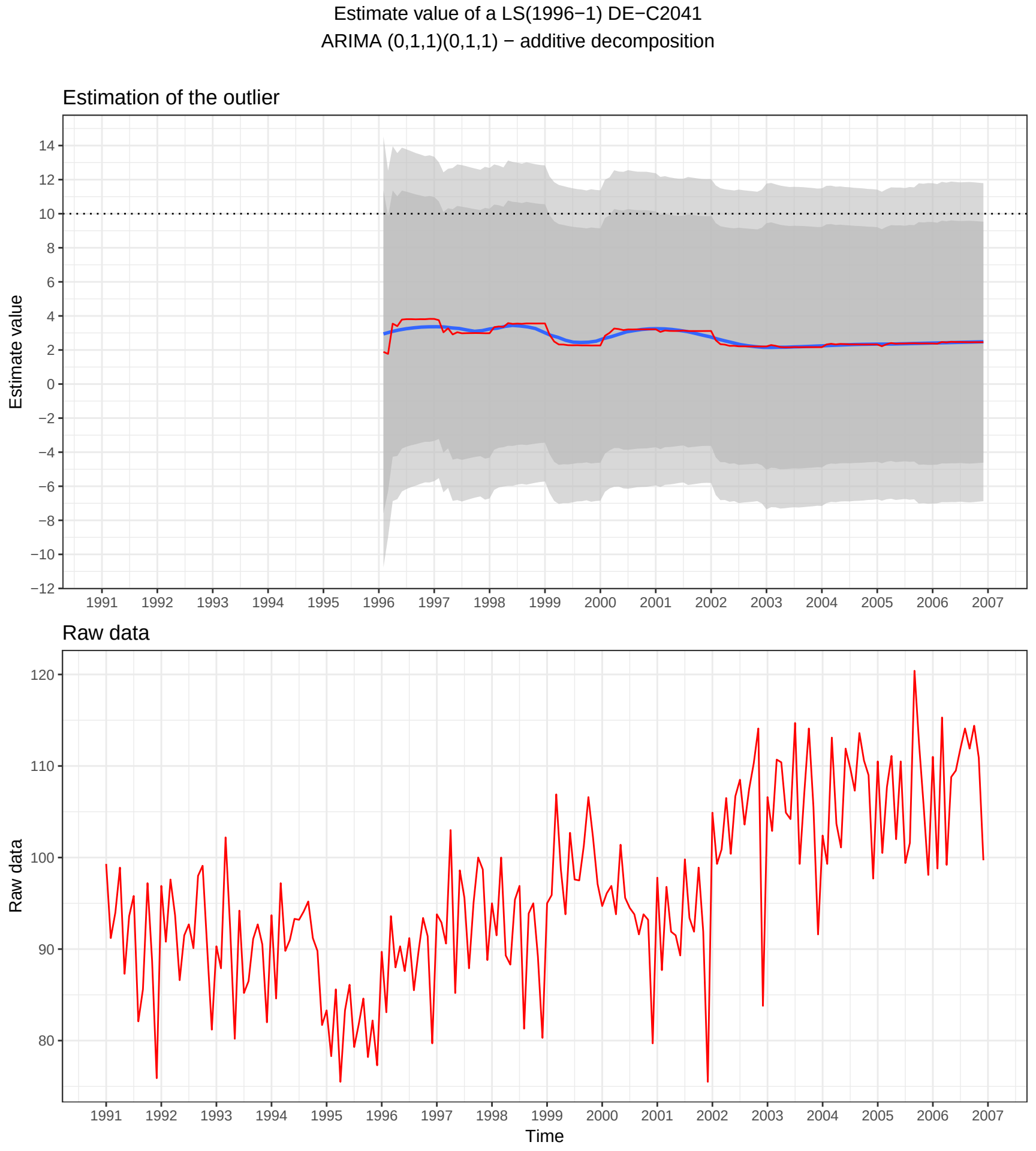


Estimate value of a LS(1995−1) IT−C2016
ARIMA (0,1,2)(0,1,1) − multiplicative decomposition

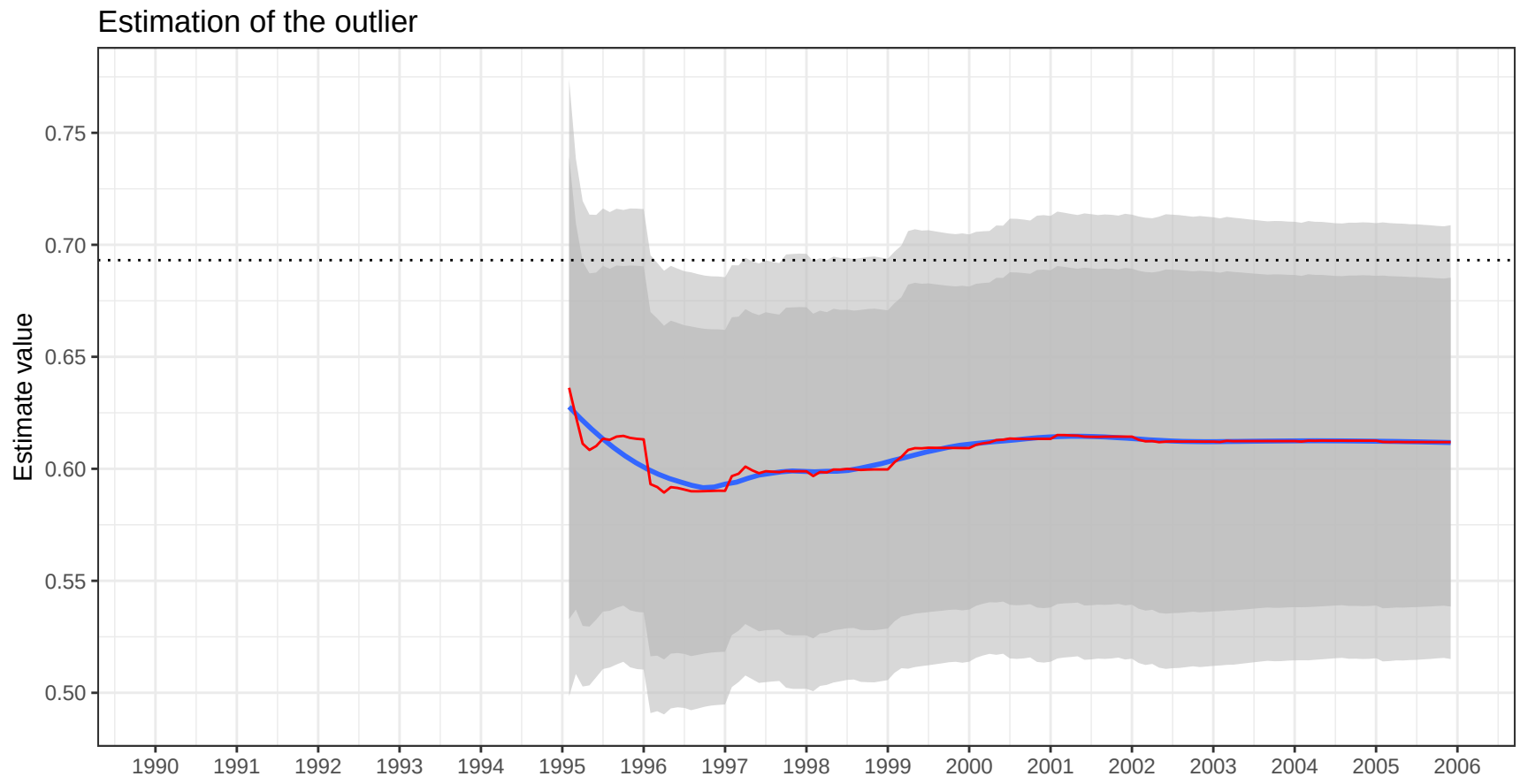


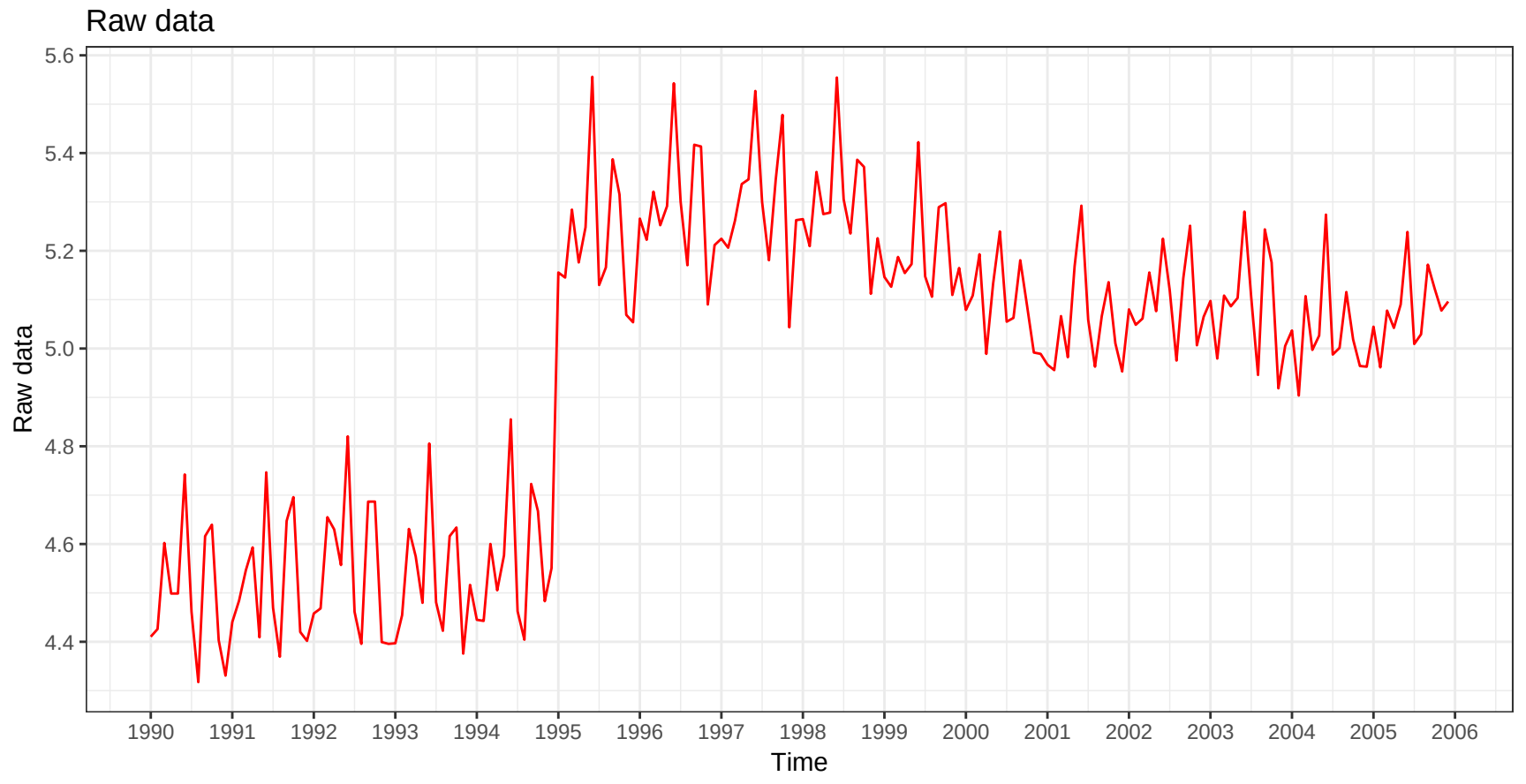

Estimate value of a LS(1996−1) DE−C2017
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
0.45
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
5.5
5.0
4.5
4.0
3.5
Time

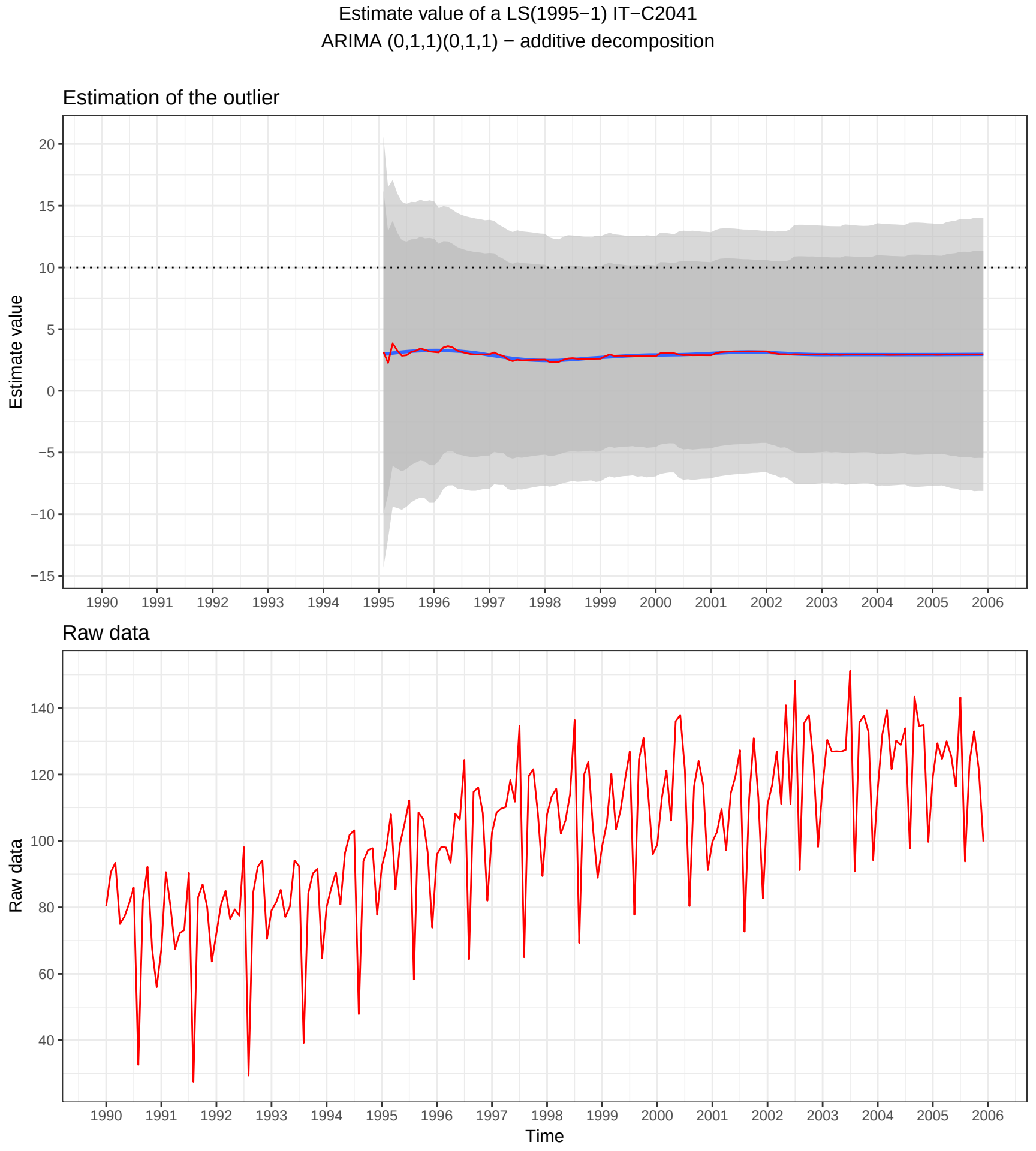

Estimate value of a LS(1995−1) FR−C2017
ARIMA (1,0,2)(1,1,1) − additive decomposition
Estimation of the outlier
Estimate value
80
70
60
50
40
30
20
10
0
−10
−20
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
120
100
80
60
Time


Estimate value of a LS(1996−1) DE−C2041
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
14
12
10
8
6
4
2
0
−2
−4
−6
−8
−10
−12
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
120
110
100
90
80
Time

Estimate value of a LS(1995−1) FR−C2041
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

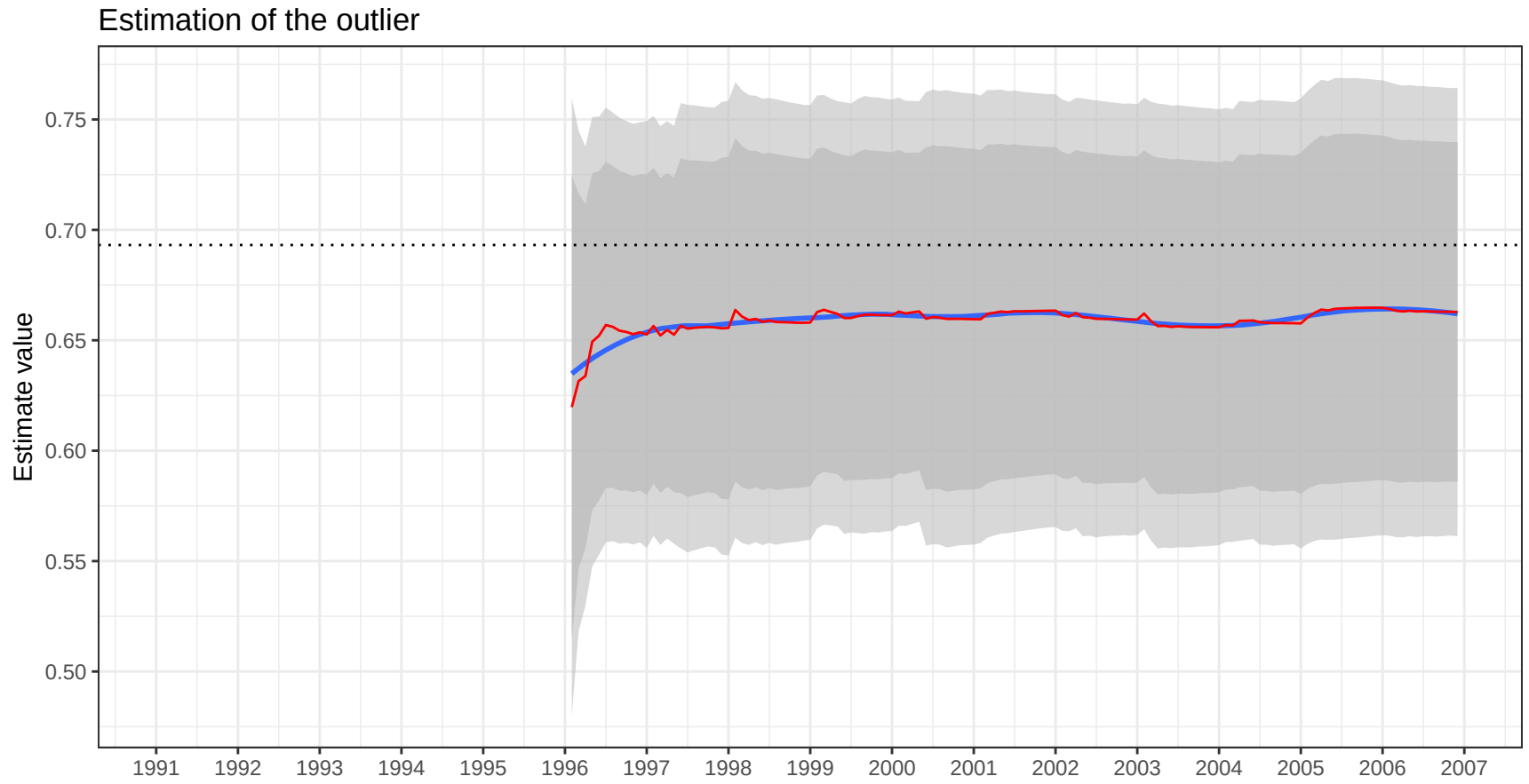


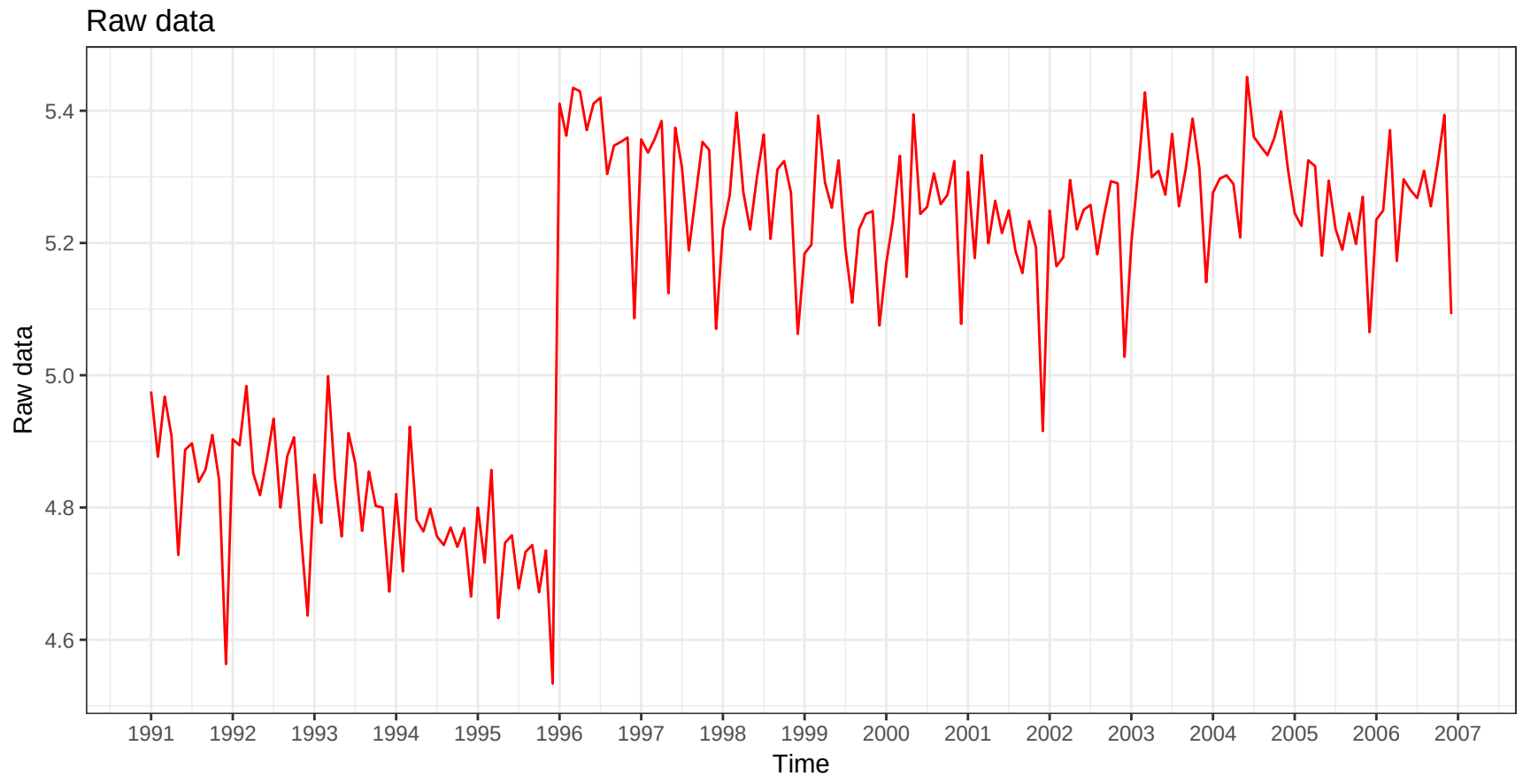



Estimate value of a LS(1995−1) IT−C2041
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
20
15
10
5
0
−5
−10
−15
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
140
120
100
80
60
40
Time

Estimate value of a LS(1996−1) DE−C2042

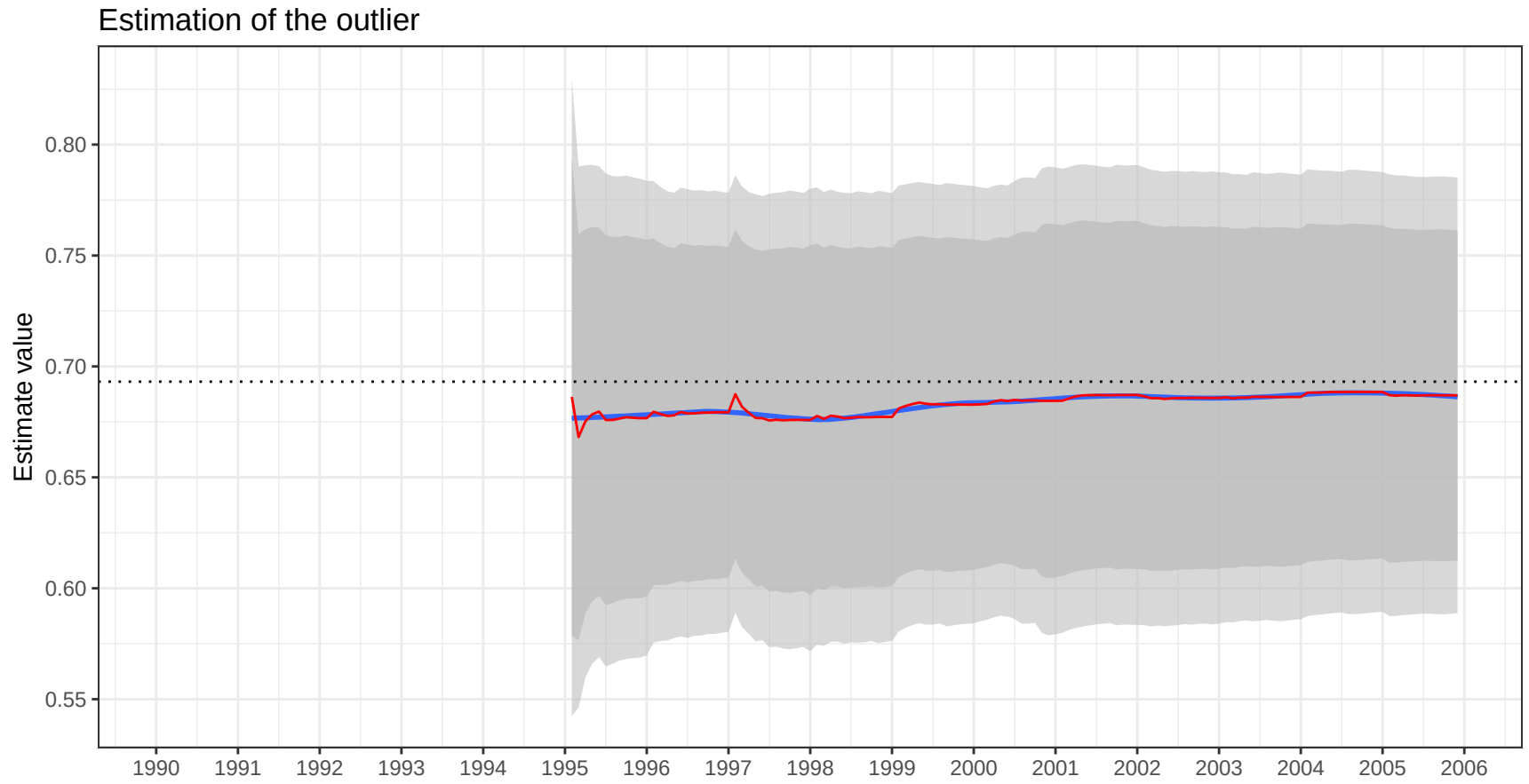
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

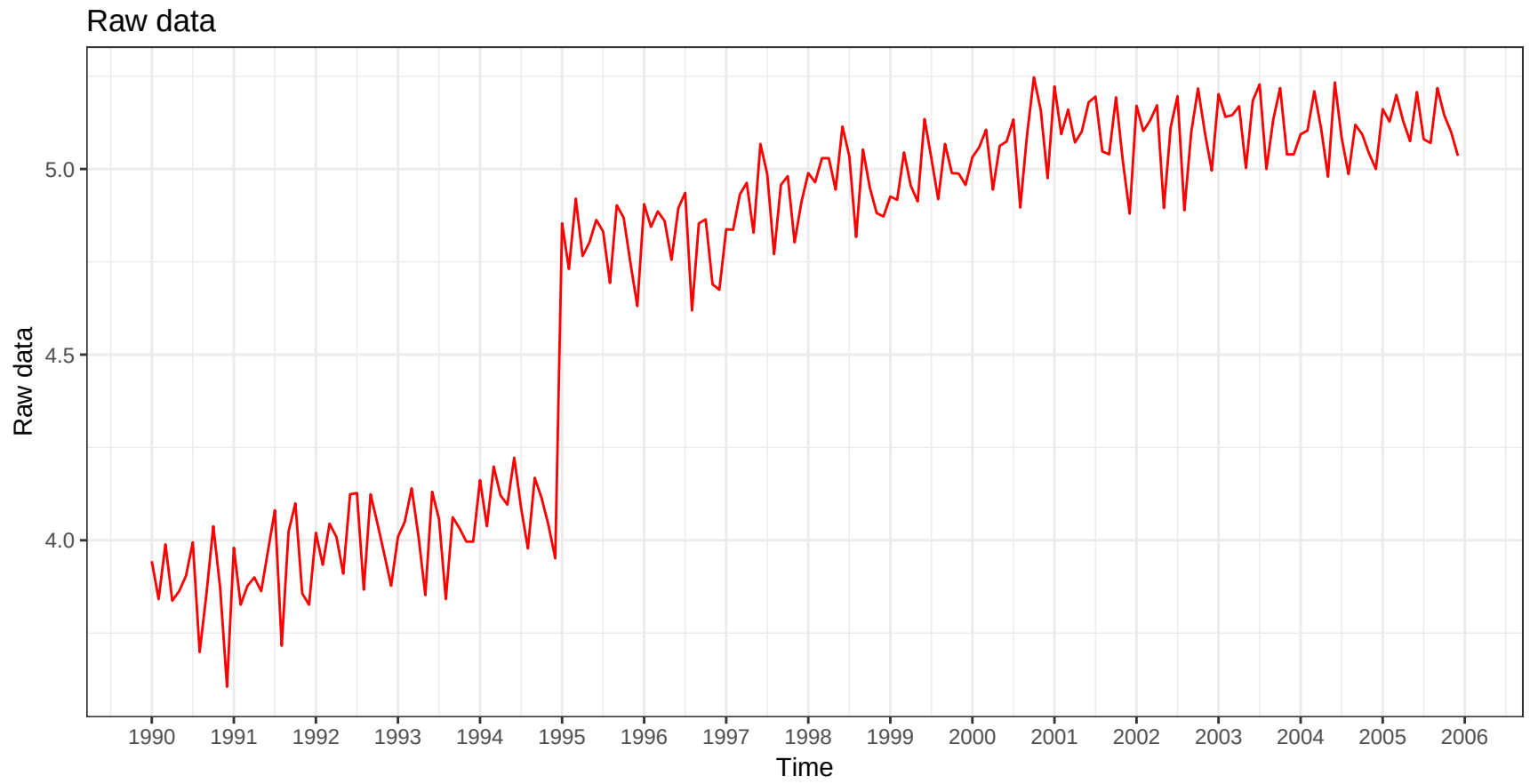


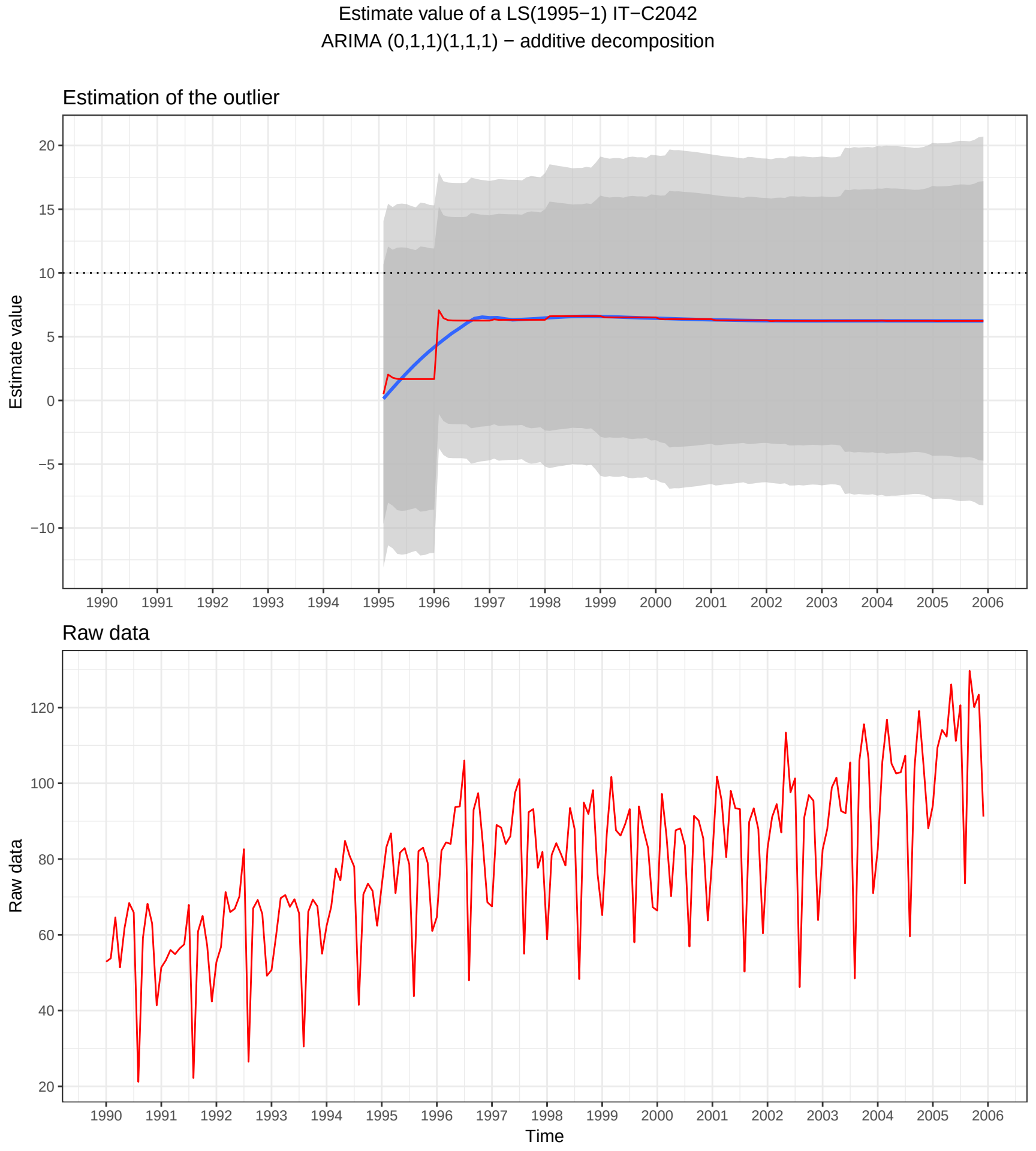


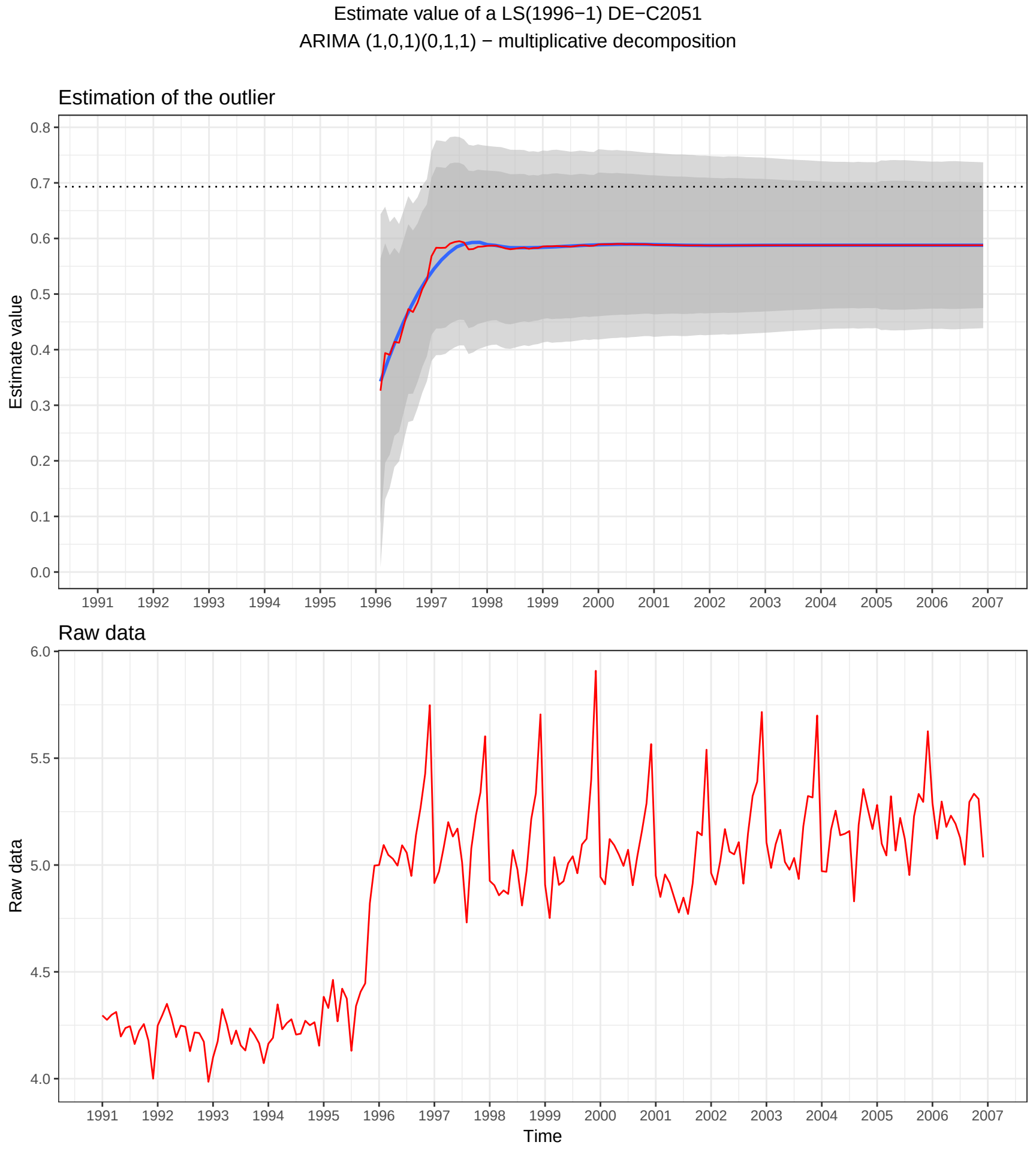
Estimate value of a LS(1995−1) FR−C2042

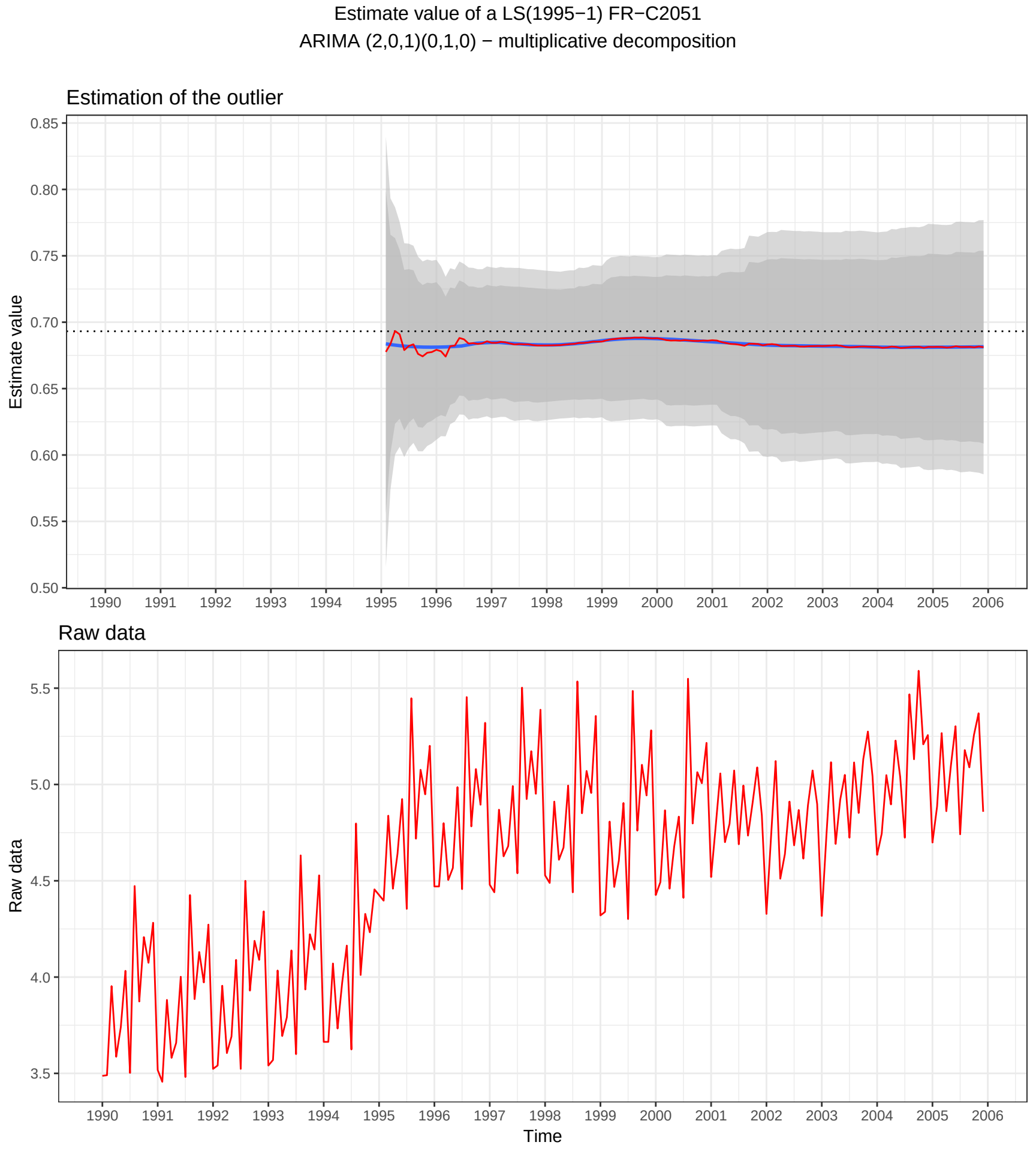
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition



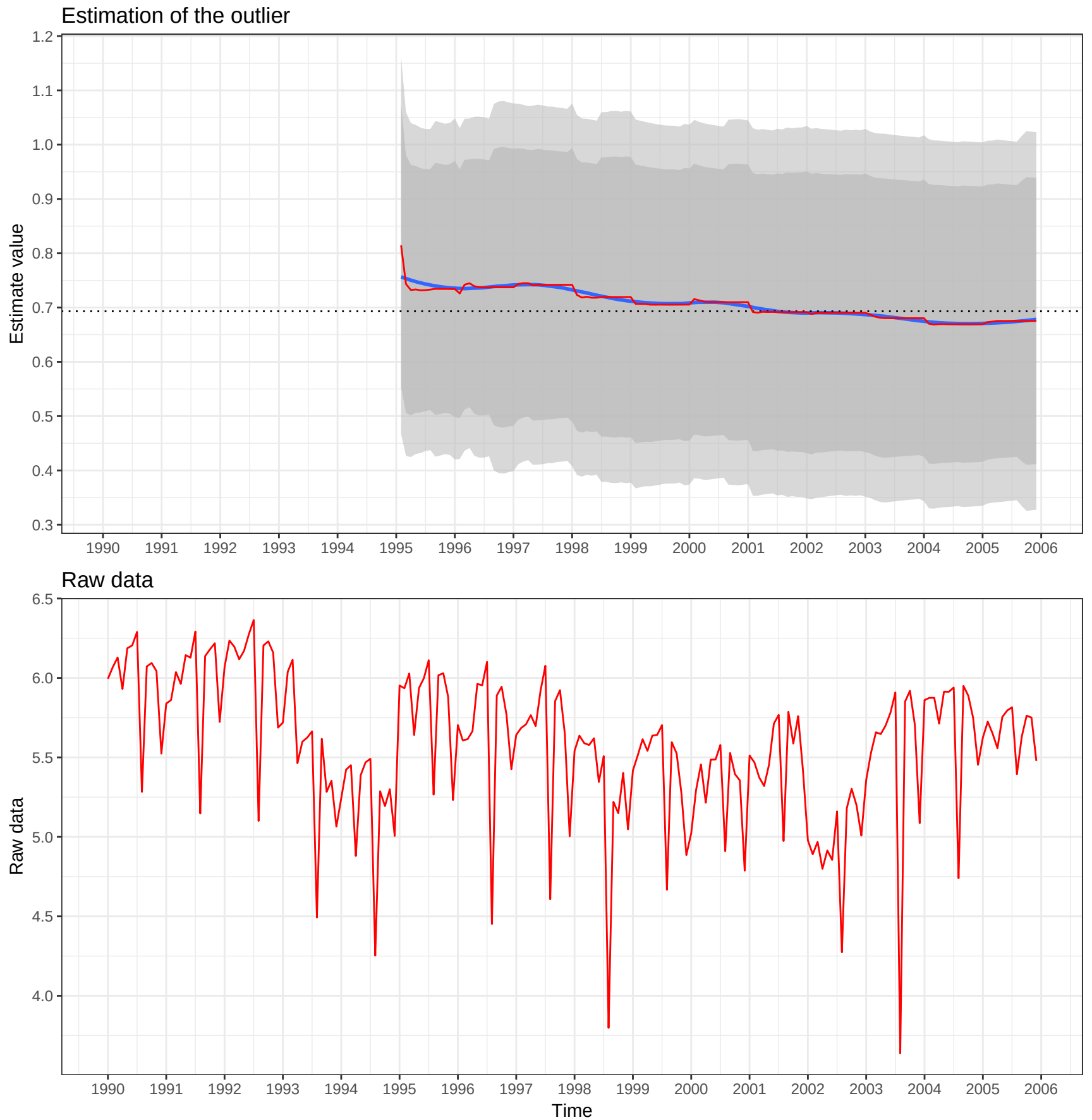


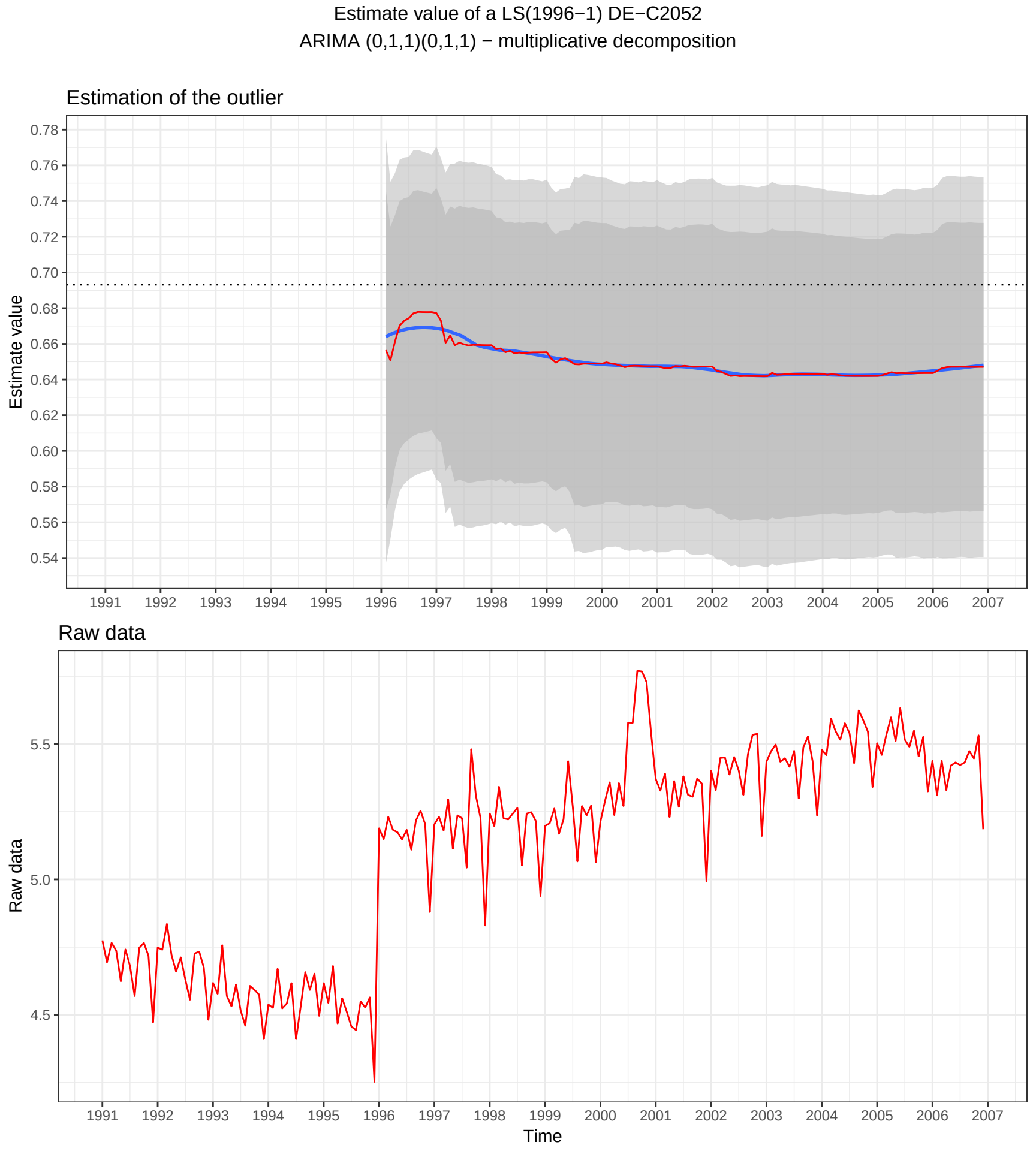

Estimate value of a LS(1995−1) IT−C2042
ARIMA (0,1,1)(1,1,1) − additive decomposition
Estimation of the outlier
Estimate value
20
15
10
5
0
−5
−10
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
120
100
80
60
40
20
Time

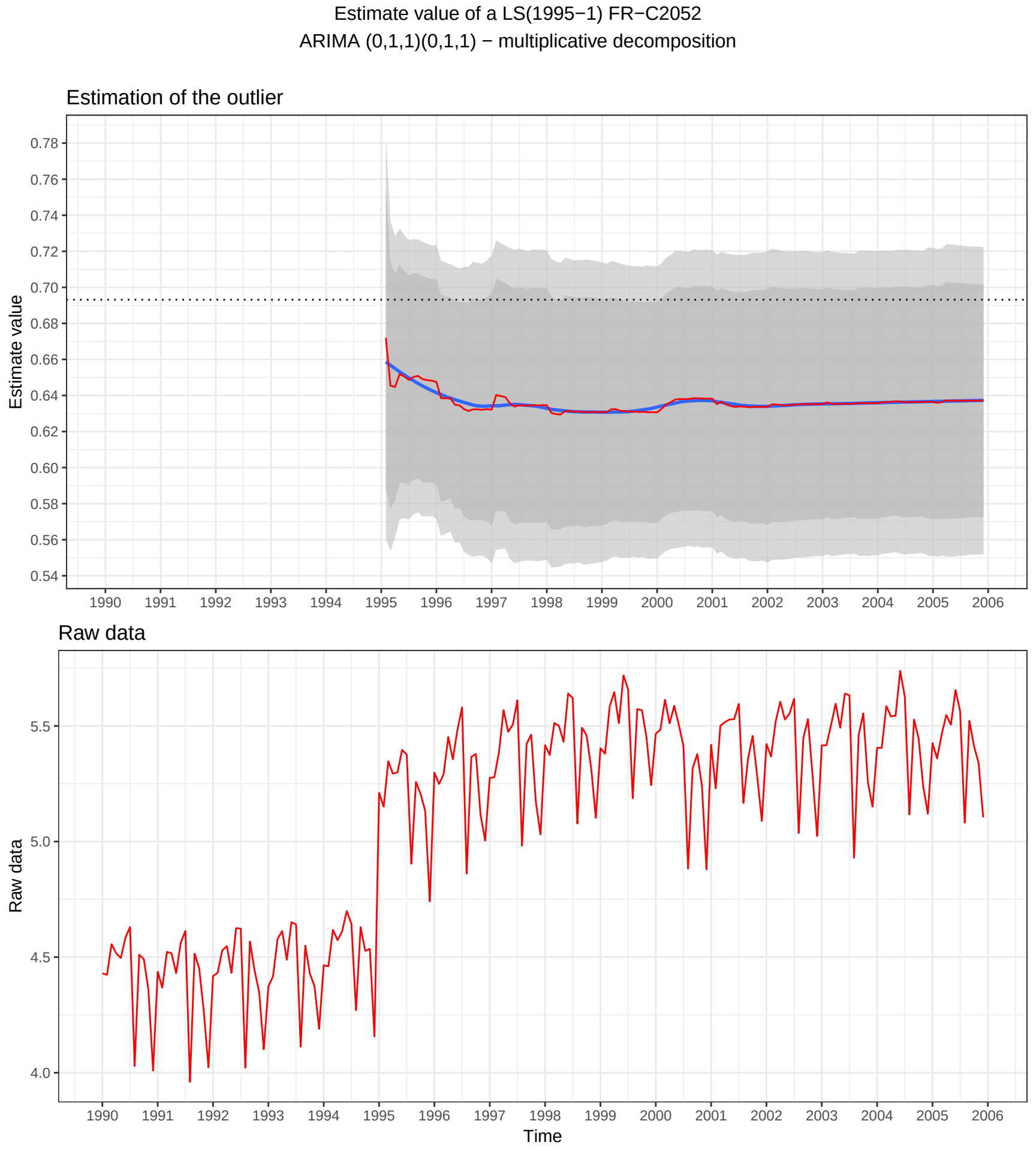

Estimate value of a LS(1996−1) DE−C2051
ARIMA (1,0,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
4.0
4.5
5.0
5.5
6.0
Time


Estimate value of a LS(1995−1) FR−C2051
ARIMA (2,0,1)(0,1,0) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
5.5
5.0
4.5
4.0
3.5
Time

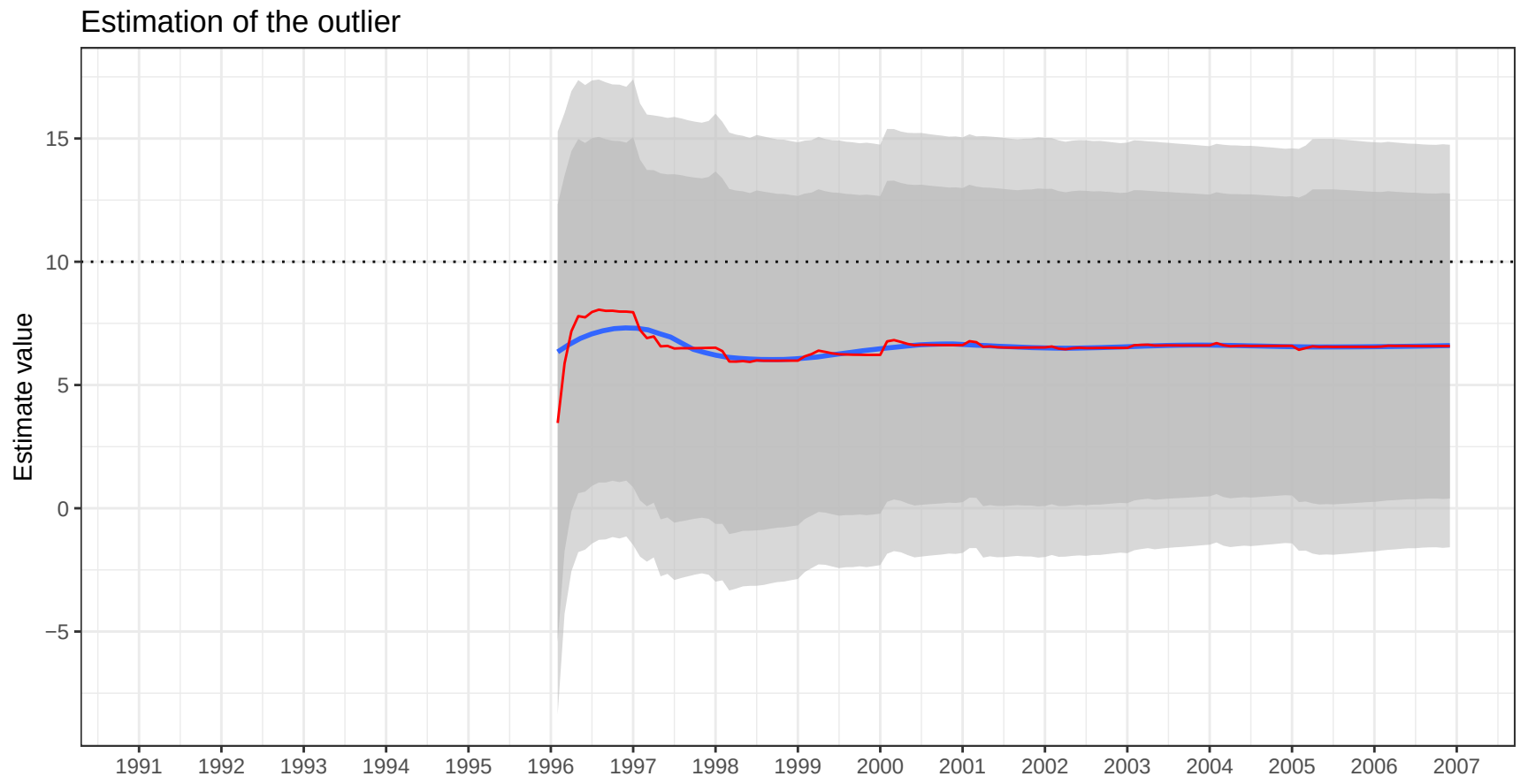
Estimate value of a LS(1995−1) IT−C2051
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

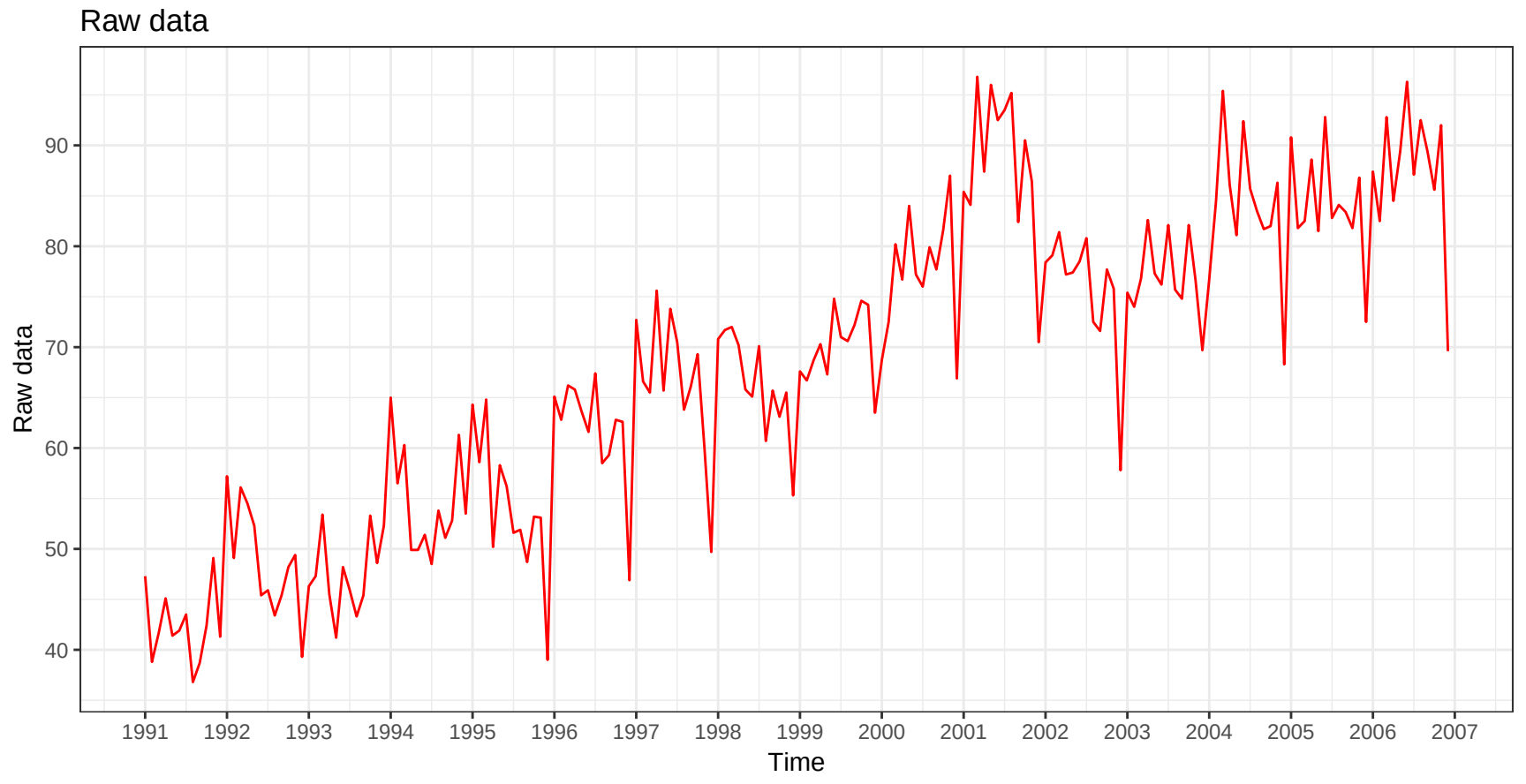



Estimate value of a LS(1996−1) DE−C2052
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.78
0.76
0.74
0.72
0.70
0.68
0.66
0.64
0.62
0.60
0.58
0.56
0.54
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
5.5
5.0
4.5
Time

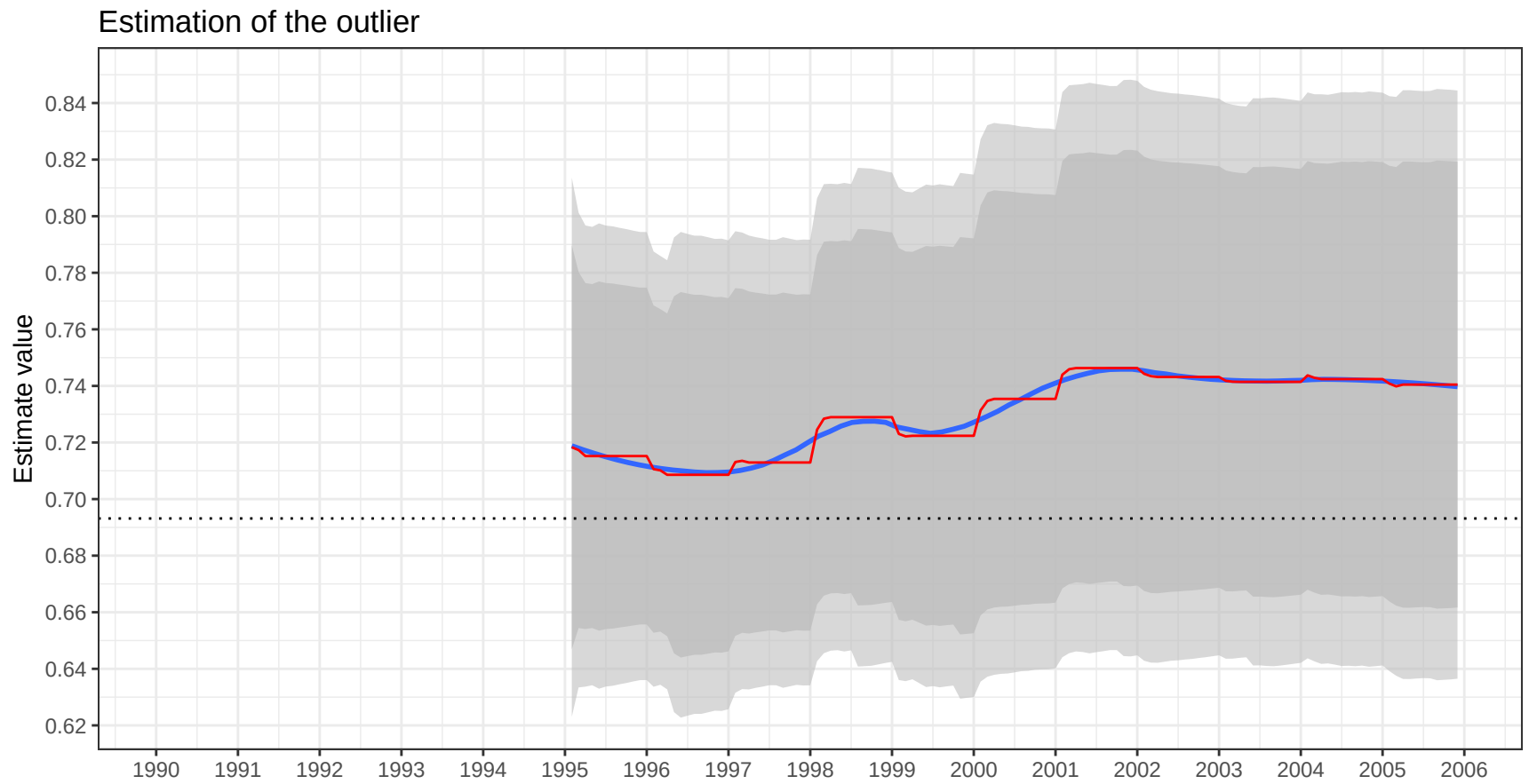

Estimate value of a LS(1995−1) FR−C2052
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.78
0.76
0.74
0.72
0.70
0.68
0.66
0.64
0.62
0.60
0.58
0.56
0.54
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
5.5
5.0
4.5
4.0
Time

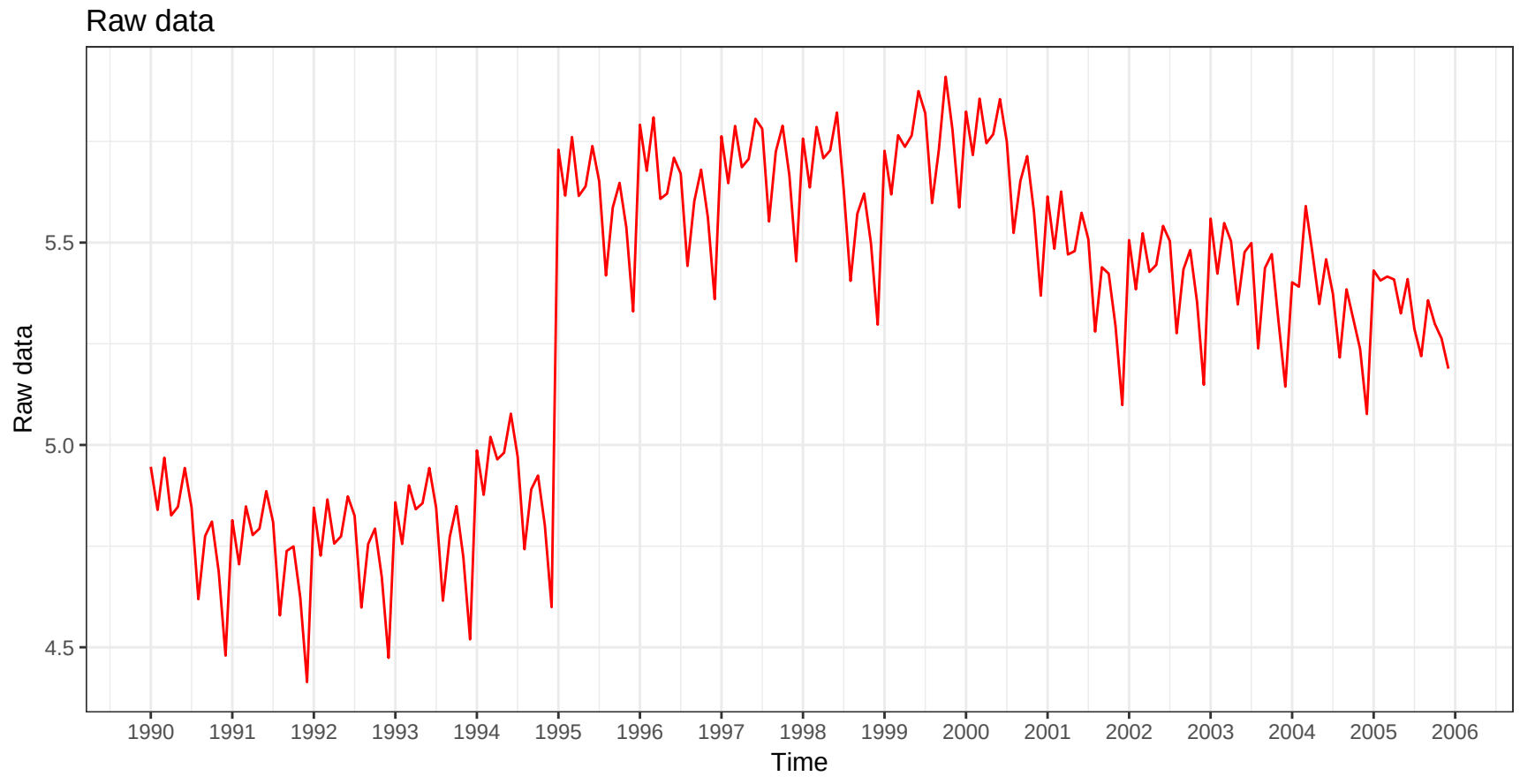
Estimate value of a LS(1996−1) DE−C2053
ARIMA (0,1,1)(0,1,1) − additive decomposition



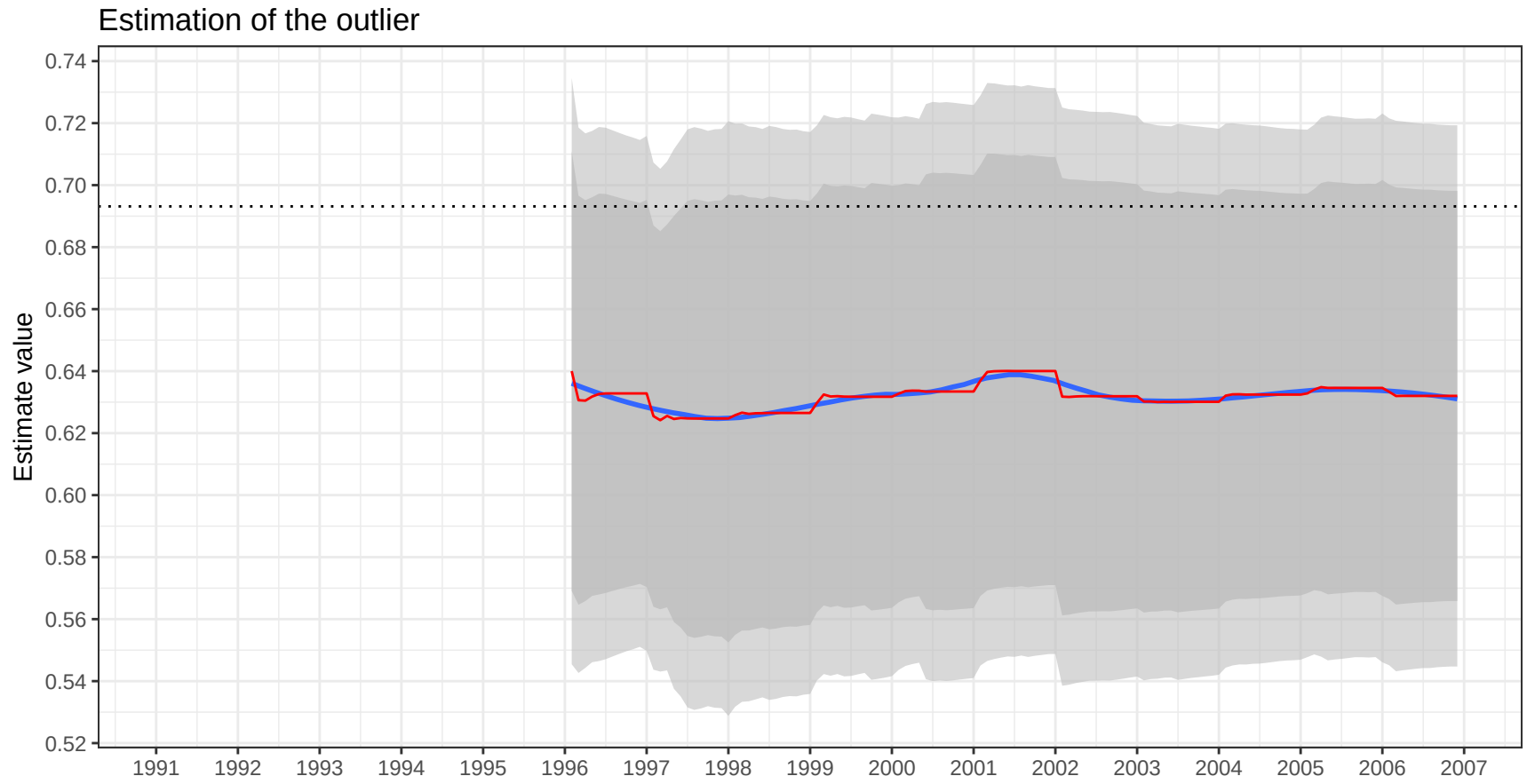


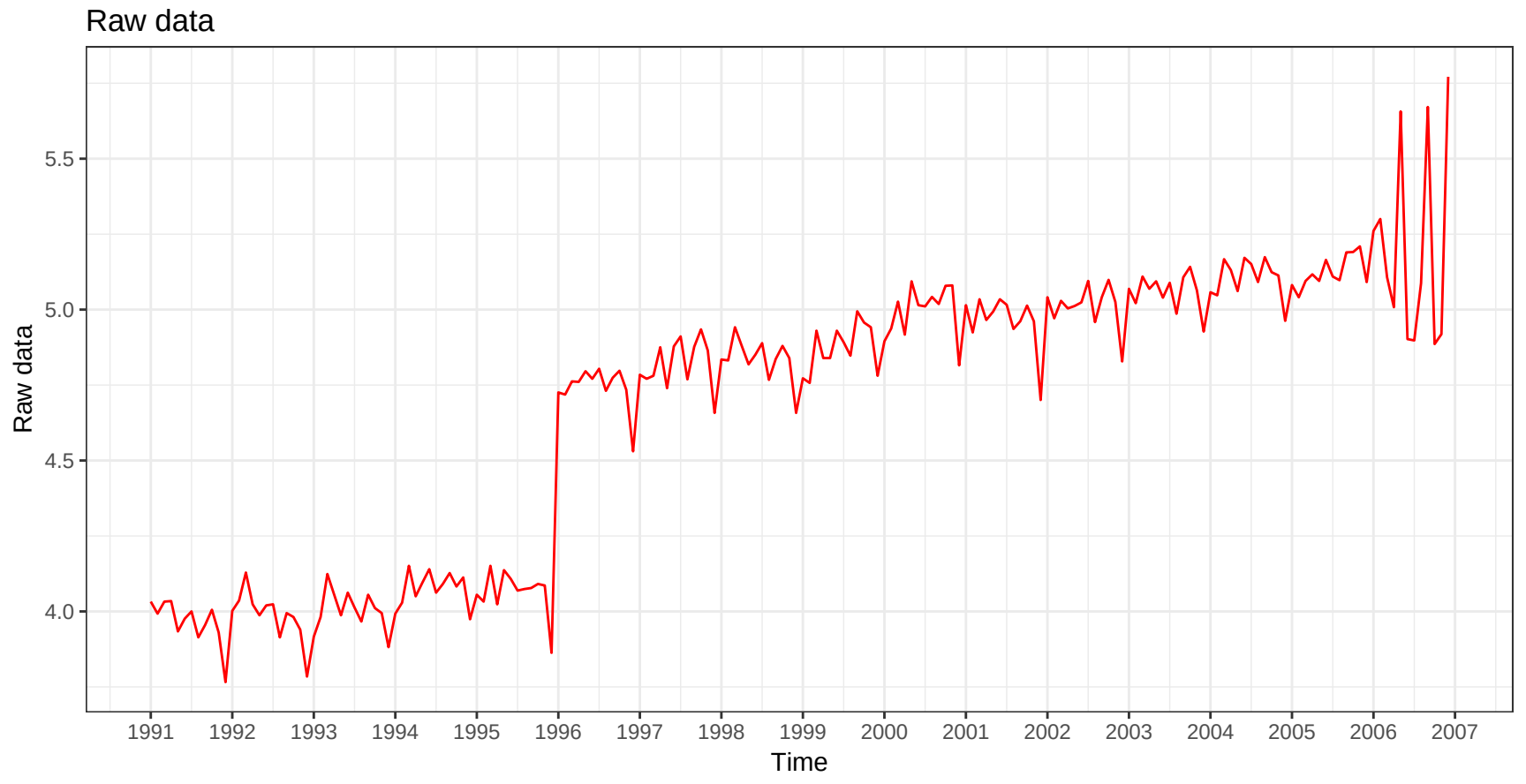
Estimate value of a LS(1995−1) FR−C2053
ARIMA (2,1,0)(0,1,1) − multiplicative decomposition



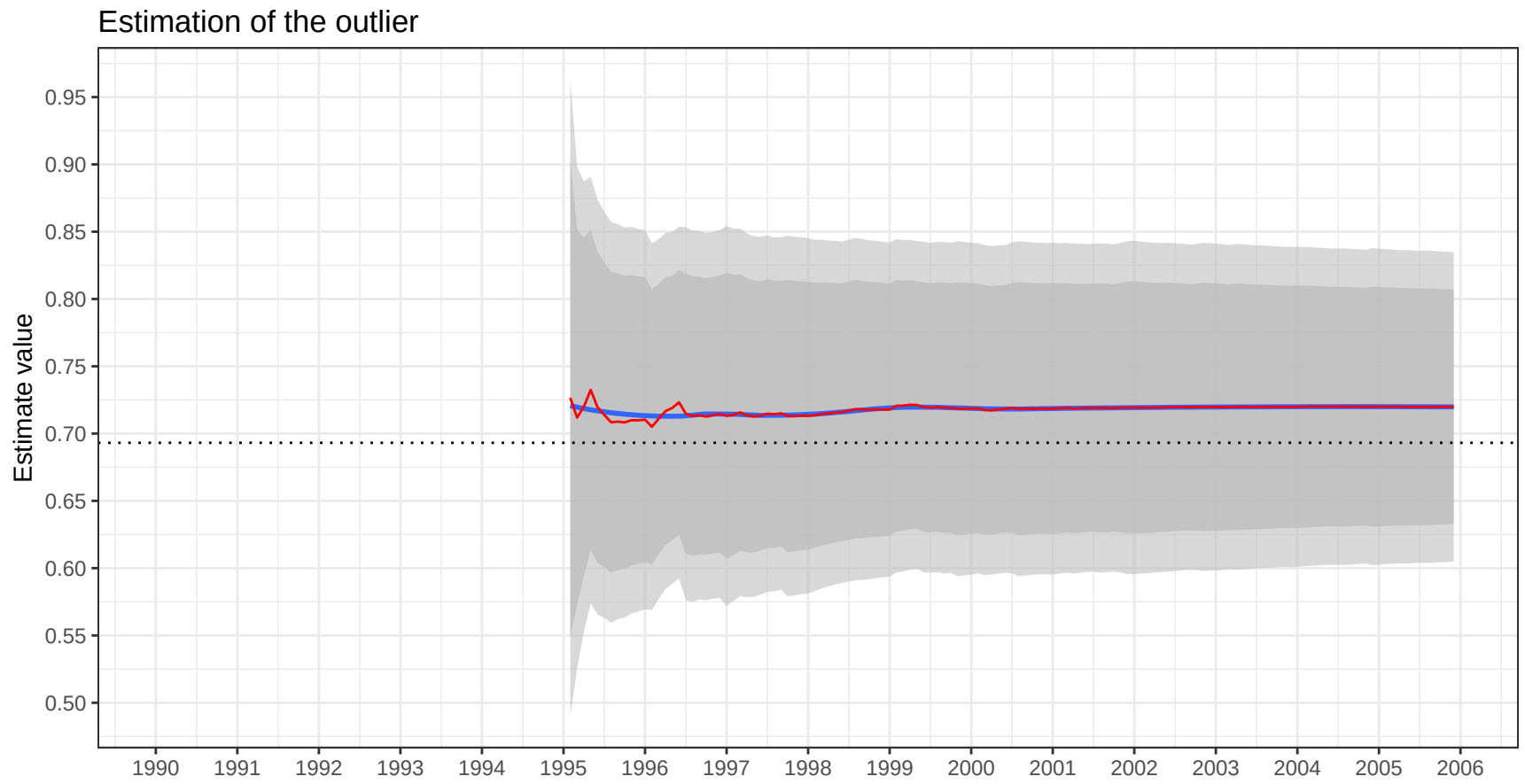


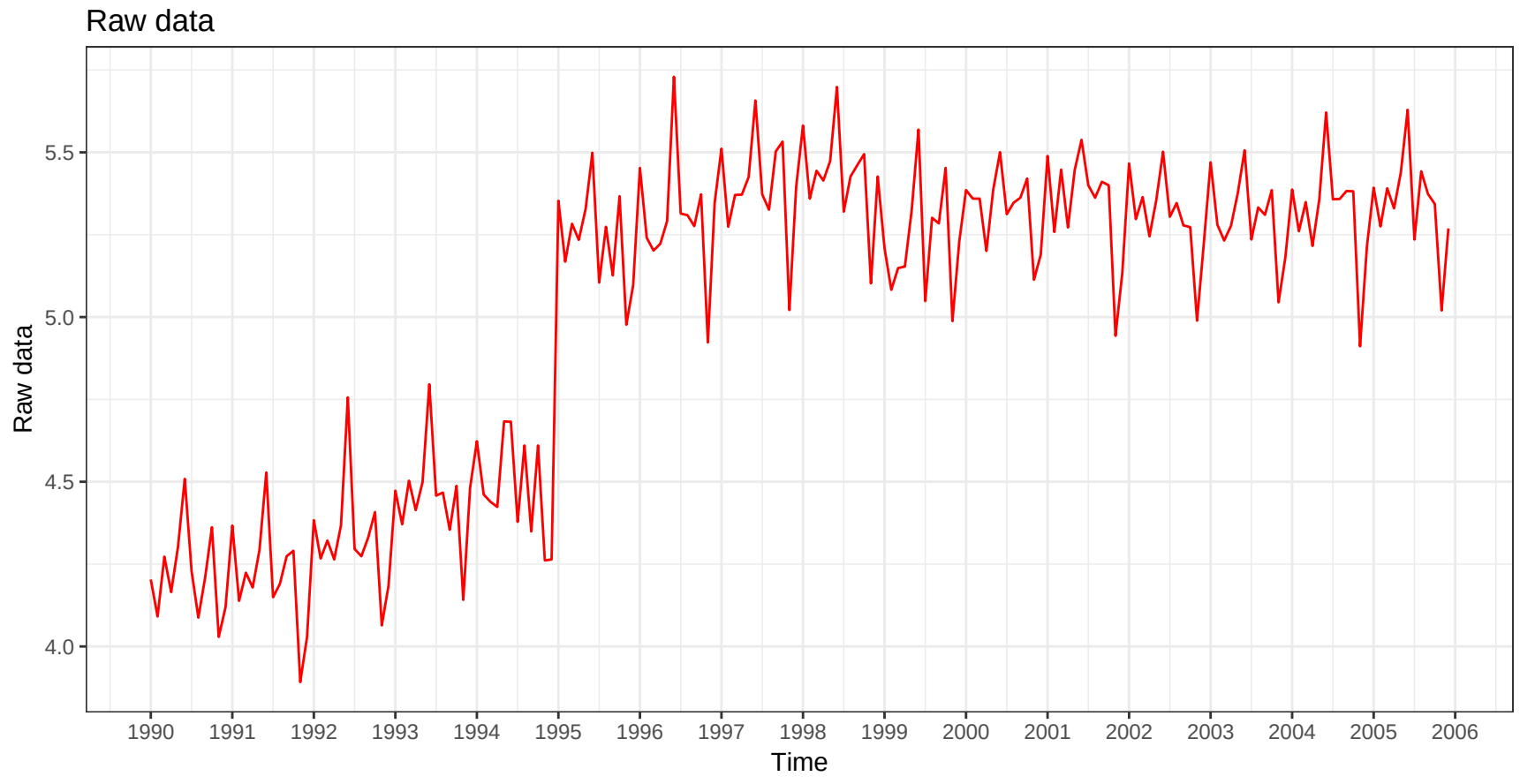
Estimate value of a LS(1996−1) DE−C2059
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

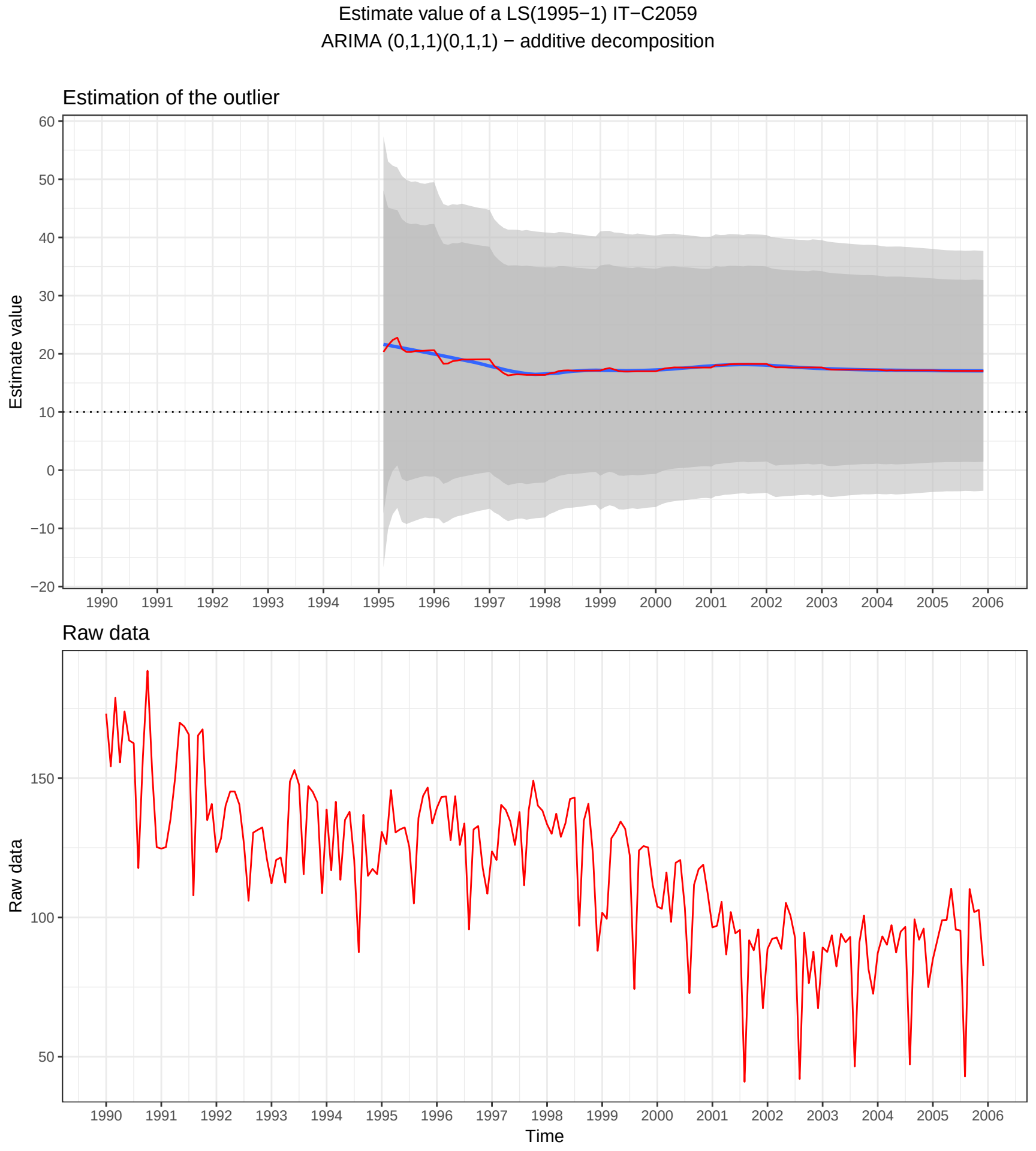


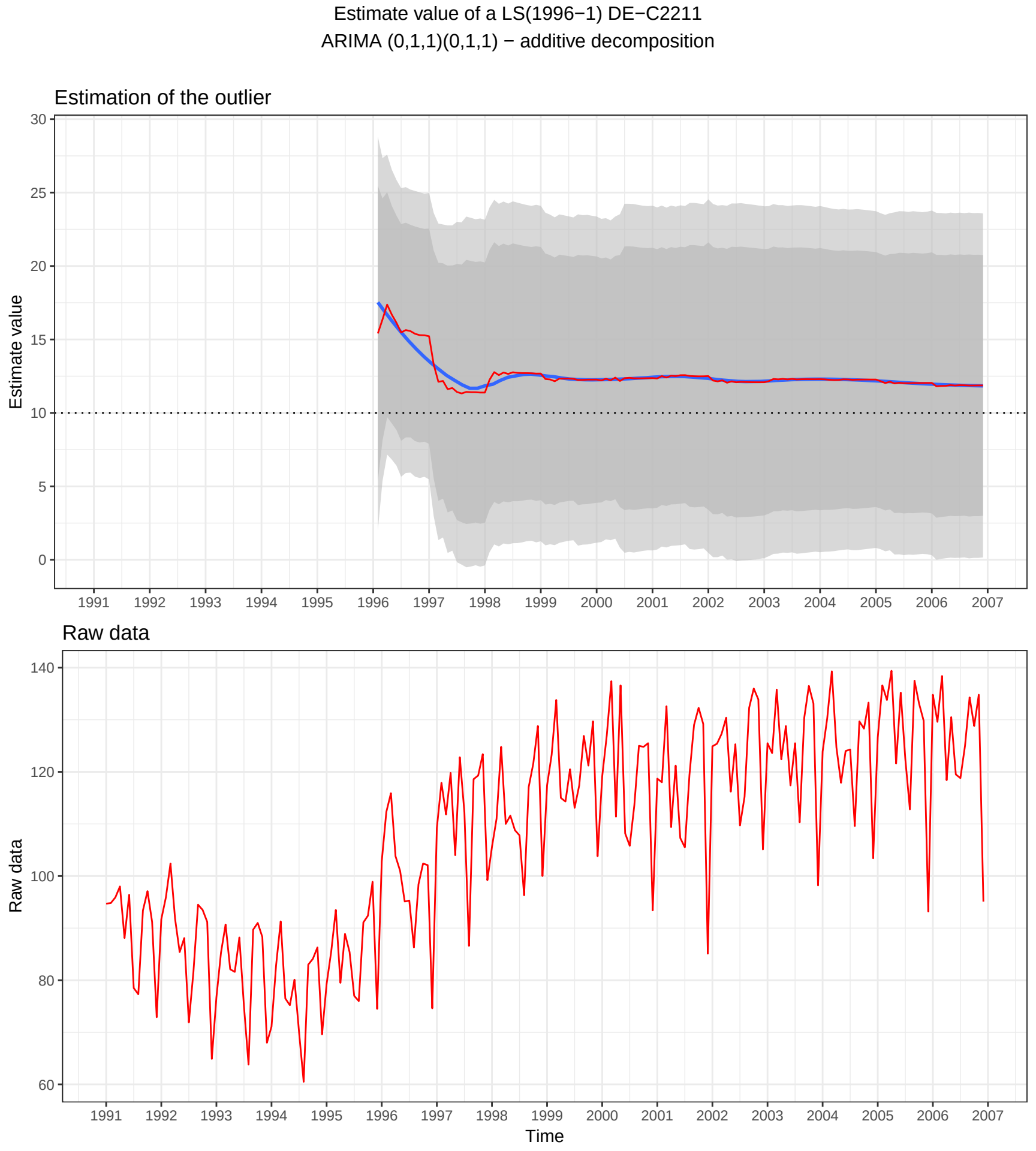


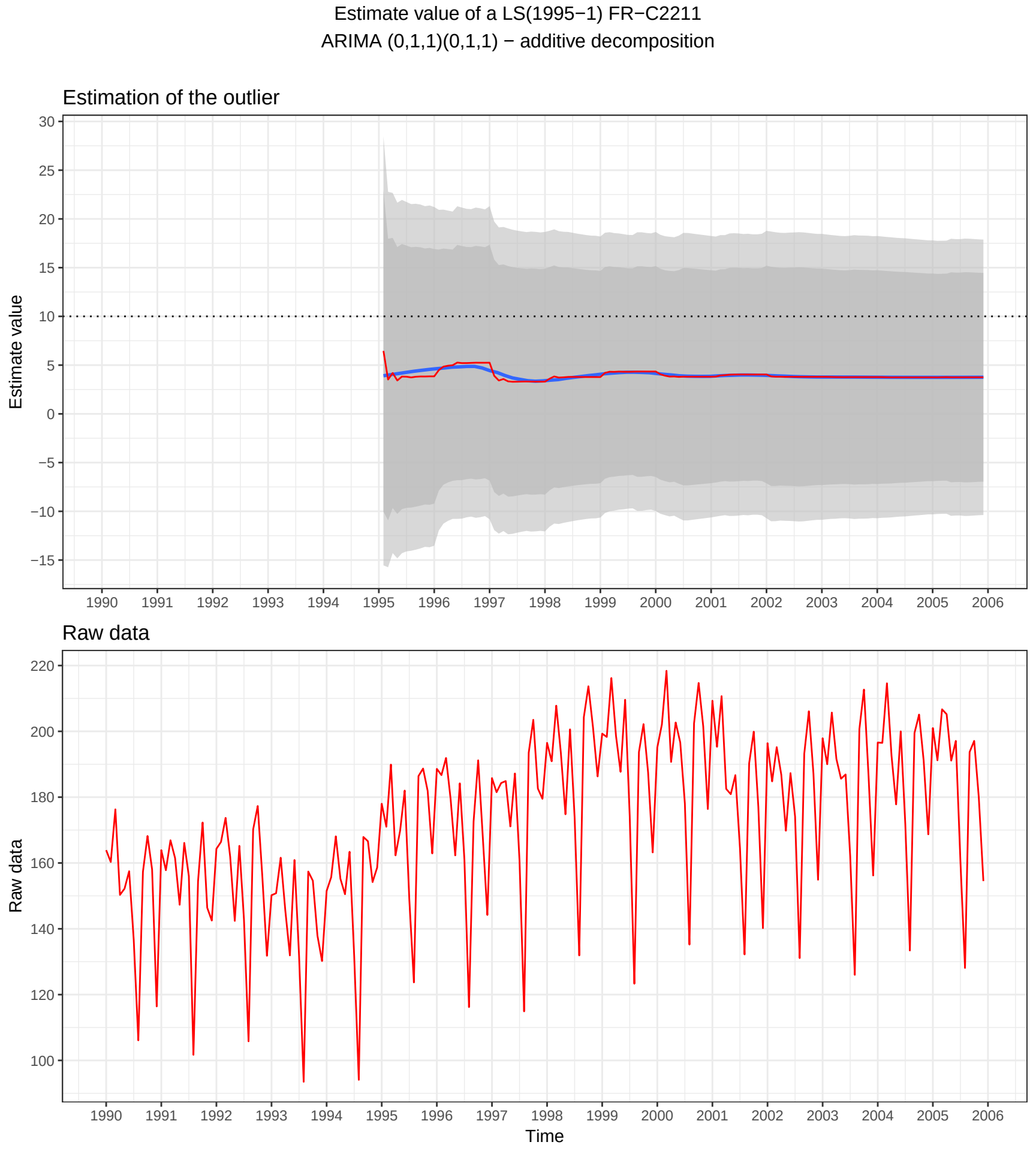
Estimate value of a LS(1995−1) FR−C2059
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

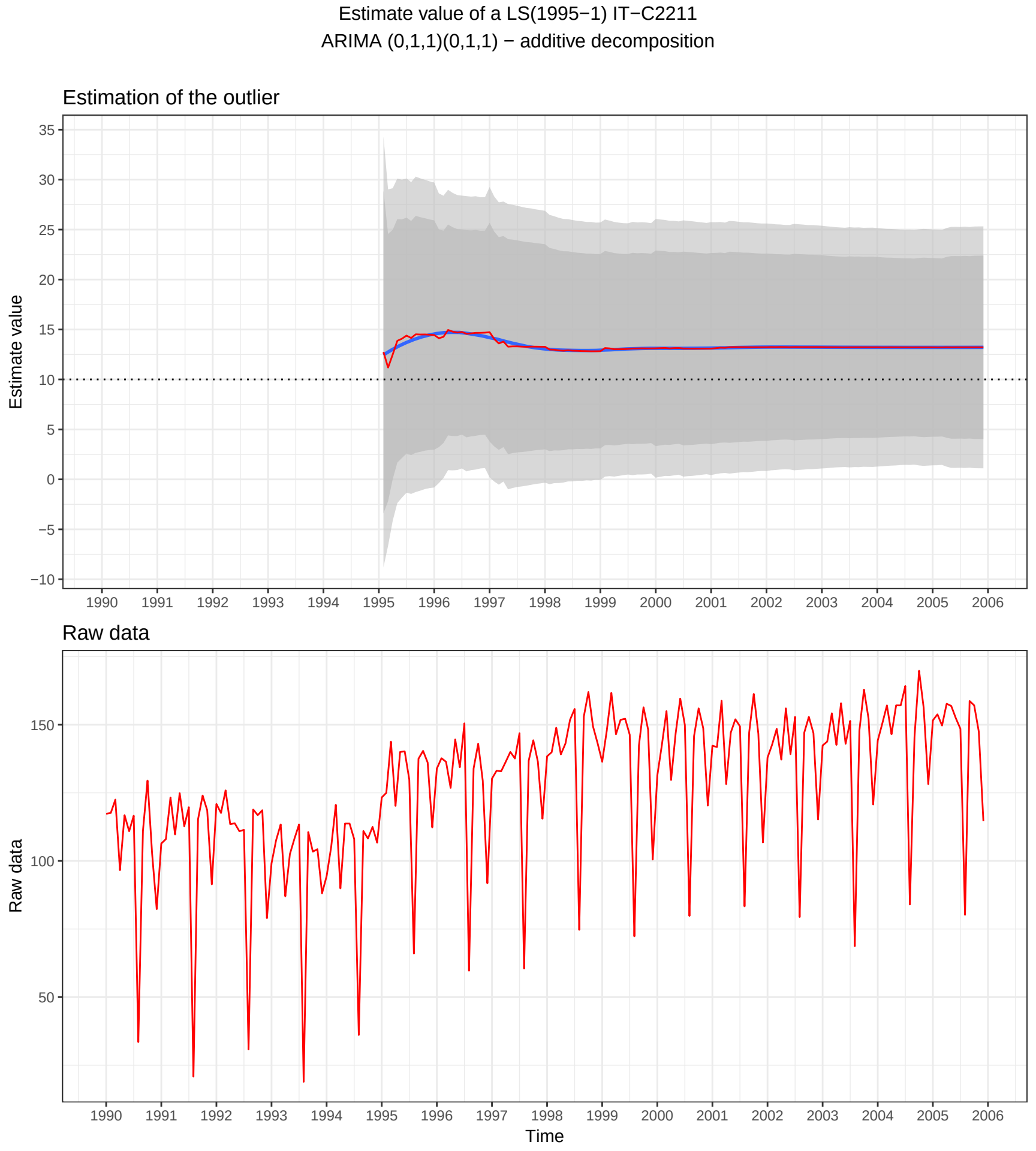


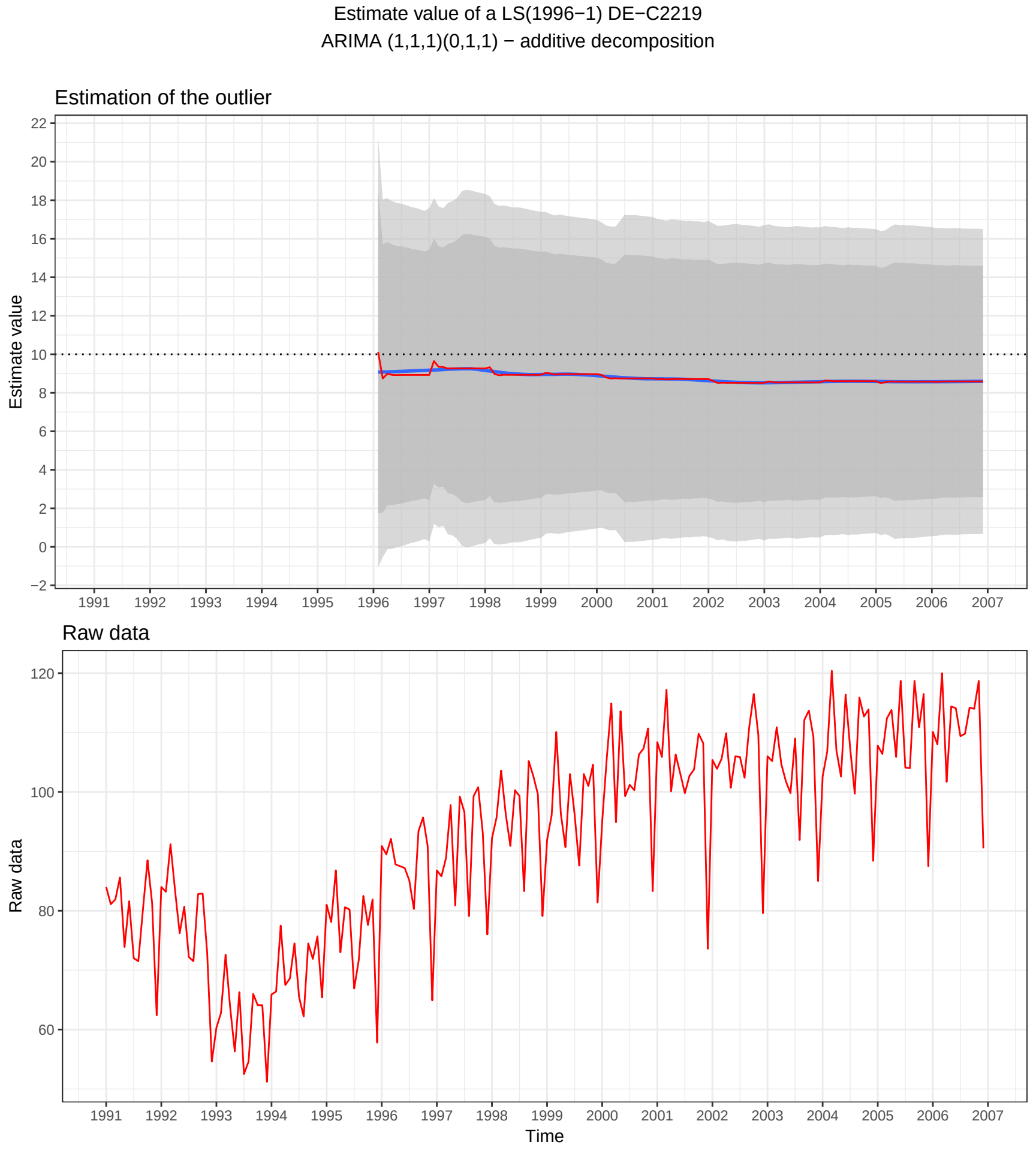


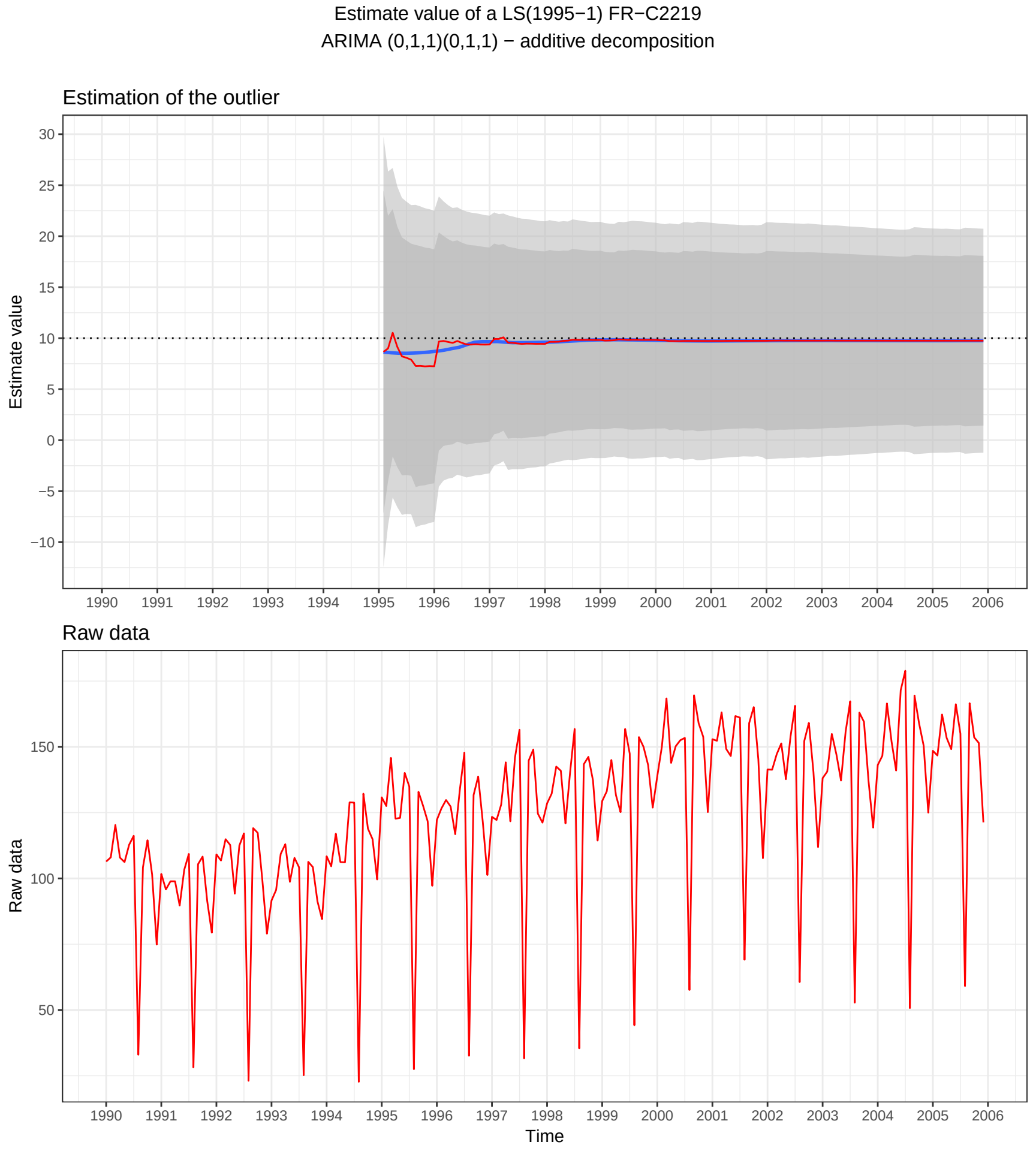

Estimate value of a LS(1995−1) IT−C2059
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
60
50
40
30
20
10
0
−10
−20
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
150
100
50
Time

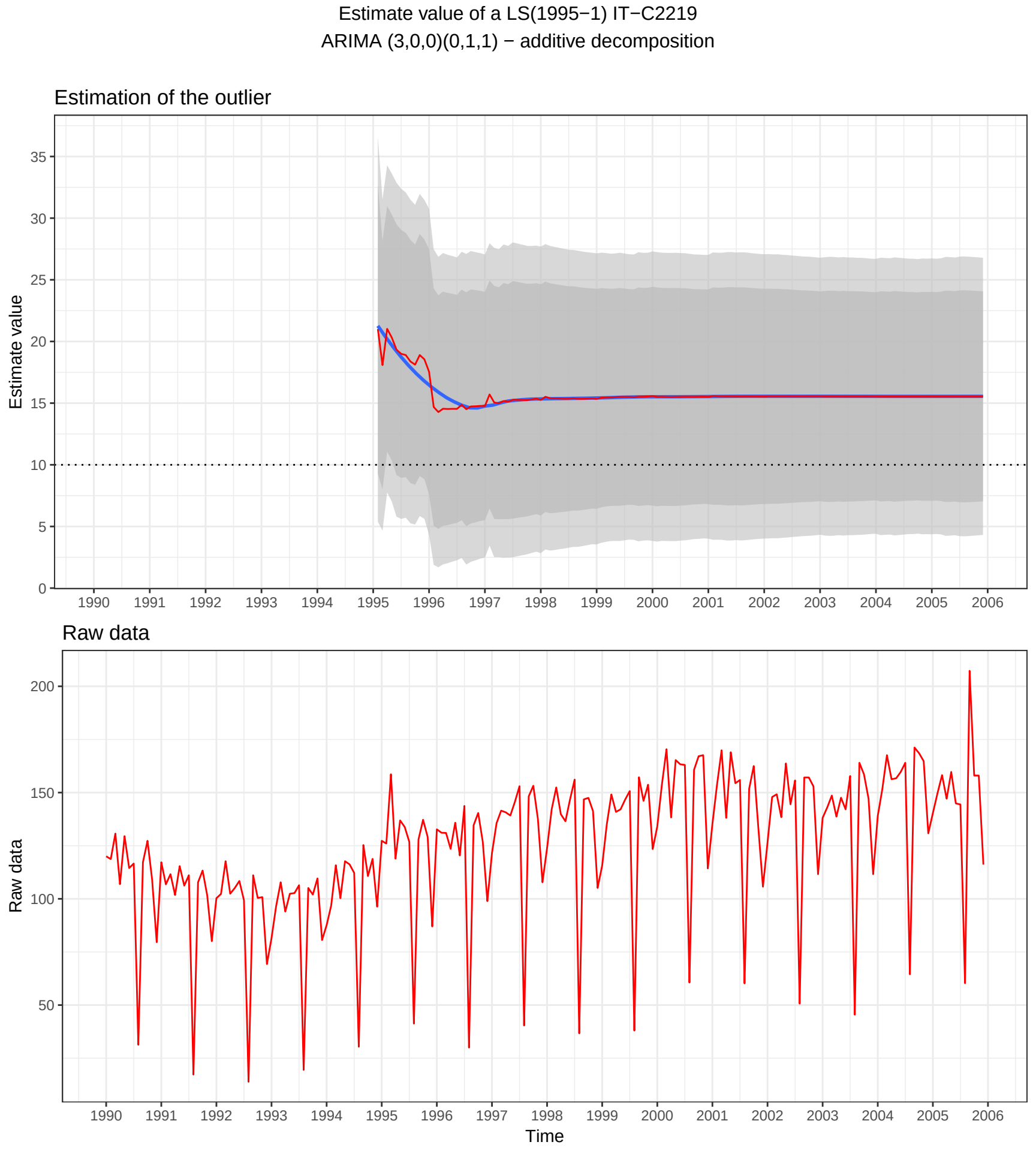

Estimate value of a LS(1996−1) DE−C2211
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
30
25
20
15
10
5
0
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
140
120
100
80
60
Time

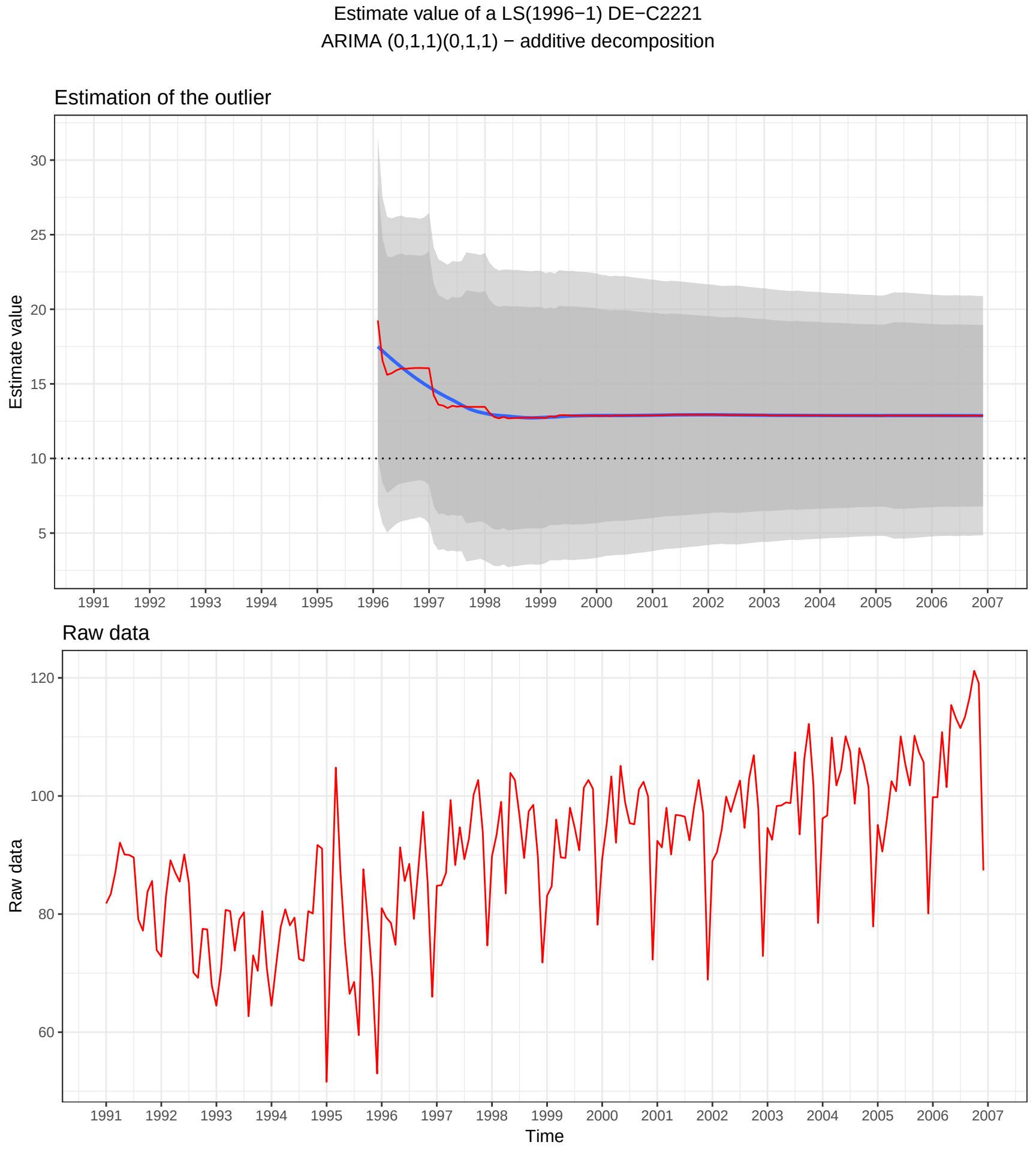

Estimate value of a LS(1995−1) FR−C2211
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
30
25
20
15
10
5
0
−5
−10
−15
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
220
200
180
160
140
120
100
Time


Estimate value of a LS(1995−1) IT−C2211
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
35
30
25
20
15
10
5
0
−5
−10
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
150
100
50
Time


Estimate value of a LS(1996−1) DE−C2219
ARIMA (1,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
22
20
18
16
14
12
10
8
6
4
2
0
−2
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
120
100
80
60
Time

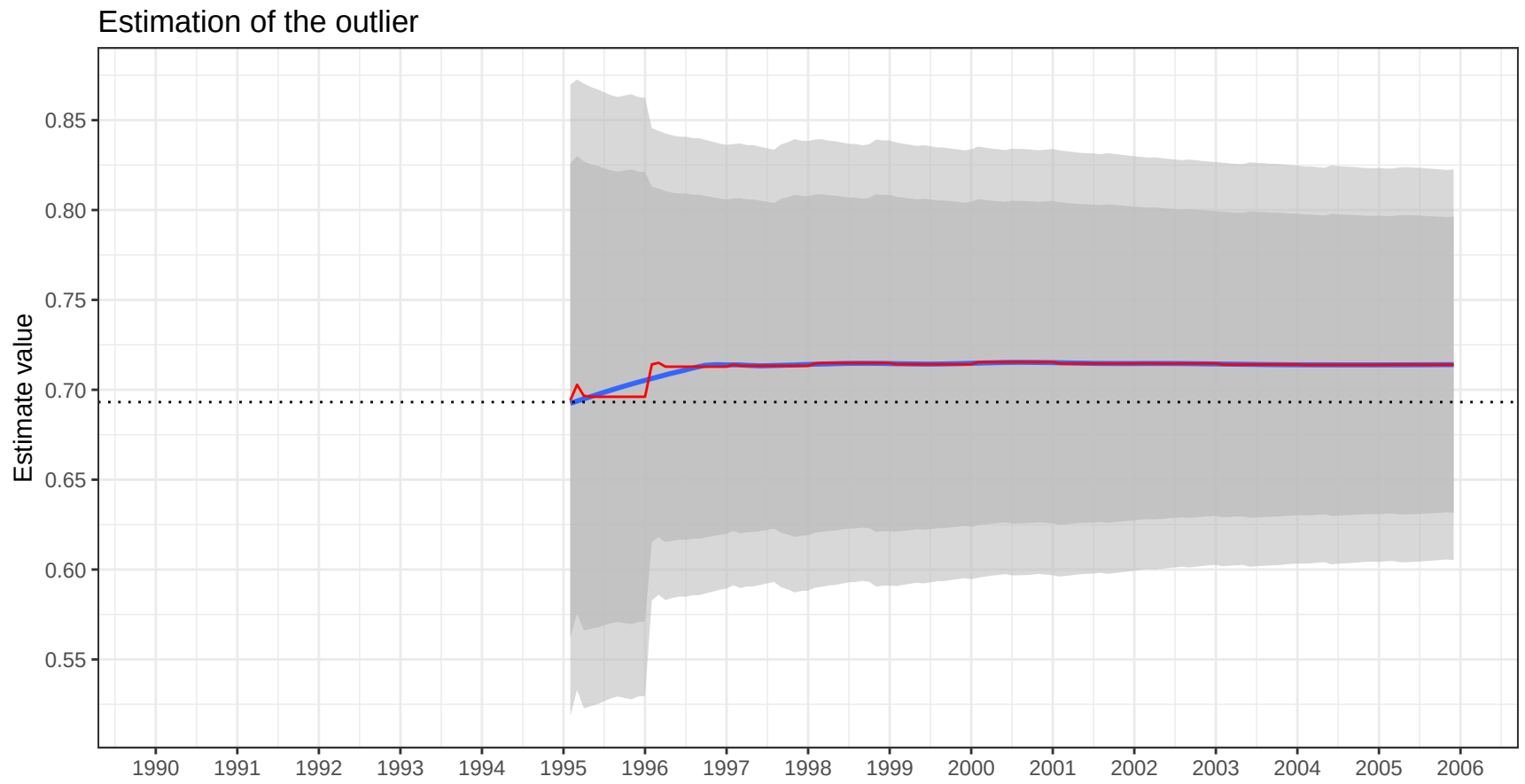

Estimate value of a LS(1995−1) FR−C2219
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
30
25
20
15
10
5
0
−5
−10
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
150
100
50
Time

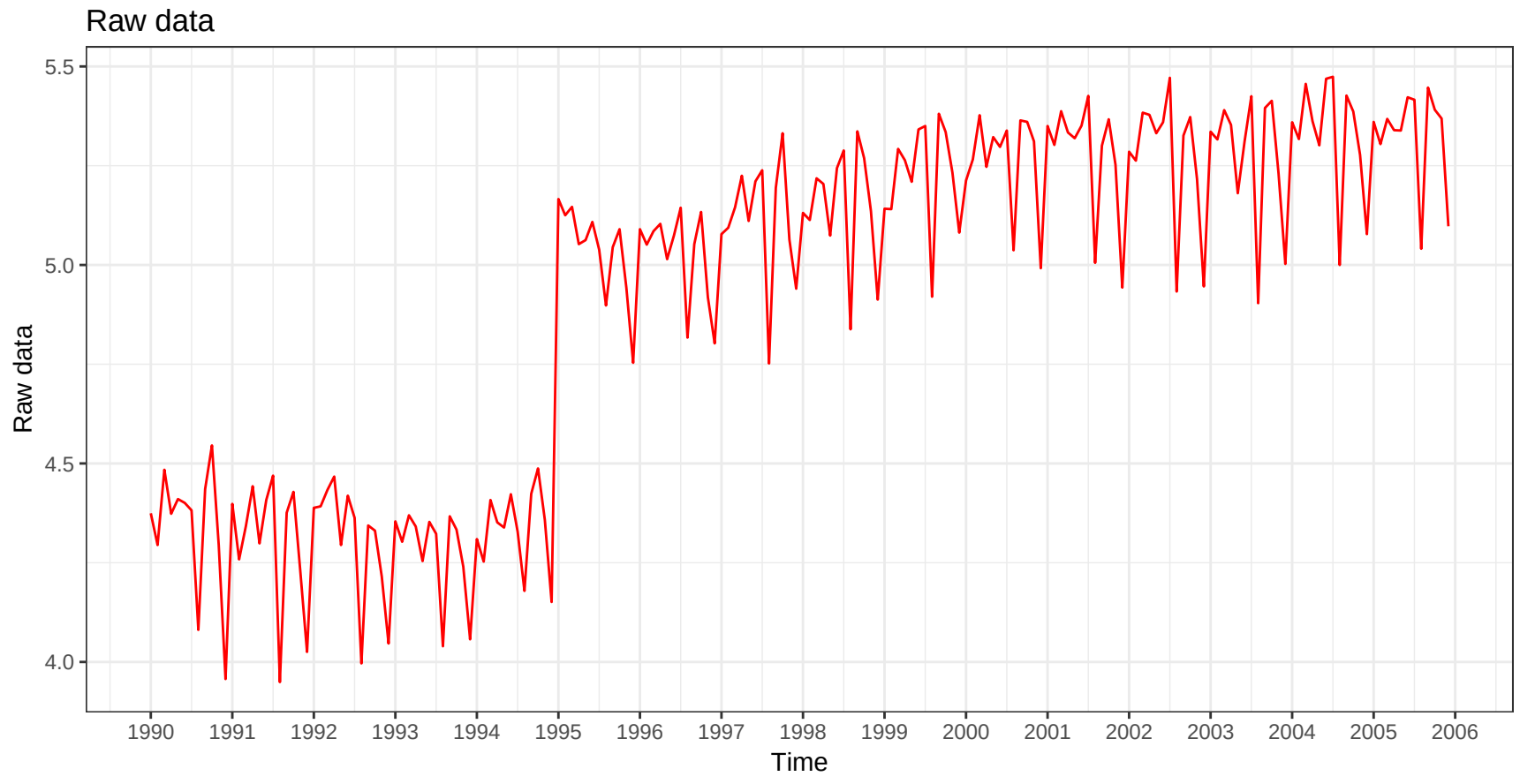

Estimate value of a LS(1995−1) IT−C2219
ARIMA (3,0,0)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
0
5
10
15
20
25
30
35
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
50
100
150
200
Time

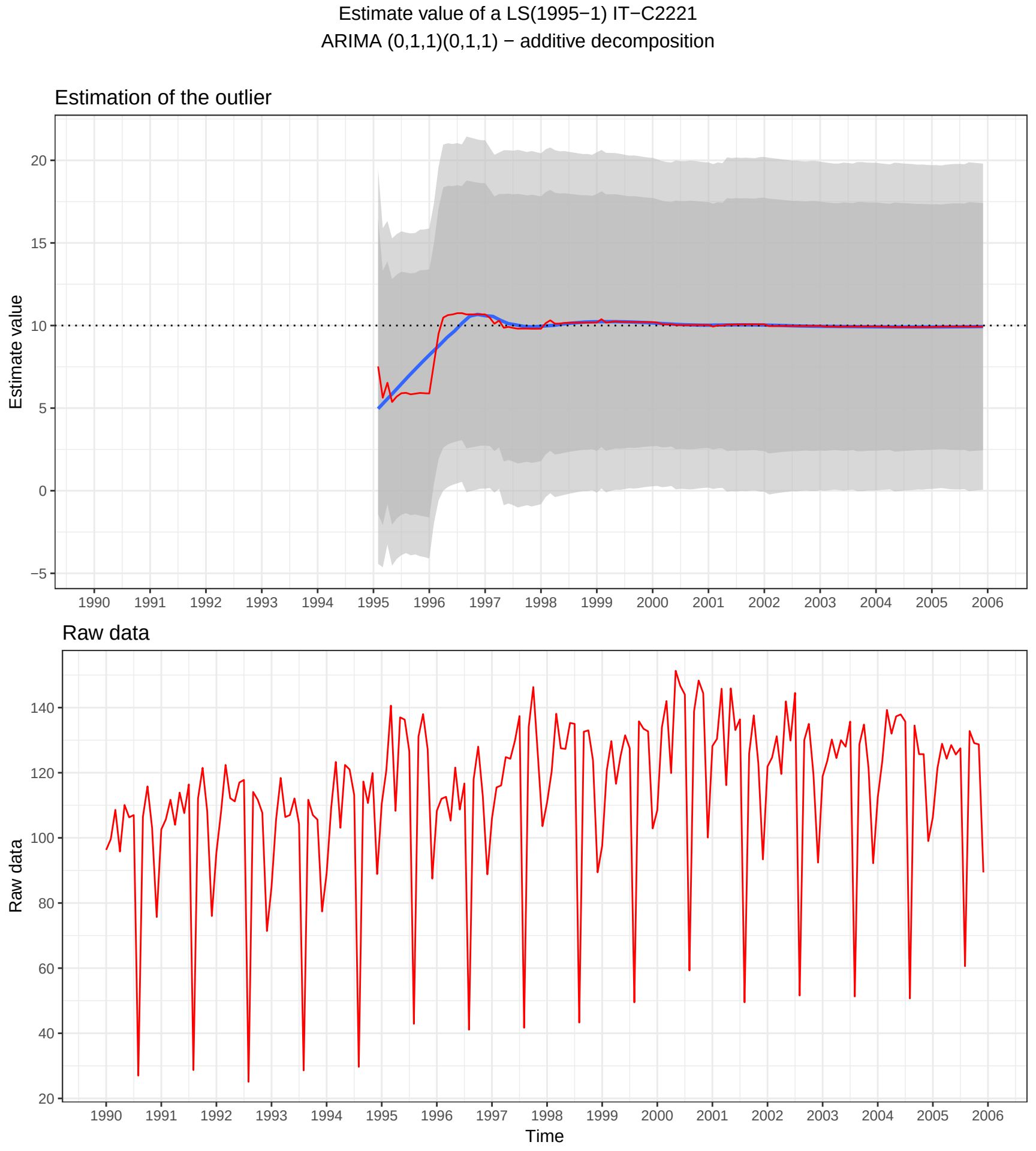

Estimate value of a LS(1996−1) DE−C2221
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
30
25
20
15
10
5
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
120
100
80
60
Time

Estimate value of a LS(1995−1) FR−C2221

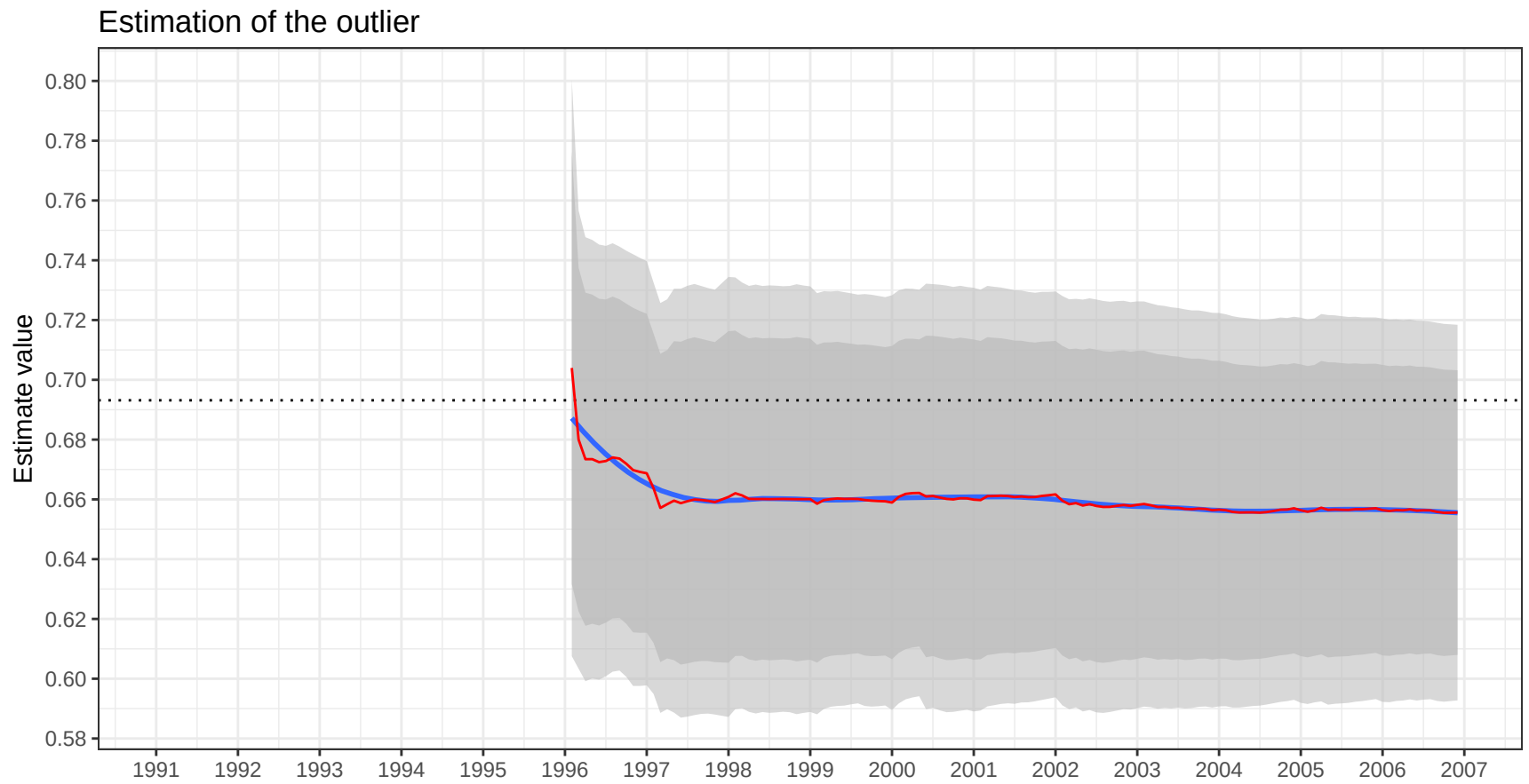
ARIMA (0,1,1)(1,1,1) − multiplicative decomposition

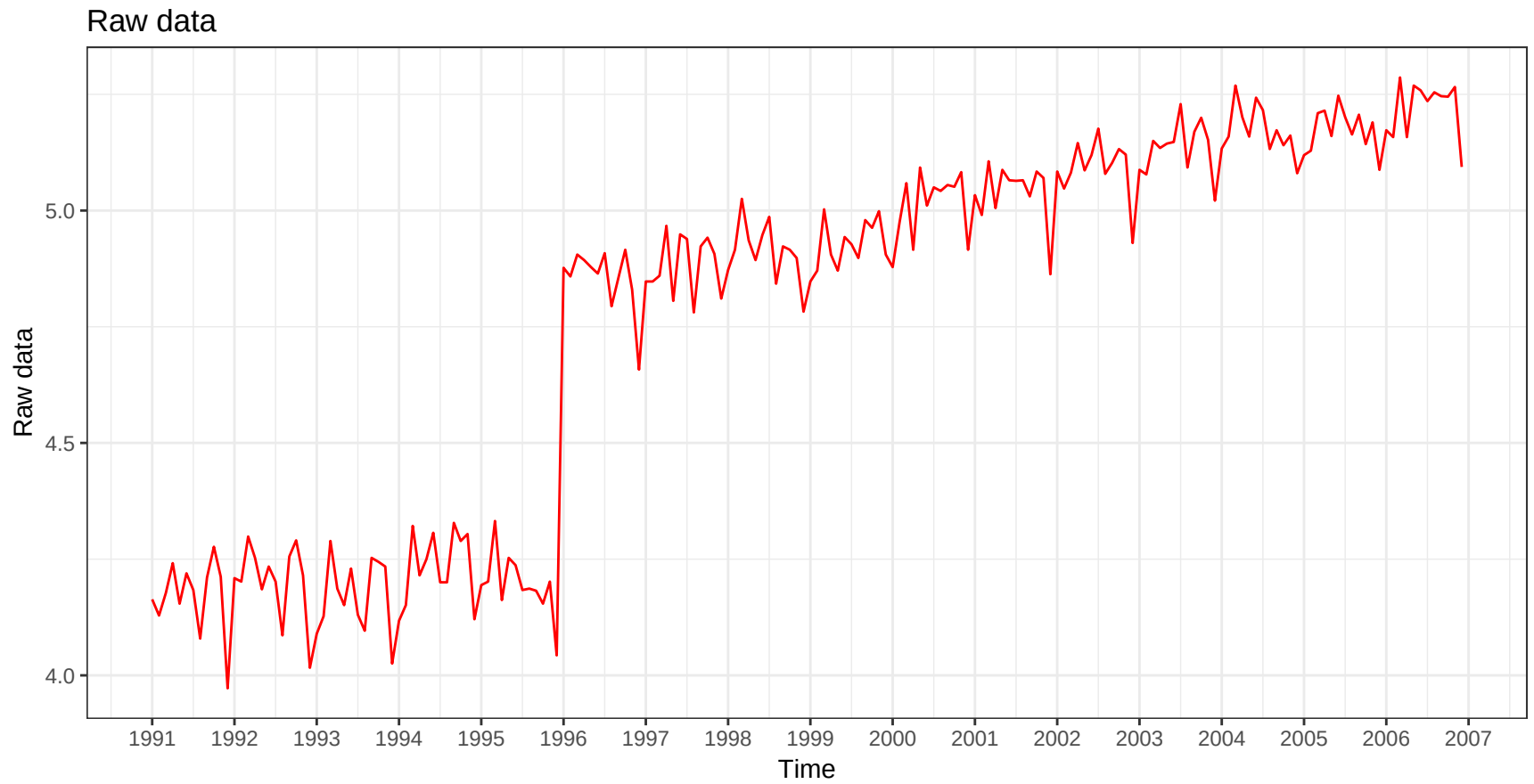


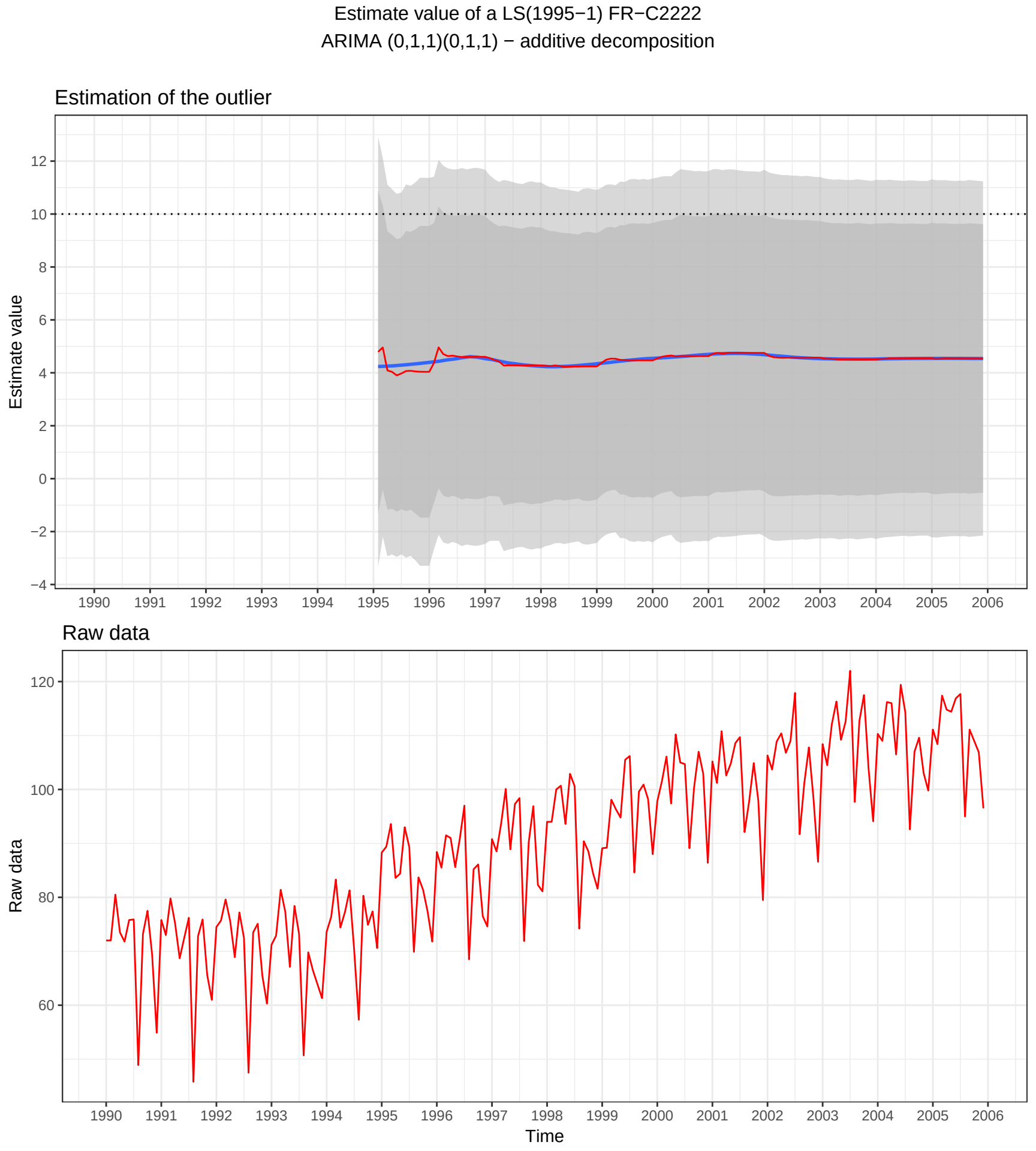



Estimate value of a LS(1995−1) IT−C2221
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
20
15
10
5
0
−5
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
140
120
100
80
60
40
20
Time

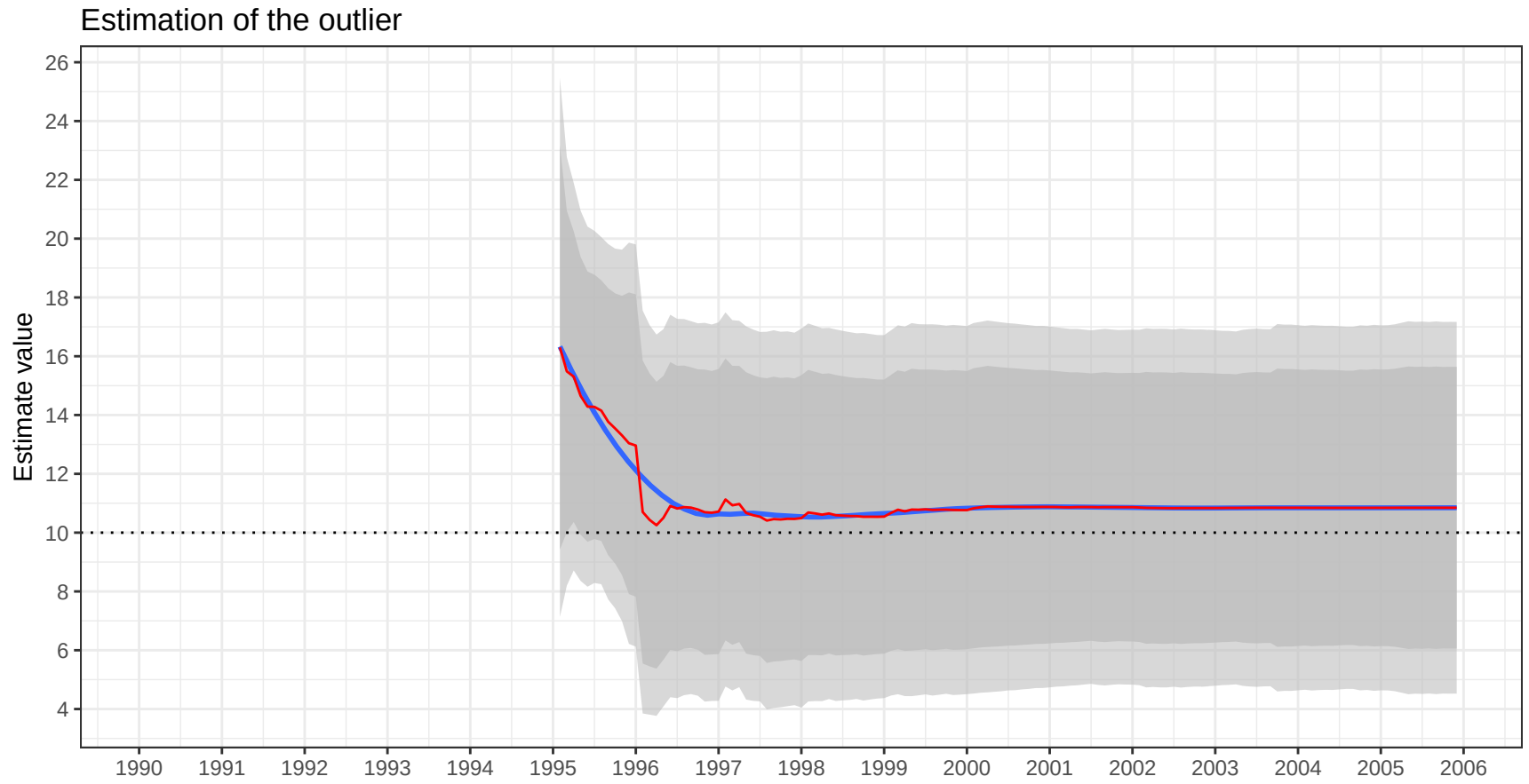
Estimate value of a LS(1996−1) DE−C2222
ARIMA (3,0,0)(0,1,1) − multiplicative decomposition

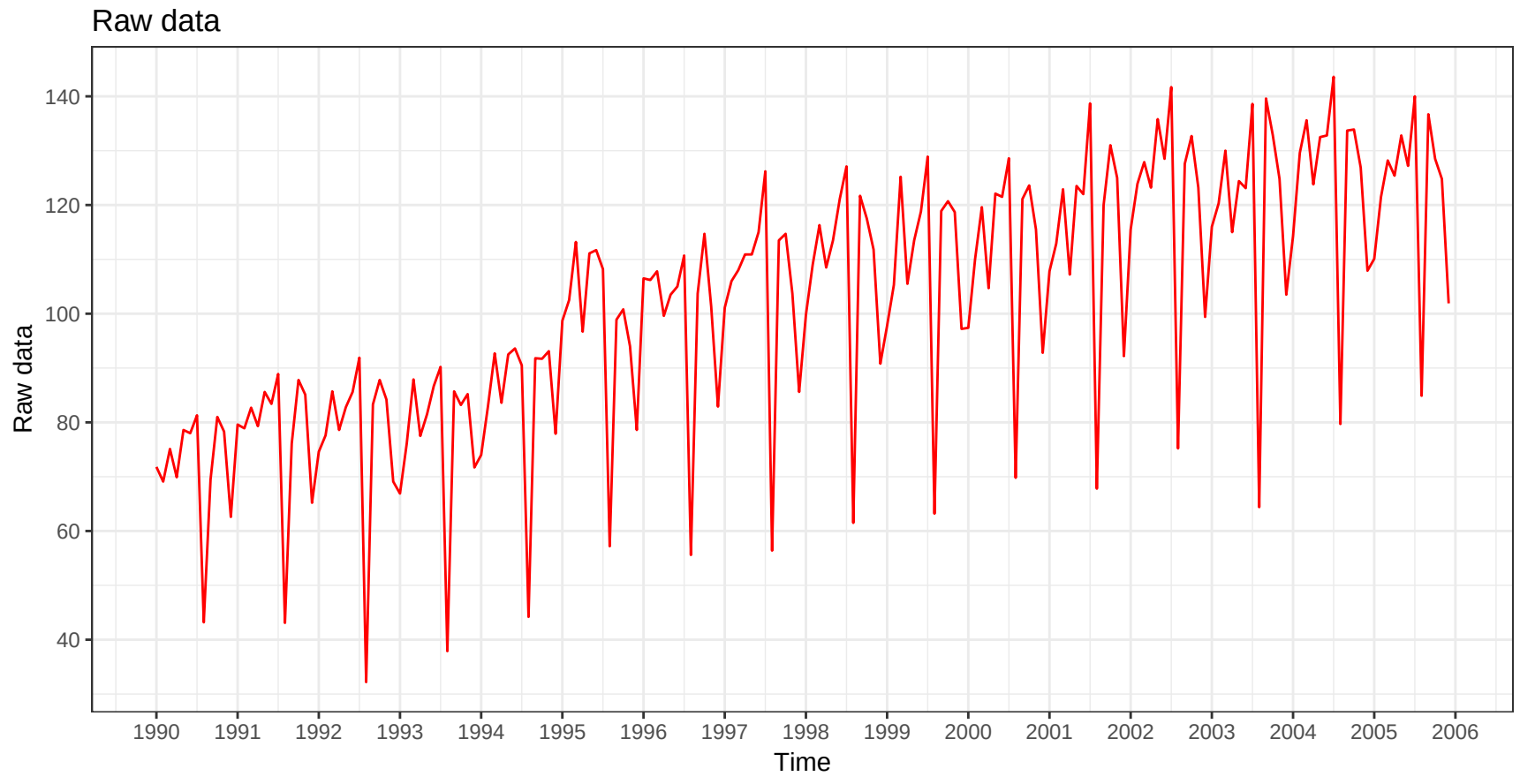




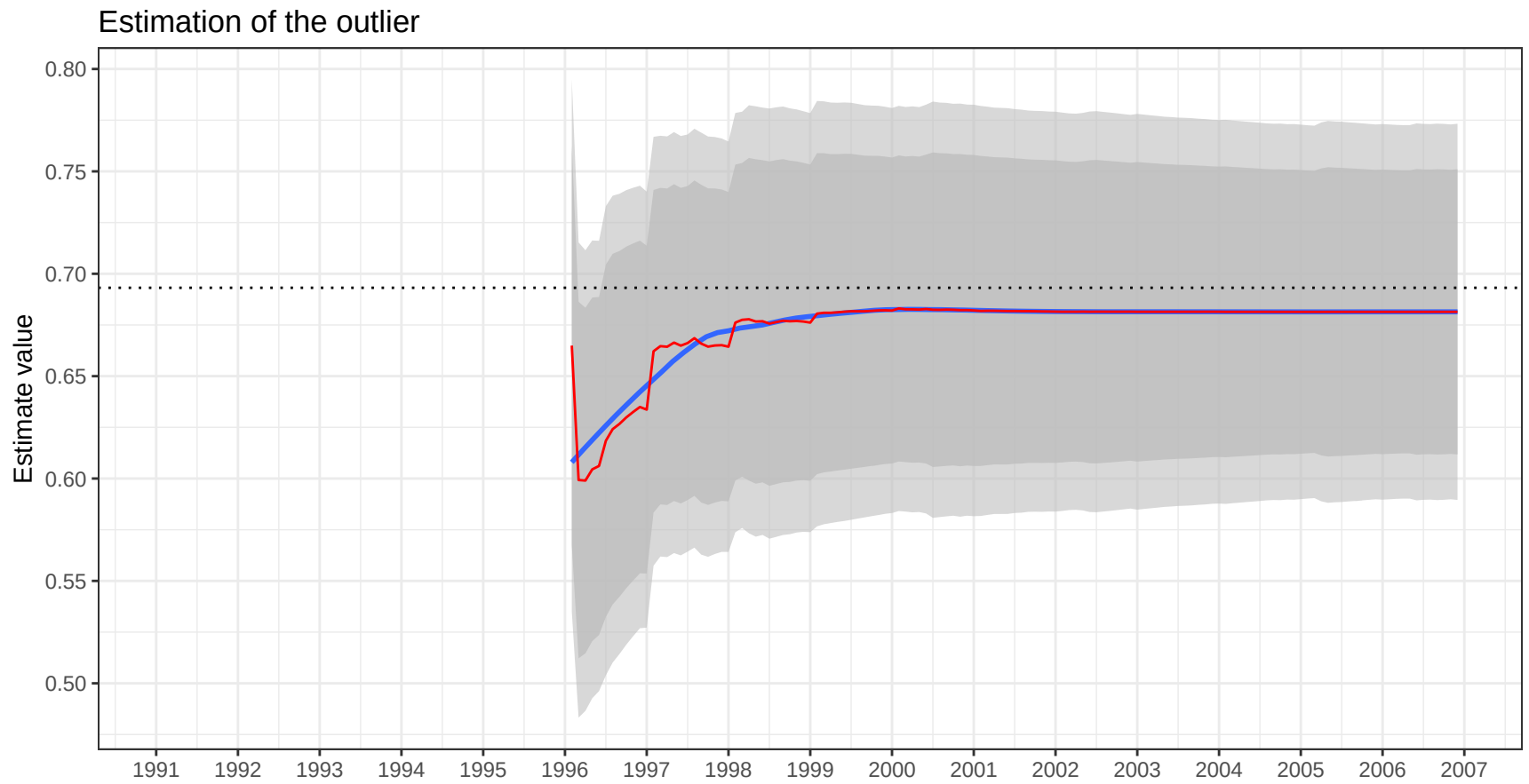

Estimate value of a LS(1995−1) FR−C2222
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
12
10
8
6
4
2
0
−2
−4
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
120
100
80
60
Time

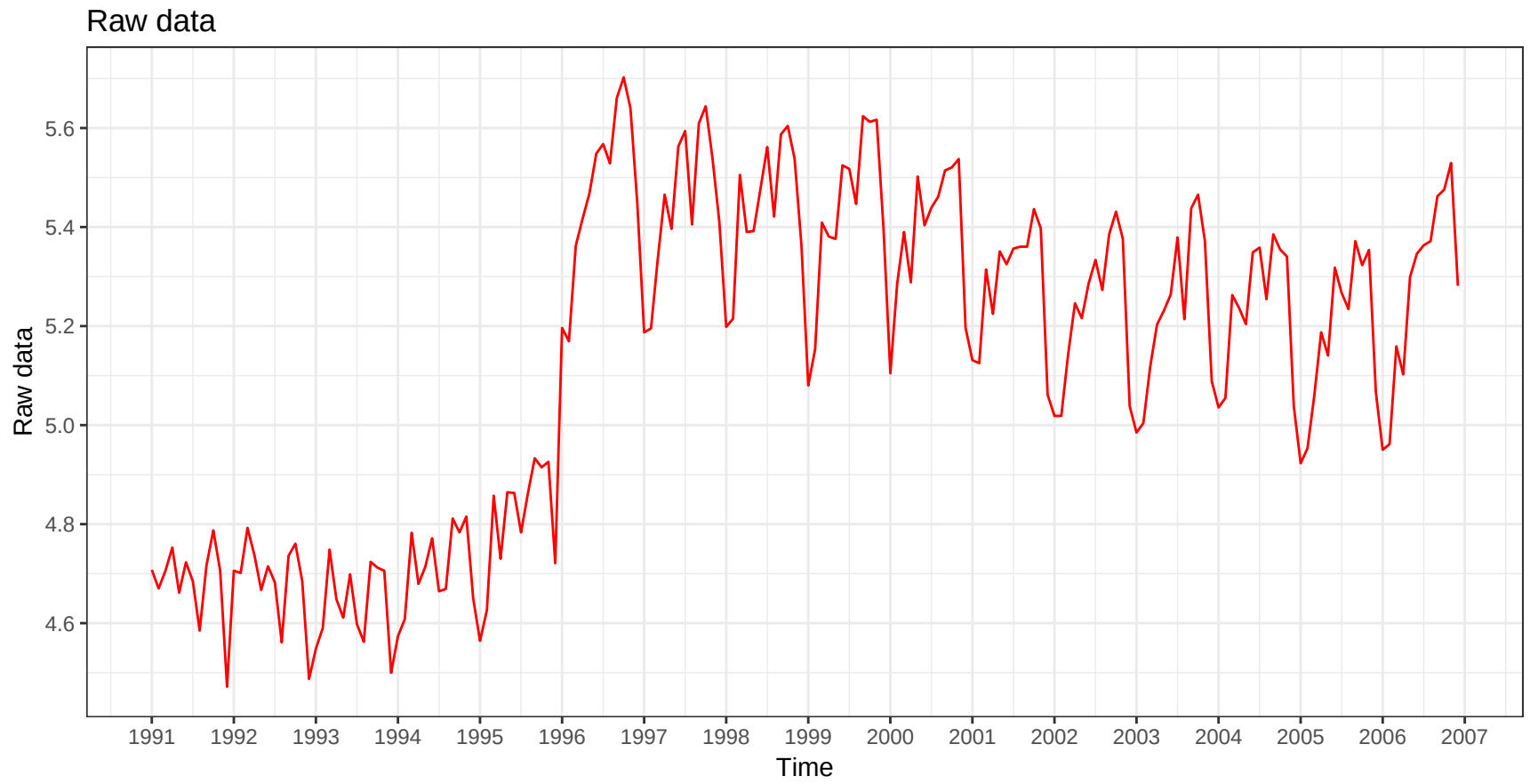
Estimate value of a LS(1995−1) IT−C2222
ARIMA (0,1,1)(0,1,1) − additive decomposition

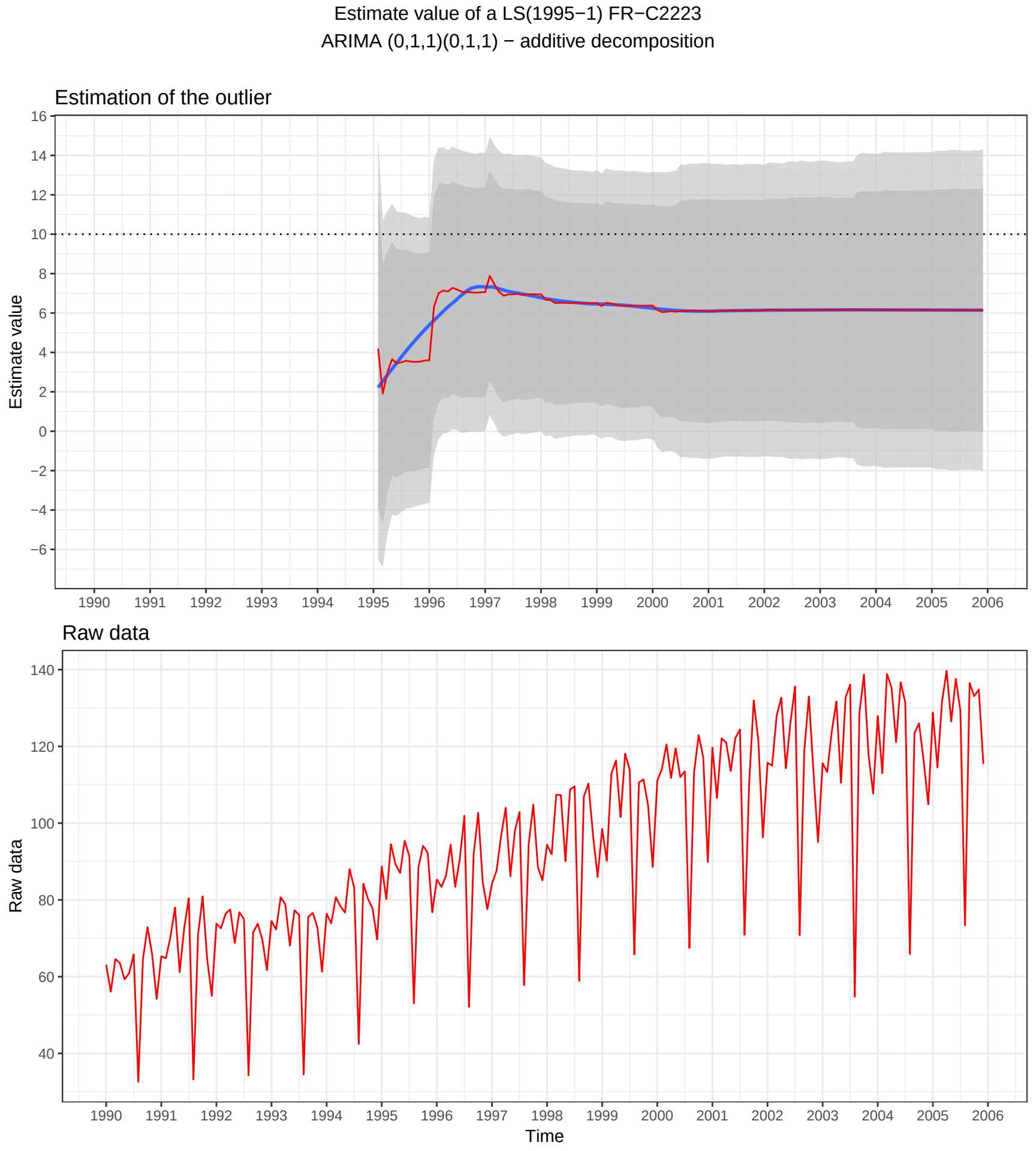




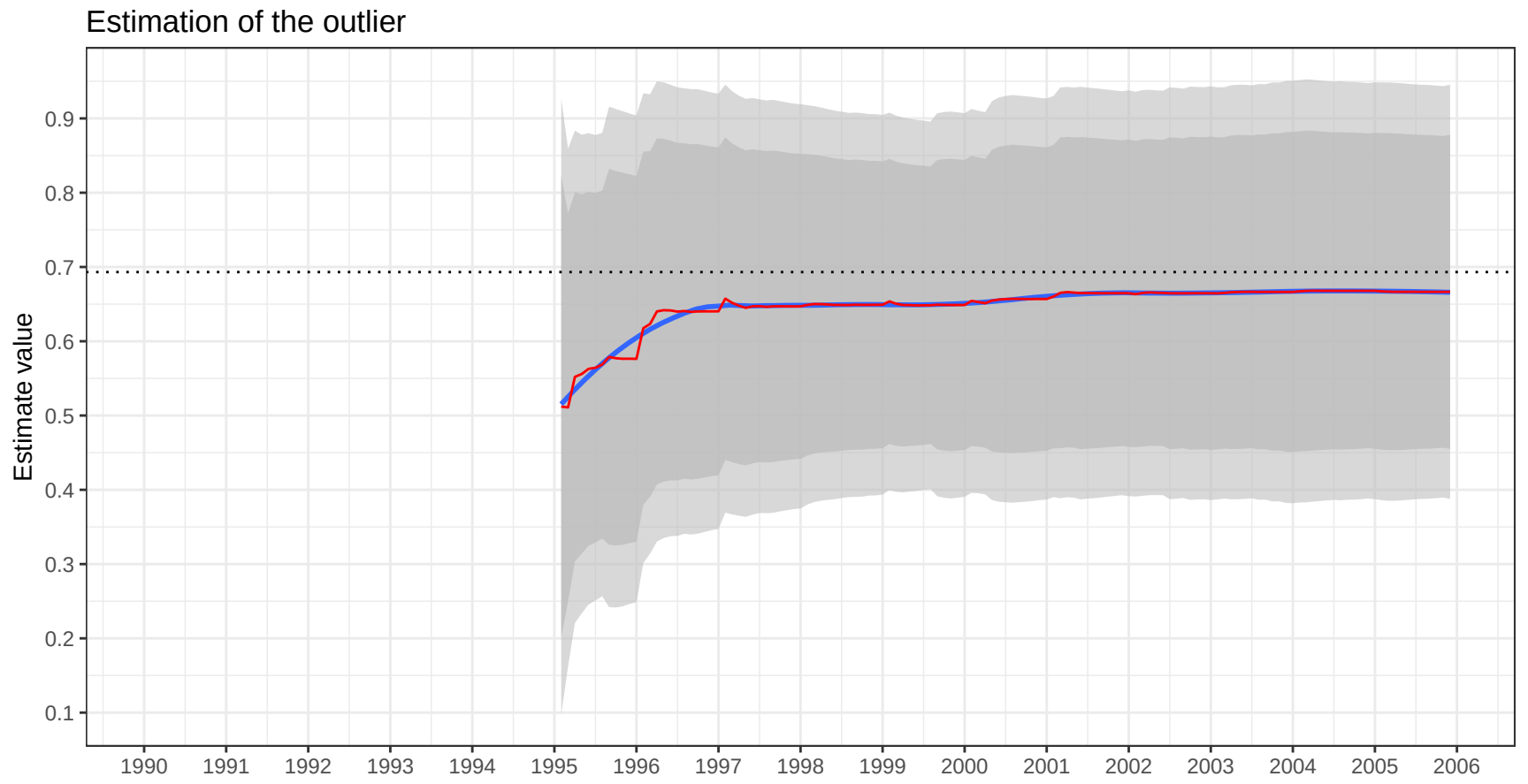
Estimate value of a LS(1996−1) DE−C2223
ARIMA (3,0,0)(0,1,1) − multiplicative decomposition

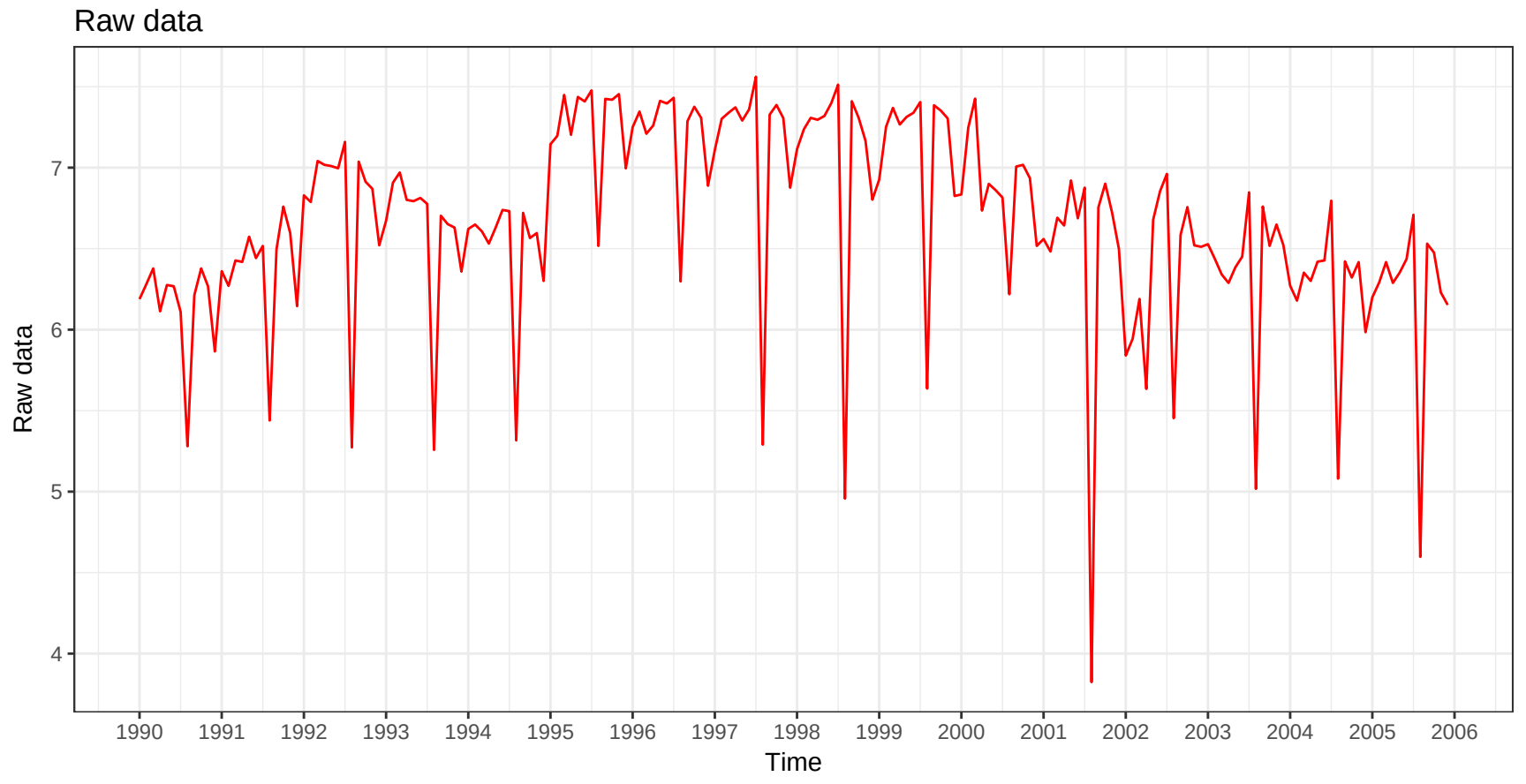




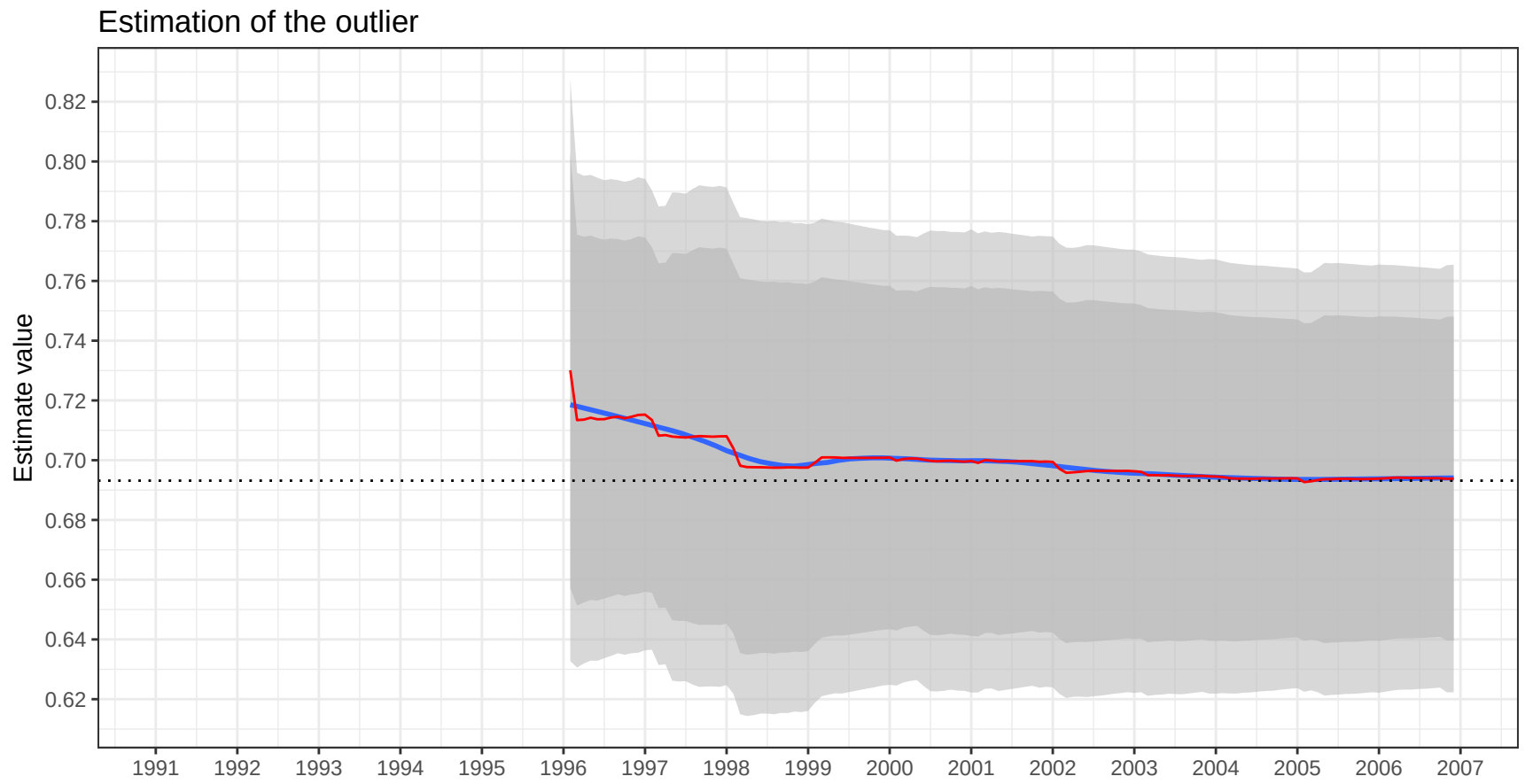

Estimate value of a LS(1995−1) FR−C2223
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
16
14
12
10
8
6
4
2
0
−2
−4
−6
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
140
120
100
80
60
40
Time

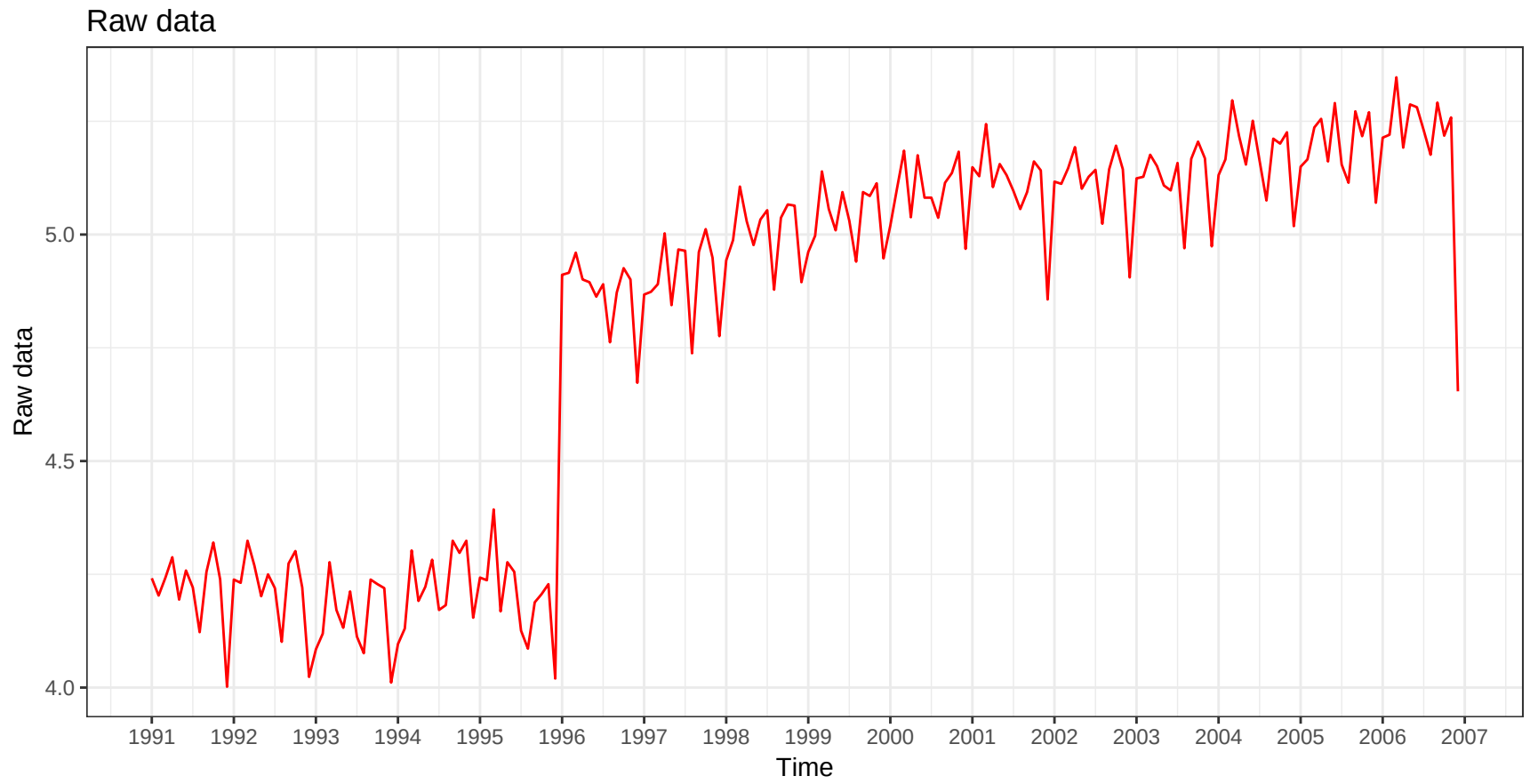
Estimate value of a LS(1995−1) IT−C2223
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition



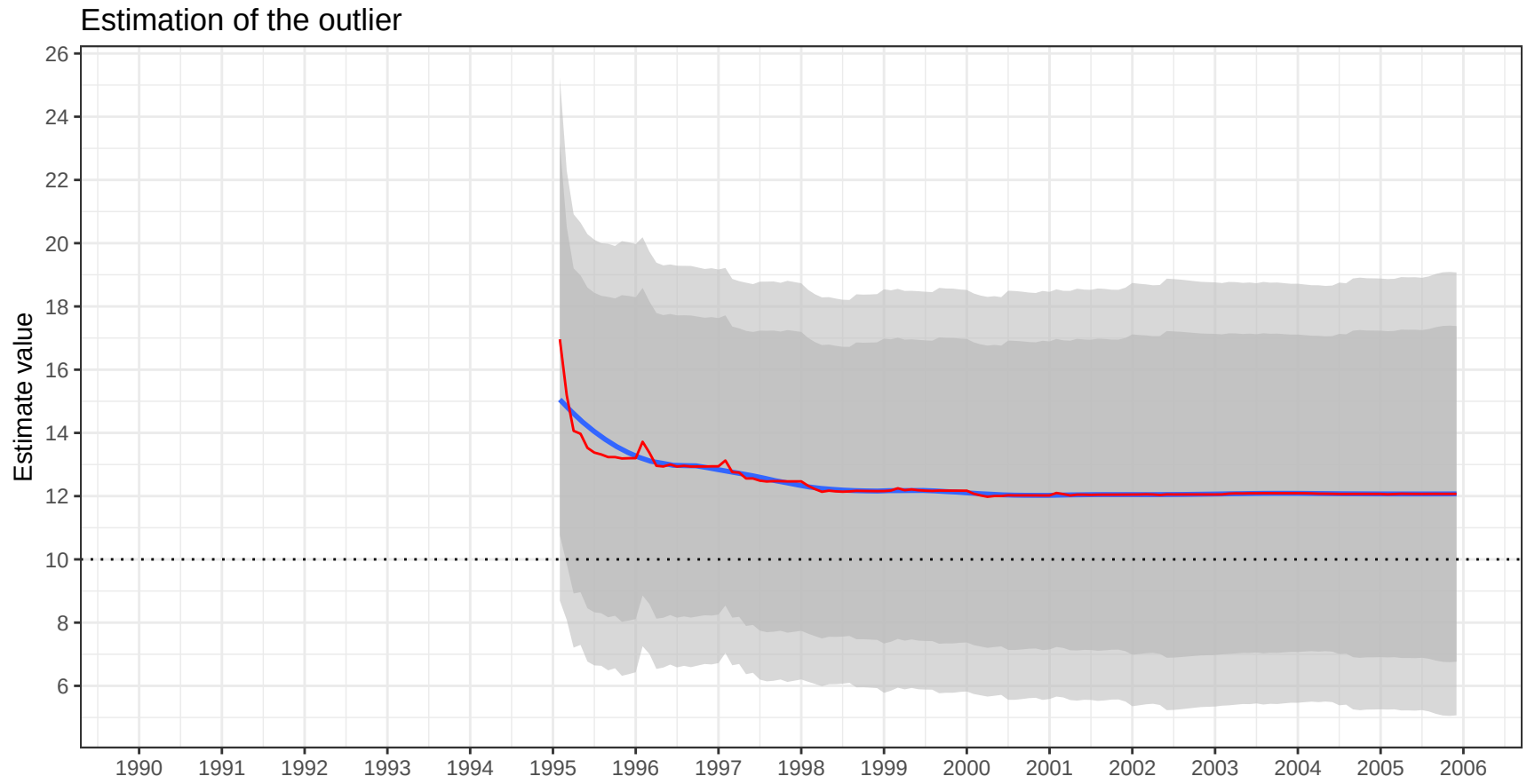


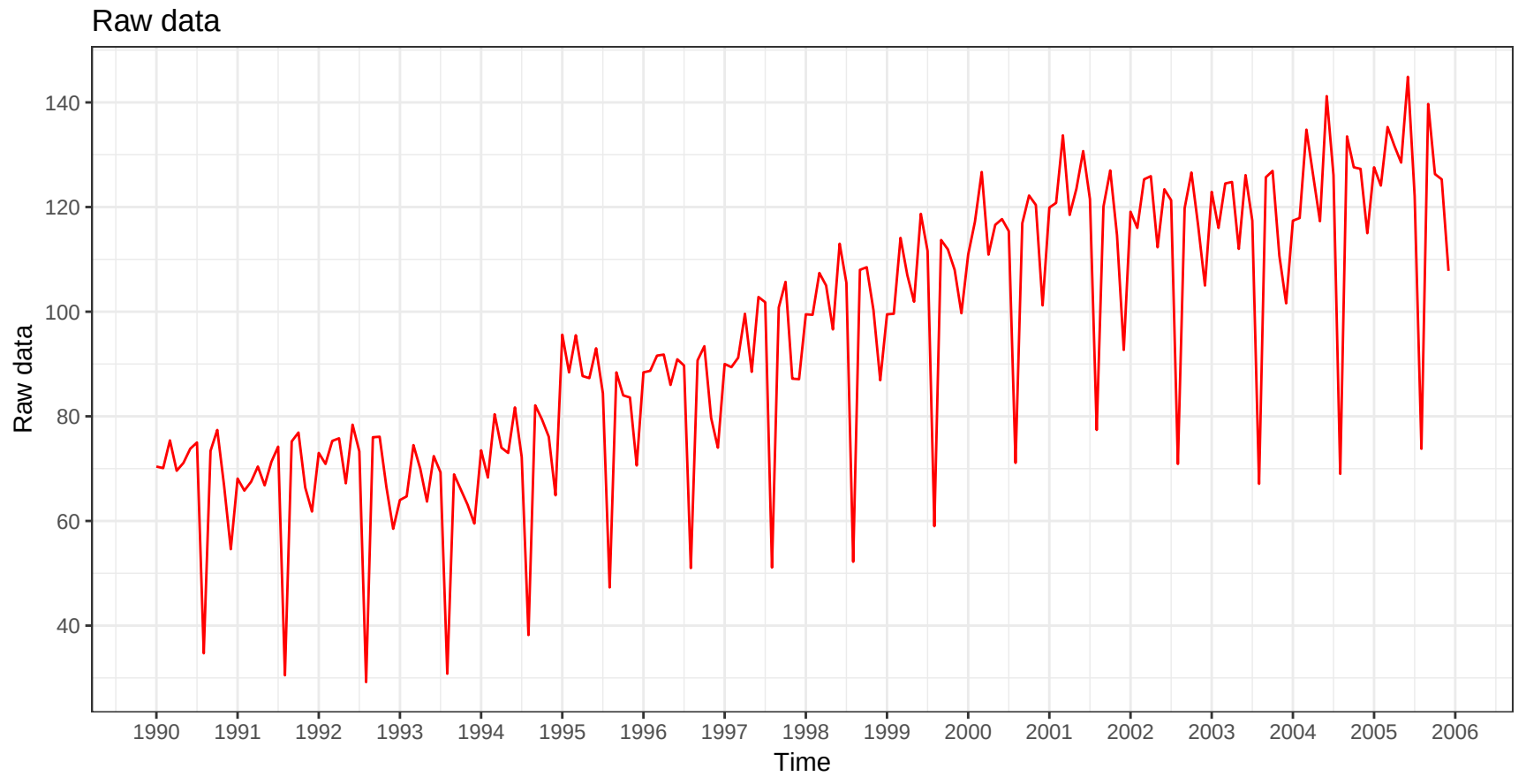
Estimate value of a LS(1996−1) DE−C2229
ARIMA (3,1,1)(0,1,1) − multiplicative decomposition



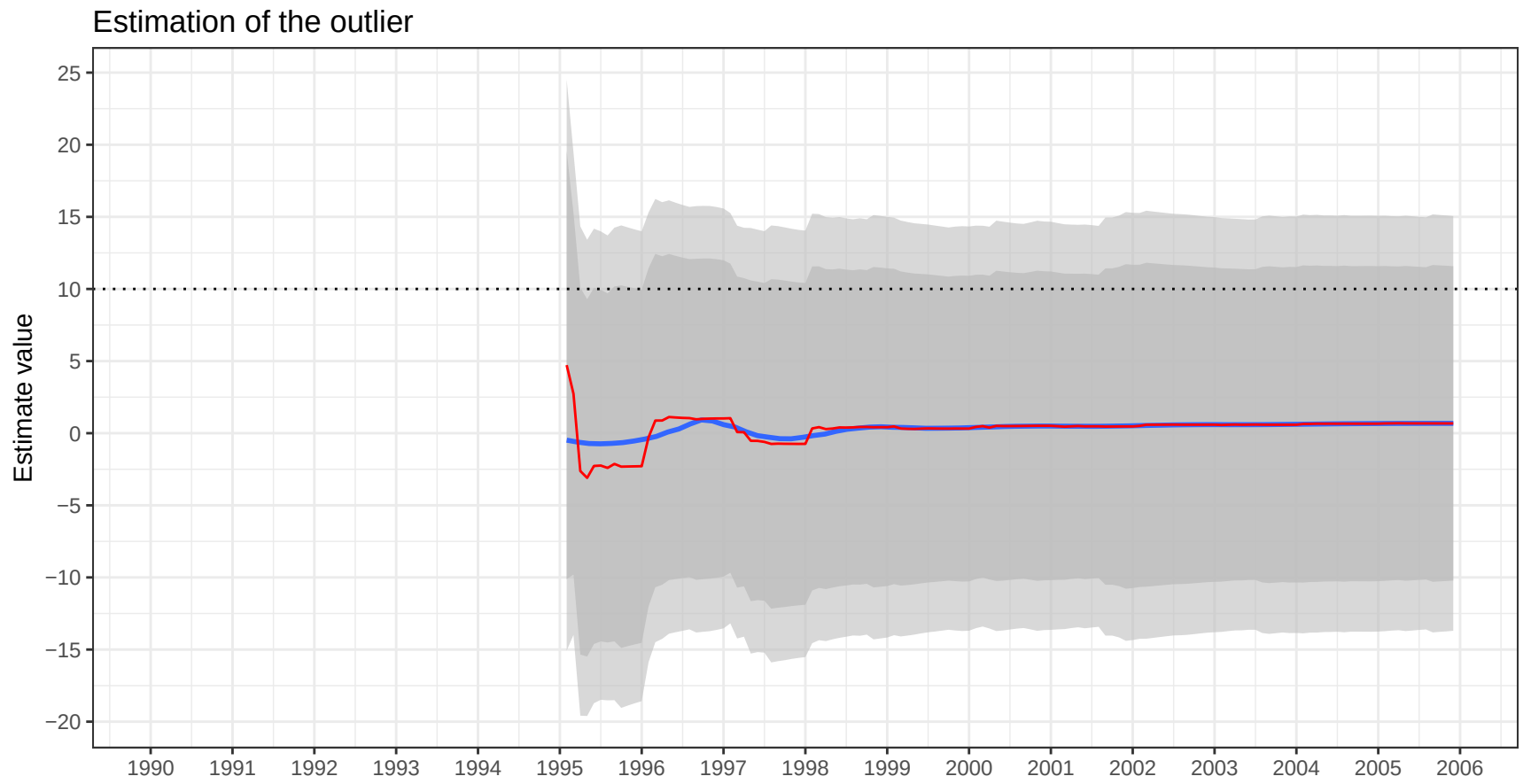


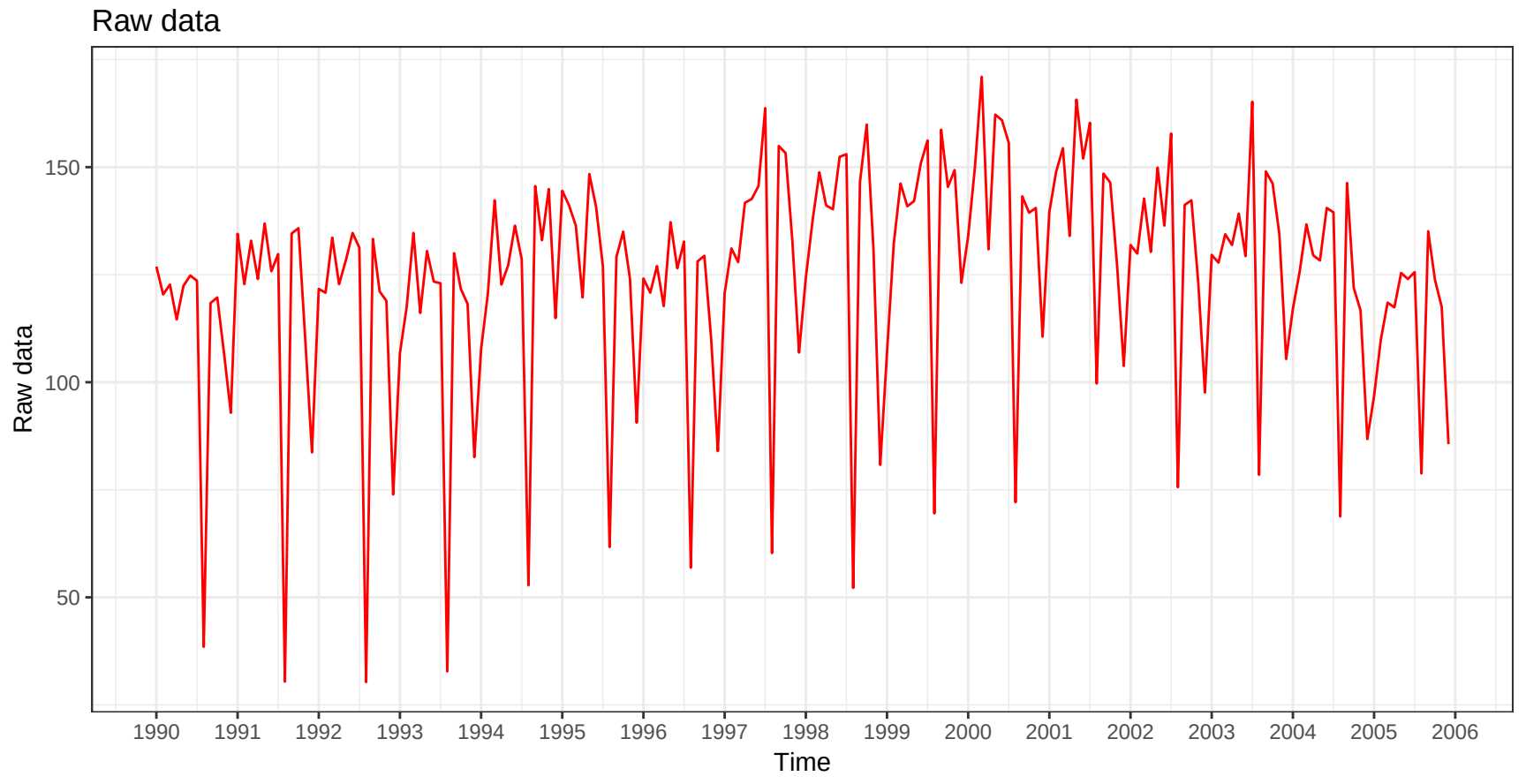
Estimate value of a LS(1995−1) FR−C2229
ARIMA (0,1,1)(0,1,1) − additive decomposition

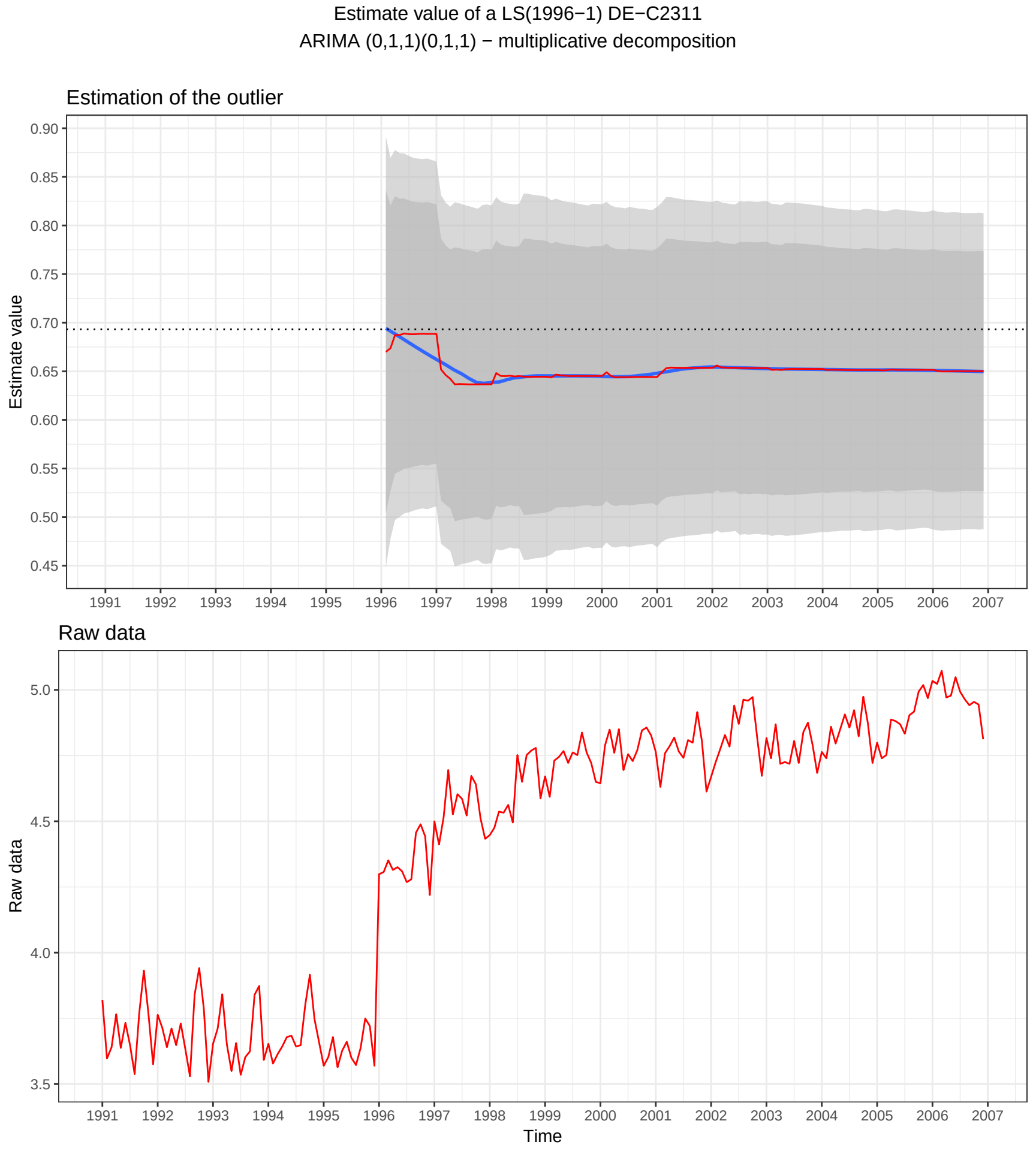




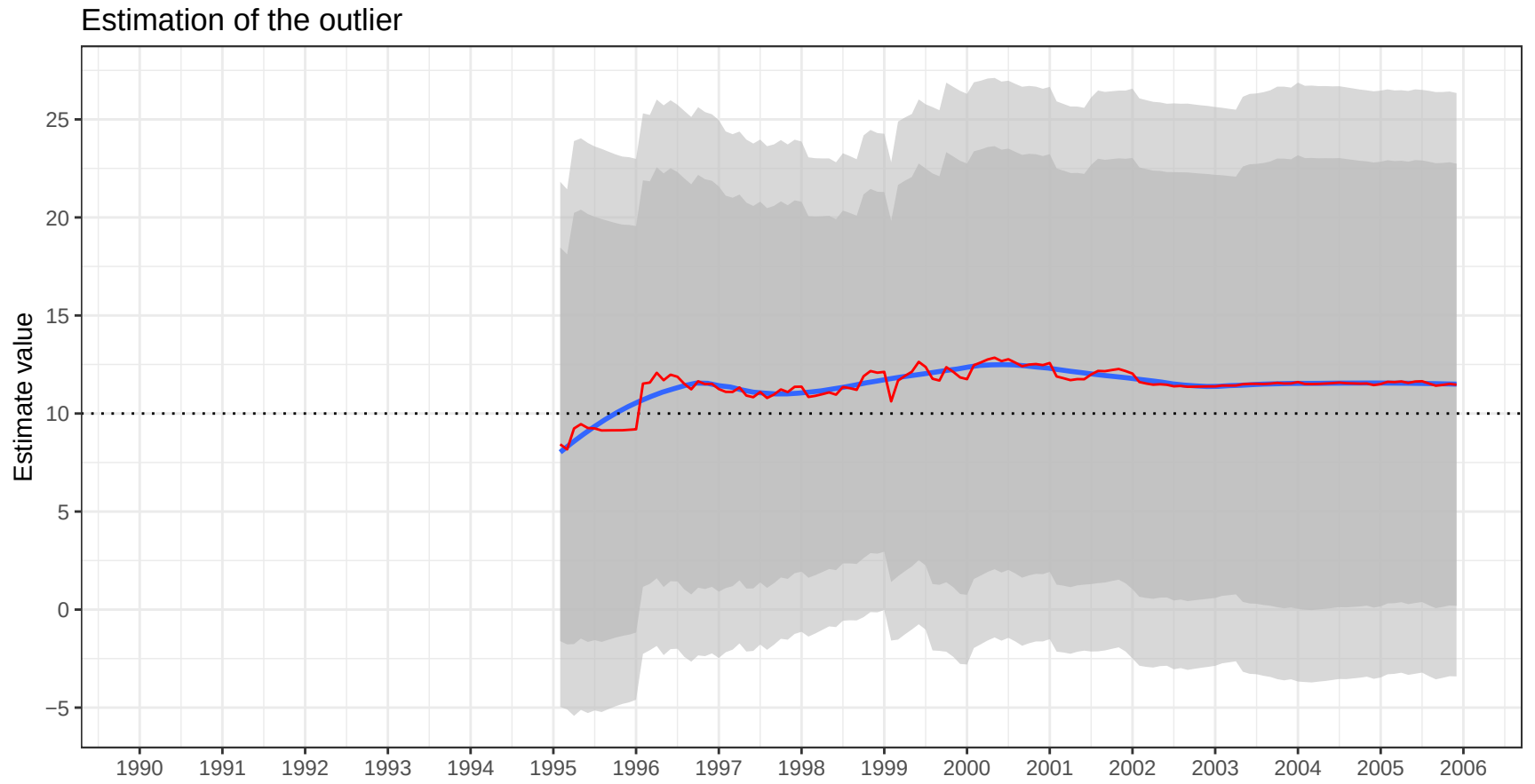
Estimate value of a LS(1995−1) IT−C2229
ARIMA (0,1,1)(0,1,1) − additive decomposition

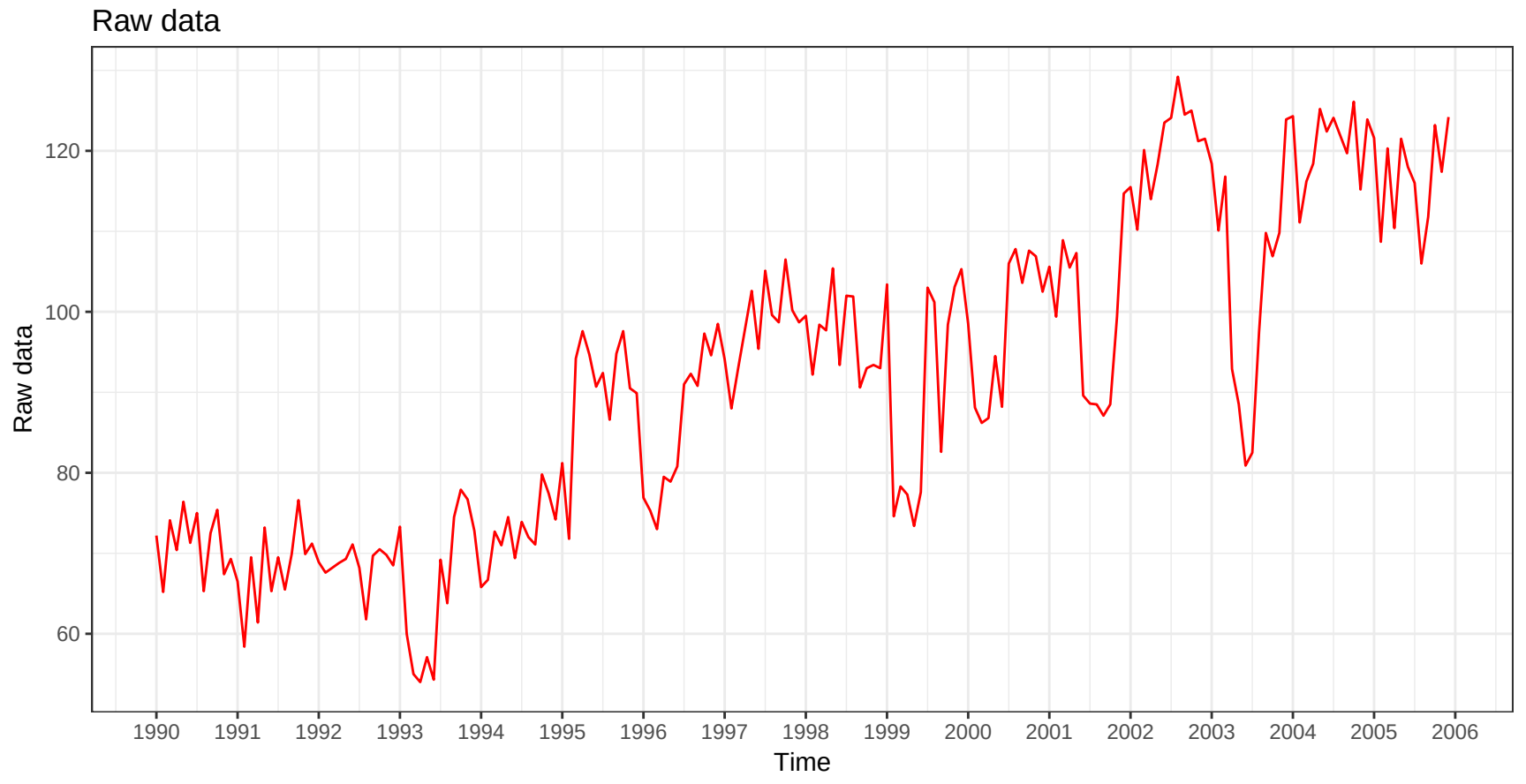


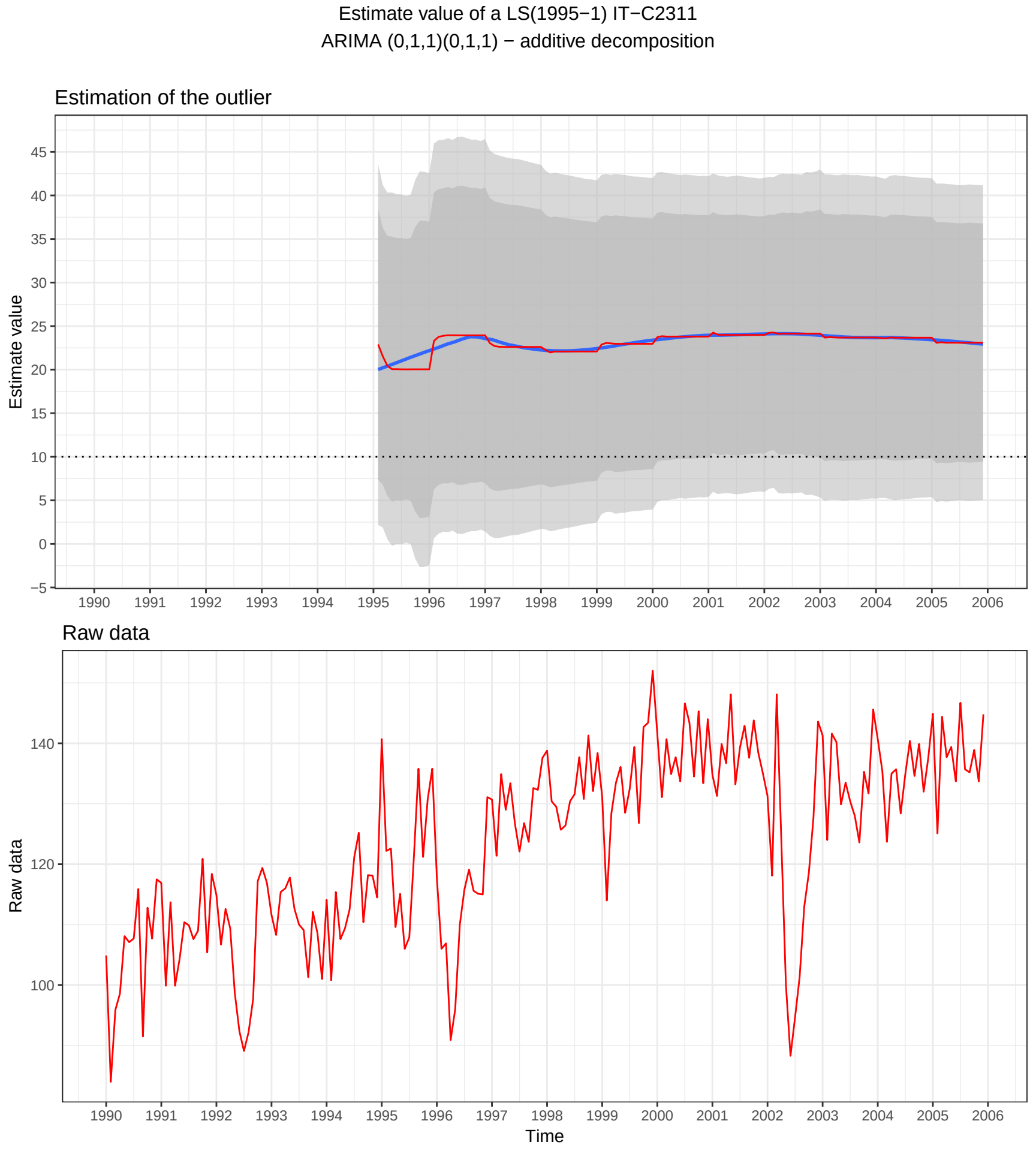



Estimate value of a LS(1996−1) DE−C2311
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
0.45
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
5.0
4.5
4.0
3.5
Time

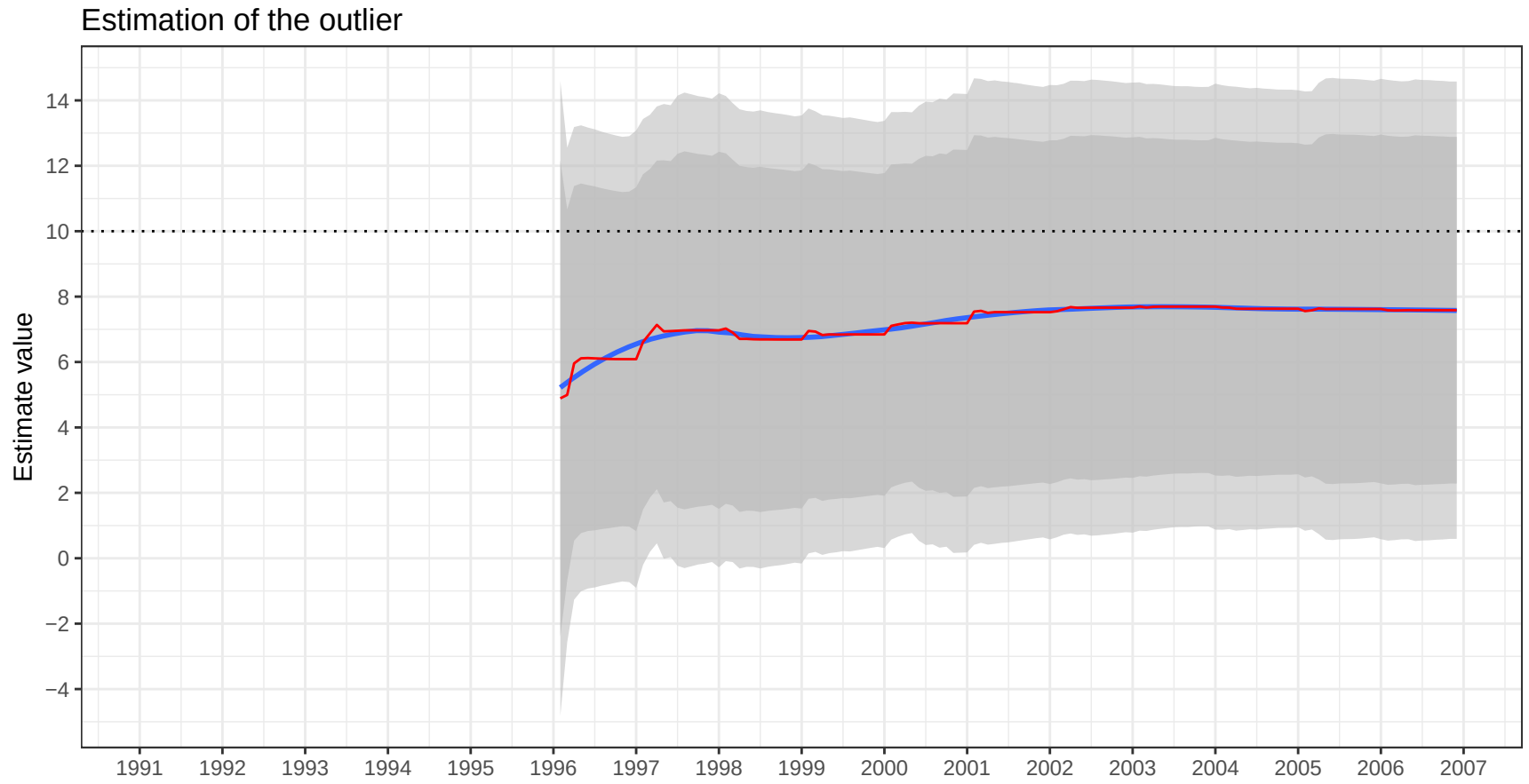
Estimate value of a LS(1995−1) FR−C2311
ARIMA (1,1,1)(0,1,1) − additive decomposition

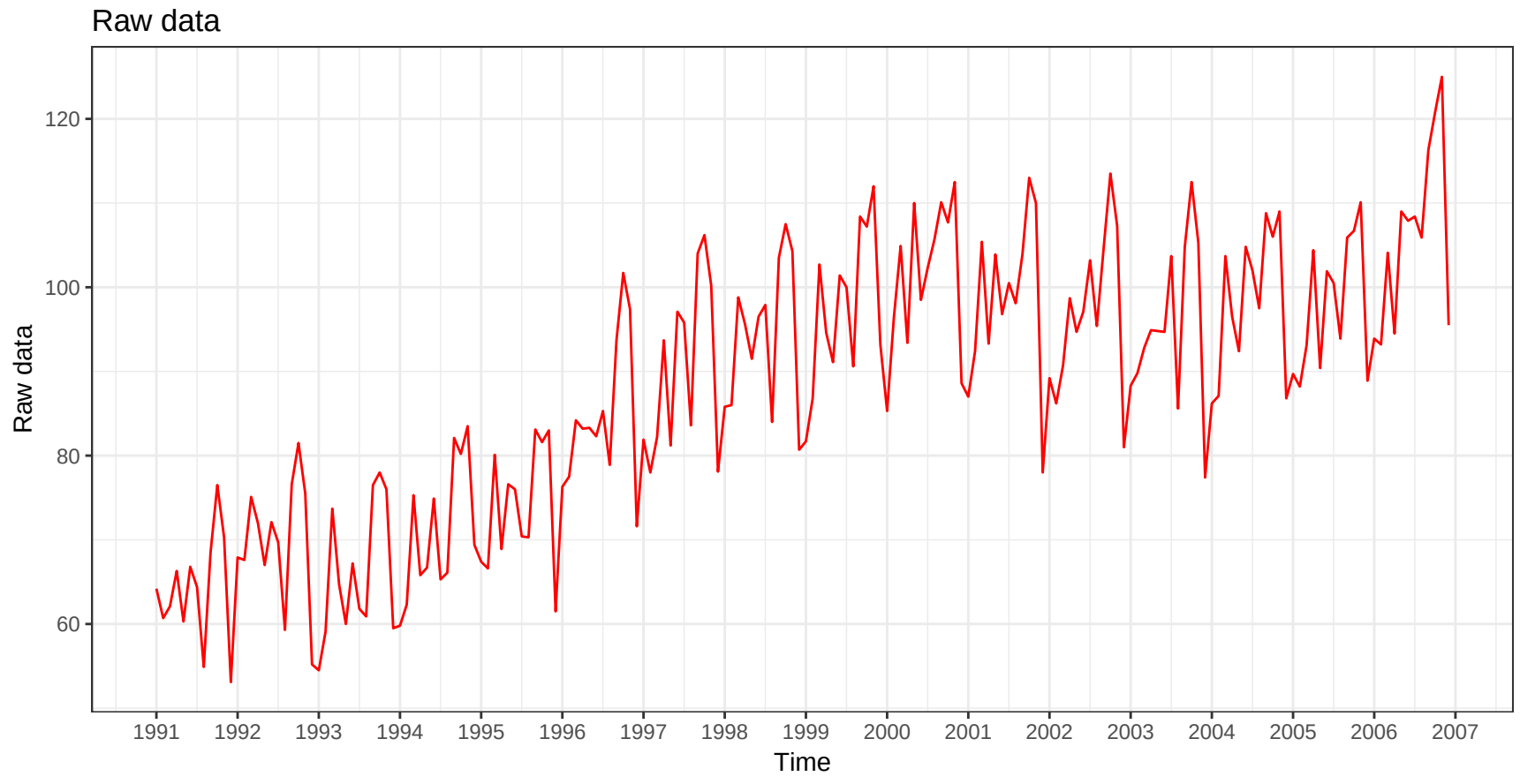


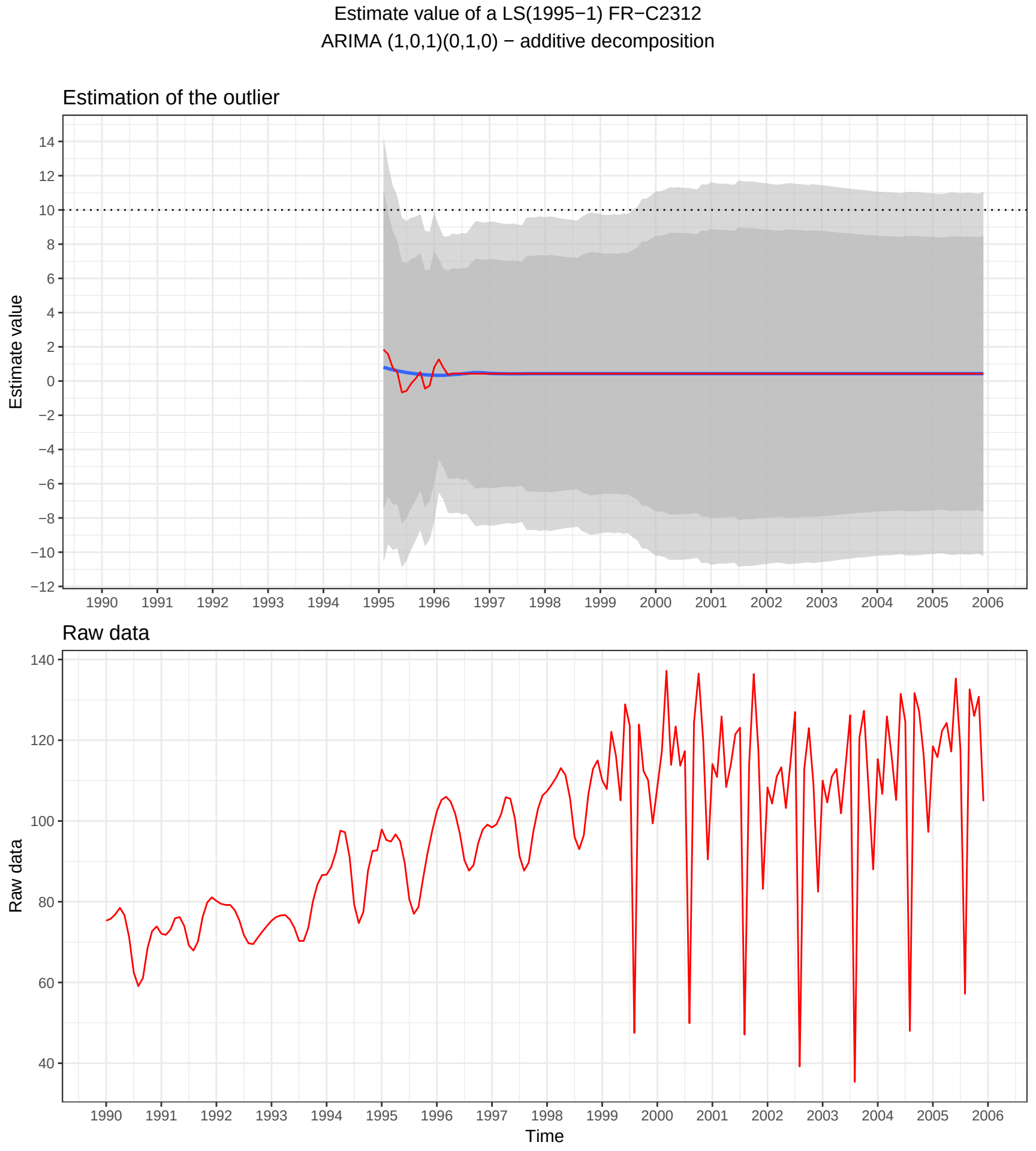


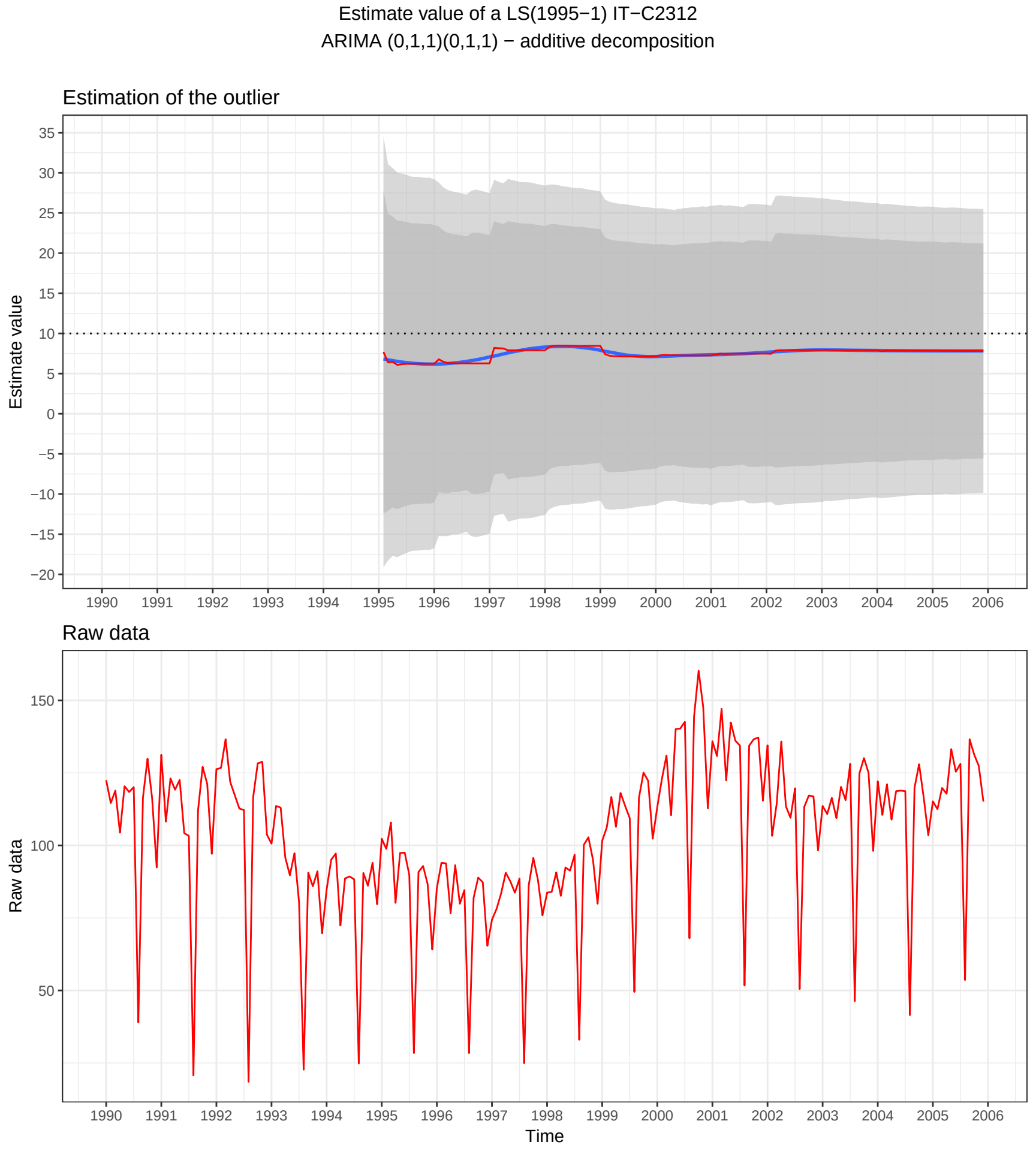

Estimate value of a LS(1995−1) IT−C2311
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
45
40
35
30
25
20
15
10
5
0
−5
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
140
120
100
Time

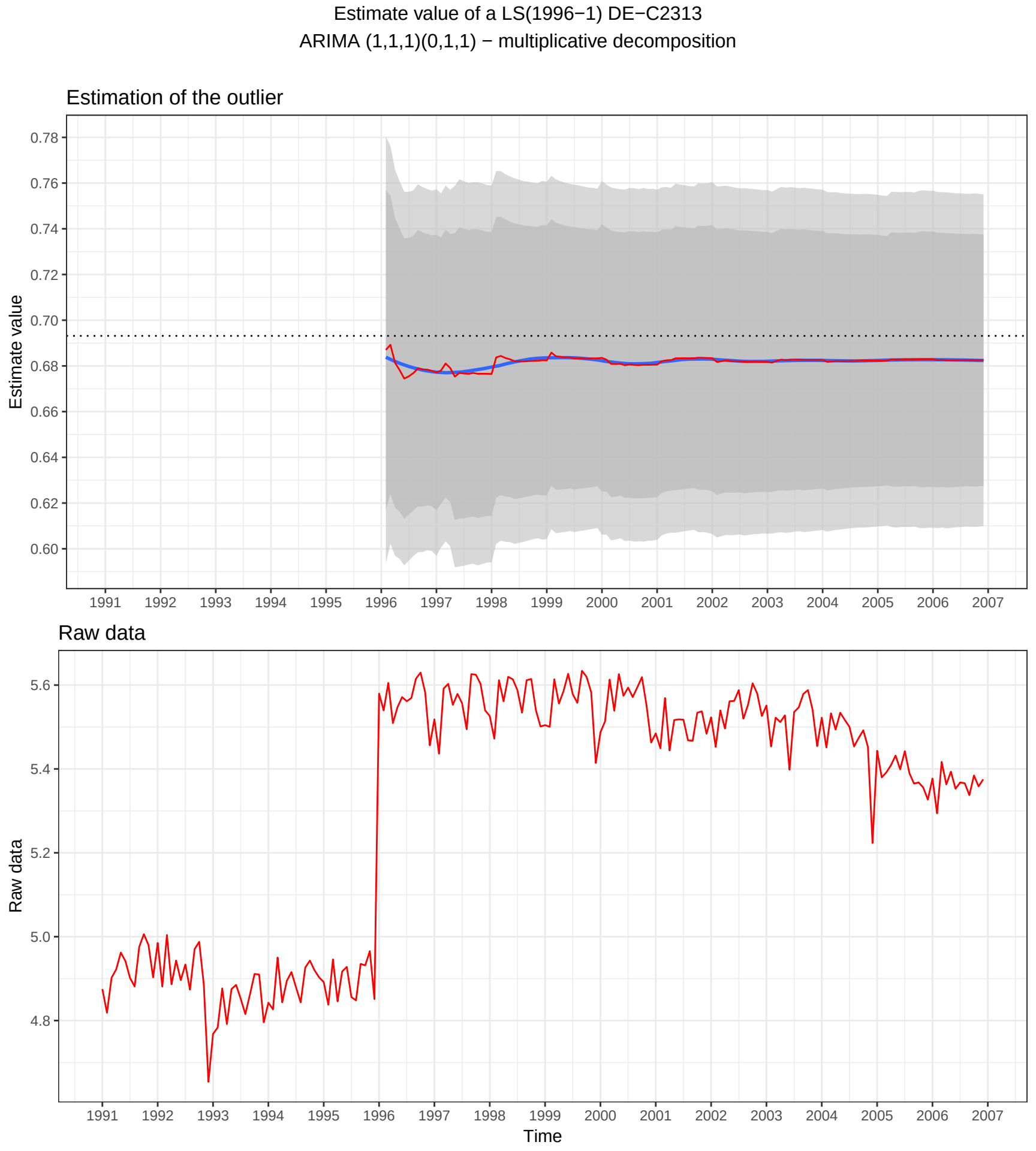
Estimate value of a LS(1996−1) DE−C2312
ARIMA (0,1,2)(0,1,1) − additive decomposition

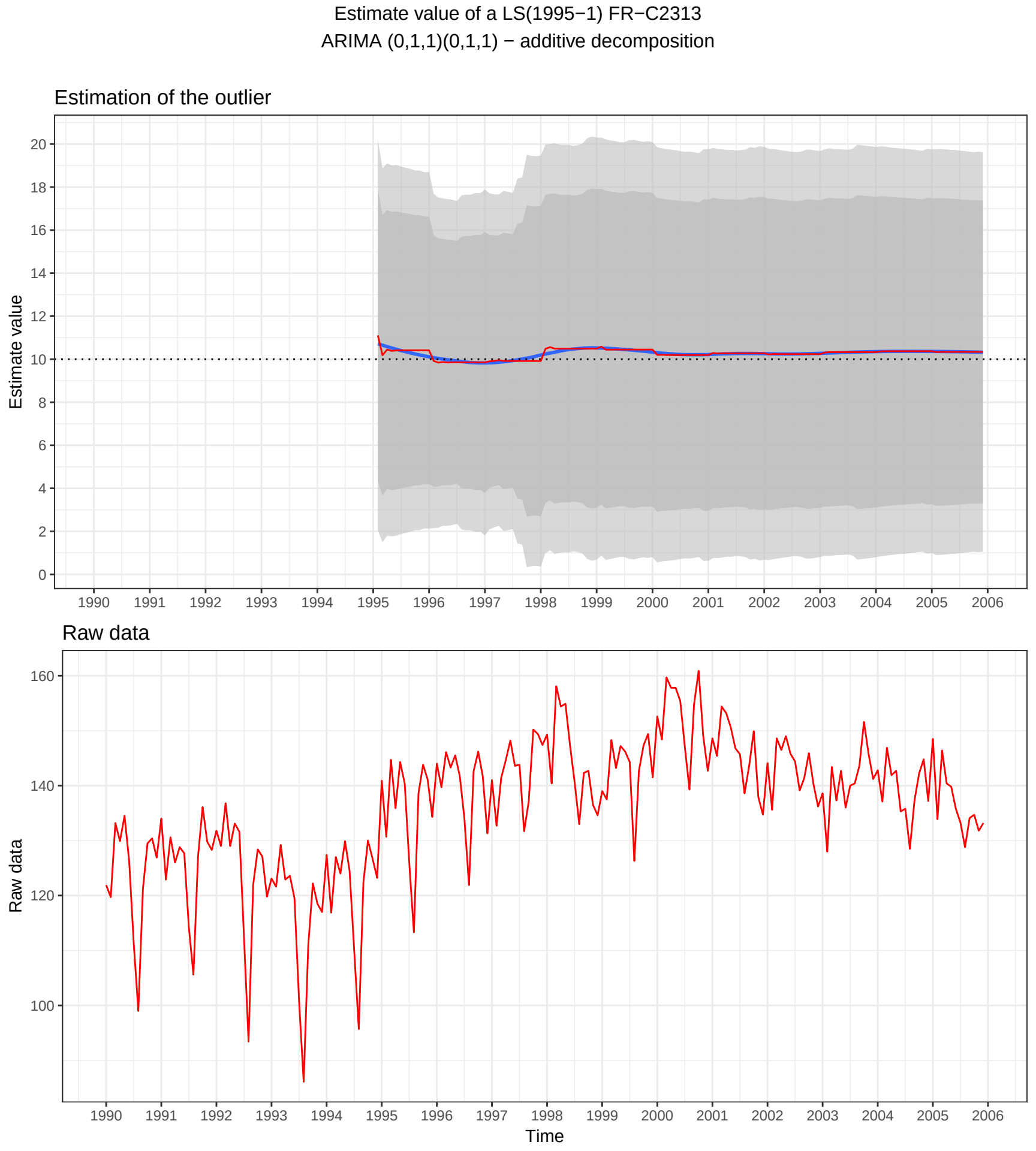


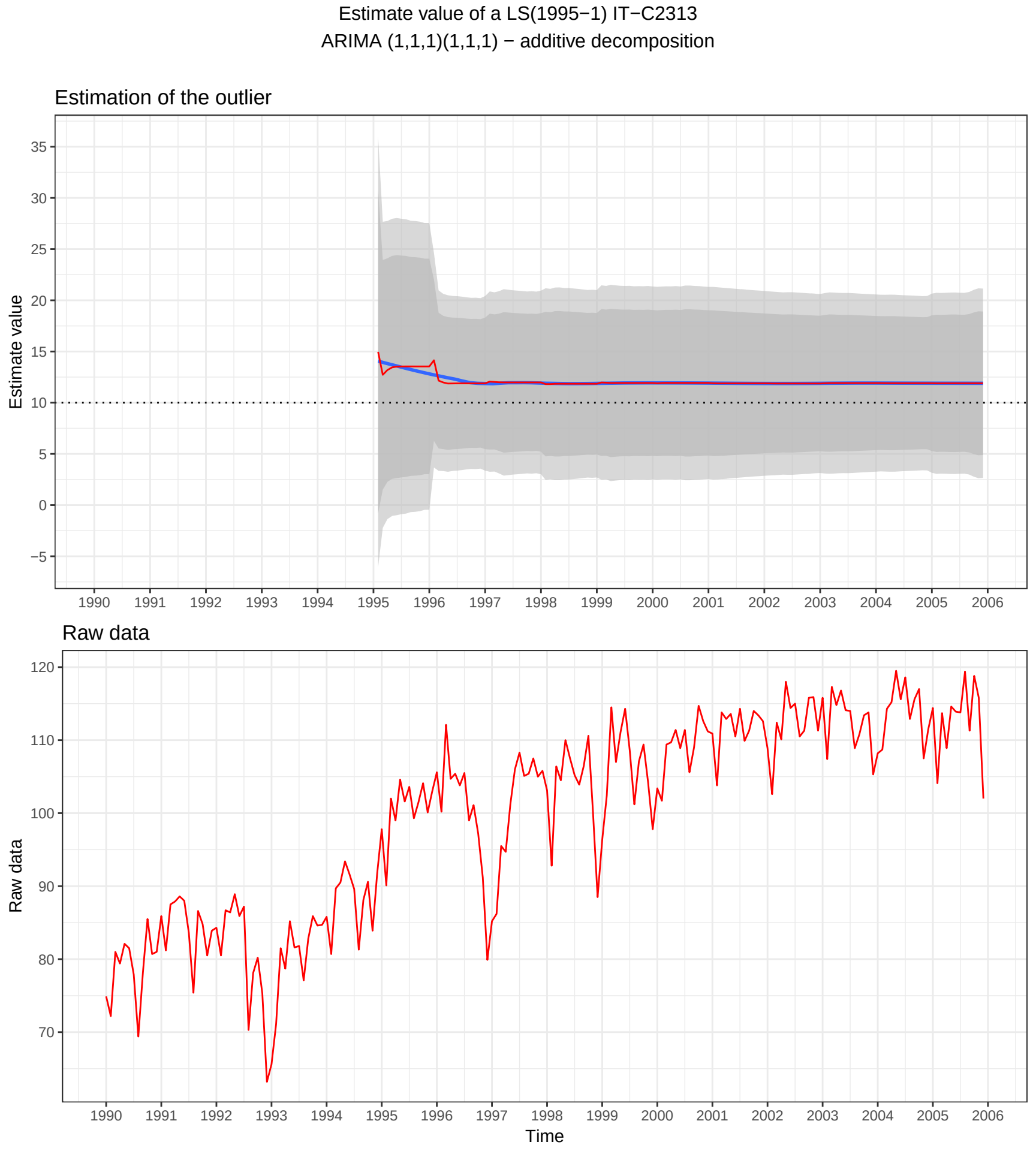


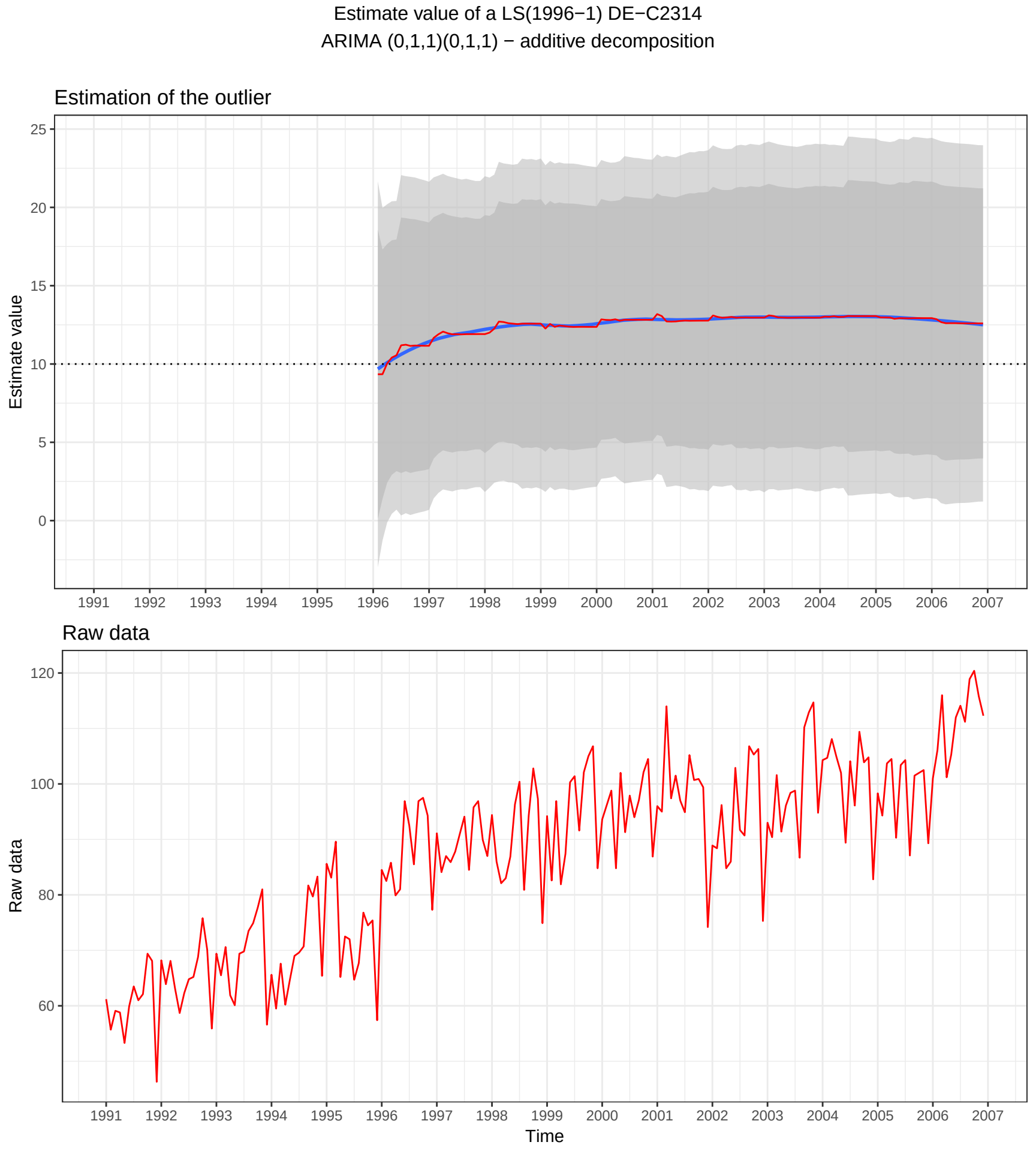

Estimate value of a LS(1995−1) FR−C2312
ARIMA (1,0,1)(0,1,0) − additive decomposition
Estimation of the outlier
Estimate value
14
12
10
8
6
4
2
0
−2
−4
−6
−8
−10
−12
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
140
120
100
80
60
40
Time

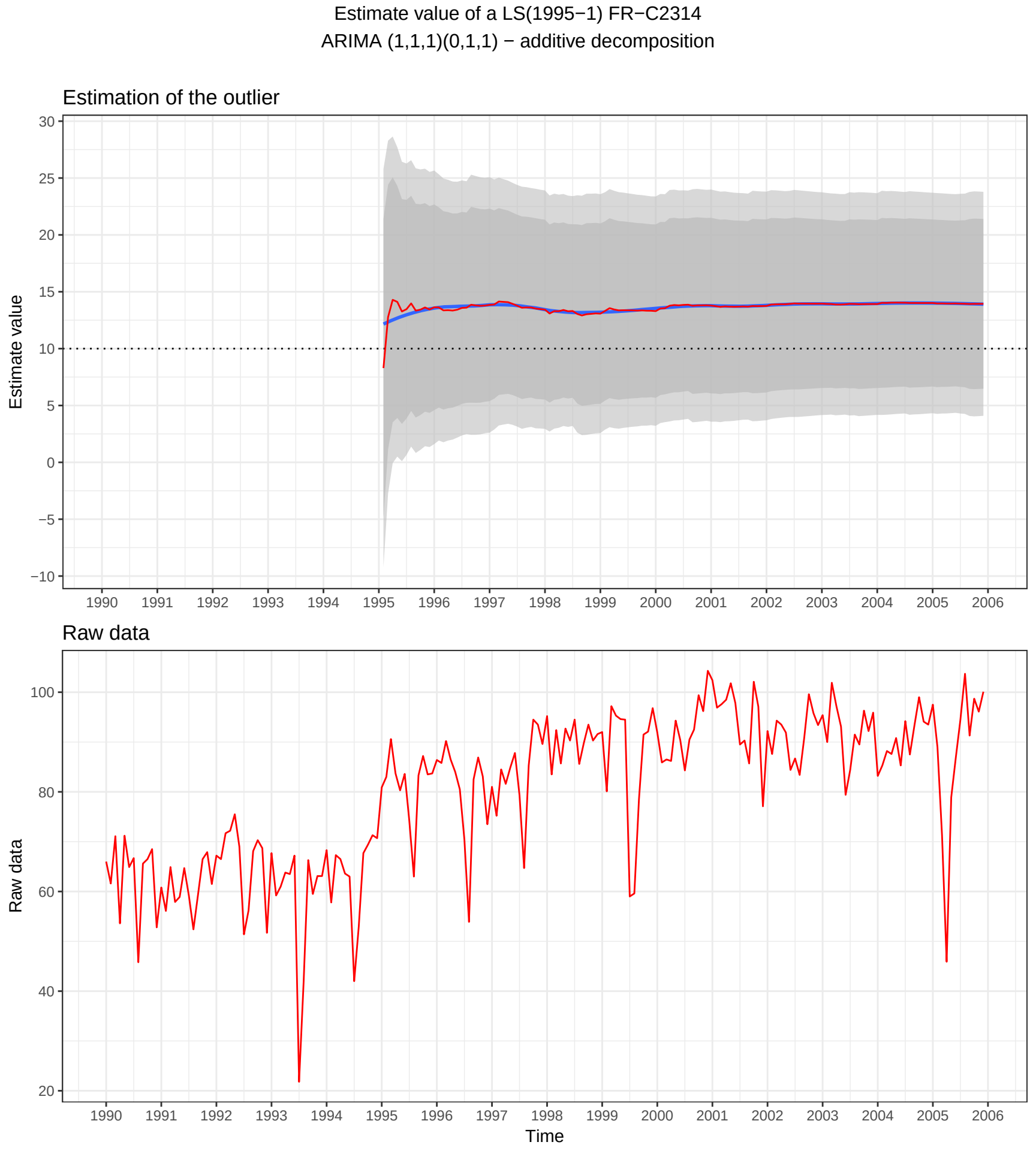

Estimate value of a LS(1995−1) IT−C2312
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
35
30
25
20
15
10
5
0
−5
−10
−15
−20
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
150
100
50
Time


Estimate value of a LS(1996−1) DE−C2313
ARIMA (1,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.78
0.76
0.74
0.72
0.70
0.68
0.66
0.64
0.62
0.60
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
5.6
5.4
5.2
5.0
4.8
Time

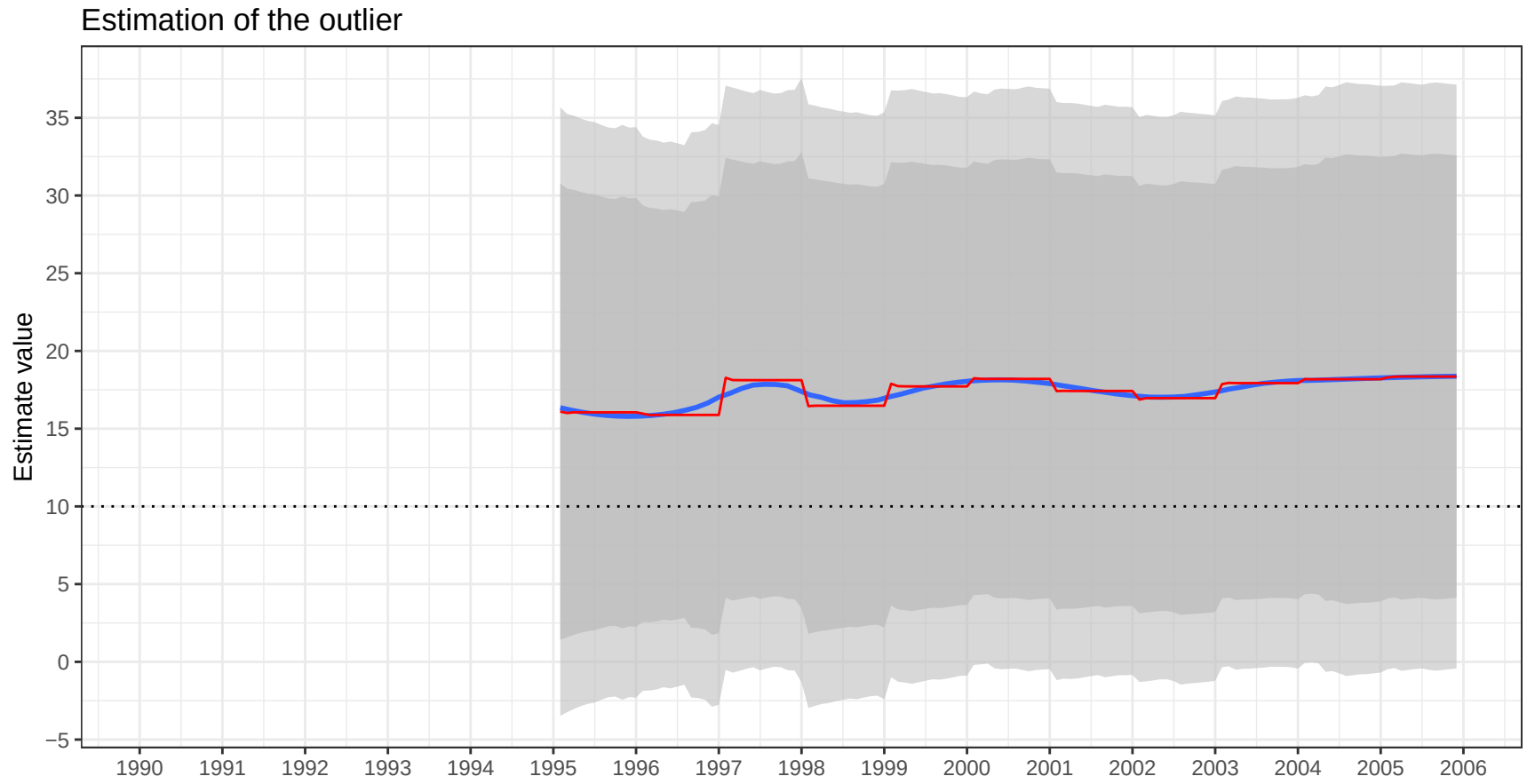

Estimate value of a LS(1995−1) FR−C2313
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
20
18
16
14
12
10
8
6
4
2
0
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
160
140
120
100
Time

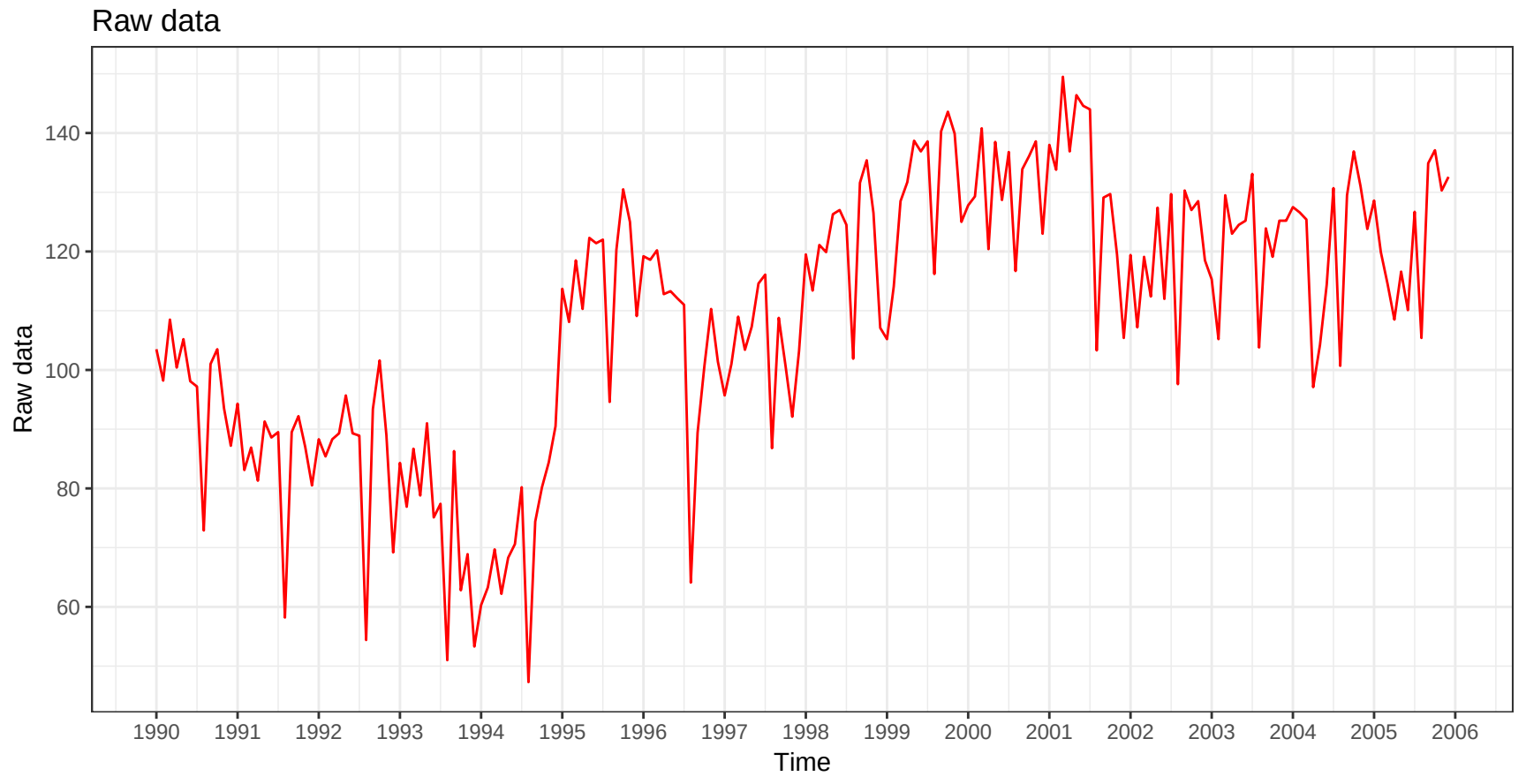

Estimate value of a LS(1995−1) IT−C2313
ARIMA (1,1,1)(1,1,1) − additive decomposition
Estimation of the outlier
Estimate value
35
30
25
20
15
10
5
0
−5
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
120
110
100
90
80
70
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Time


Estimate value of a LS(1996−1) DE−C2314
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
25
20
15
10
5
0
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
120
100
80
60
Time


Estimate value of a LS(1995−1) FR−C2314
ARIMA (1,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
30
25
20
15
10
5
0
−5
−10
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
100
80
60
40
20
Time

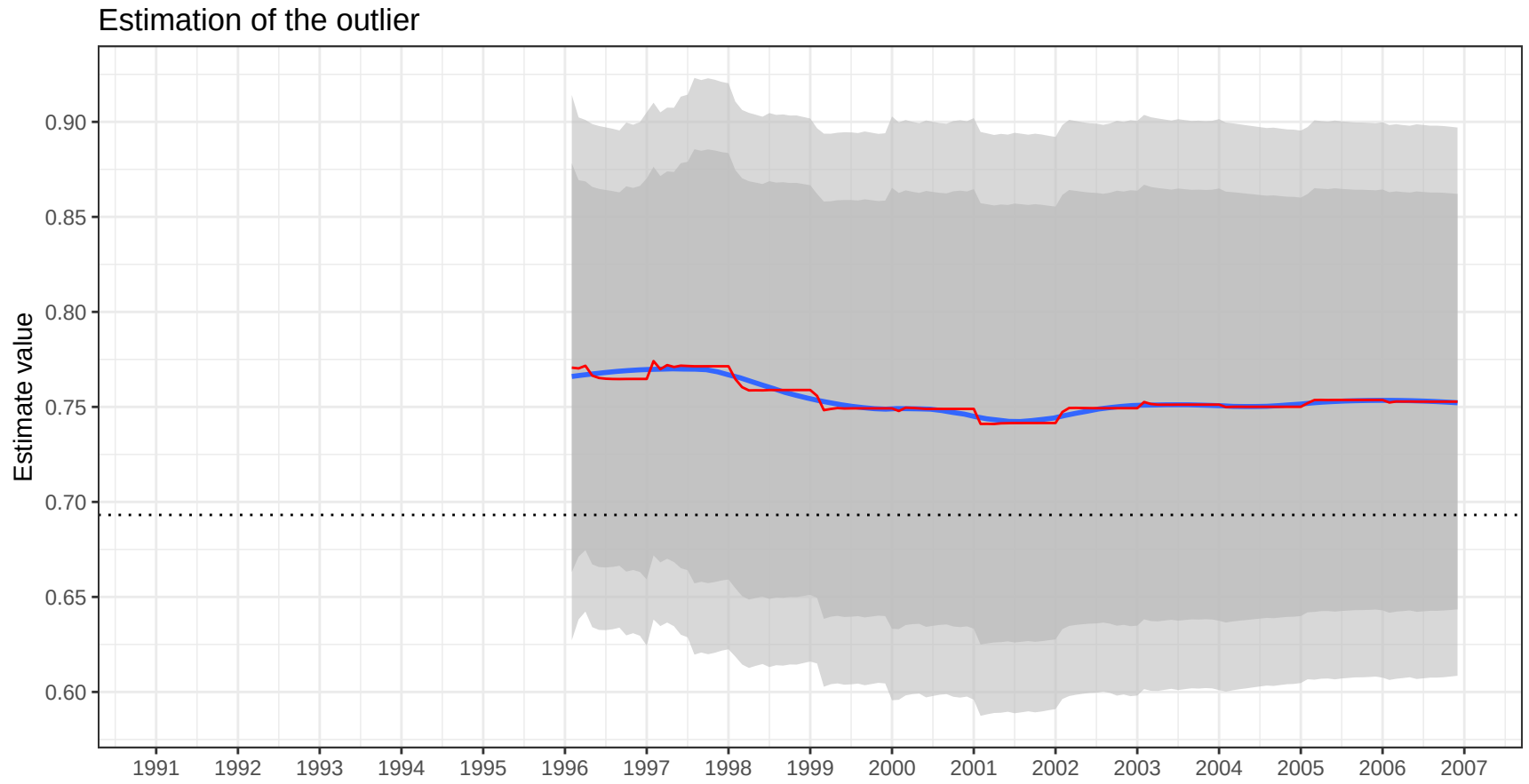
Estimate value of a LS(1995−1) IT−C2314
ARIMA (0,1,1)(0,1,1) − additive decomposition

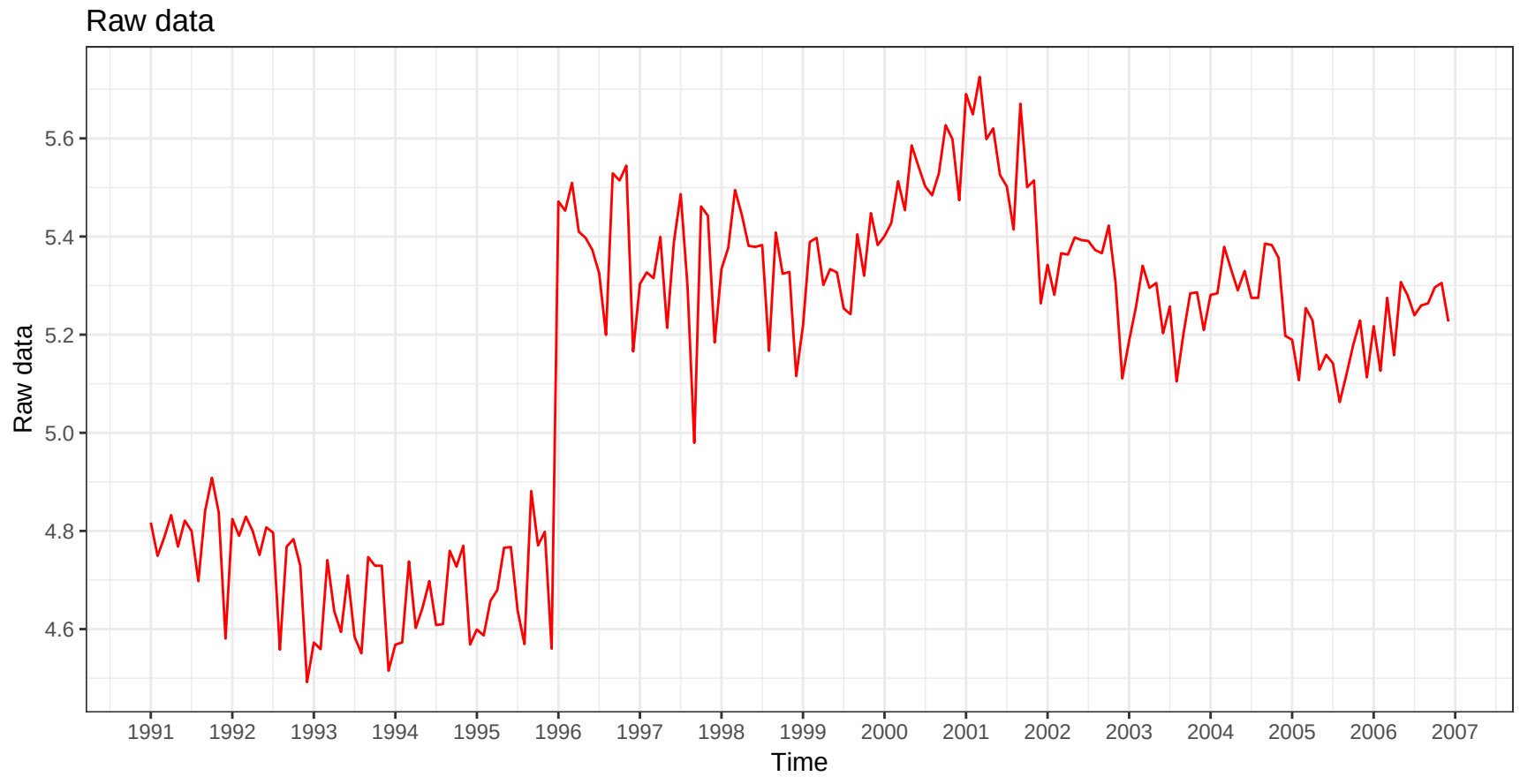




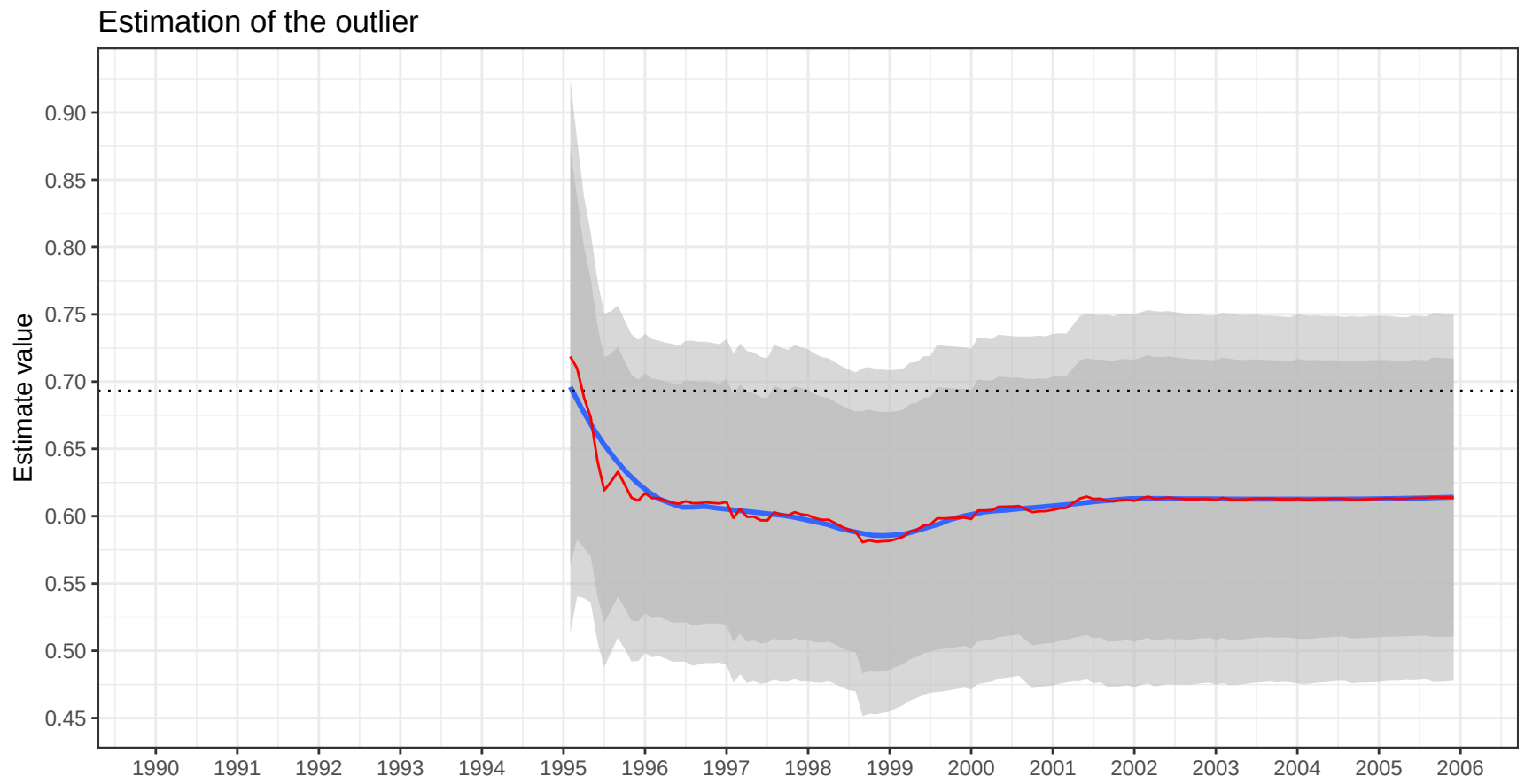
Estimate value of a LS(1996−1) DE−C2319

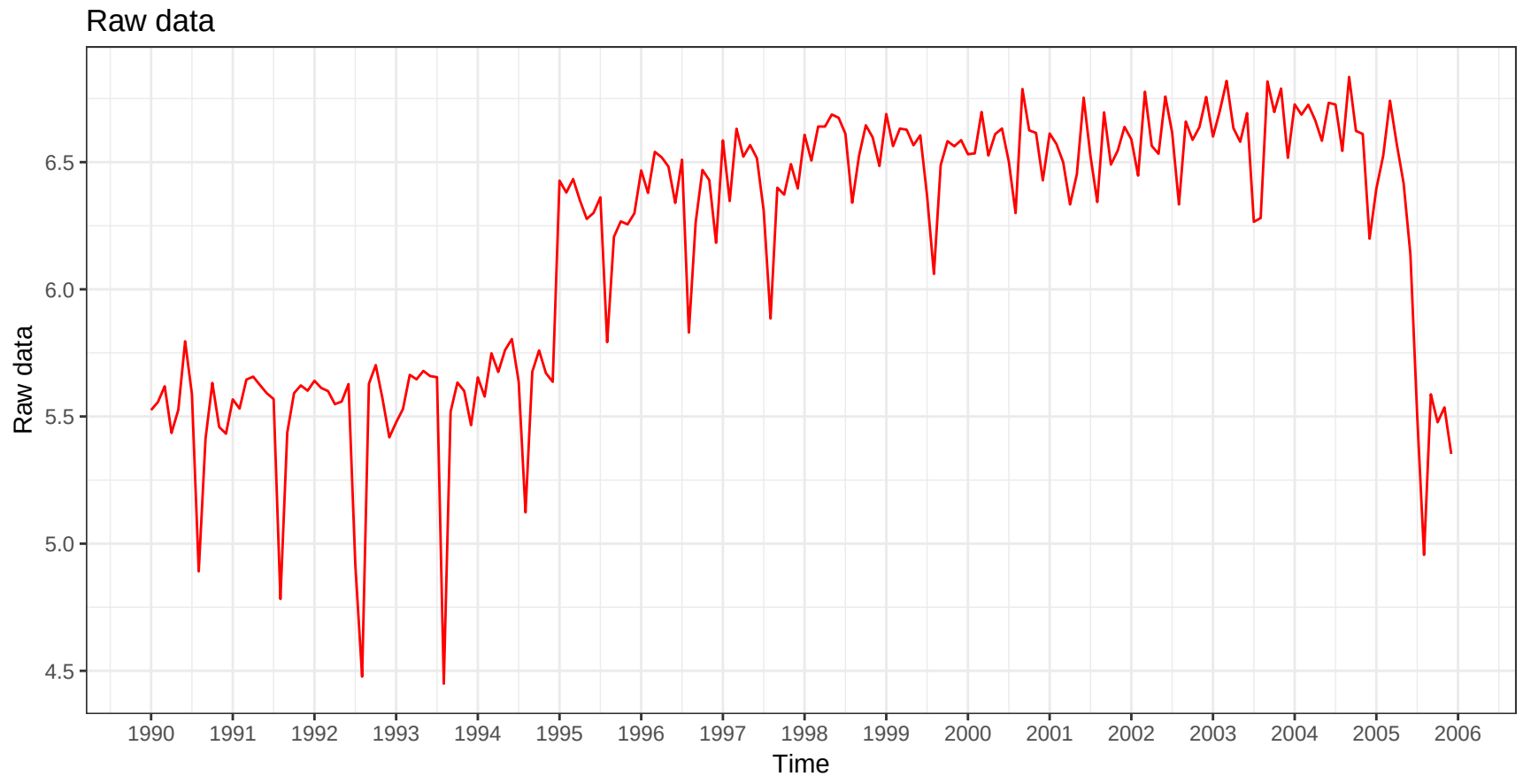
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition



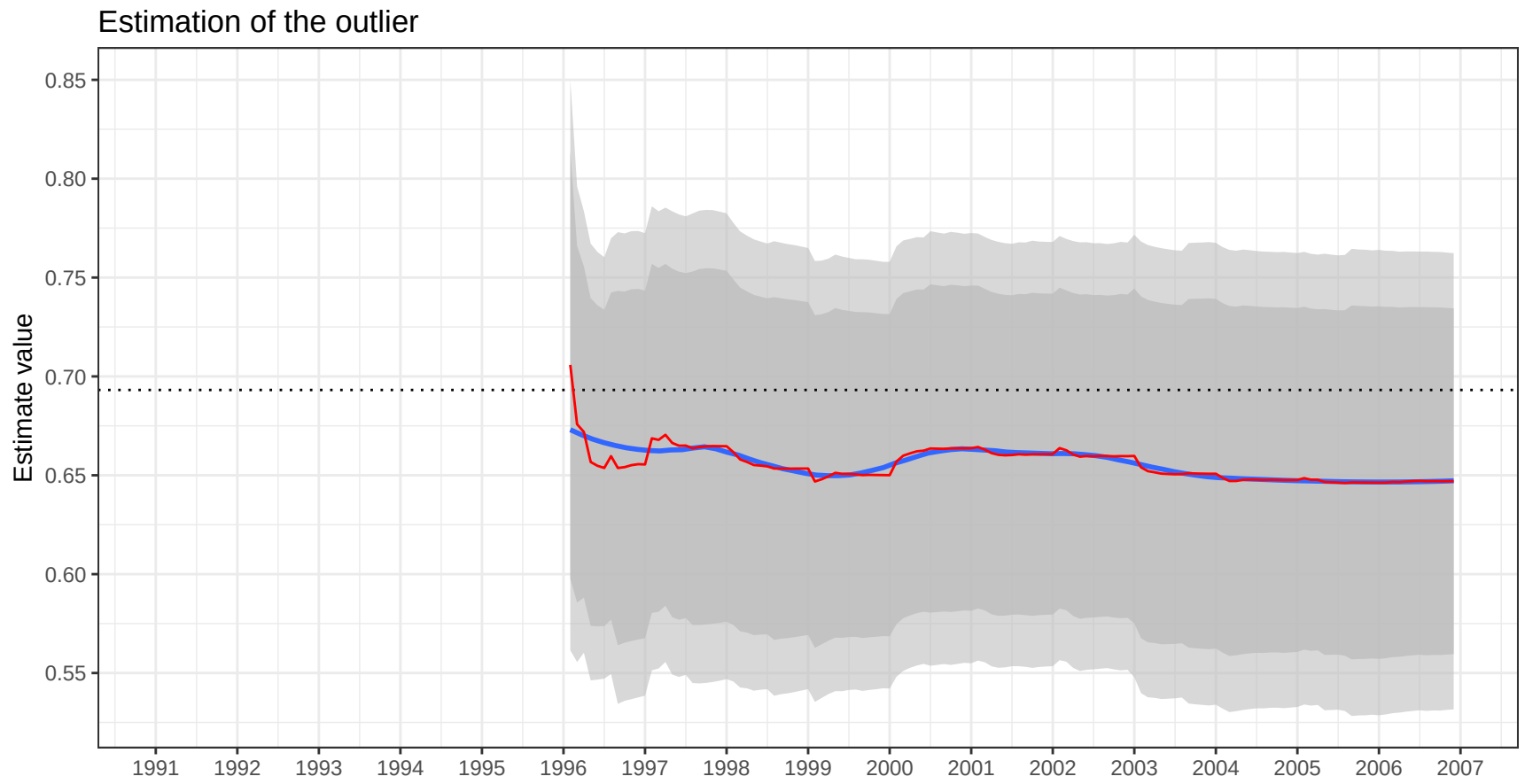


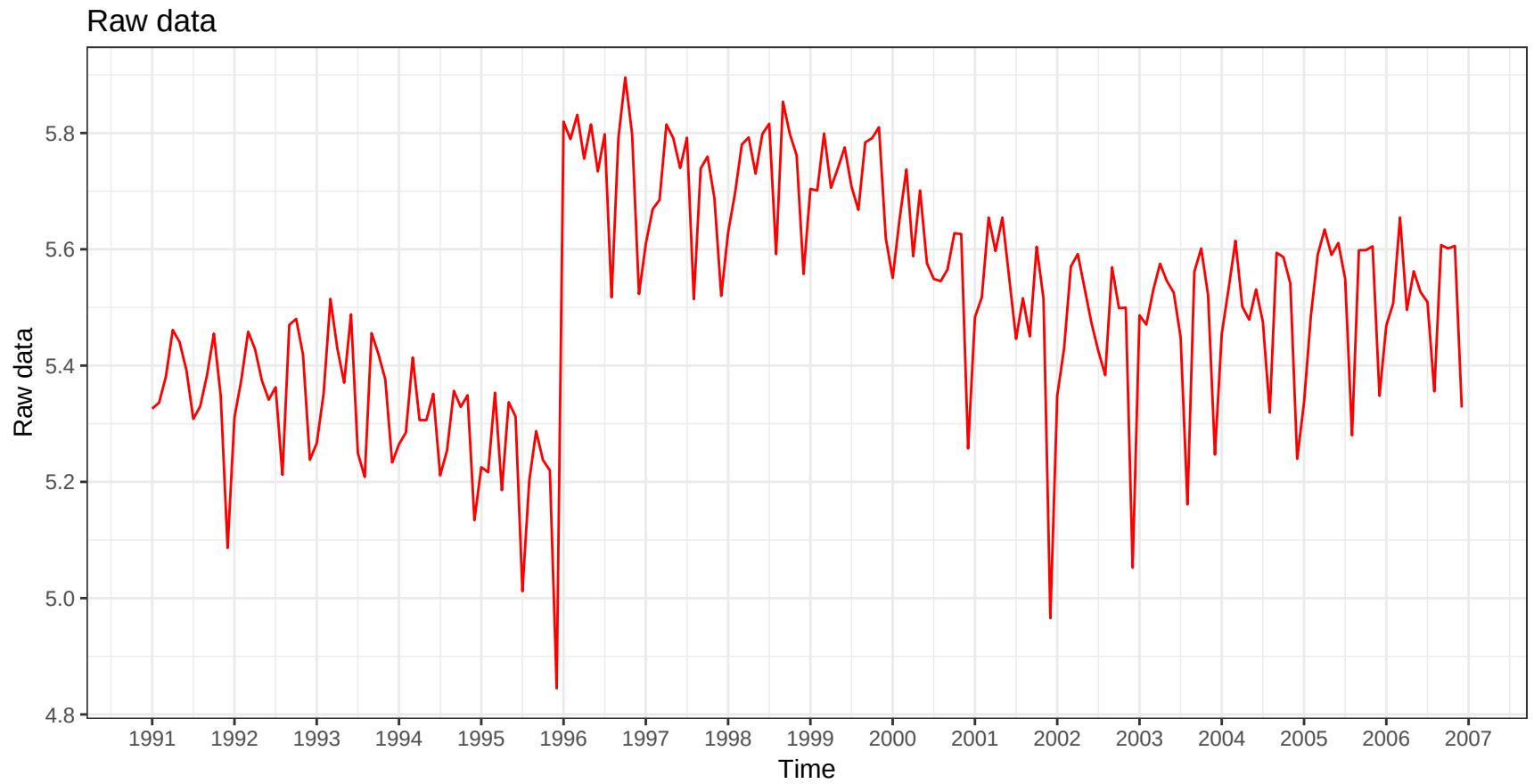
Estimate value of a LS(1995−1) FR−C2319
ARIMA (0,1,2)(0,1,1) − multiplicative decomposition

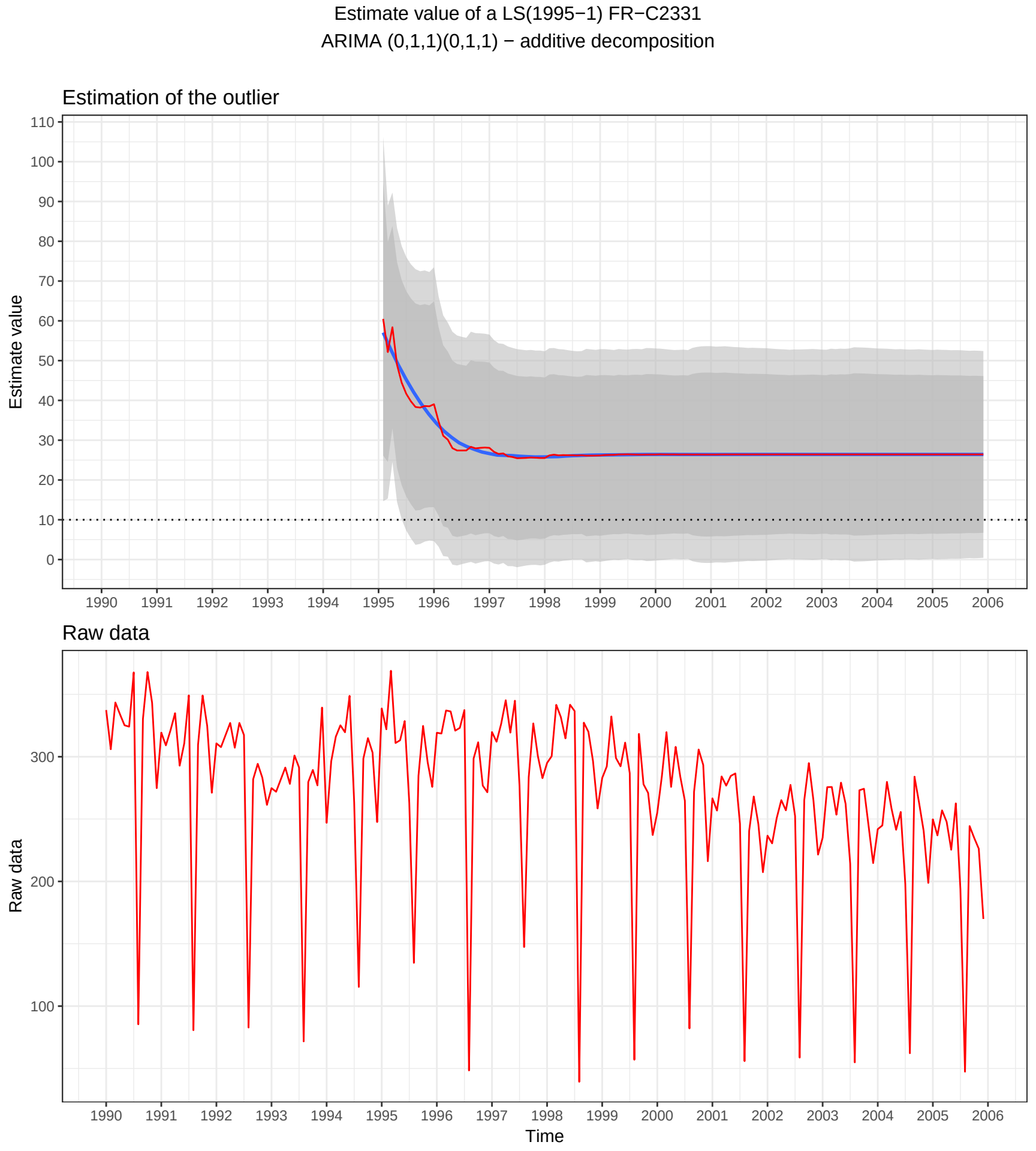




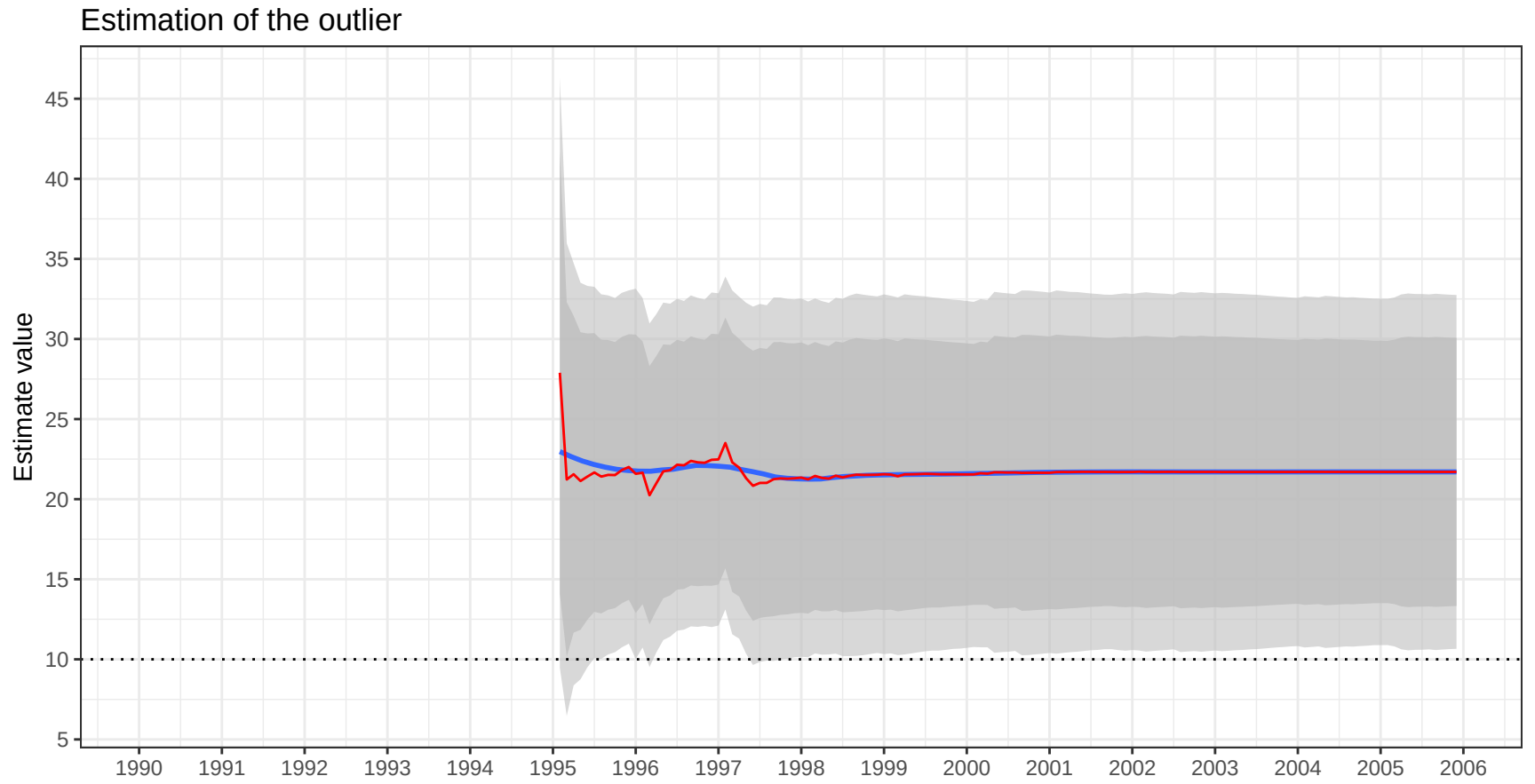
Estimate value of a LS(1996−1) DE−C2331
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

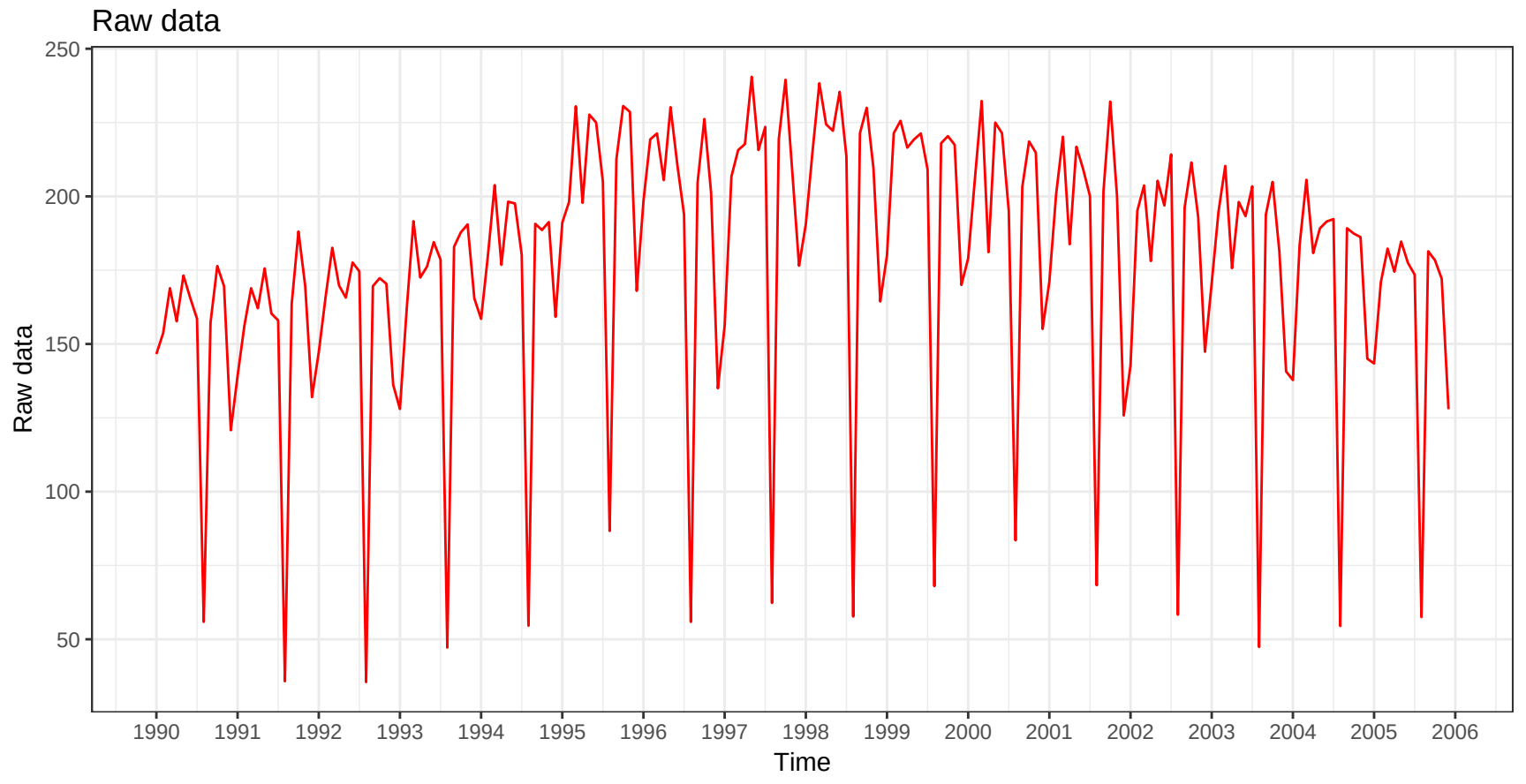


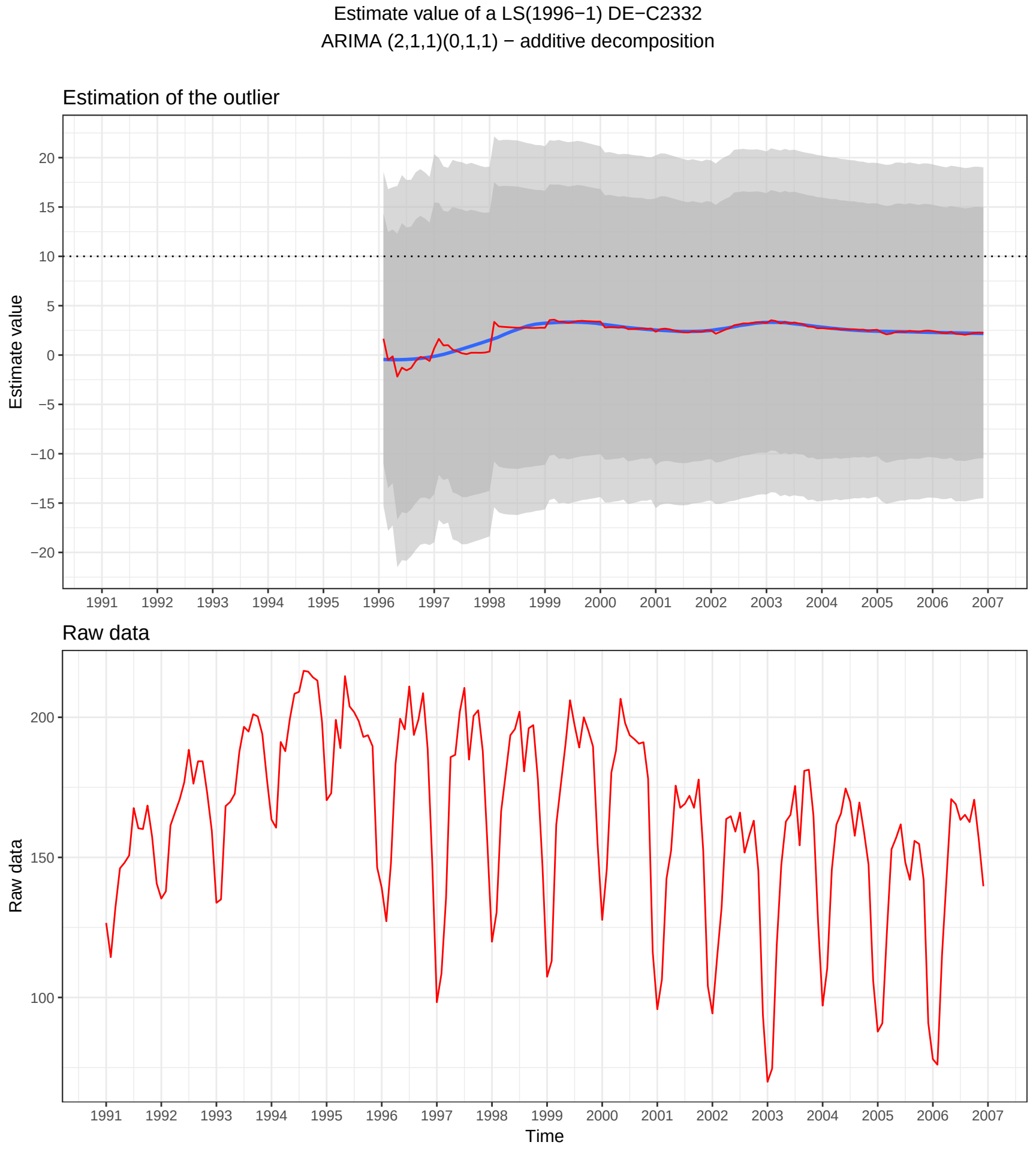


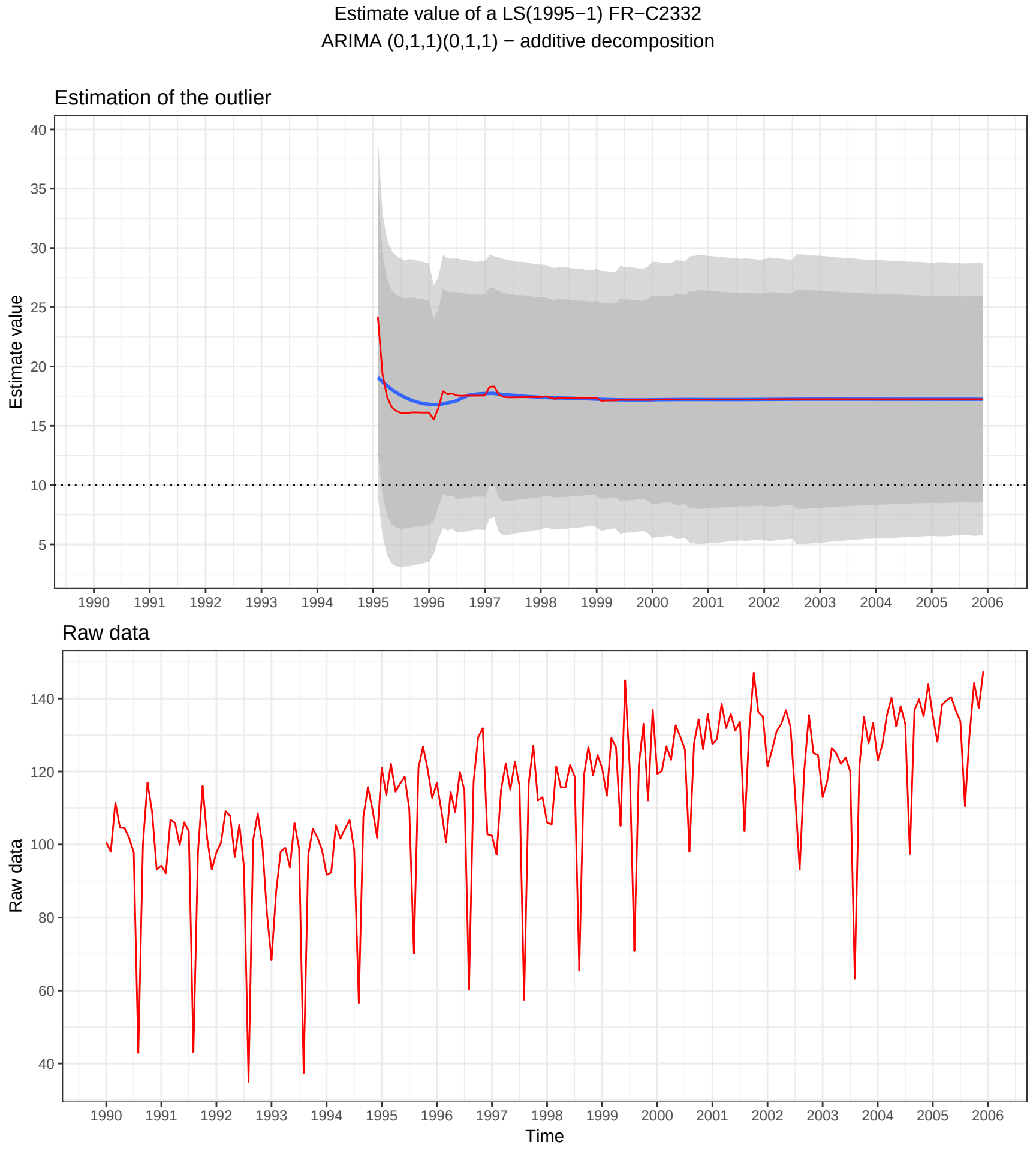

Estimate value of a LS(1995−1) FR−C2331
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
110
100
90
80
70
60
50
40
30
20
10
0
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
300
200
100
Time

Estimate value of a LS(1995−1) IT−C2331
ARIMA (0,1,1)(0,1,1) − additive decomposition

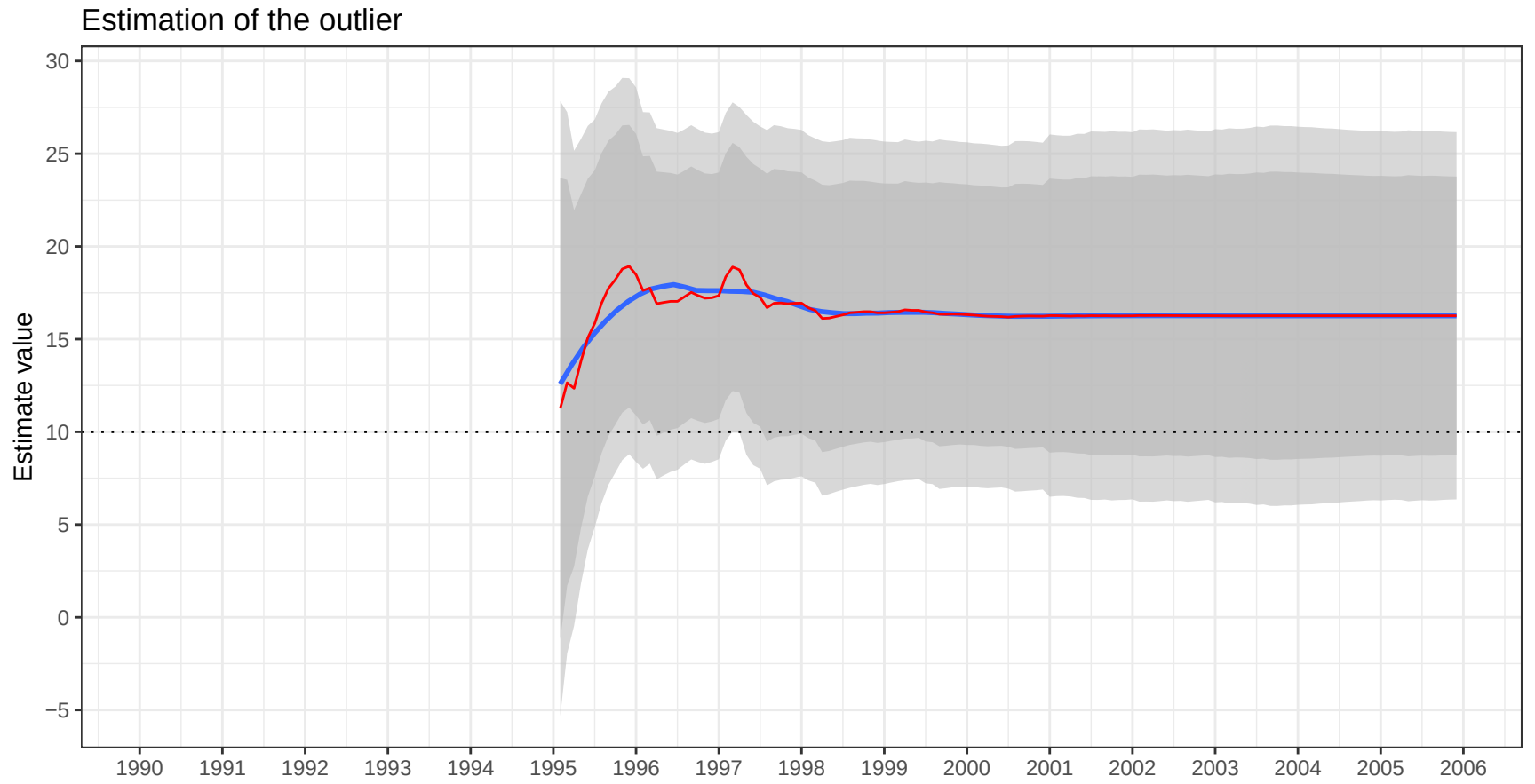


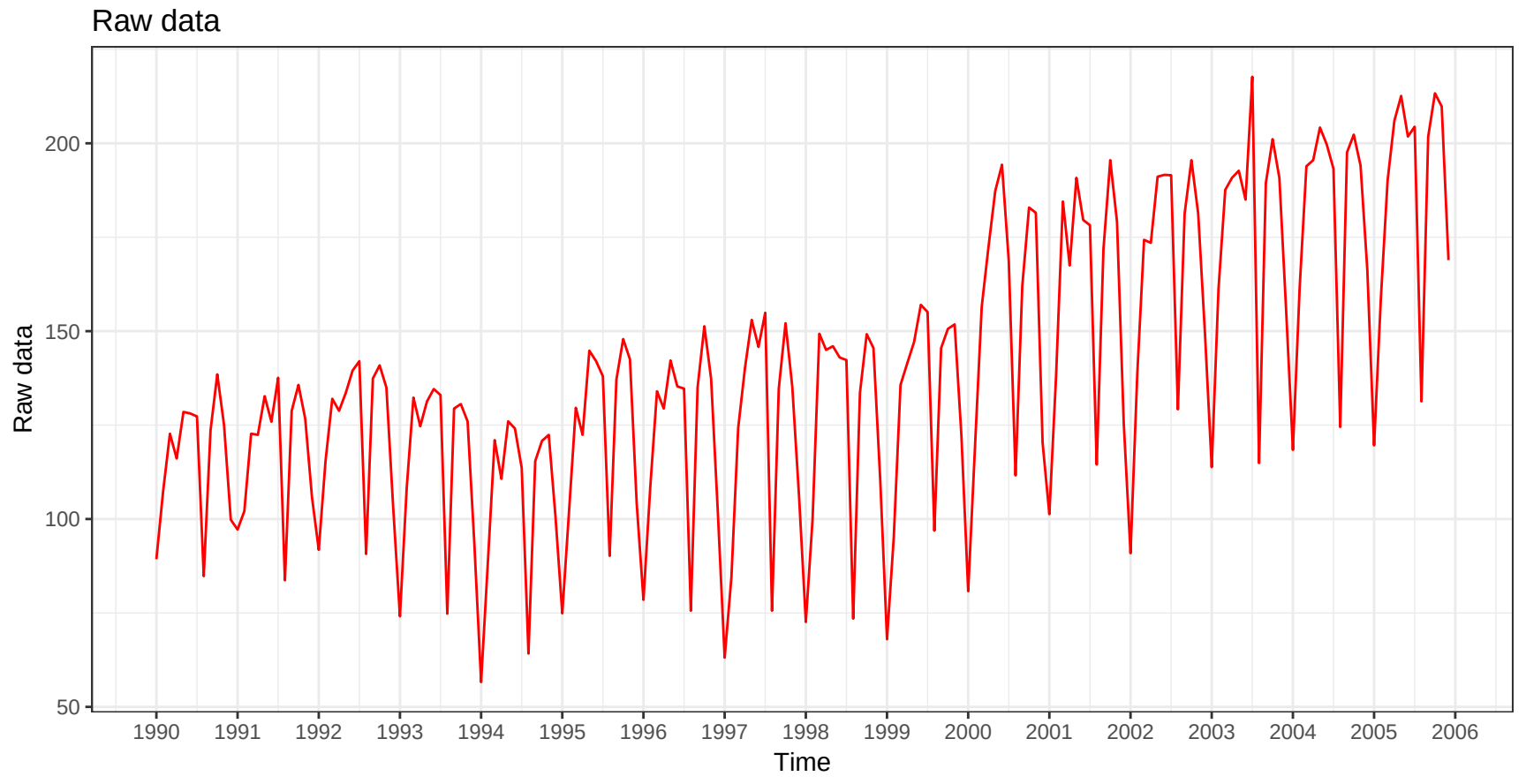



Estimate value of a LS(1996−1) DE−C2332
ARIMA (2,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
20
15
10
5
0
−5
−10
−15
−20
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
200
150
100
Time

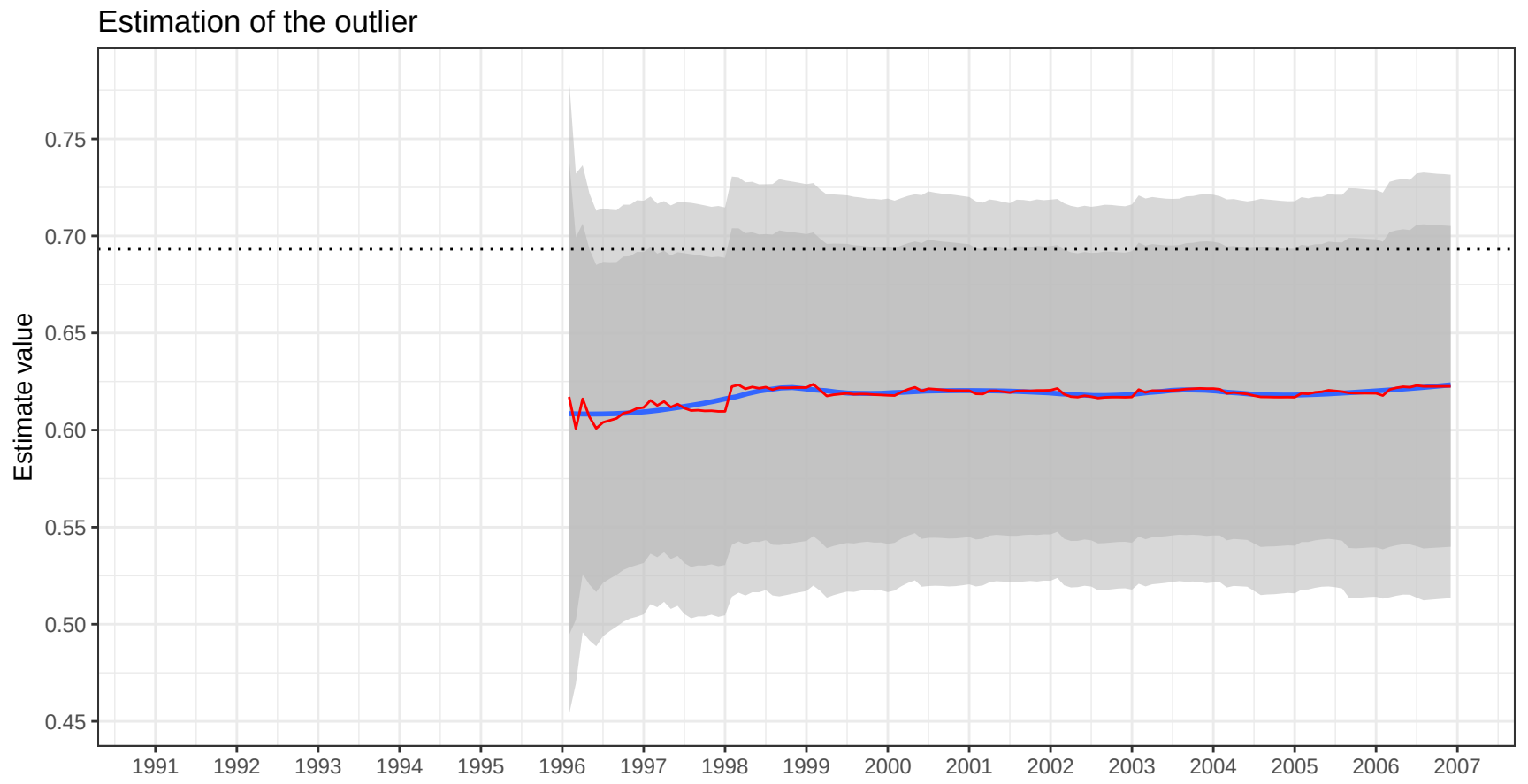

Estimate value of a LS(1995−1) FR−C2332
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
40
35
30
25
20
15
10
5
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
140
120
100
80
60
40
Time

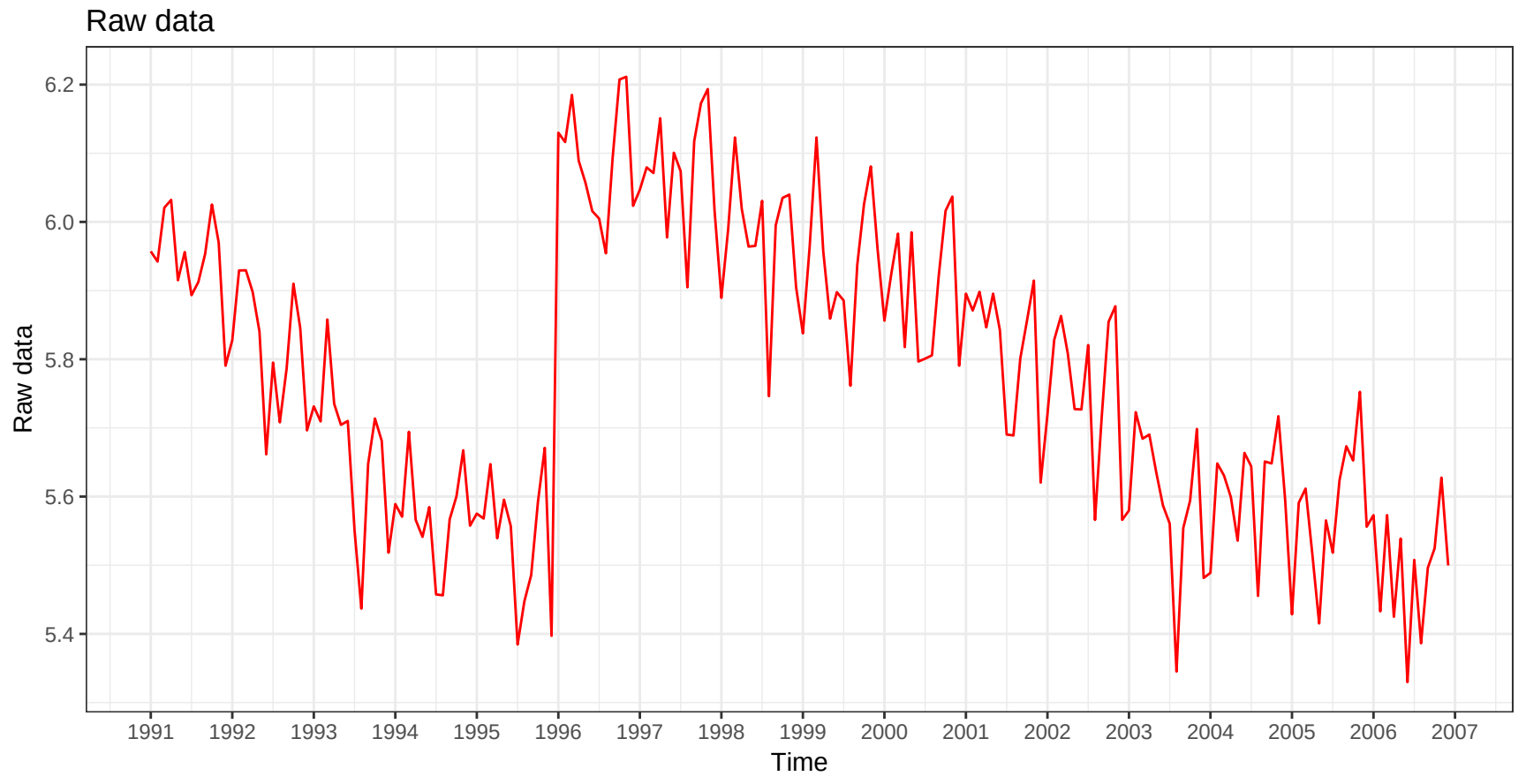
Estimate value of a LS(1995−1) IT−C2332
ARIMA (0,1,2)(0,1,1) − additive decomposition





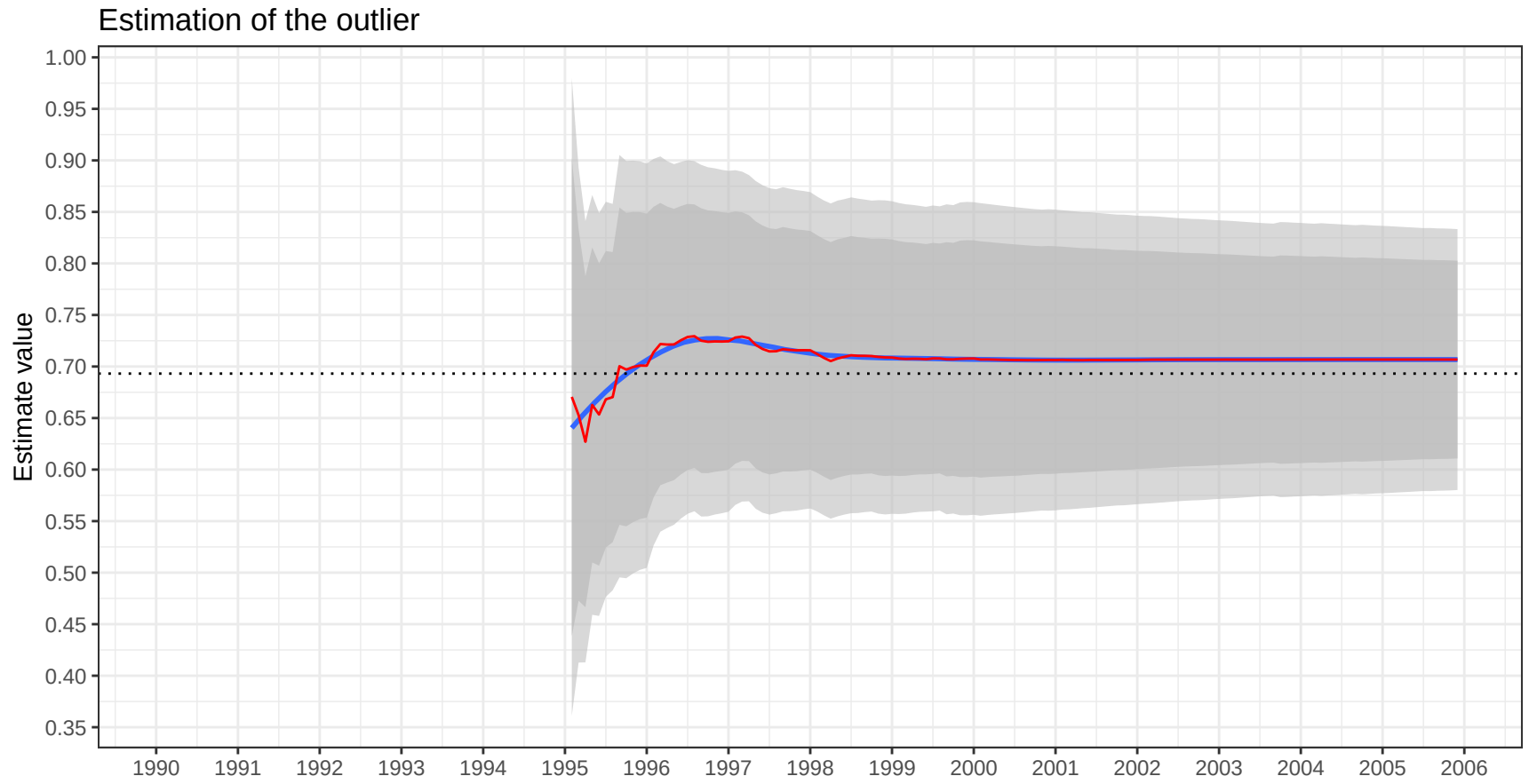
Estimate value of a LS(1996−1) DE−C2341
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

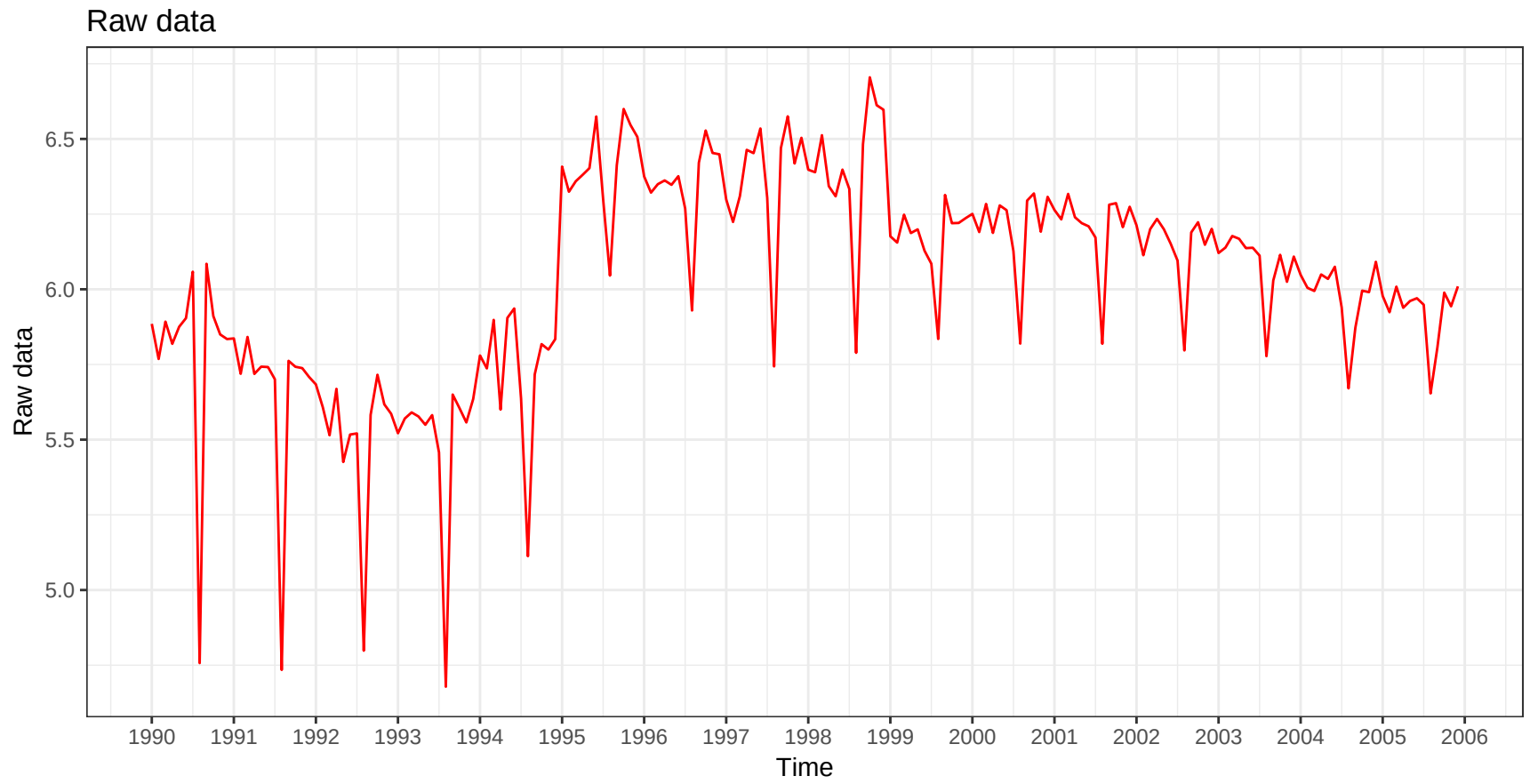




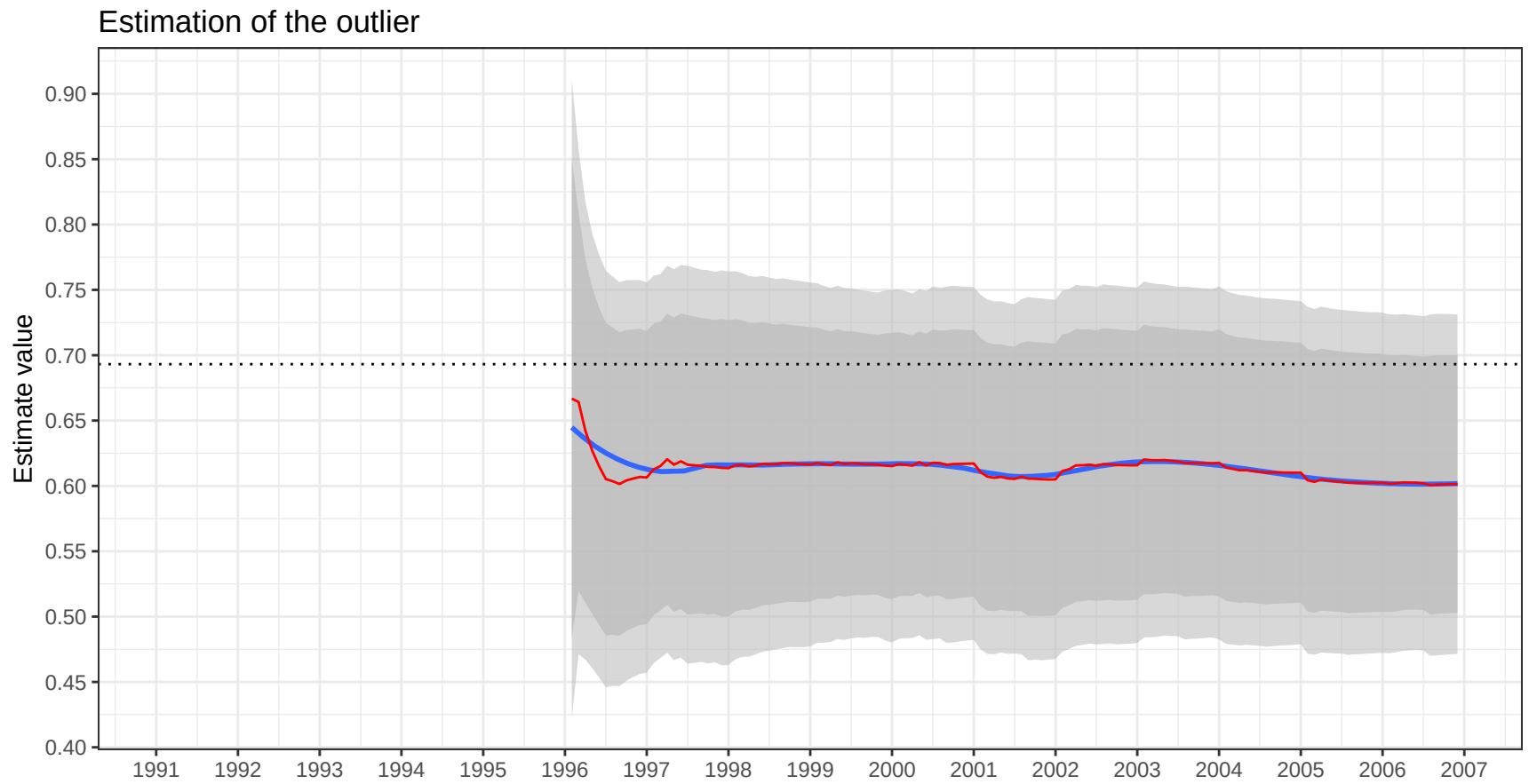
Estimate value of a LS(1995−1) FR−C2341

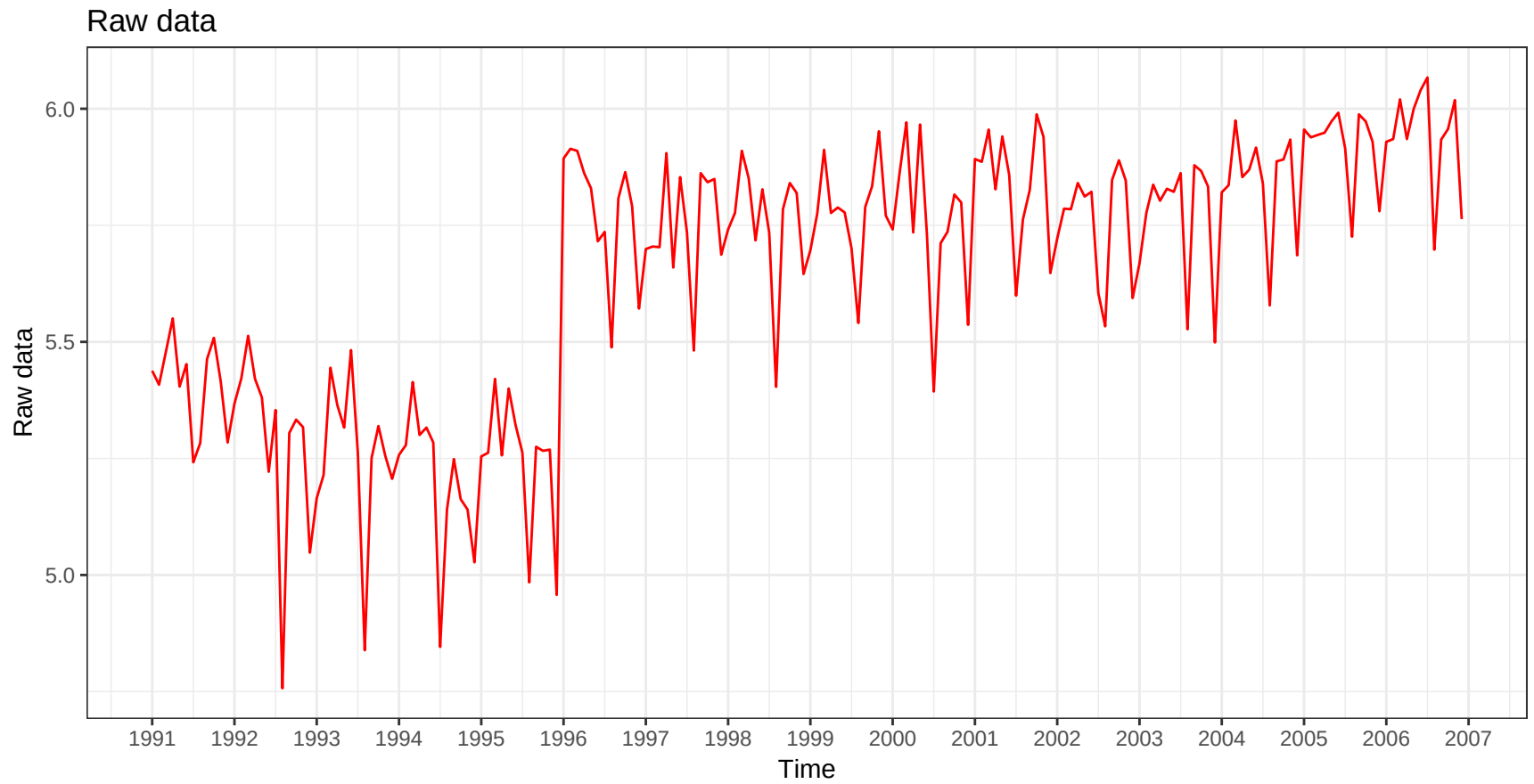
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

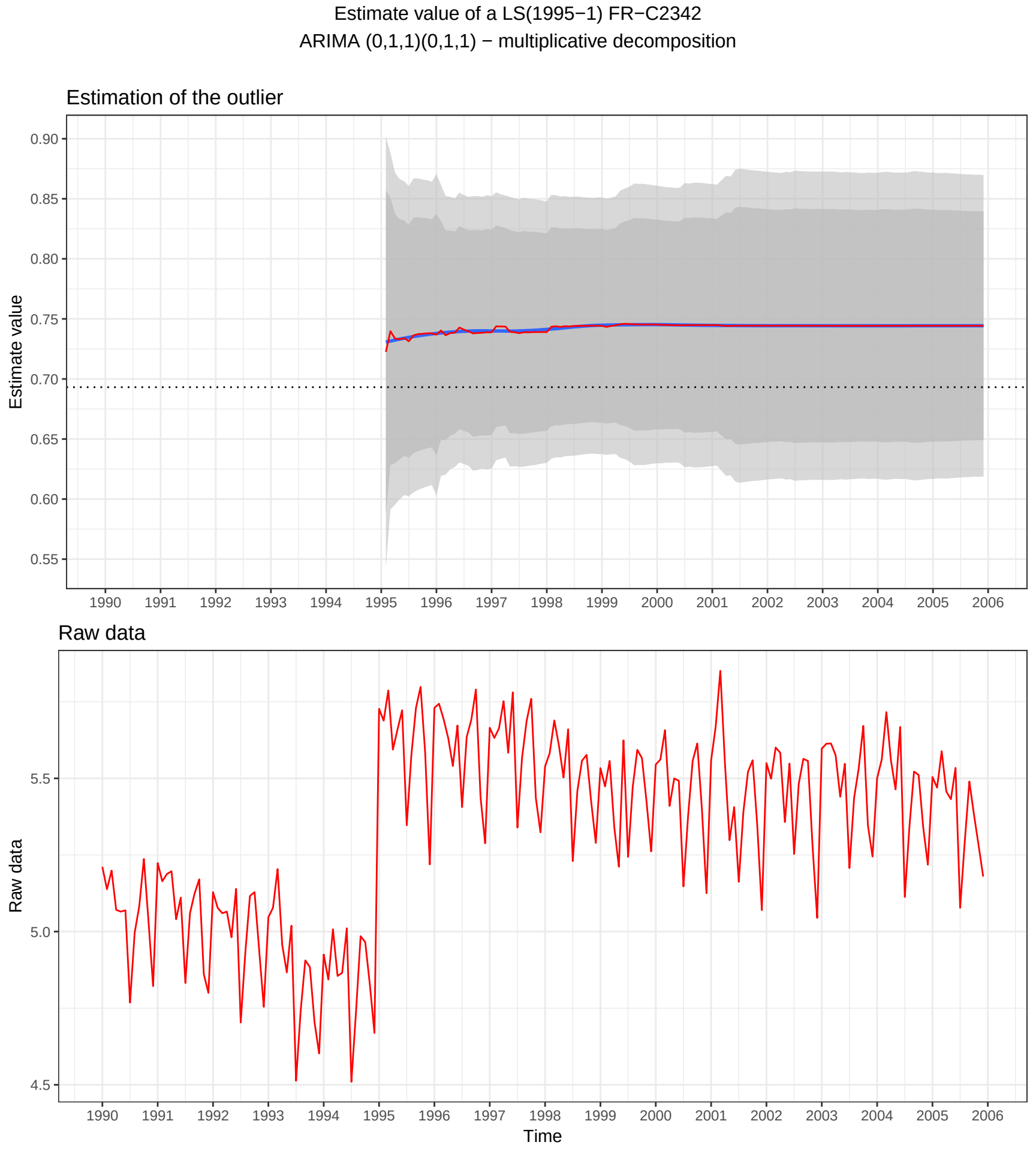




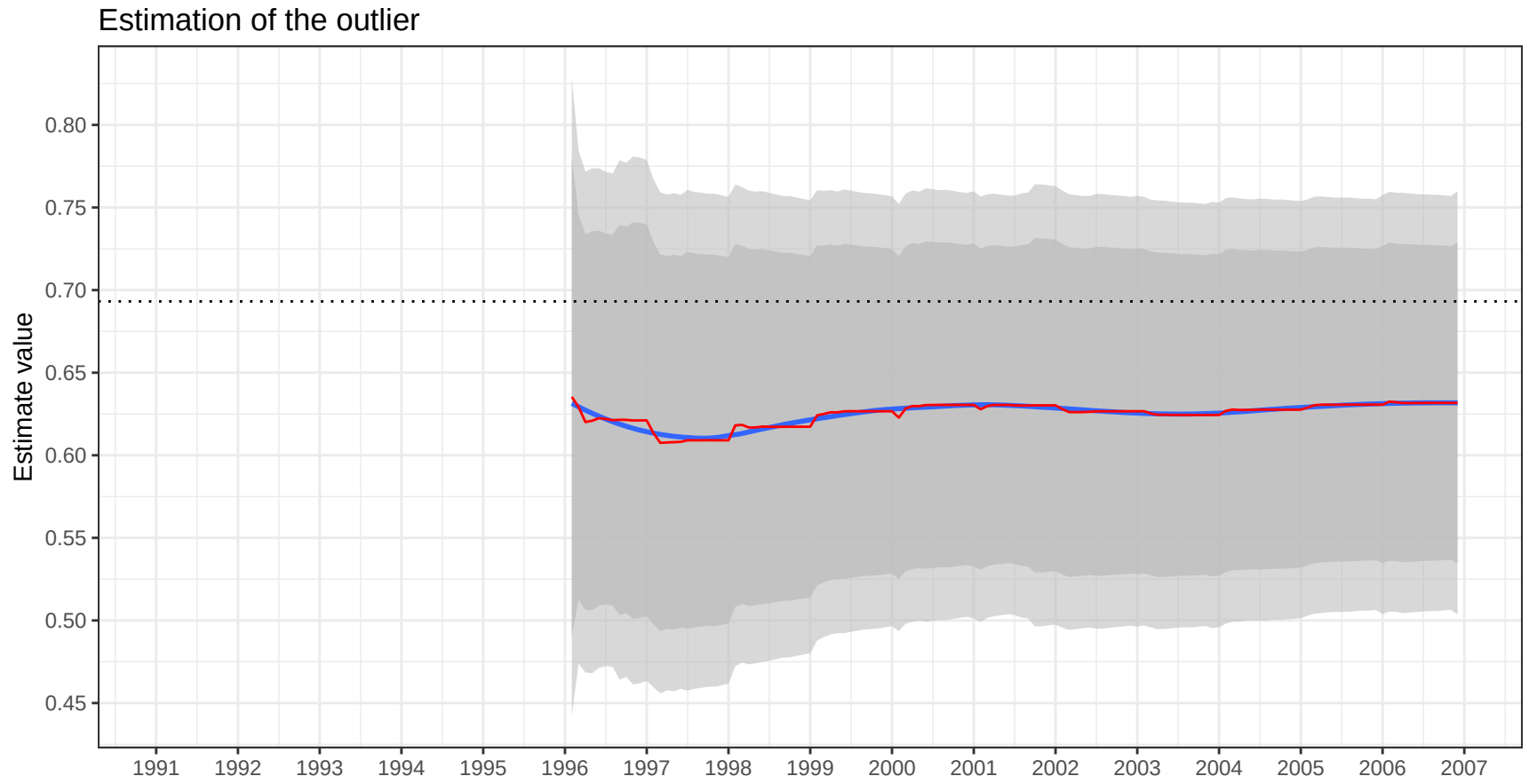
Estimate value of a LS(1996−1) DE−C2342
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

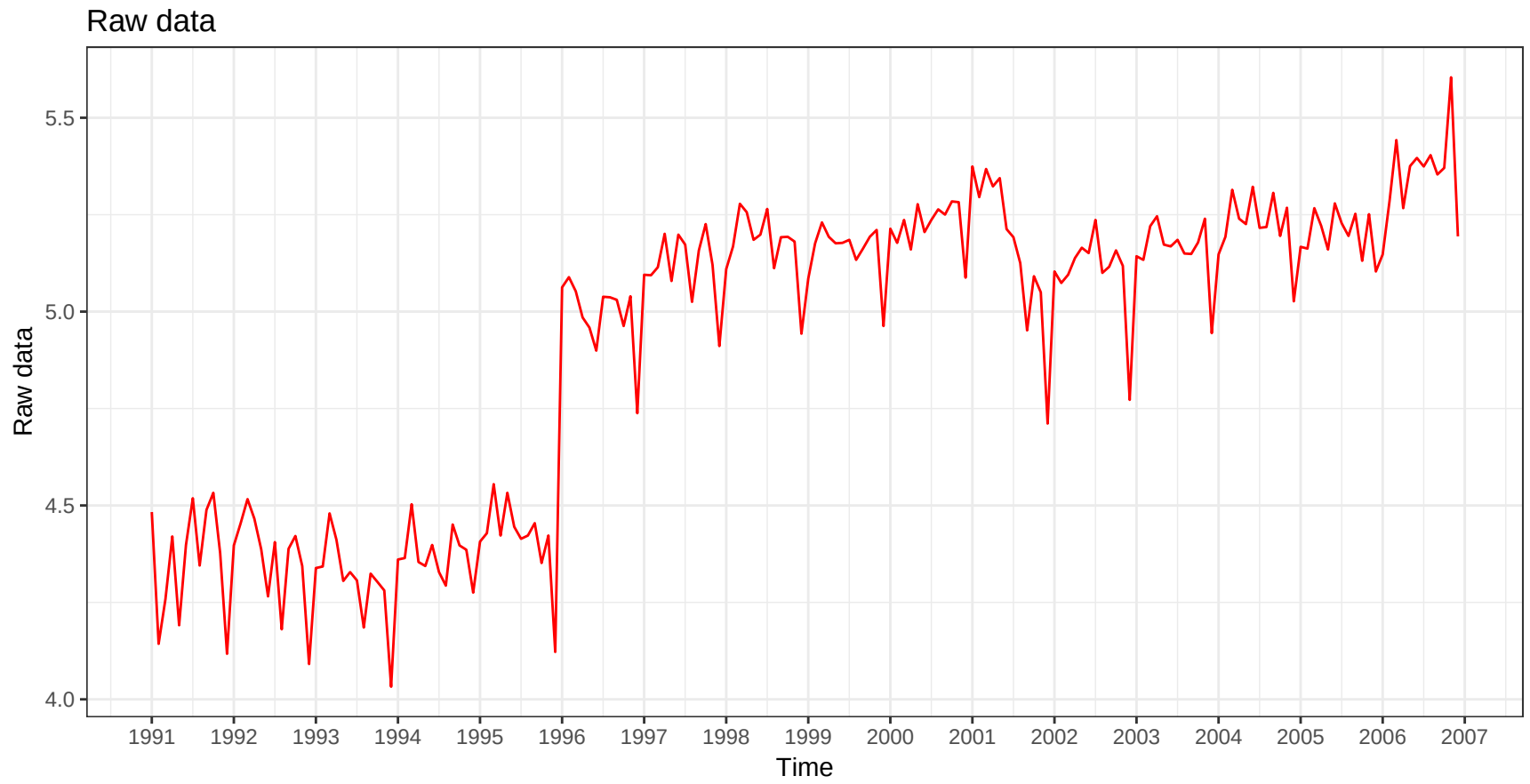




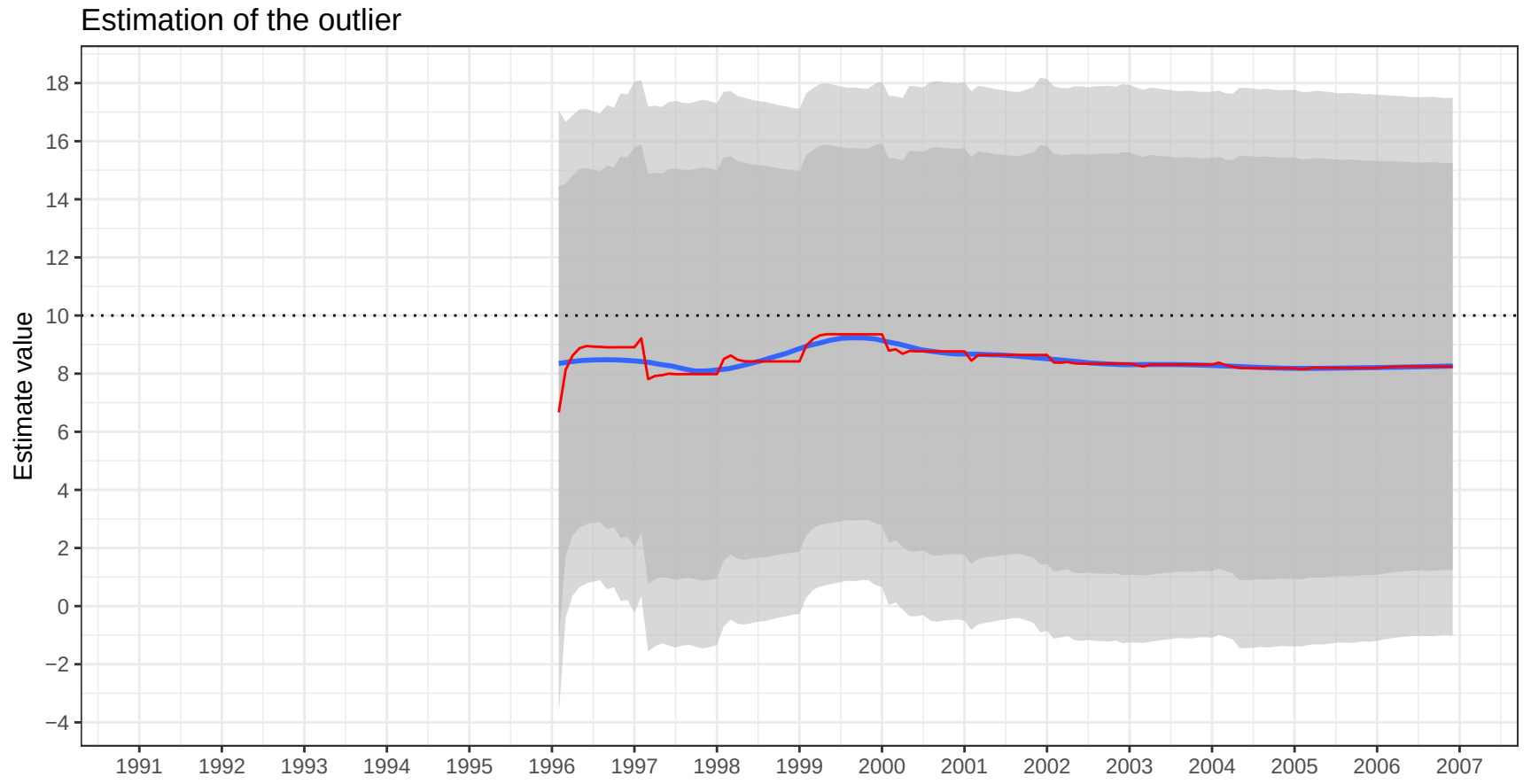

Estimate value of a LS(1995−1) FR−C2342
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0.55
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
5.5
5.0
4.5
Time

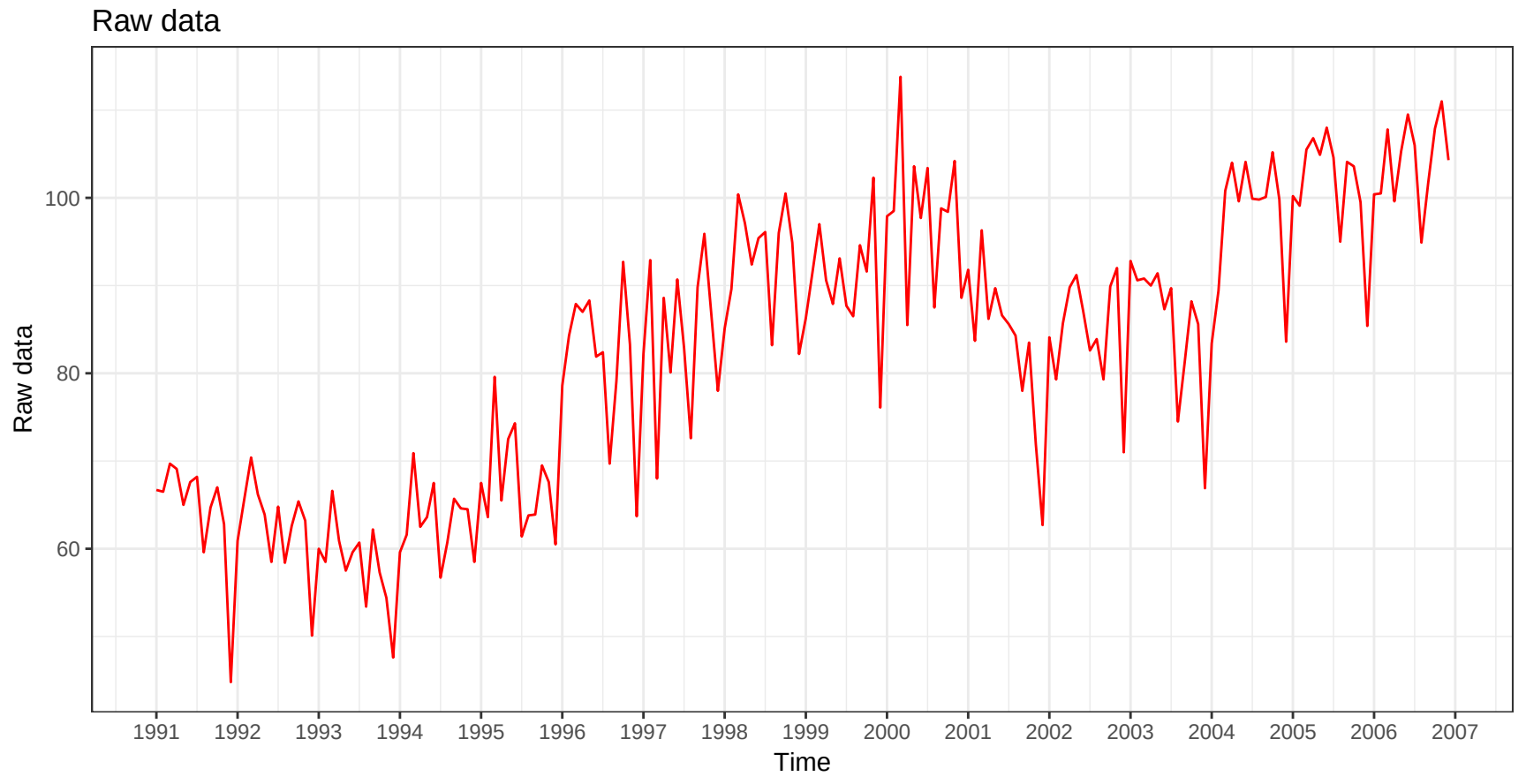
Estimate value of a LS(1996−1) DE−C2343
ARIMA (0,1,2)(0,1,1) − multiplicative decomposition





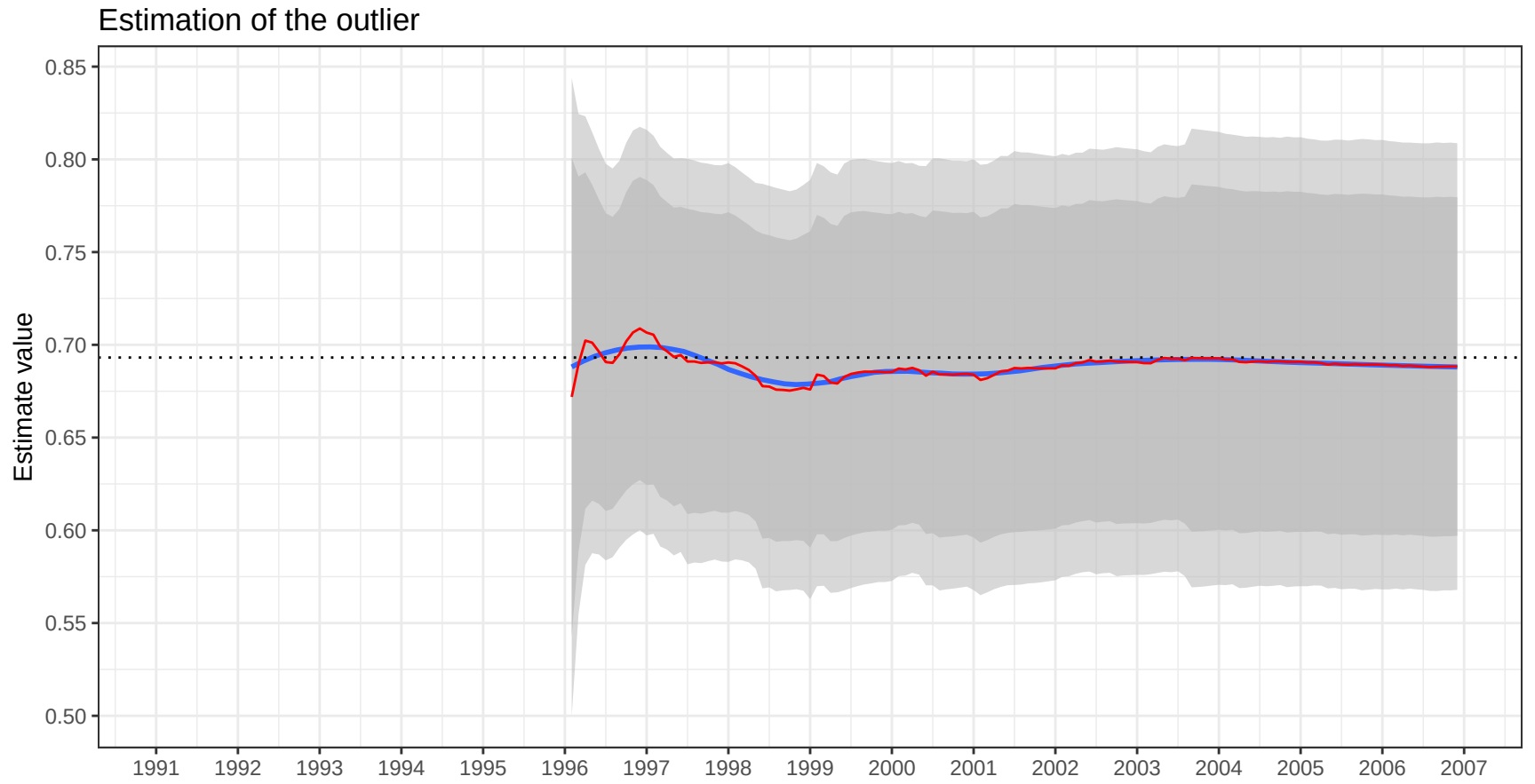
Estimate value of a LS(1996−1) DE−C2344
ARIMA (1,1,1)(0,1,1) − additive decomposition

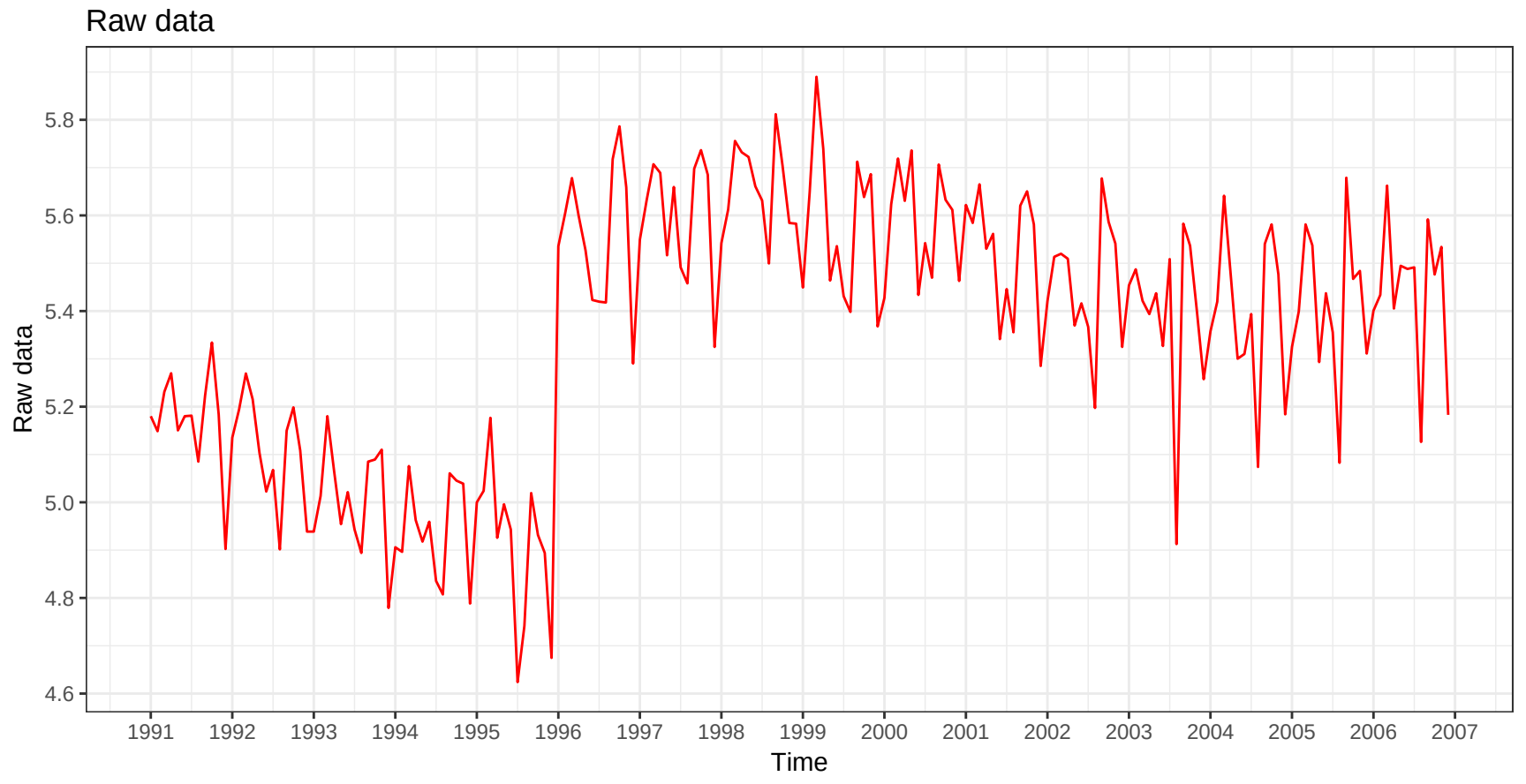


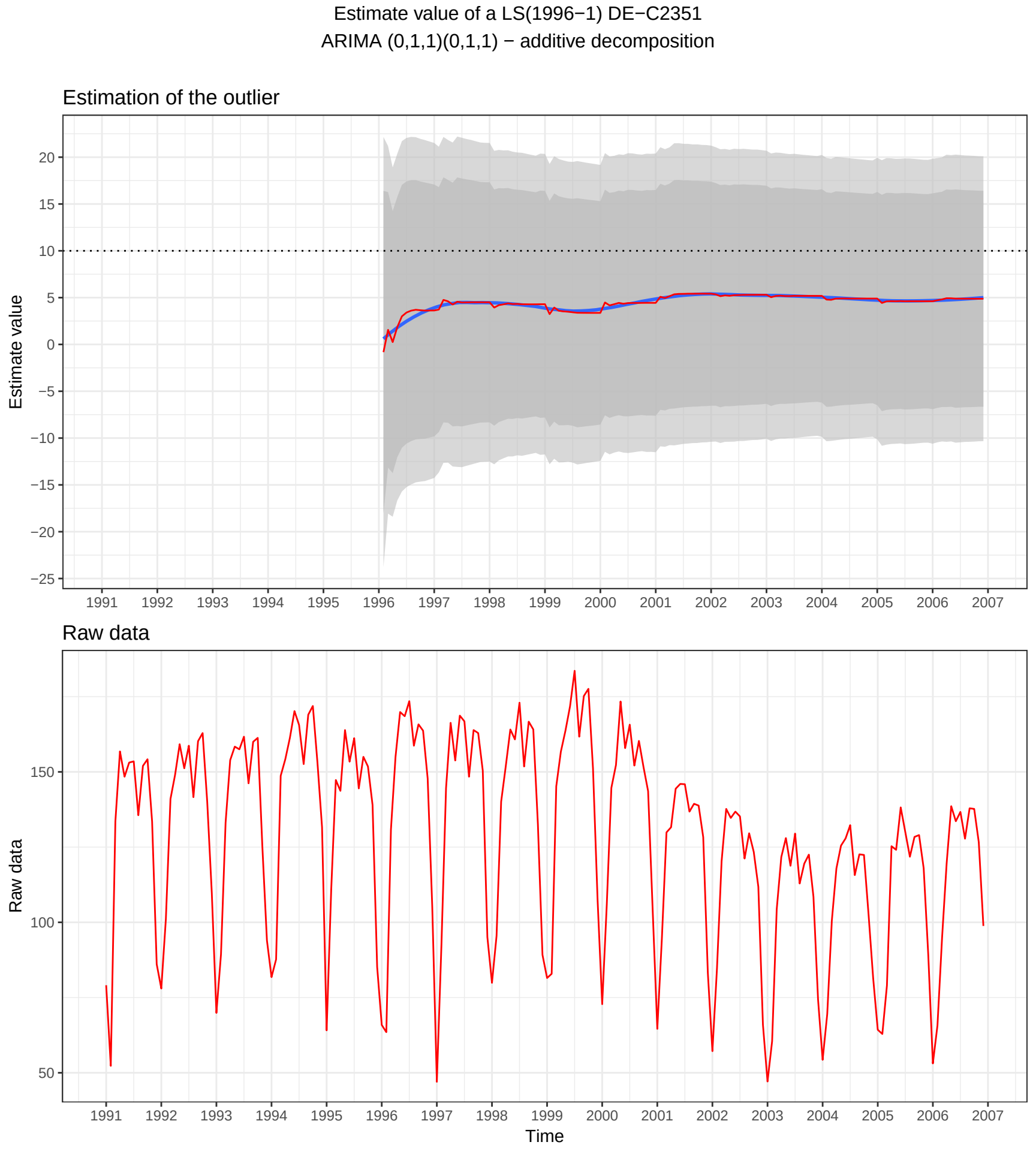


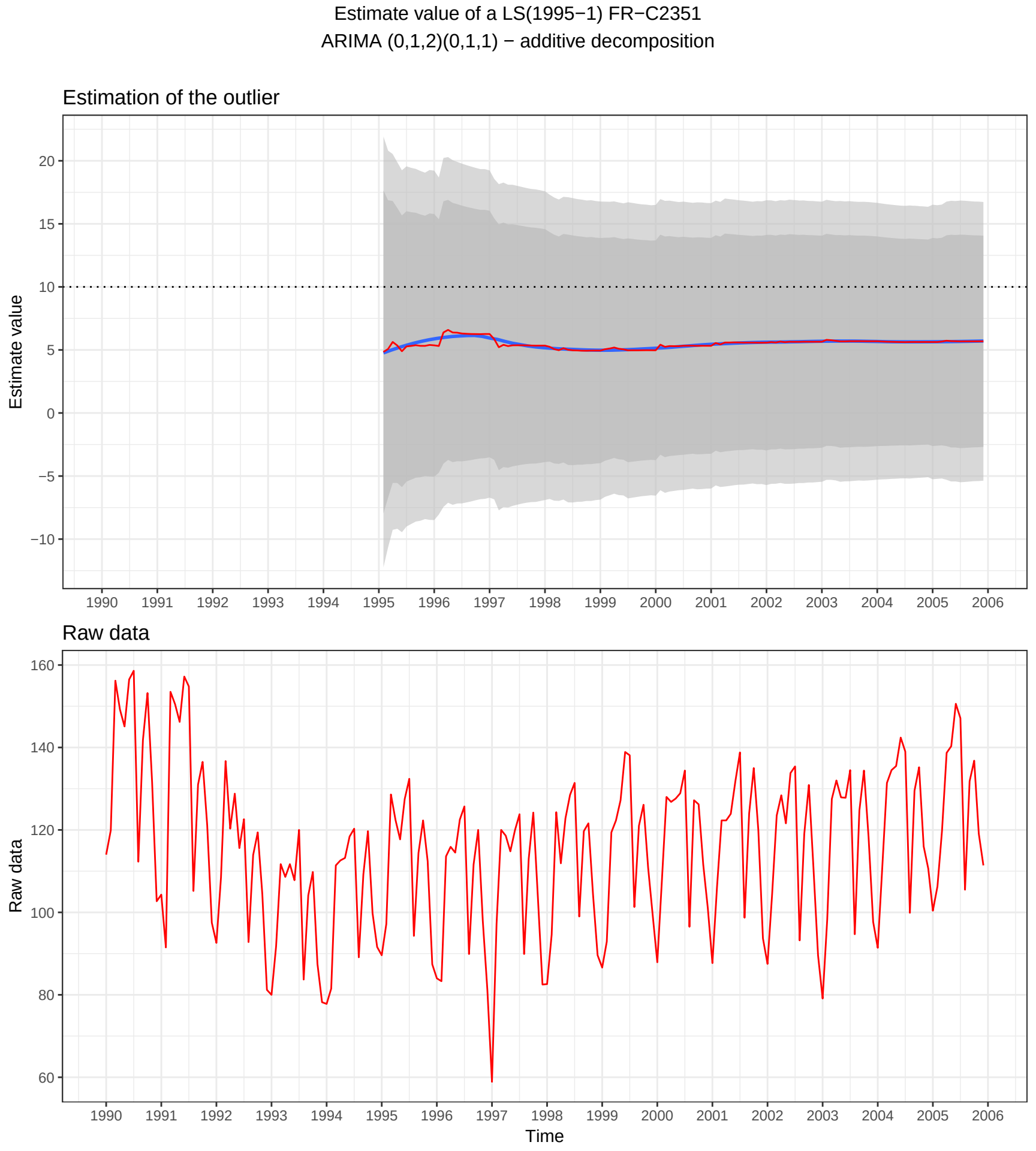
Estimate value of a LS(1996−1) DE−C2349

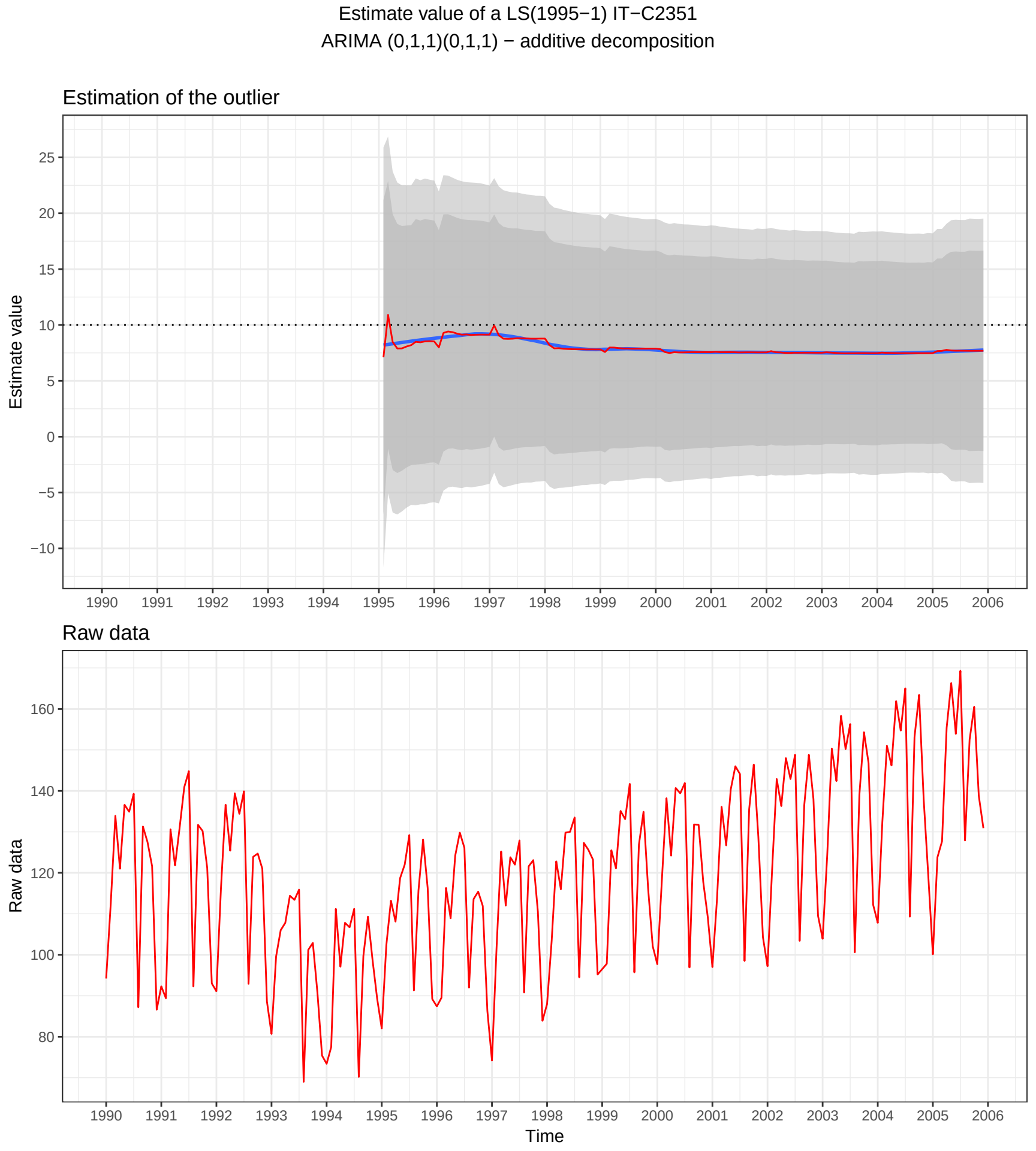
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition



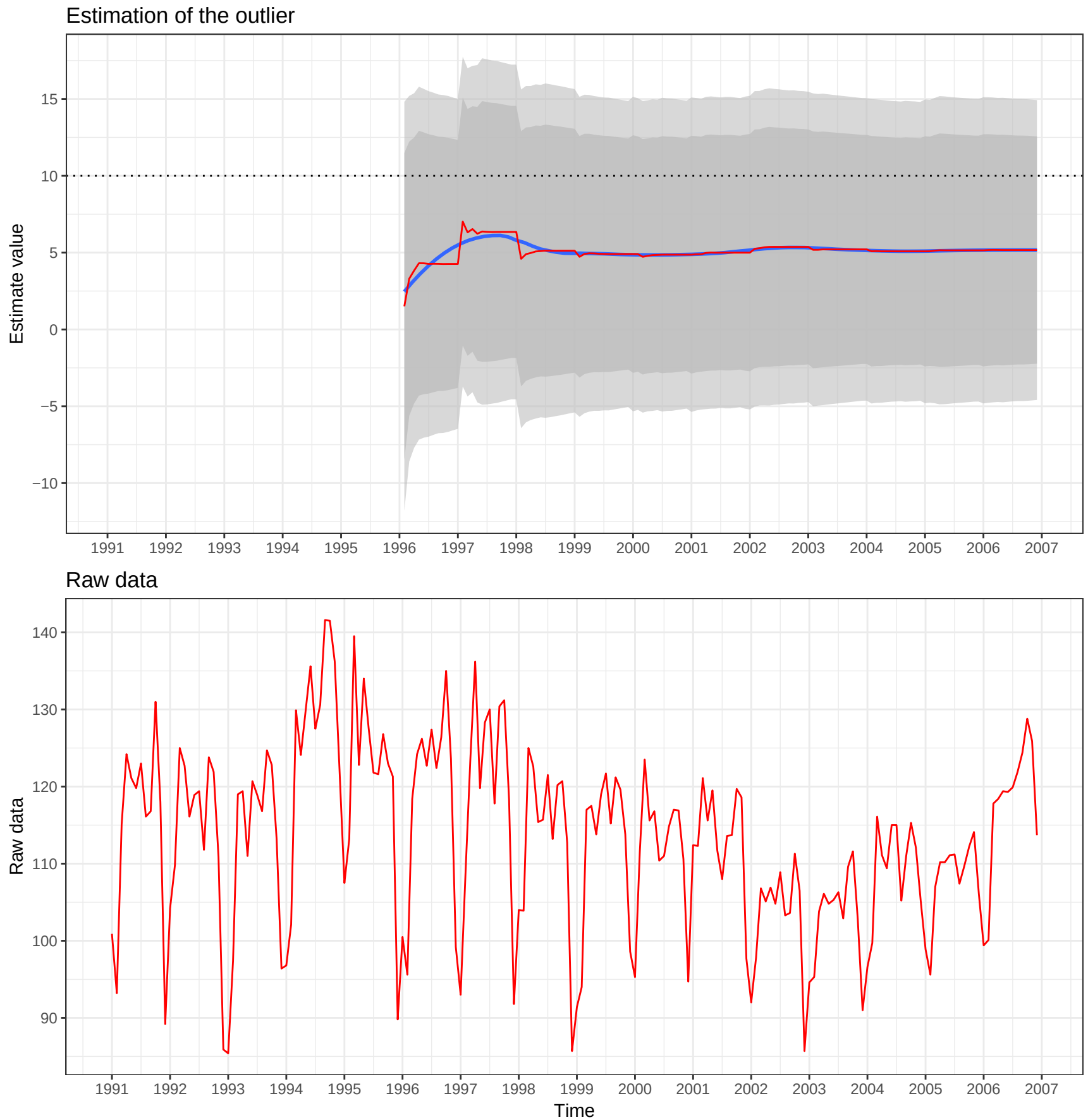



Estimate value of a LS(1996−1) DE−C2351
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
20
15
10
5
0
−5
−10
−15
−20
−25
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
150
100
50
Time


Estimate value of a LS(1995−1) FR−C2351
ARIMA (0,1,2)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
20
15
10
5
0
−5
−10
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
160
140
120
100
80
60
Time

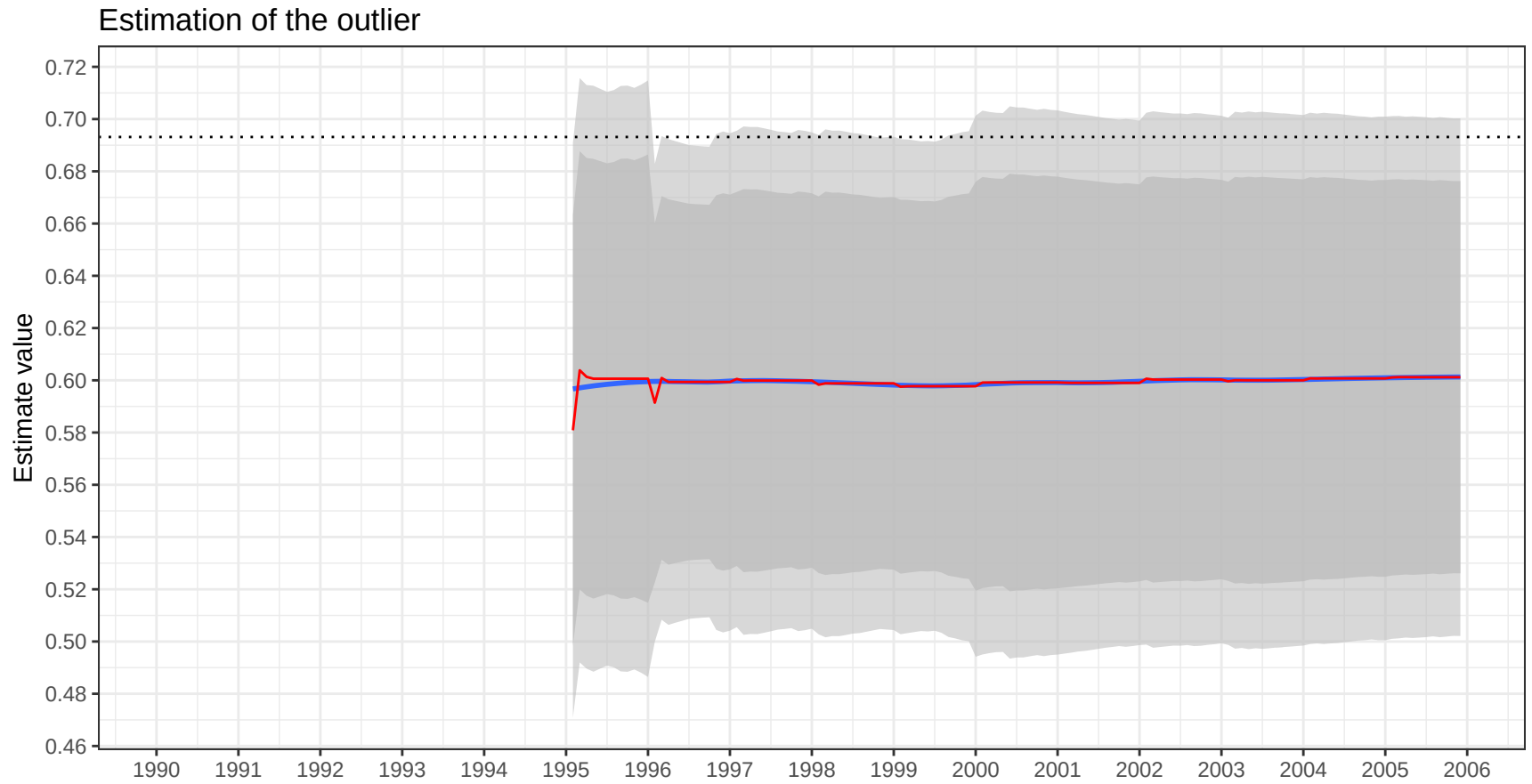

Estimate value of a LS(1995−1) IT−C2351
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
25
20
15
10
5
0
−5
−10
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
160
140
120
100
80
Time

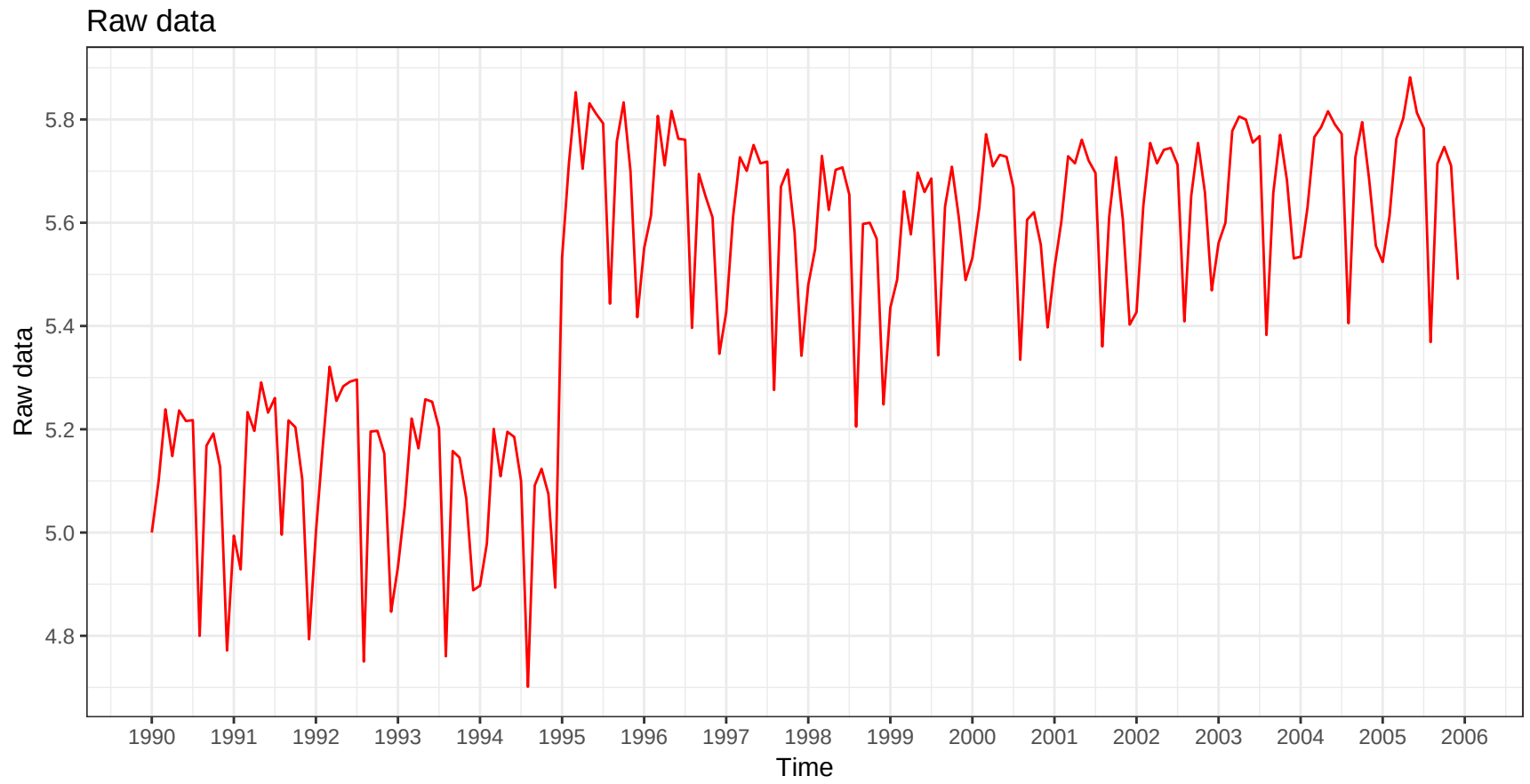
Estimate value of a LS(1996−1) DE−C2352
ARIMA (0,1,1)(0,1,1) − additive decomposition

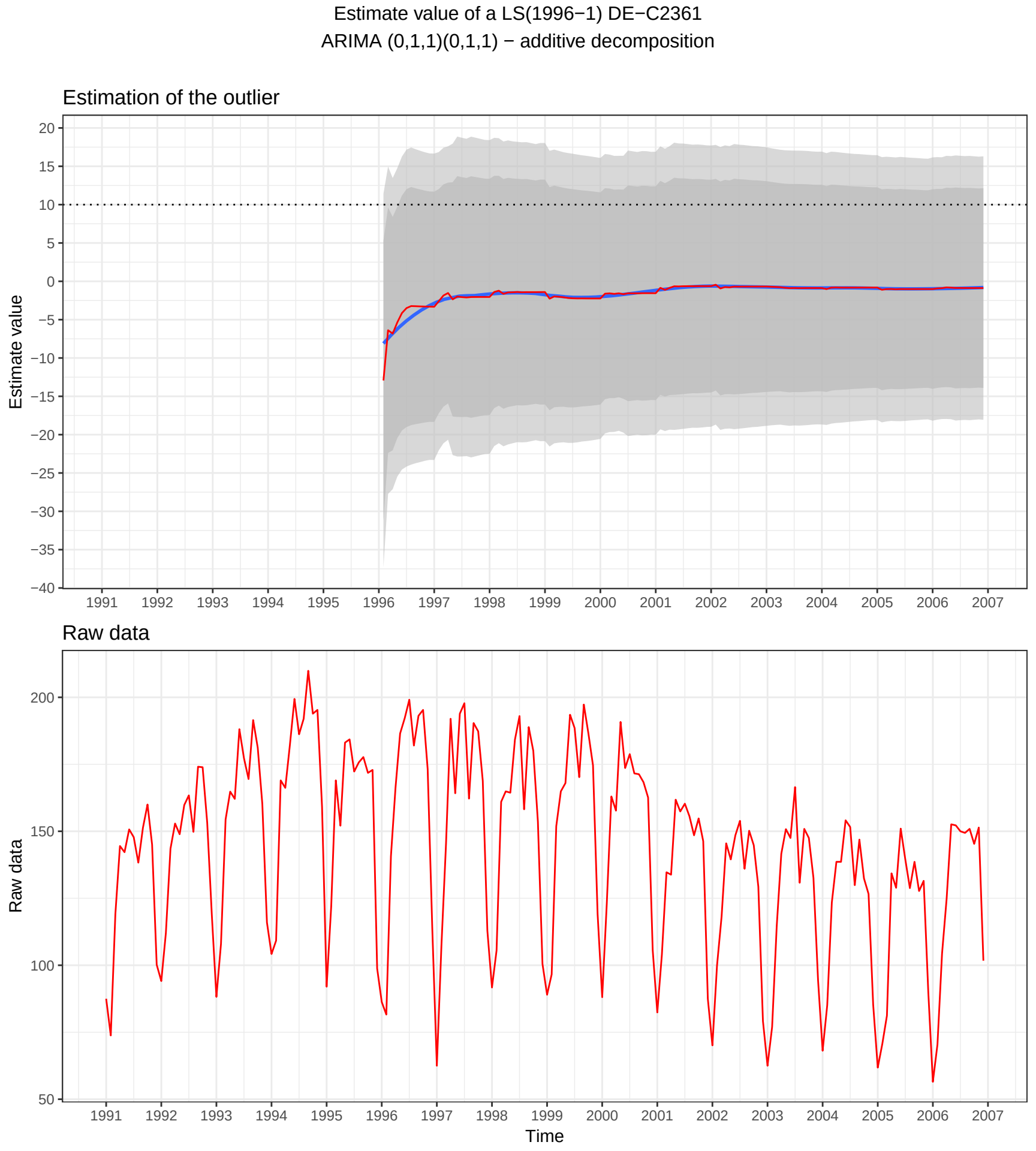


Estimate value of a LS(1995−1) IT−C2352

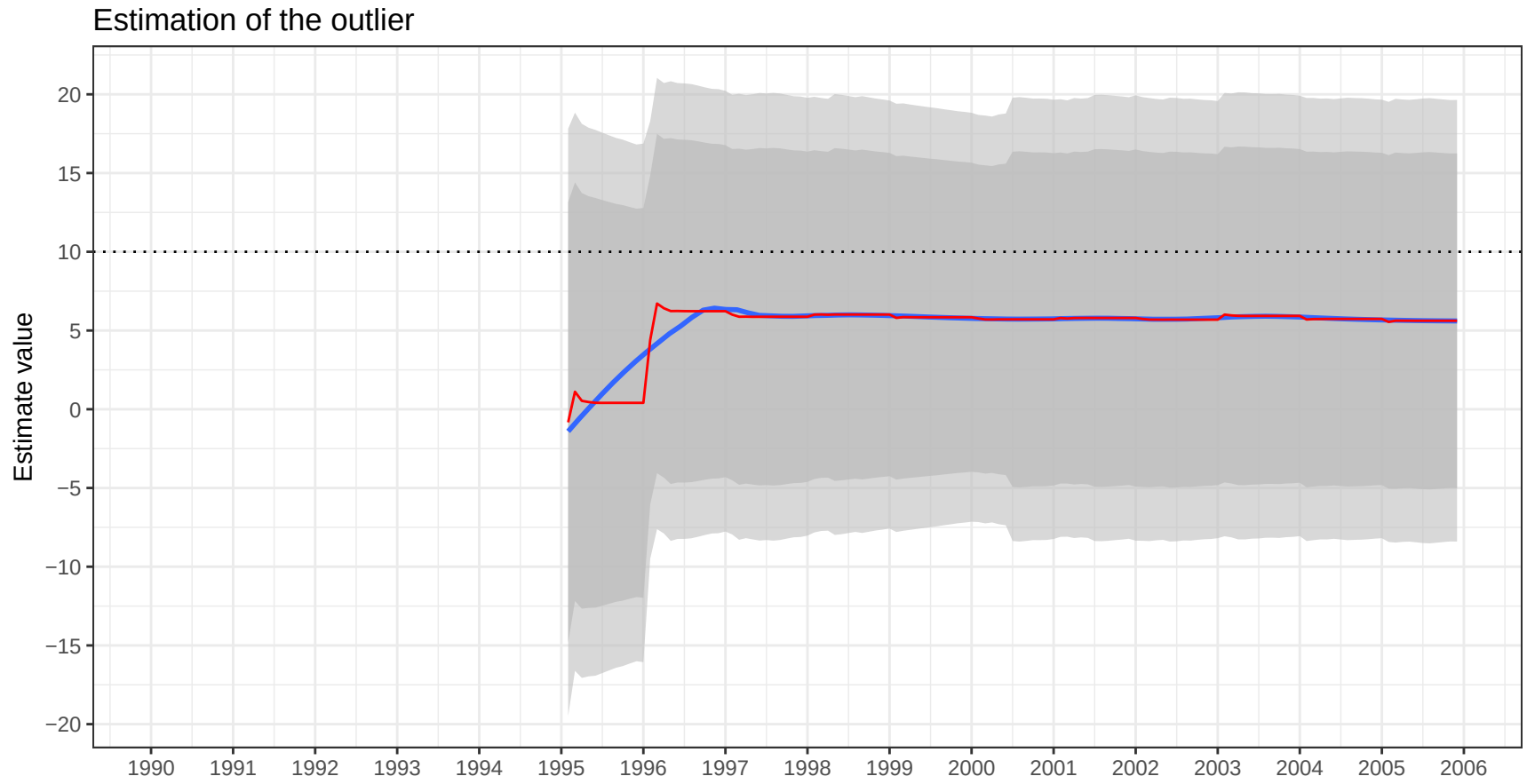
ARIMA (0,1,1)(1,1,1) − multiplicative decomposition

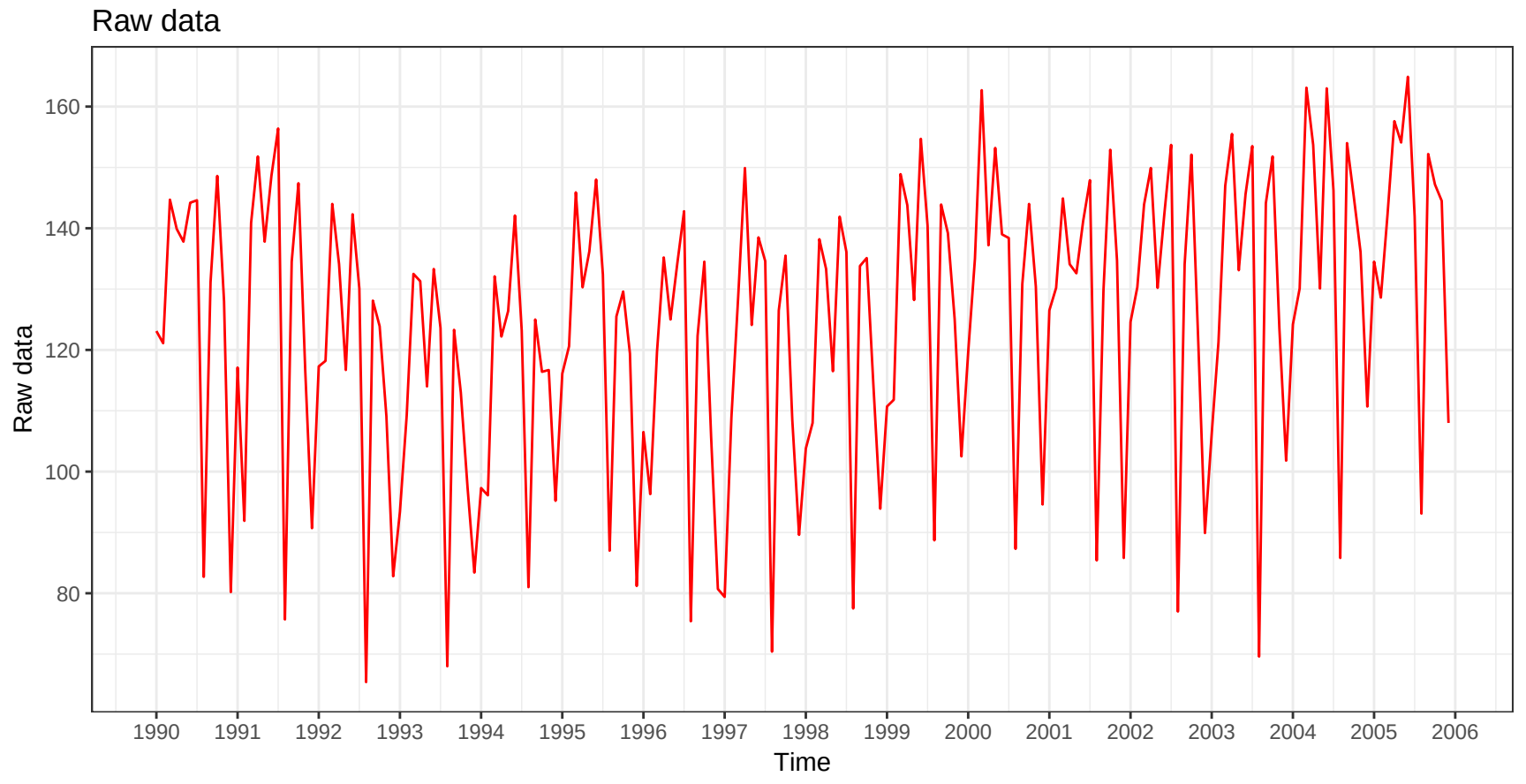


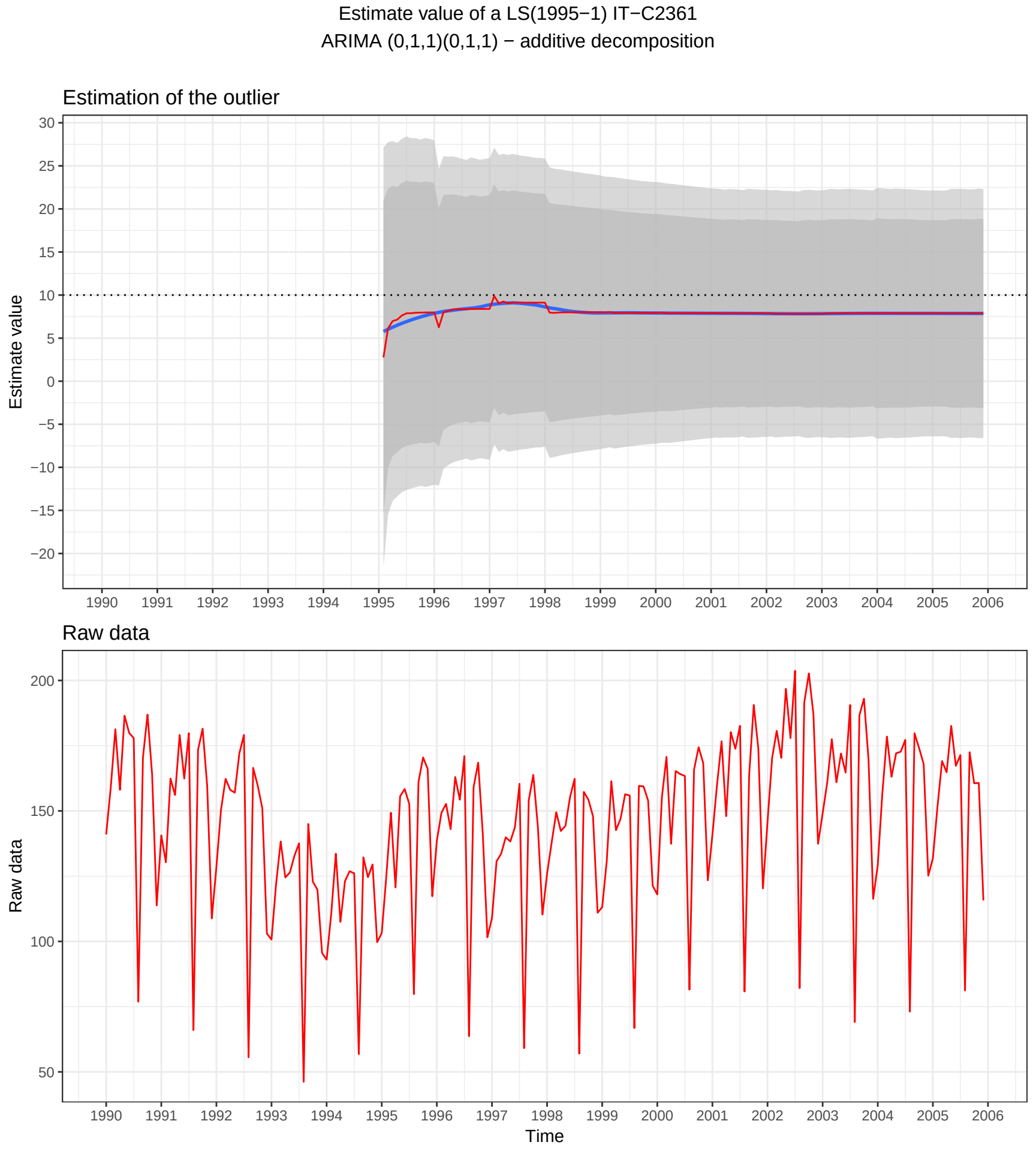


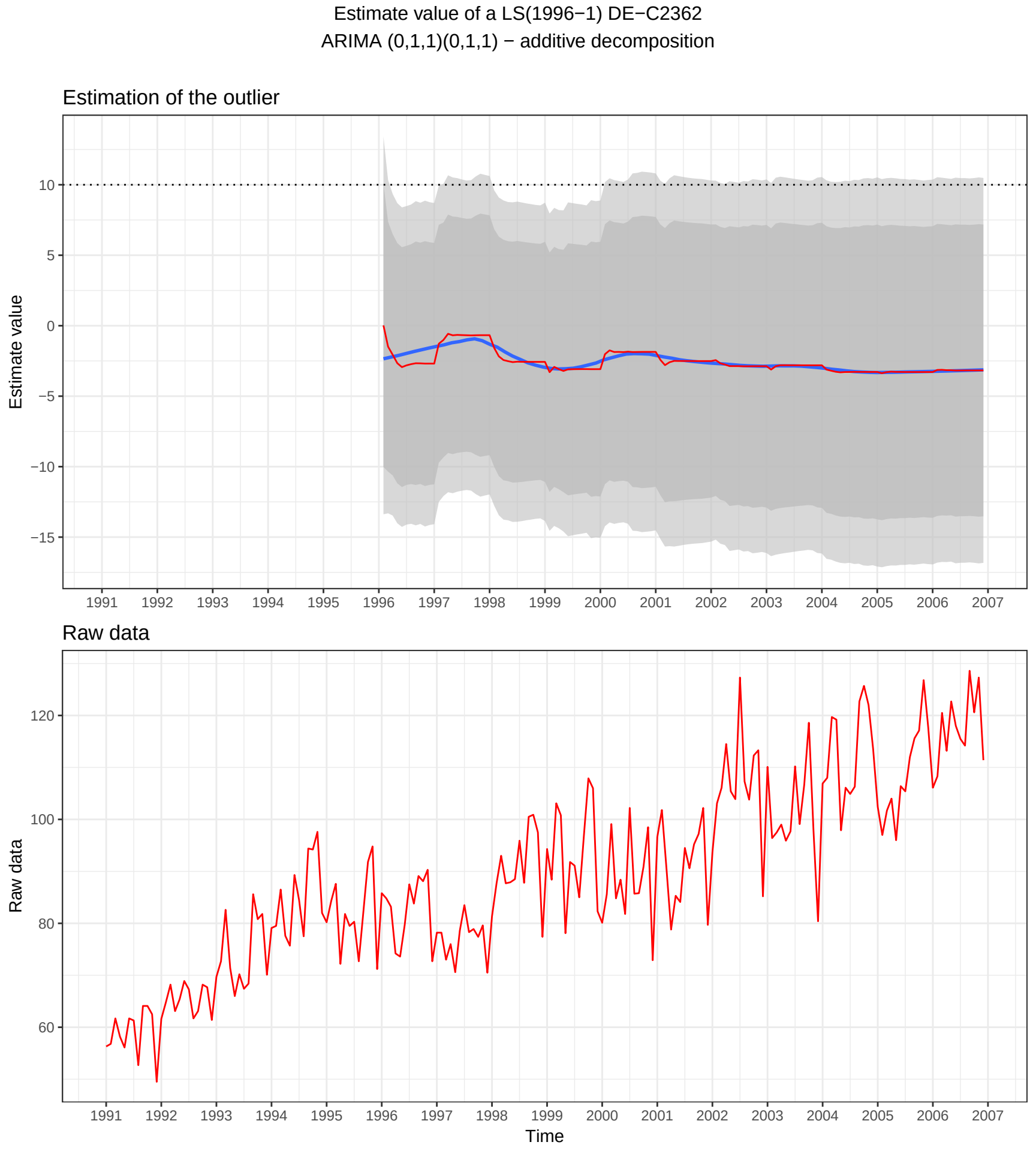

Estimate value of a LS(1996−1) DE−C2361
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
20
15
10
5
0
−5
−10
−15
−20
−25
−30
−35
−40
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
200
150
100
50
Time

Estimate value of a LS(1995−1) FR−C2361
ARIMA (0,1,1)(1,1,1) − additive decomposition

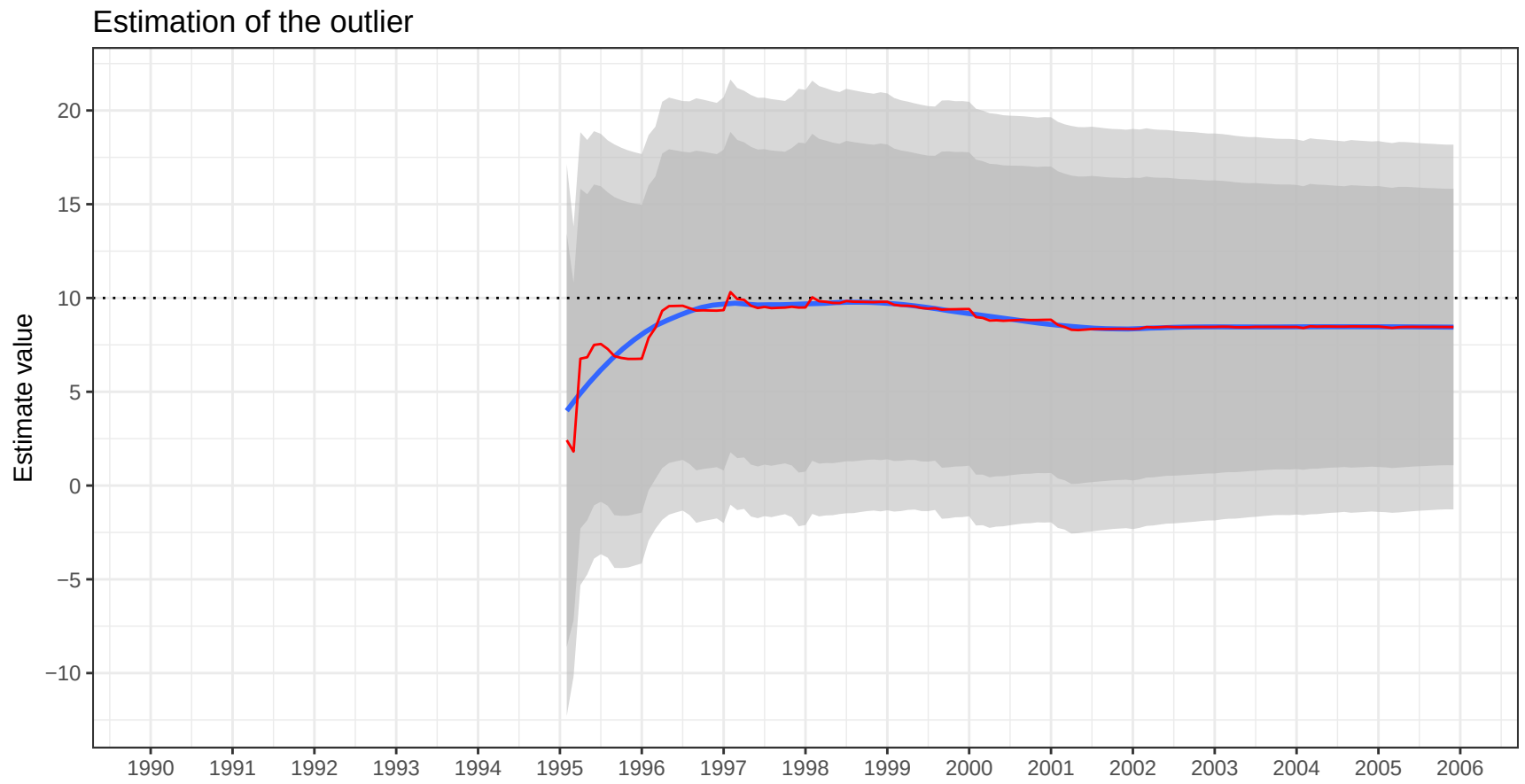


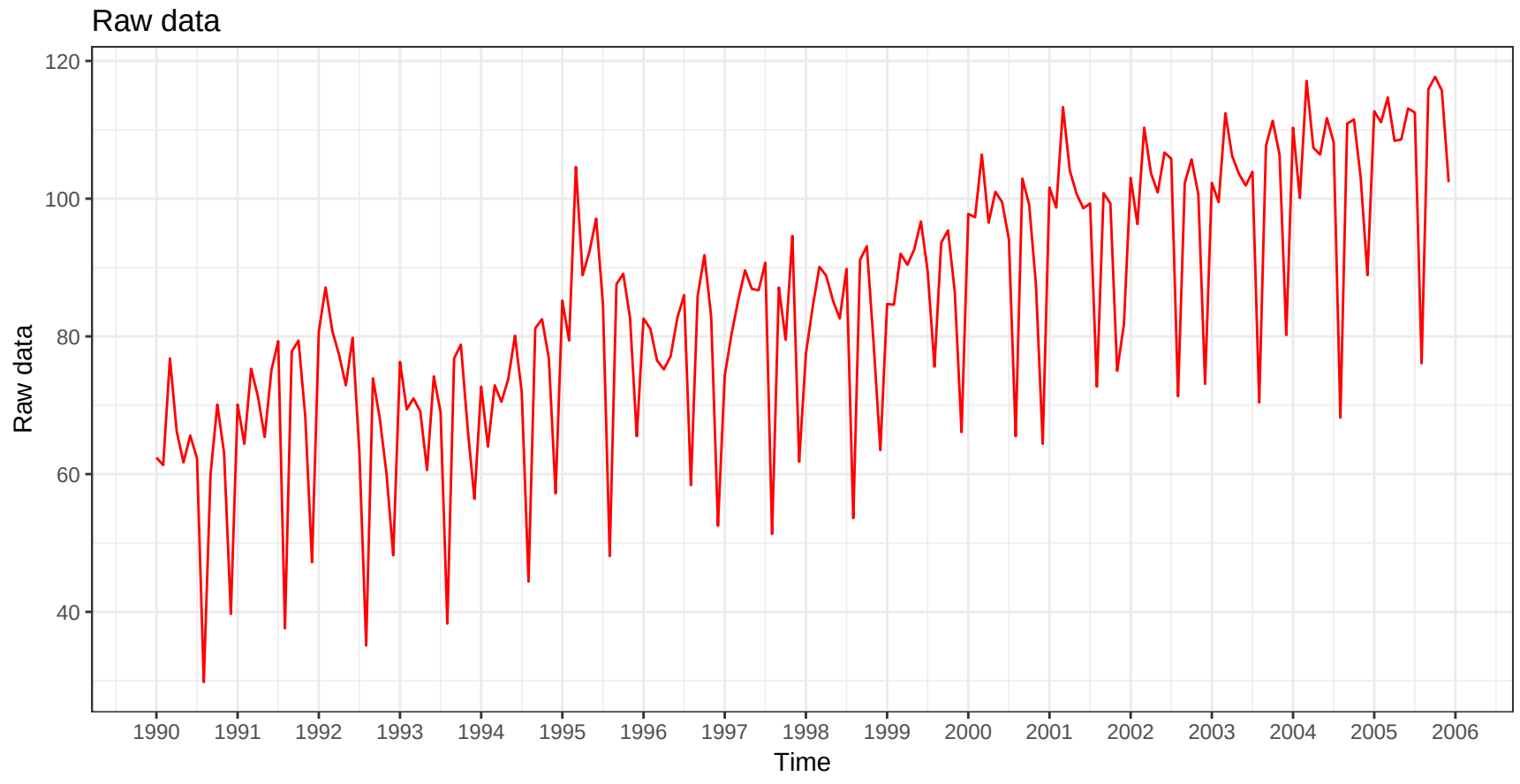


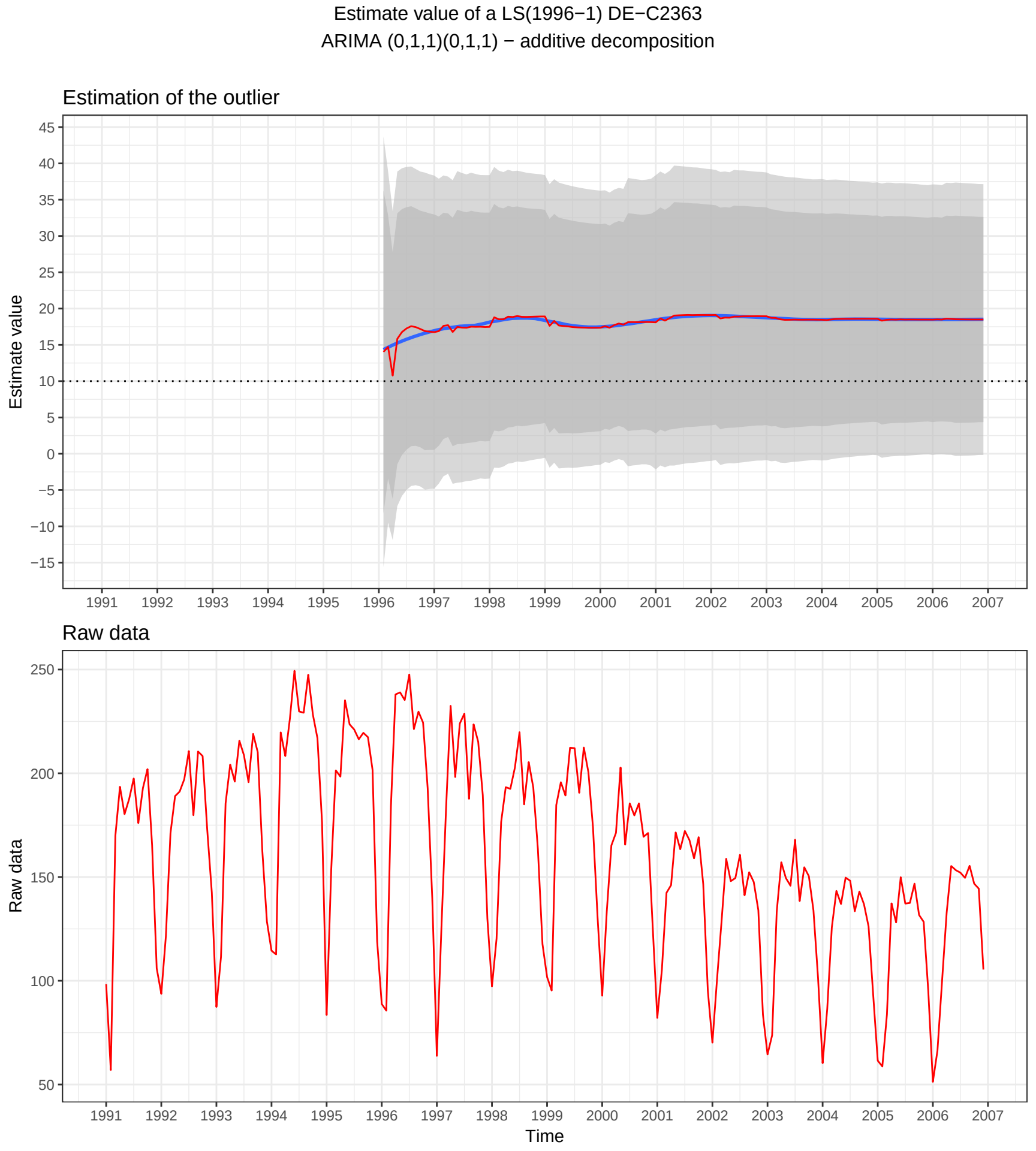

Estimate value of a LS(1995−1) IT−C2361
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
30
25
20
15
10
5
0
−5
−10
−15
−20
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
200
150
100
50
Time


Estimate value of a LS(1996−1) DE−C2362
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
10
5
0
−5
−10
−15
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
120
100
80
60
Time

Estimate value of a LS(1995−1) FR−C2362
ARIMA (0,1,1)(0,1,1) − additive decomposition

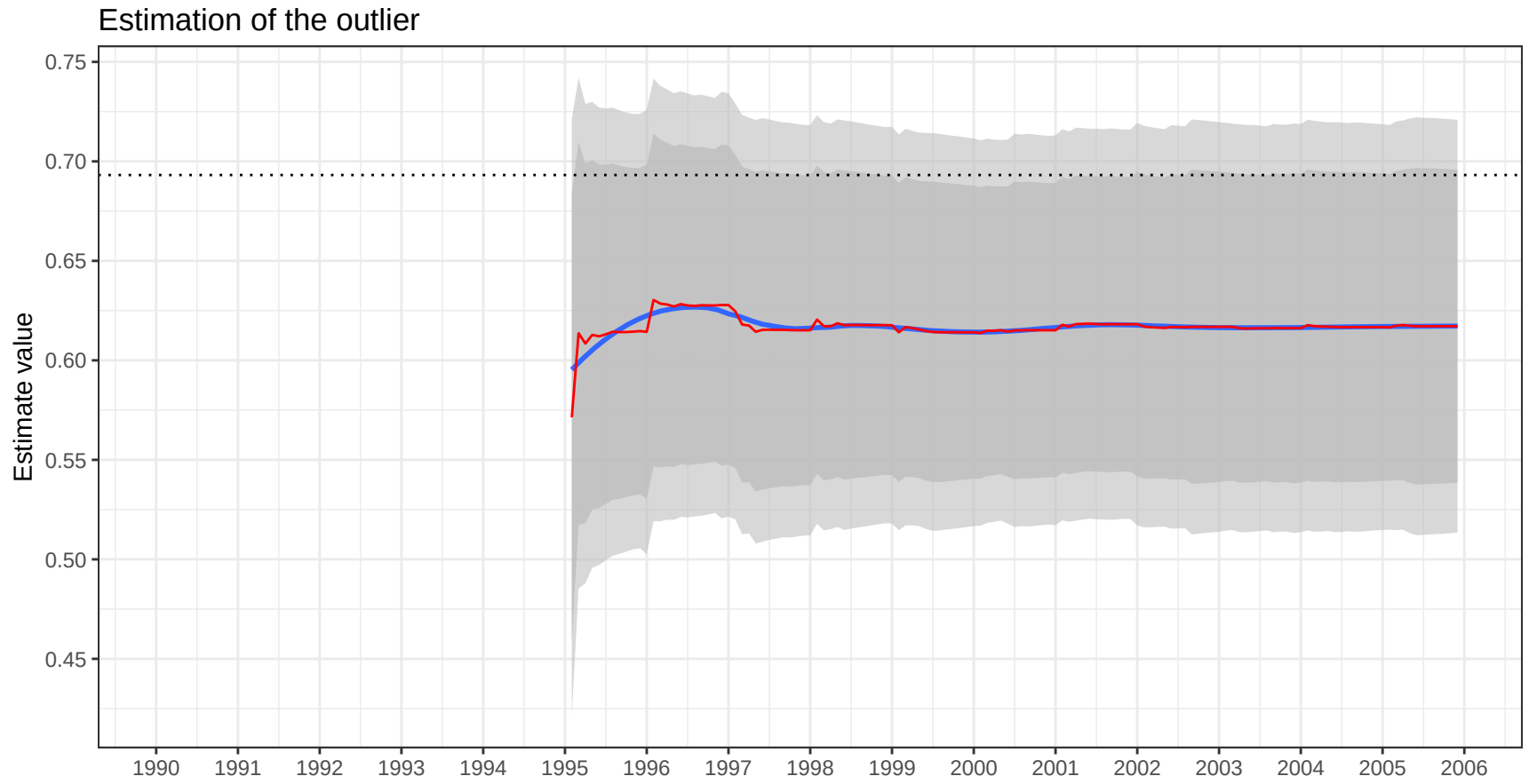


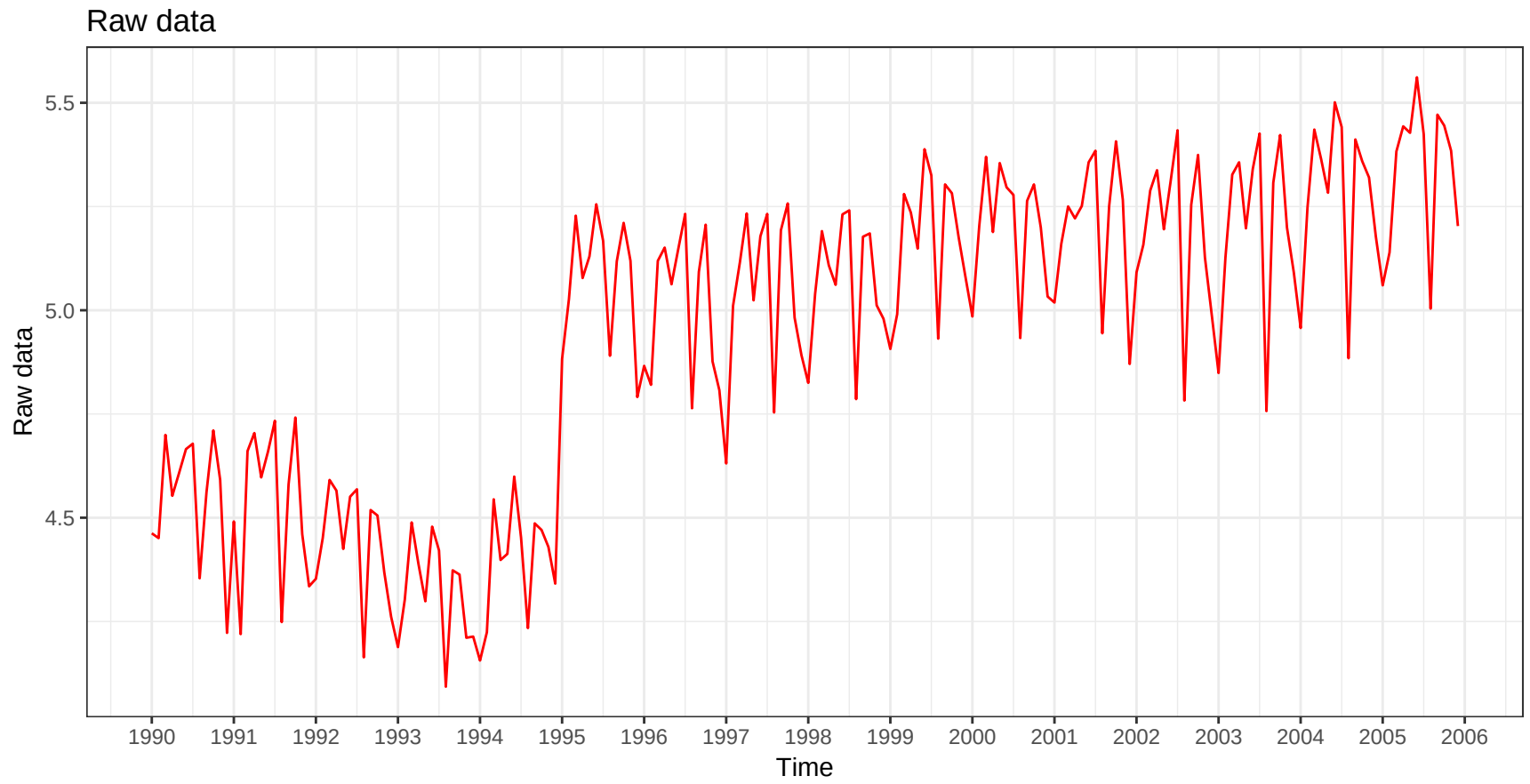


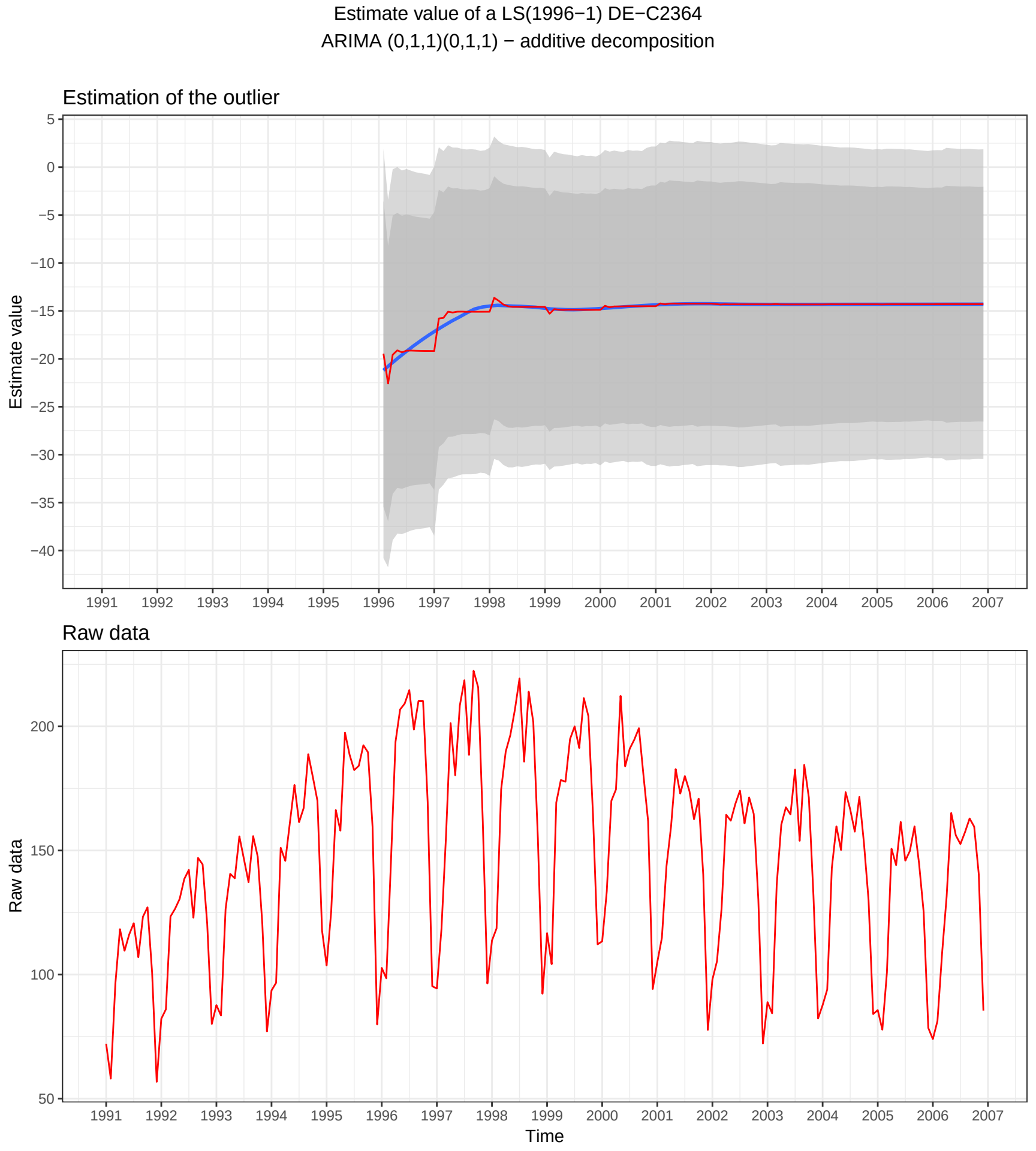

Estimate value of a LS(1996−1) DE−C2363
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
45
40
35
30
25
20
15
10
5
0
−5
−10
−15
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
250
200
150
100
50
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Time

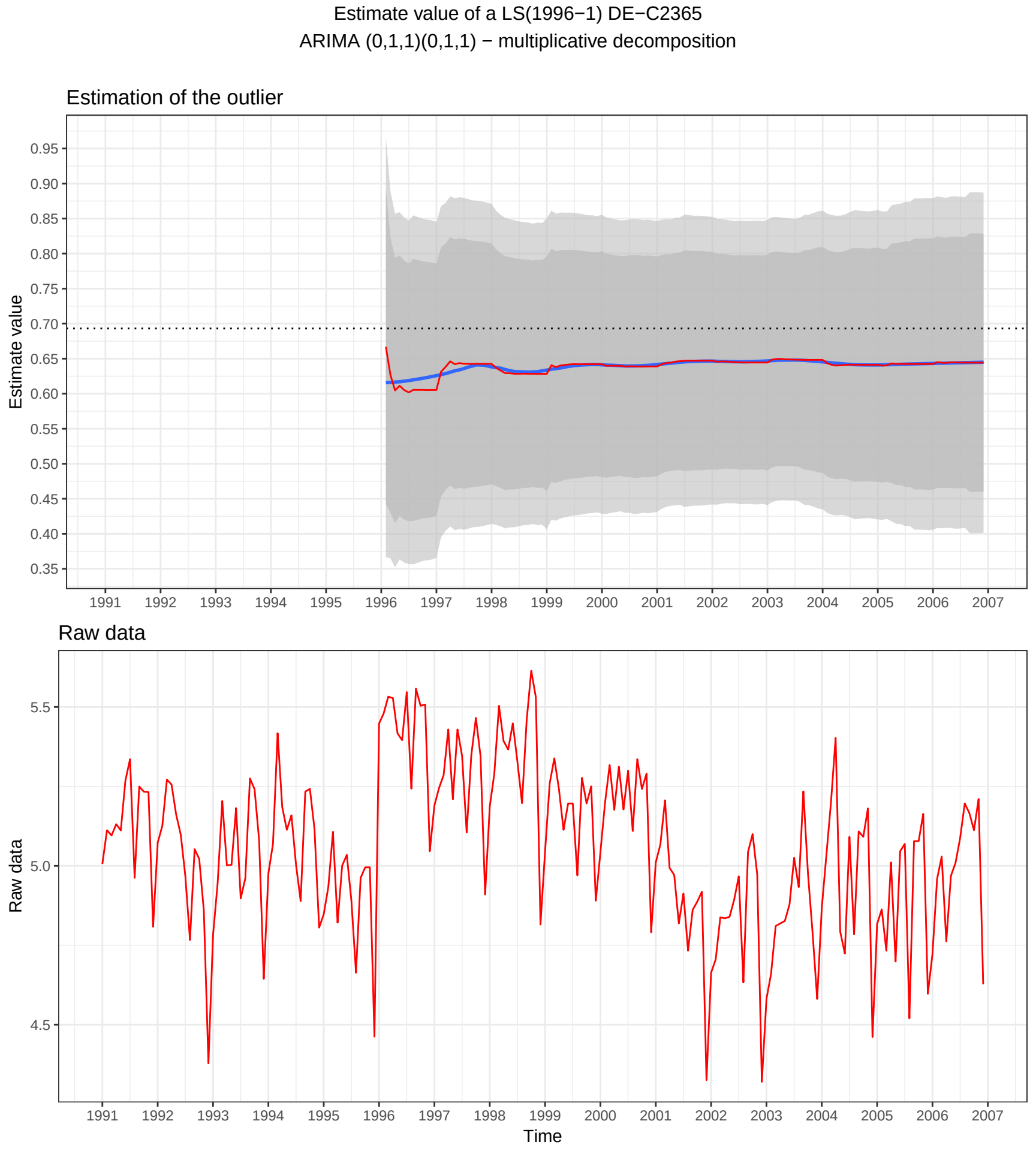
Estimate value of a LS(1995−1) FR−C2363

ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

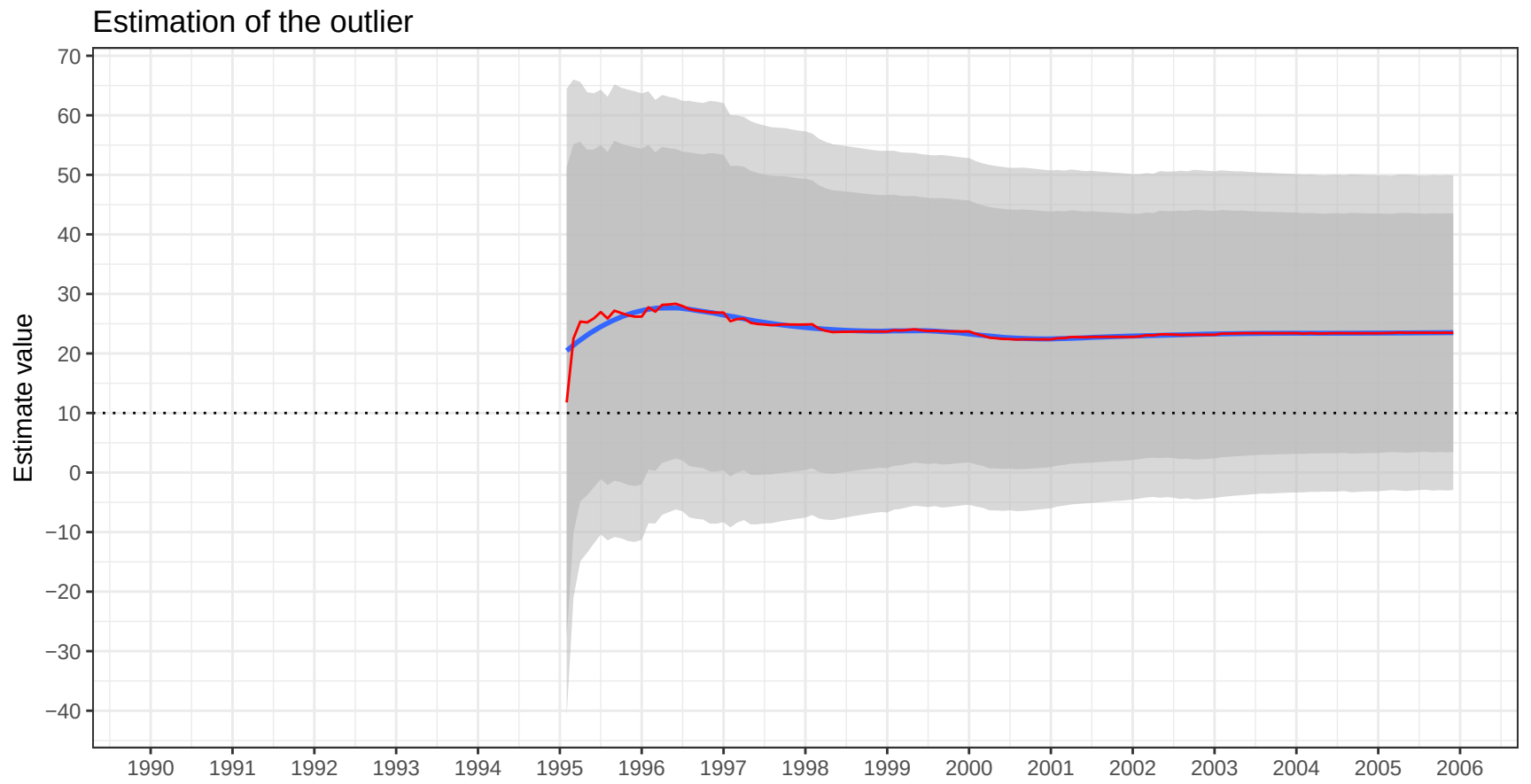


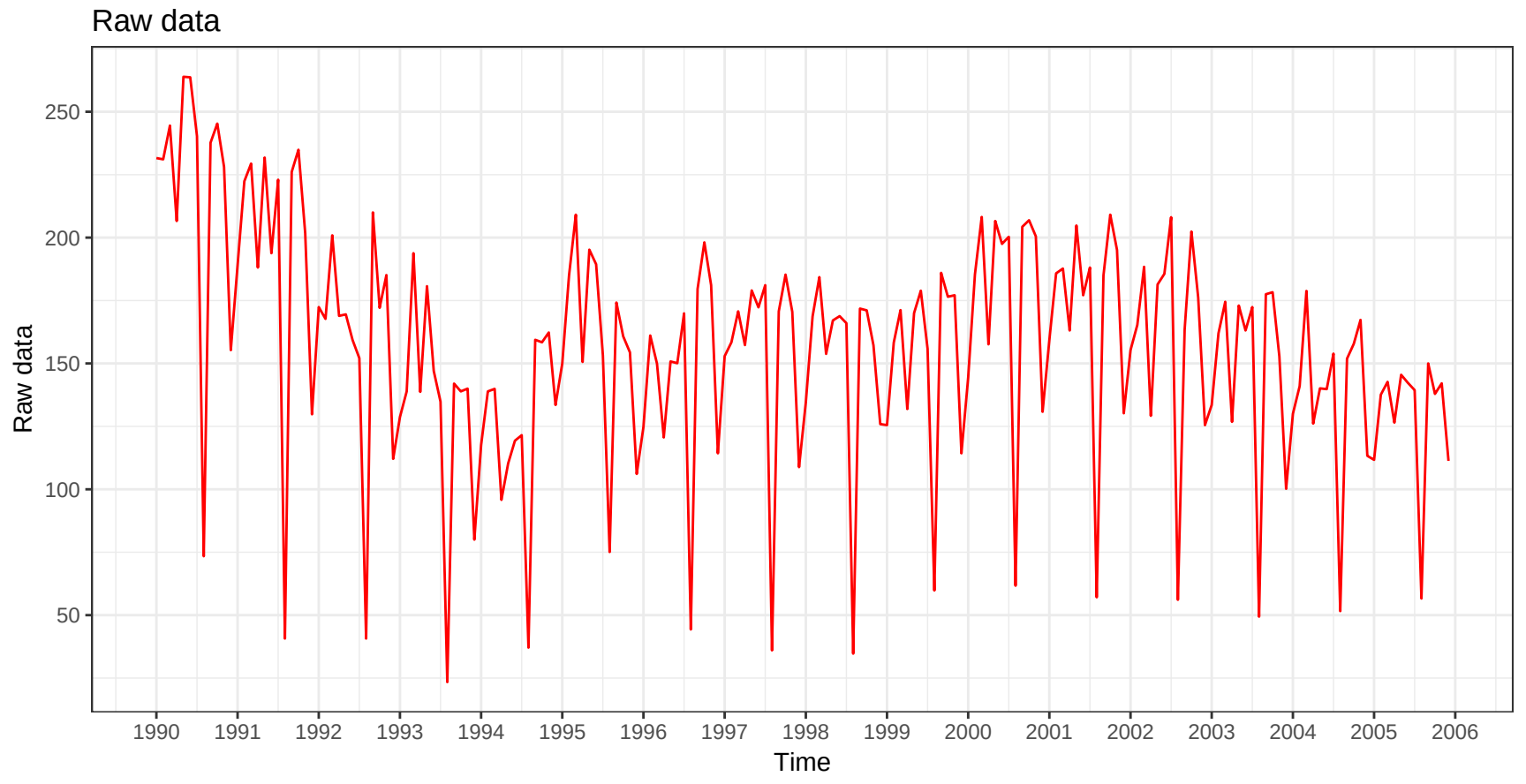


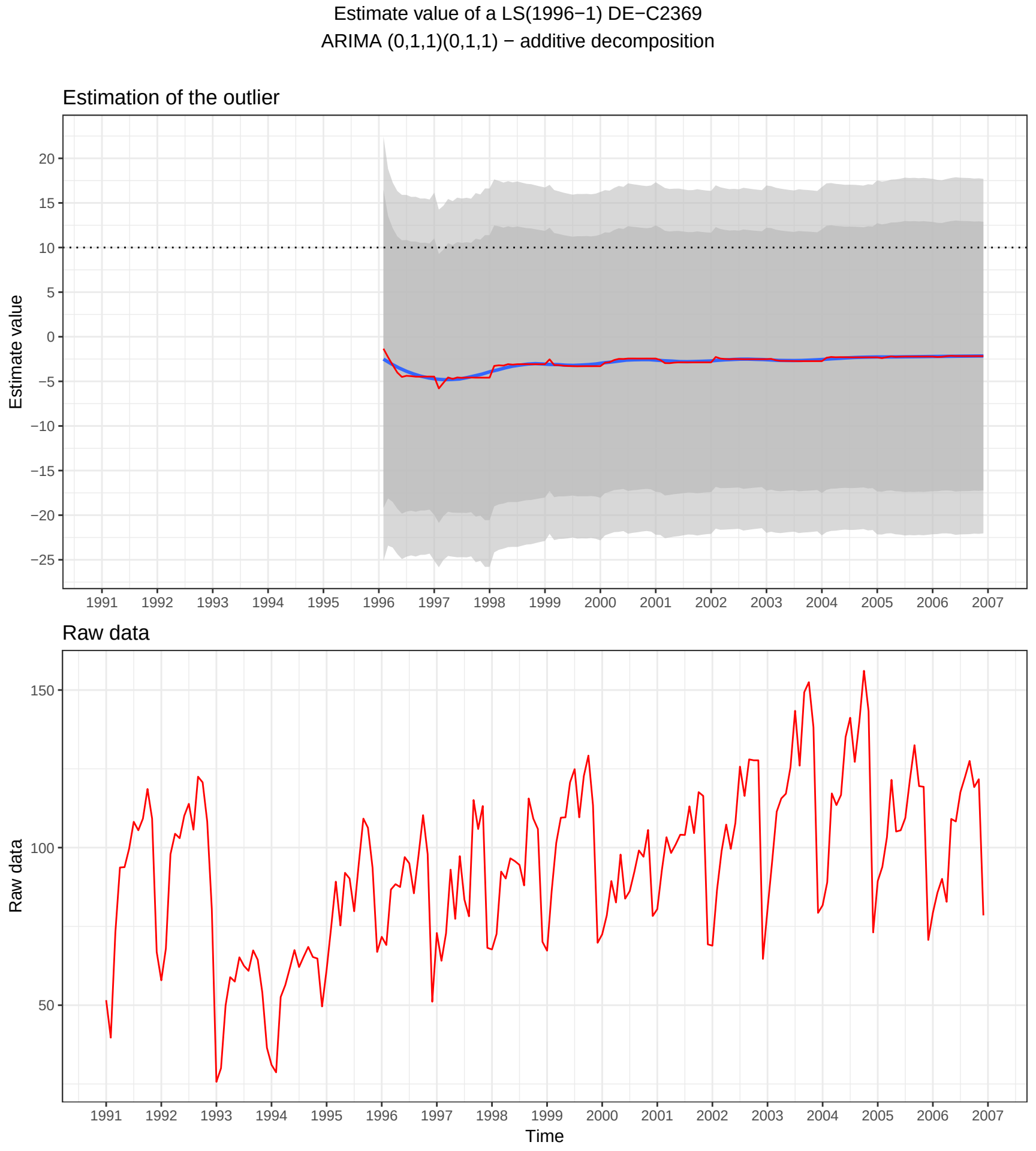

Estimate value of a LS(1996−1) DE−C2364
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
5
0
−5
−10
−15
−20
−25
−30
−35
−40
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
200
150
100
50
Time


Estimate value of a LS(1996−1) DE−C2365
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.95
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
0.45
0.40
0.35
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
5.5
5.0
4.5
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Time

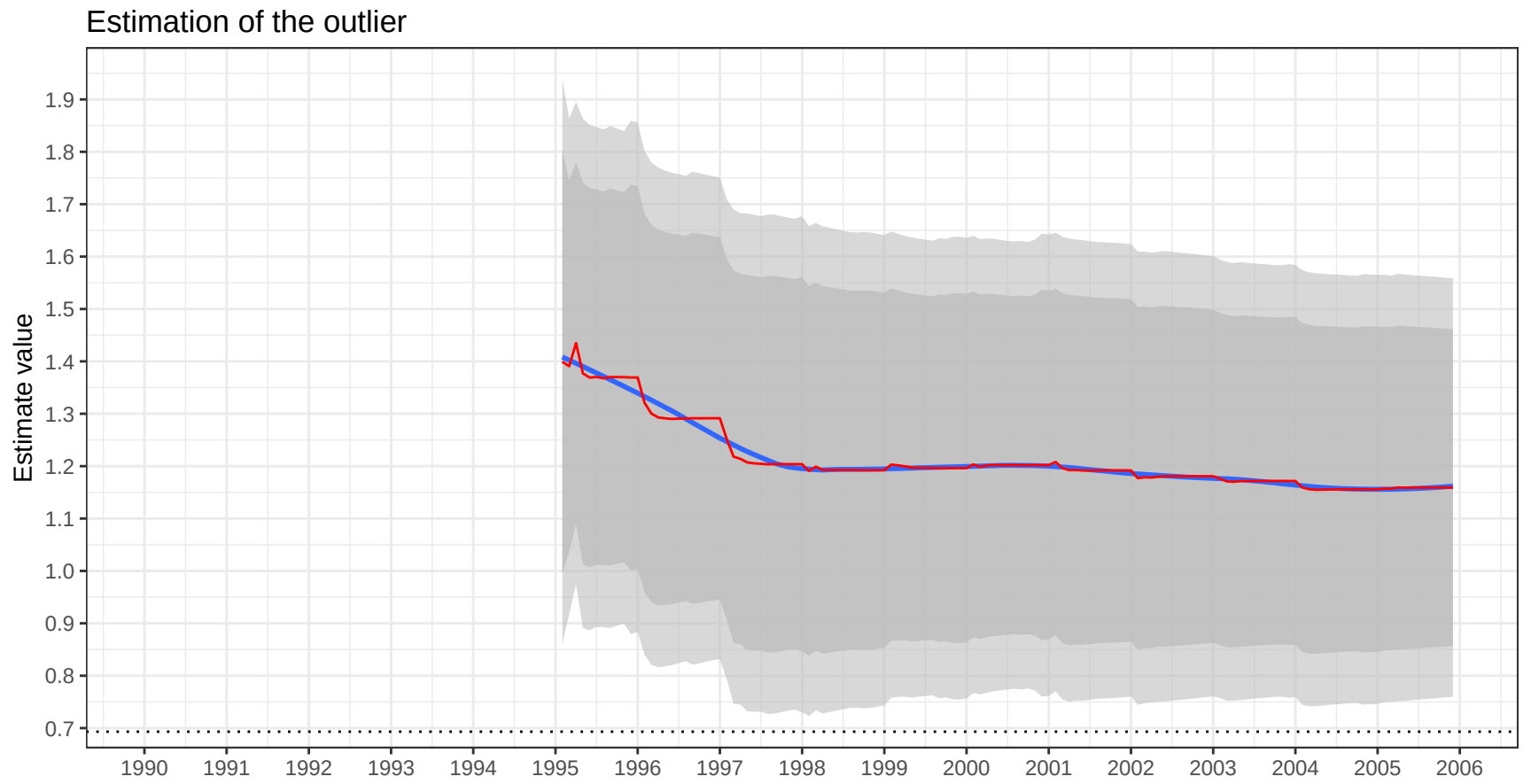
Estimate value of a LS(1995−1) IT−C2365
ARIMA (0,1,1)(0,1,1) − additive decomposition

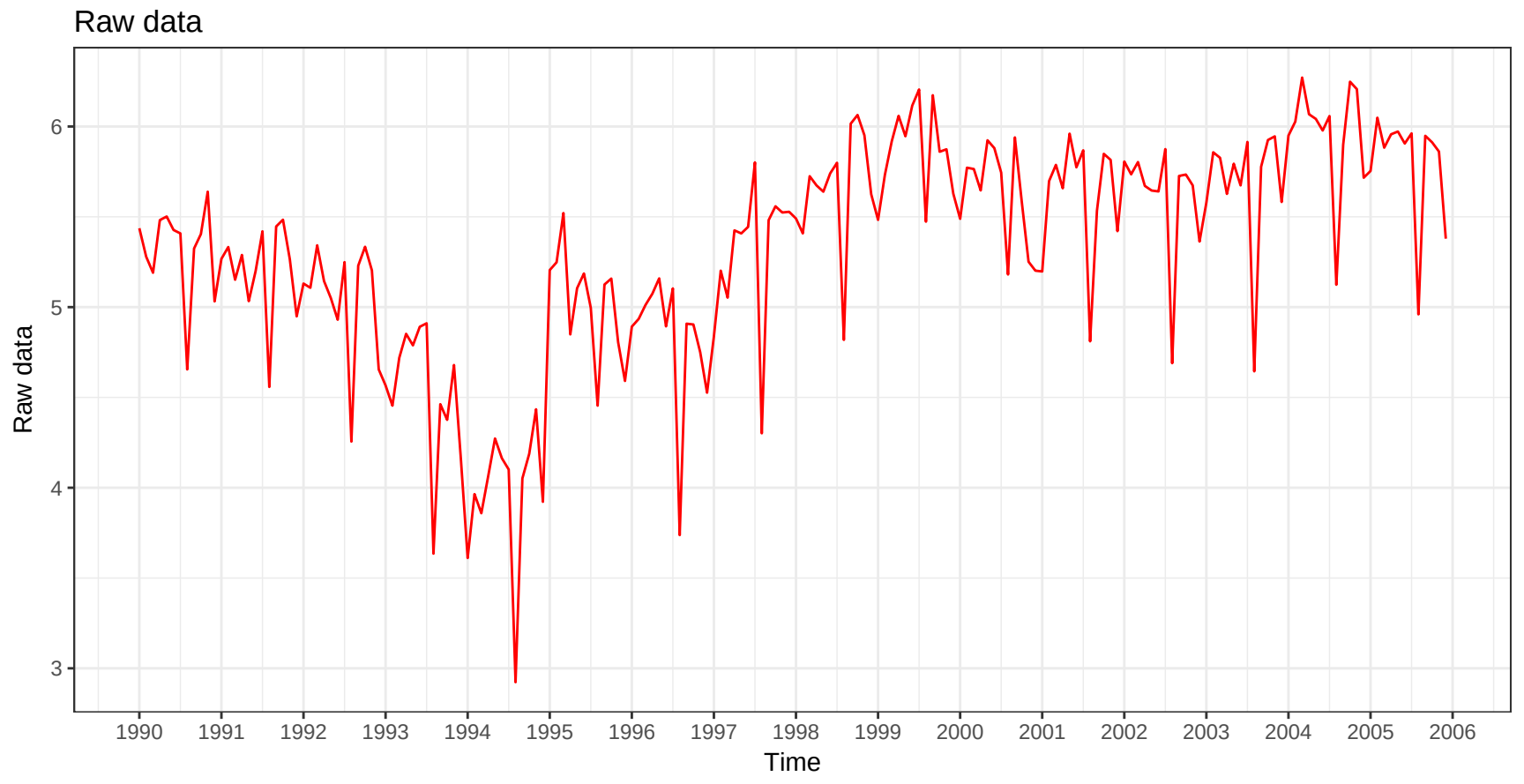


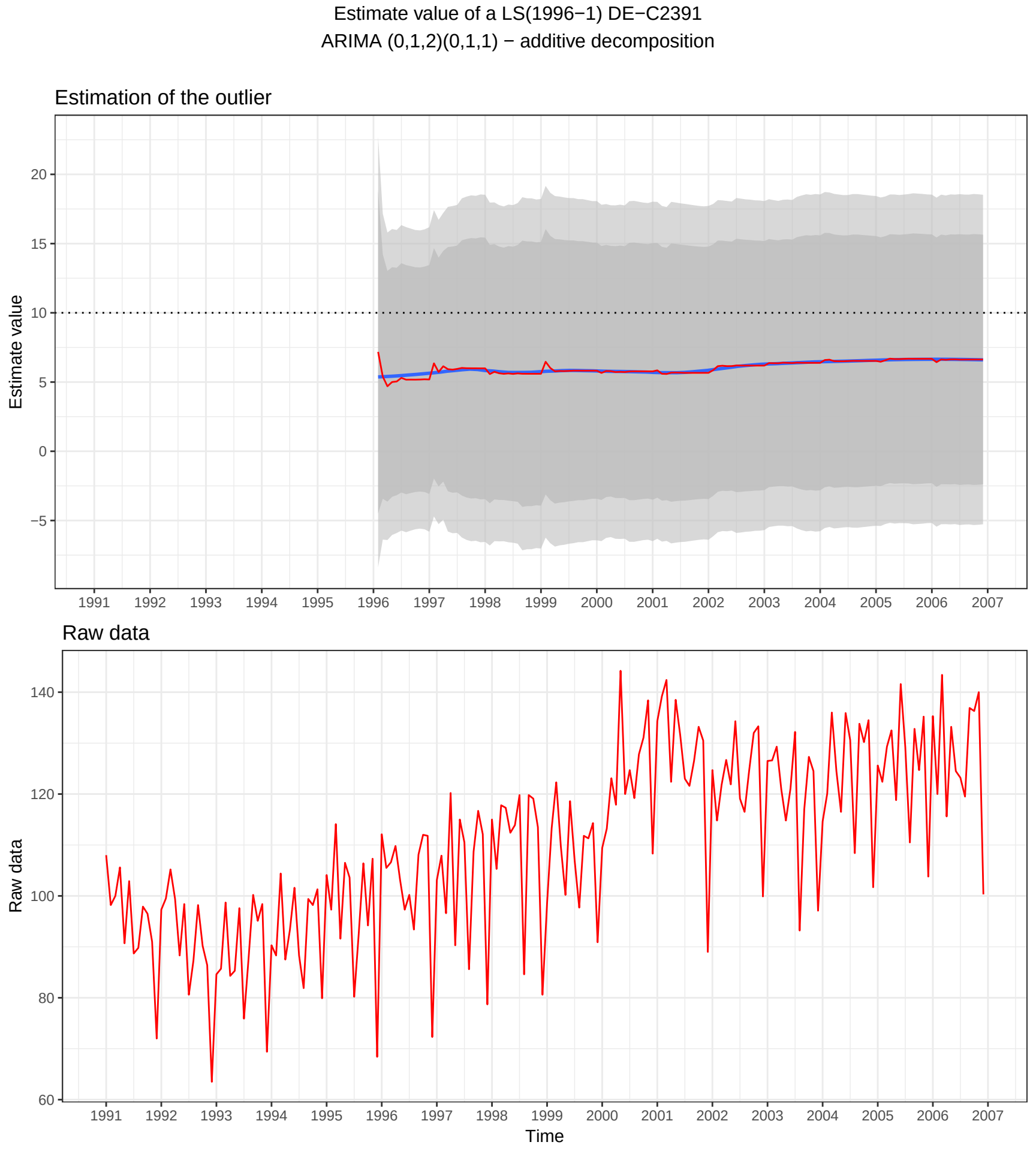



Estimate value of a LS(1996−1) DE−C2369
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
20
15
10
5
0
−5
−10
−15
−20
−25
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
150
100
50
Time

Estimate value of a LS(1995−1) IT−C2369
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

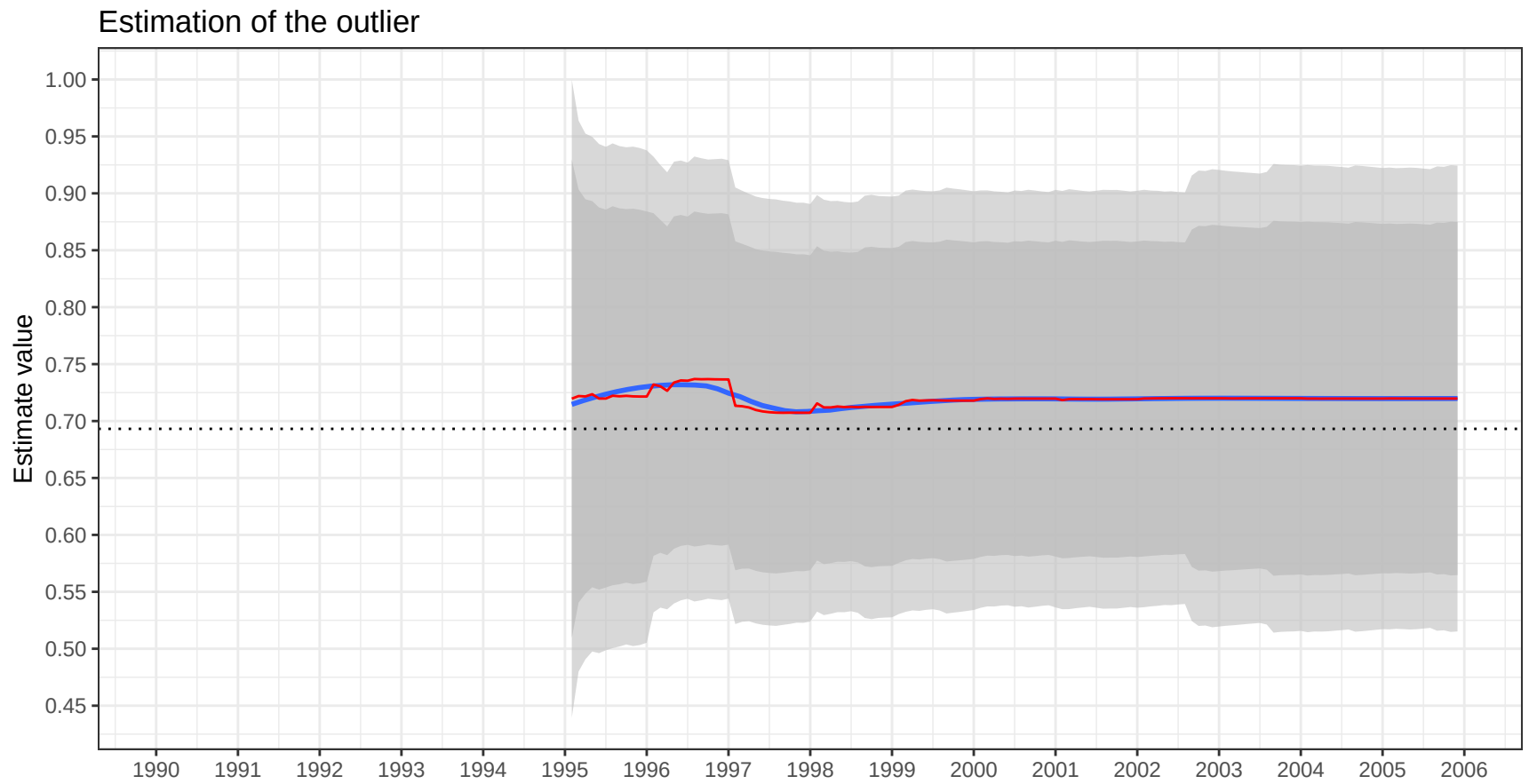


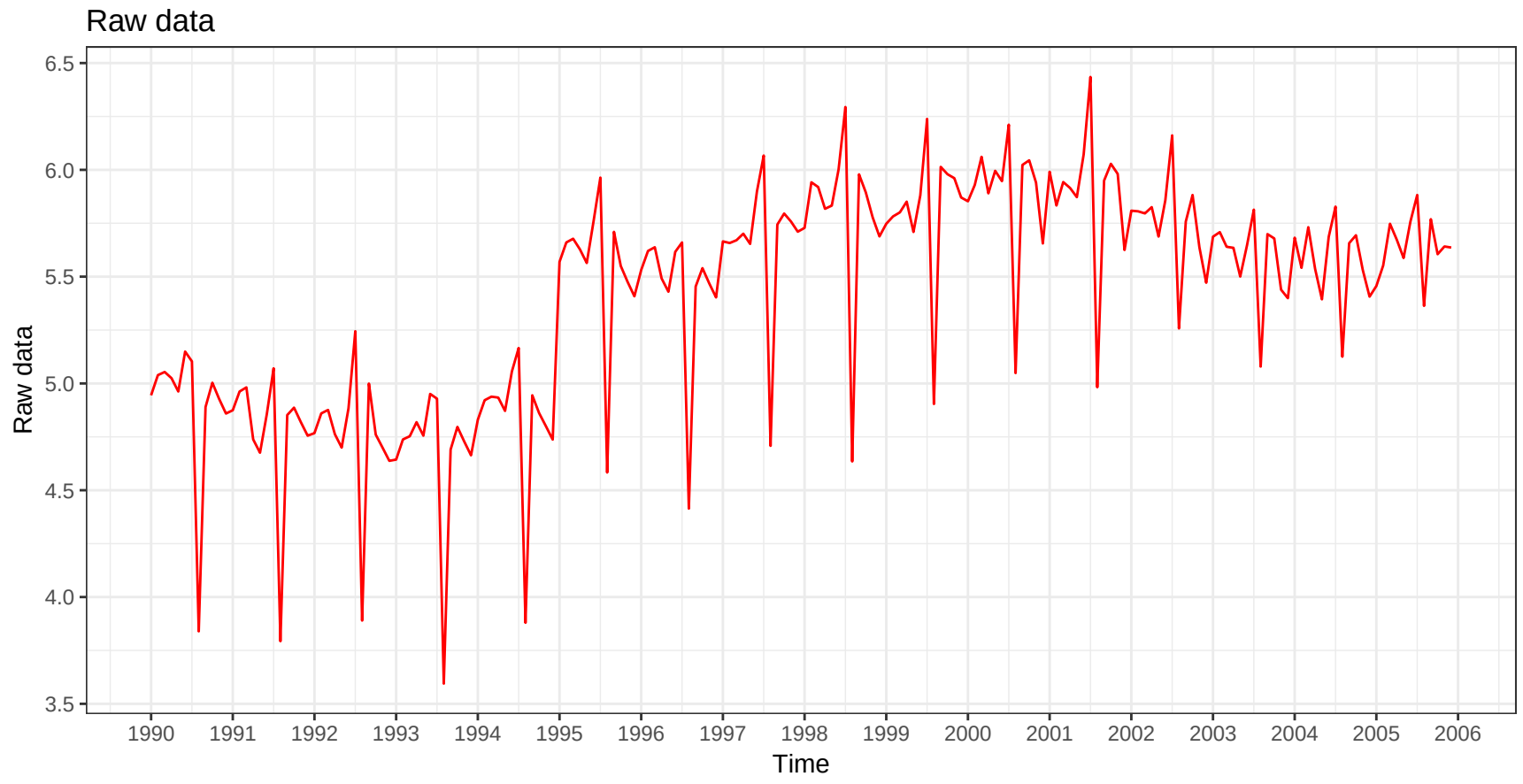



Estimate value of a LS(1996−1) DE−C2391
ARIMA (0,1,2)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
20
15
10
5
0
−5
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
140
120
100
80
60
Time

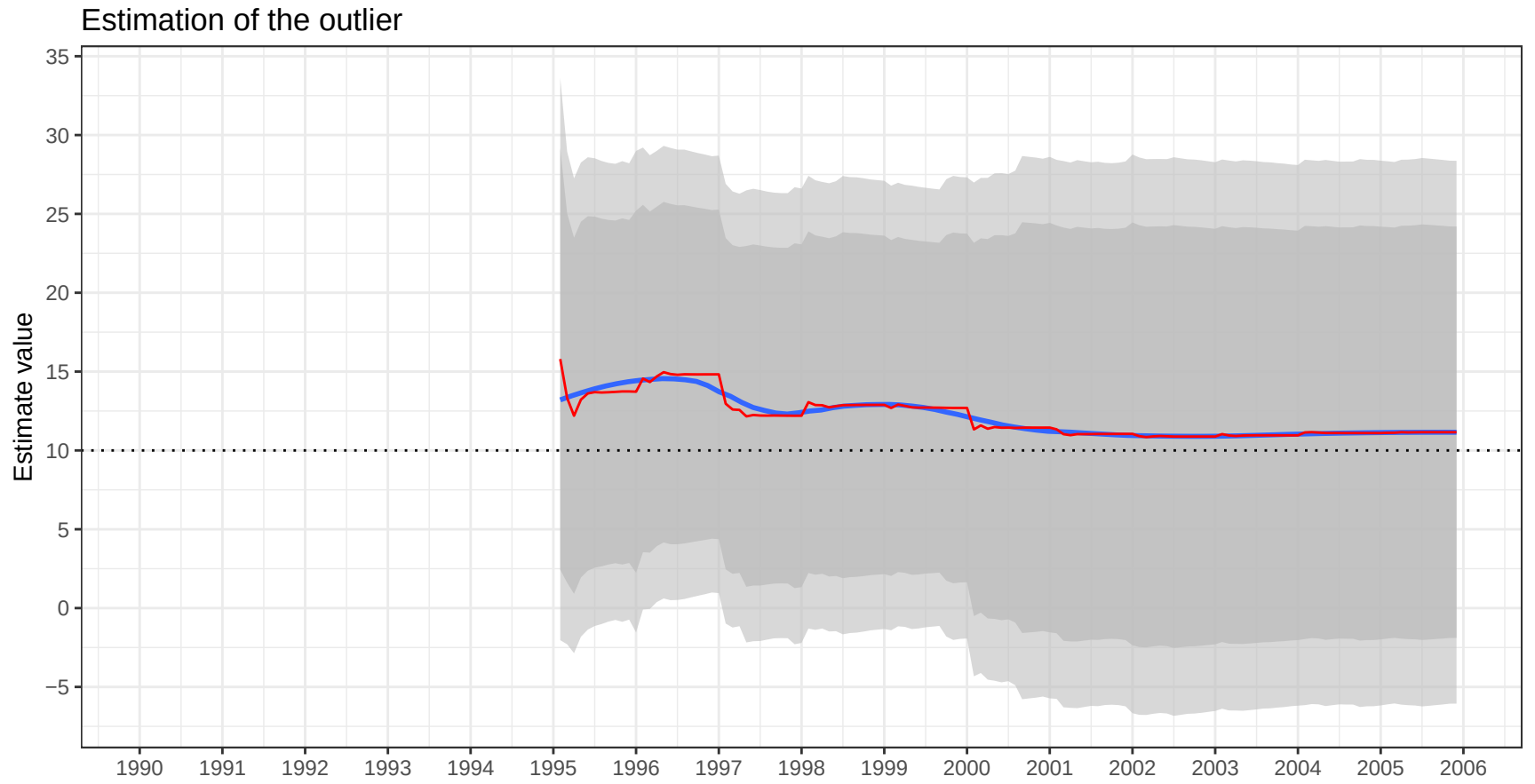
Estimate value of a LS(1995−1) FR−C2391

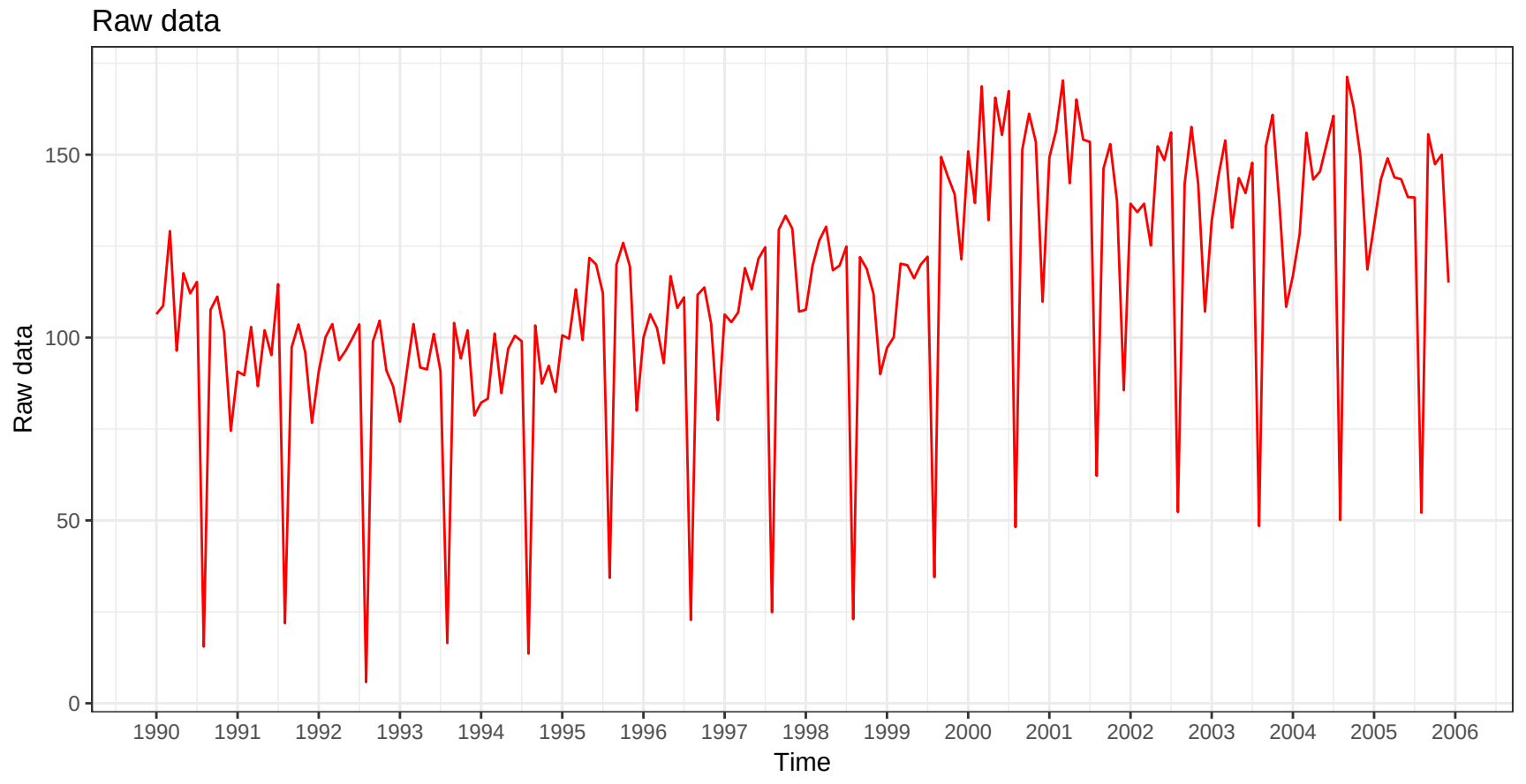
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

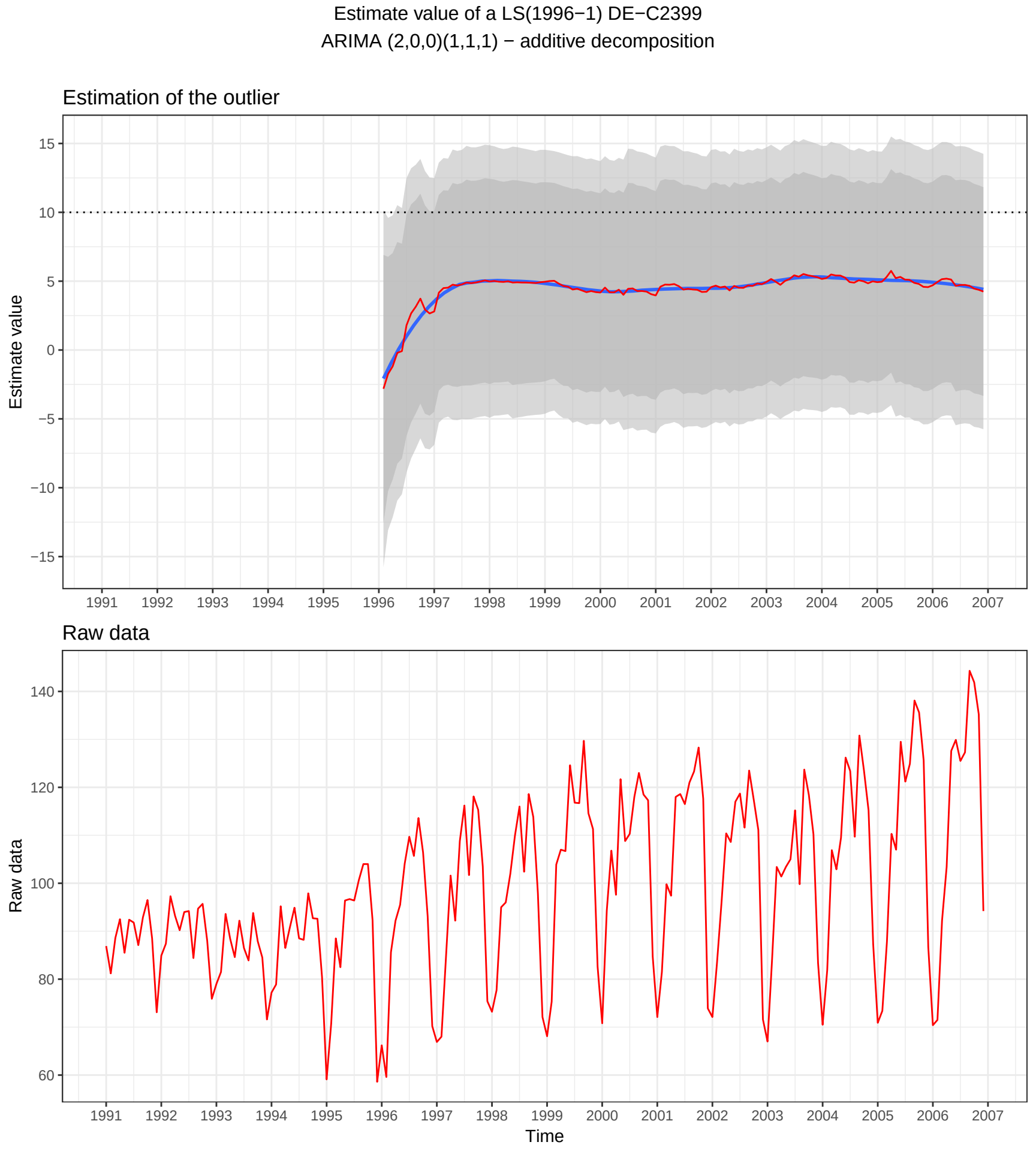


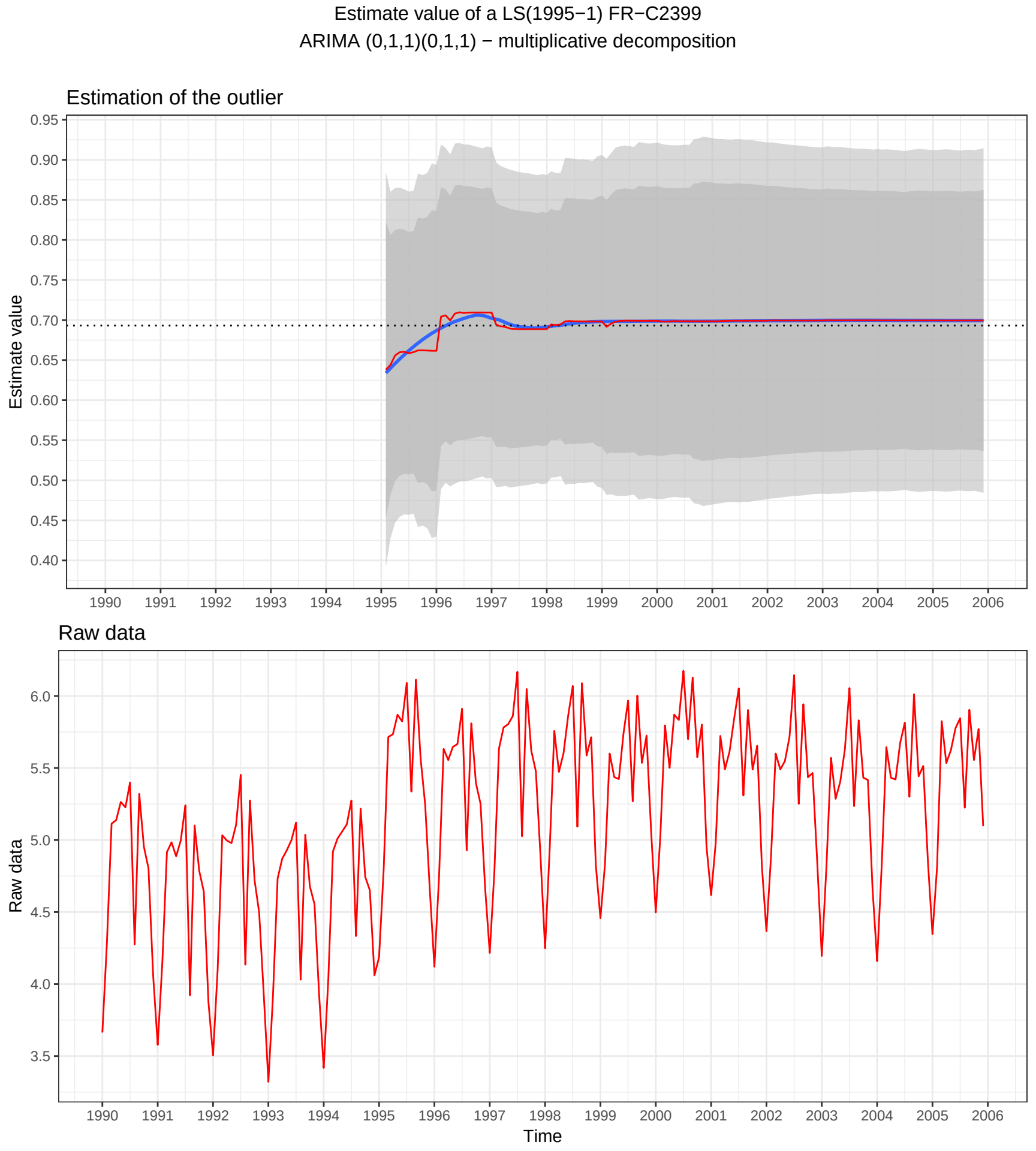


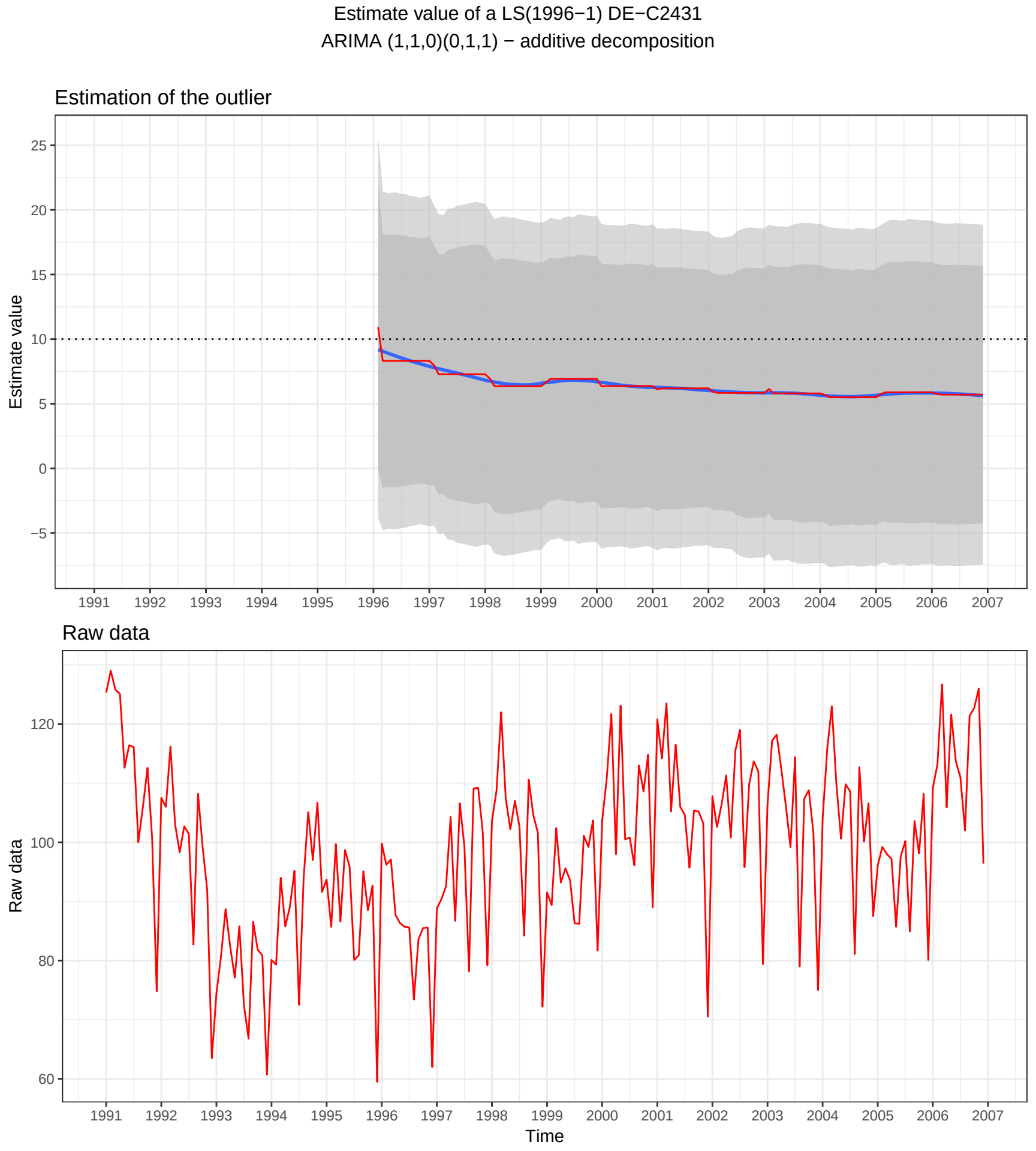
Estimate value of a LS(1995−1) IT−C2391
ARIMA (0,1,1)(0,1,1) − additive decomposition

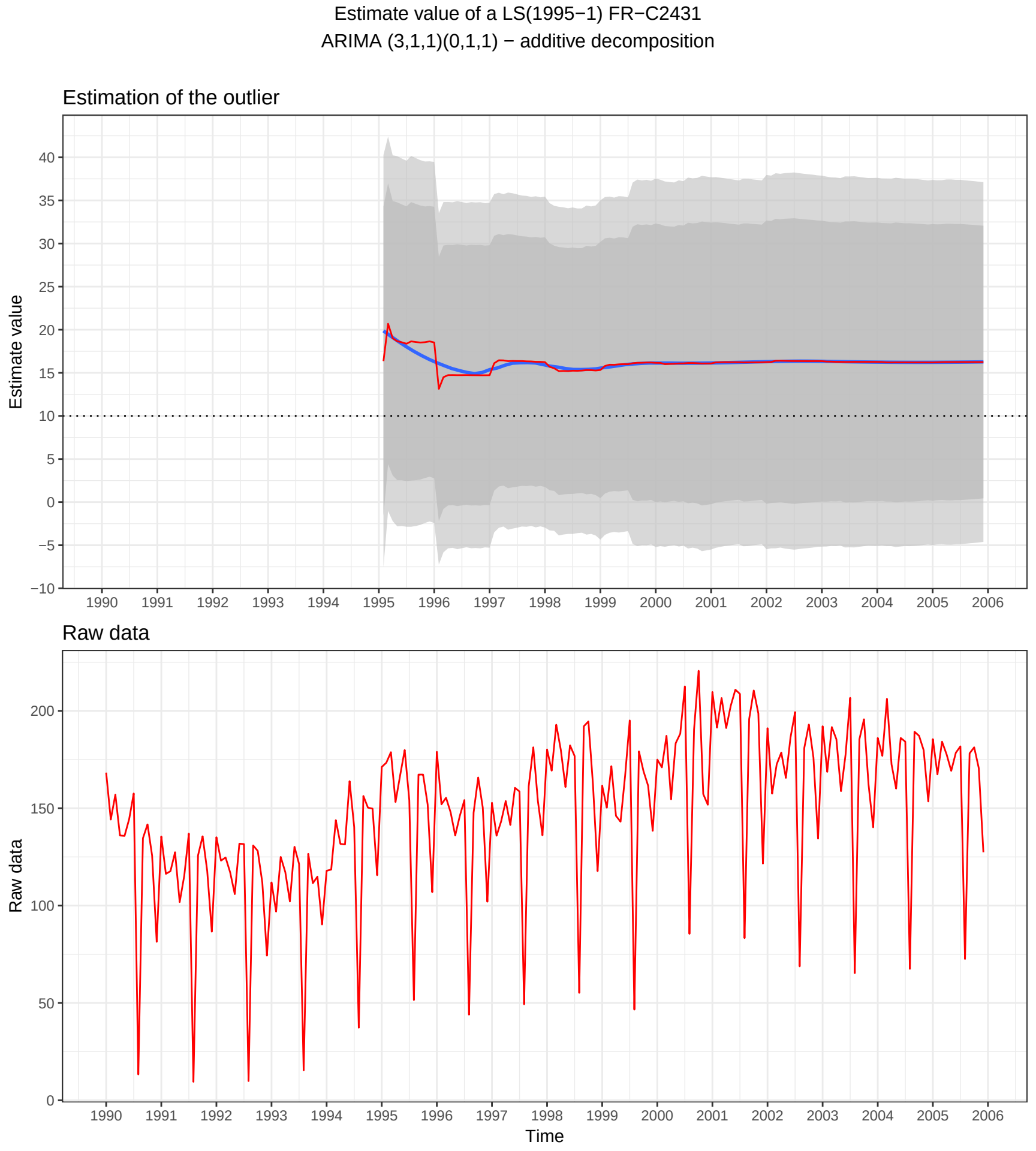




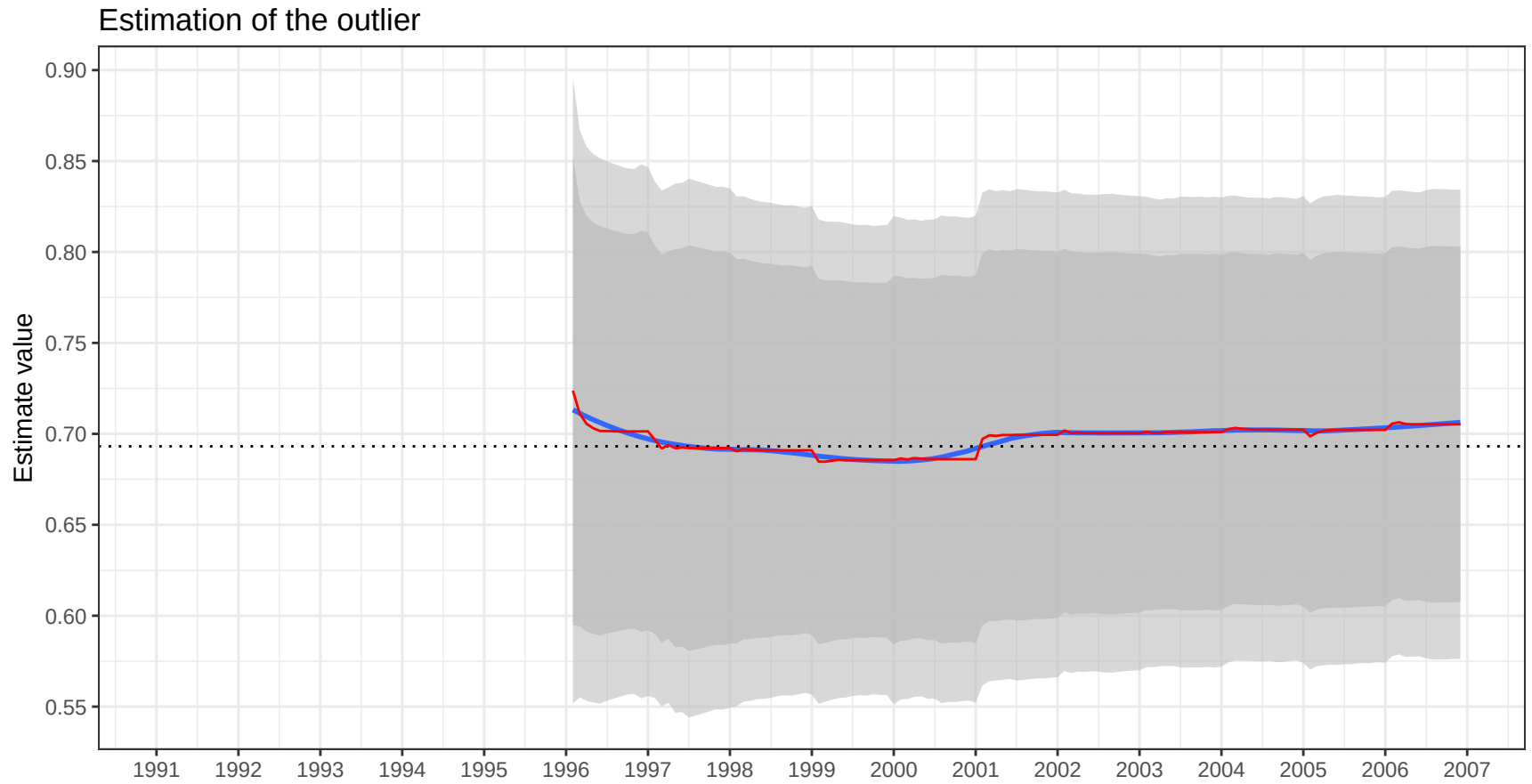

Estimate value of a LS(1996−1) DE−C2399
ARIMA (2,0,0)(1,1,1) − additive decomposition
Estimation of the outlier
Estimate value
15
10
5
0
−5
−10
−15
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
140
120
100
80
60
Time

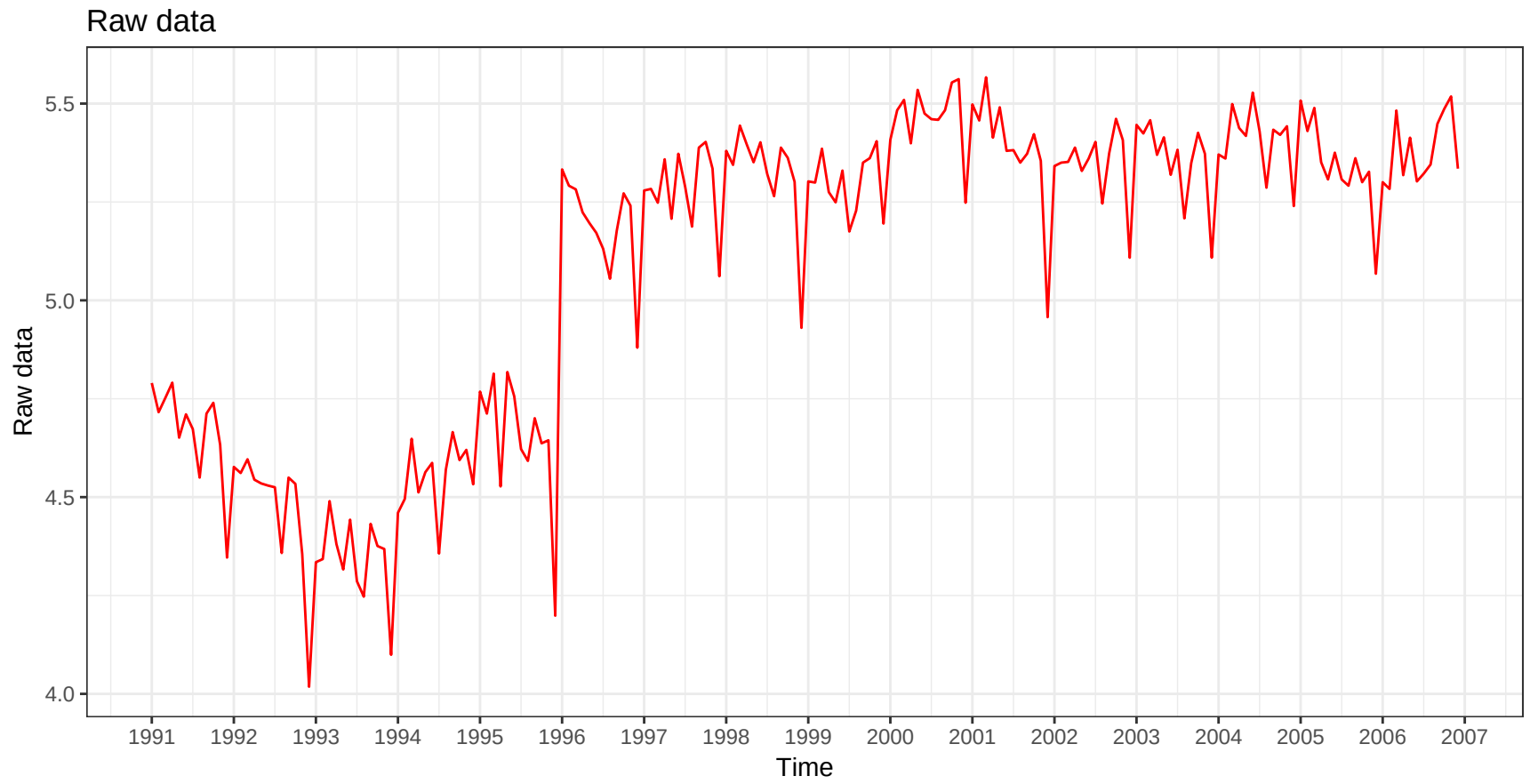

Estimate value of a LS(1995−1) FR−C2399
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.95
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
0.45
0.40
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
6.0
5.5
5.0
4.5
4.0
3.5
Time

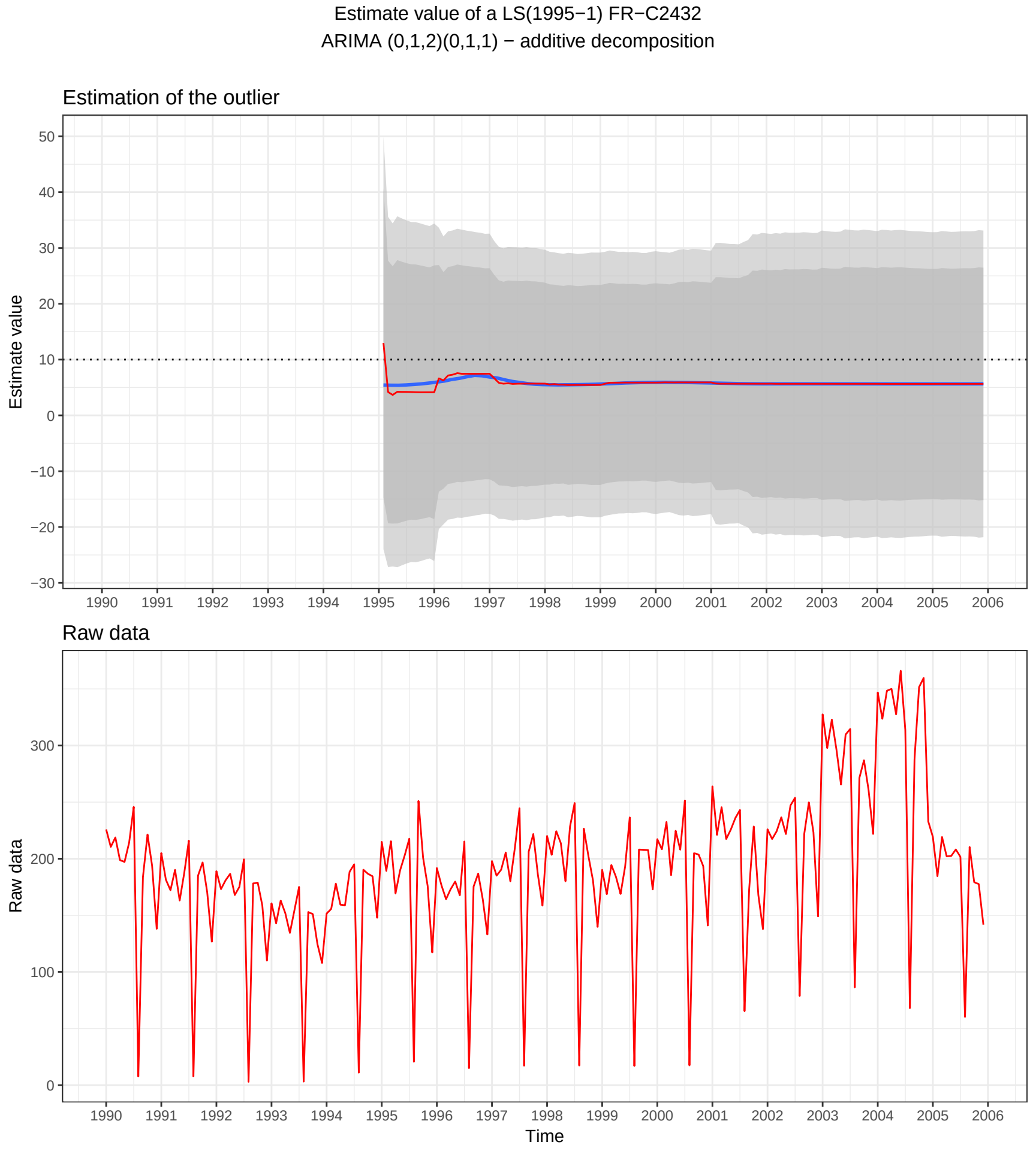

Estimate value of a LS(1996−1) DE−C2431
ARIMA (1,1,0)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
25
20
15
10
5
0
−5
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
120
100
80
60
Time

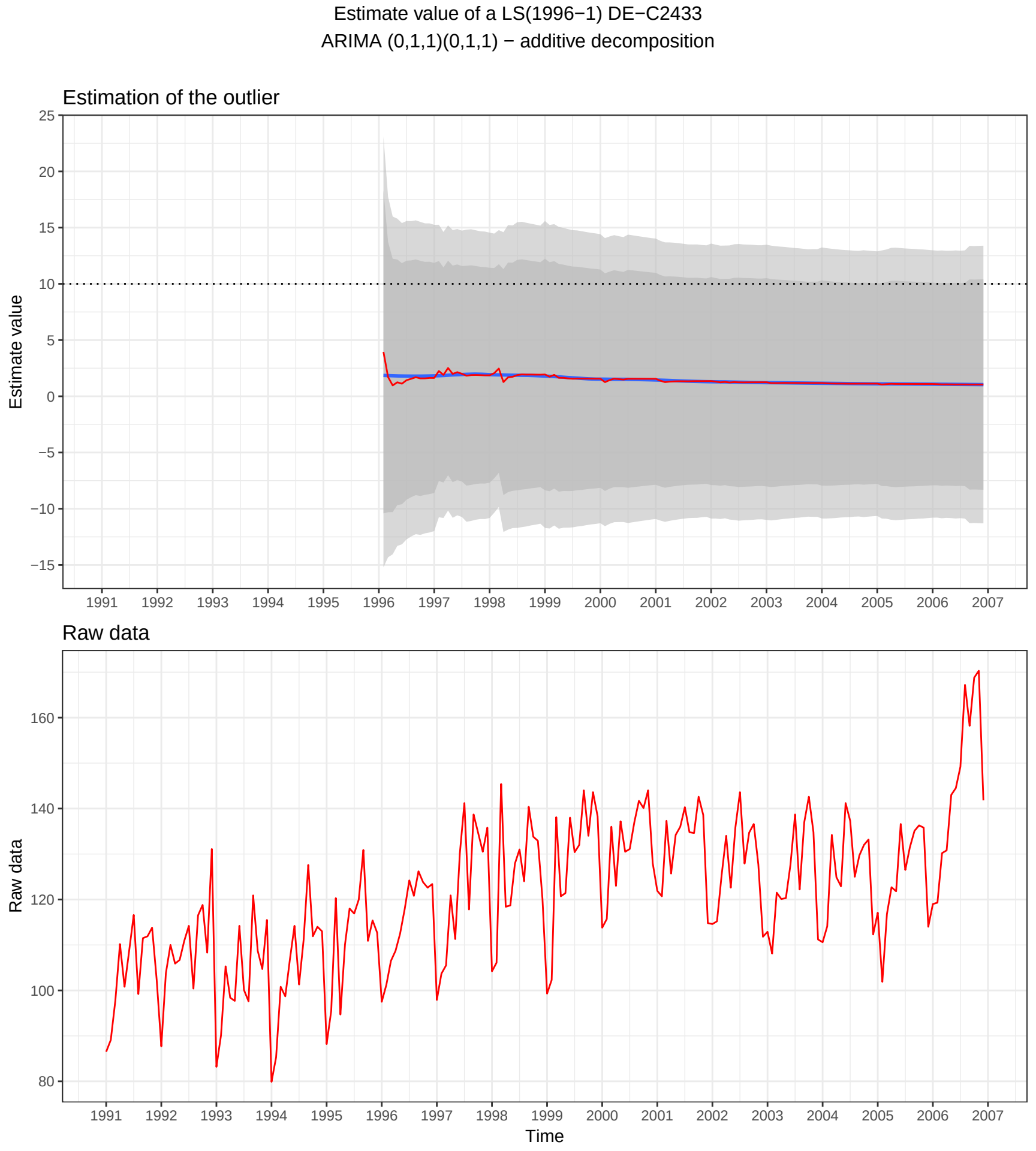

Estimate value of a LS(1995−1) FR−C2431
ARIMA (3,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
40
35
30
25
20
15
10
5
0
−5
−10
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
200
150
100
50
0
Time

Estimate value of a LS(1996−1) DE−C2432
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition



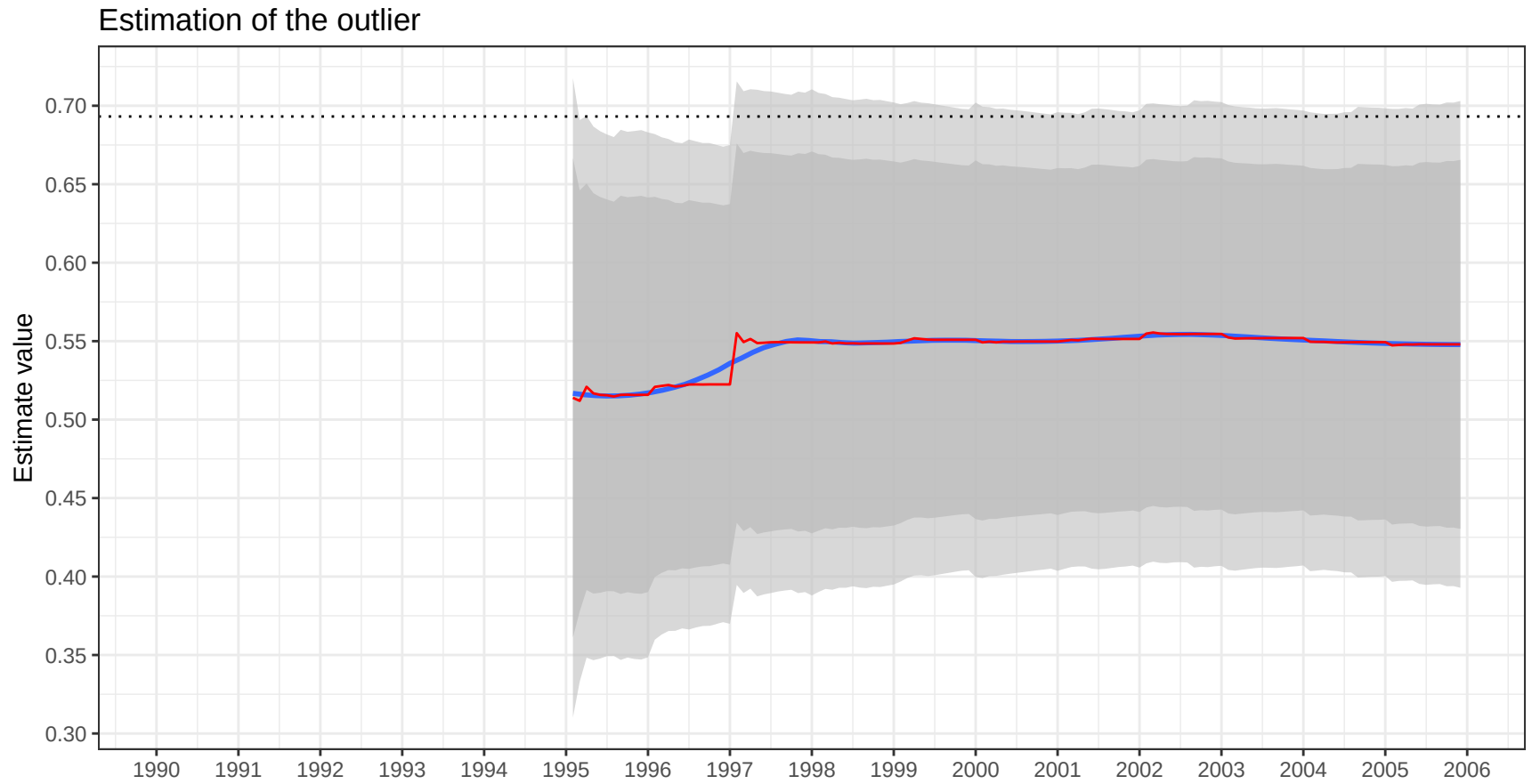


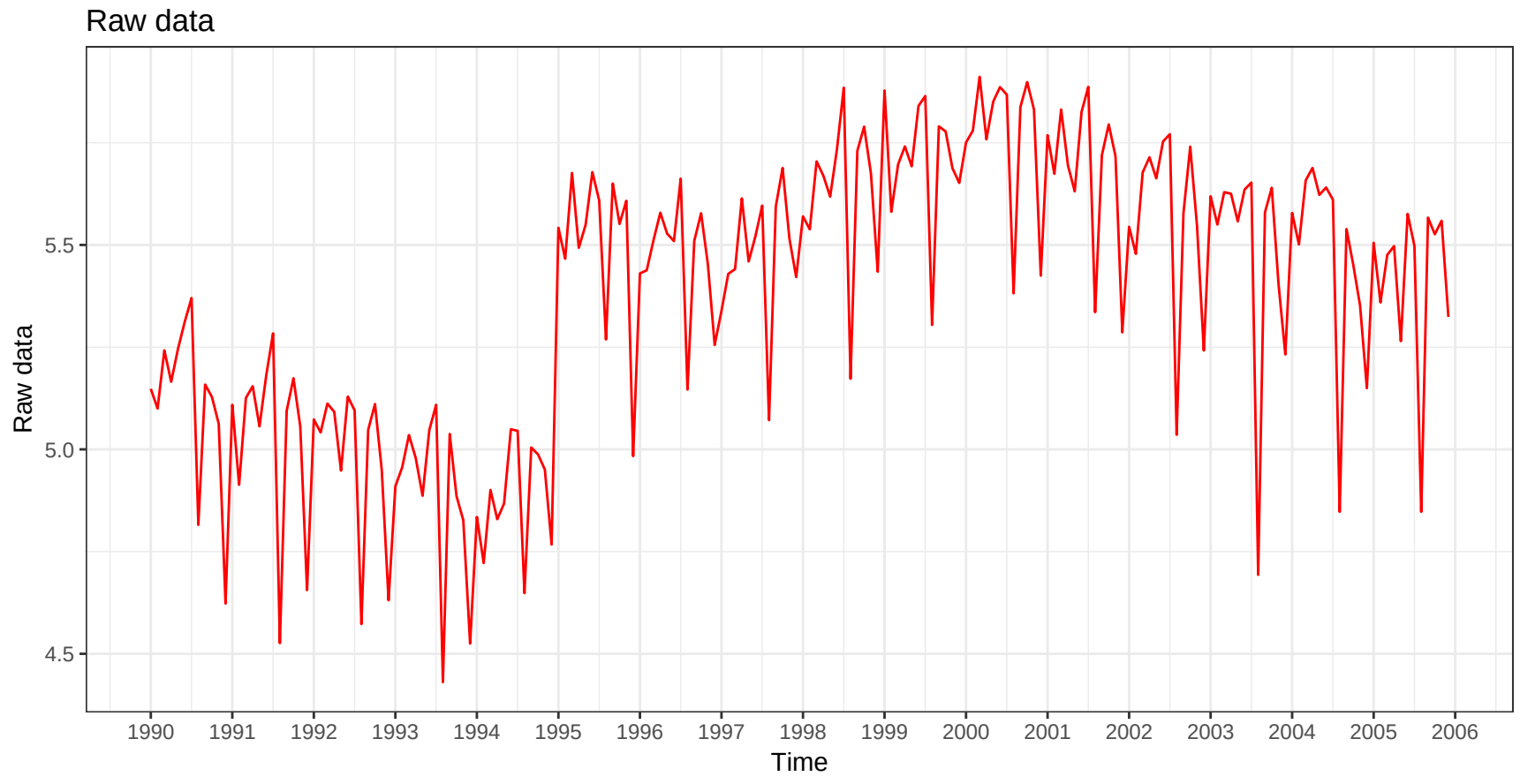

Estimate value of a LS(1995−1) FR−C2432
ARIMA (0,1,2)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
50
40
30
20
10
0
−10
−20
−30
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
300
200
100
0
Time

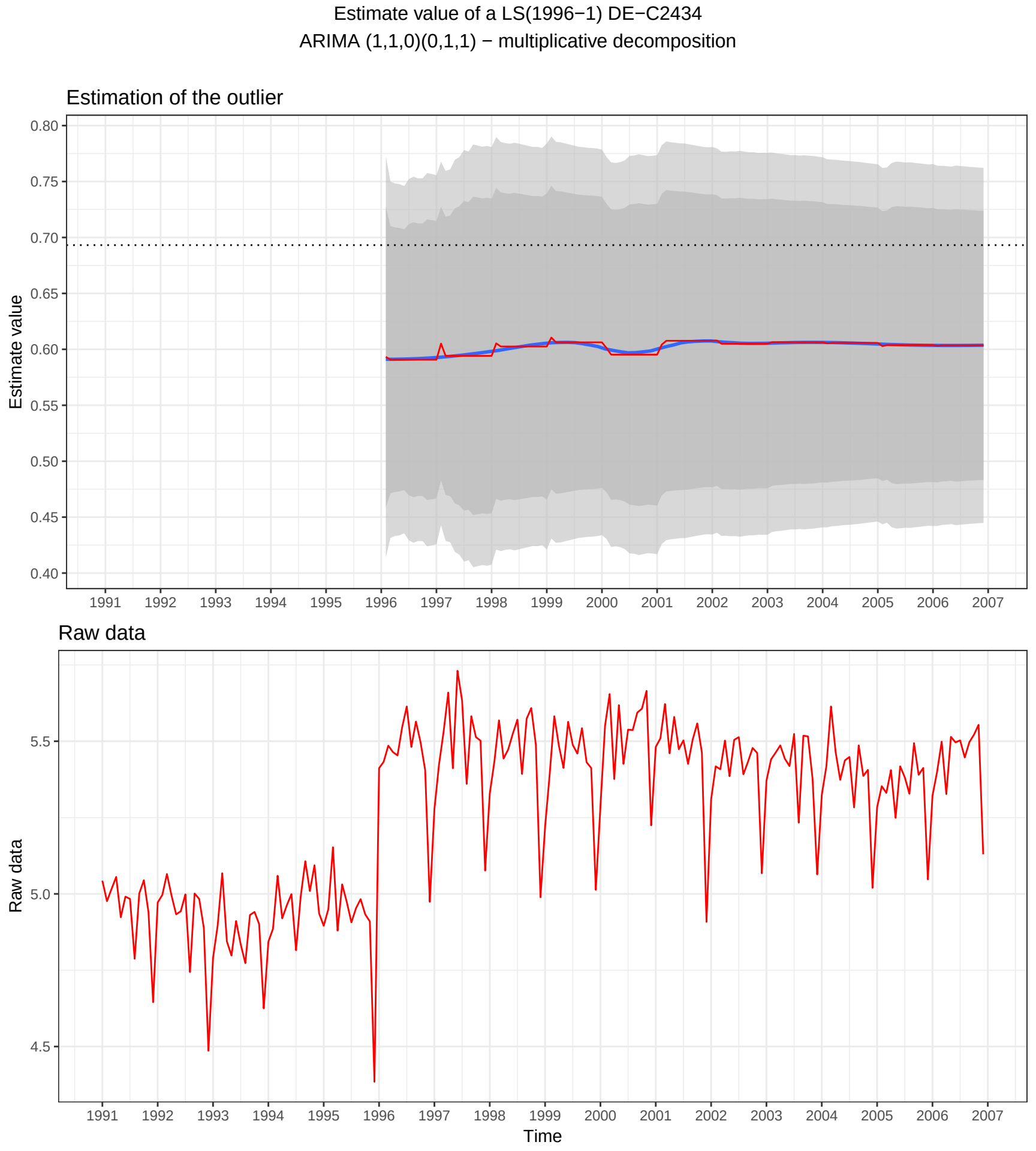

Estimate value of a LS(1996−1) DE−C2433
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
25
20
15
10
5
0
−5
−10
−15
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
160
140
120
100
80
Time

Estimate value of a LS(1995−1) FR−C2433

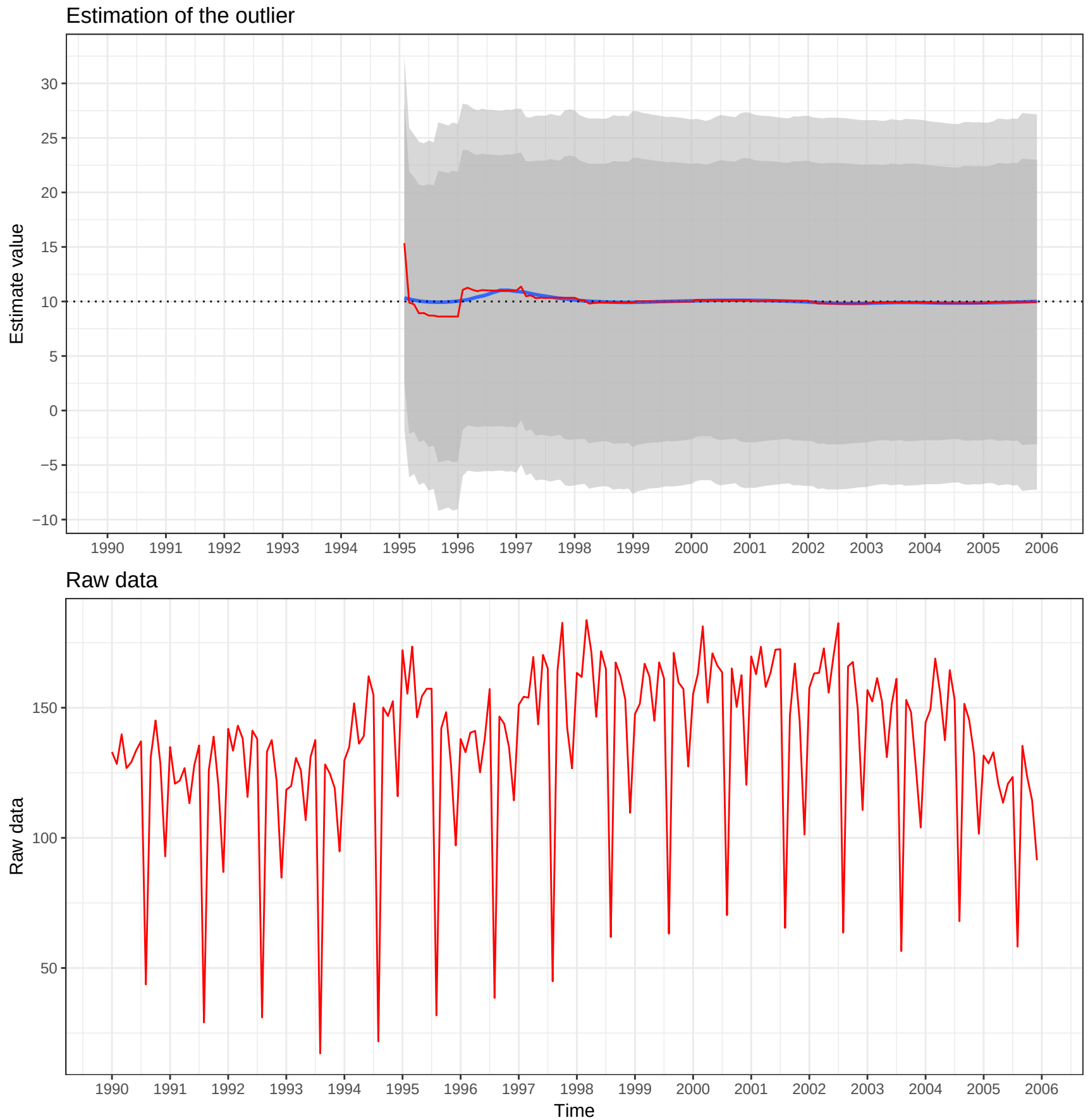
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition





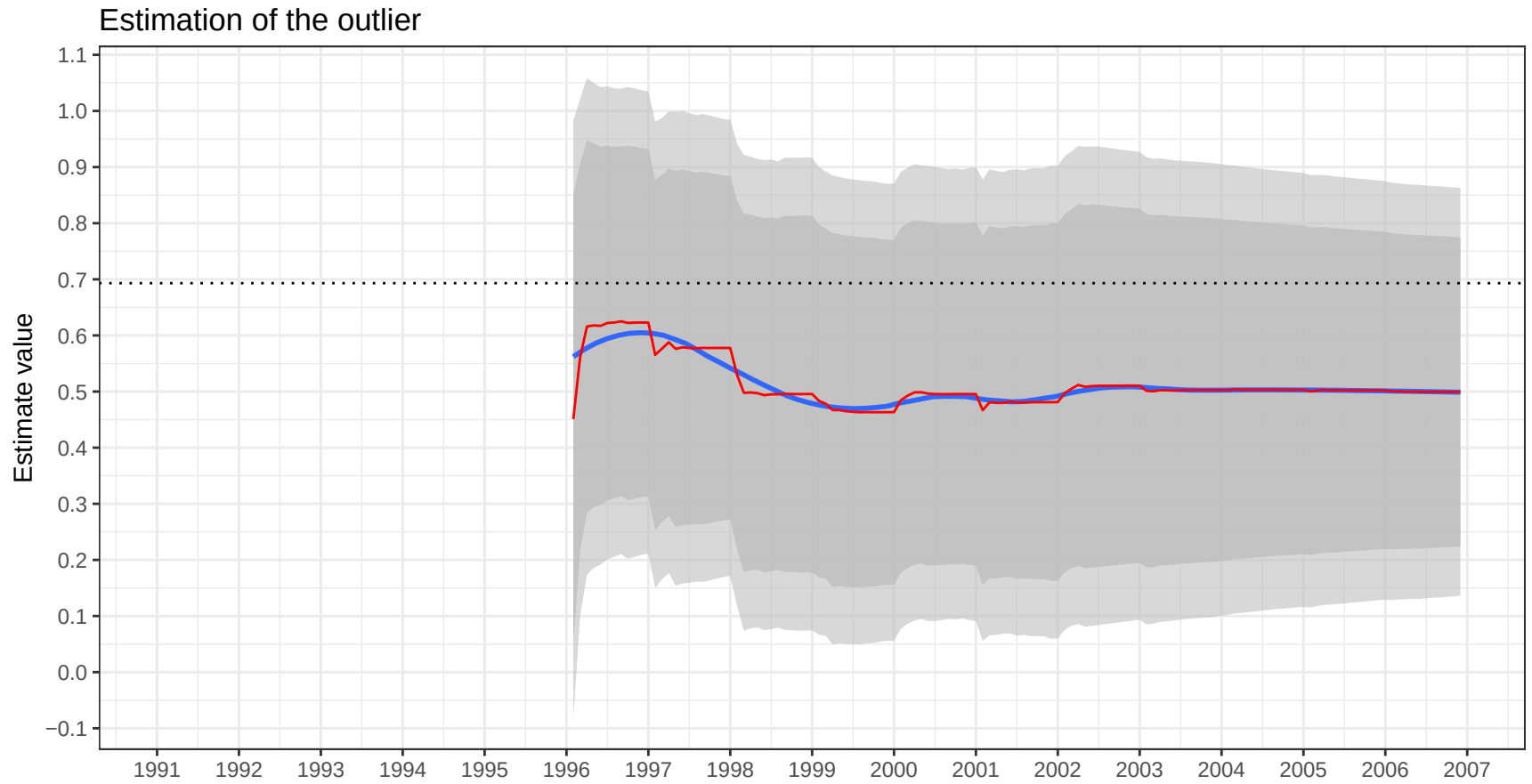

Estimate value of a LS(1996−1) DE−C2434
ARIMA (1,1,0)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.80
0.75
0.70
0.65
0.60
0.55
0.50
0.45
0.40
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
5.5
5.0
4.5
Time

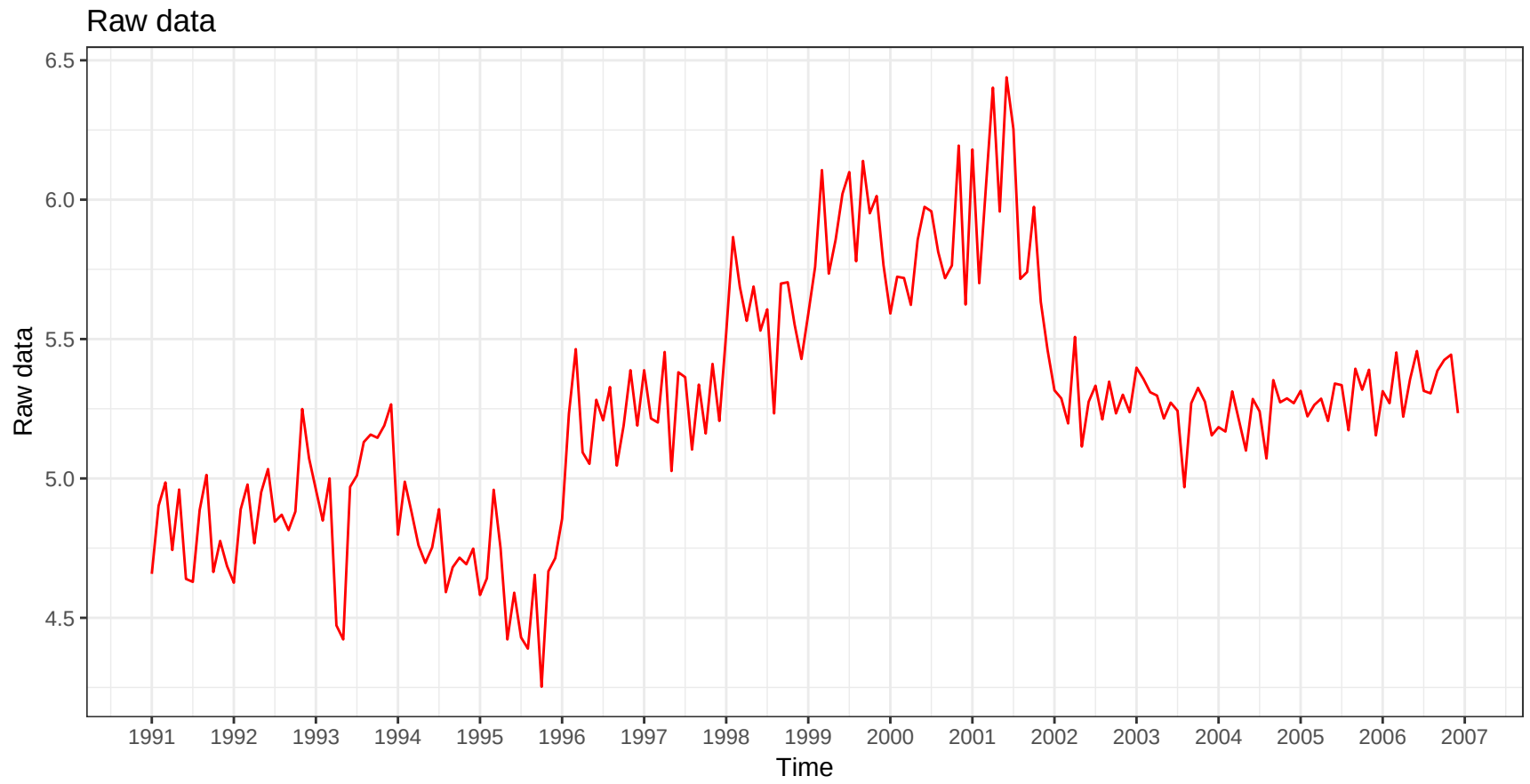
Estimate value of a LS(1995−1) FR−C2434
ARIMA (0,1,1)(0,1,1) − additive decomposition



Estimate value of a LS(1996−1) DE−C2441

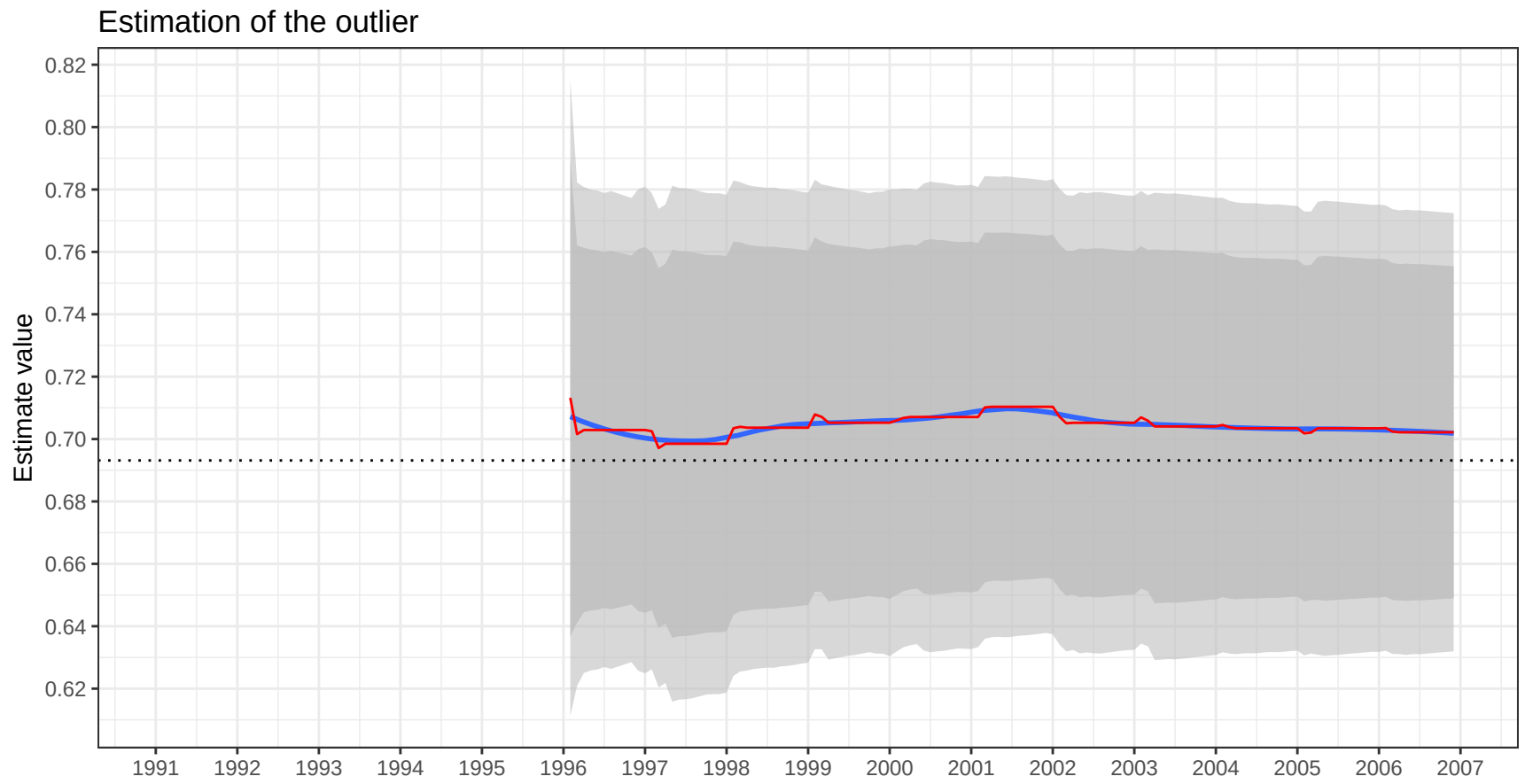
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

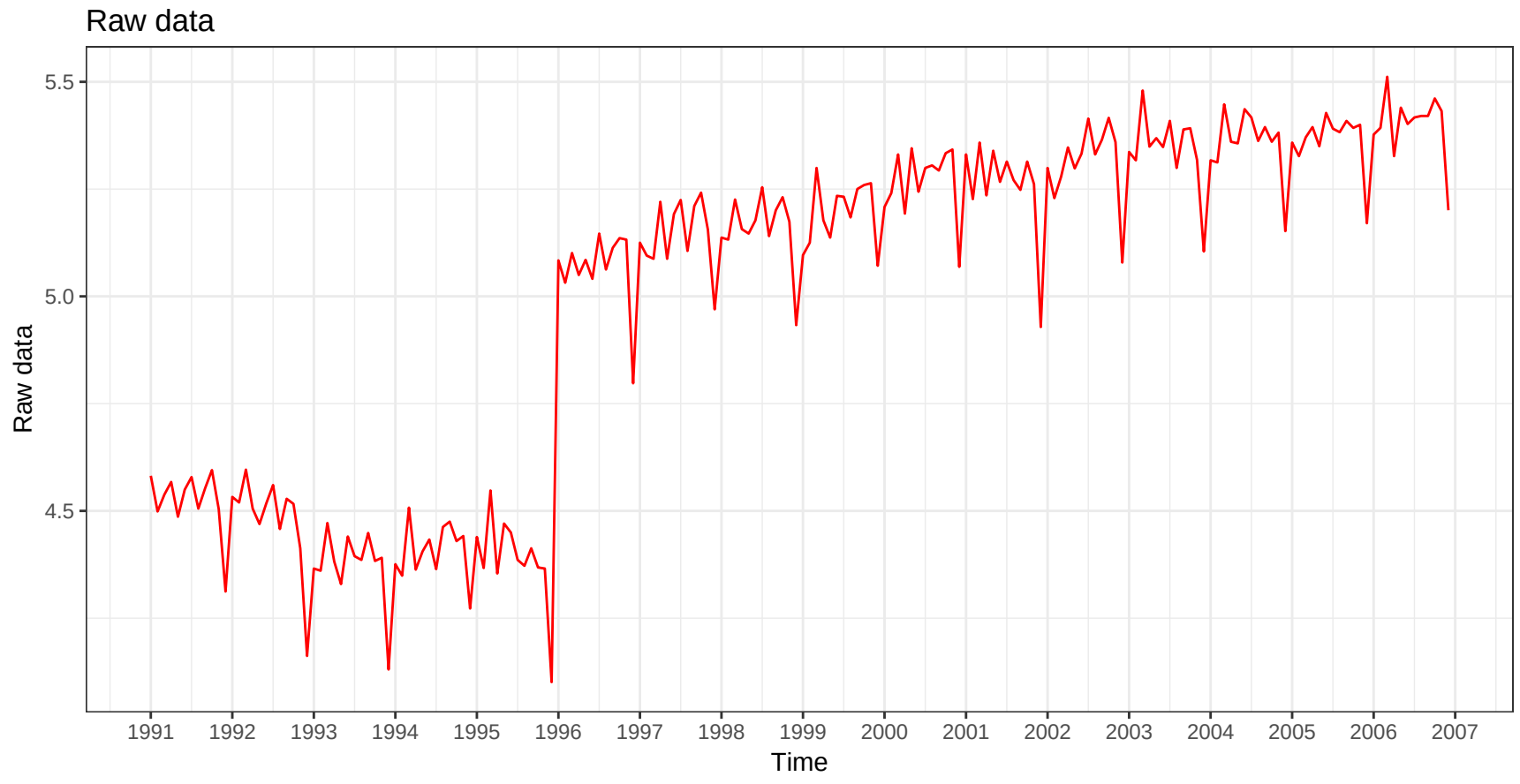




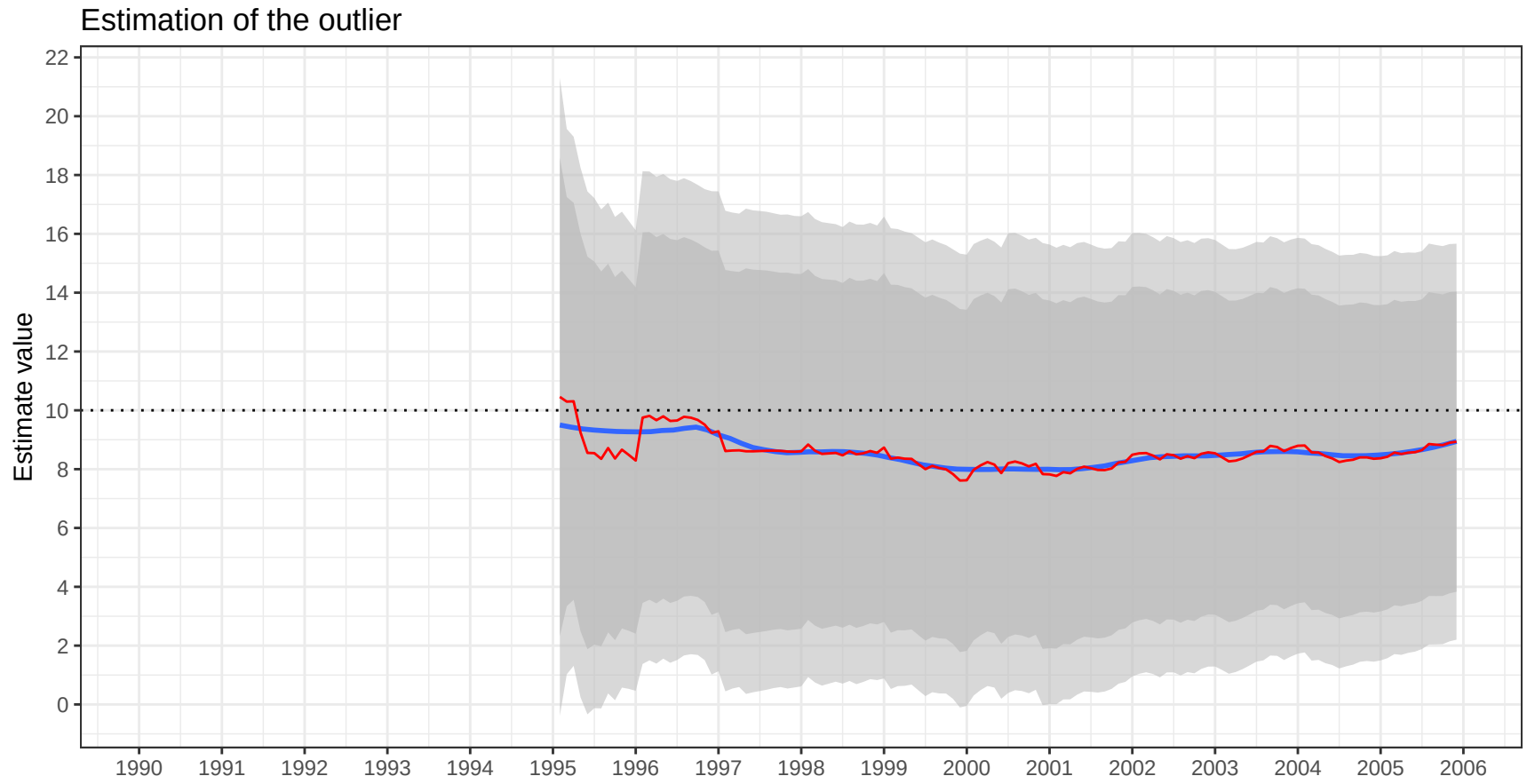
Estimate value of a LS(1996−1) DE−C2442

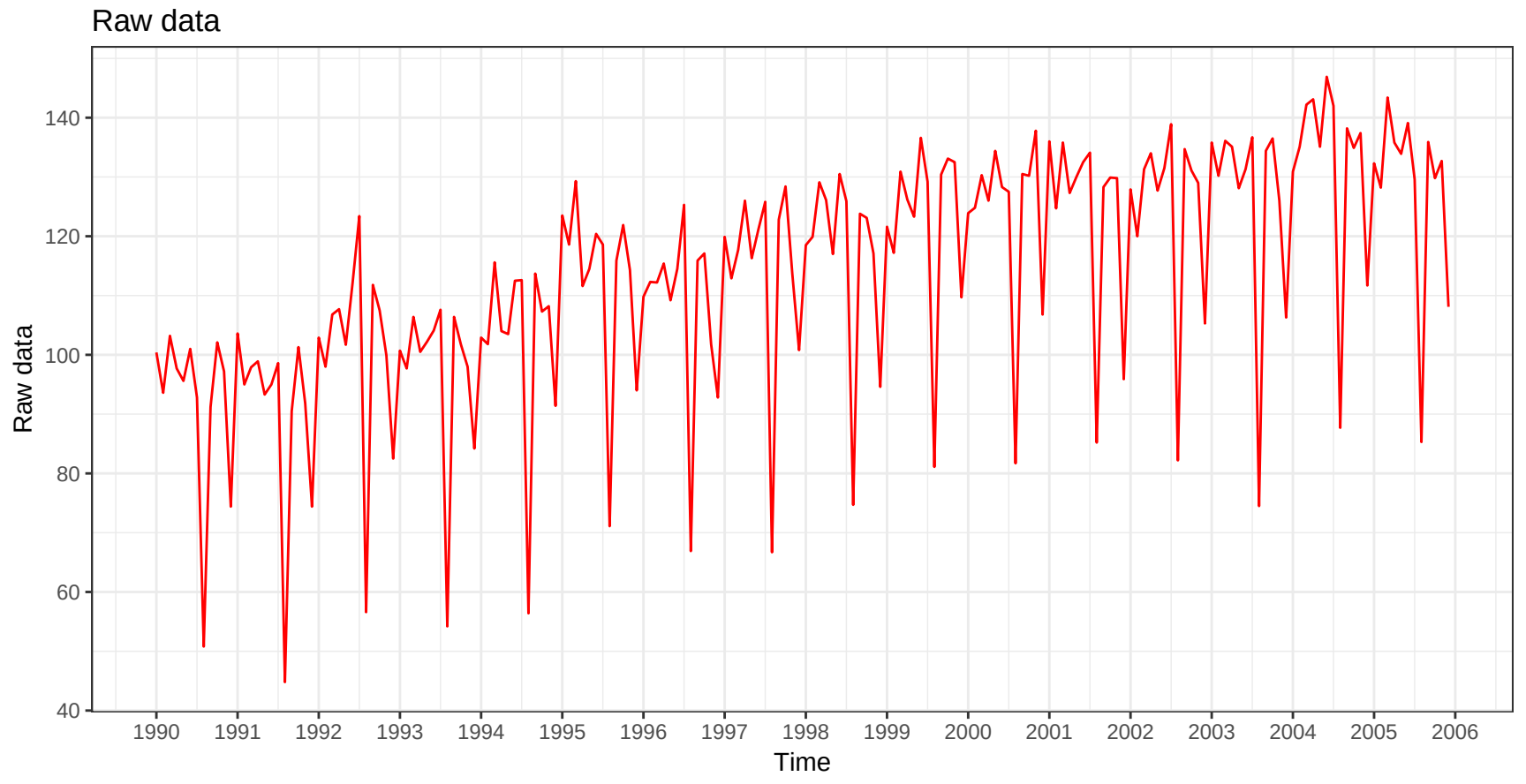
ARIMA (2,1,0)(0,1,1) − multiplicative decomposition

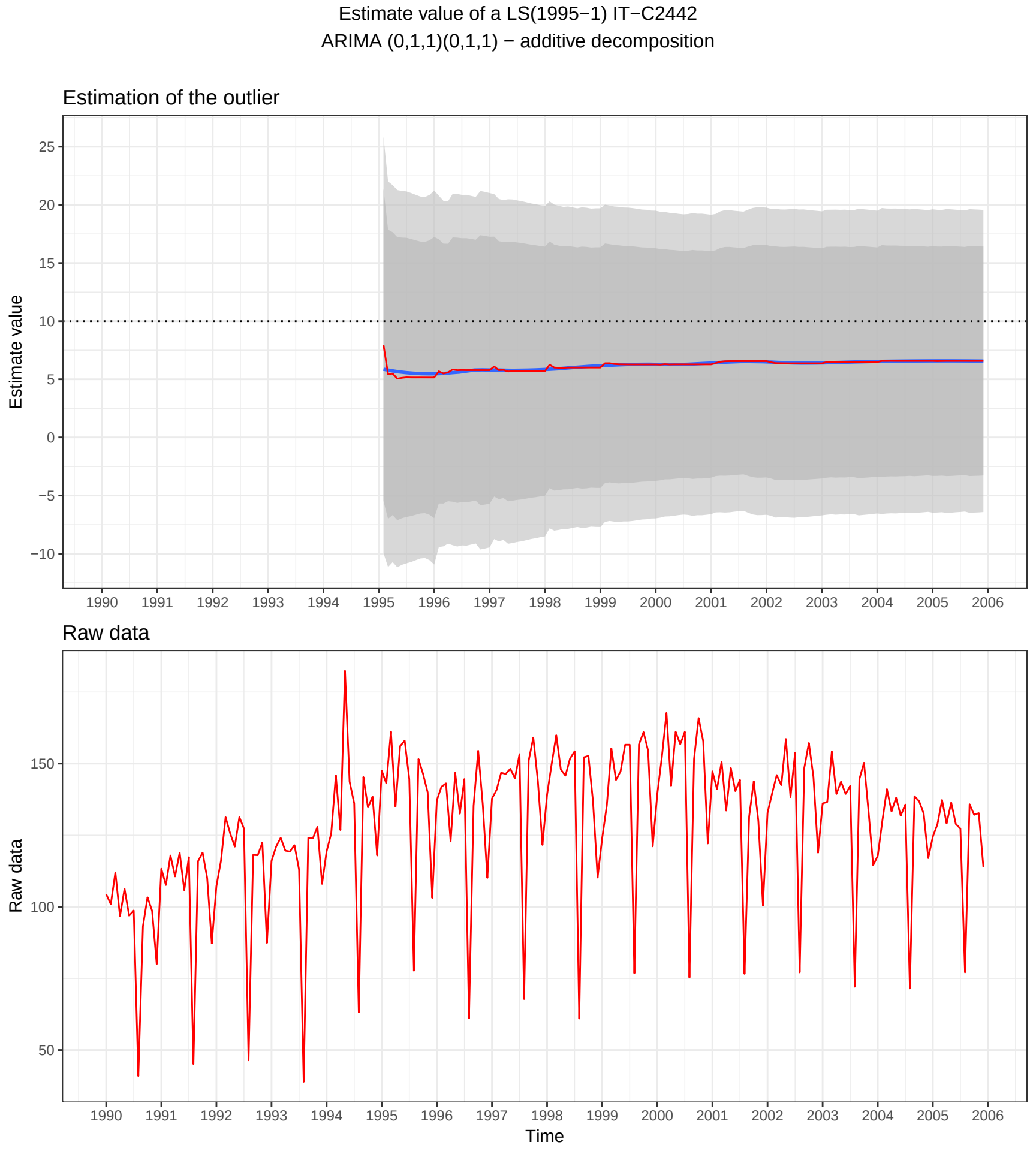




Estimate value of a LS(1995−1) FR−C2442
ARIMA (2,0,0)(0,1,1) − additive decomposition

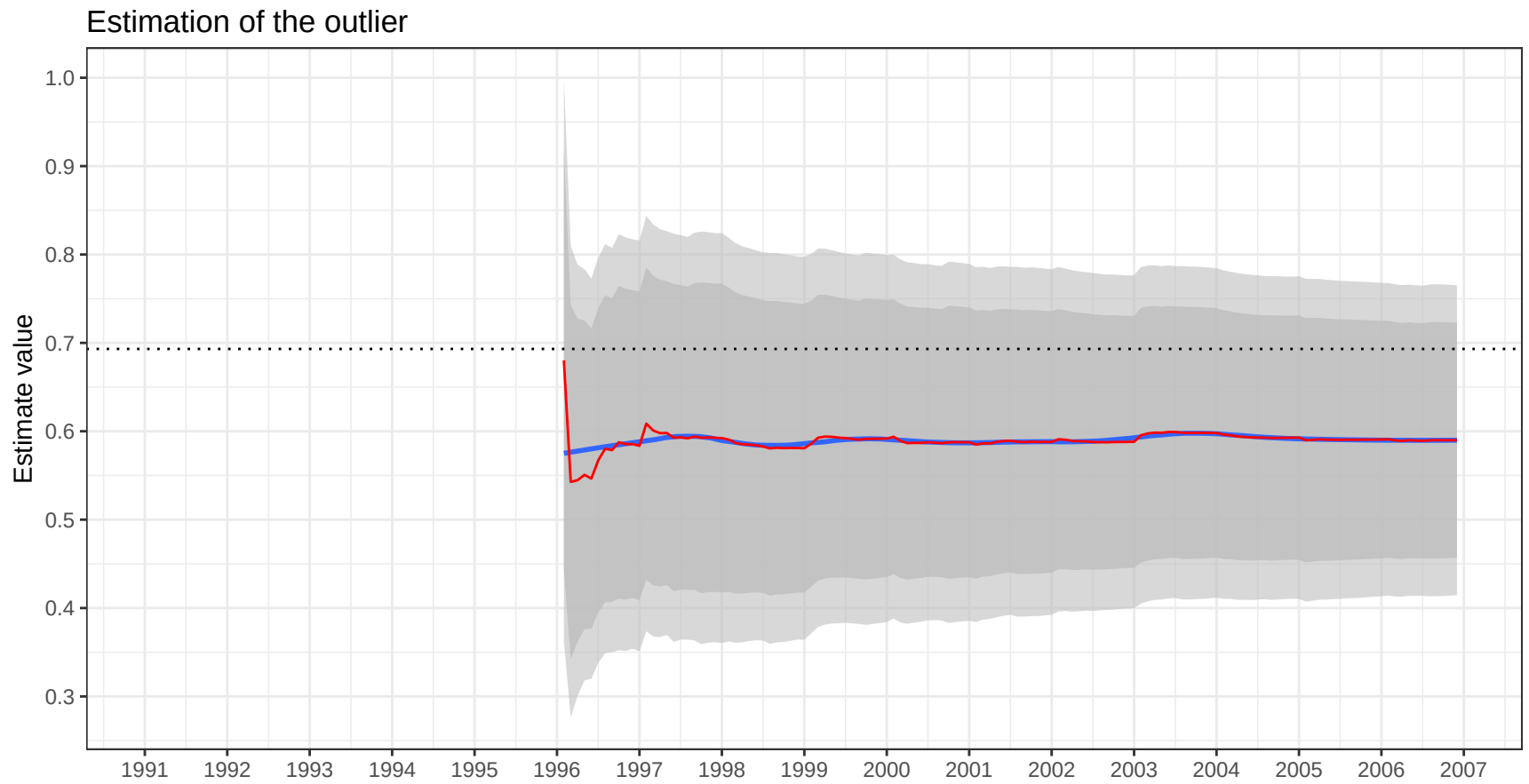


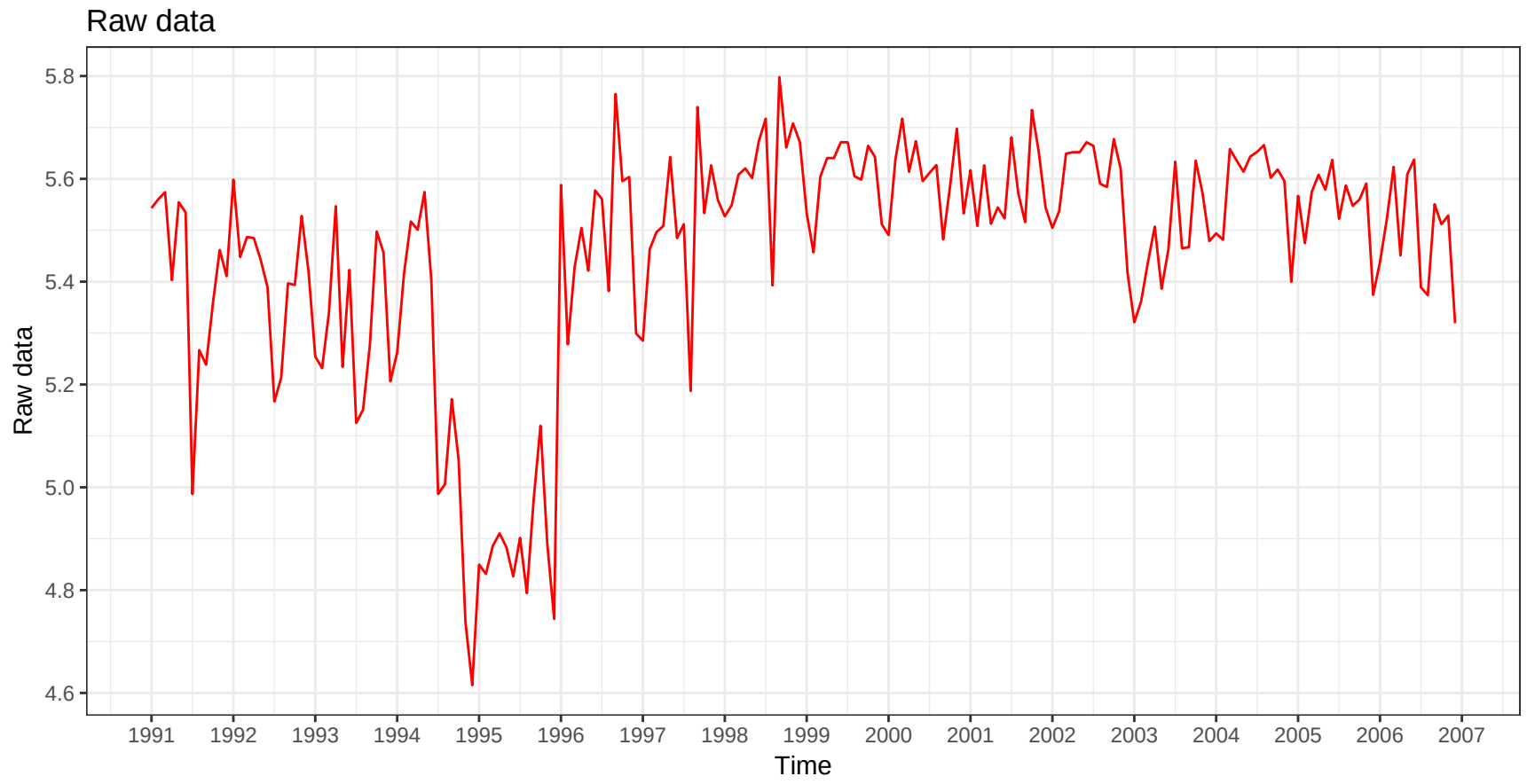



Estimate value of a LS(1995−1) IT−C2442
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
25
20
15
10
5
0
−5
−10
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
150
100
50
Time

Estimate value of a LS(1996−1) DE−C2443

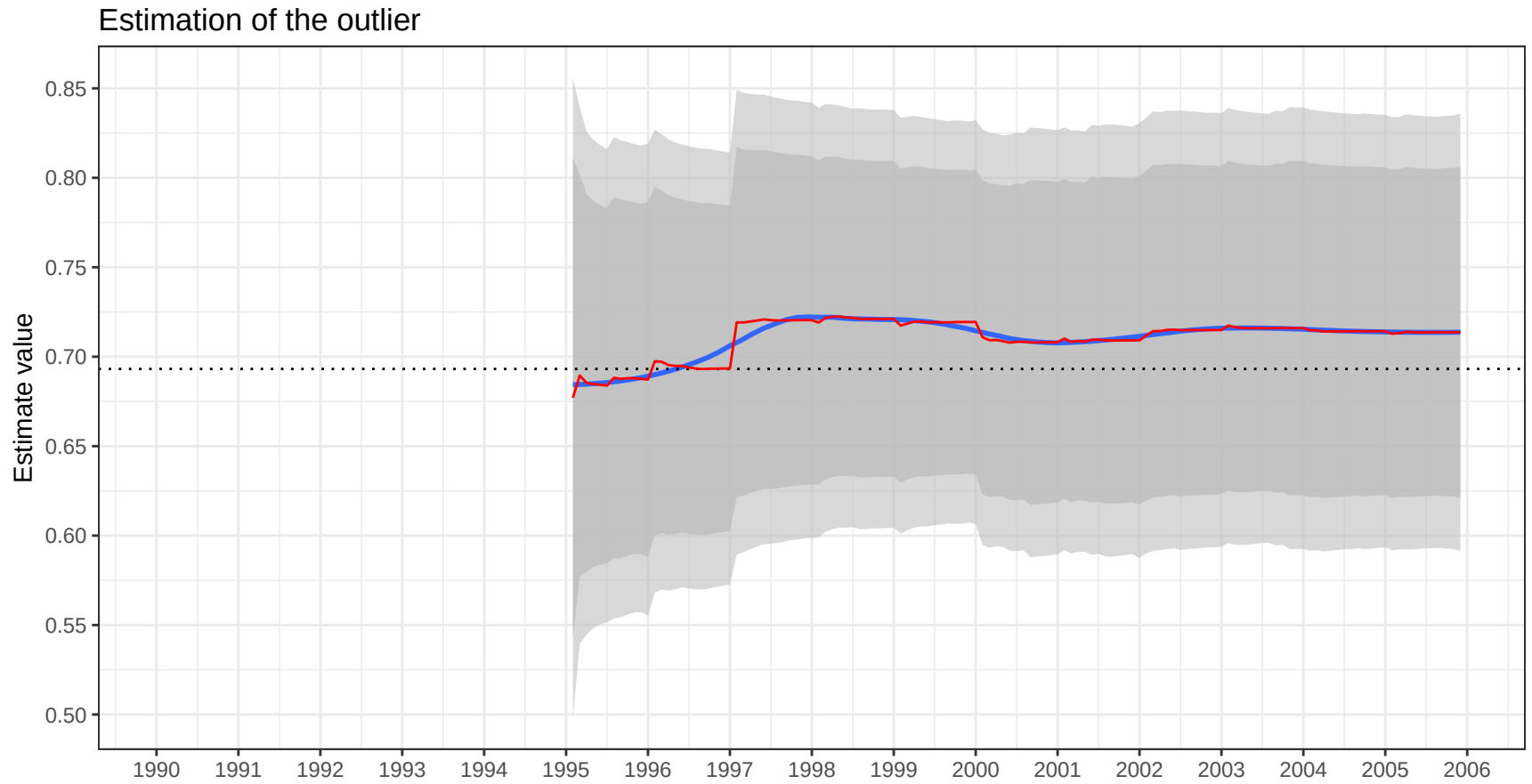
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

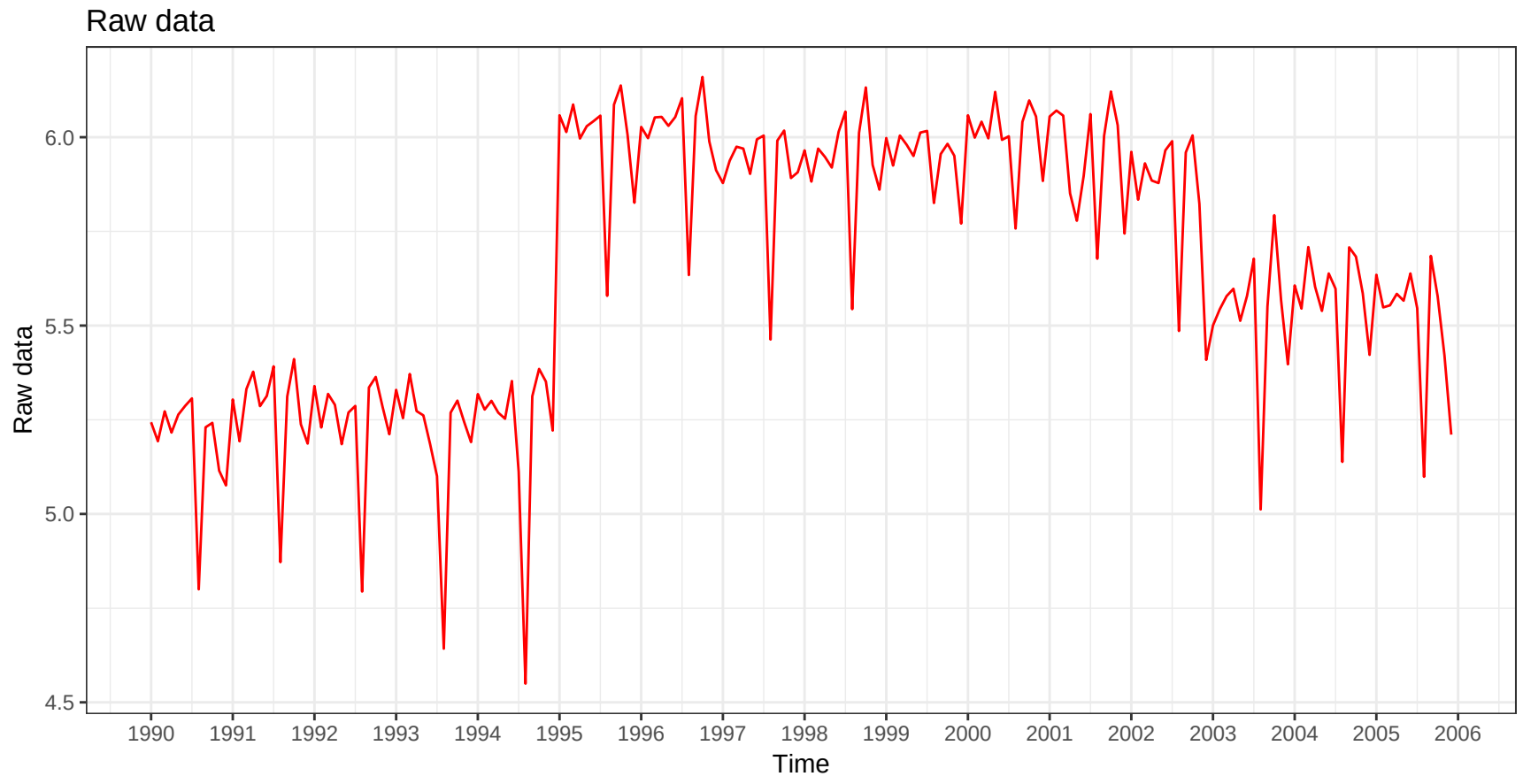


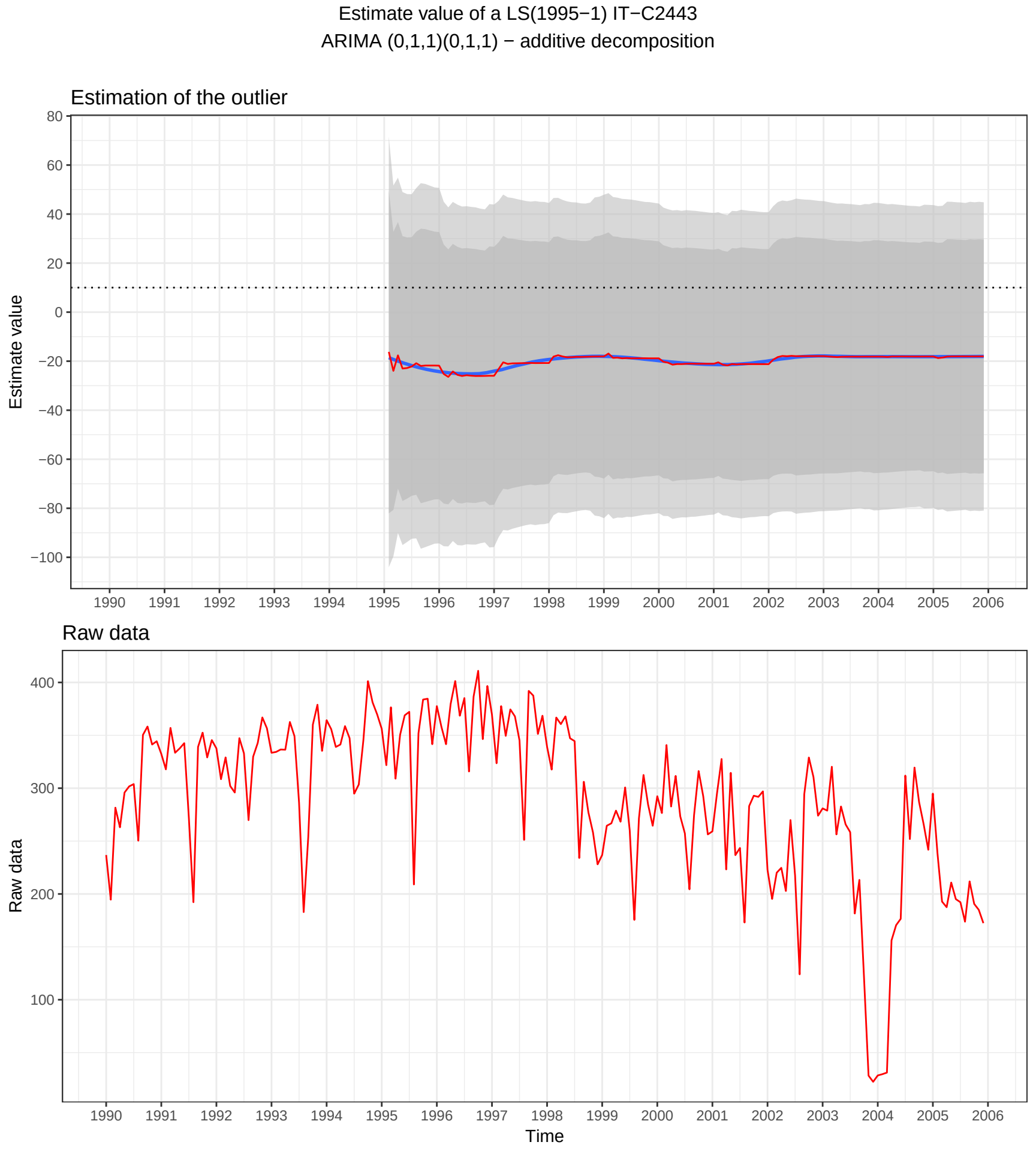


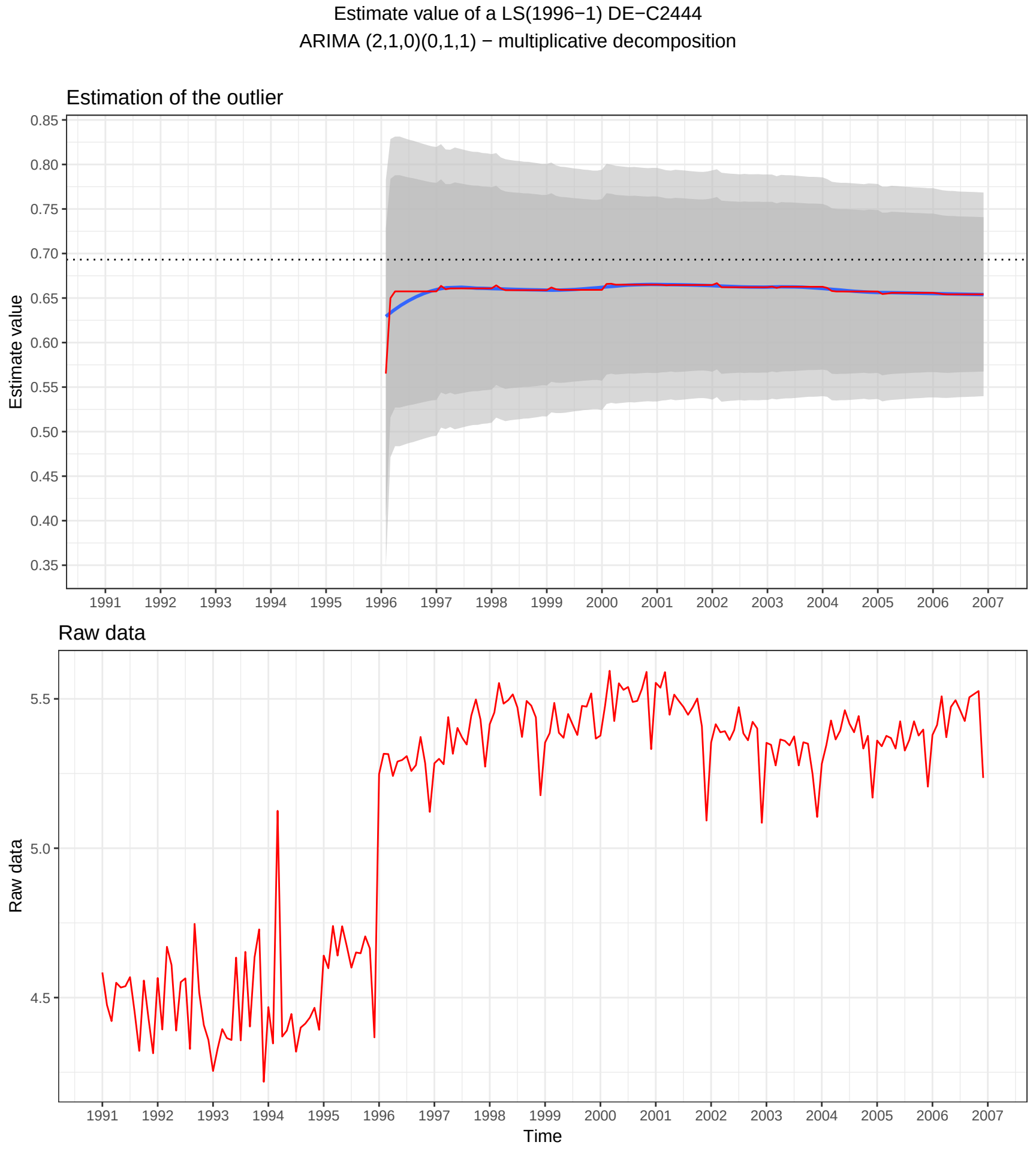
Estimate value of a LS(1995−1) FR−C2443

ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

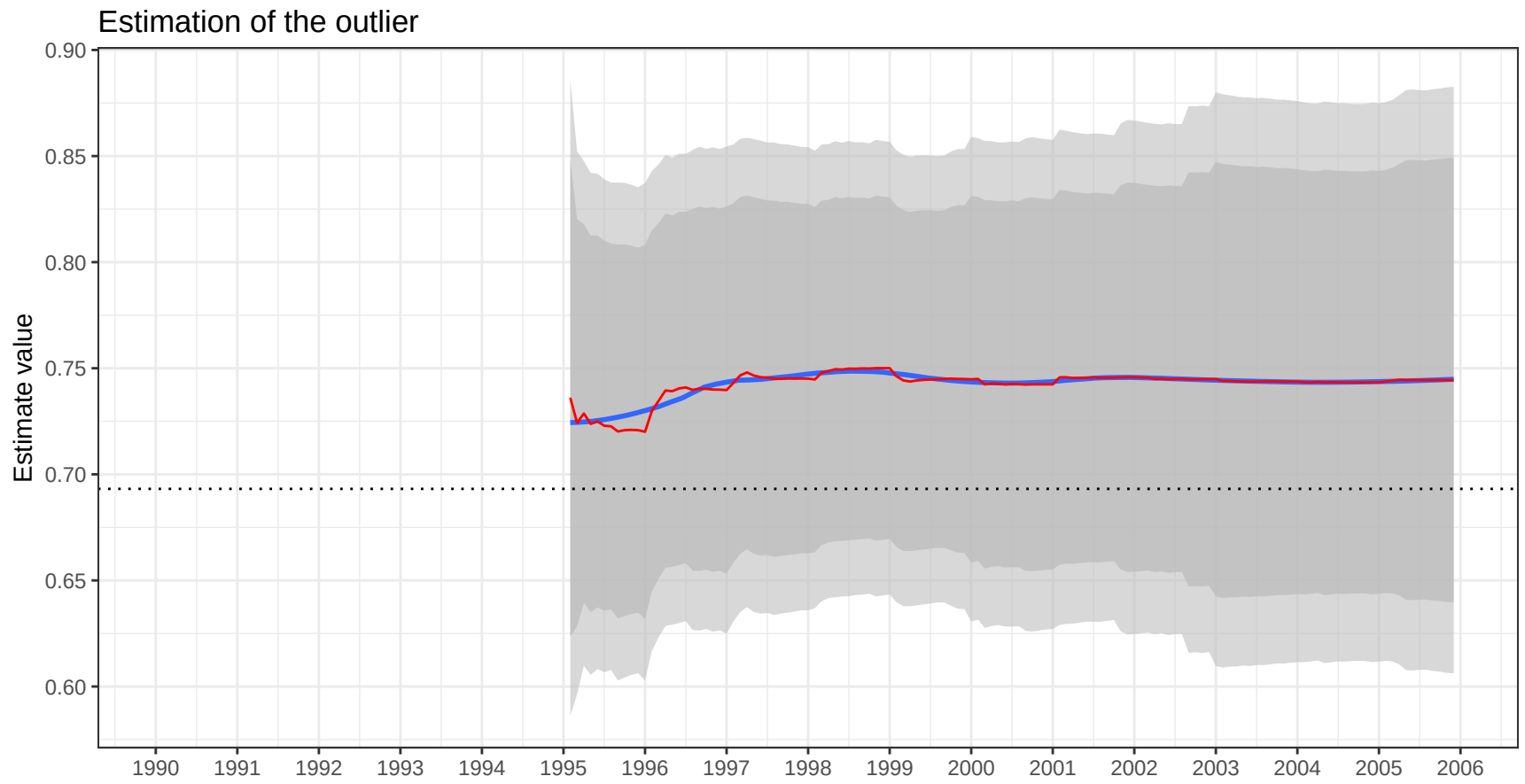


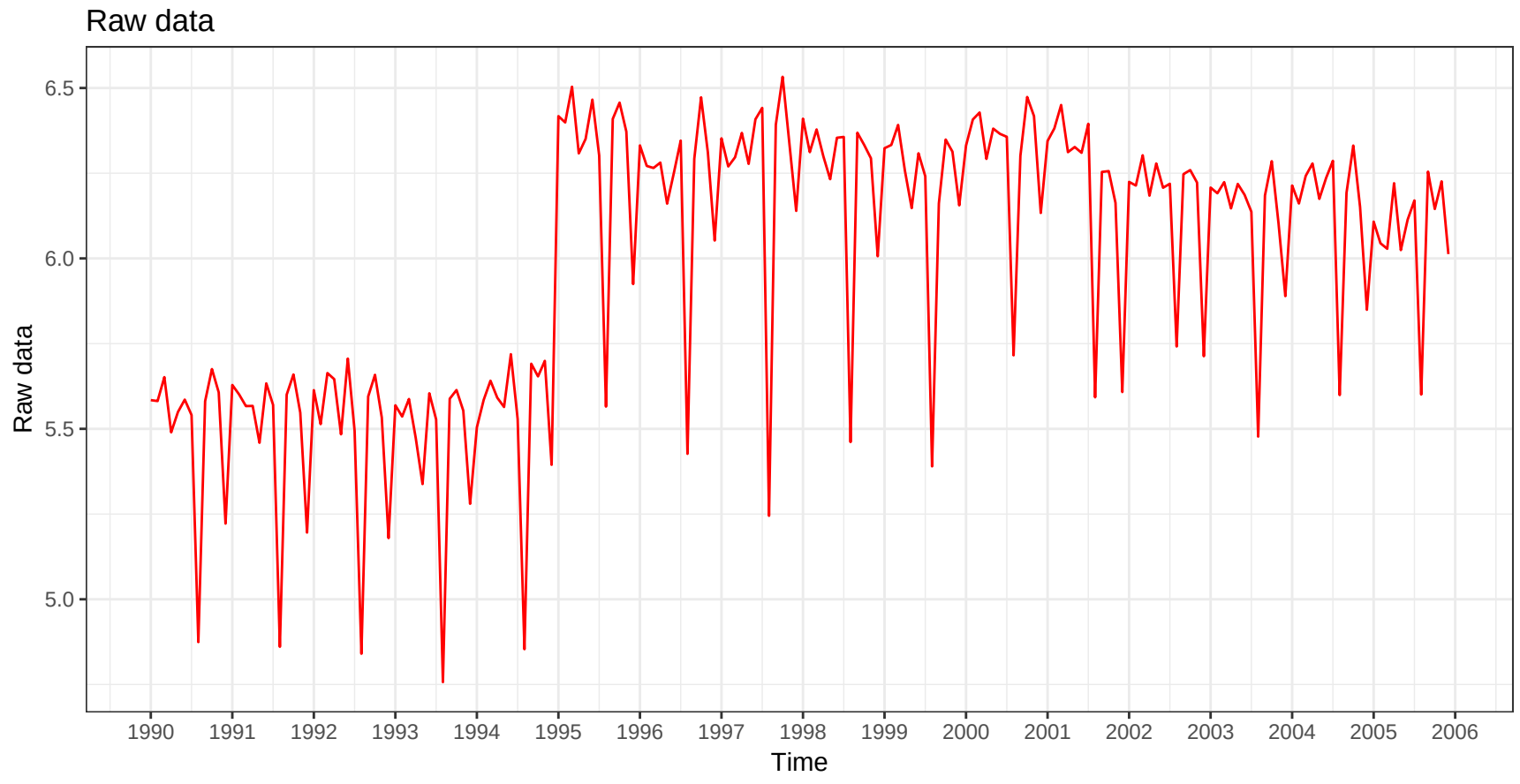



Estimate value of a LS(1995−1) IT−C2443
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
80
60
40
20
0
−20
−40
−60
−80
−100
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
400
300
200
100
Time

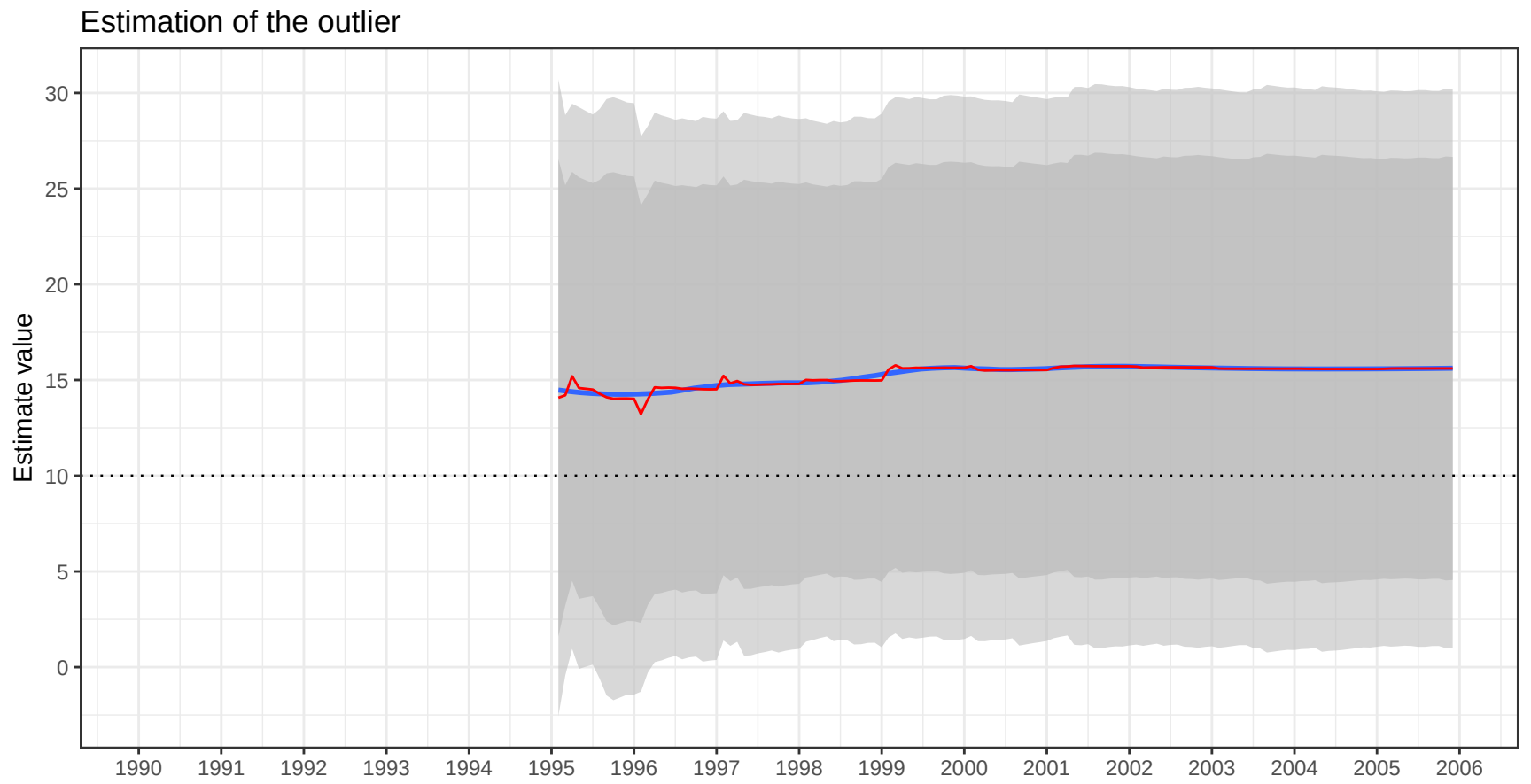

Estimate value of a LS(1996−1) DE−C2444
ARIMA (2,1,0)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
0.45
0.40
0.35
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
5.5
5.0
4.5
Time

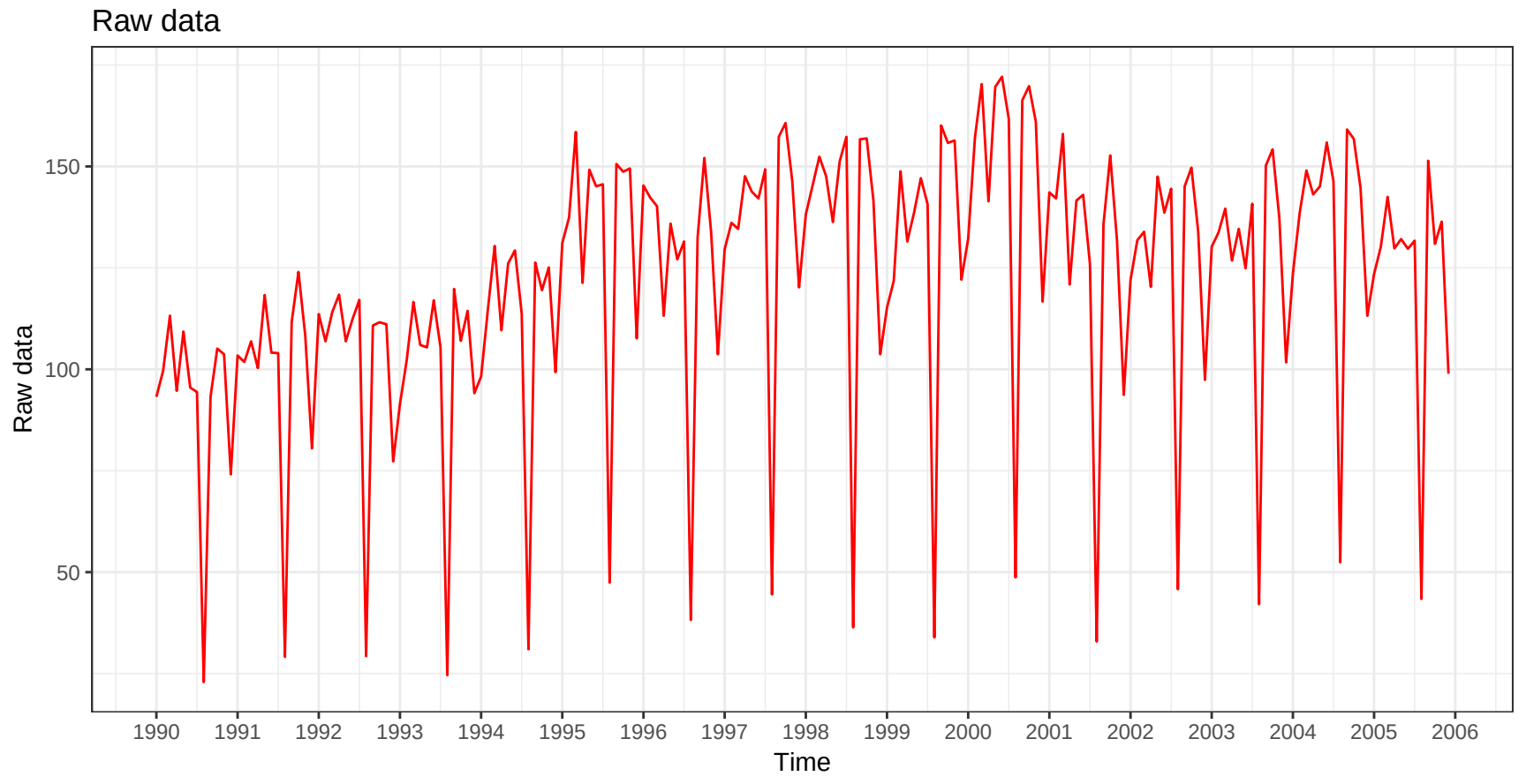
Estimate value of a LS(1995−1) FR−C2444
ARIMA (3,1,1)(0,1,1) − multiplicative decomposition





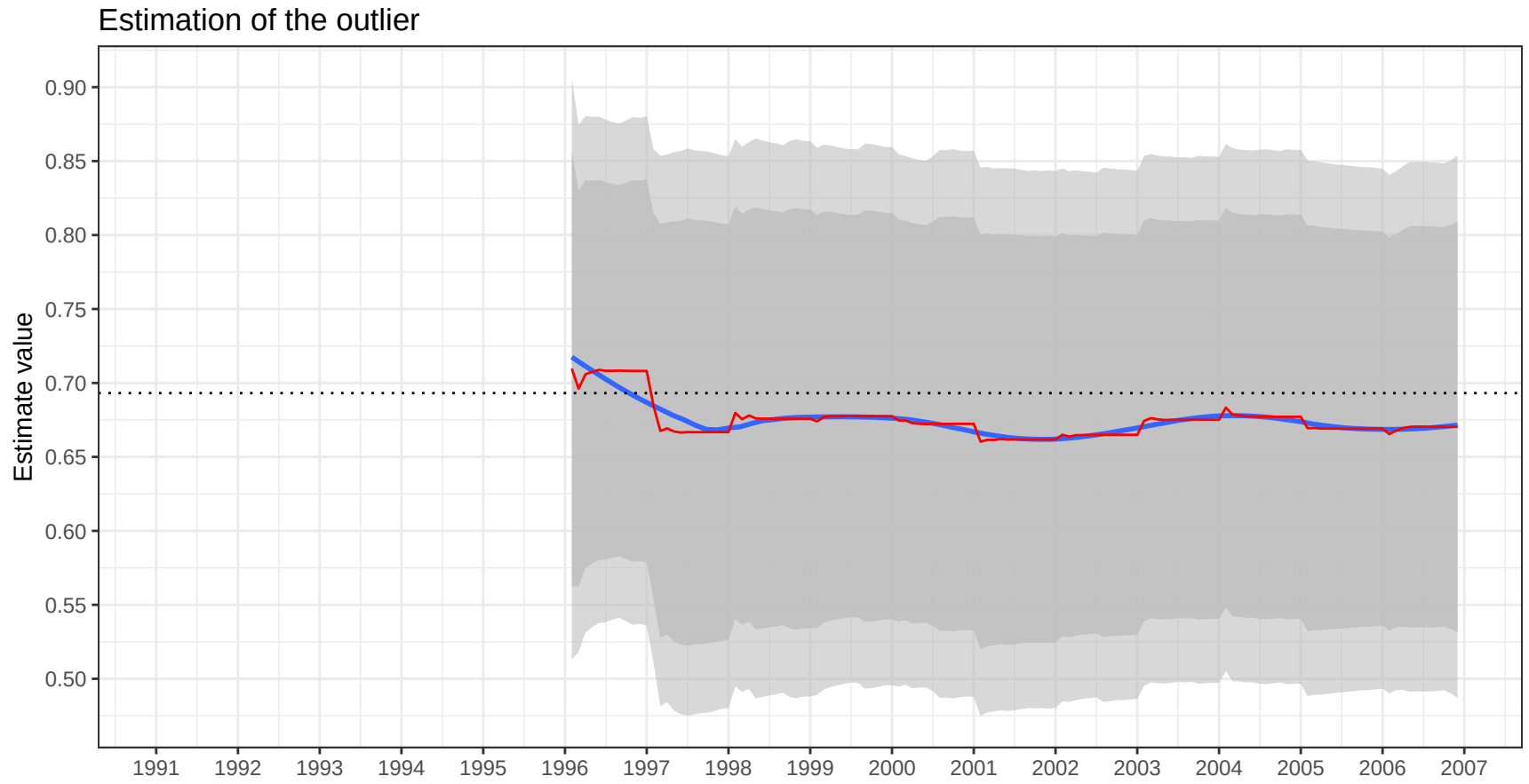
Estimate value of a LS(1995−1) IT−C2444
ARIMA (3,1,1)(0,1,1) − additive decomposition

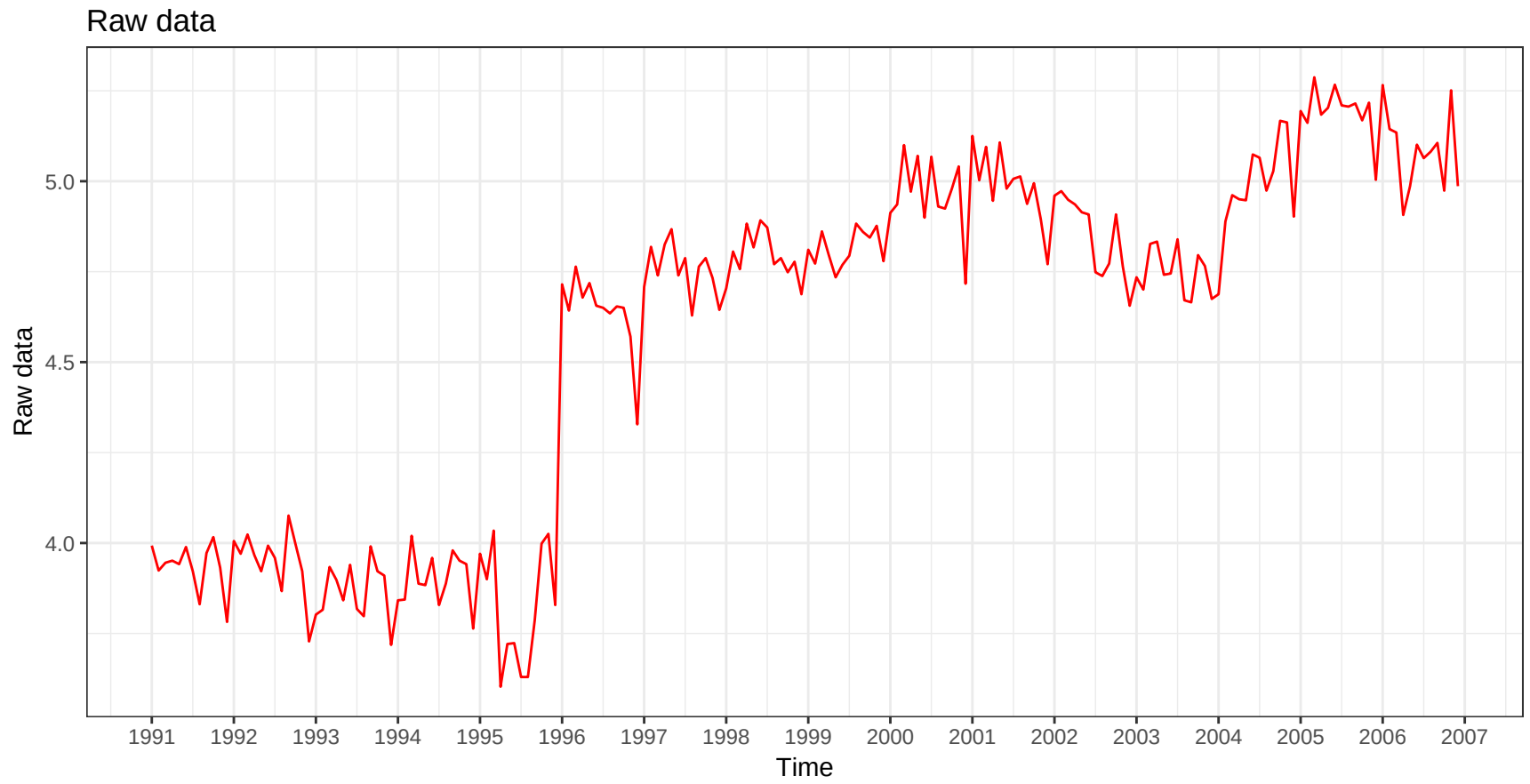


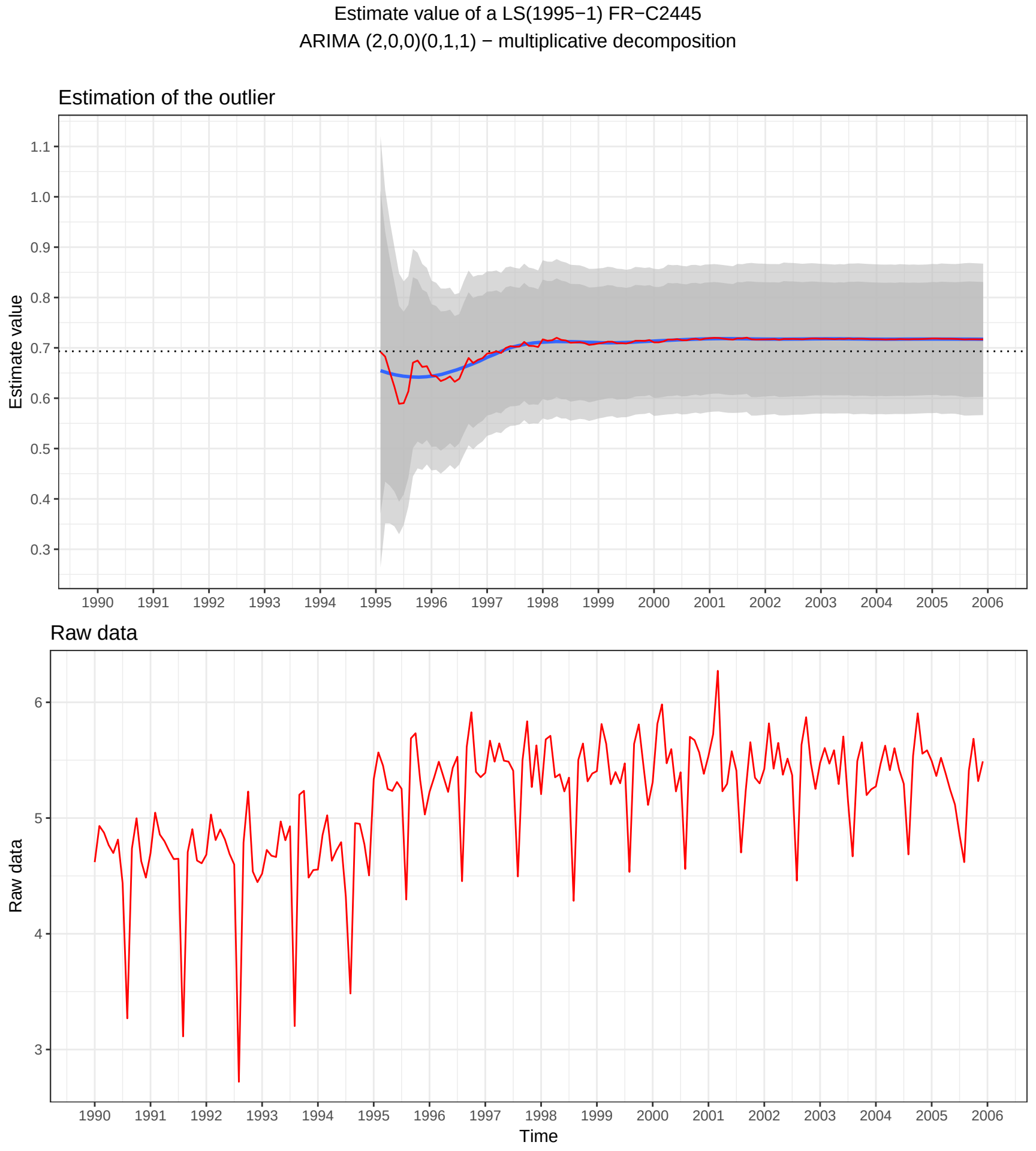


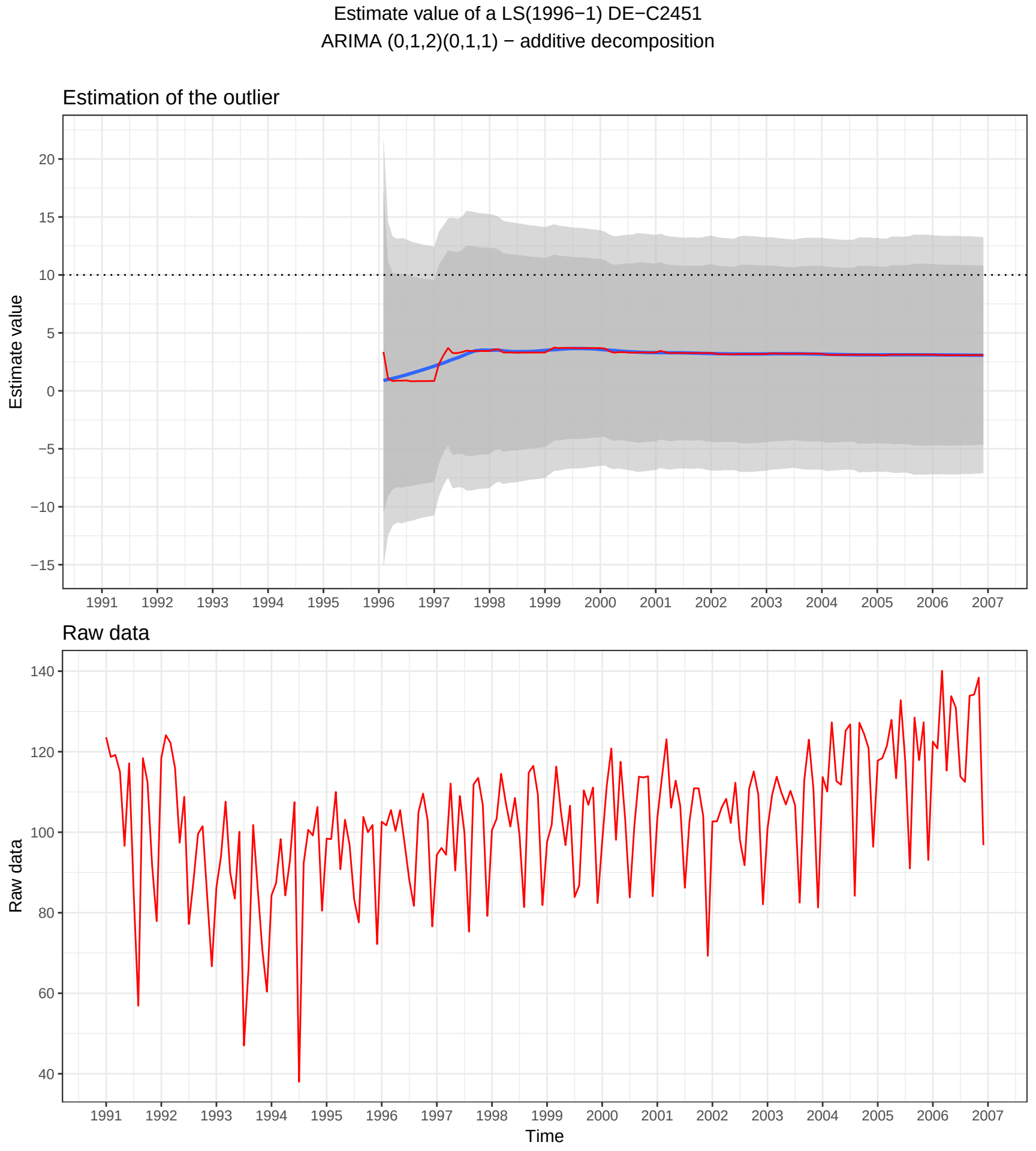
Estimate value of a LS(1996−1) DE−C2445

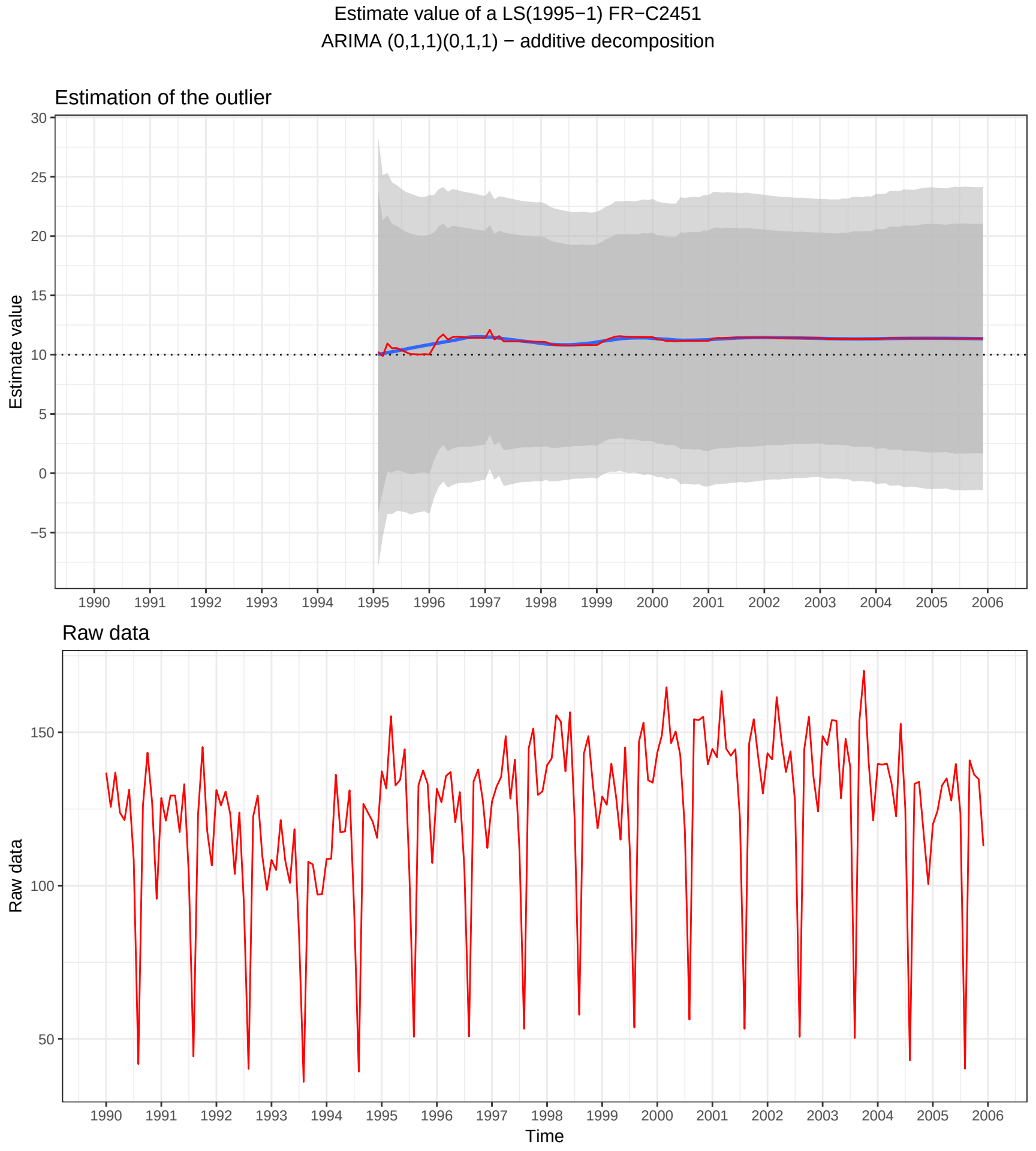
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

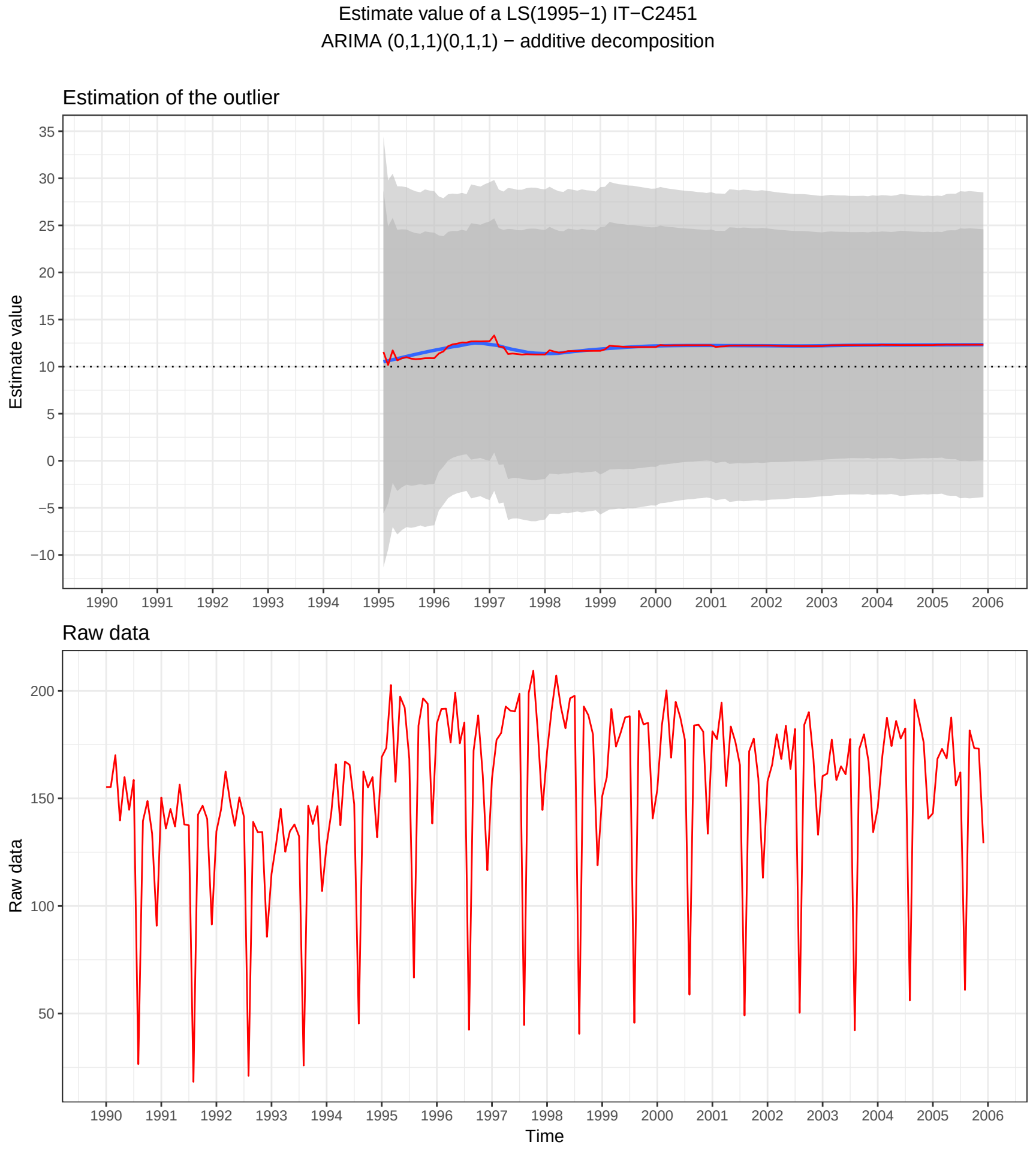




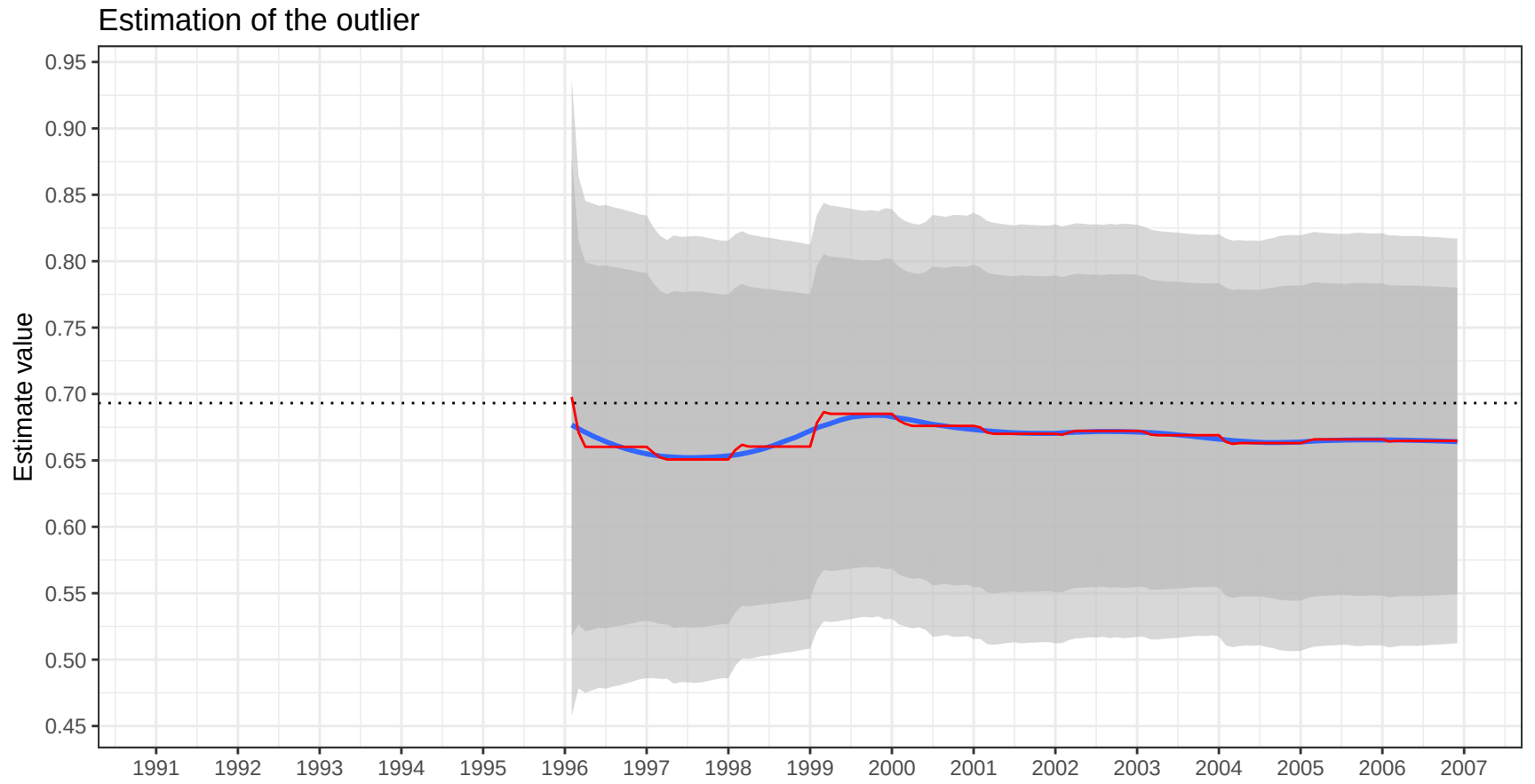

Estimate value of a LS(1995−1) FR−C2445
ARIMA (2,0,0)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
6
5
4
3
Time

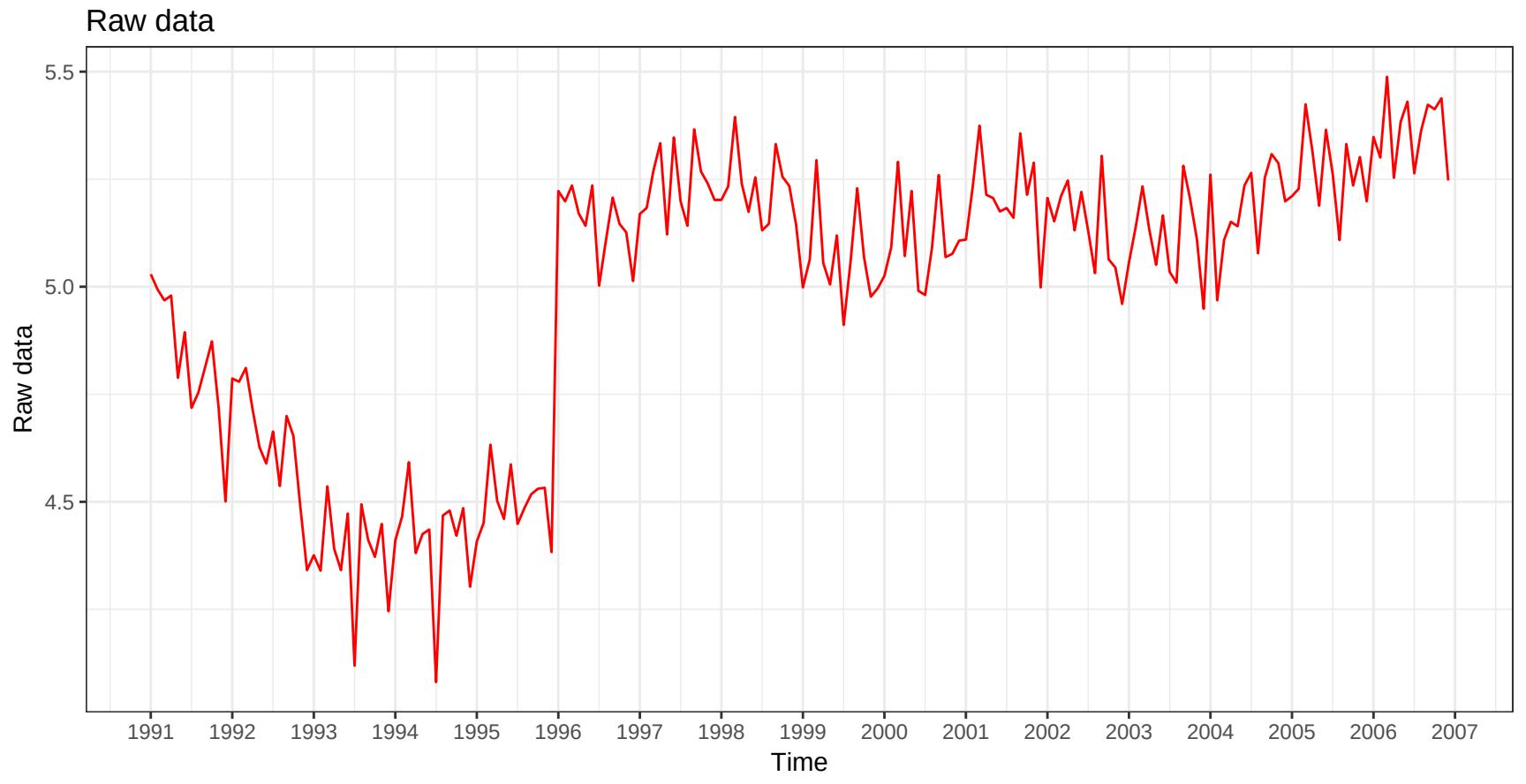

Estimate value of a LS(1996−1) DE−C2451
ARIMA (0,1,2)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
20
15
10
5
0
−5
−10
−15
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
140
120
100
80
60
40
Time


Estimate value of a LS(1995−1) FR−C2451
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
30
25
20
15
10
5
0
−5
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
150
100
50
Time


Estimate value of a LS(1995−1) IT−C2451
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
35
30
25
20
15
10
5
0
−5
−10
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
200
150
100
50
Time

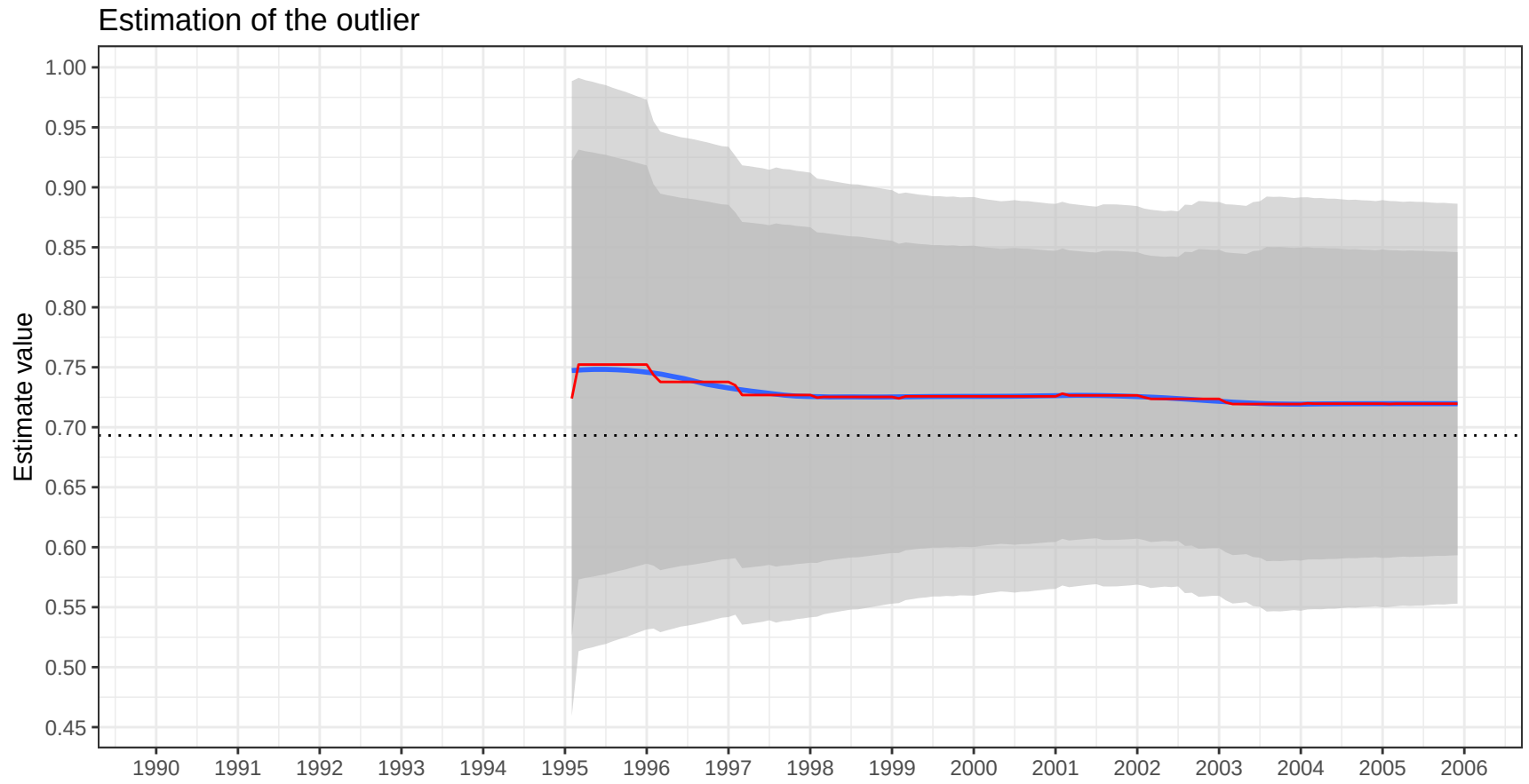
Estimate value of a LS(1996−1) DE−C2452
ARIMA (2,1,0)(0,1,1) − multiplicative decomposition

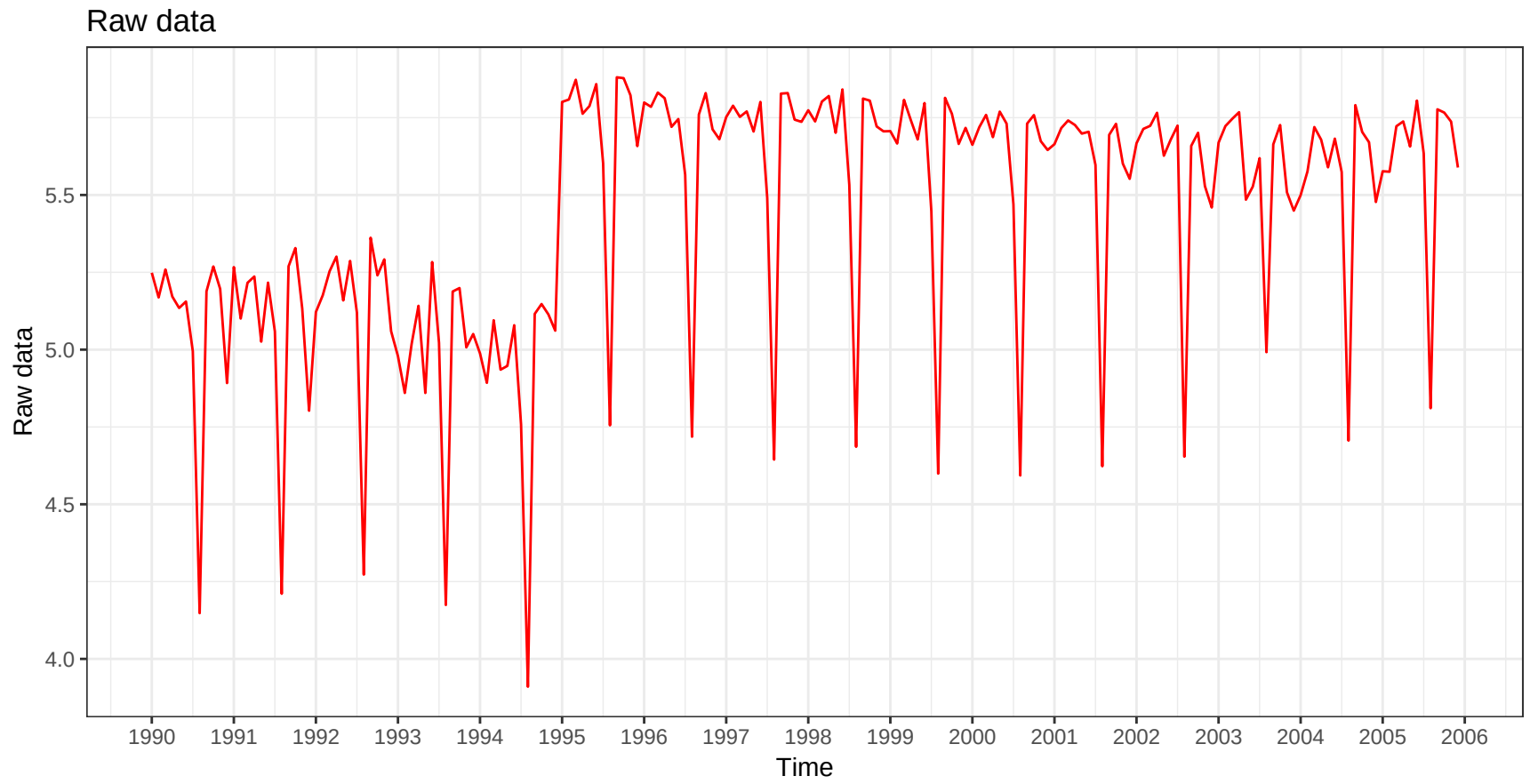


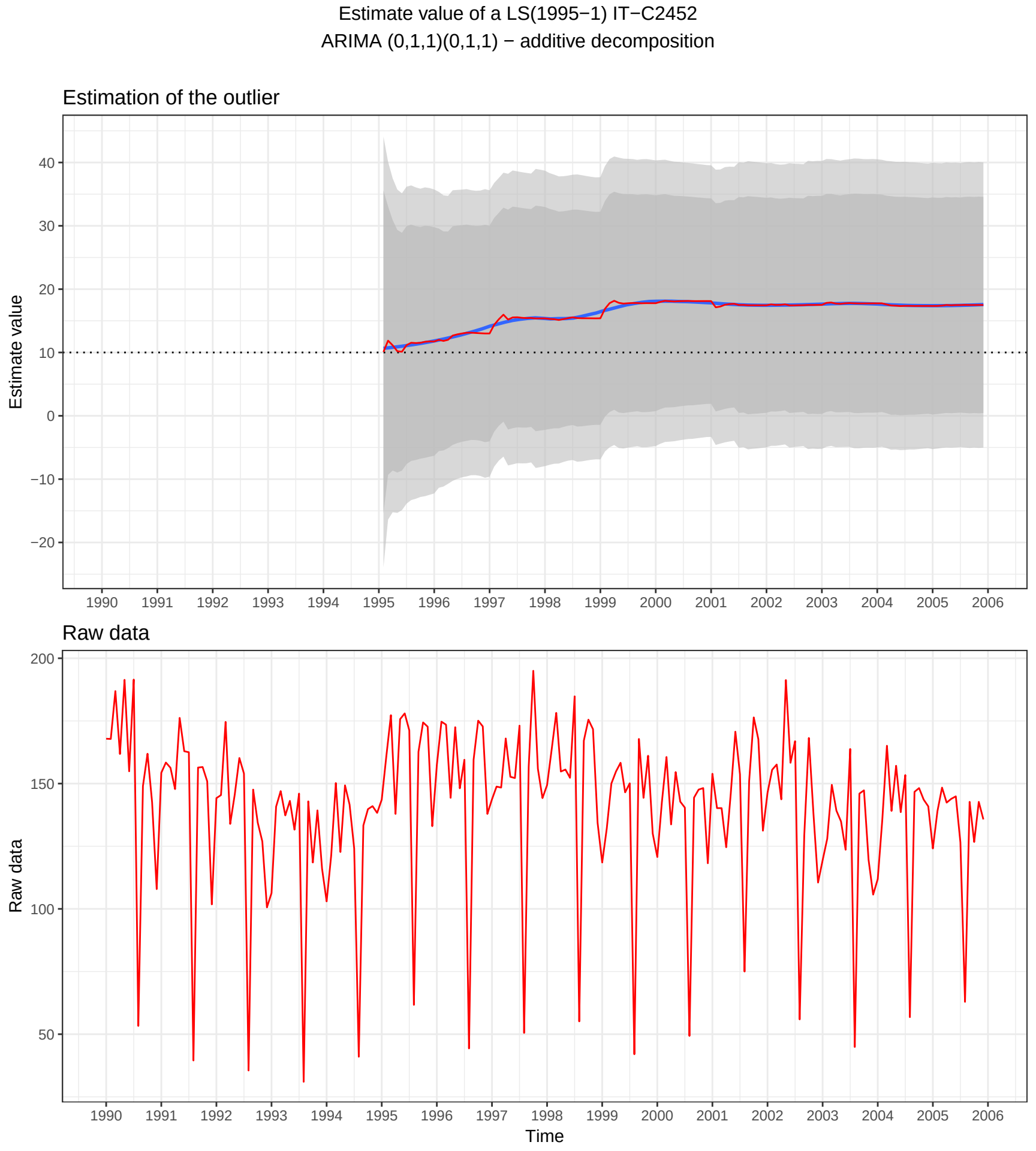


Estimate value of a LS(1995−1) FR−C2452

ARIMA (1,1,0)(0,1,1) − multiplicative decomposition

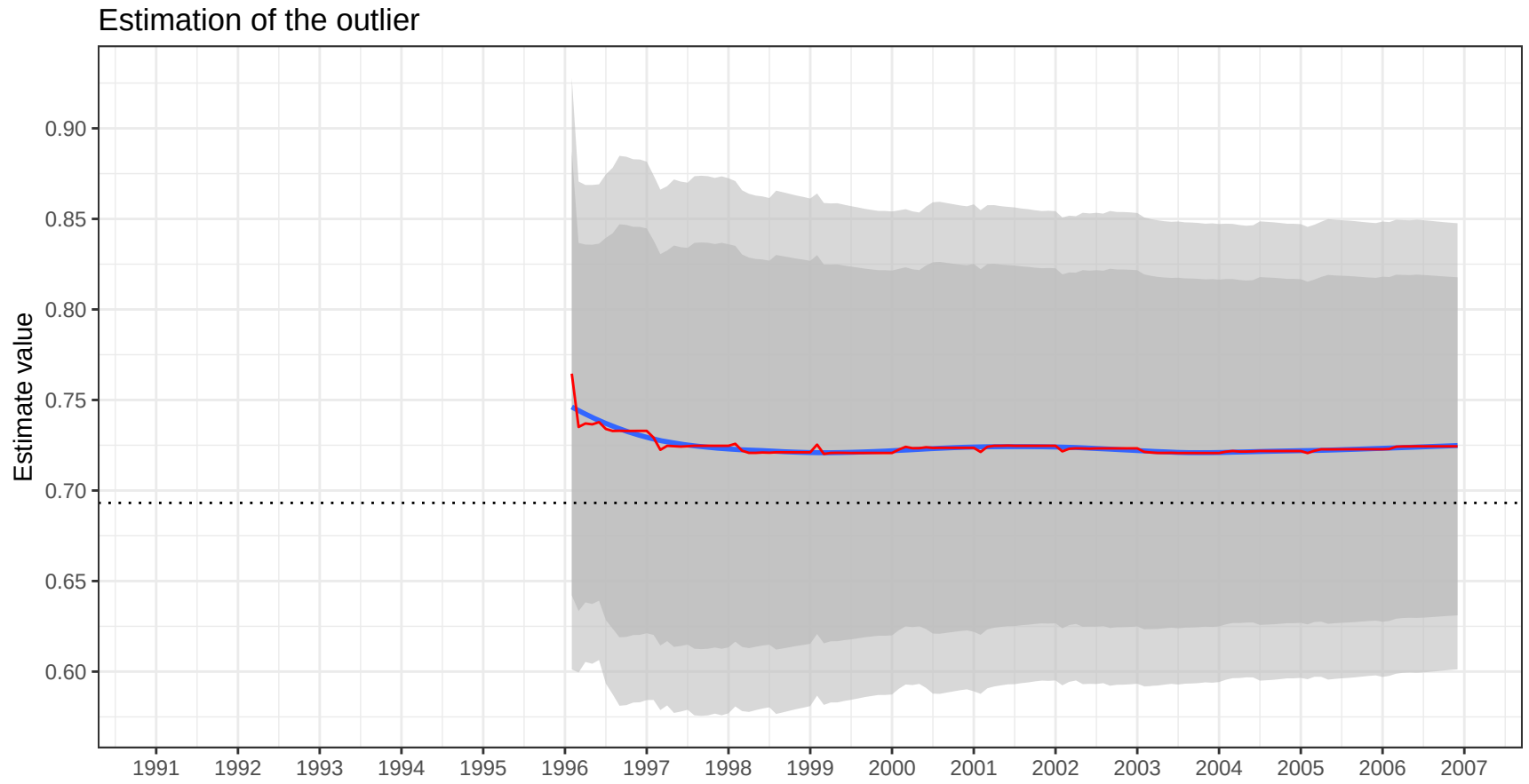


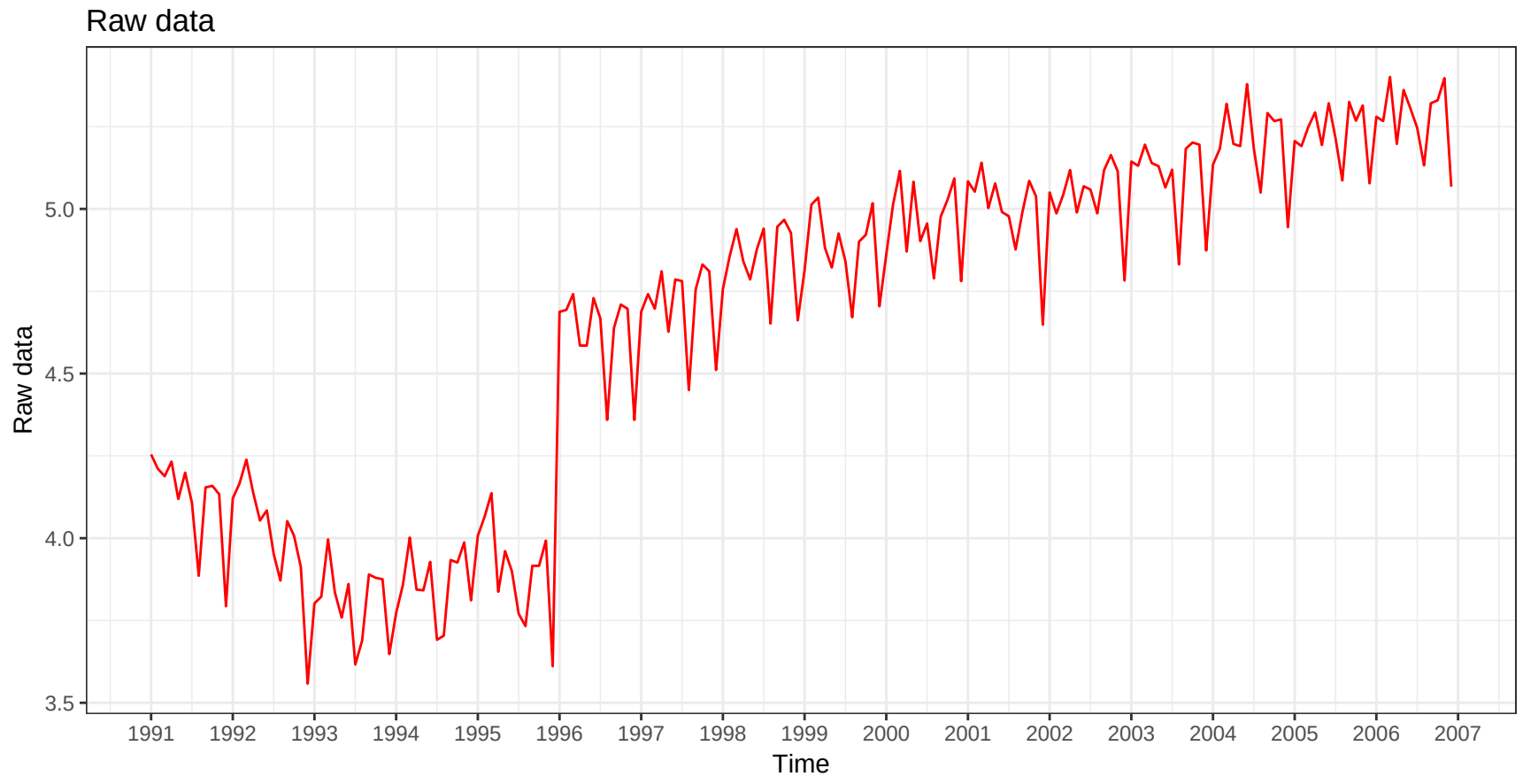


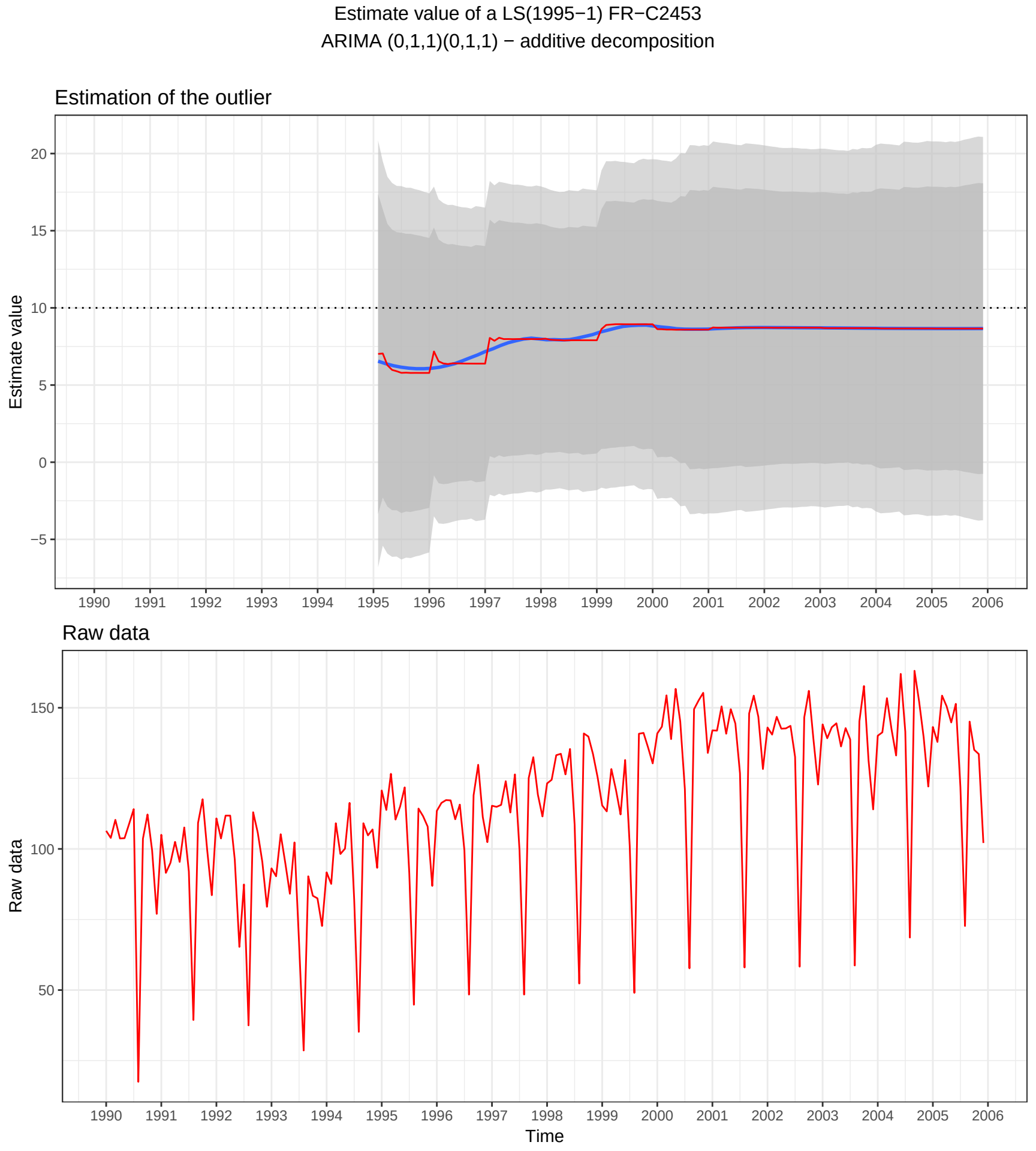

Estimate value of a LS(1995−1) IT−C2452
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
40
30
20
10
0
−10
−20
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
200
150
100
50
Time

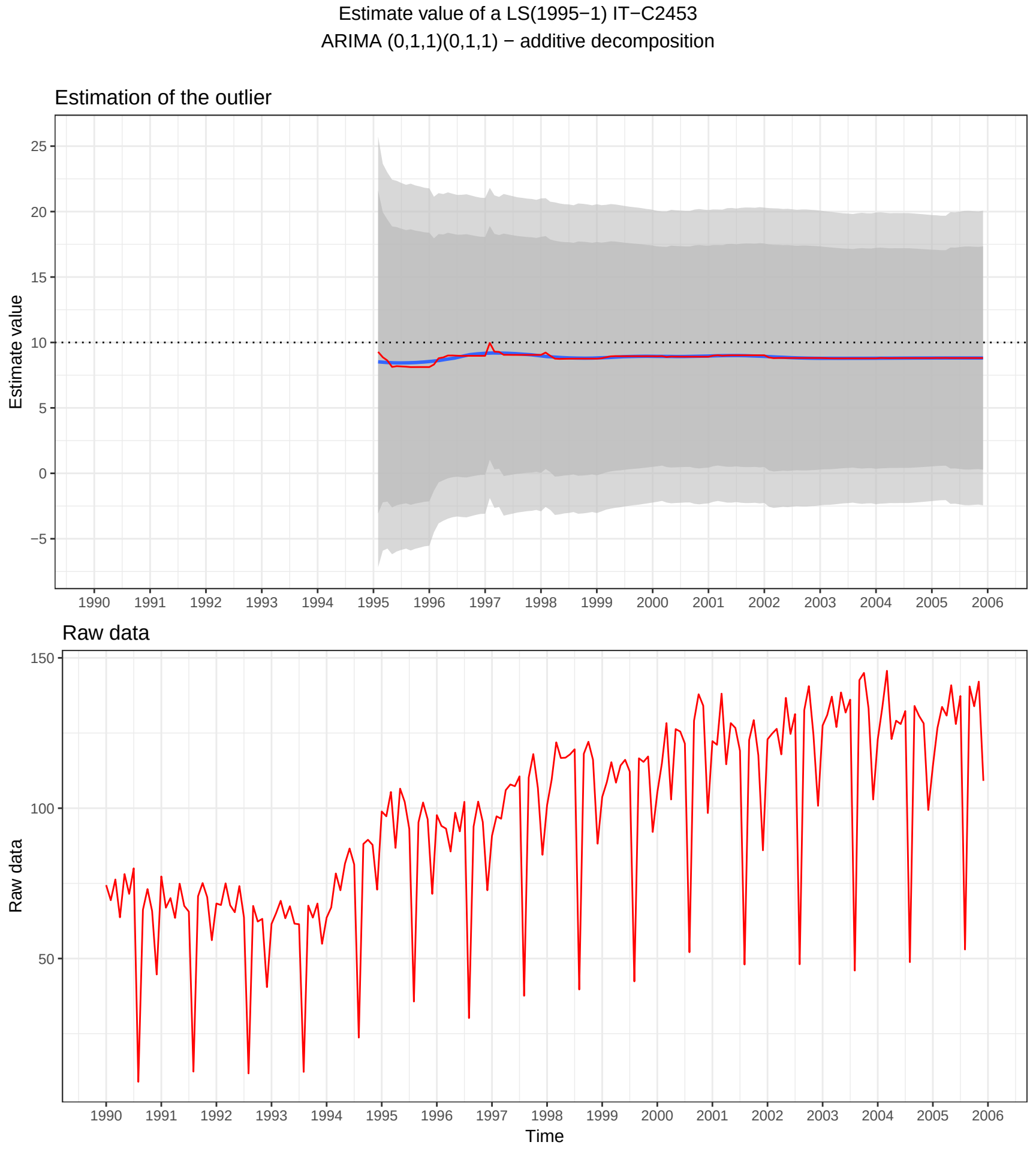
Estimate value of a LS(1996−1) DE−C2453

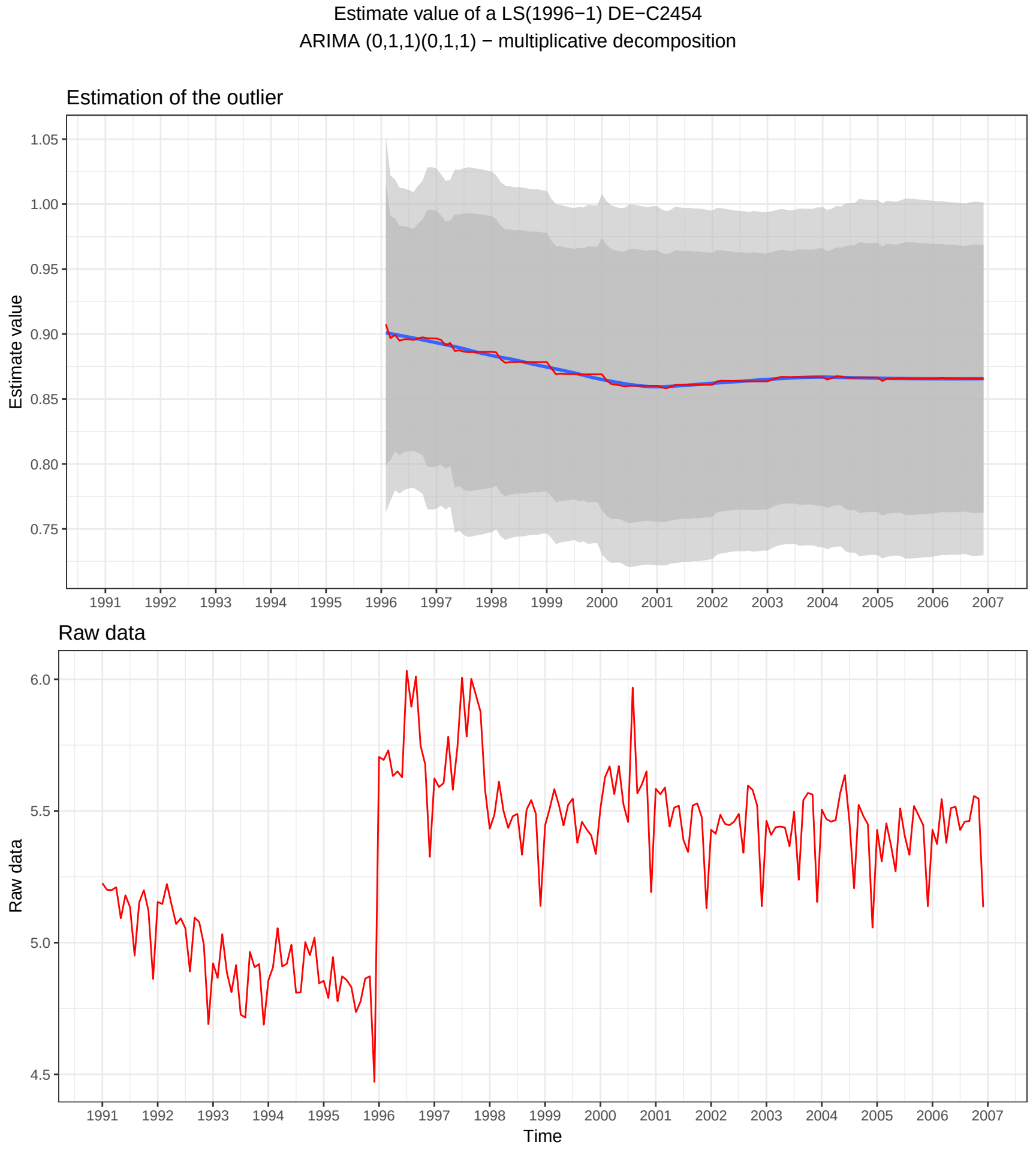
ARIMA (0,1,2)(0,1,1) − multiplicative decomposition

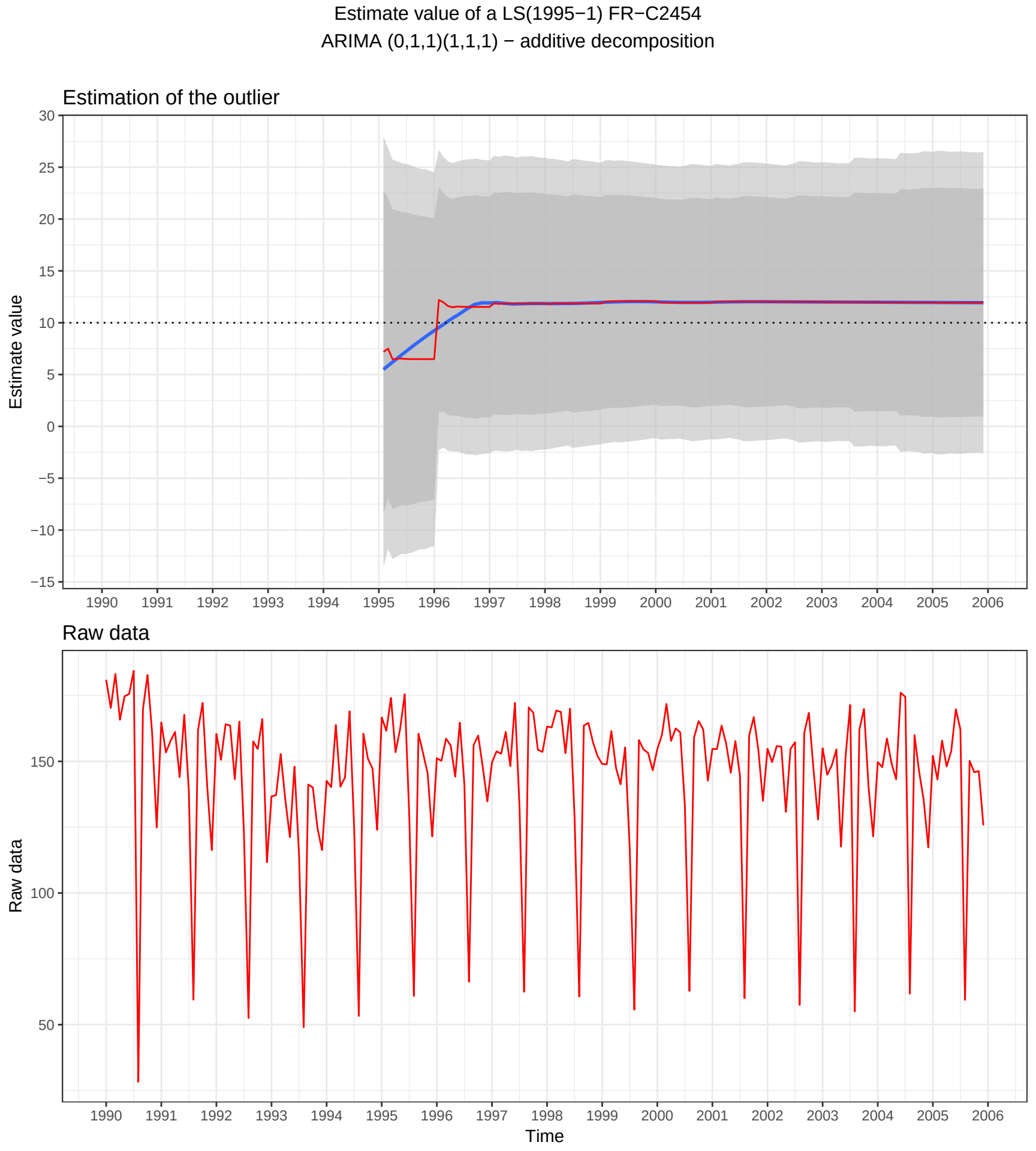


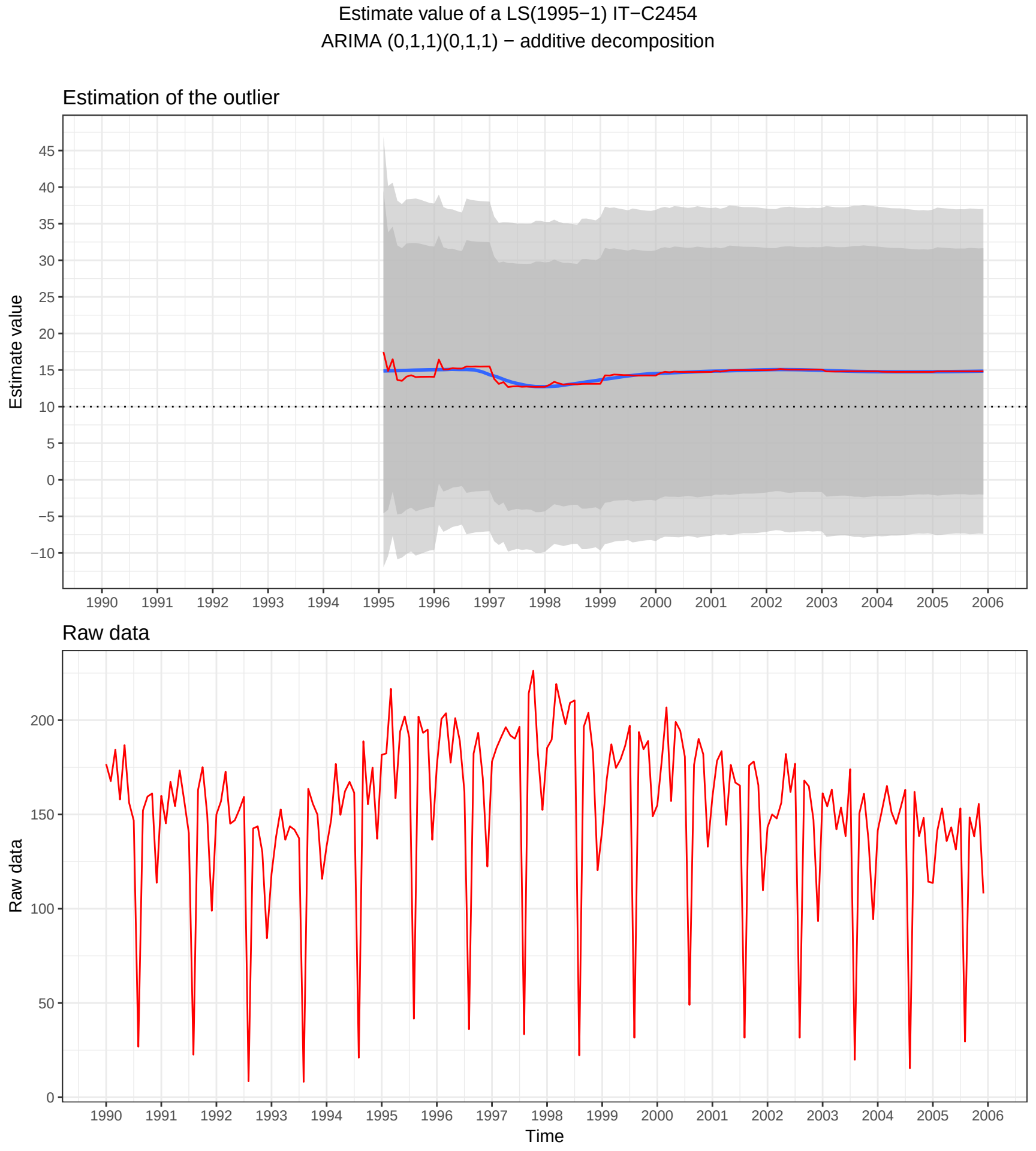



Estimate value of a LS(1995−1) FR−C2453
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
20
15
10
5
0
−5
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
150
100
50
Time

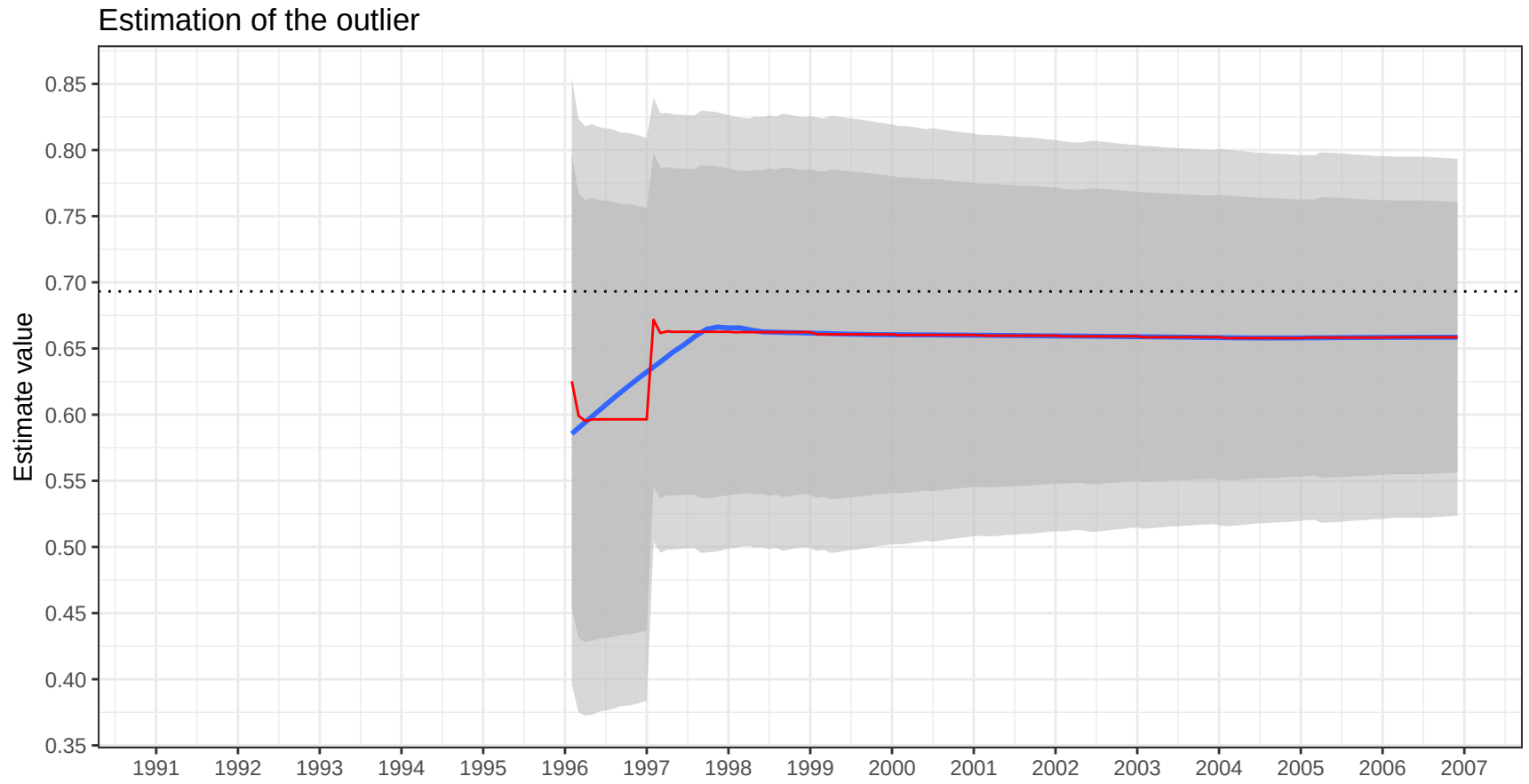

Estimate value of a LS(1995−1) IT−C2453
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
25
20
15
10
5
0
−5
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
150
100
50
Time

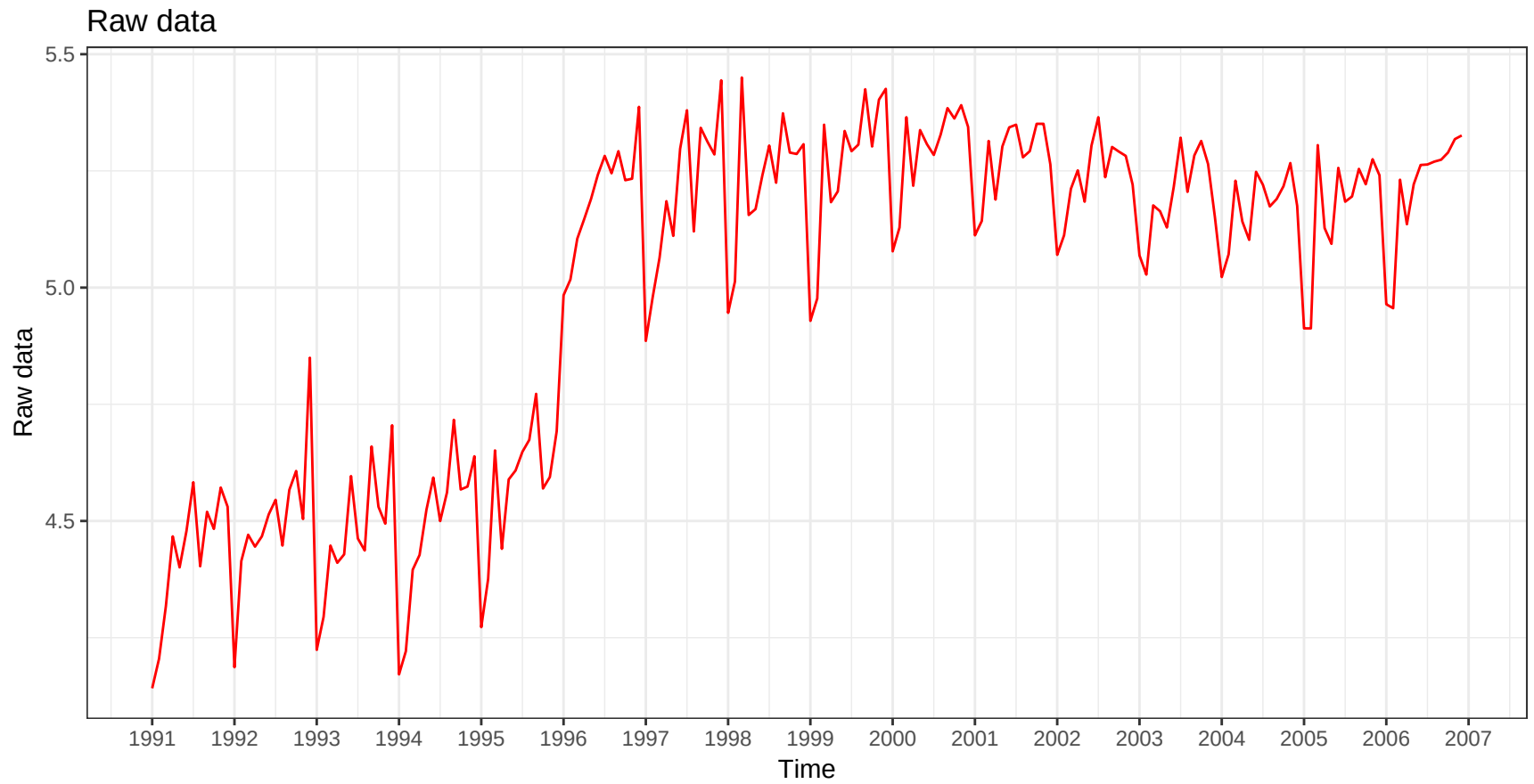

Estimate value of a LS(1996−1) DE−C2454
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
1.05
1.00
0.95
0.90
0.85
0.80
0.75
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
6.0
5.5
5.0
4.5
Time

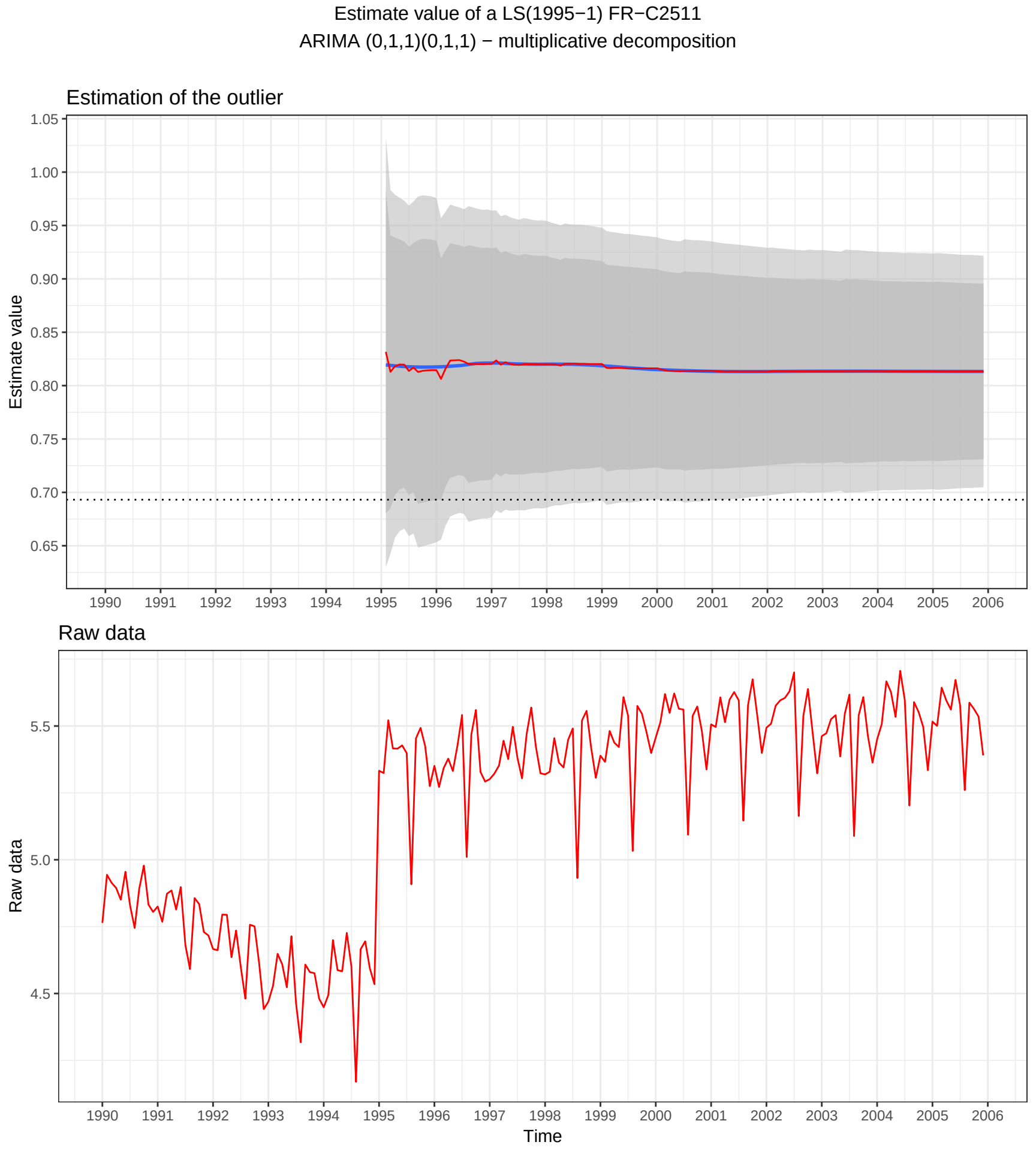

Estimate value of a LS(1995−1) FR−C2454
ARIMA (0,1,1)(1,1,1) − additive decomposition
Estimation of the outlier
Estimate value
30
25
20
15
10
5
0
−5
−10
−15
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
150
100
50
Time


Estimate value of a LS(1995−1) IT−C2454
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
45
40
35
30
25
20
15
10
5
0
−5
−10
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
200
150
100
50
0
Time

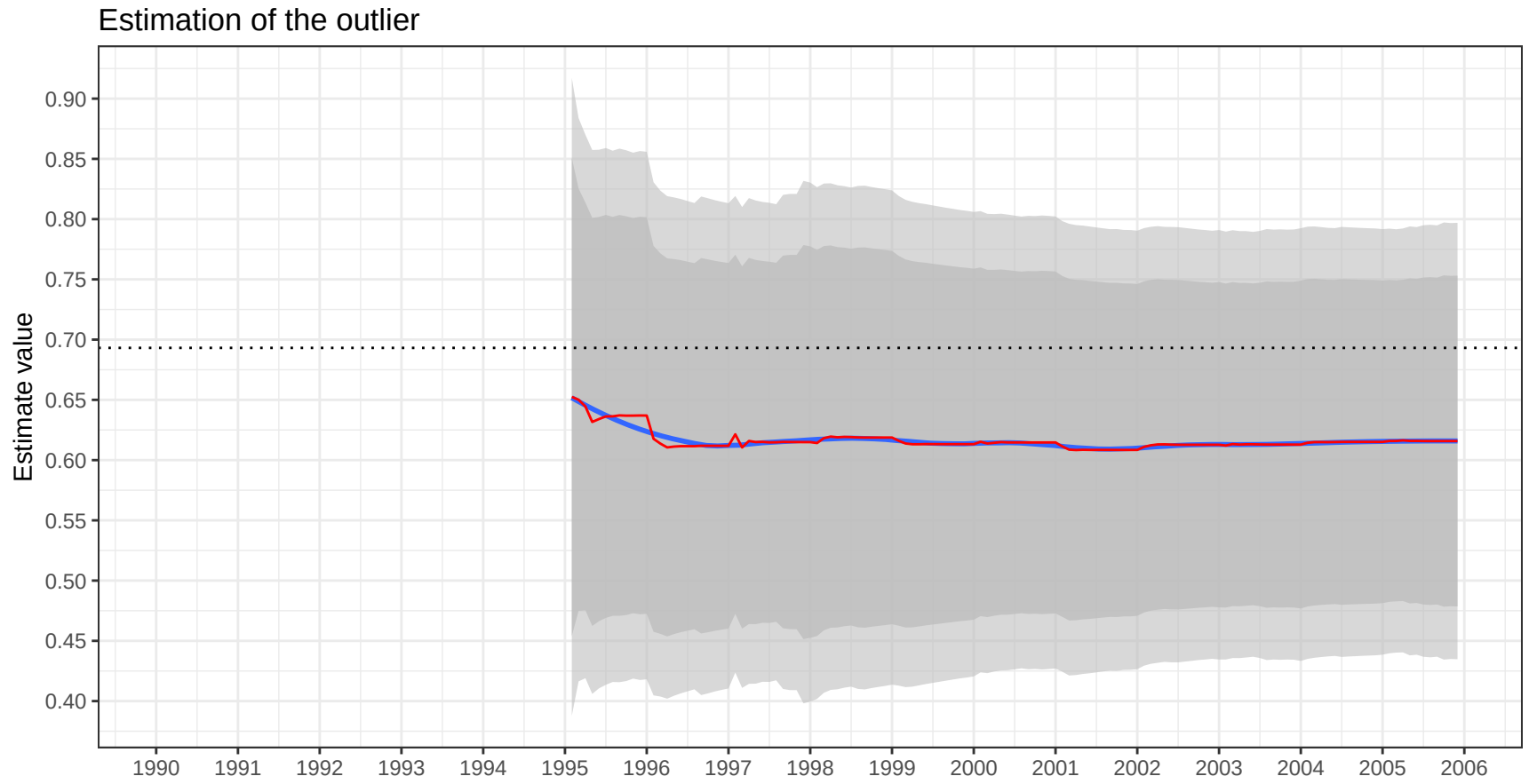
Estimate value of a LS(1996−1) DE−C2511
ARIMA (0,1,1)(1,1,1) − multiplicative decomposition

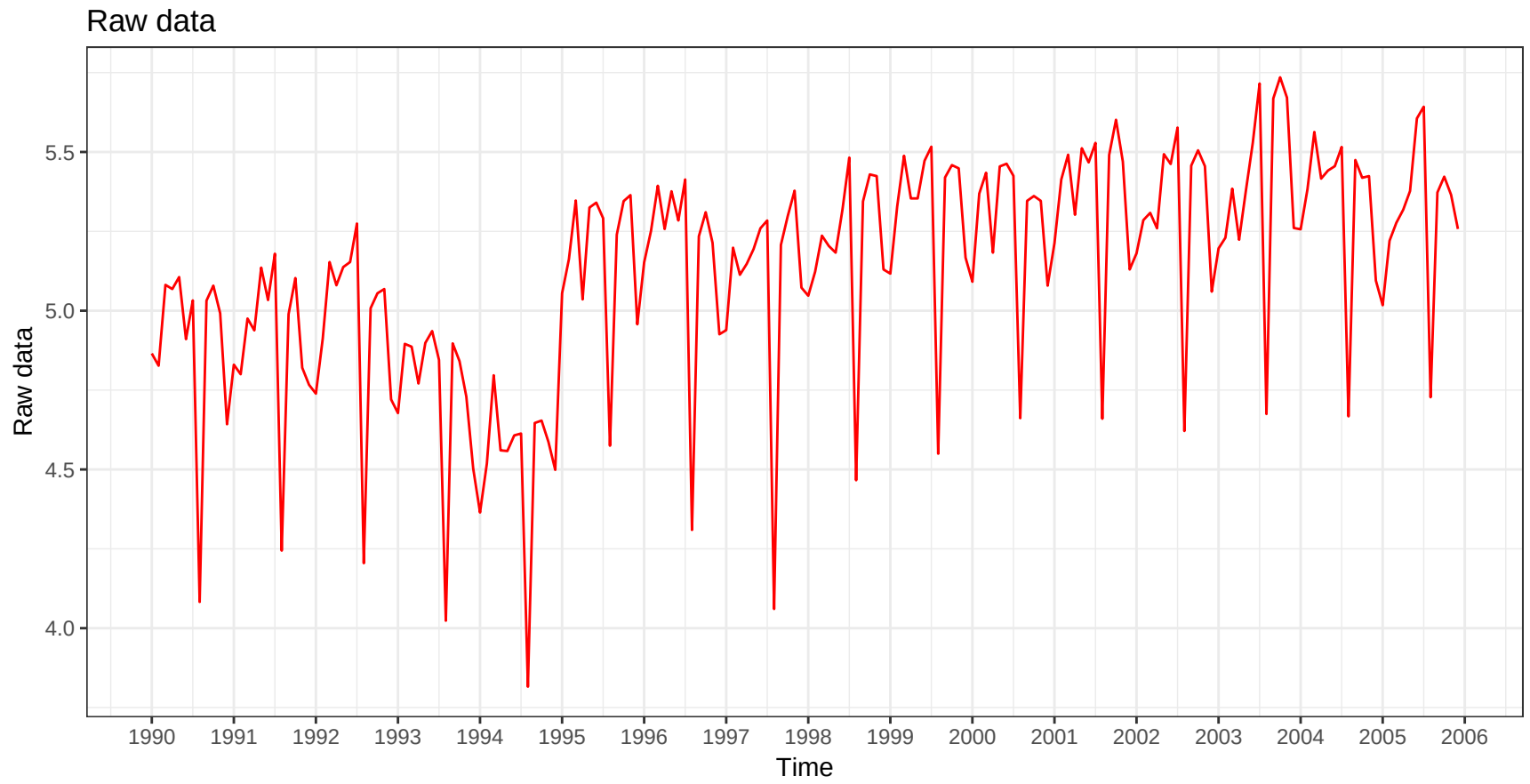





Estimate value of a LS(1995−1) FR−C2511
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
1.05
1.00
0.95
0.90
0.85
0.80
0.75
0.70
0.65
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
5.5
5.0
4.5
Time

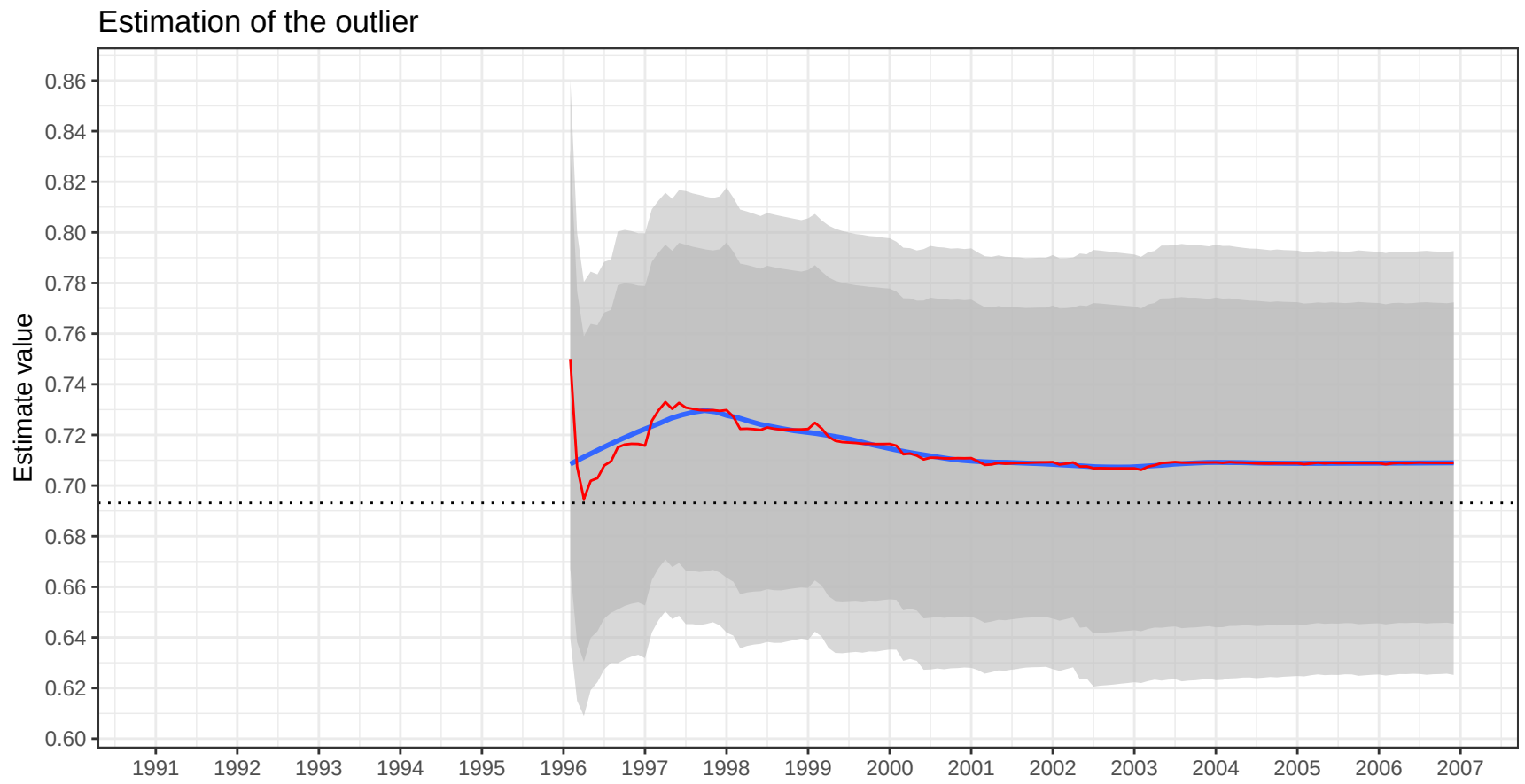
Estimate value of a LS(1995−1) IT−C2511
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

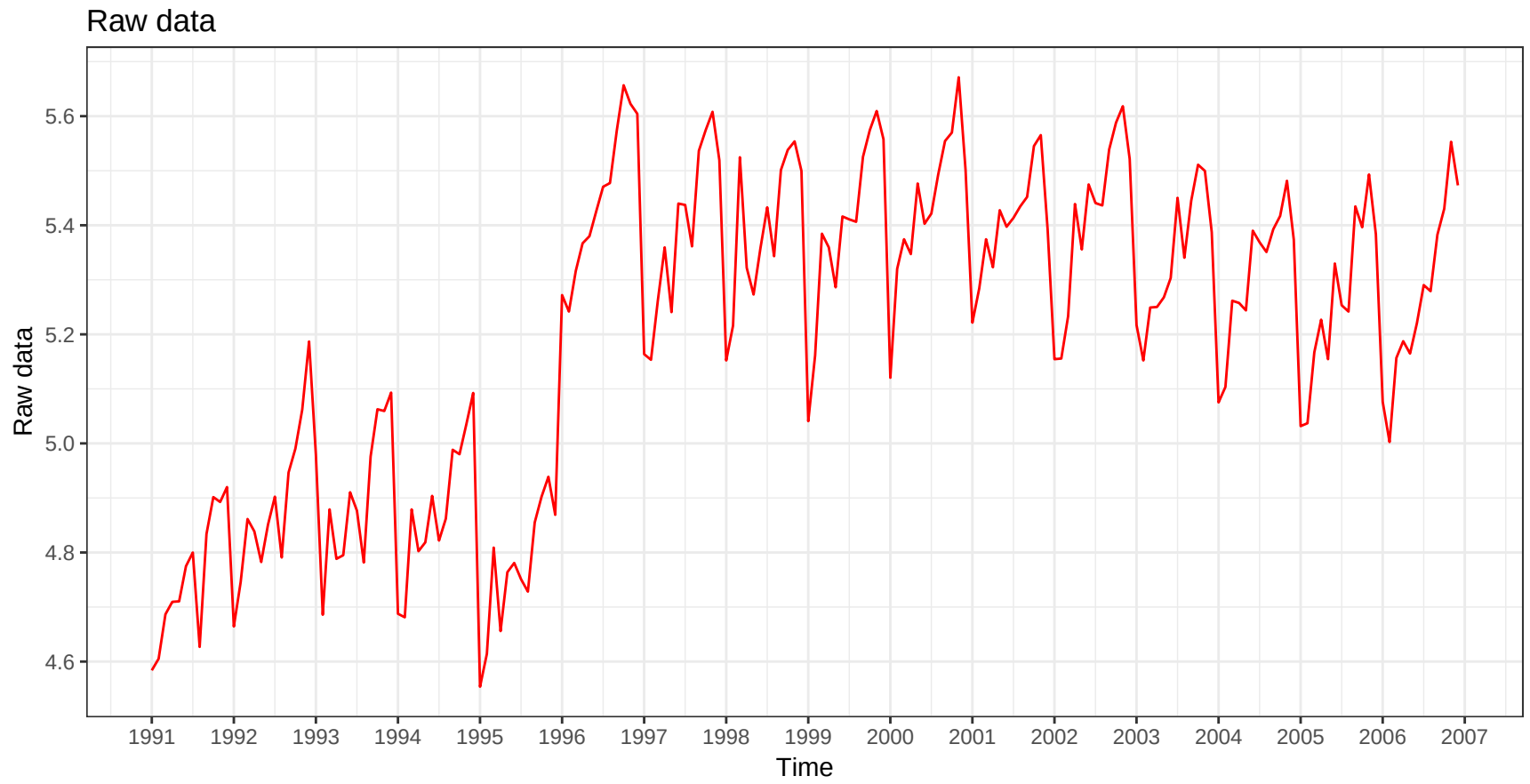


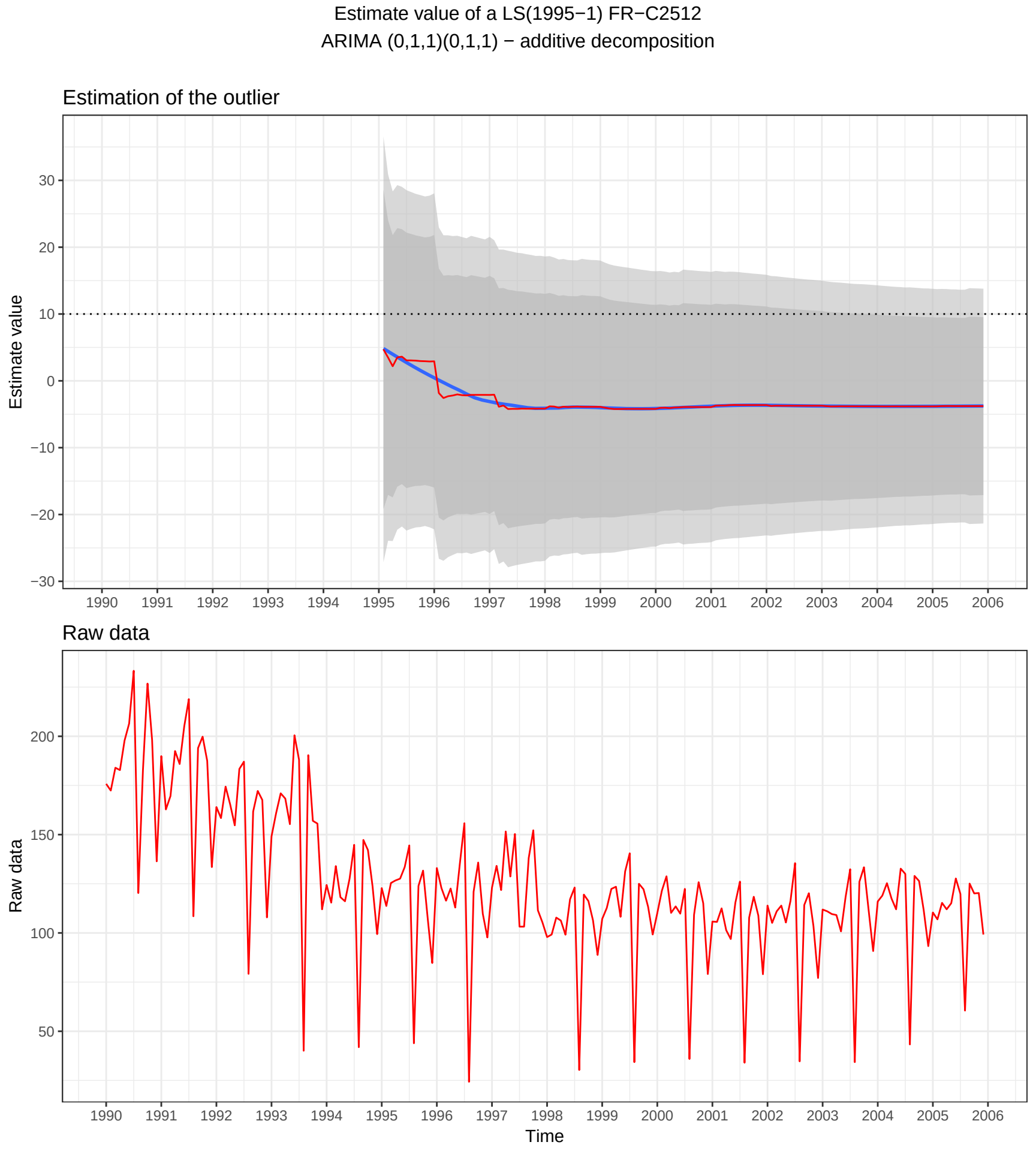


Estimate value of a LS(1996−1) DE−C2512

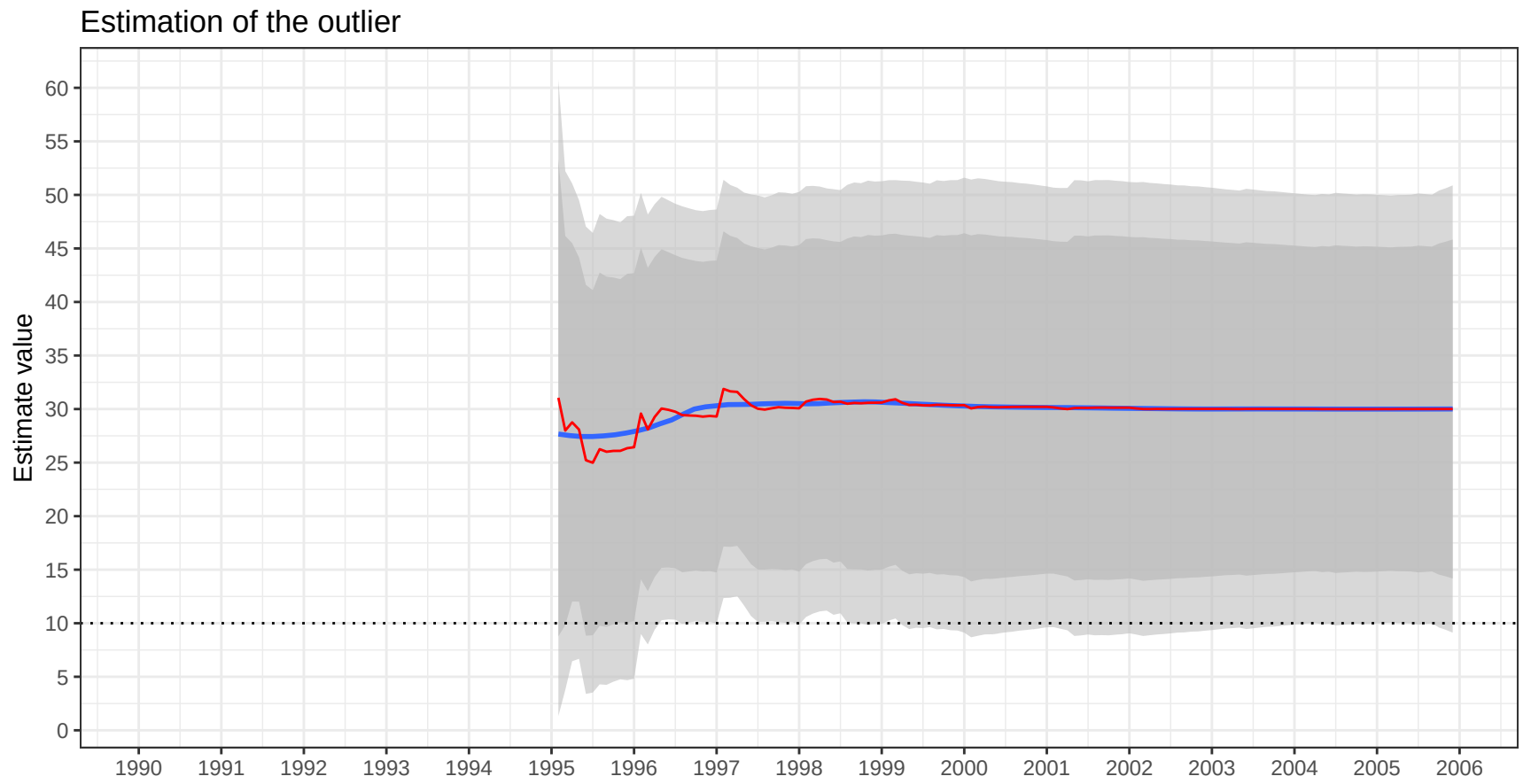
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

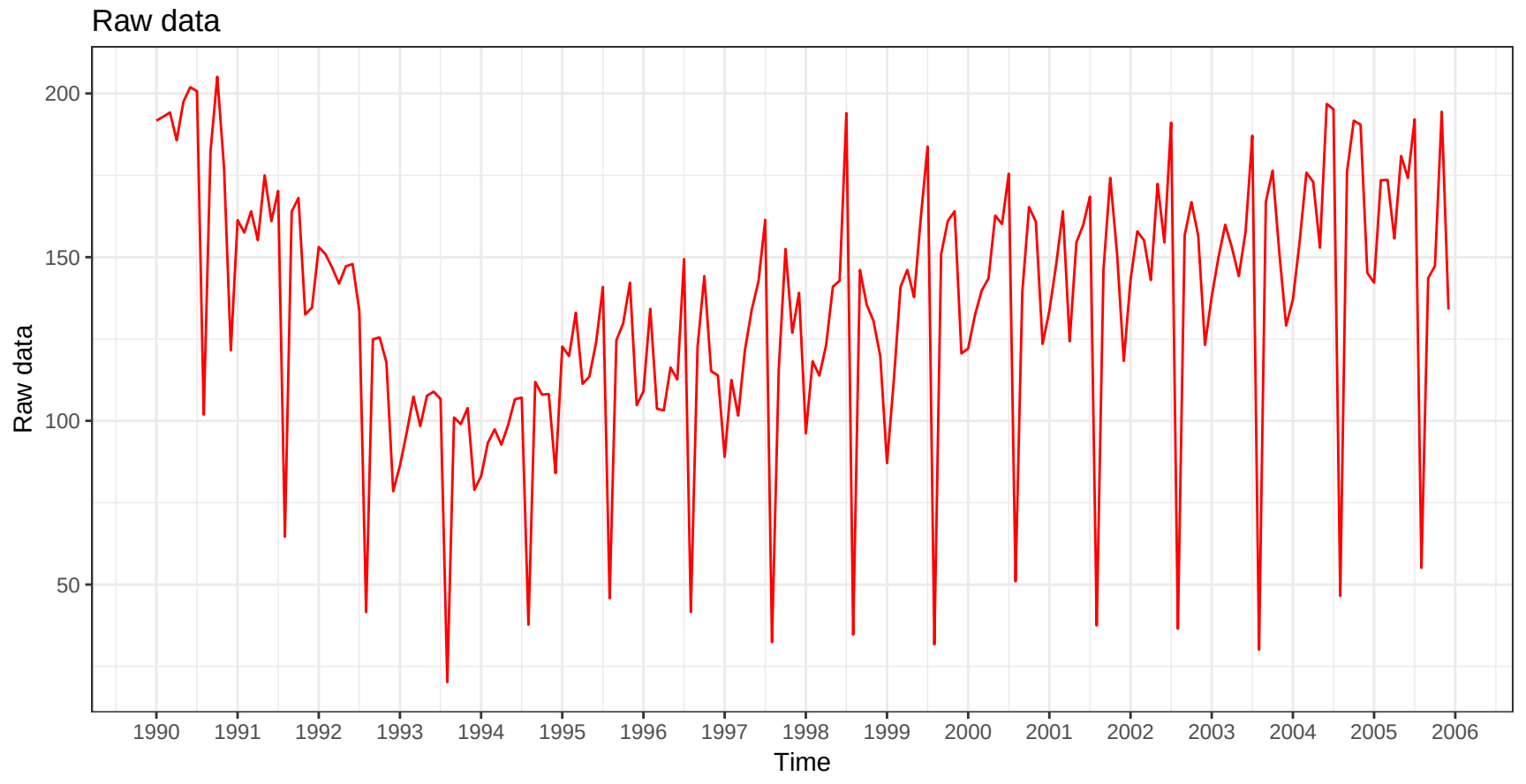





Estimate value of a LS(1995−1) FR−C2512
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
30
20
10
0
−10
−20
−30
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
200
150
100
50
Time

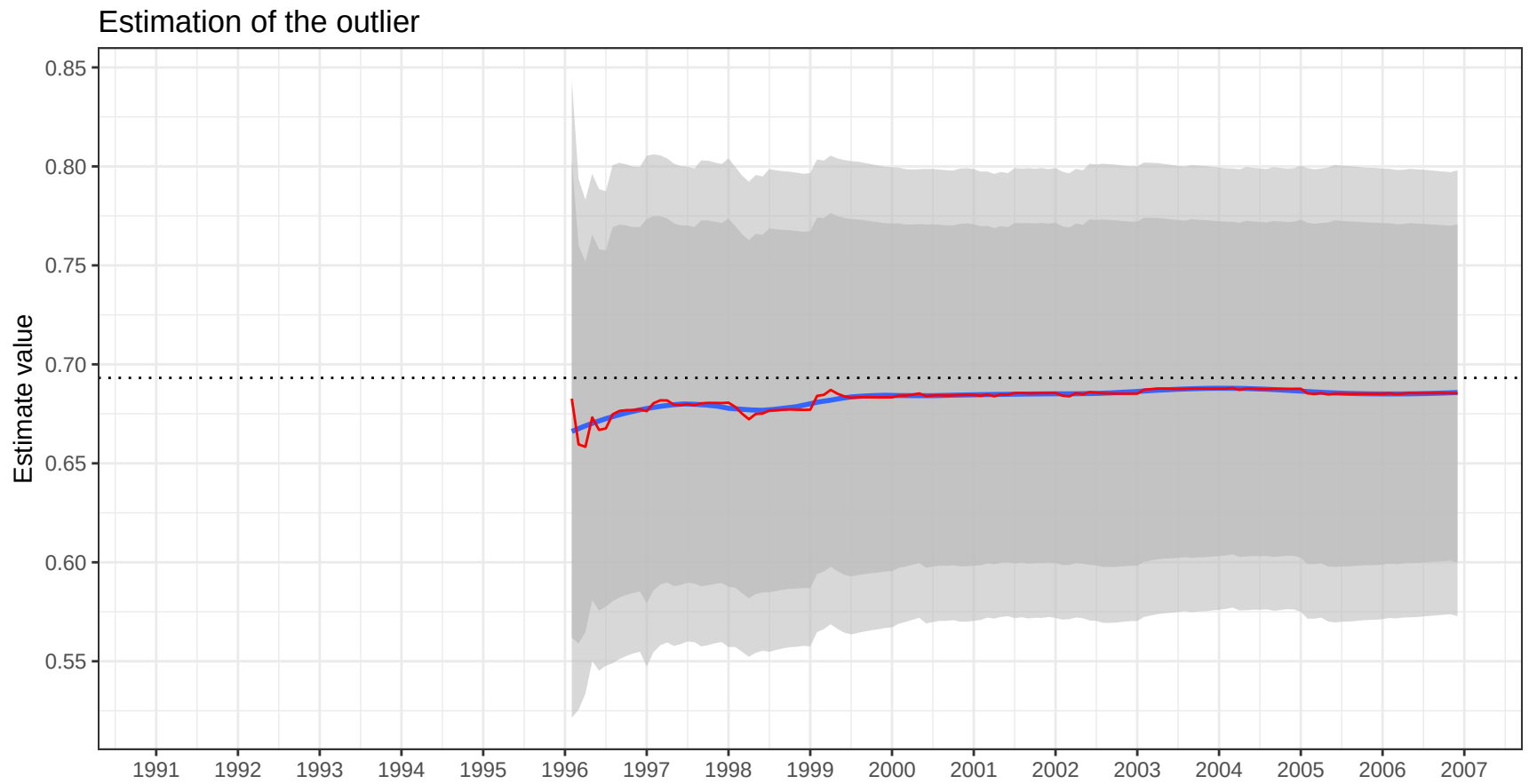
Estimate value of a LS(1995−1) IT−C2512
ARIMA (0,1,1)(0,1,1) − additive decomposition

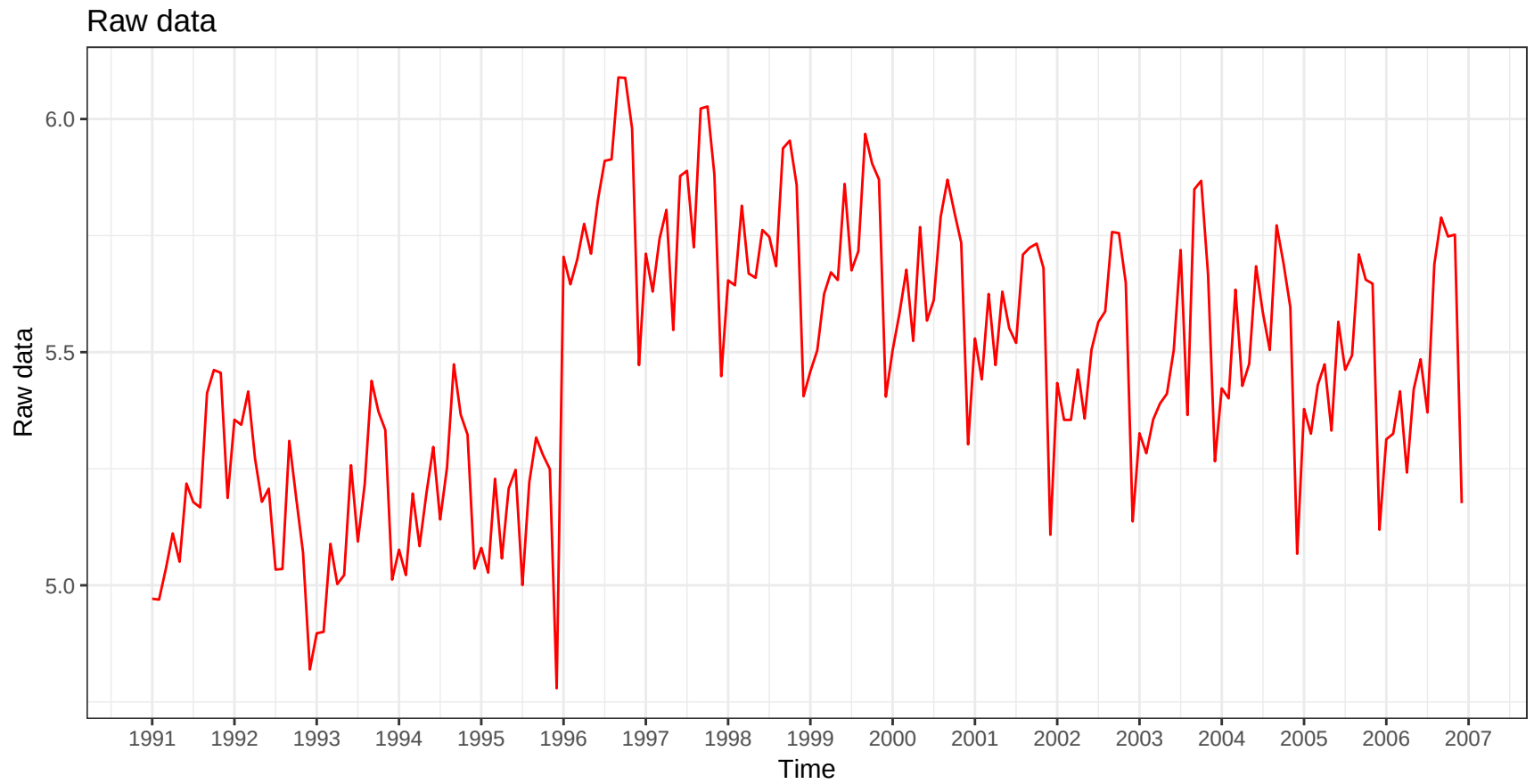




Estimate value of a LS(1996−1) DE−C2521

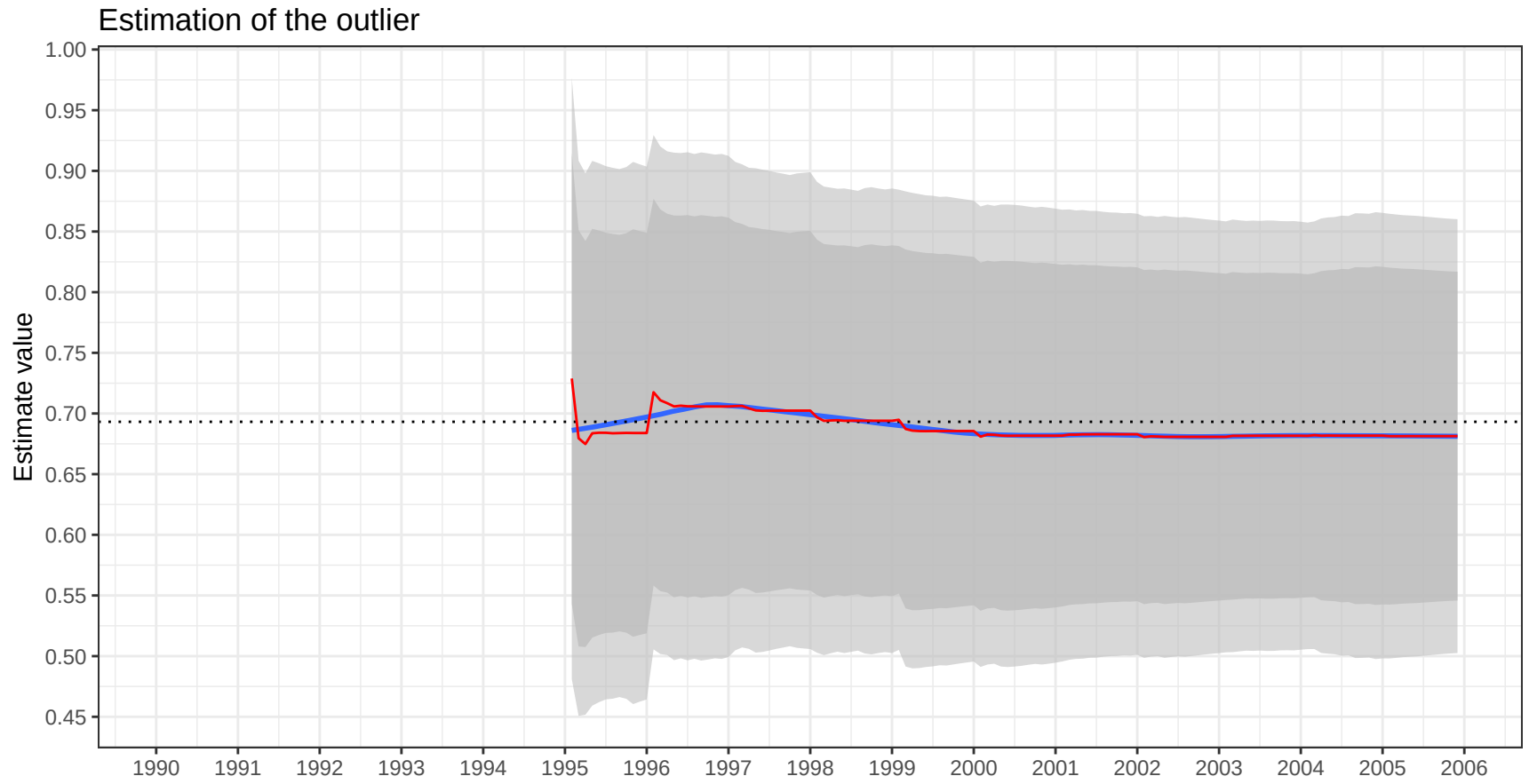
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

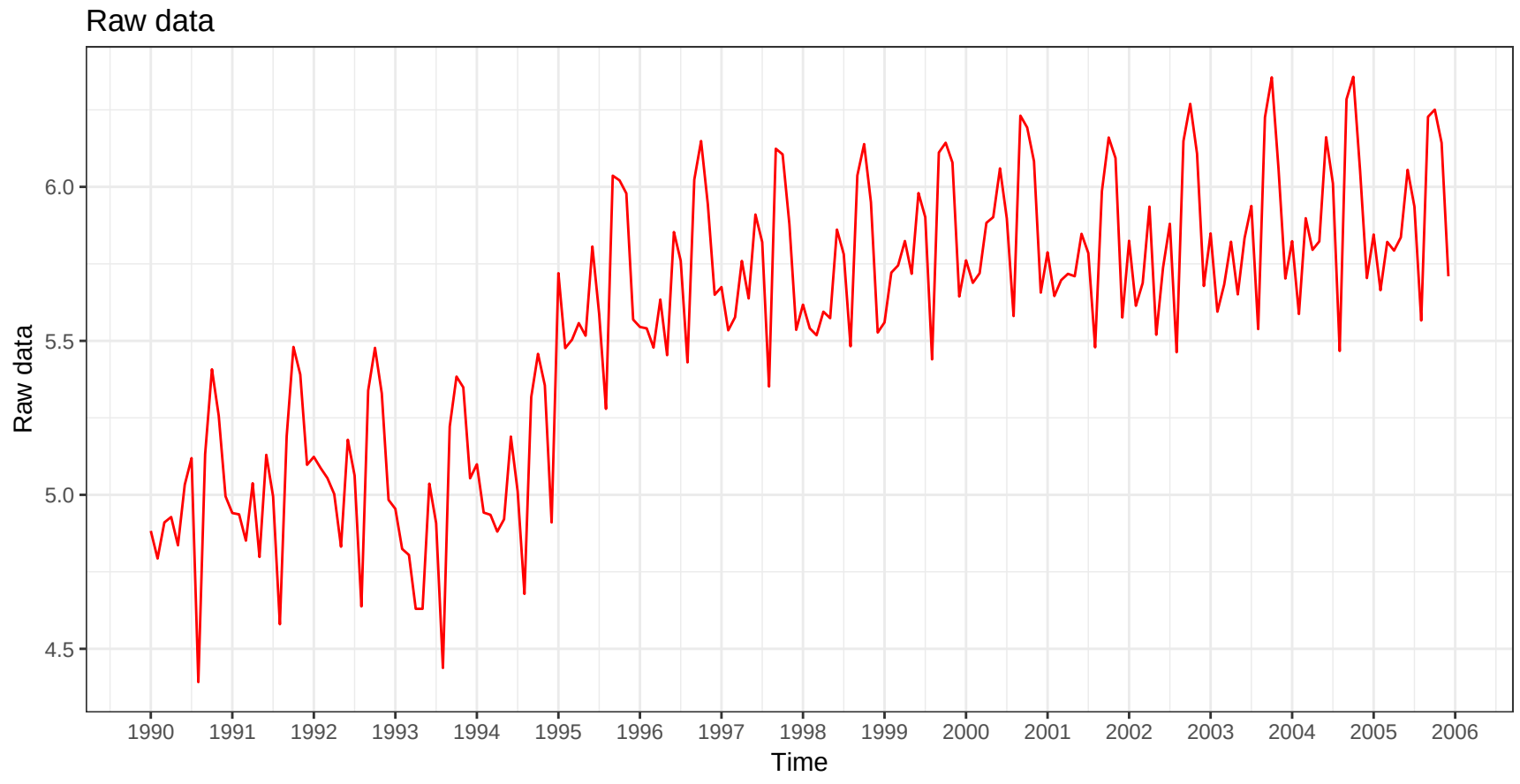


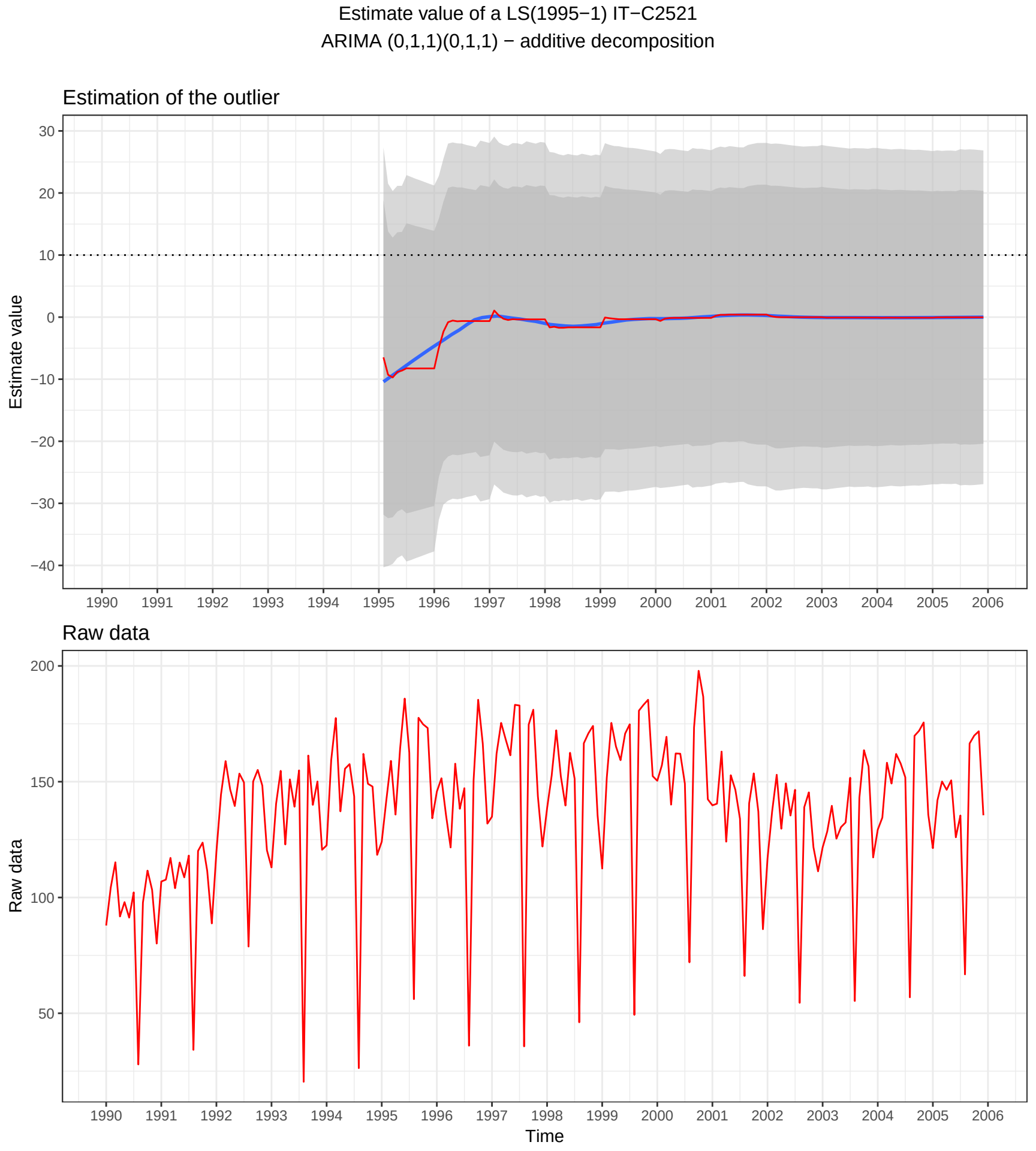


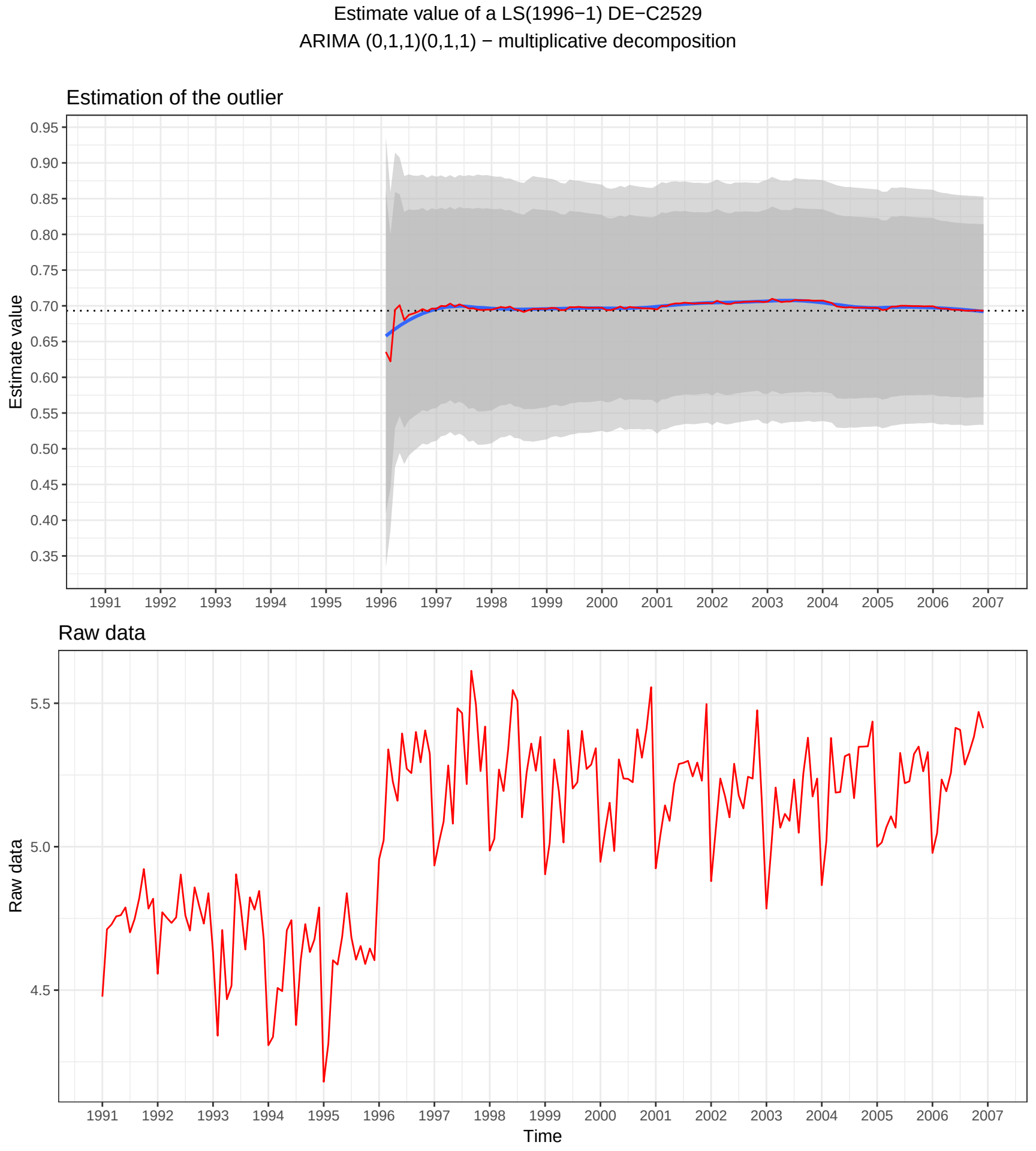
Estimate value of a LS(1995−1) FR−C2521

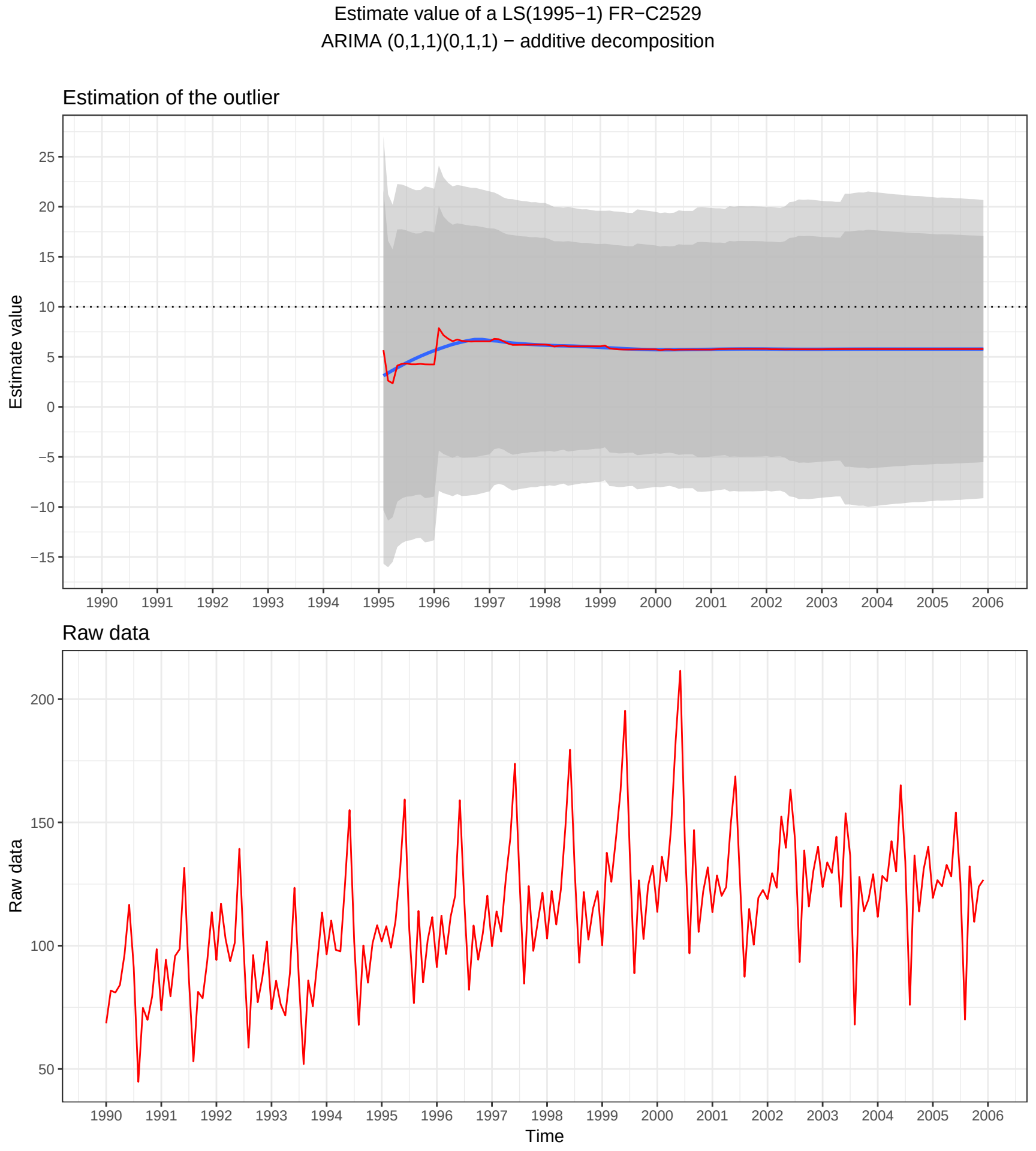
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition





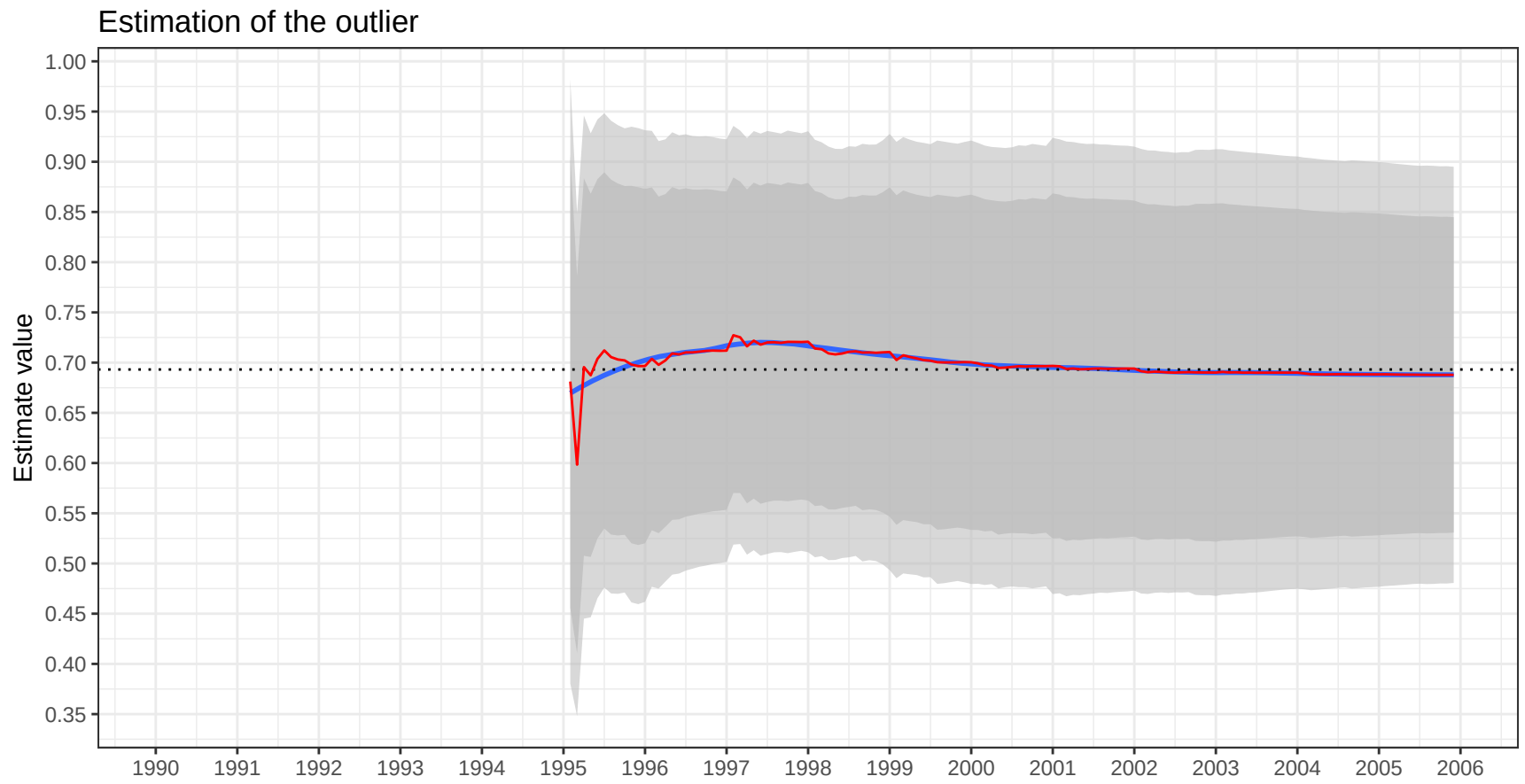

Estimate value of a LS(1995−1) IT−C2521
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
30
20
10
0
−10
−20
−30
−40
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
200
150
100
50
Time

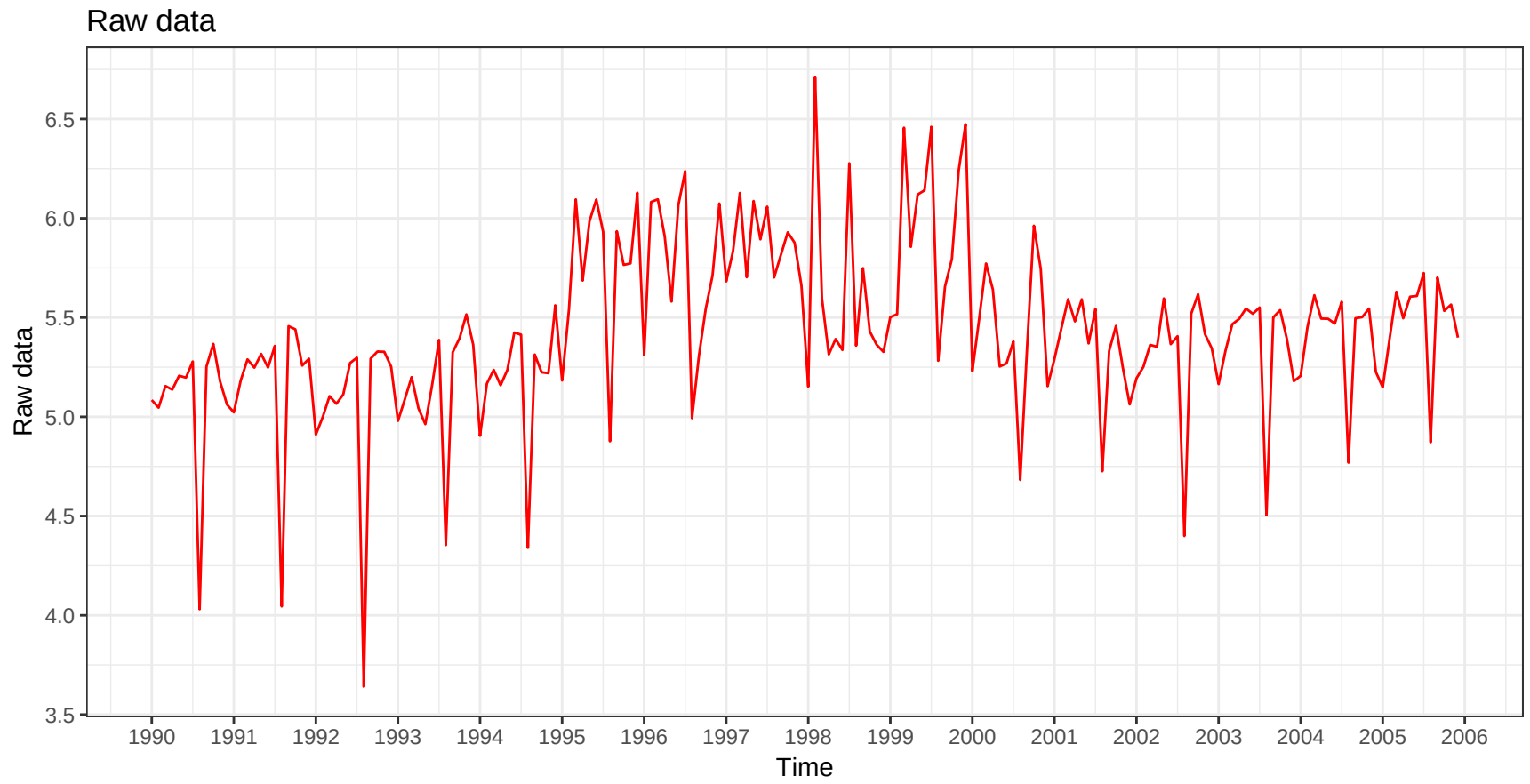

Estimate value of a LS(1996−1) DE−C2529
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.95
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
0.45
0.40
0.35
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
5.5
5.0
4.5
Time


Estimate value of a LS(1995−1) FR−C2529
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
25
20
15
10
5
0
−5
−10
−15
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
200
150
100
50
Time

Estimate value of a LS(1995−1) IT−C2529

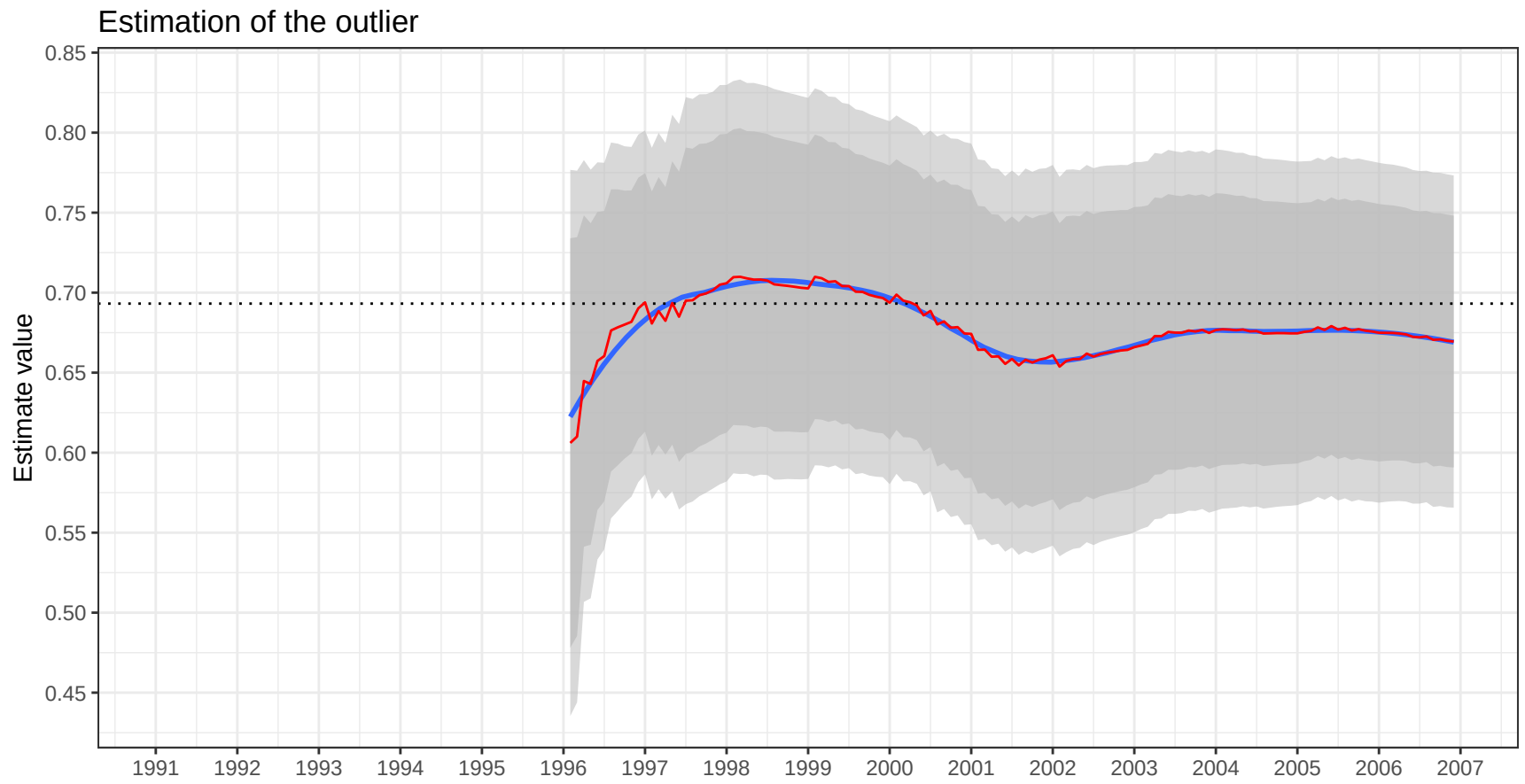
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

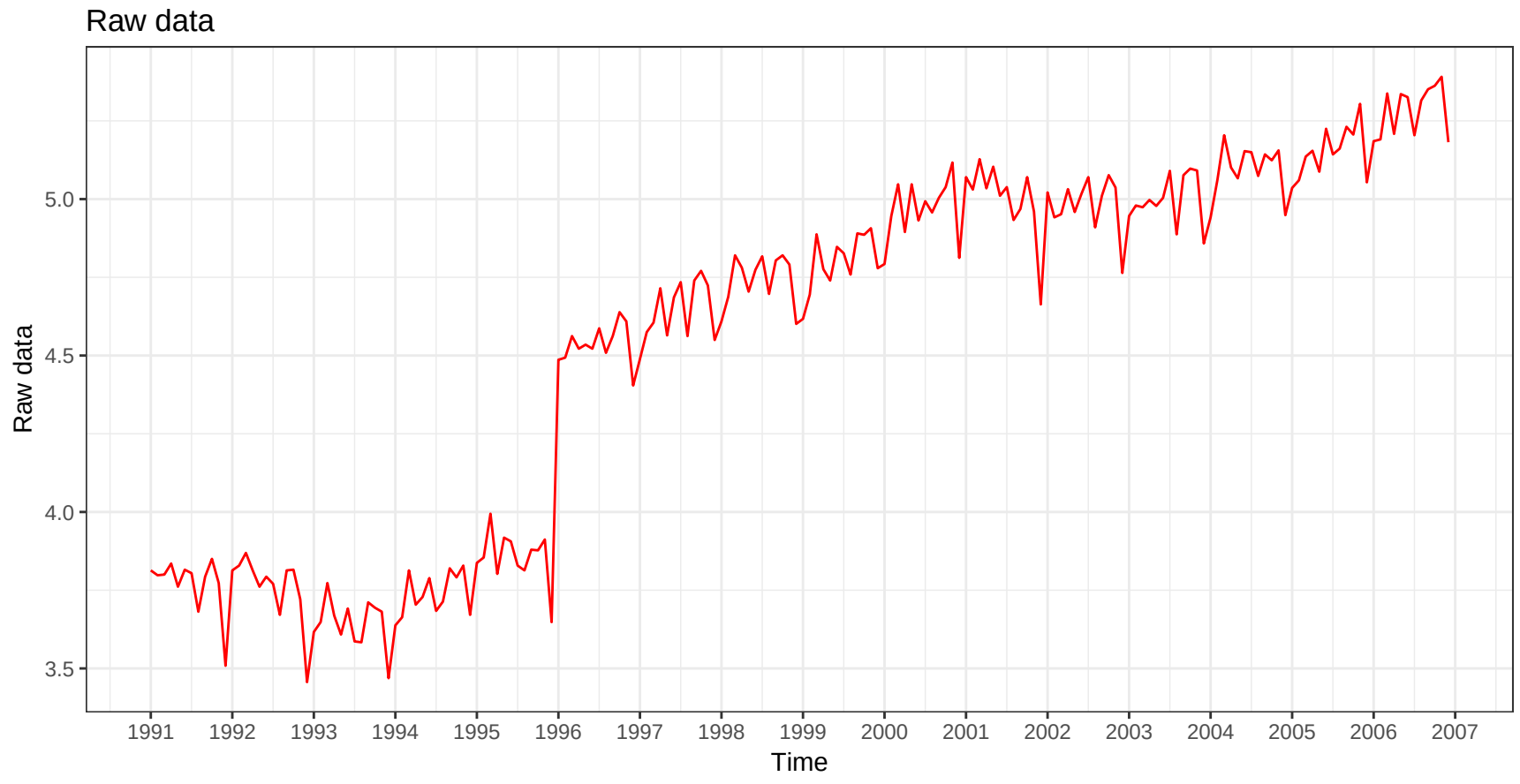


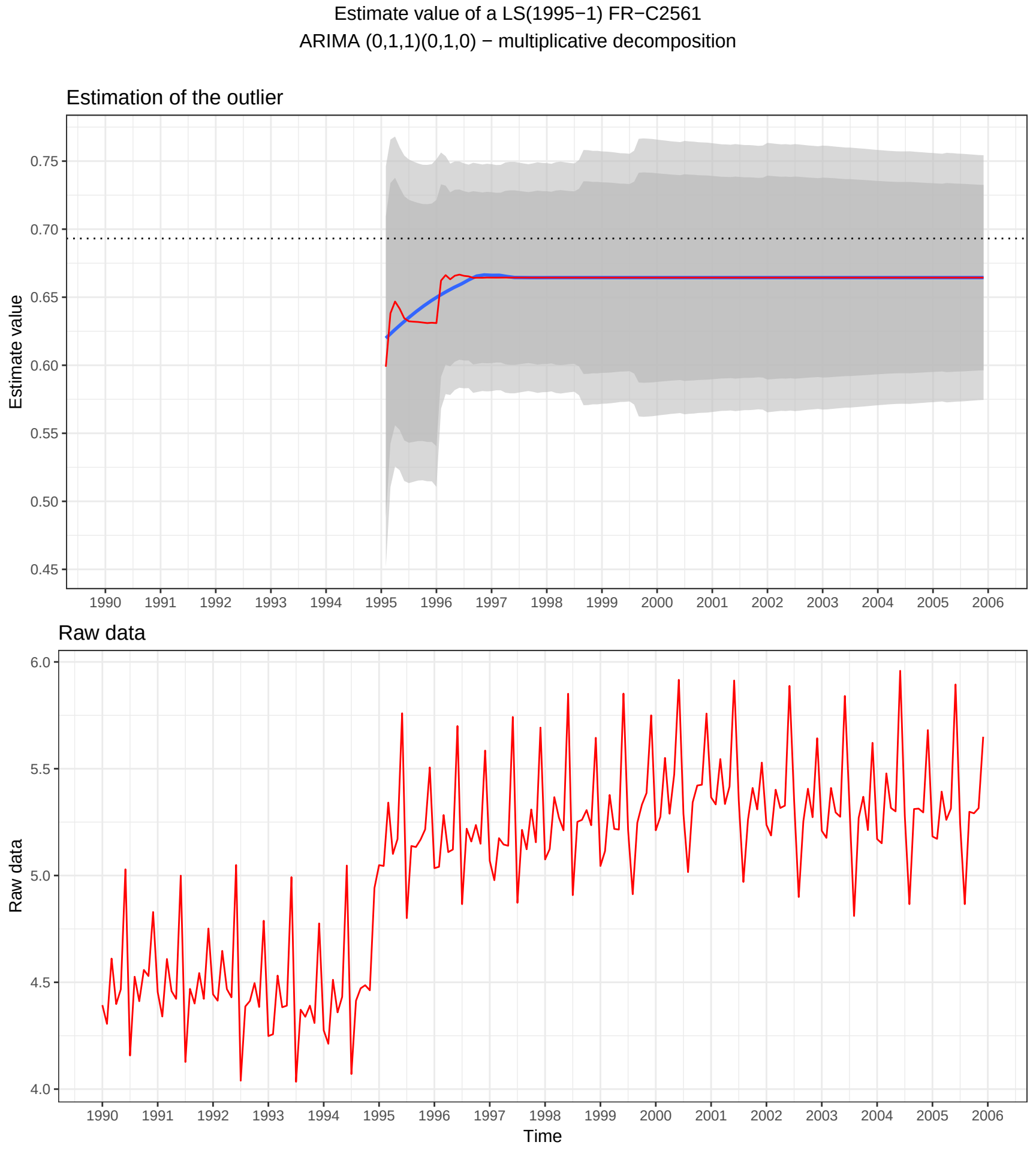


Estimate value of a LS(1996−1) DE−C2561

ARIMA (0,1,2)(1,1,1) − multiplicative decomposition

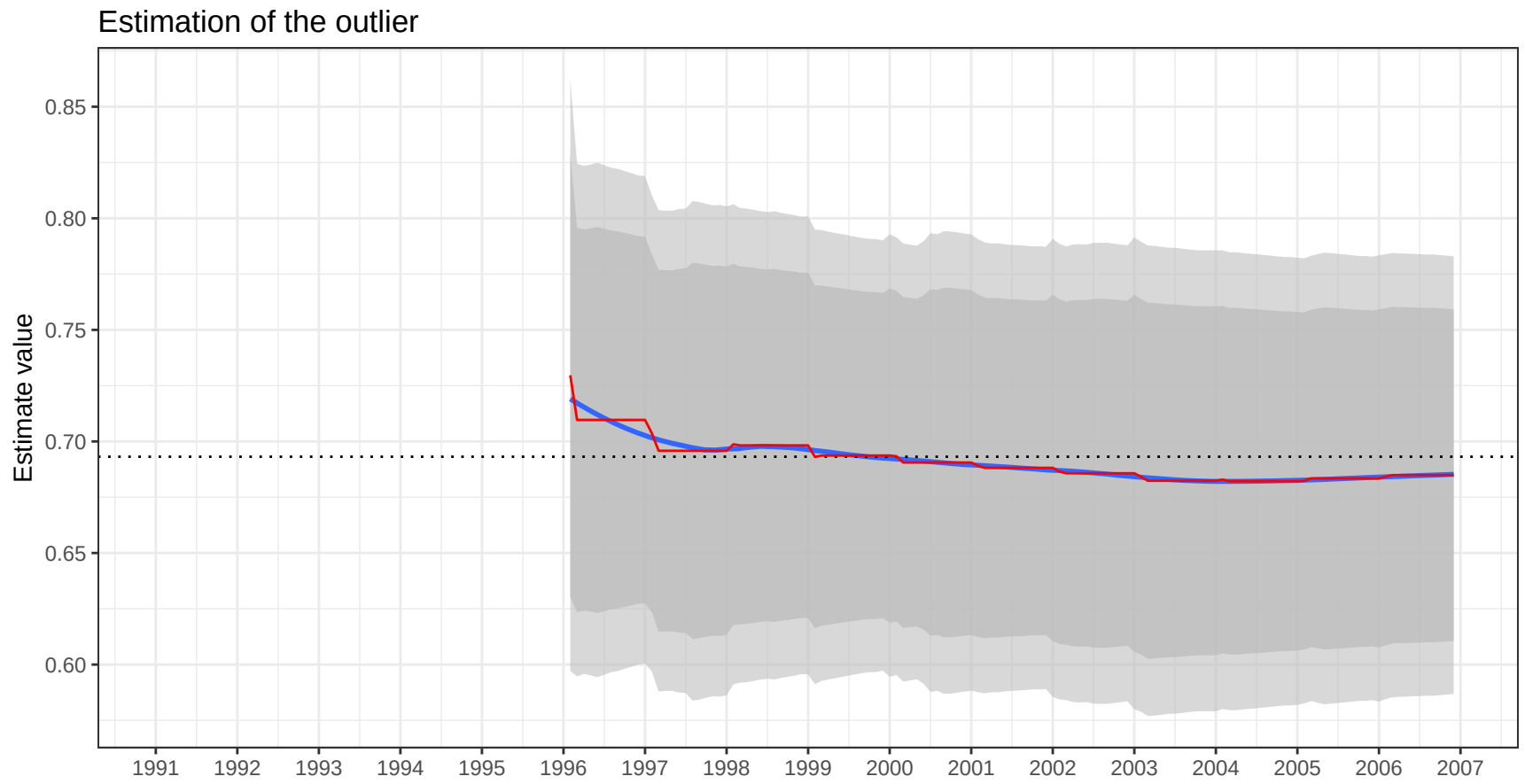


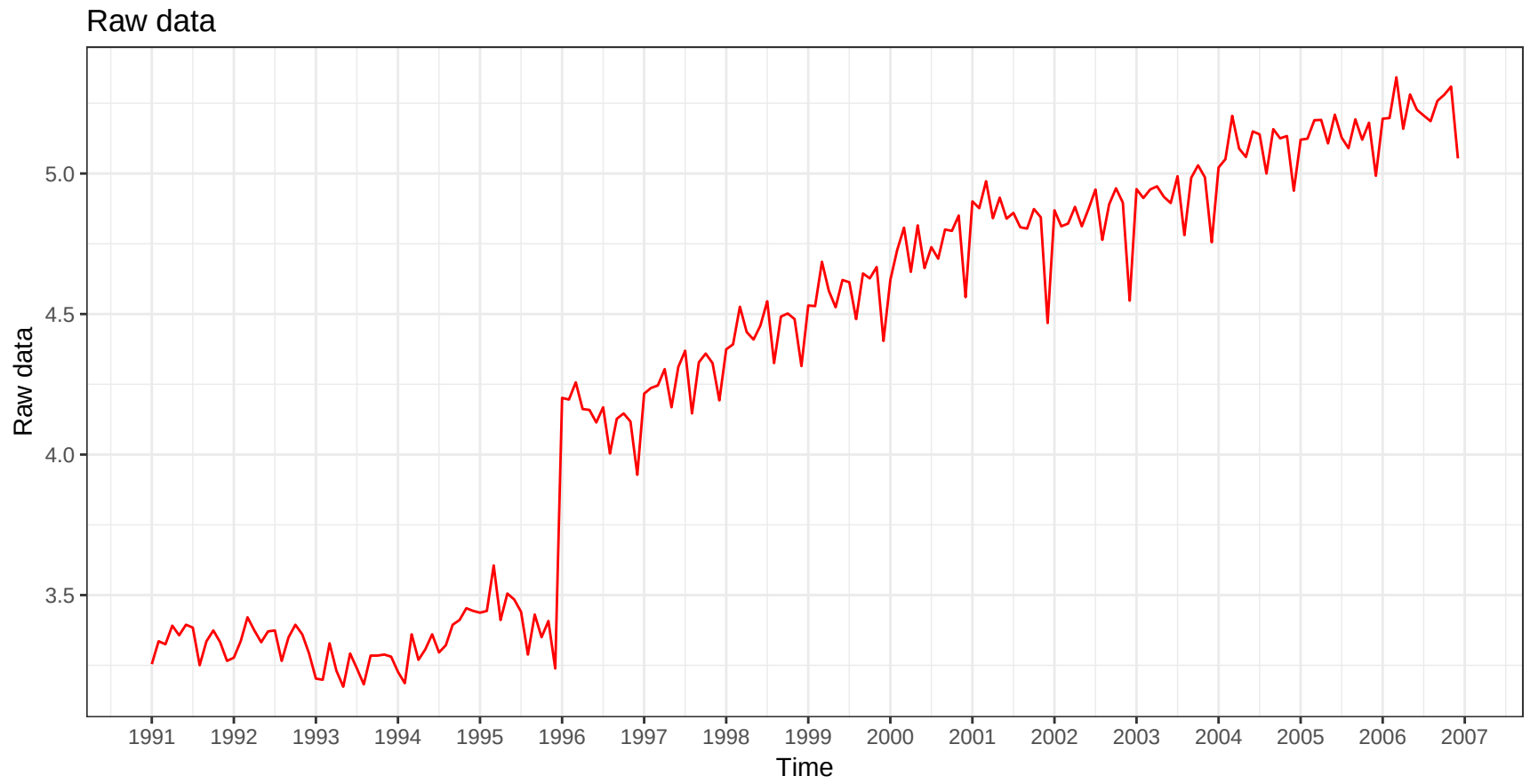


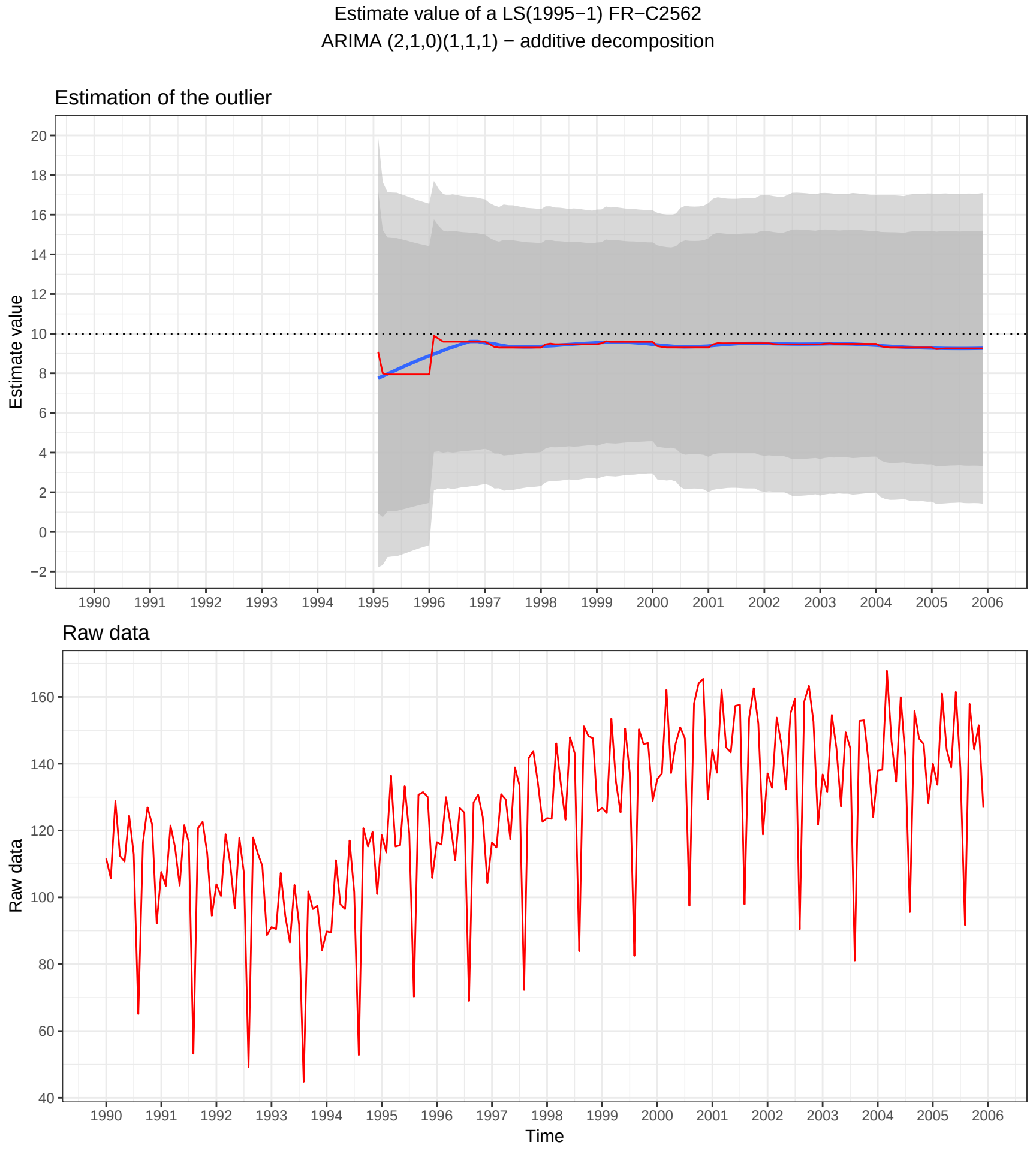

Estimate value of a LS(1995−1) FR−C2561
ARIMA (0,1,1)(0,1,0) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.75
0.70
0.65
0.60
0.55
0.50
0.45
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
6.0
5.5
5.0
4.5
4.0
Time

Estimate value of a LS(1996−1) DE−C2562

ARIMA (1,1,0)(0,1,1) − multiplicative decomposition

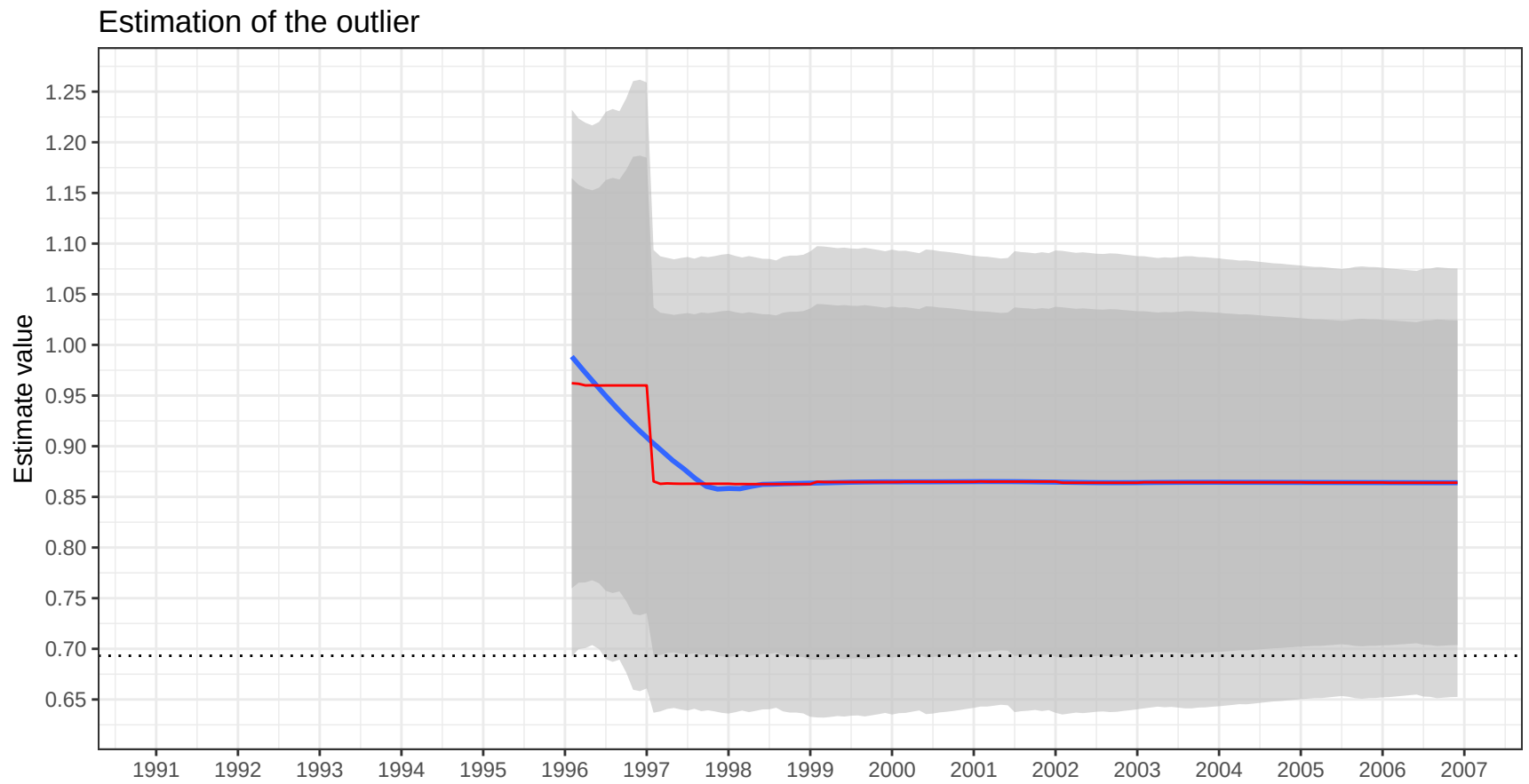


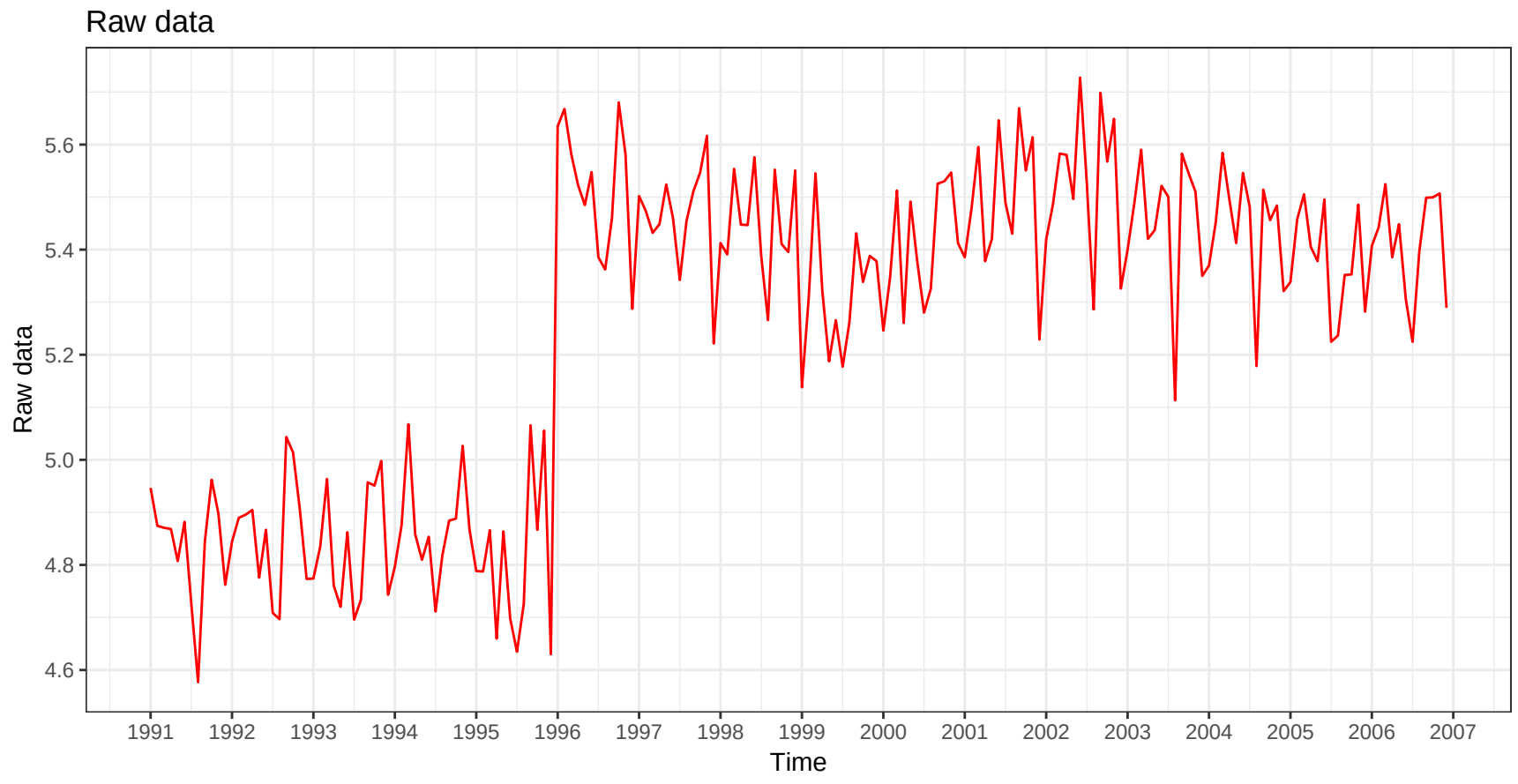



Estimate value of a LS(1995−1) FR−C2562
ARIMA (2,1,0)(1,1,1) − additive decomposition
Estimation of the outlier
Estimate value
20
18
16
14
12
10
8
6
4
2
0
−2
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
160
140
120
100
80
60
40
Time

Estimate value of a LS(1996−1) DE−C2571

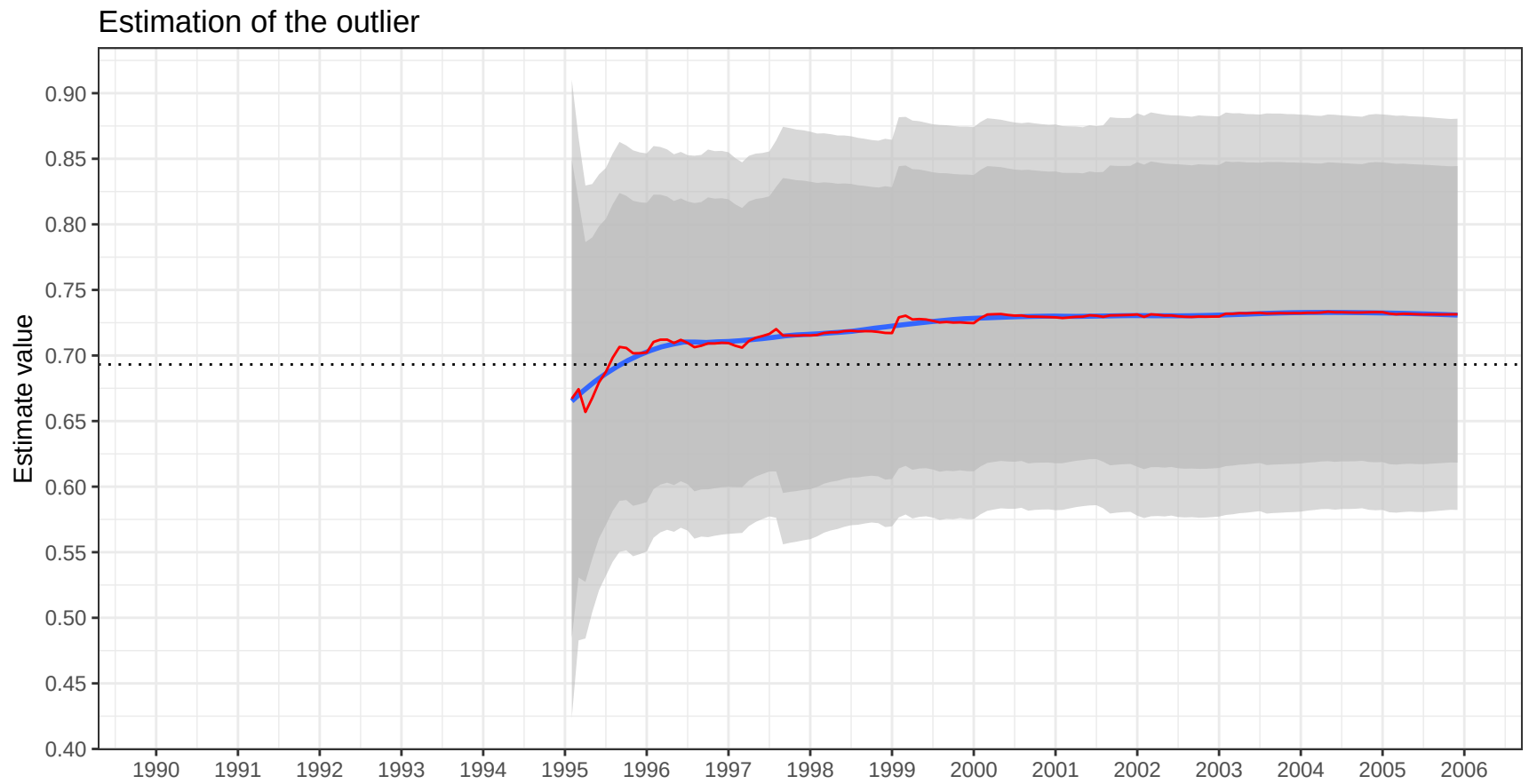
ARIMA (0,1,1)(1,1,1) − multiplicative decomposition

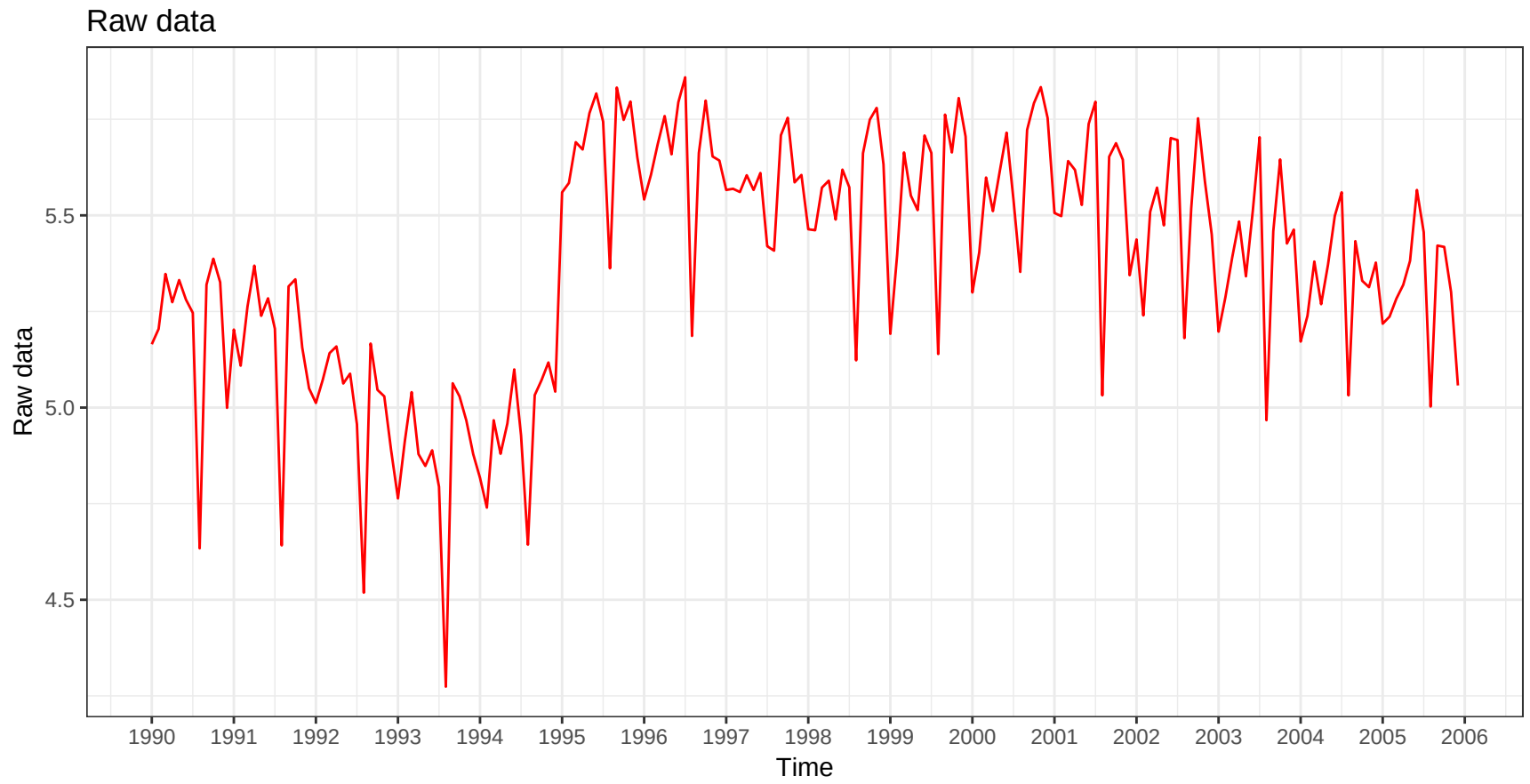


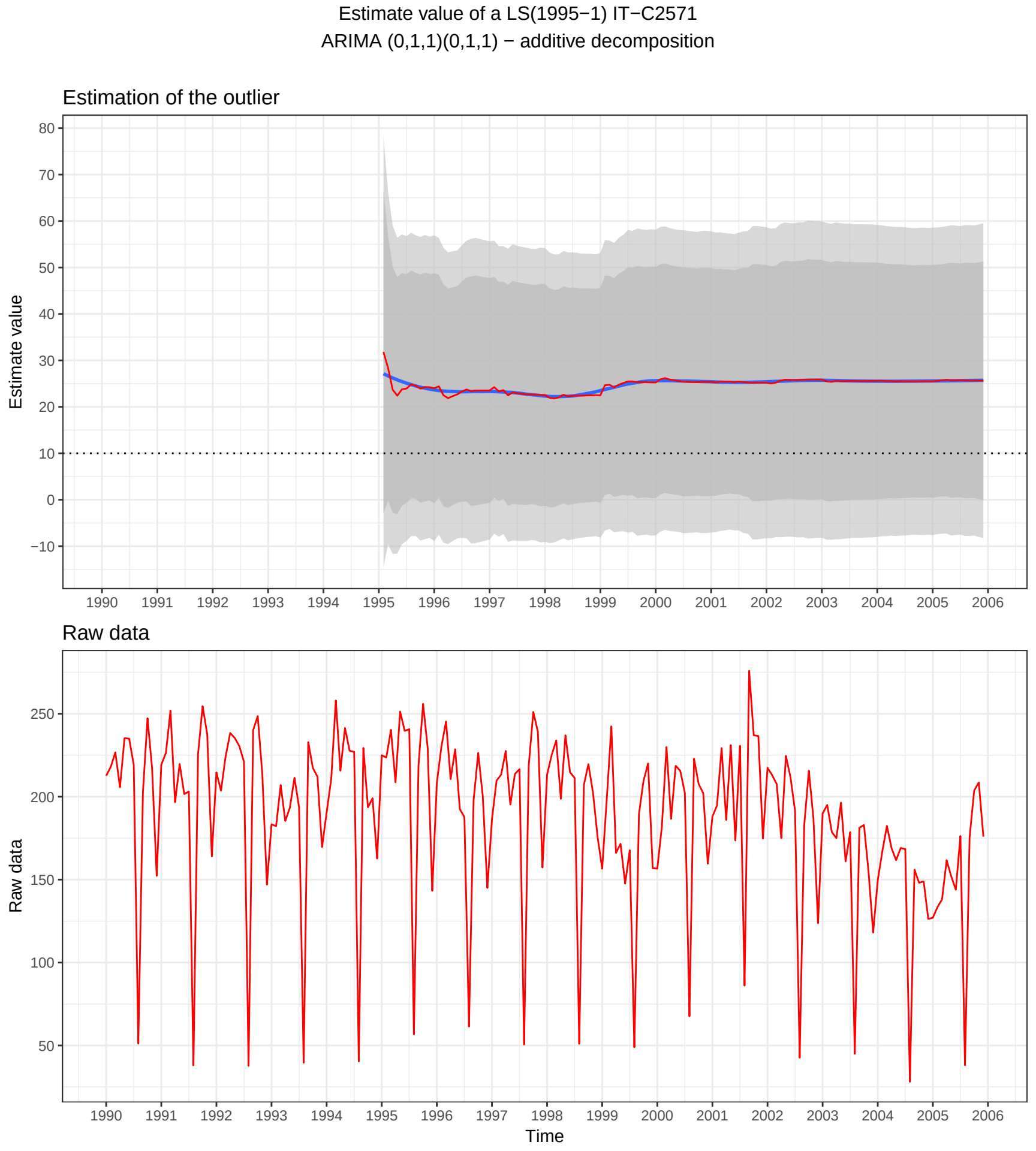


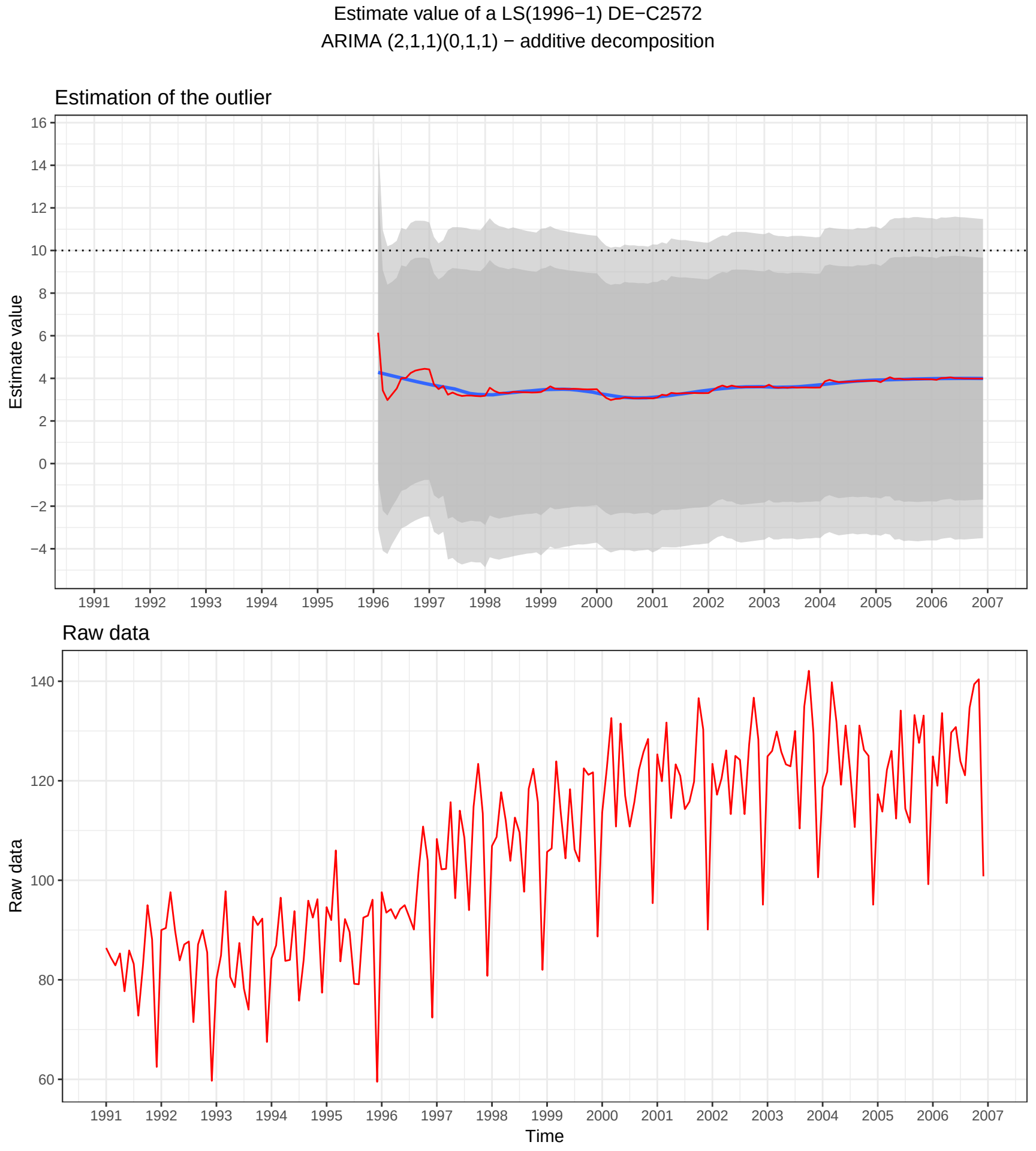
Estimate value of a LS(1995−1) FR−C2571

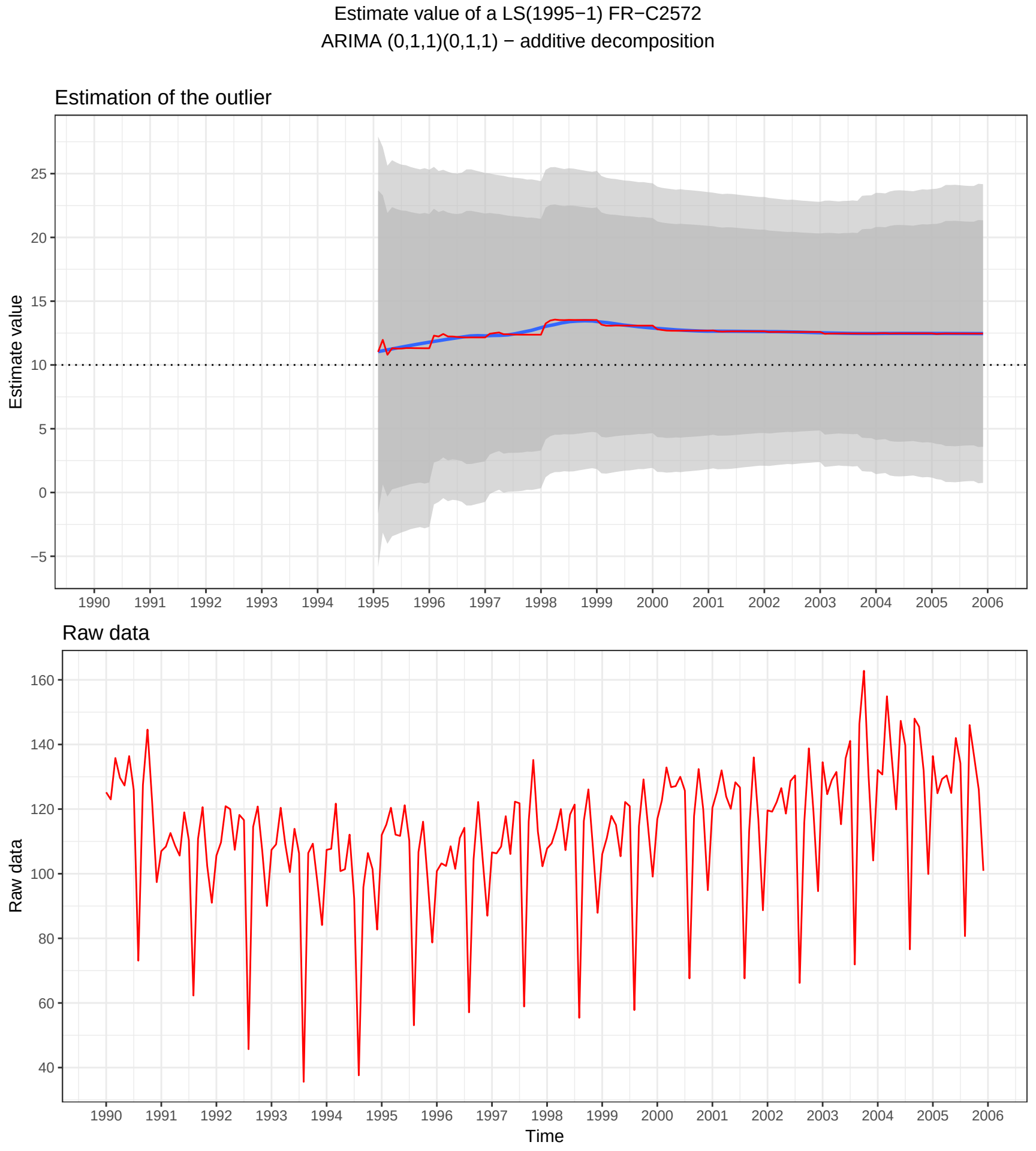
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition



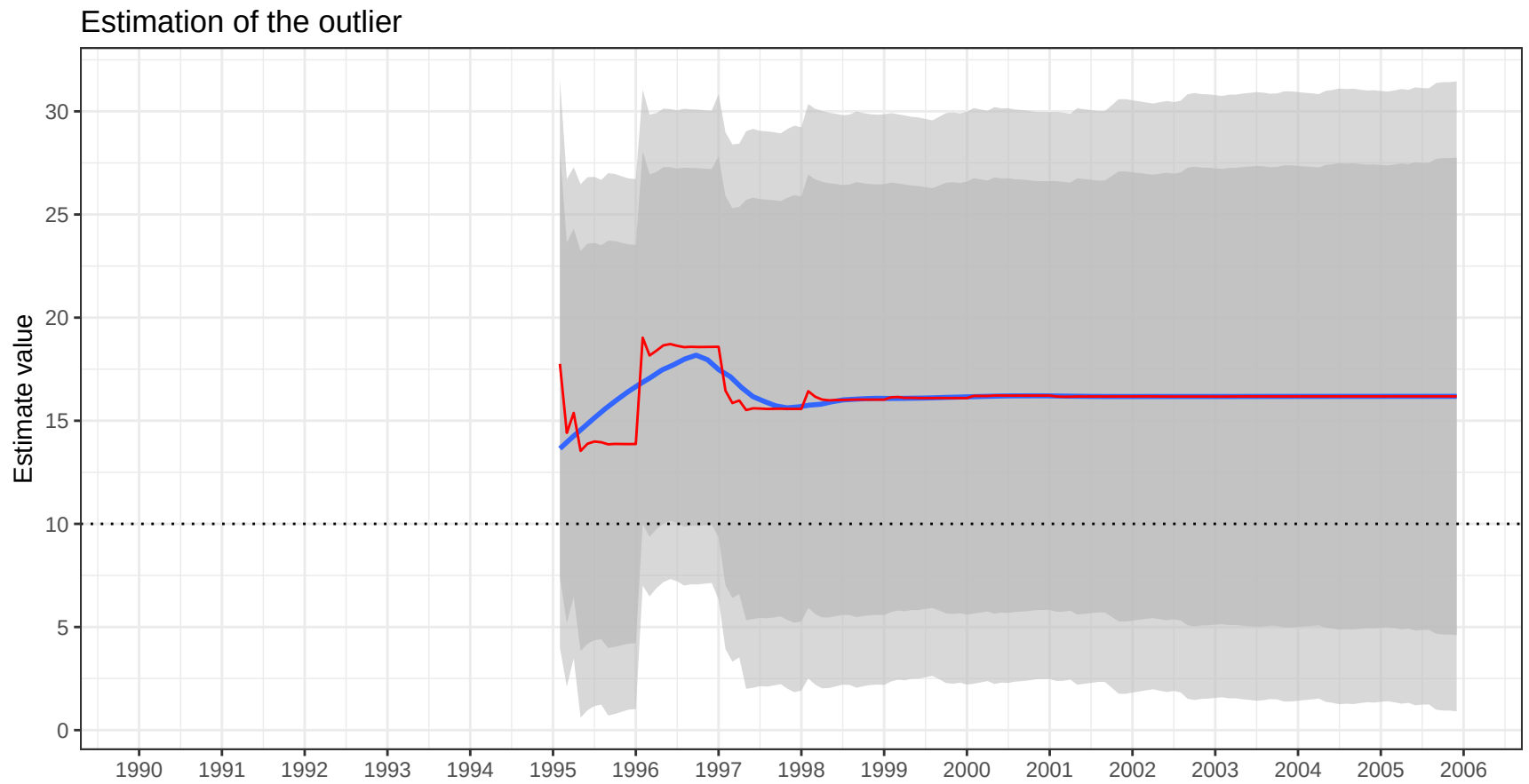


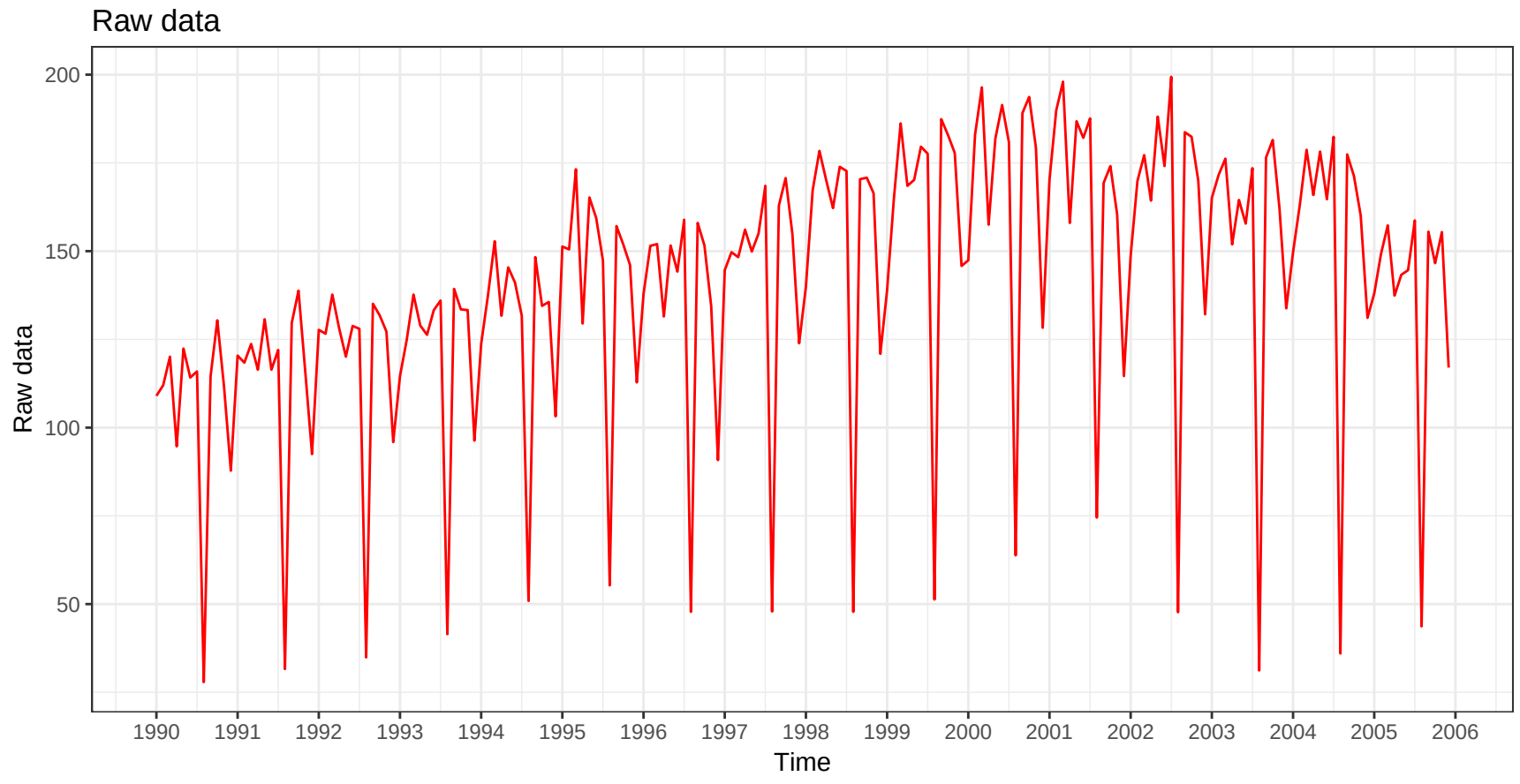

Estimate value of a LS(1995−1) IT−C2571
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
80
70
60
50
40
30
20
10
0
−10
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
250
200
150
100
50
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Time

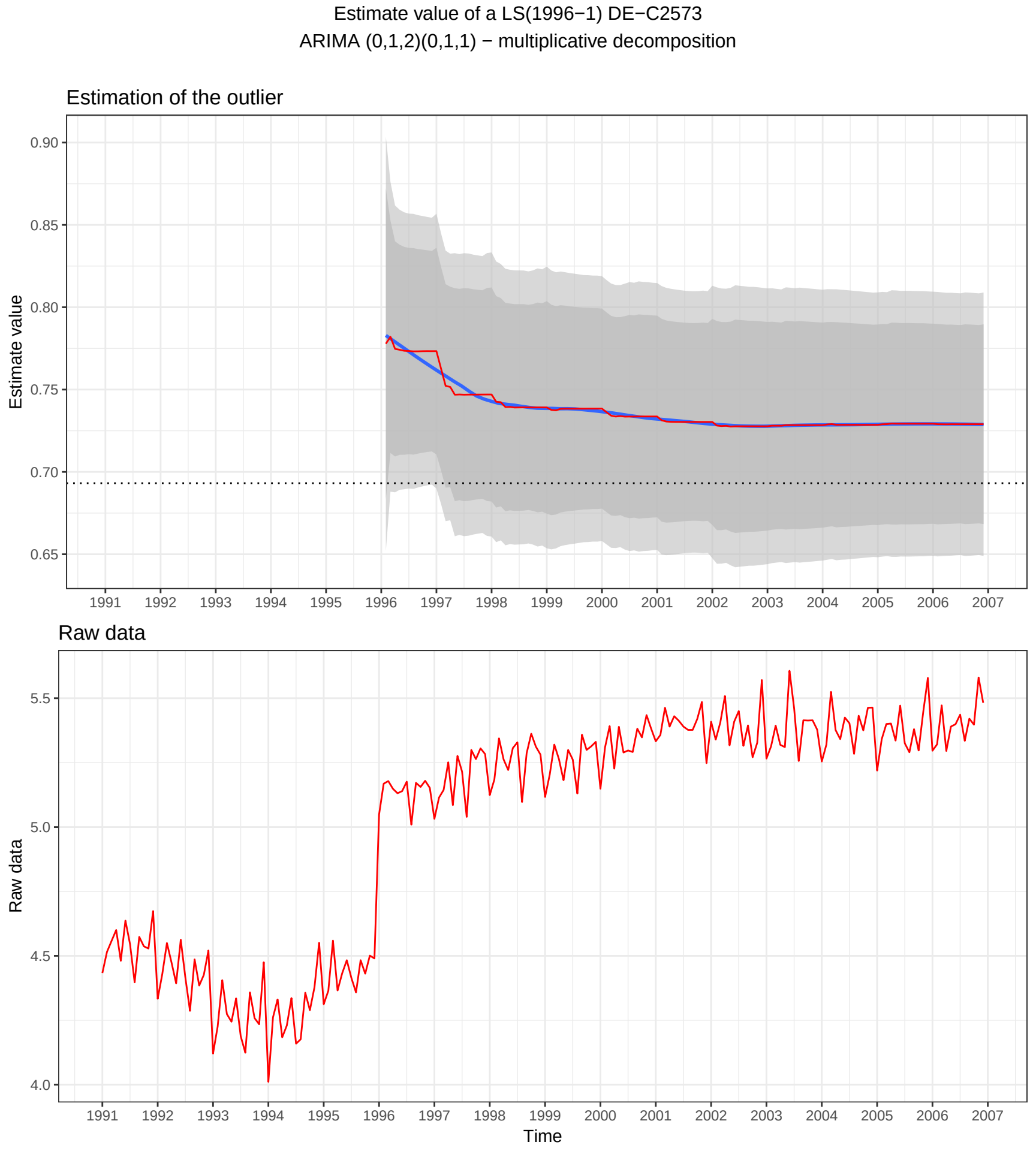

Estimate value of a LS(1996−1) DE−C2572
ARIMA (2,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
16
14
12
10
8
6
4
2
0
−2
−4
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
140
120
100
80
60
Time

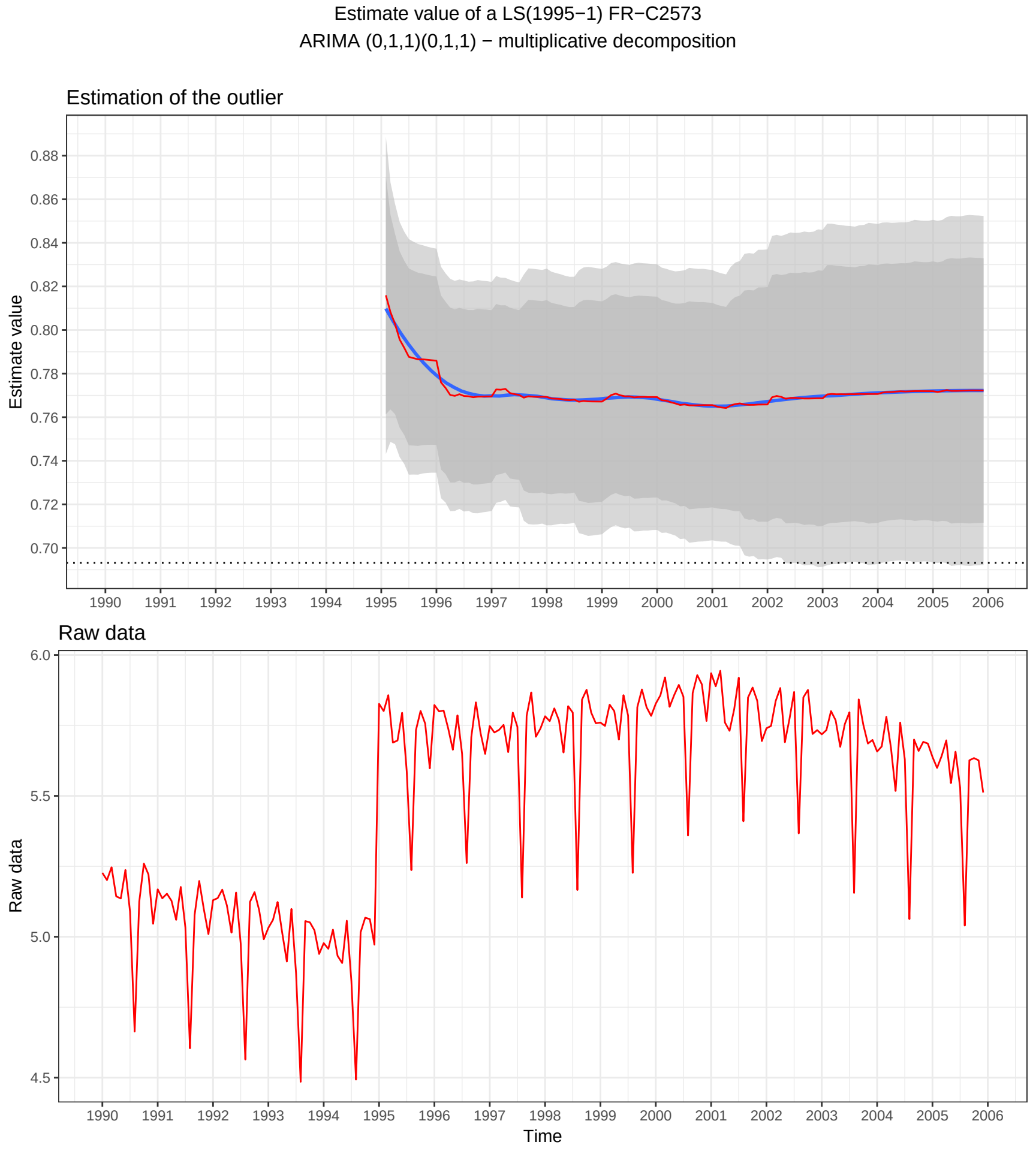

Estimate value of a LS(1995−1) FR−C2572
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
25
20
15
10
5
0
−5
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
160
140
120
100
80
60
40
Time

Estimate value of a LS(1995−1) IT−C2572
ARIMA (0,1,1)(0,1,1) − additive decomposition

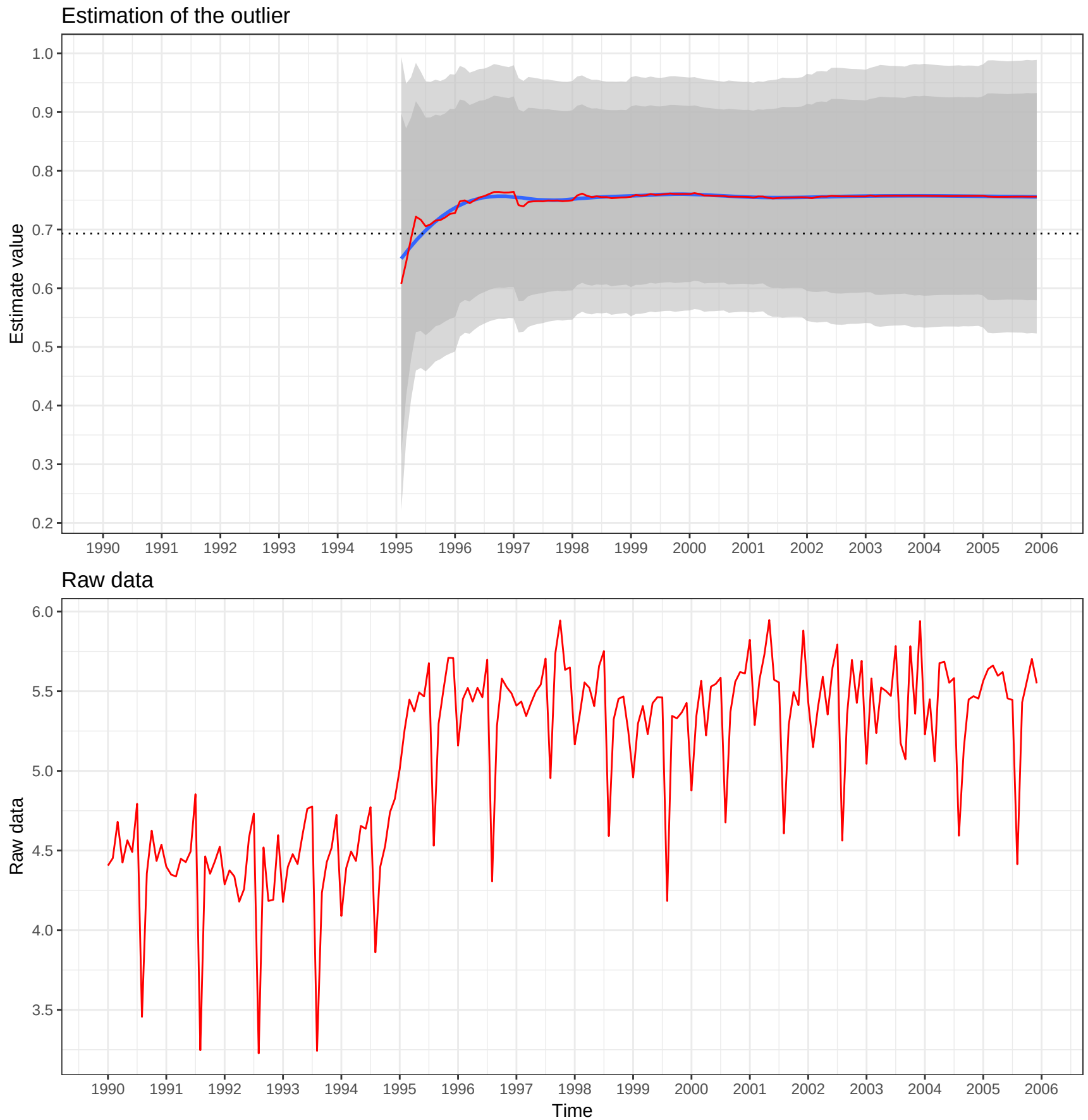




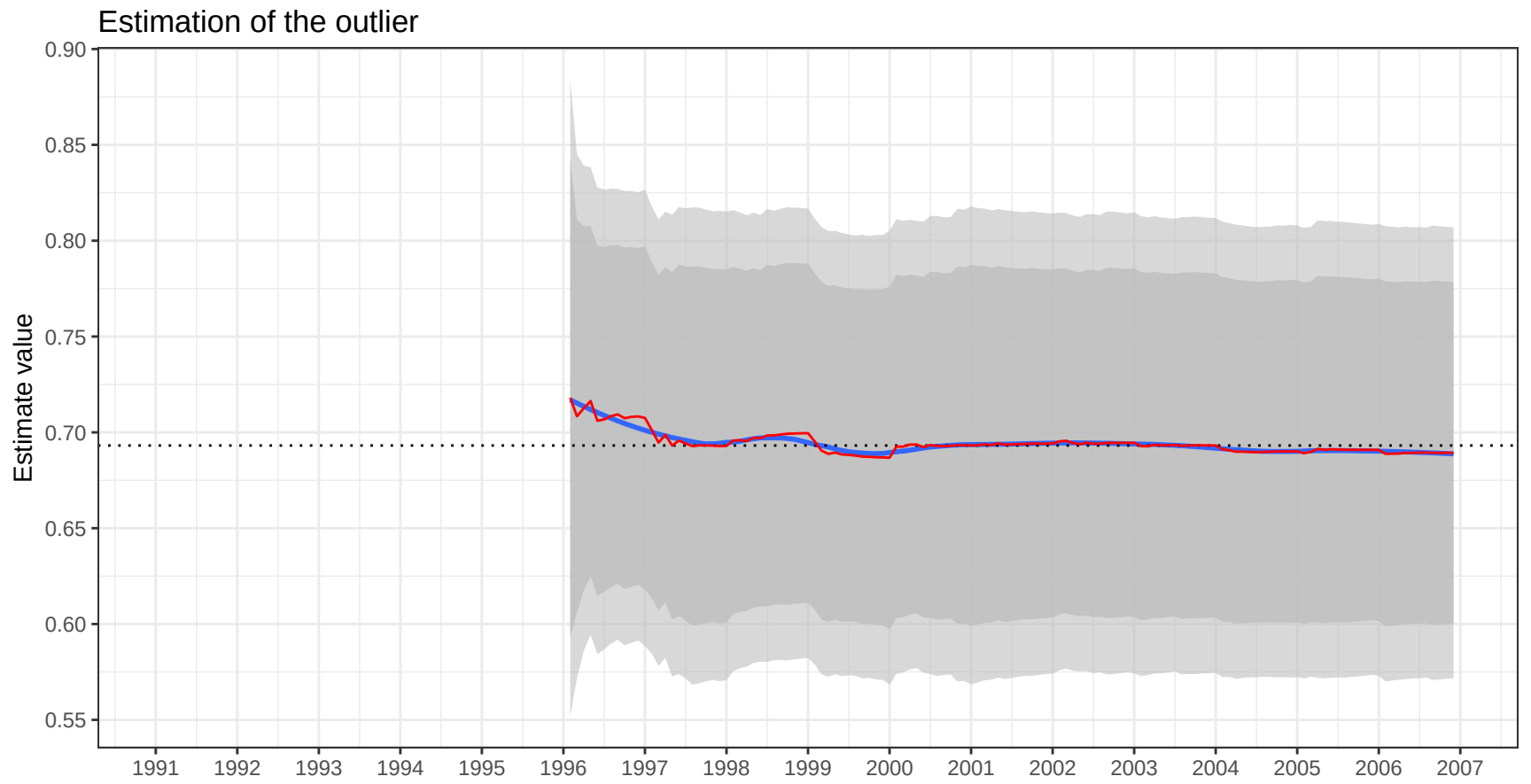

Estimate value of a LS(1996−1) DE−C2573
ARIMA (0,1,2)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.90
0.85
0.80
0.75
0.70
0.65
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
5.5
5.0
4.5
4.0
Time

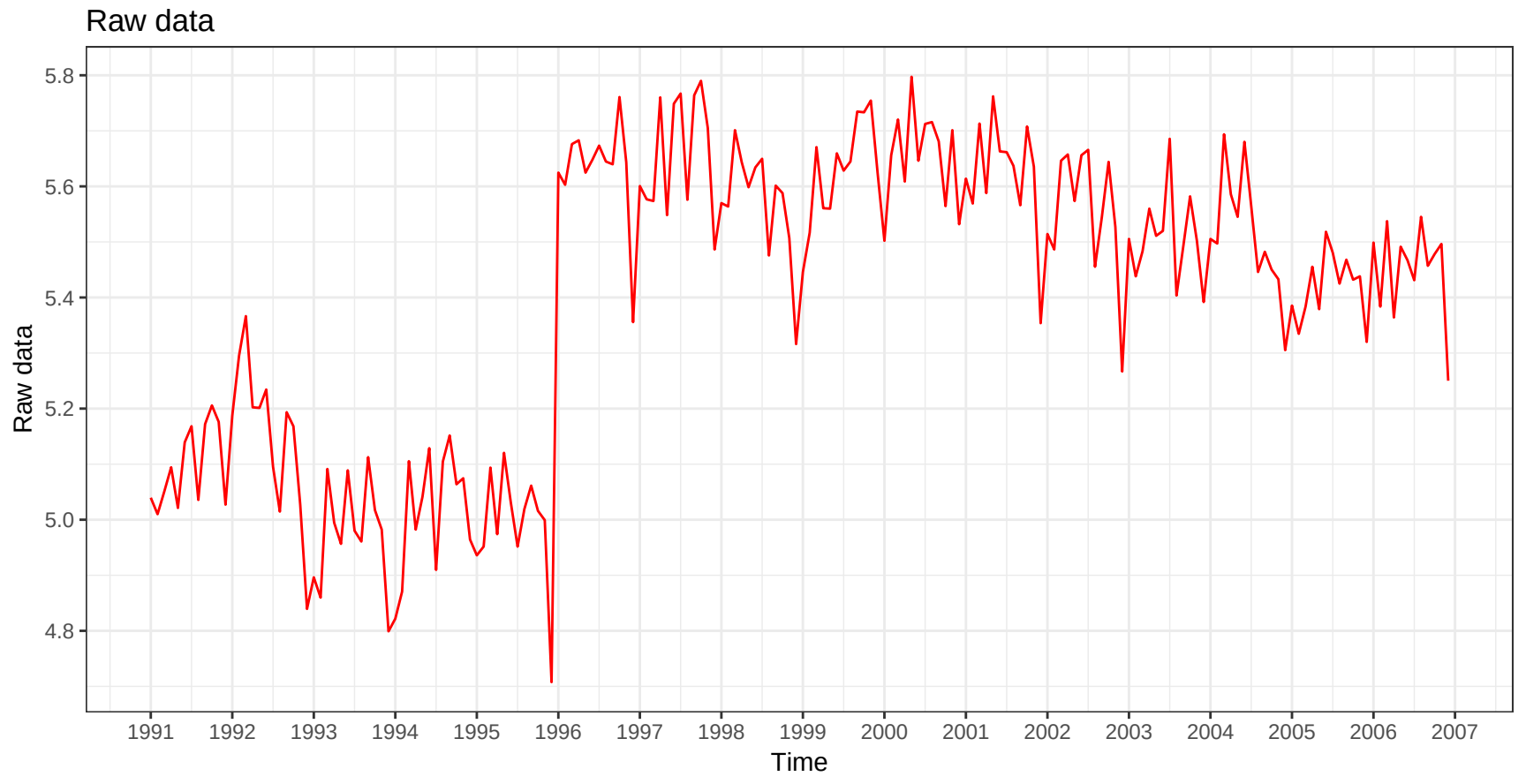

Estimate value of a LS(1995−1) FR−C2573
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.88
0.86
0.84
0.82
0.80
0.78
0.76
0.74
0.72
0.70
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
6.0
5.5
5.0
4.5
Time

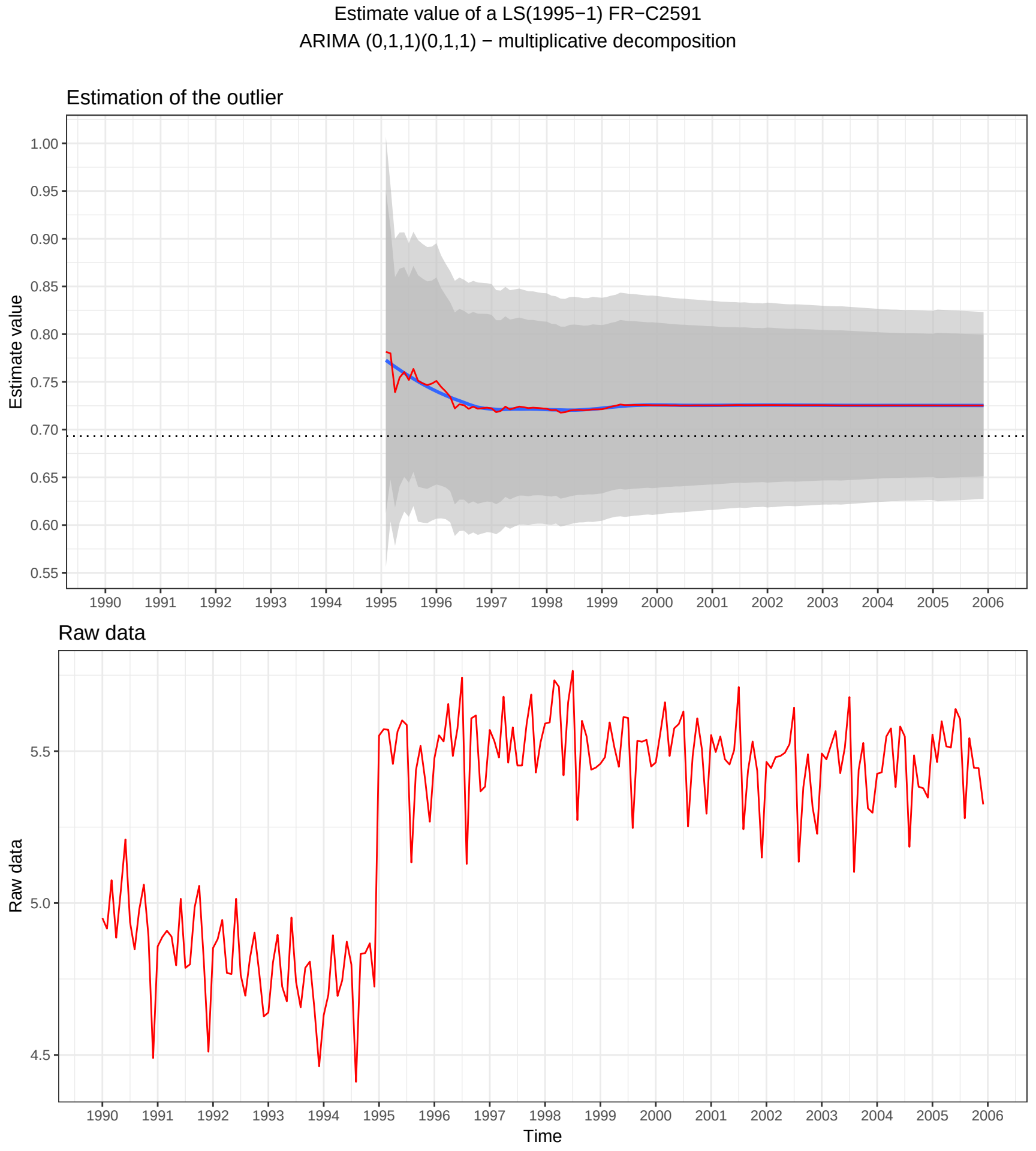
Estimate value of a LS(1995−1) IT−C2573
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition



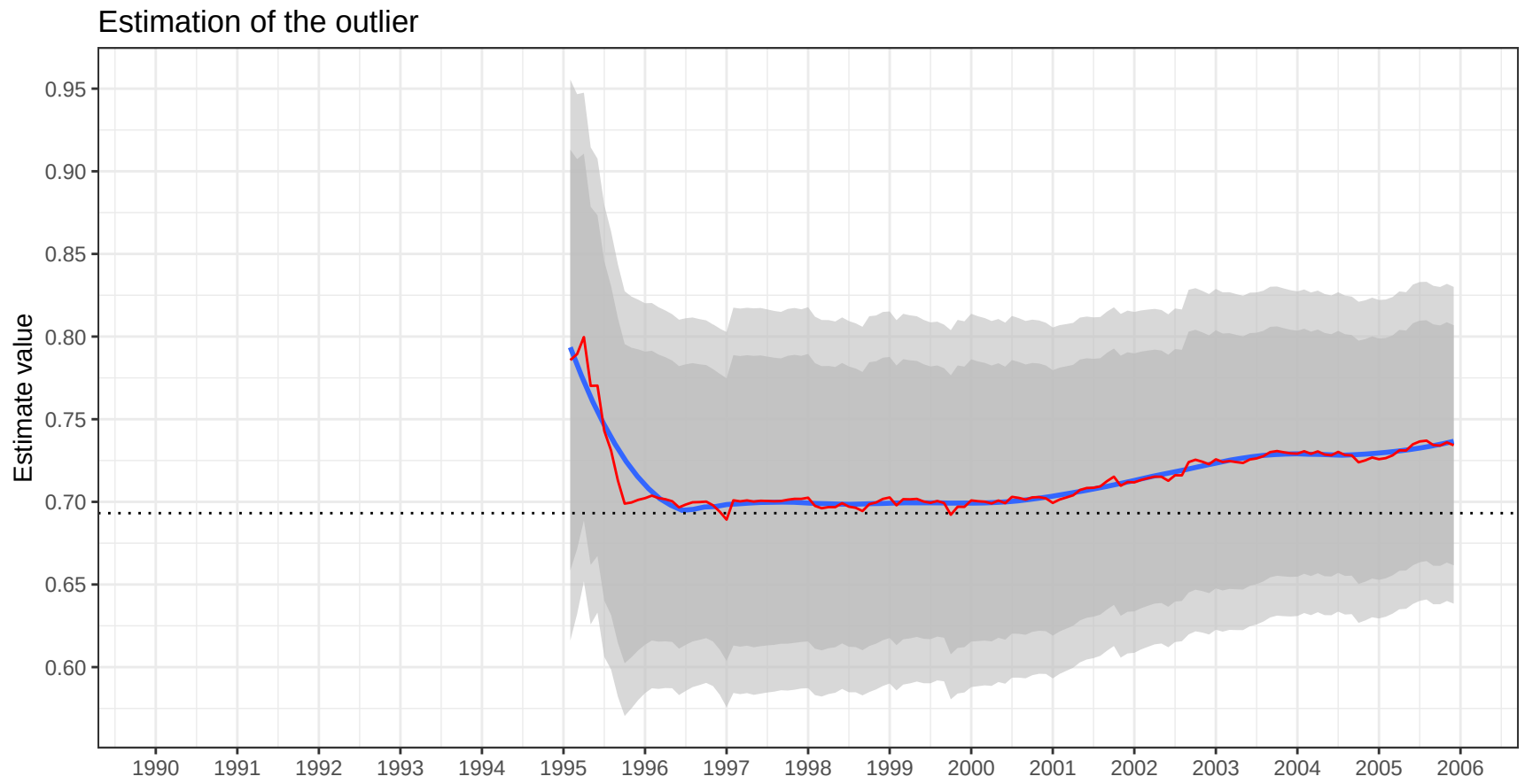
Estimate value of a LS(1996−1) DE−C2591
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

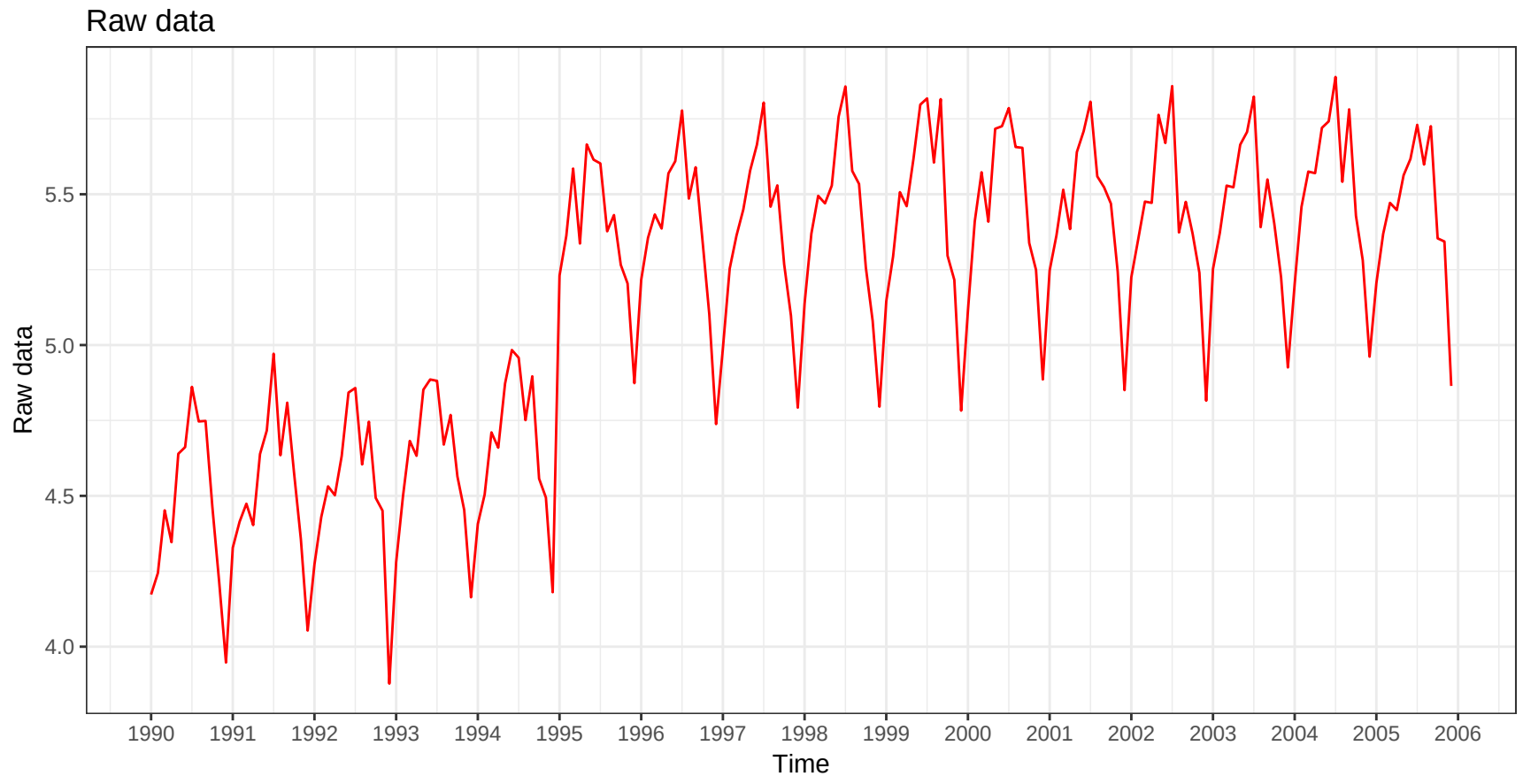


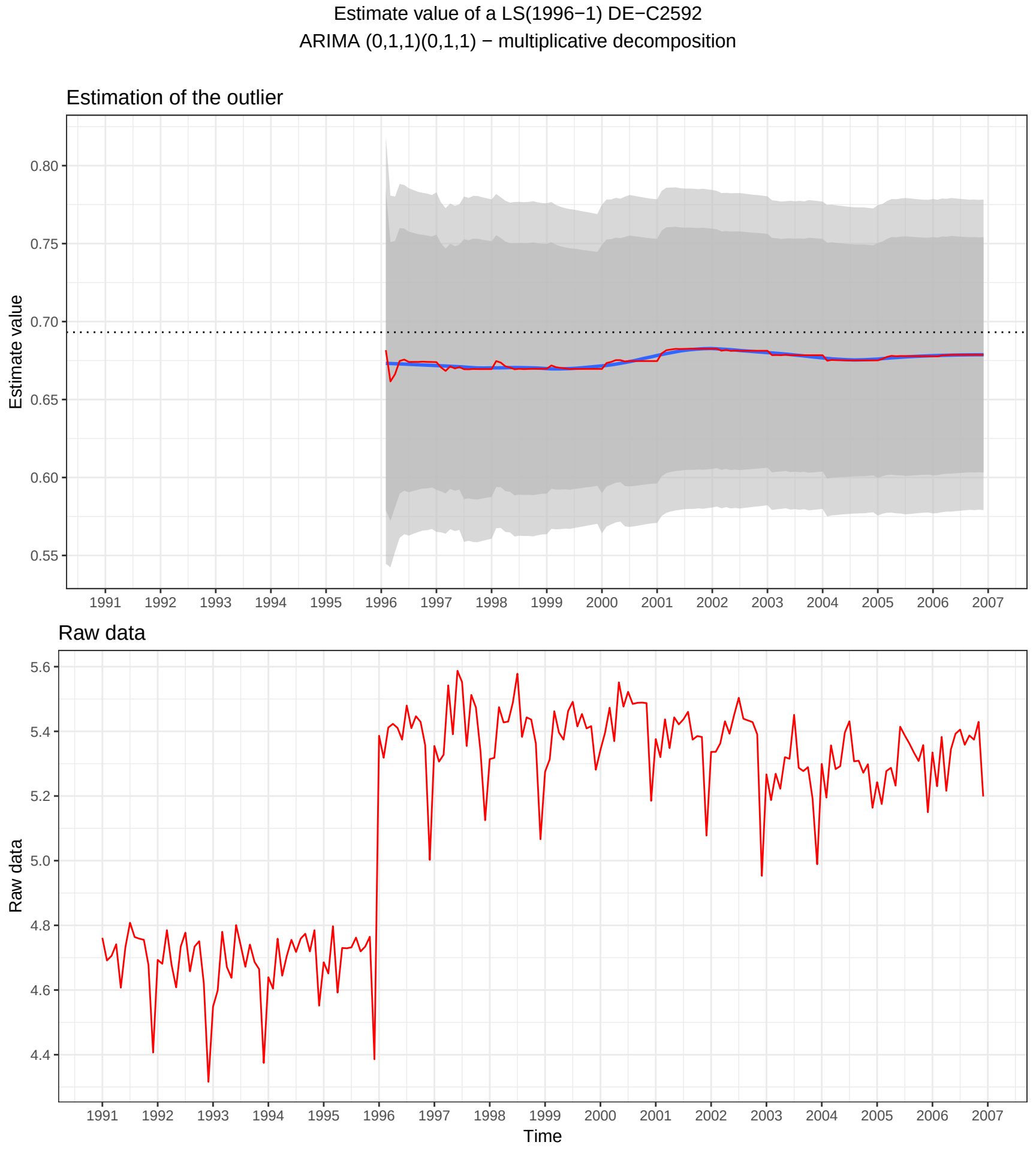


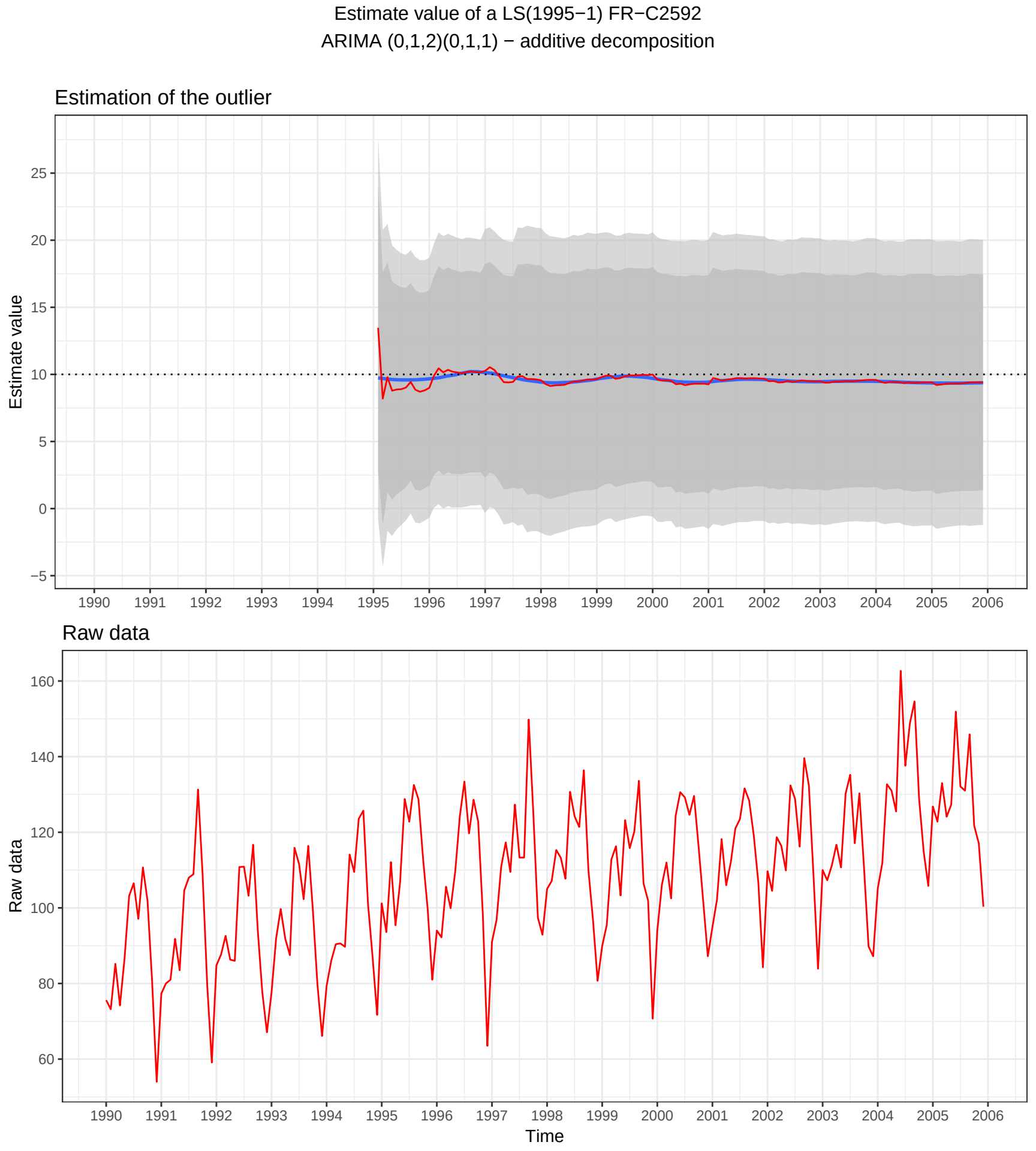

Estimate value of a LS(1995−1) FR−C2591
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
1.00
0.95
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0.55
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
5.5
5.0
4.5
Time

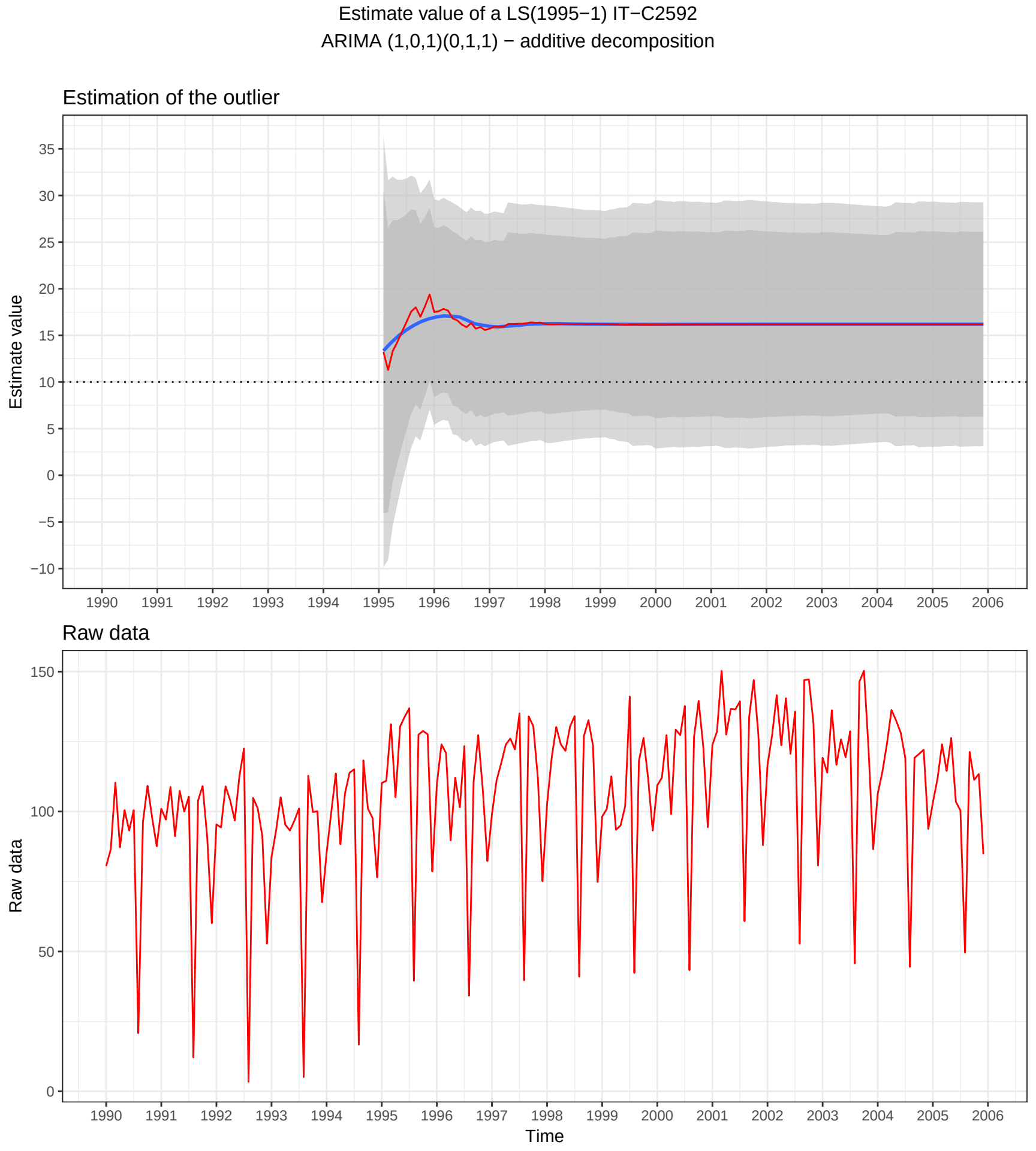
Estimate value of a LS(1995−1) IT−C2591
ARIMA (1,0,0)(0,1,1) − multiplicative decomposition





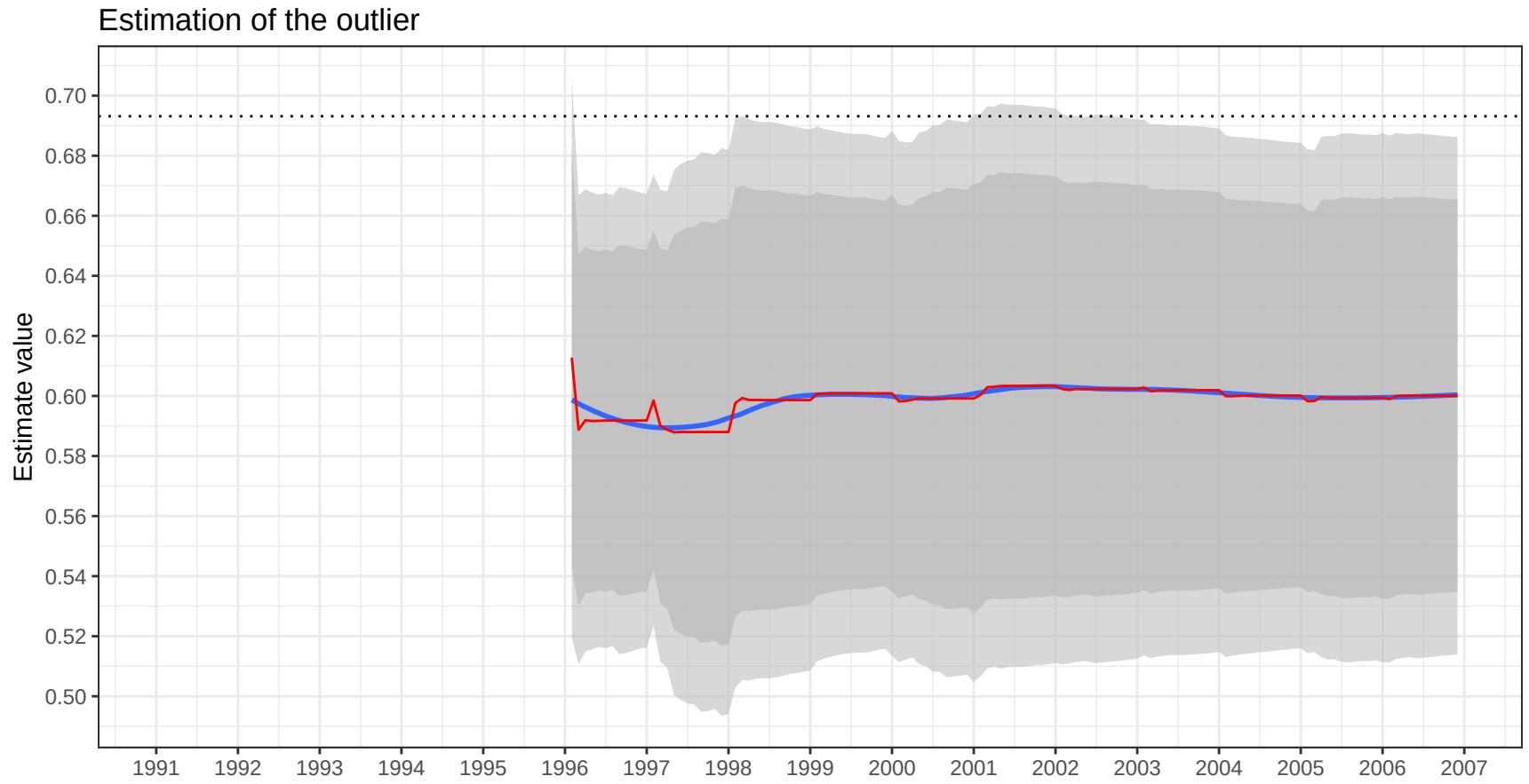

Estimate value of a LS(1996−1) DE−C2592
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.80
0.75
0.70
0.65
0.60
0.55
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
5.6
5.4
5.2
5.0
4.8
4.6
4.4
Time

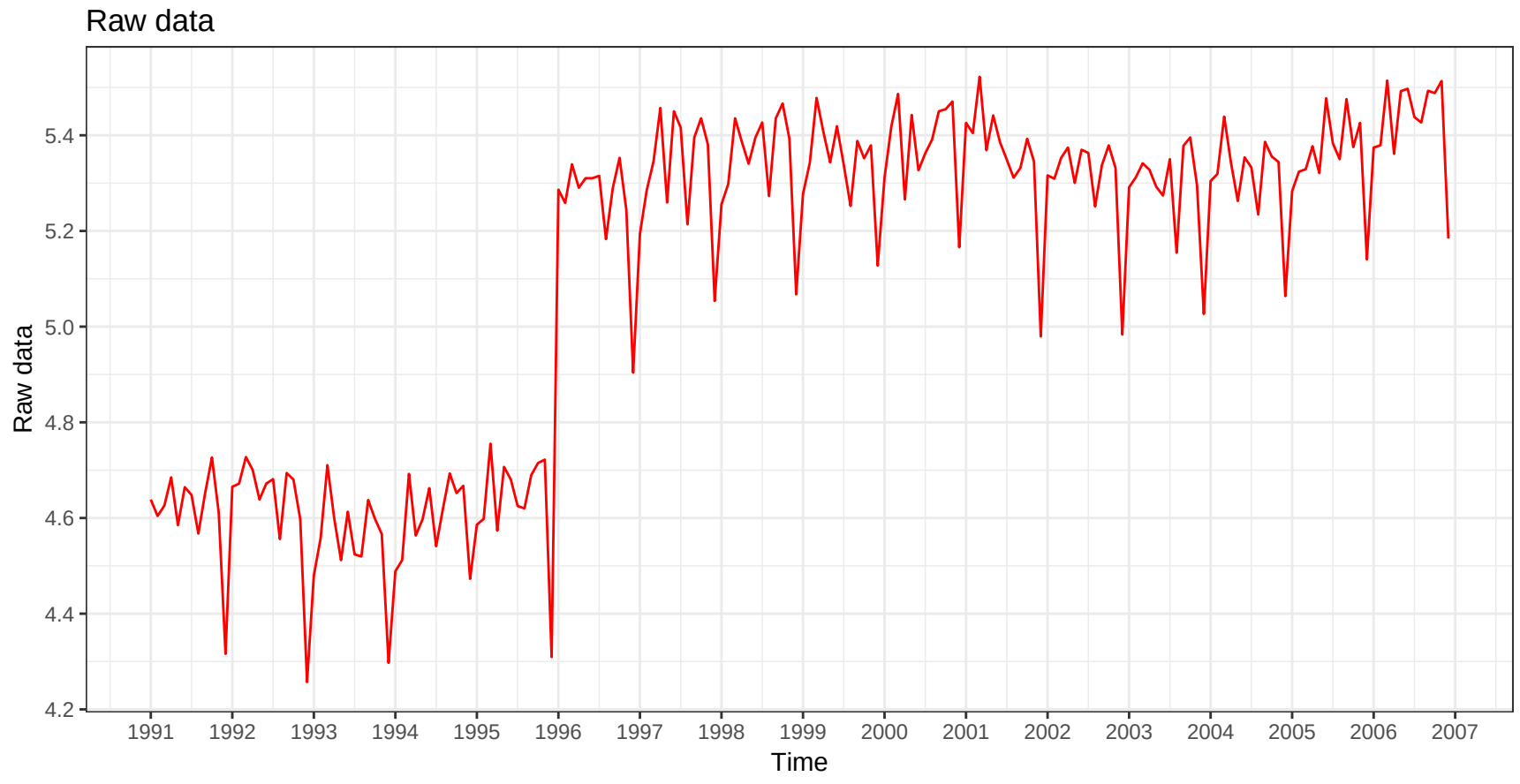

Estimate value of a LS(1995−1) FR−C2592
ARIMA (0,1,2)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
25
20
15
10
5
0
−5
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
160
140
120
100
80
60
Time


Estimate value of a LS(1995−1) IT−C2592
ARIMA (1,0,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
35
30
25
20
15
10
5
0
−5
−10
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
150
100
50
0
Time

Estimate value of a LS(1996−1) DE−C2593

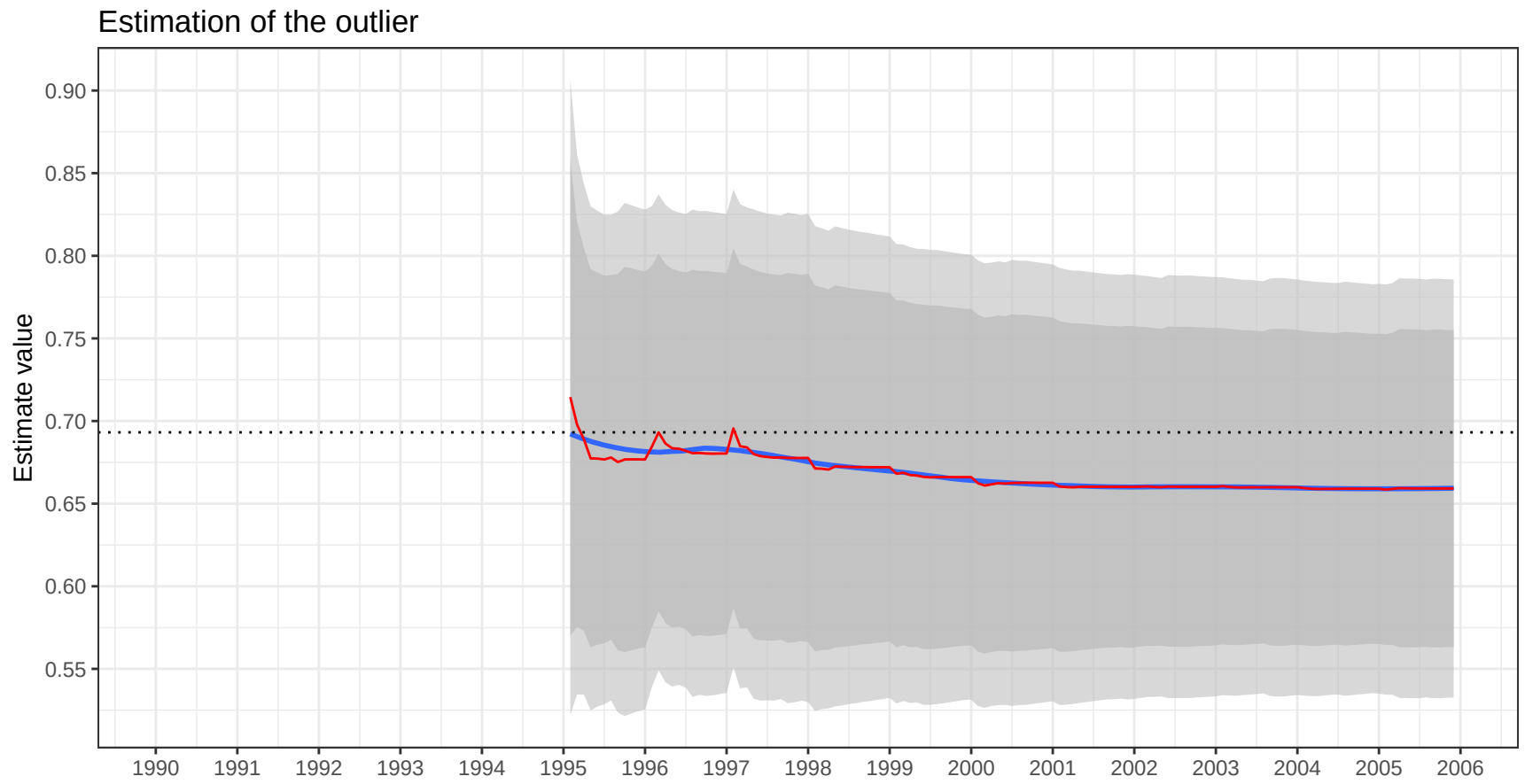
ARIMA (1,1,1)(0,1,1) − multiplicative decomposition

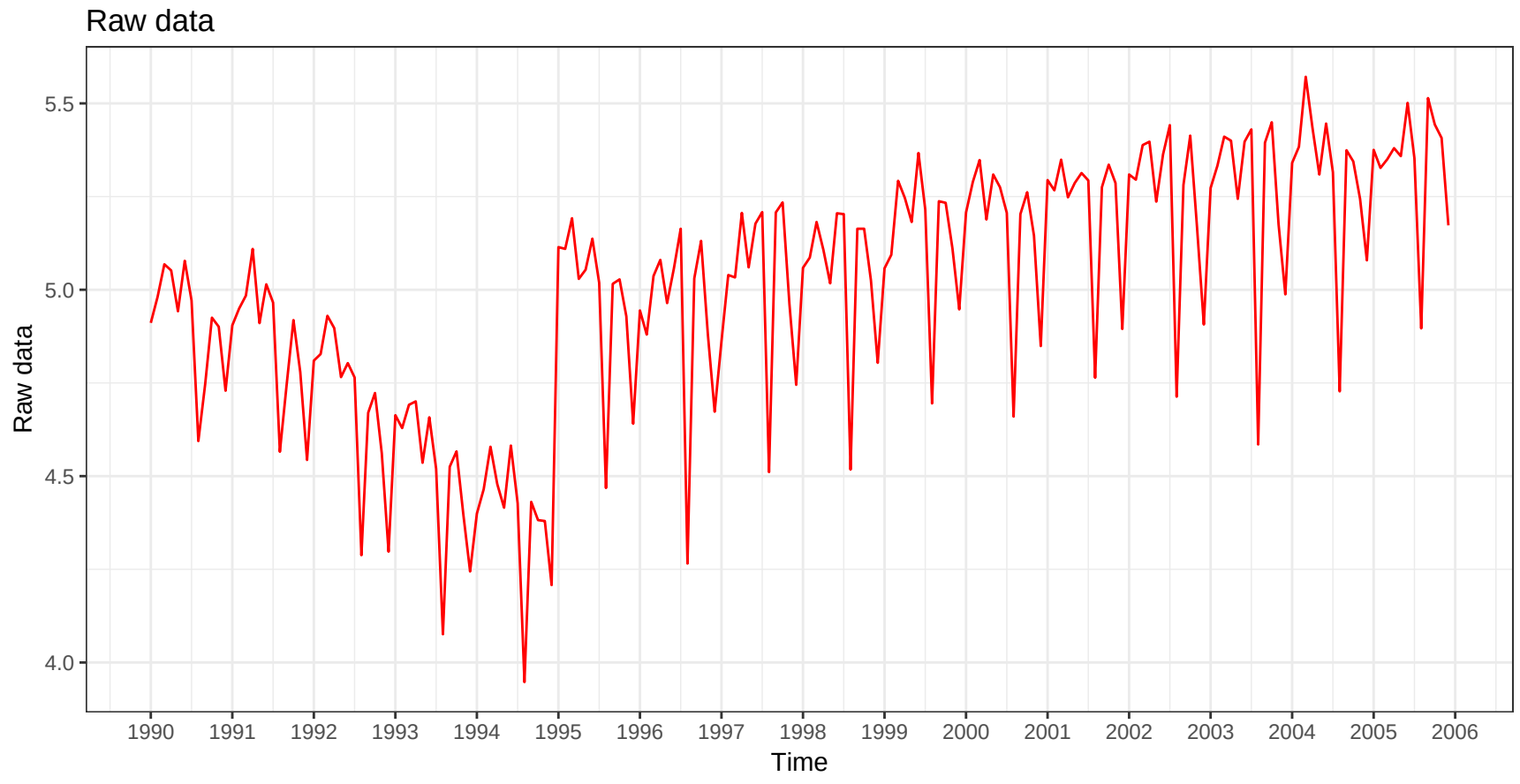




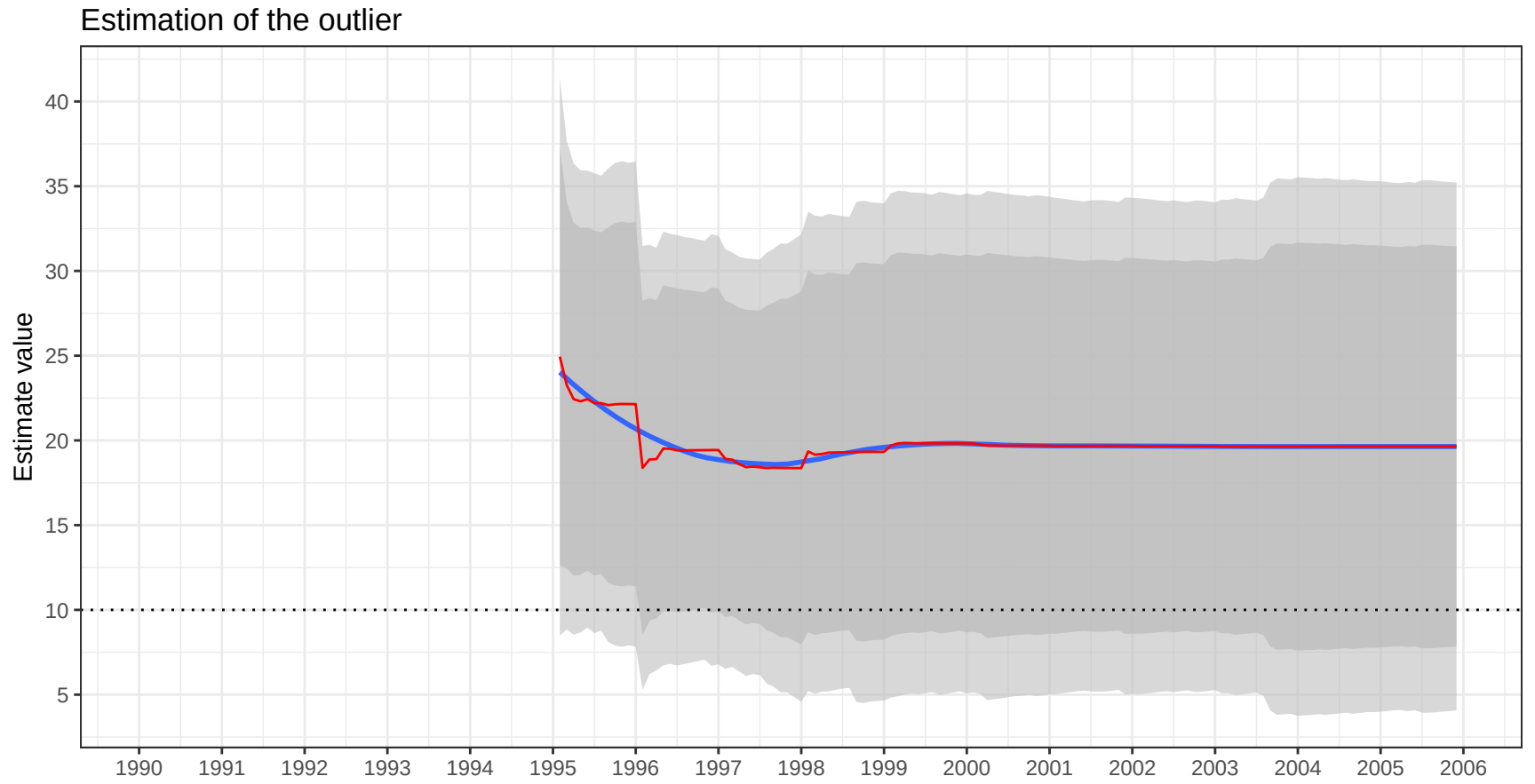
Estimate value of a LS(1995−1) FR−C2593

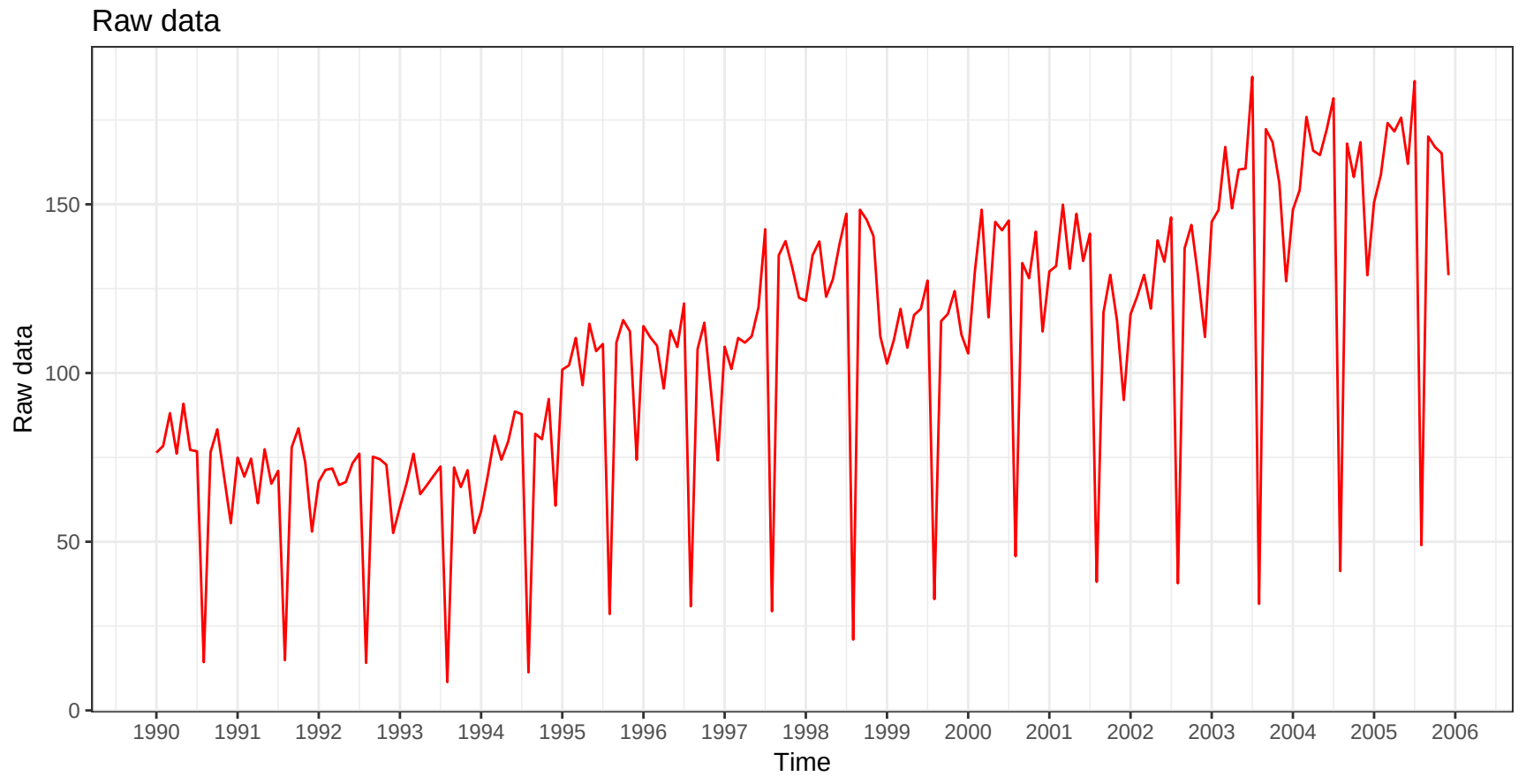
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition



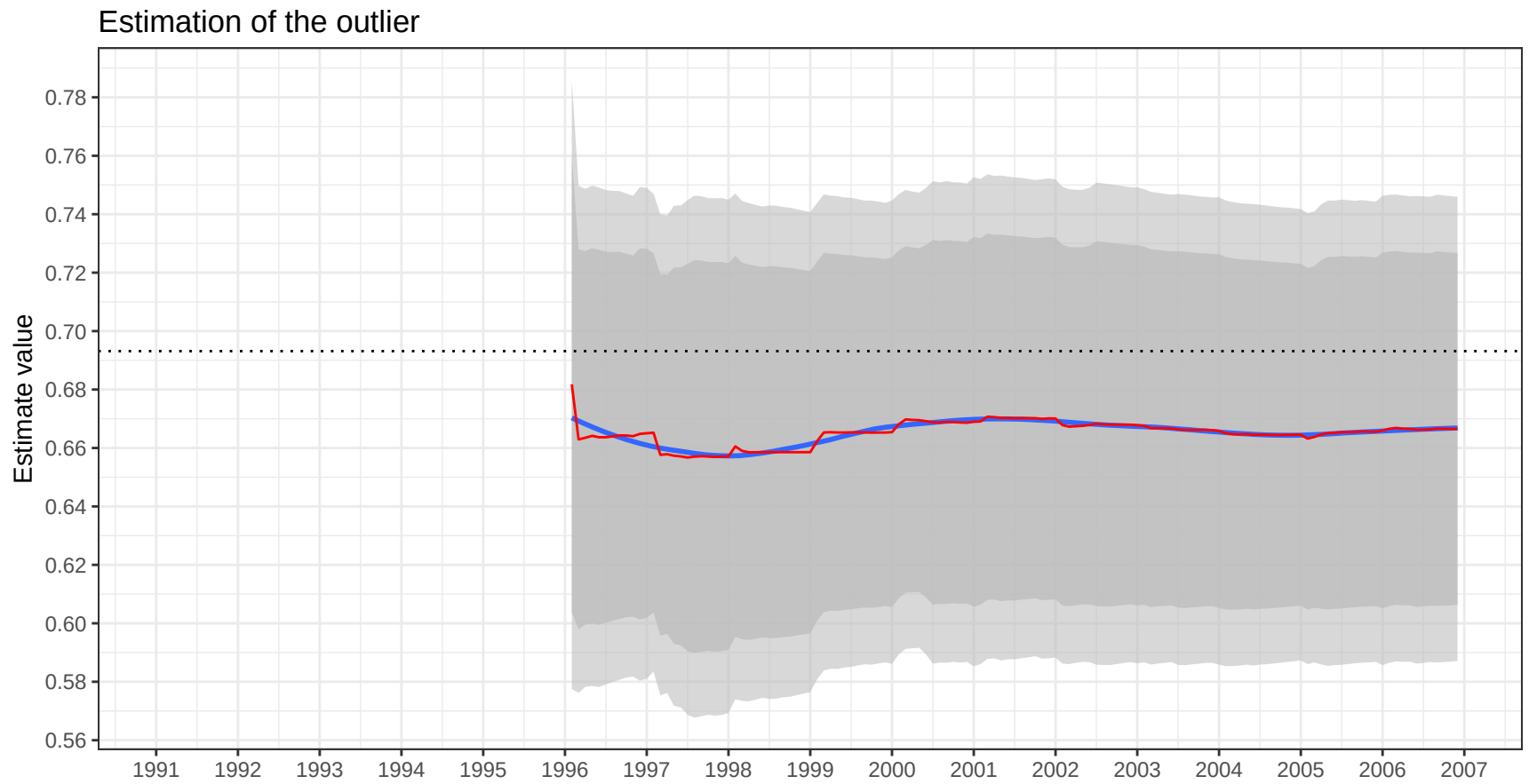


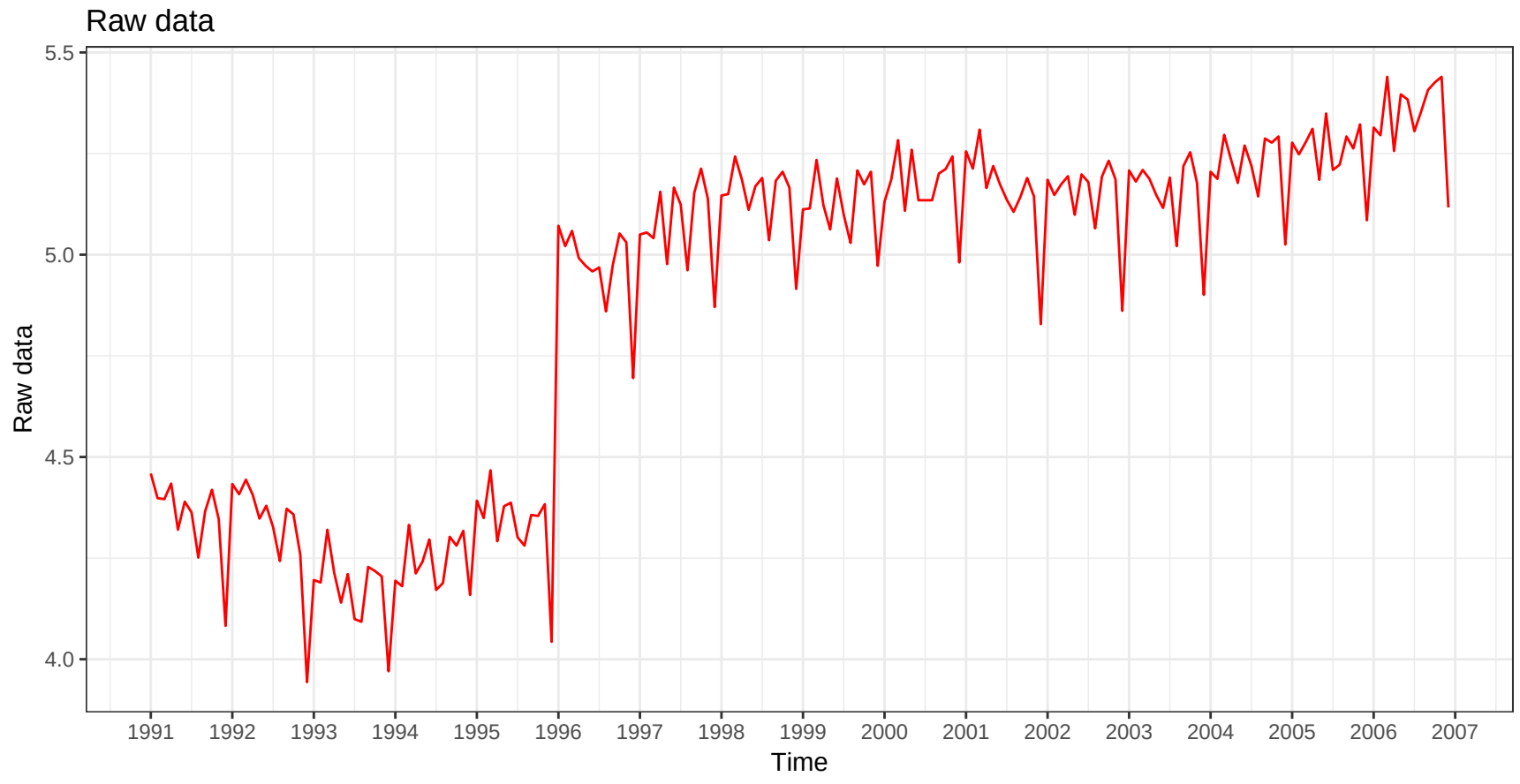
Estimate value of a LS(1995−1) IT−C2593
ARIMA (0,1,1)(0,1,1) − additive decomposition

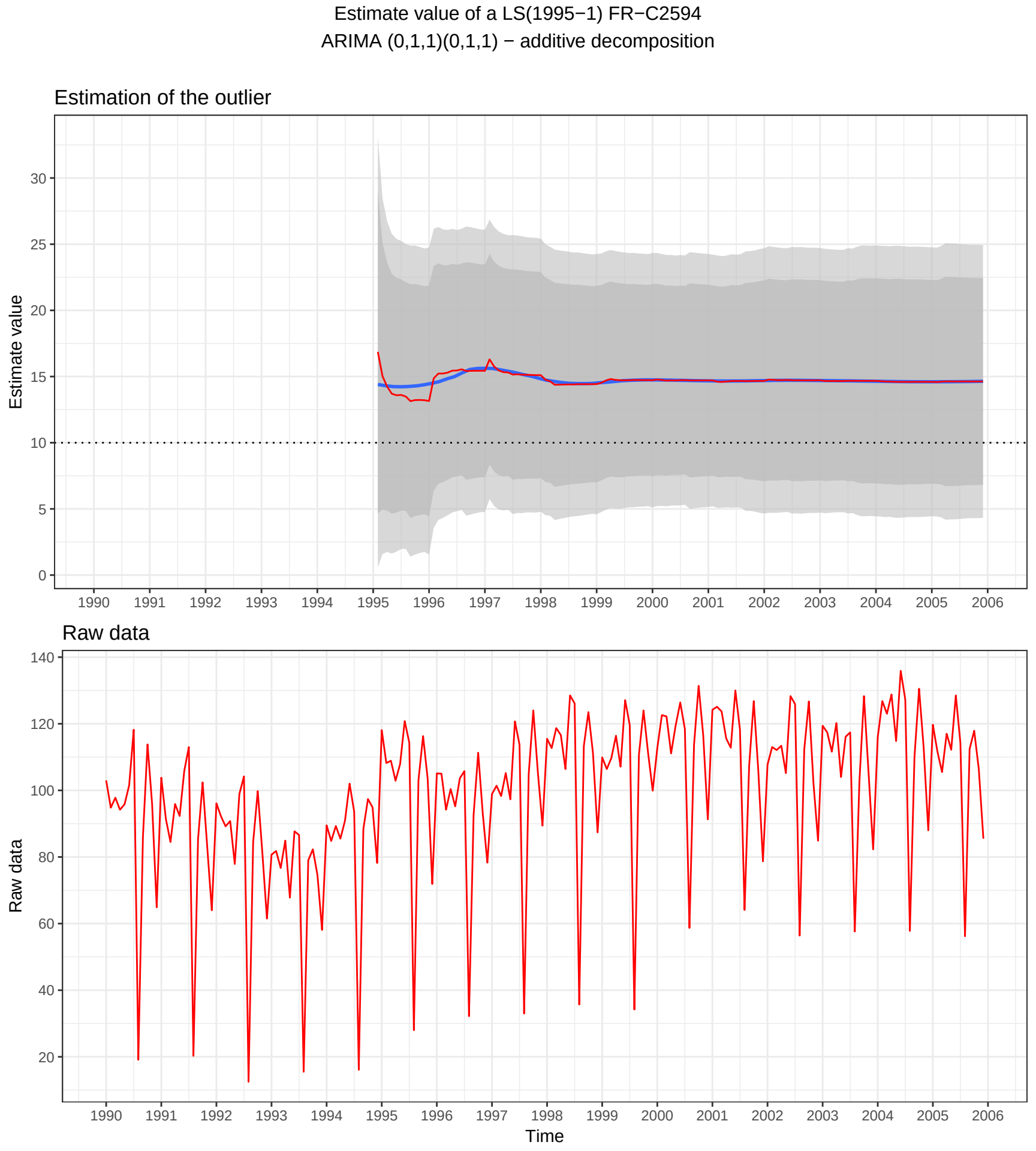




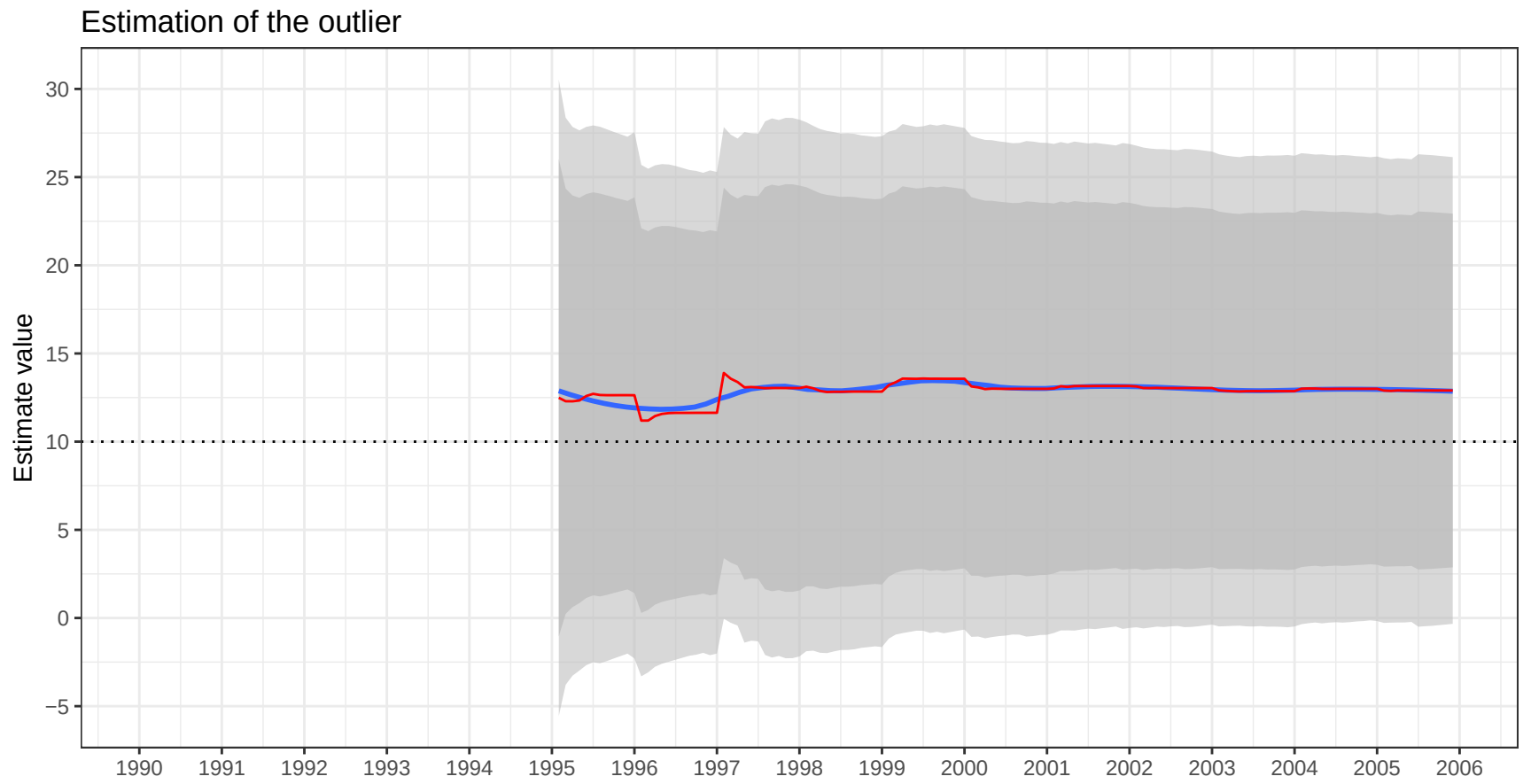
Estimate value of a LS(1996−1) DE−C2594
ARIMA (3,1,1)(0,1,1) − multiplicative decomposition

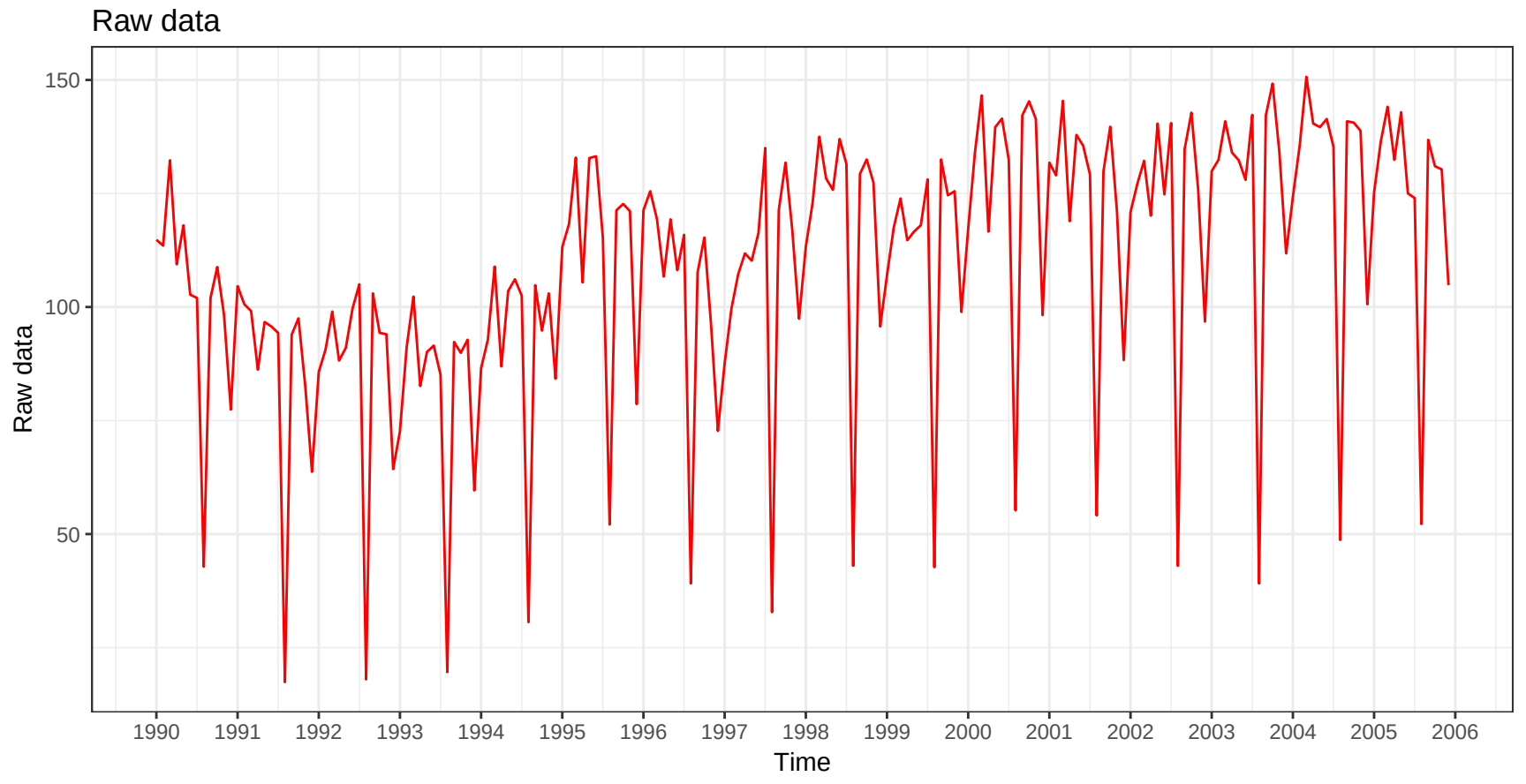


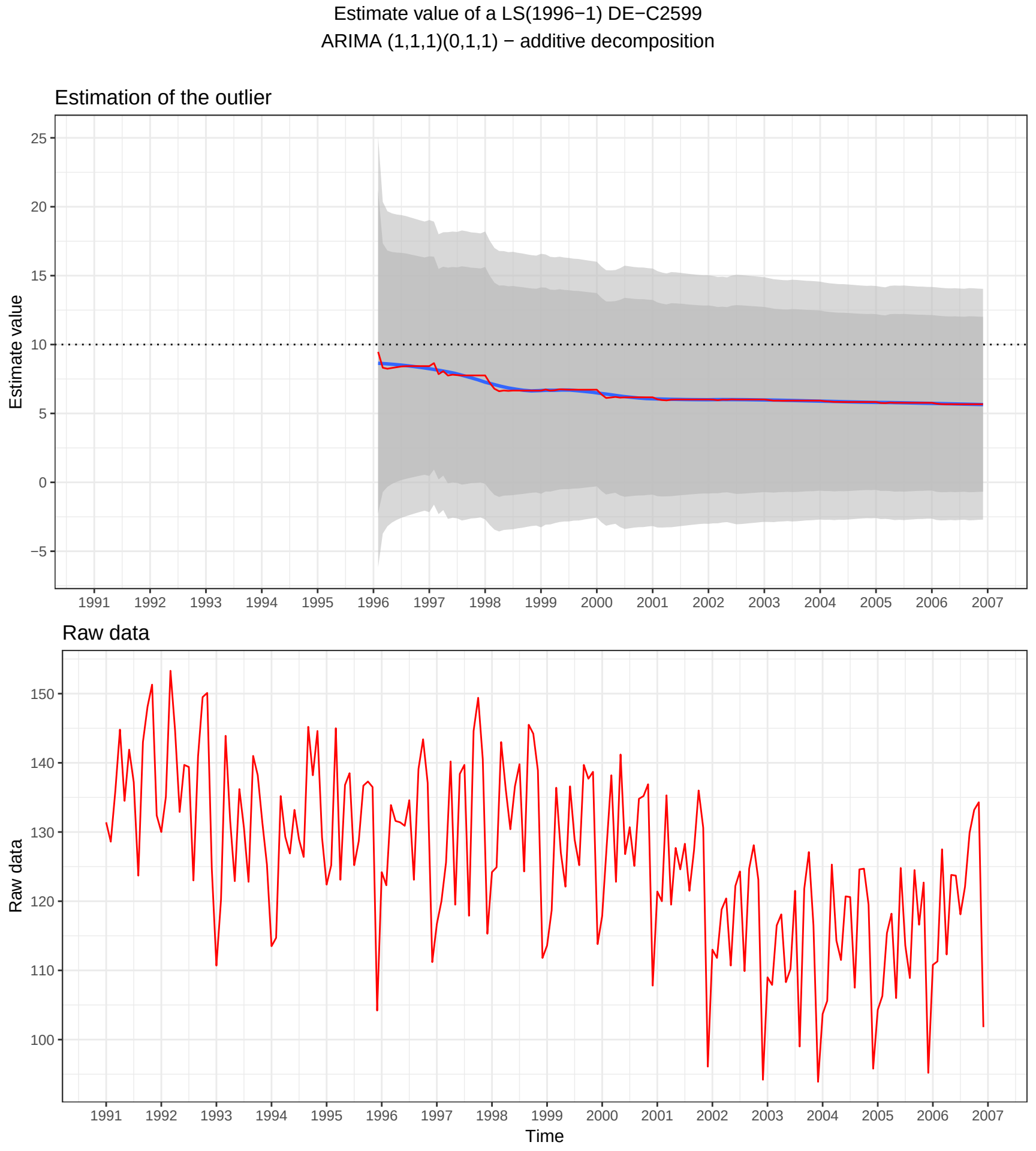



Estimate value of a LS(1995−1) FR−C2594
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
30
25
20
15
10
5
0
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
140
120
100
80
60
40
20
Time

Estimate value of a LS(1995−1) IT−C2594
ARIMA (0,1,1)(0,1,1) − additive decomposition

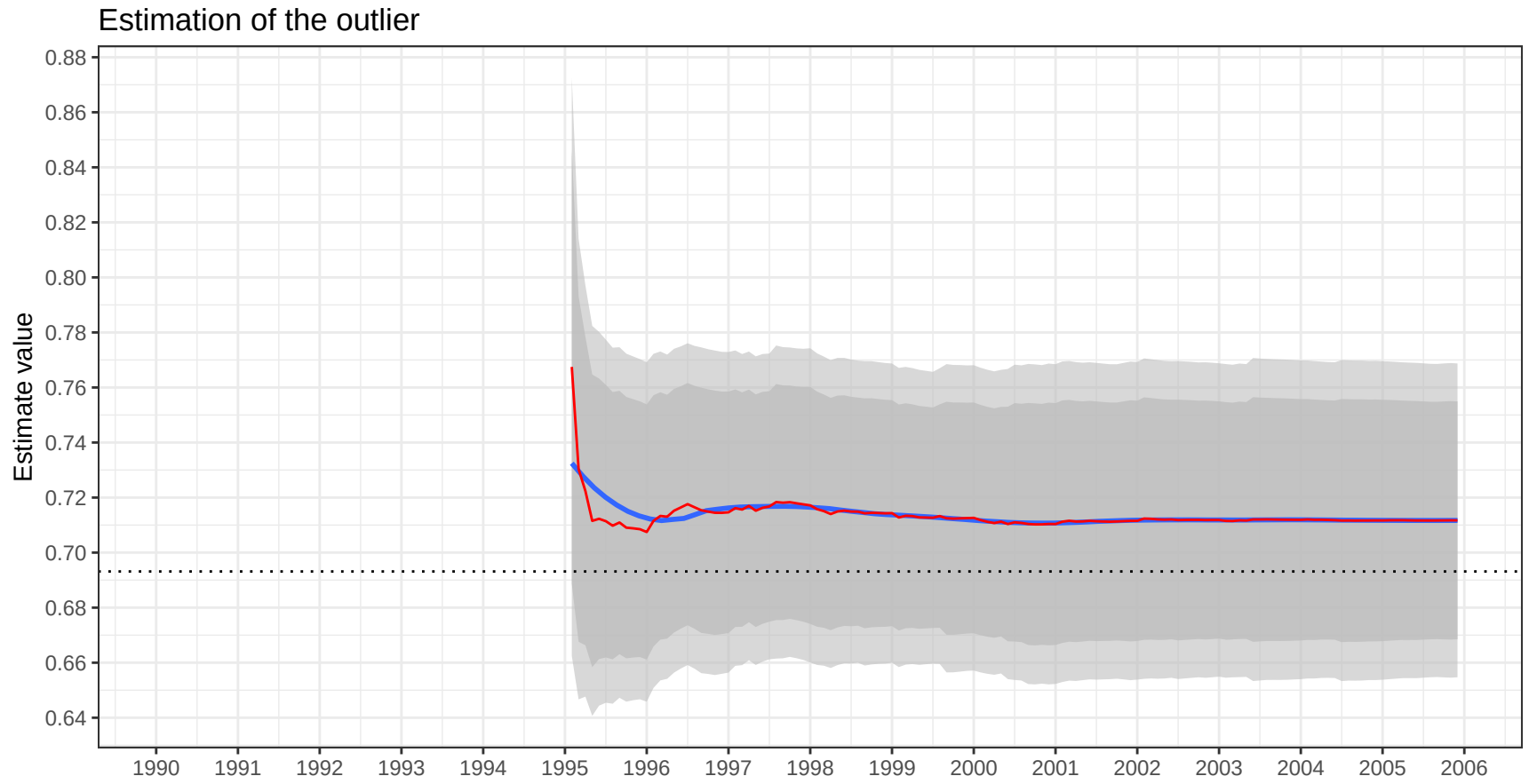


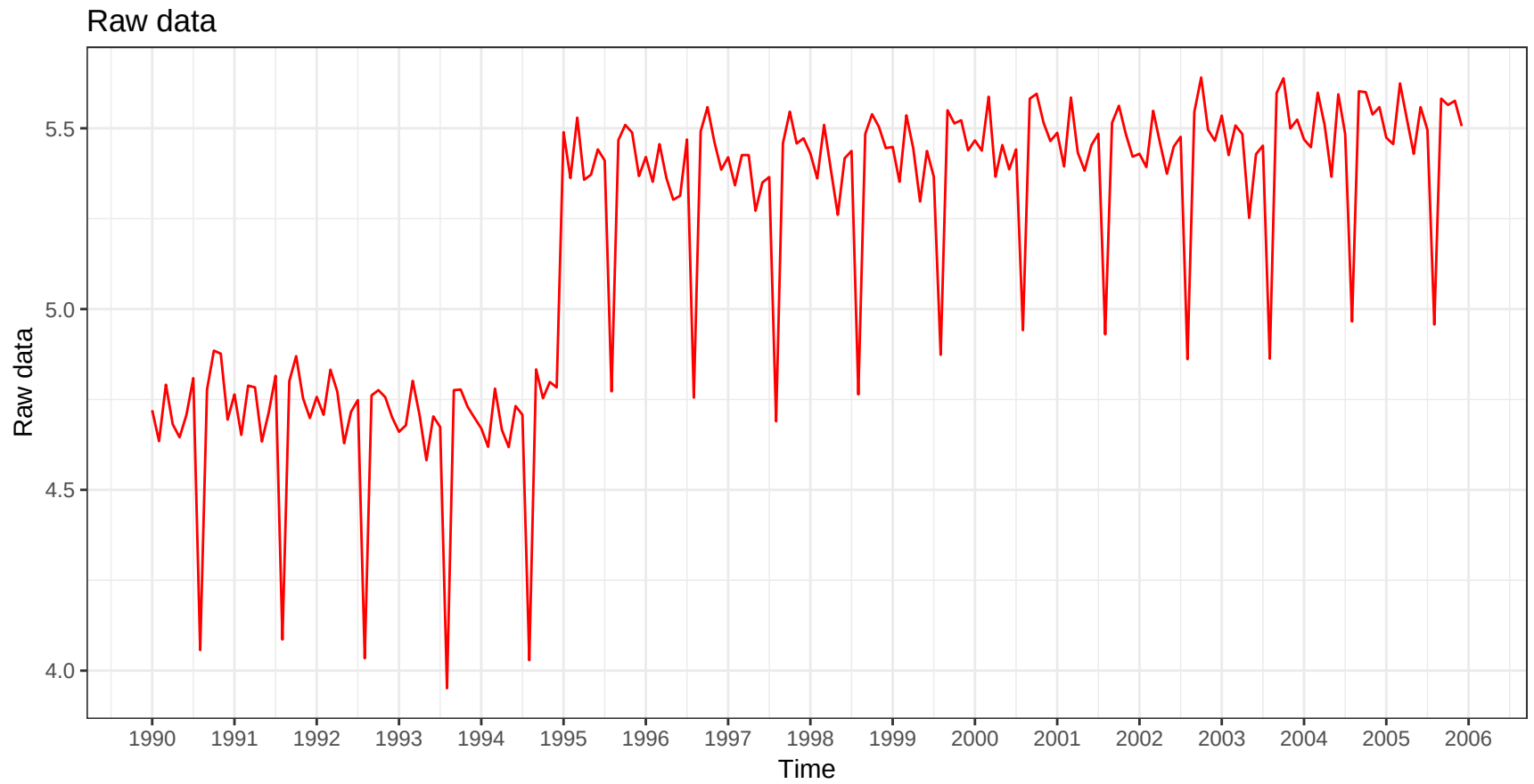


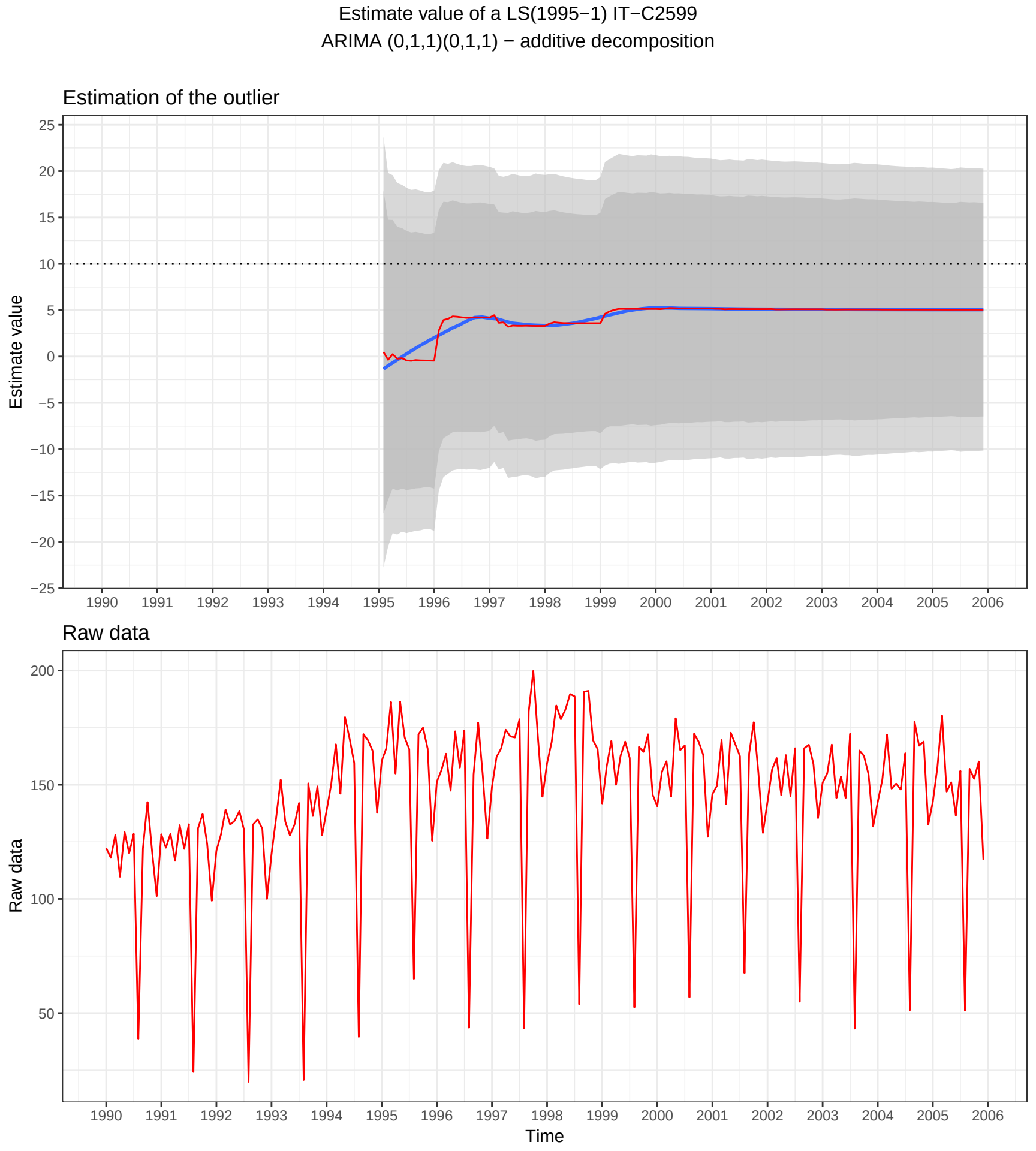

Estimate value of a LS(1996−1) DE−C2599
ARIMA (1,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
25
20
15
10
5
0
−5
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
150
140
130
120
110
100
Time

Estimate value of a LS(1995−1) FR−C2599

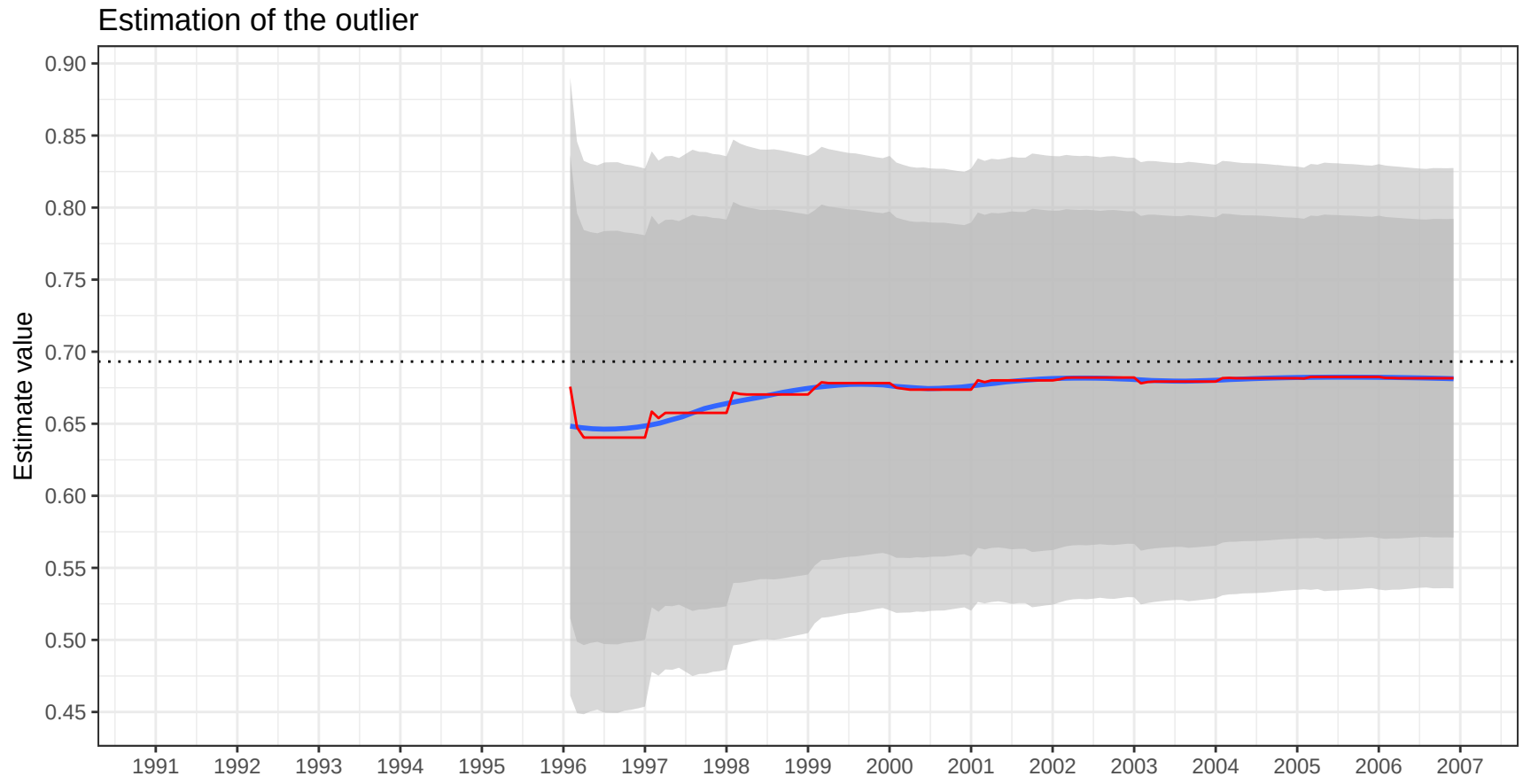
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

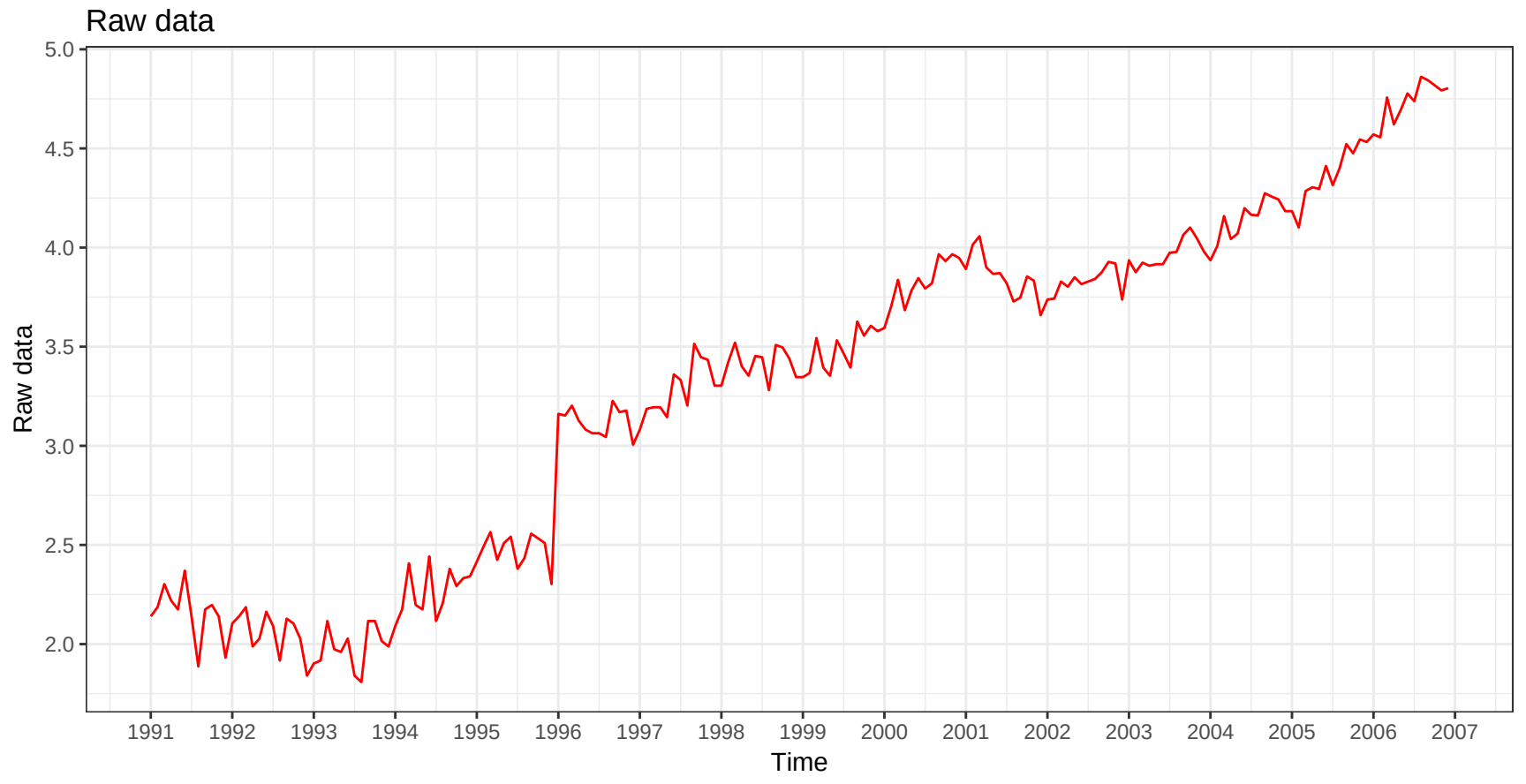




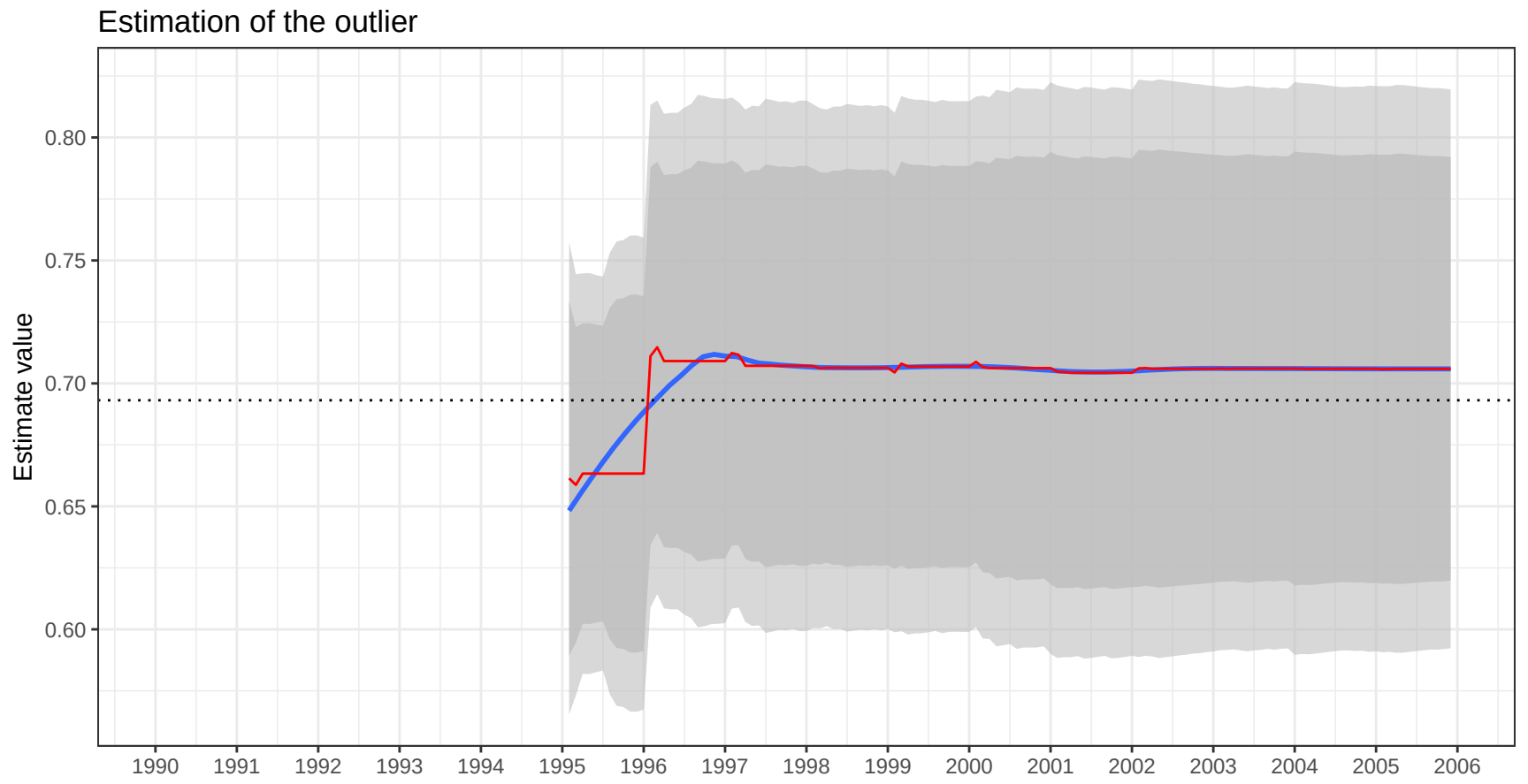

Estimate value of a LS(1995−1) IT−C2599
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
25
20
15
10
5
0
−5
−10
−15
−20
−25
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
200
150
100
50
Time

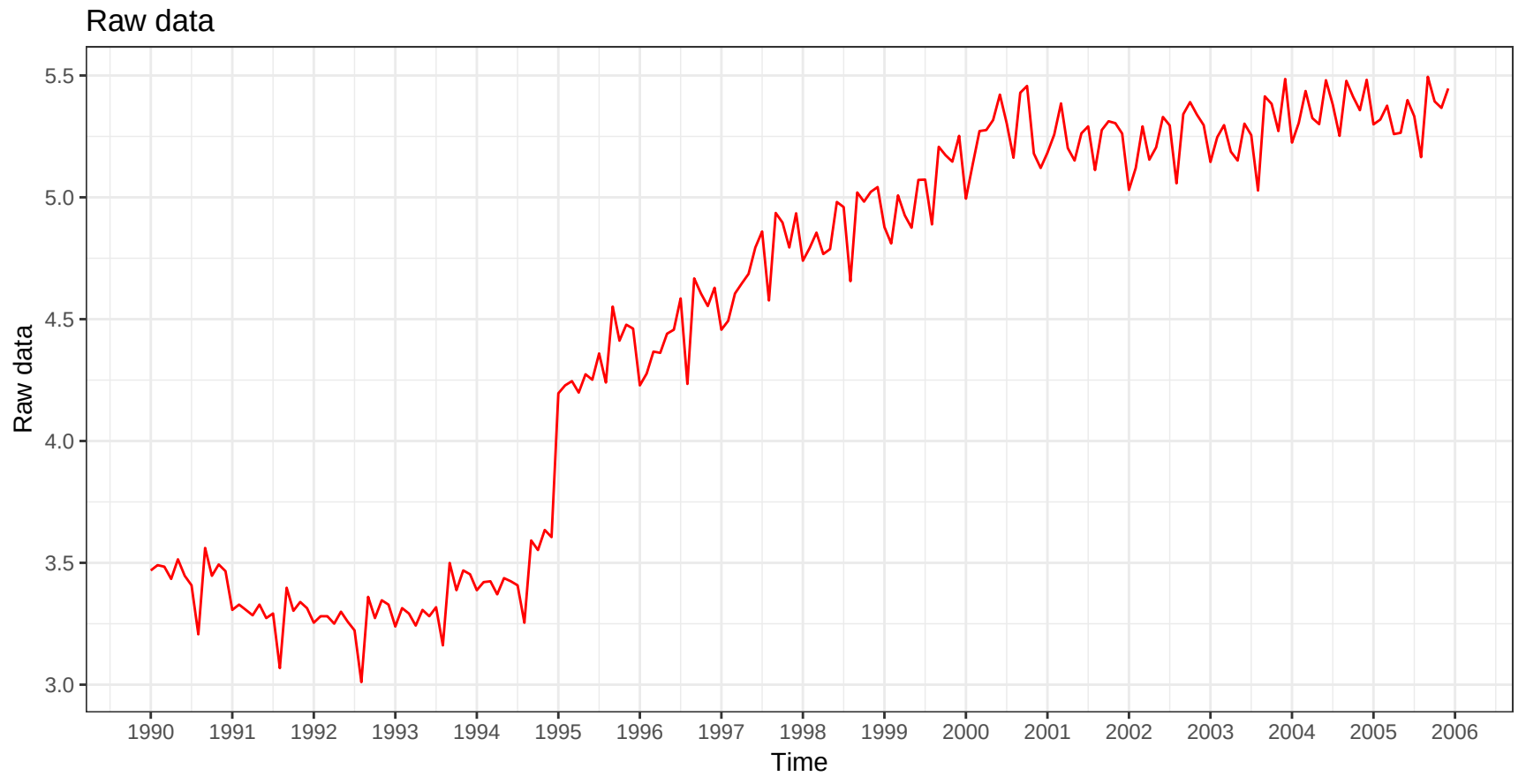
Estimate value of a LS(1996−1) DE−C2611
ARIMA (2,1,0)(0,1,1) − multiplicative decomposition





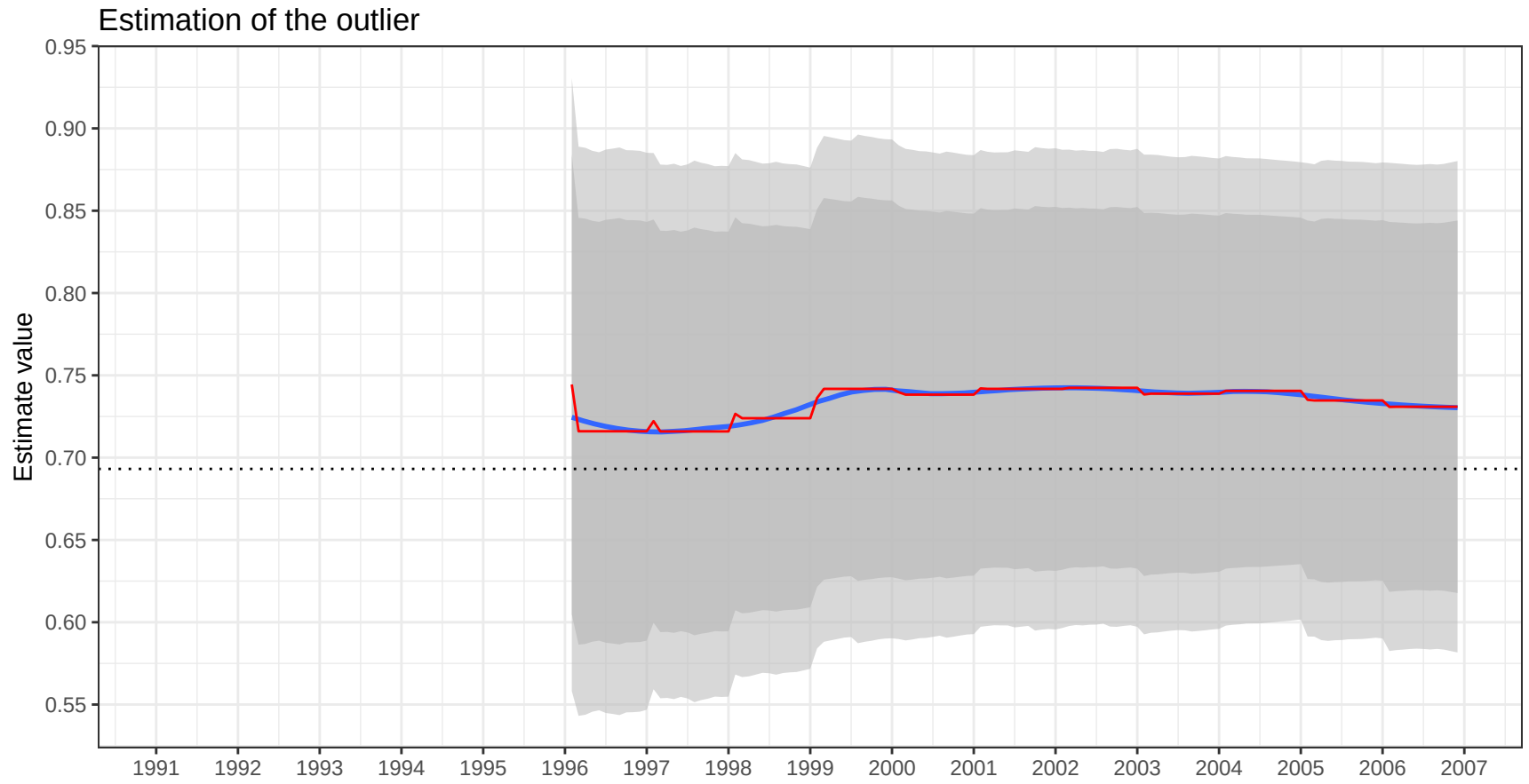
Estimate value of a LS(1995−1) FR−C2611
ARIMA (2,1,0)(0,1,1) − multiplicative decomposition

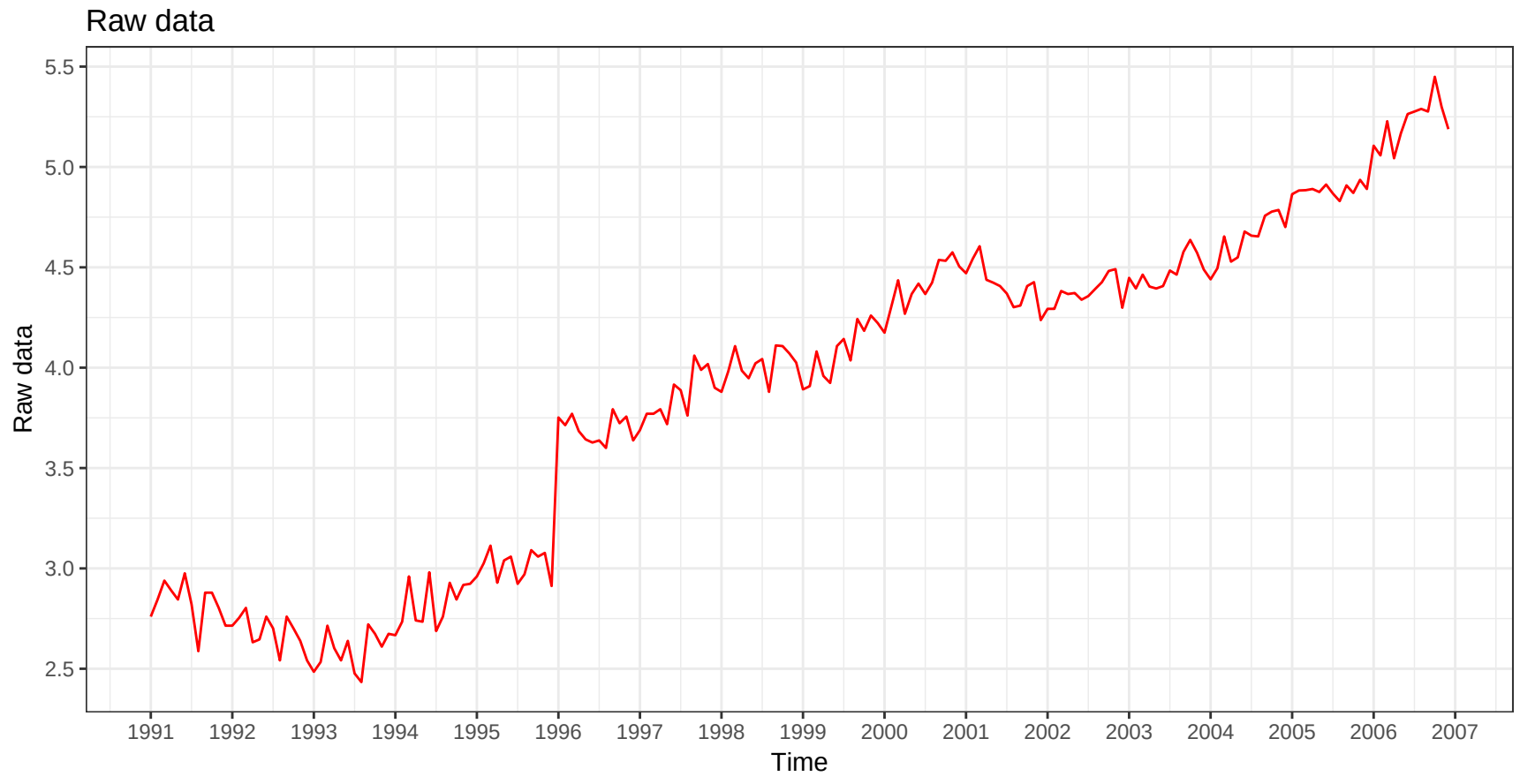




Estimate value of a LS(1996−1) DE−C2612

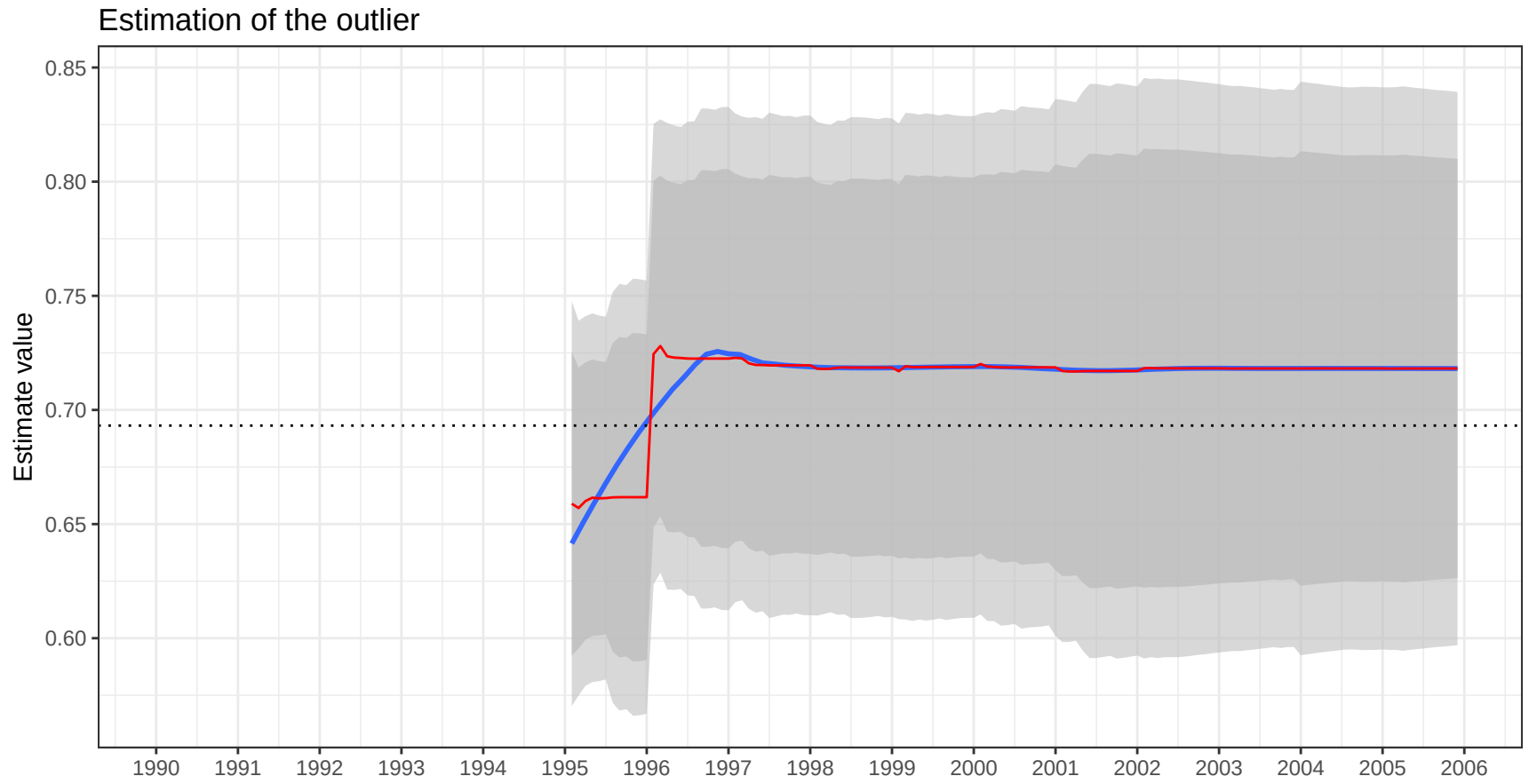
ARIMA (1,1,0)(0,1,1) − multiplicative decomposition

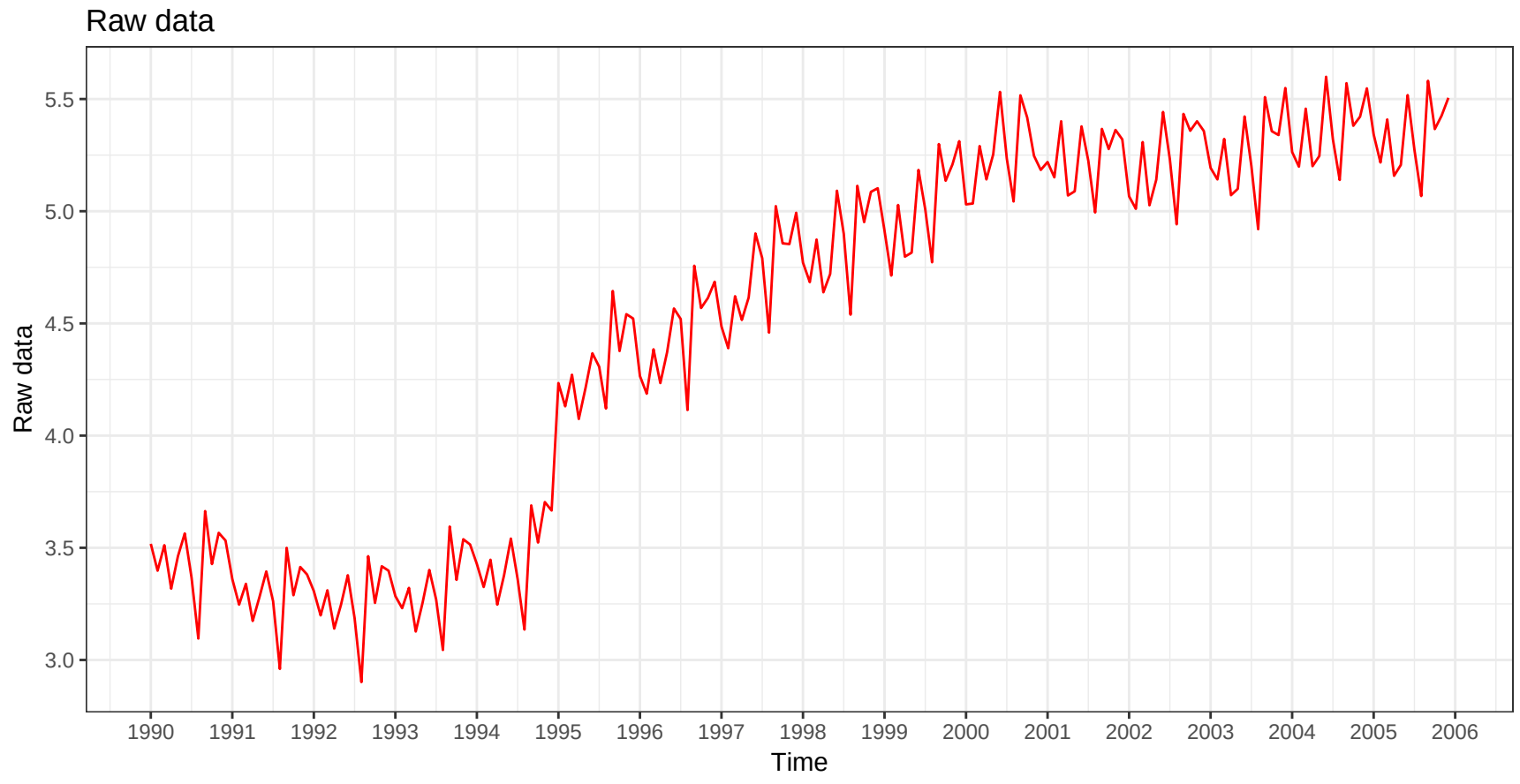


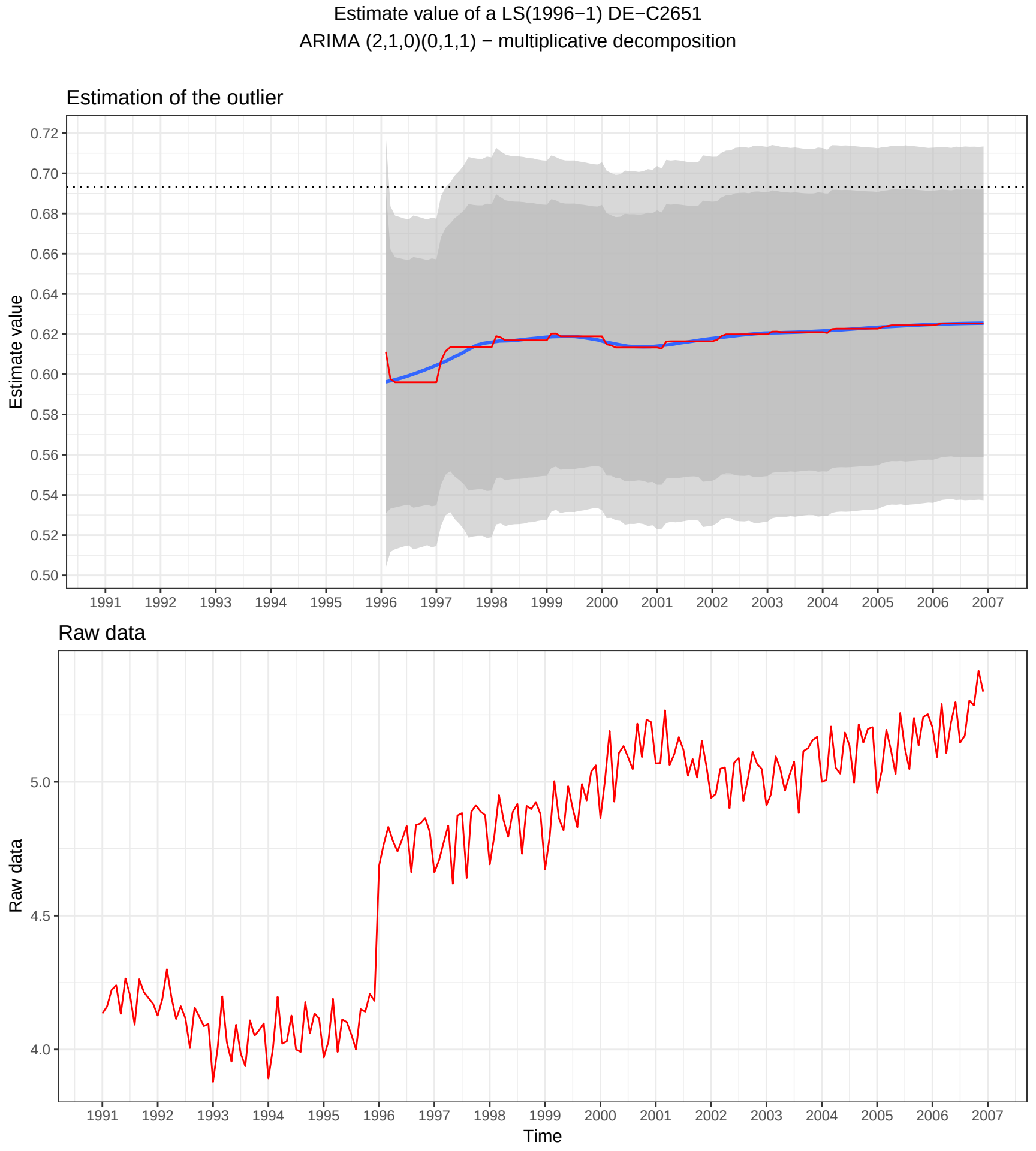


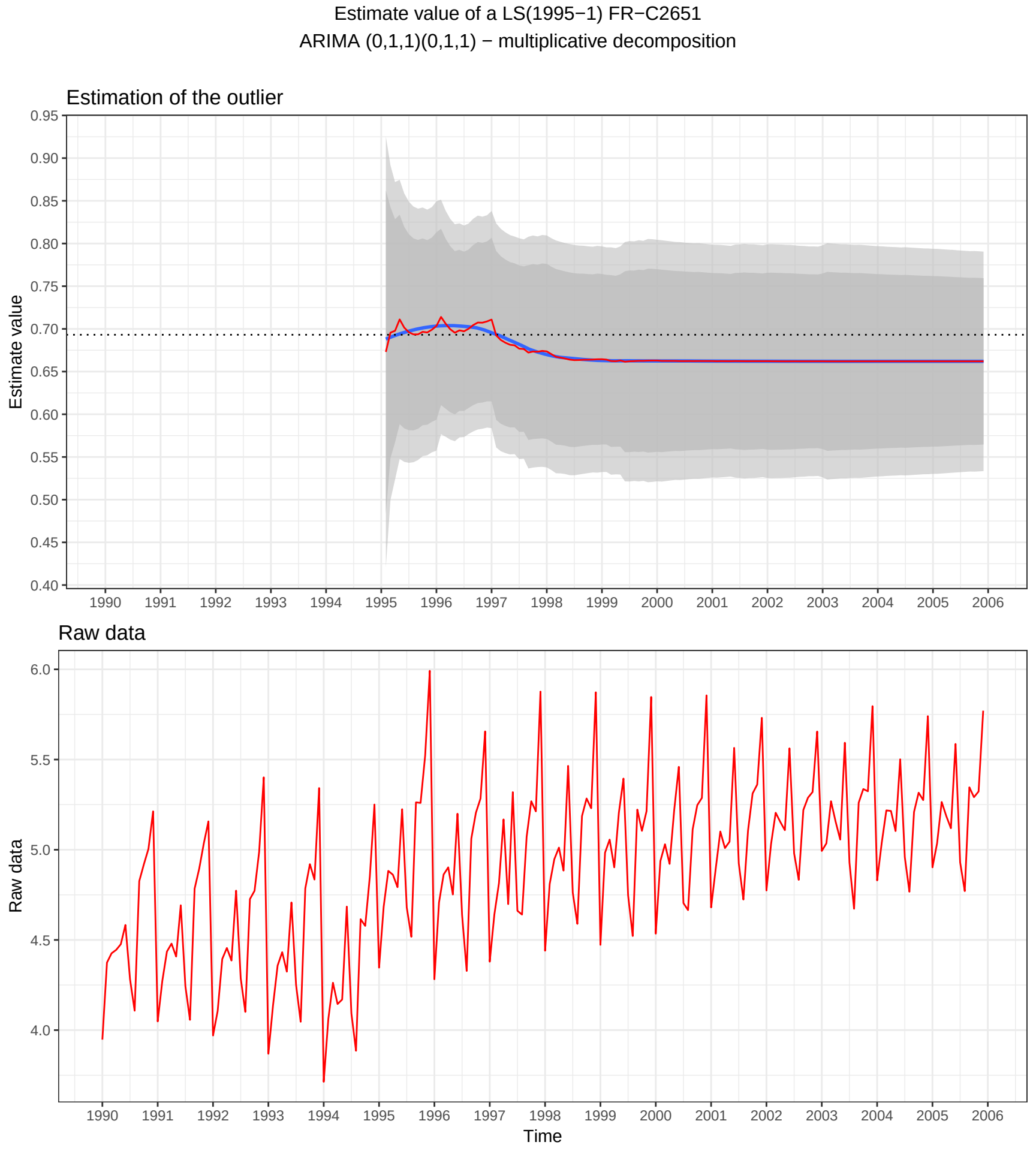
Estimate value of a LS(1995−1) FR−C2612

ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

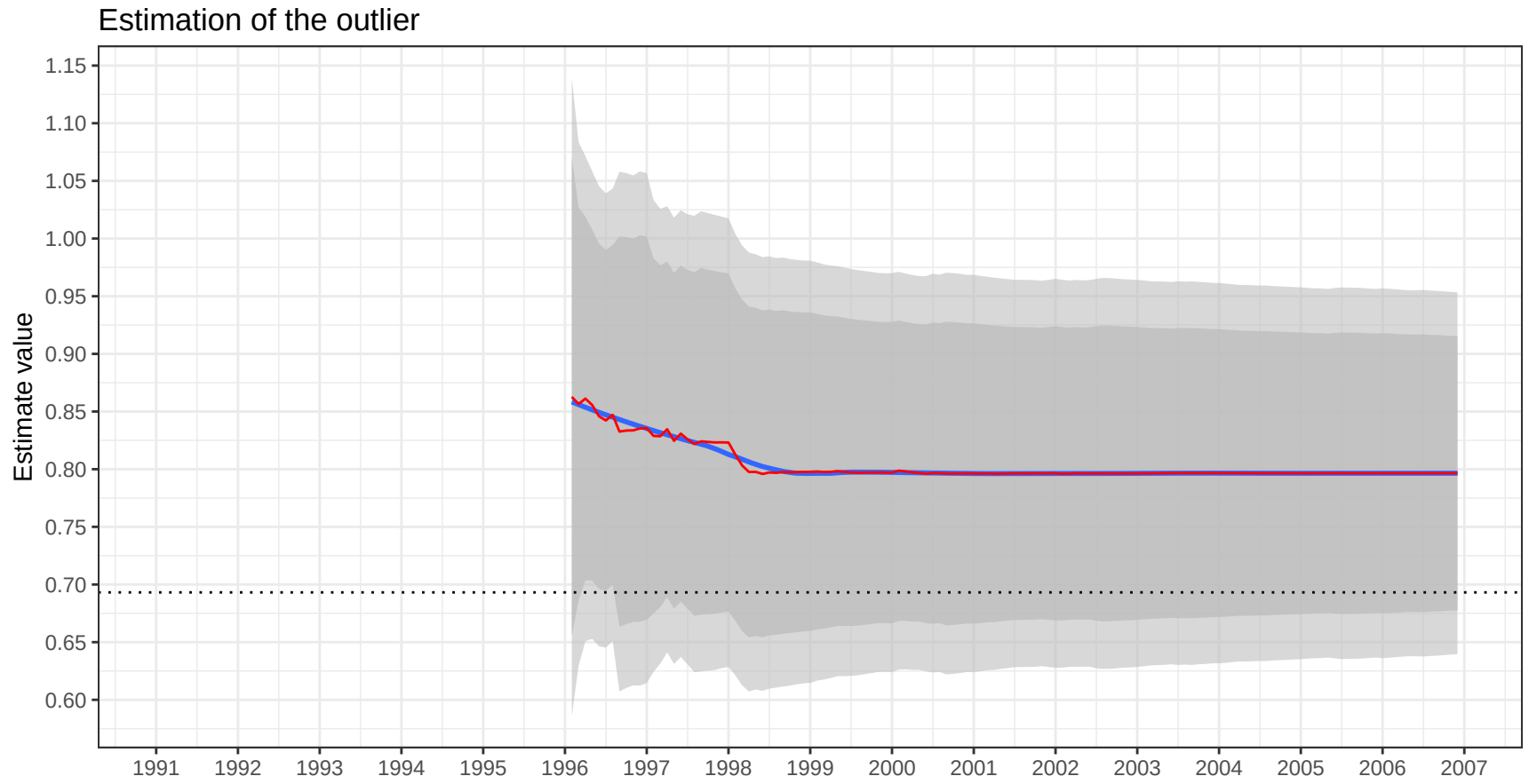


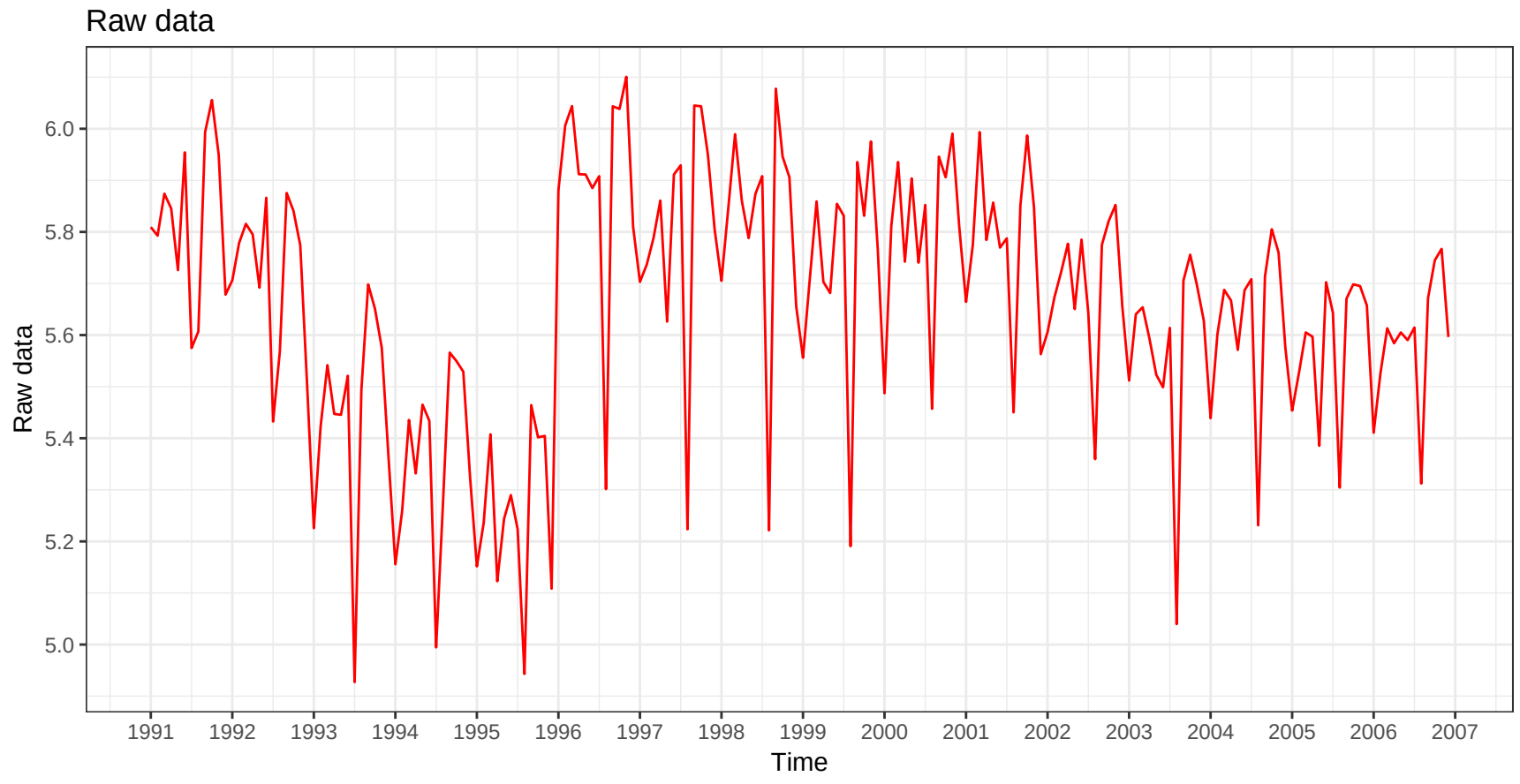


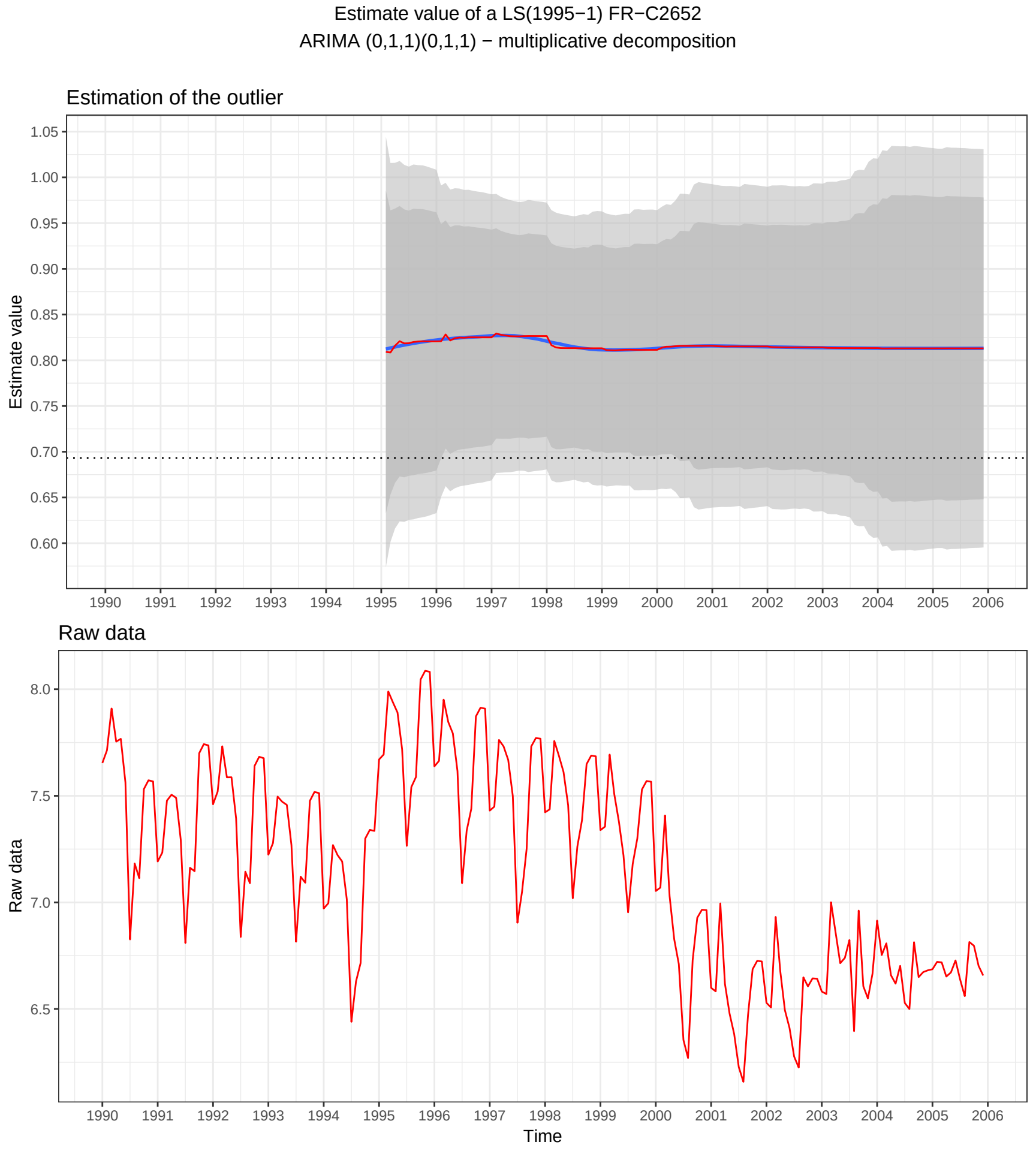

Estimate value of a LS(1996−1) DE−C2651
ARIMA (2,1,0)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.72
0.70
0.68
0.66
0.64
0.62
0.60
0.58
0.56
0.54
0.52
0.50
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
5.0
4.5
4.0
Time


Estimate value of a LS(1995−1) FR−C2651
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.95
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
0.45
0.40
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
6.0
5.5
5.0
4.5
4.0
Time

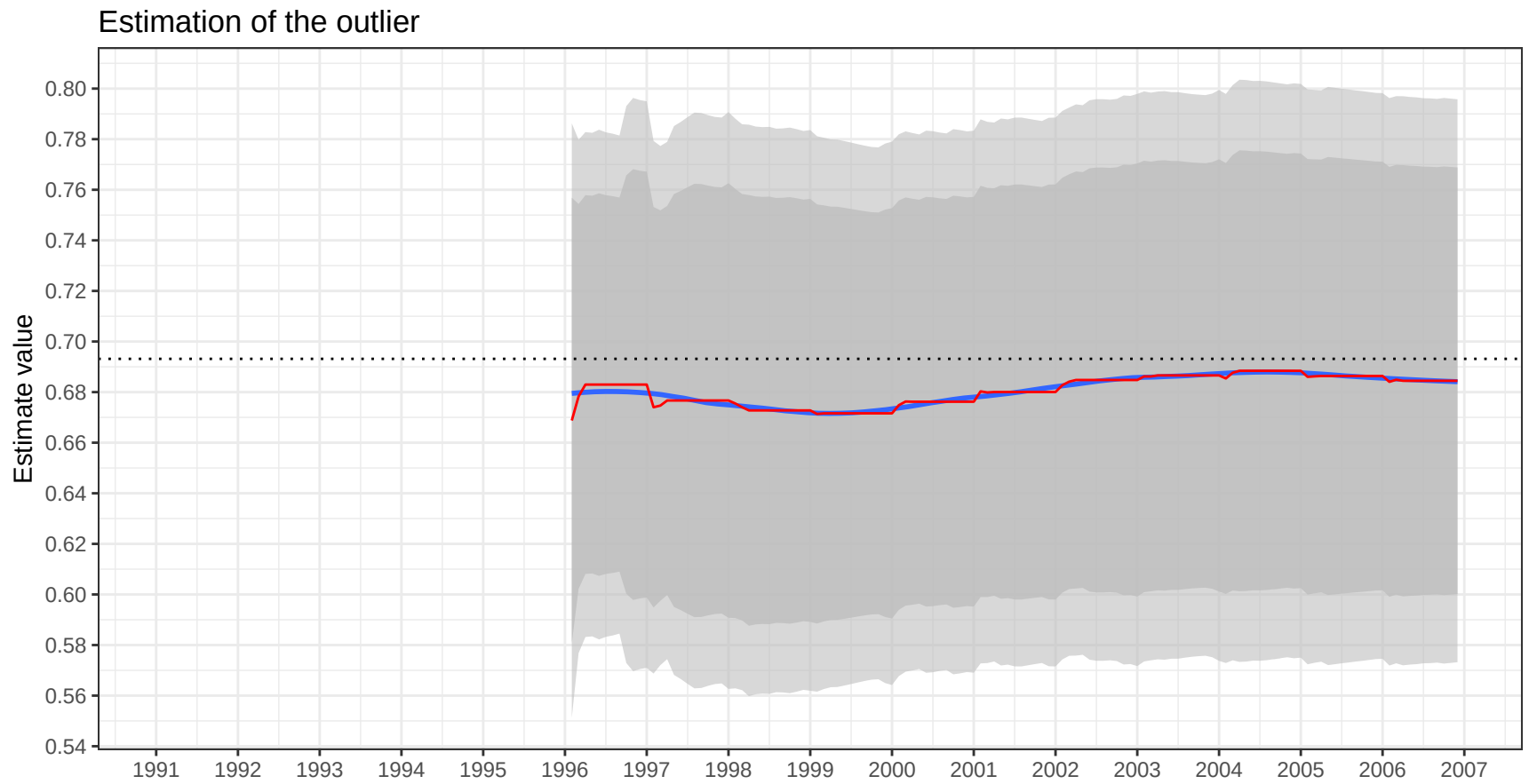
Estimate value of a LS(1996−1) DE−C2652
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

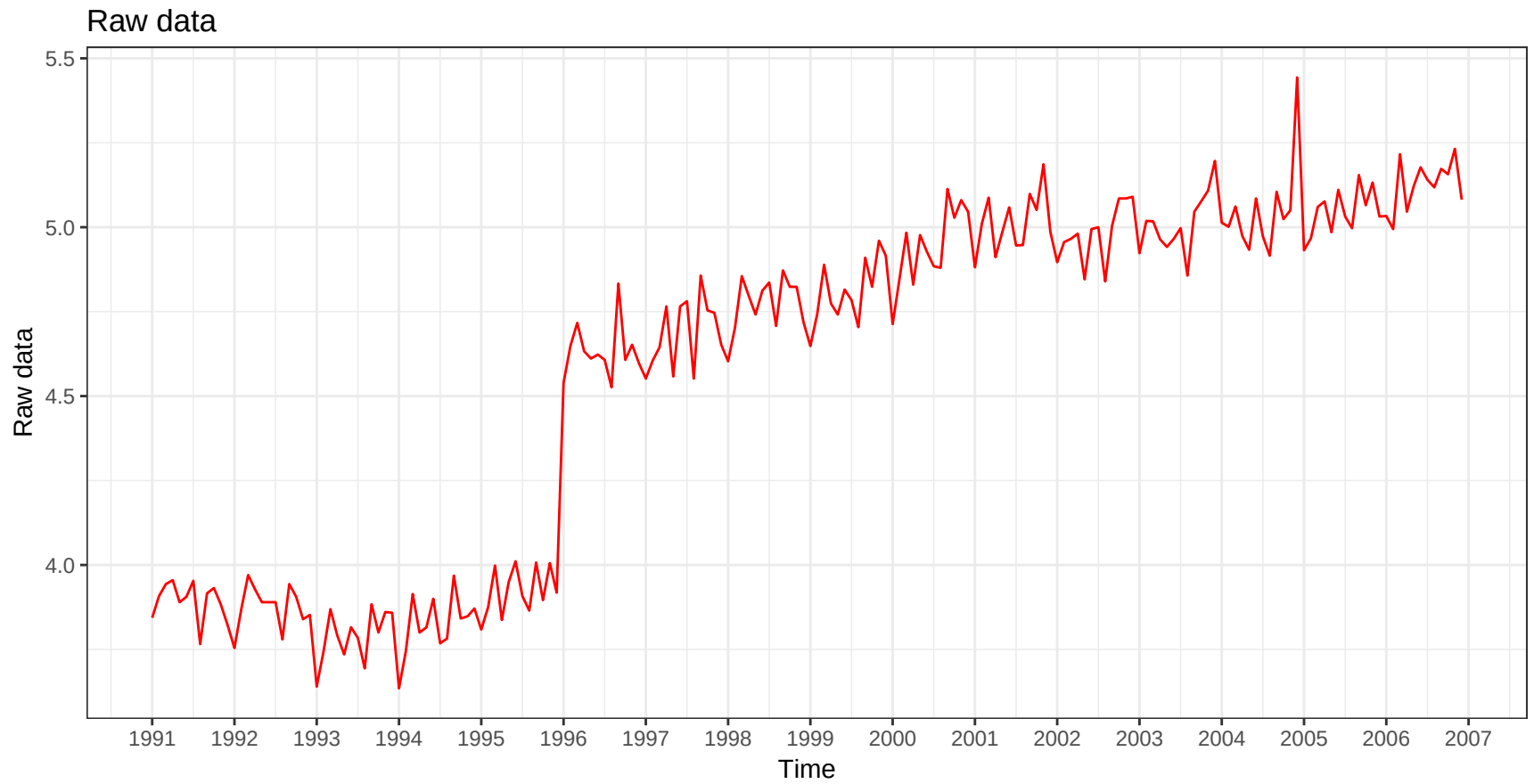


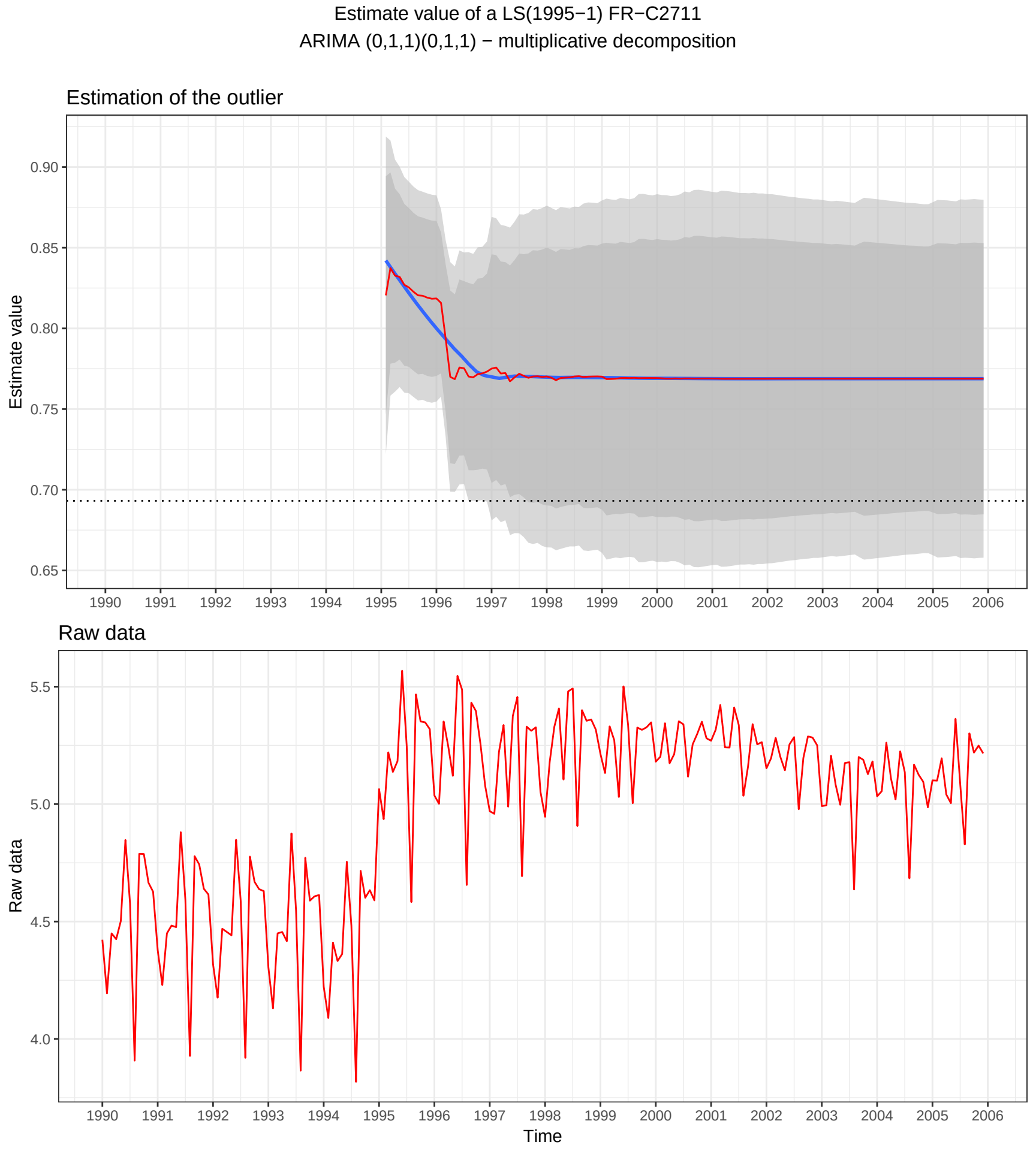


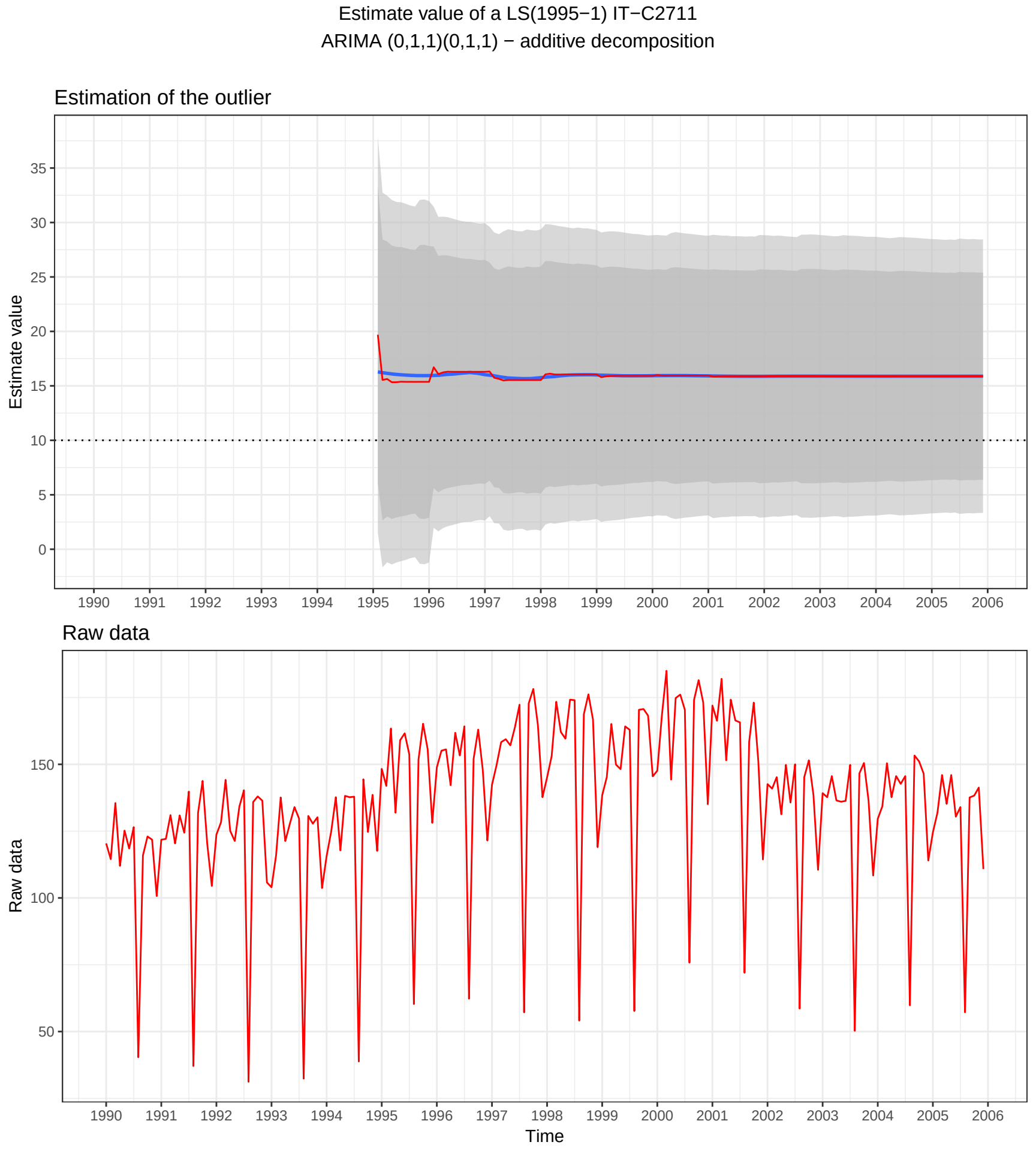

Estimate value of a LS(1995−1) FR−C2652
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
1.05
1.00
0.95
0.90
0.85
0.80
0.75
0.70
0.65
0.60
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
8.0
7.5
7.0
6.5
Time

Estimate value of a LS(1996−1) DE−C2711
ARIMA (2,1,0)(1,1,1) − multiplicative decomposition

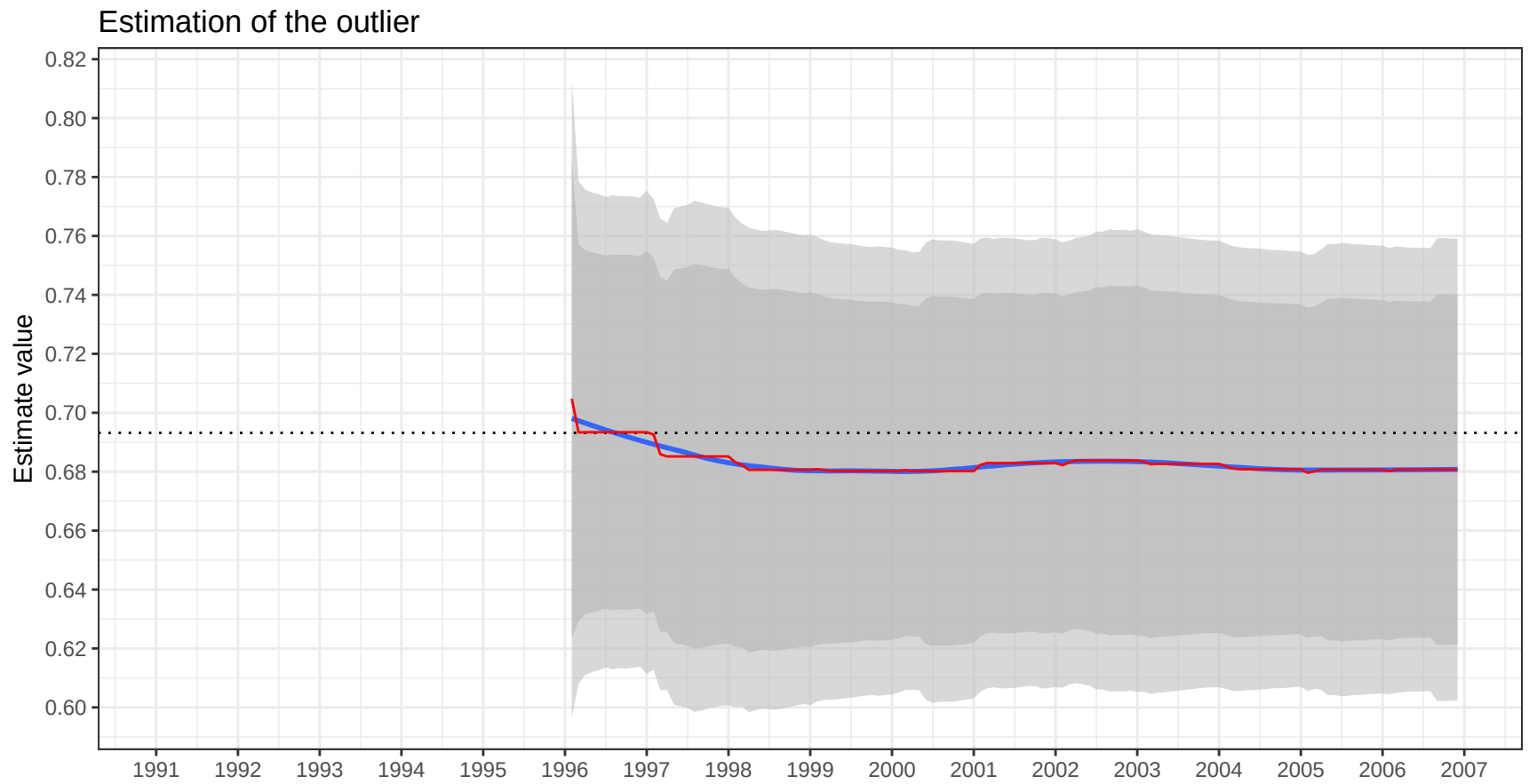


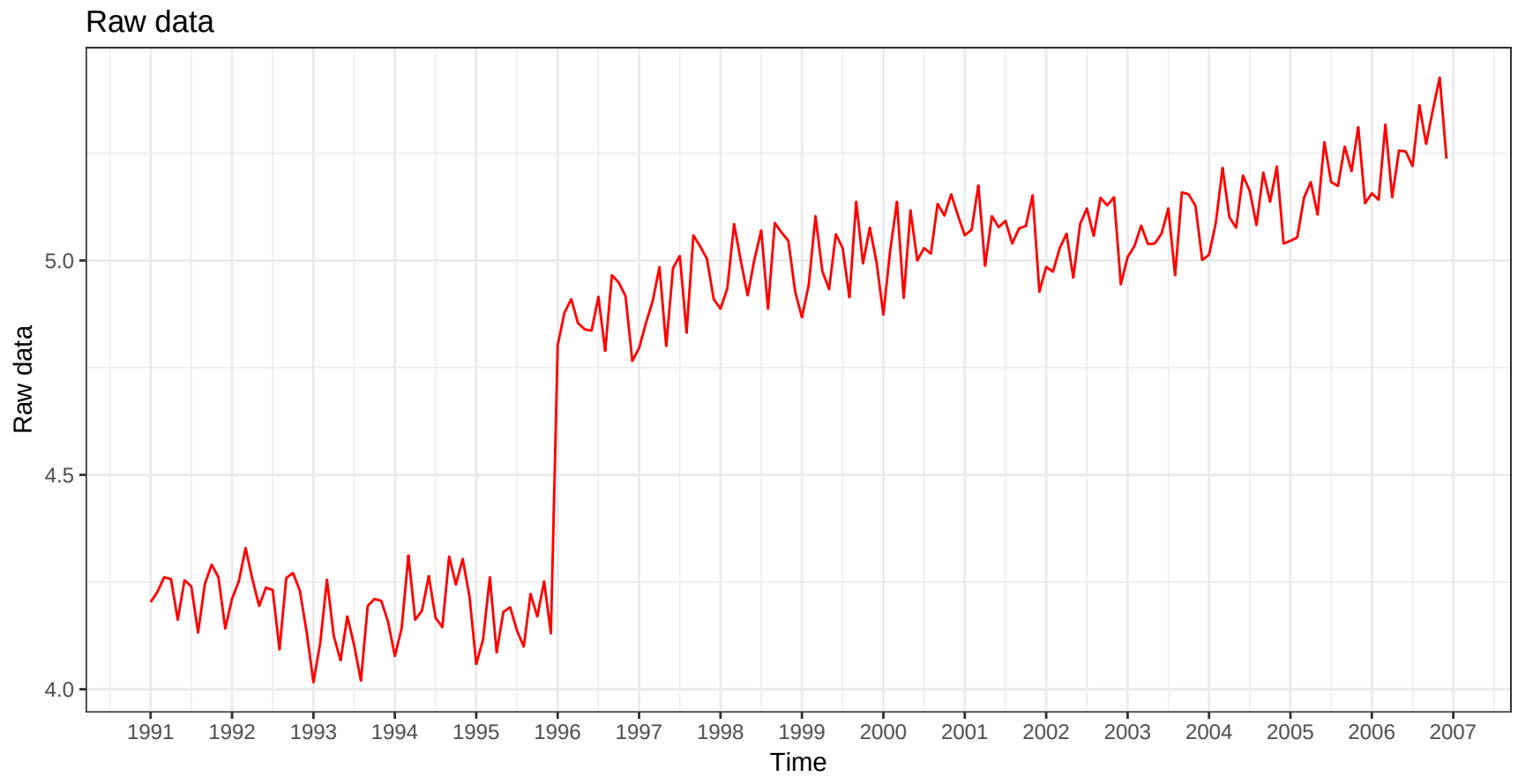


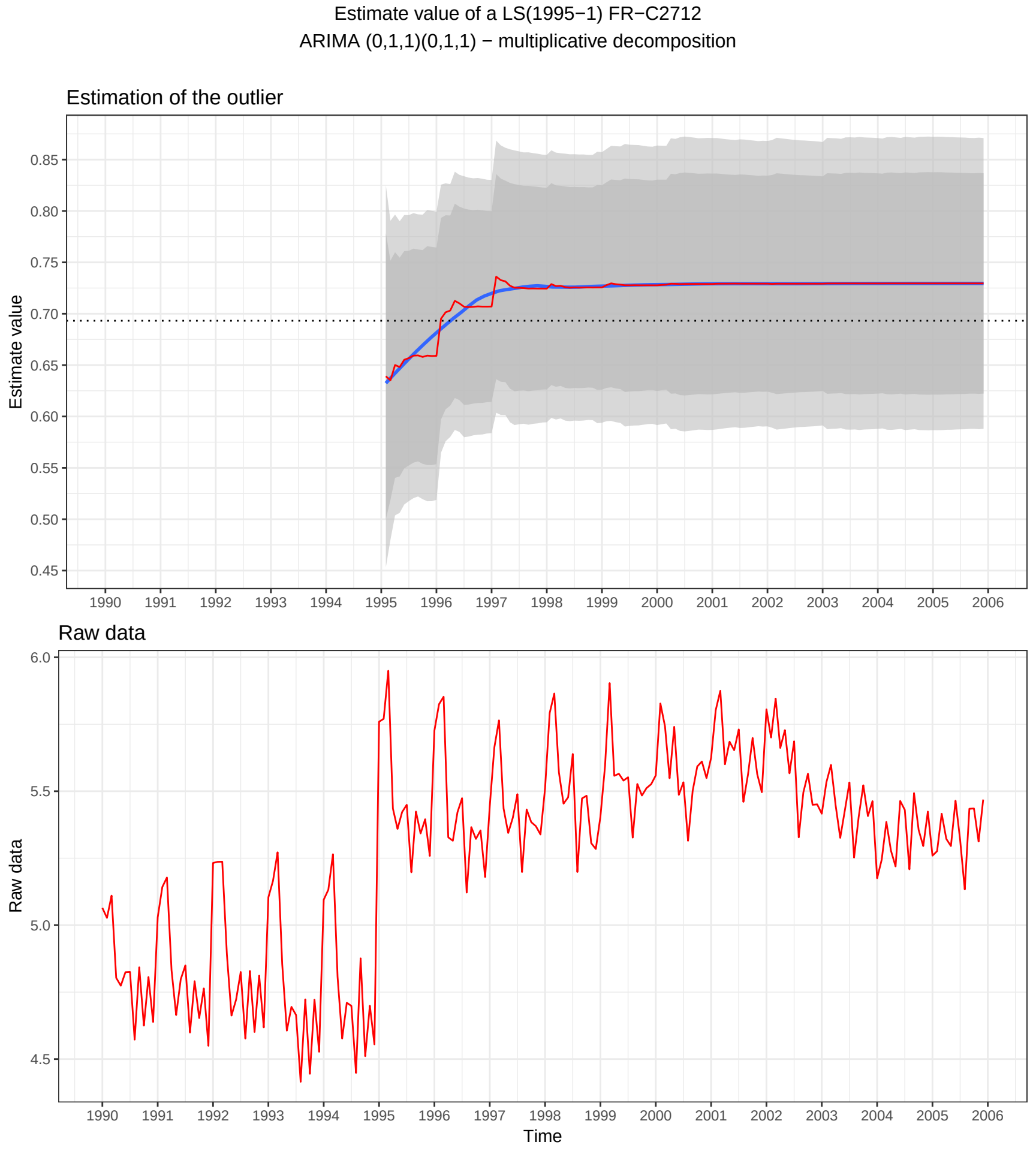

Estimate value of a LS(1995−1) FR−C2711
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.90
0.85
0.80
0.75
0.70
0.65
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
5.5
5.0
4.5
4.0
Time

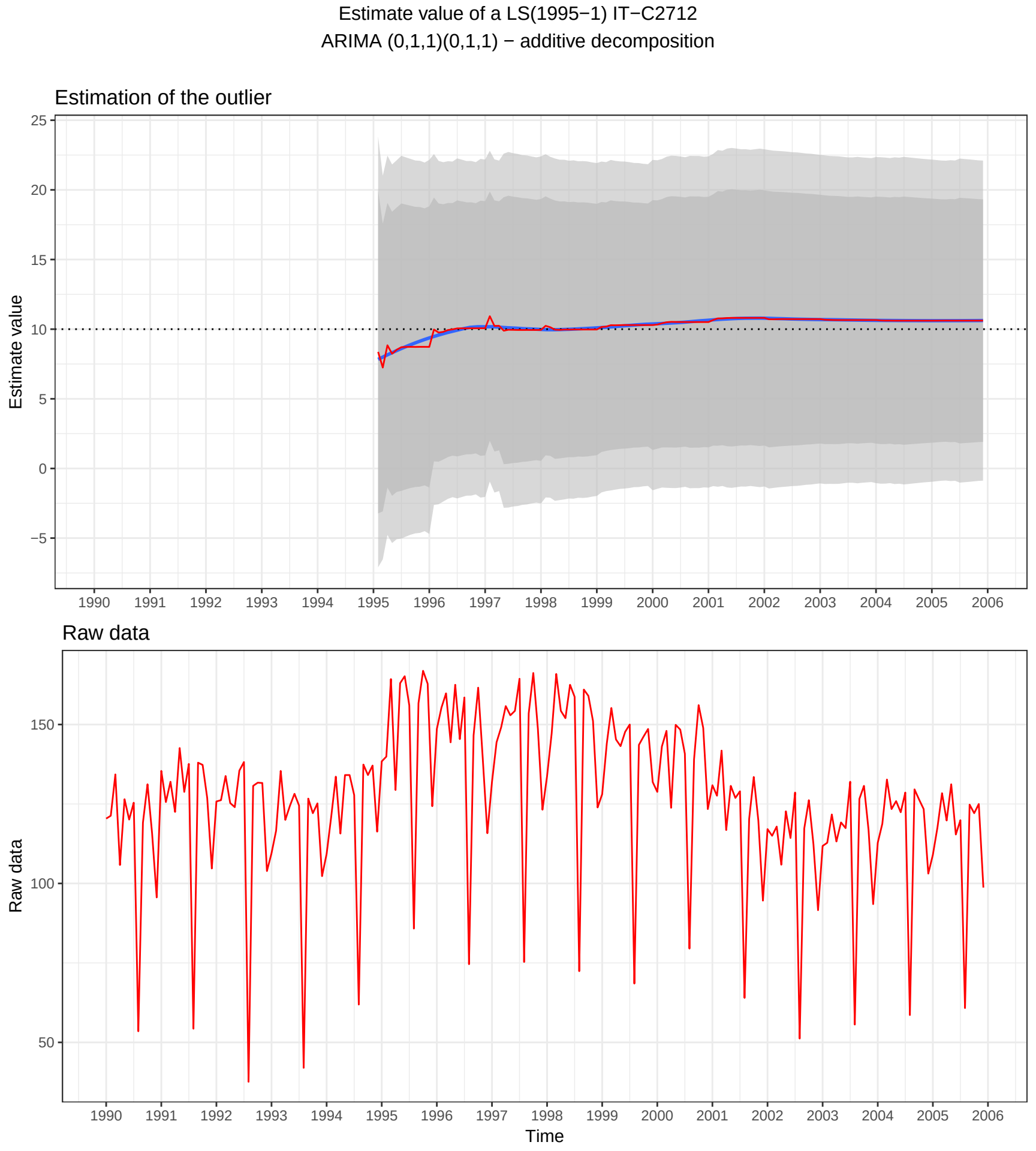

Estimate value of a LS(1995−1) IT−C2711
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
35
30
25
20
15
10
5
0
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
150
100
50
Time

Estimate value of a LS(1996−1) DE−C2712
ARIMA (2,1,0)(0,1,1) − multiplicative decomposition

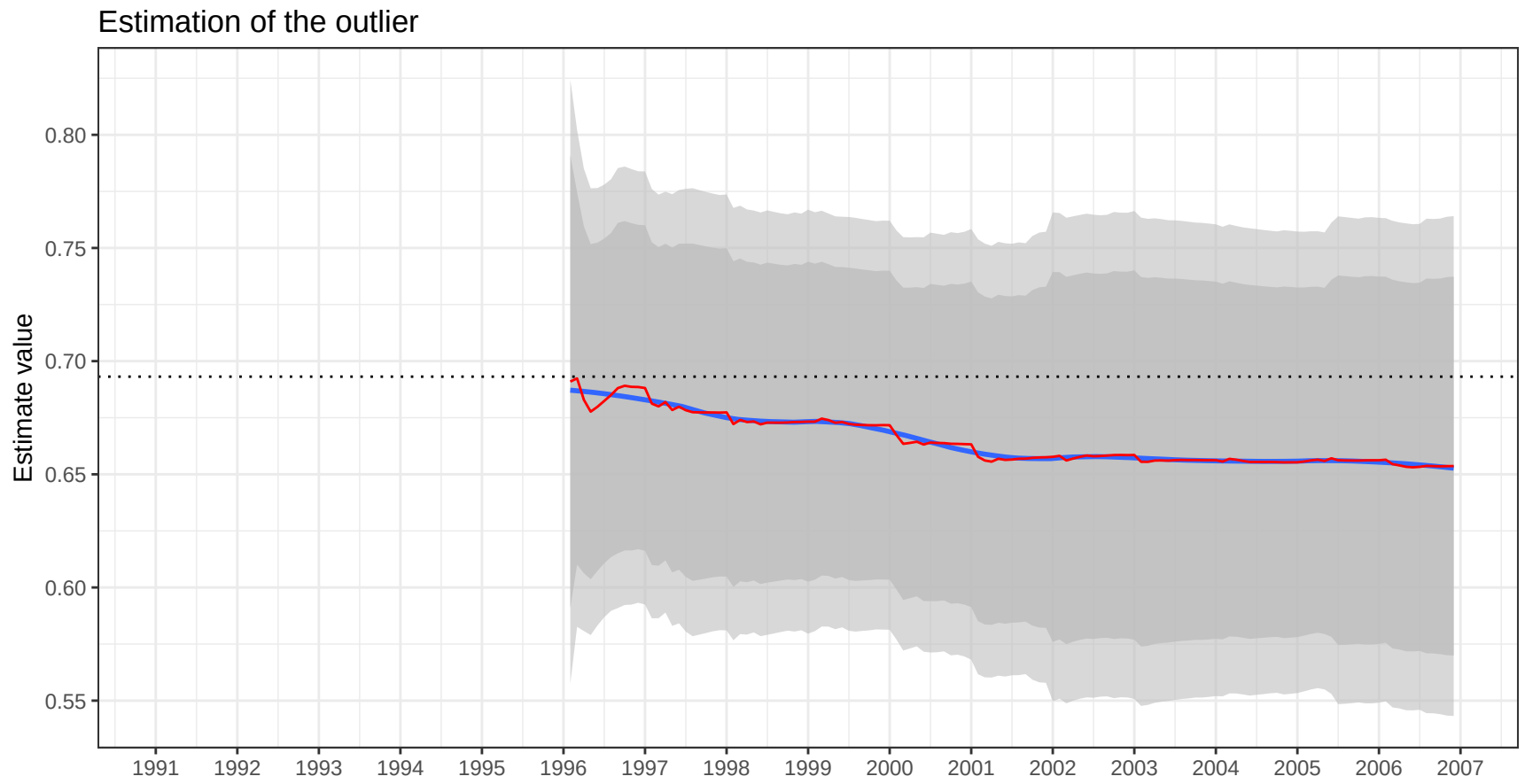


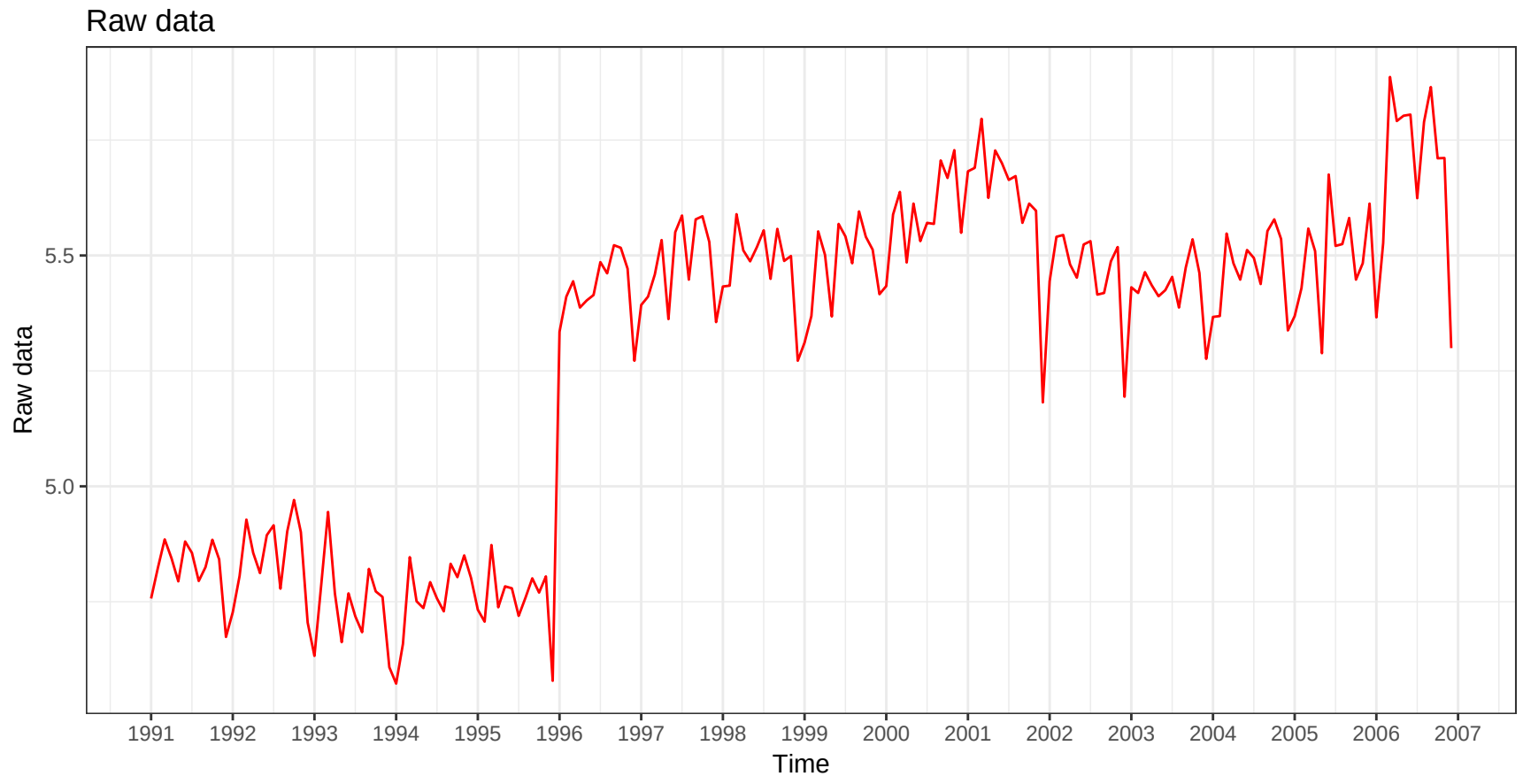



Estimate value of a LS(1995−1) FR−C2712
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
0.45
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
6.0
5.5
5.0
4.5
Time


Estimate value of a LS(1995−1) IT−C2712
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
25
20
15
10
5
0
−5
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
150
100
50
Time

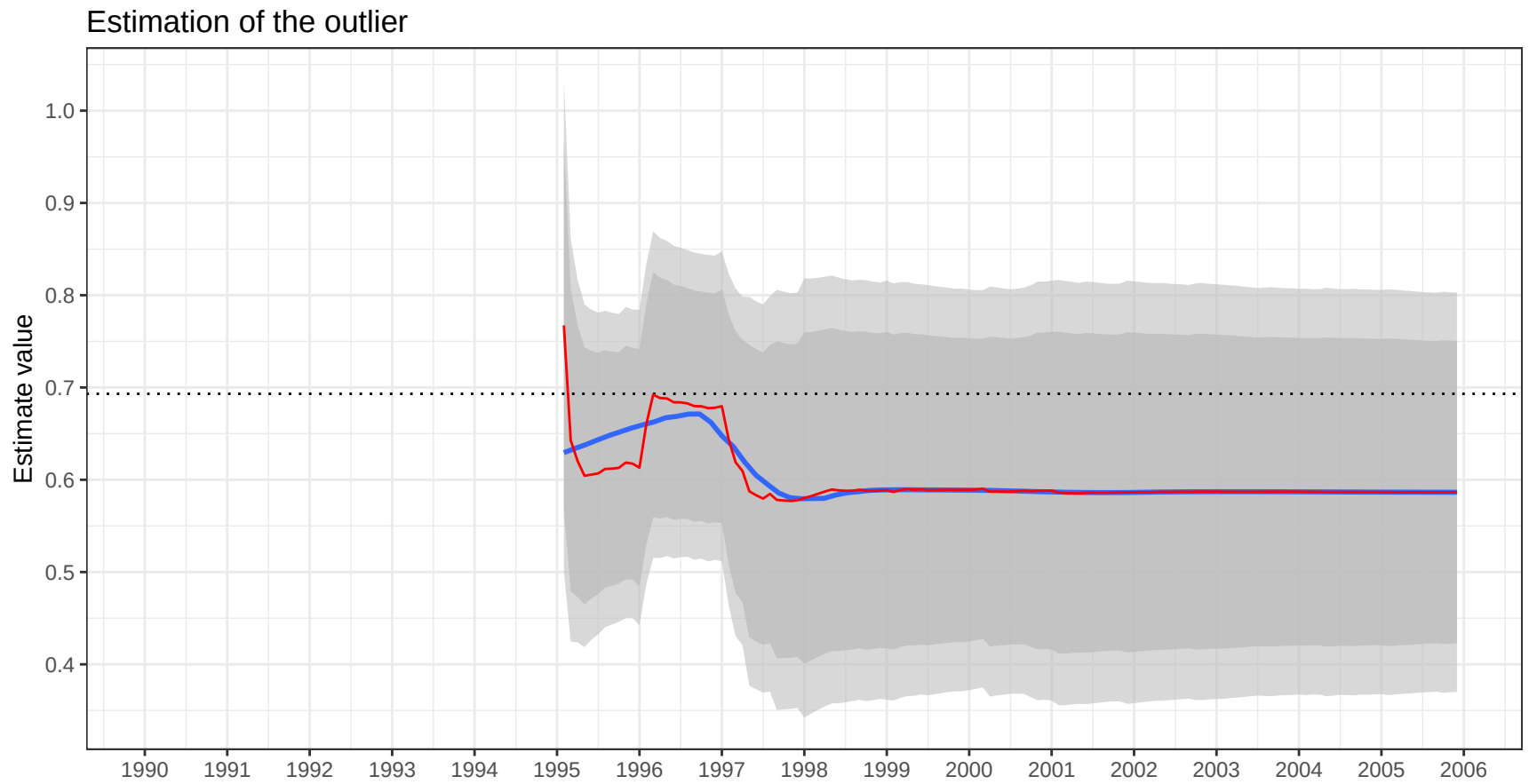
Estimate value of a LS(1996−1) DE−C2731
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

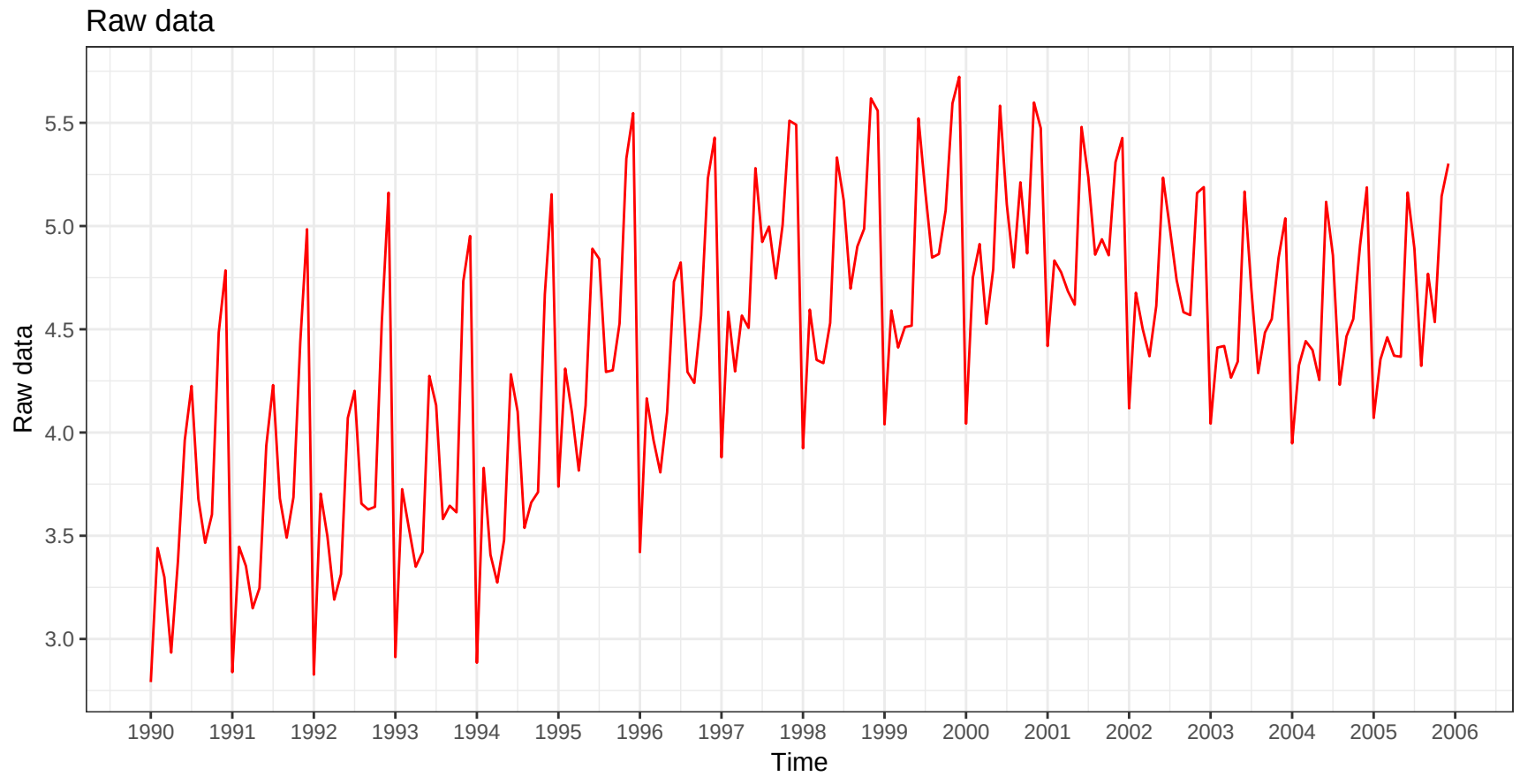




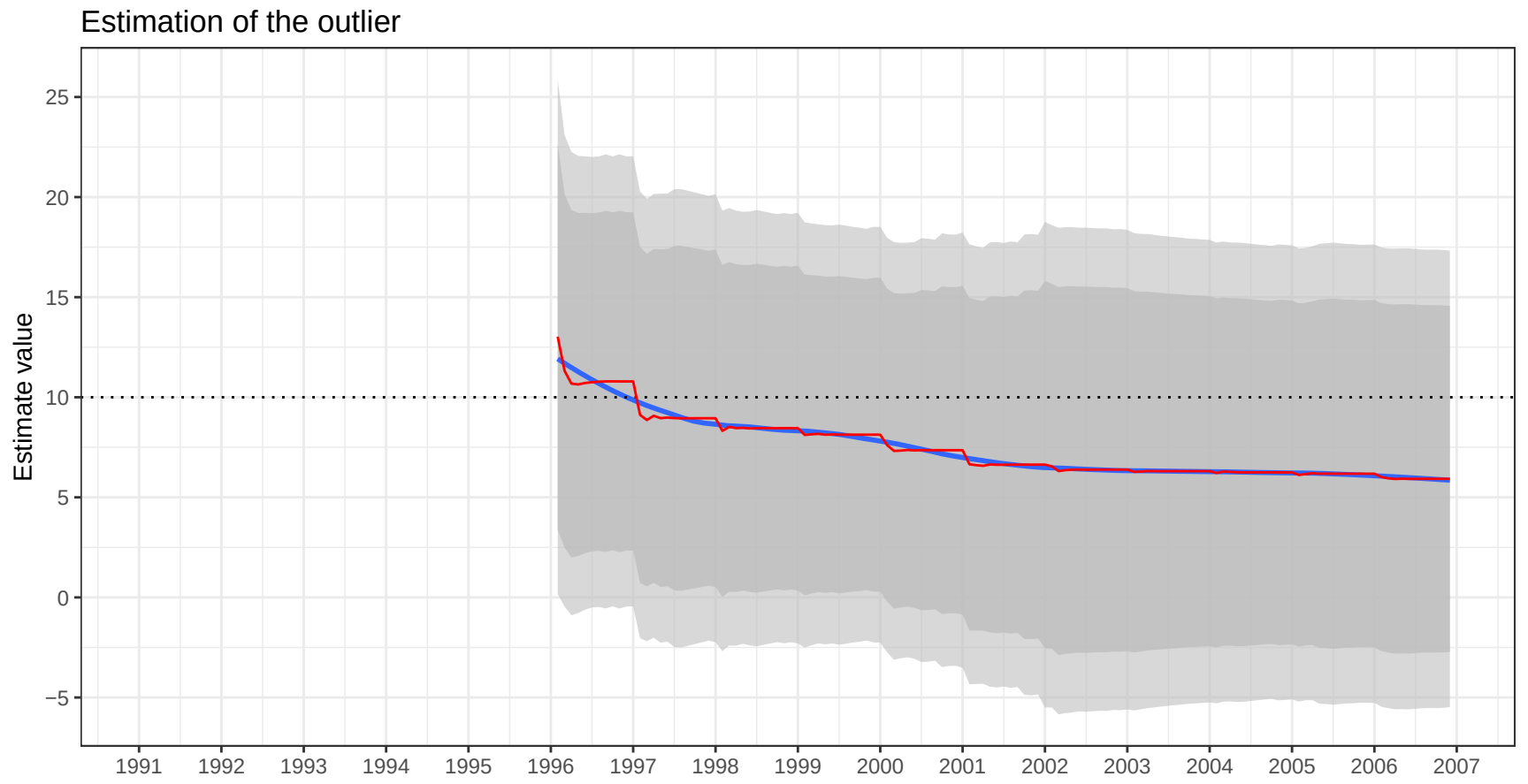
Estimate value of a LS(1995−1) FR−C2731

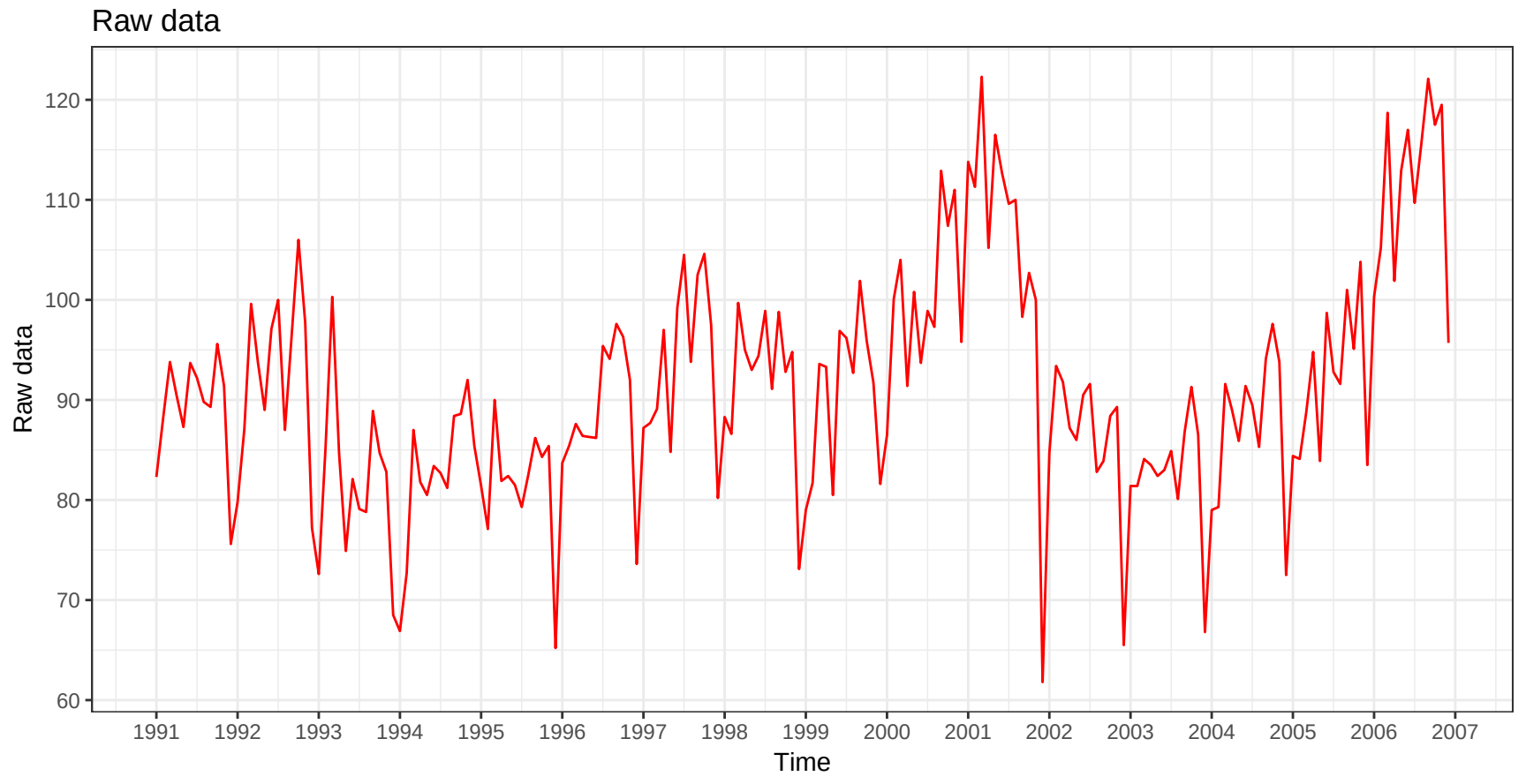
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition





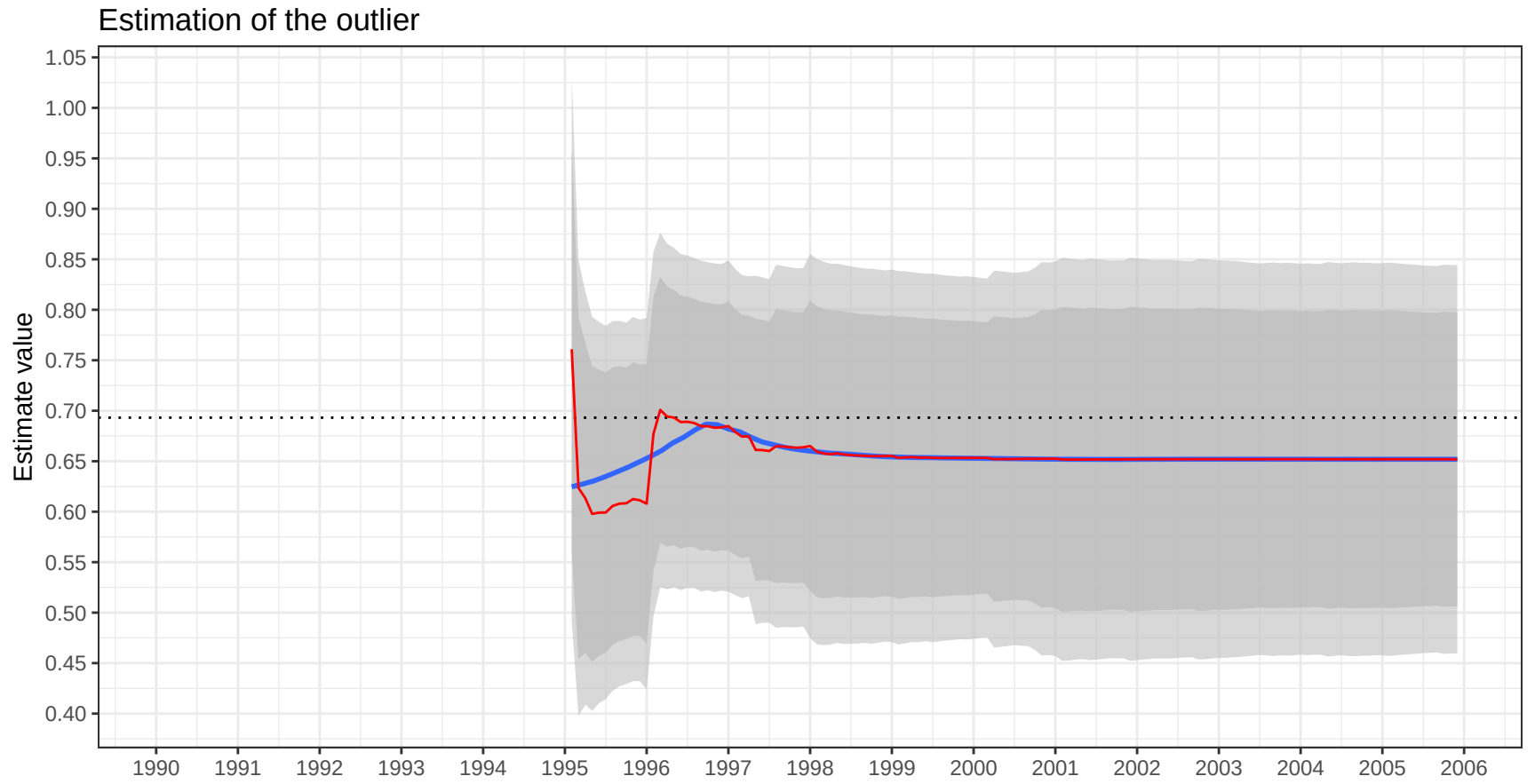
Estimate value of a LS(1996−1) DE−C2732
ARIMA (0,1,1)(0,1,1) − additive decomposition

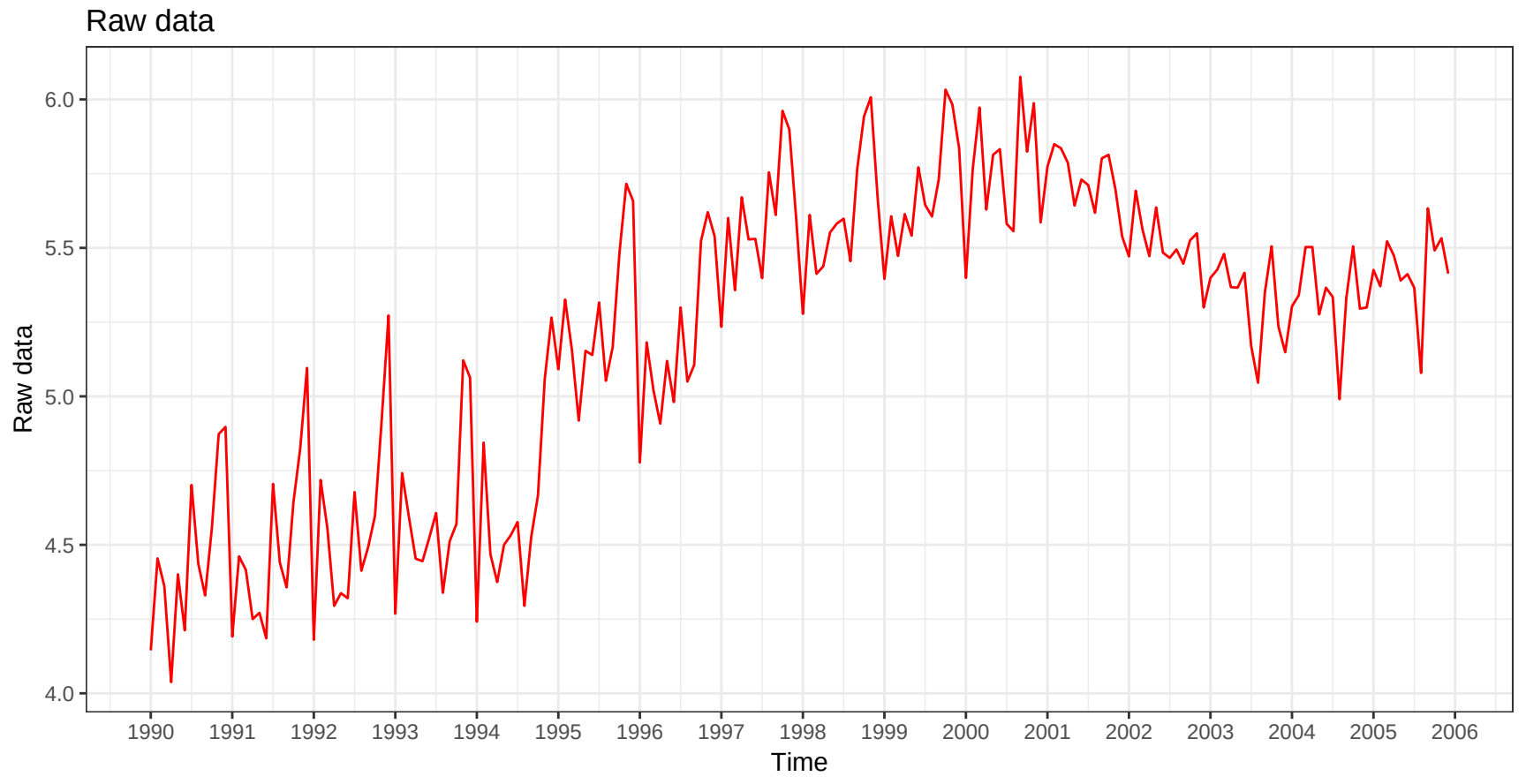


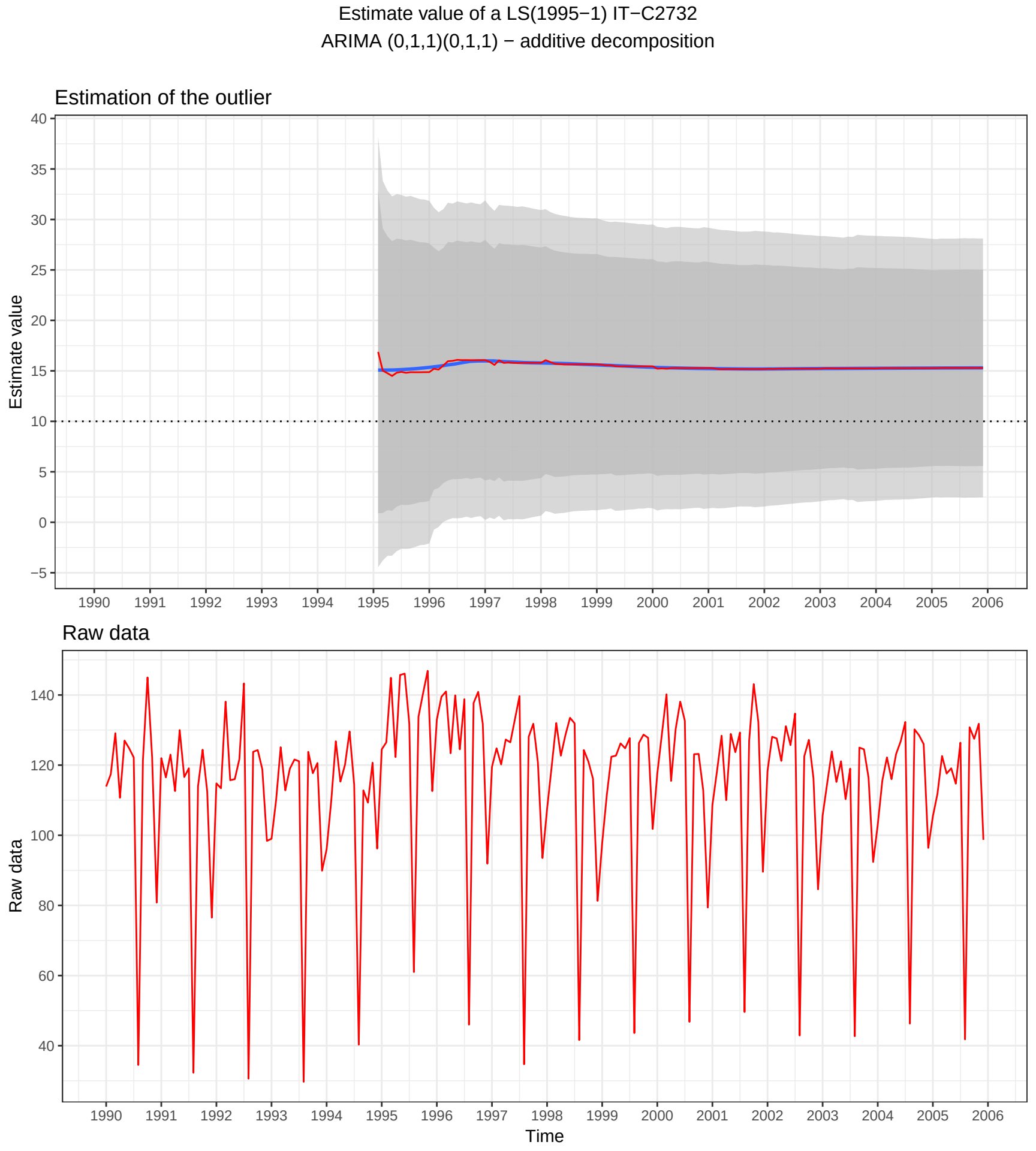


Estimate value of a LS(1995−1) FR−C2732

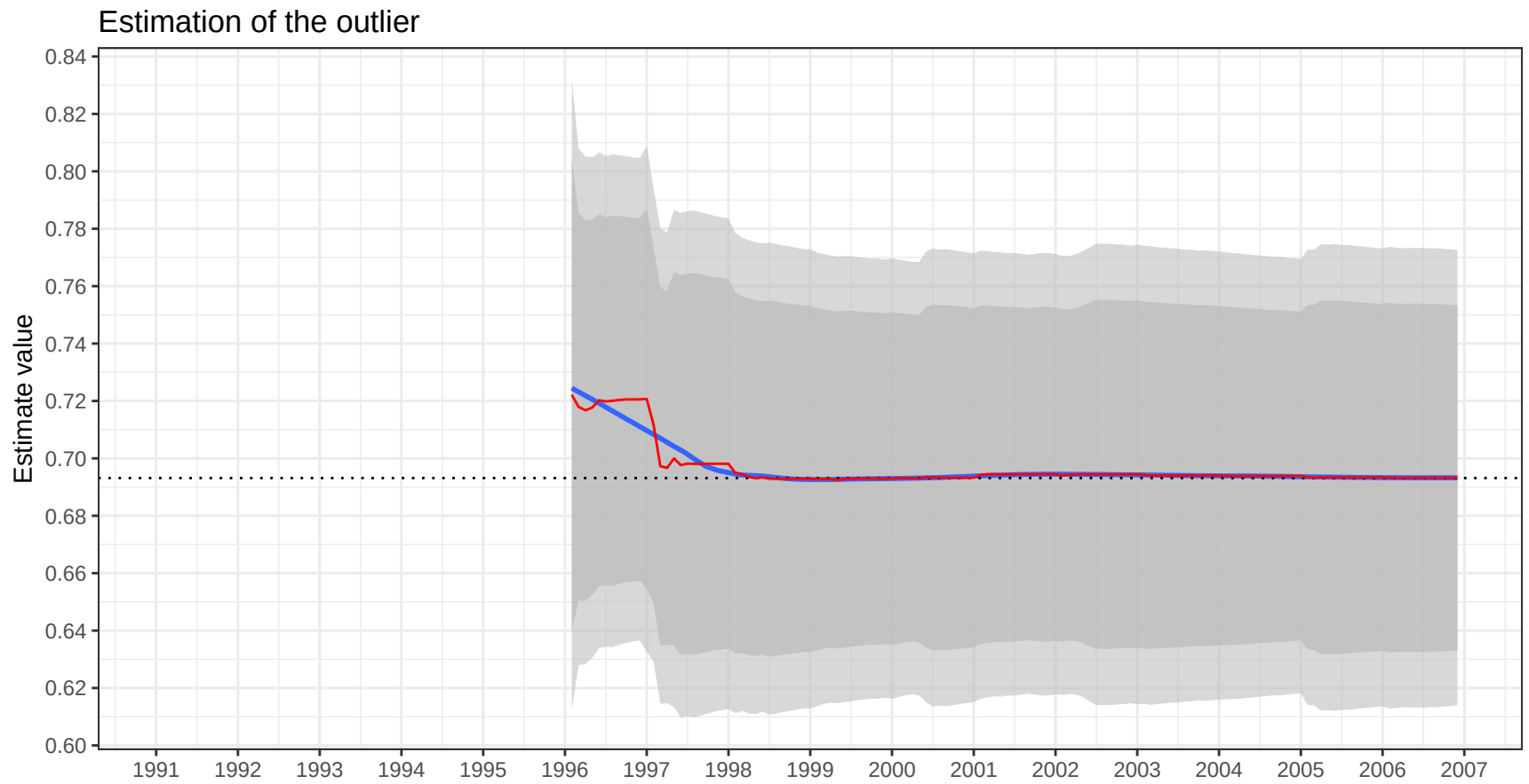
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

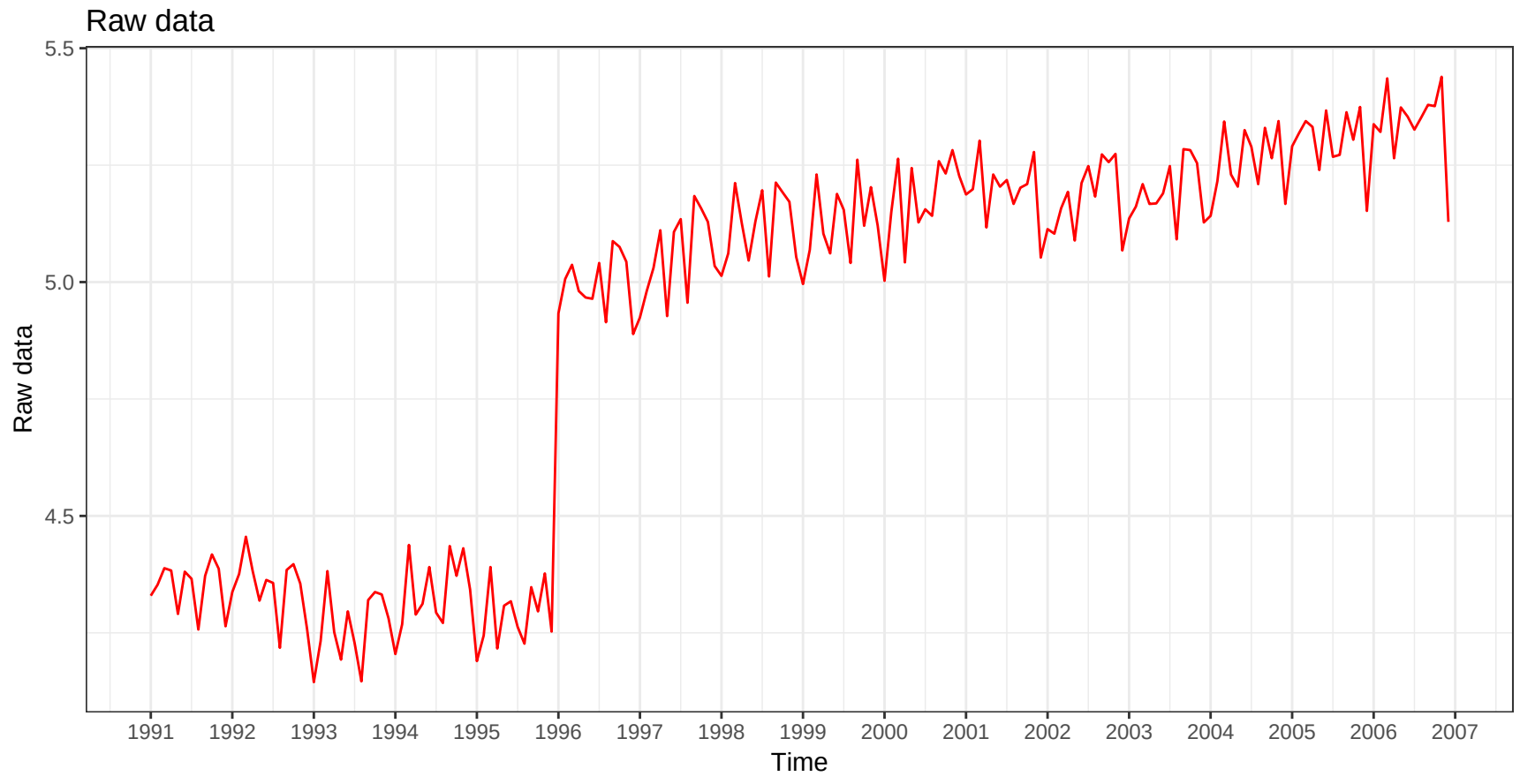





Estimate value of a LS(1995−1) IT−C2732
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
40
35
30
25
20
15
10
5
0
−5
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
140
120
100
80
60
40
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Time

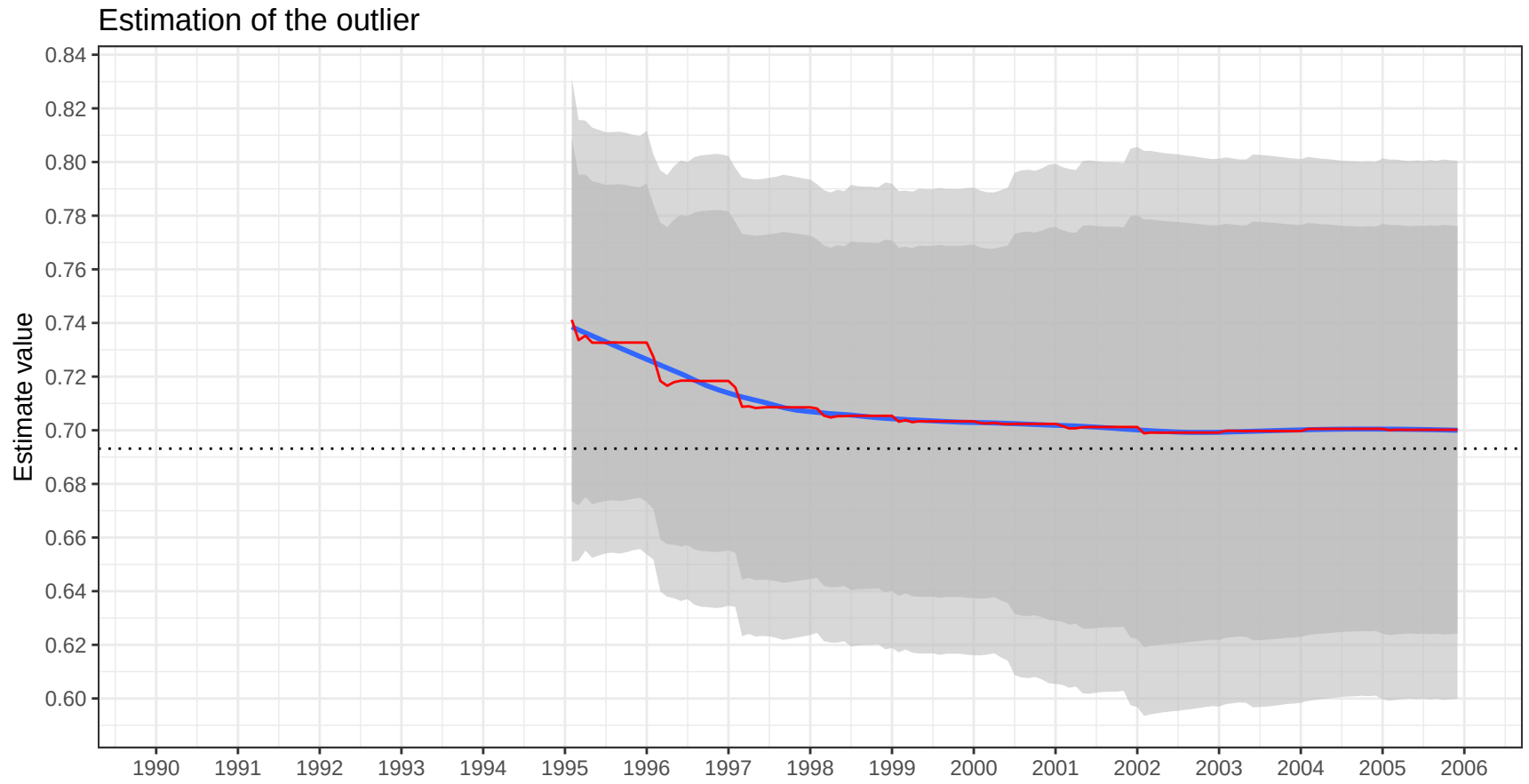
Estimate value of a LS(1996−1) DE−C2733
ARIMA (0,1,2)(0,1,1) − multiplicative decomposition

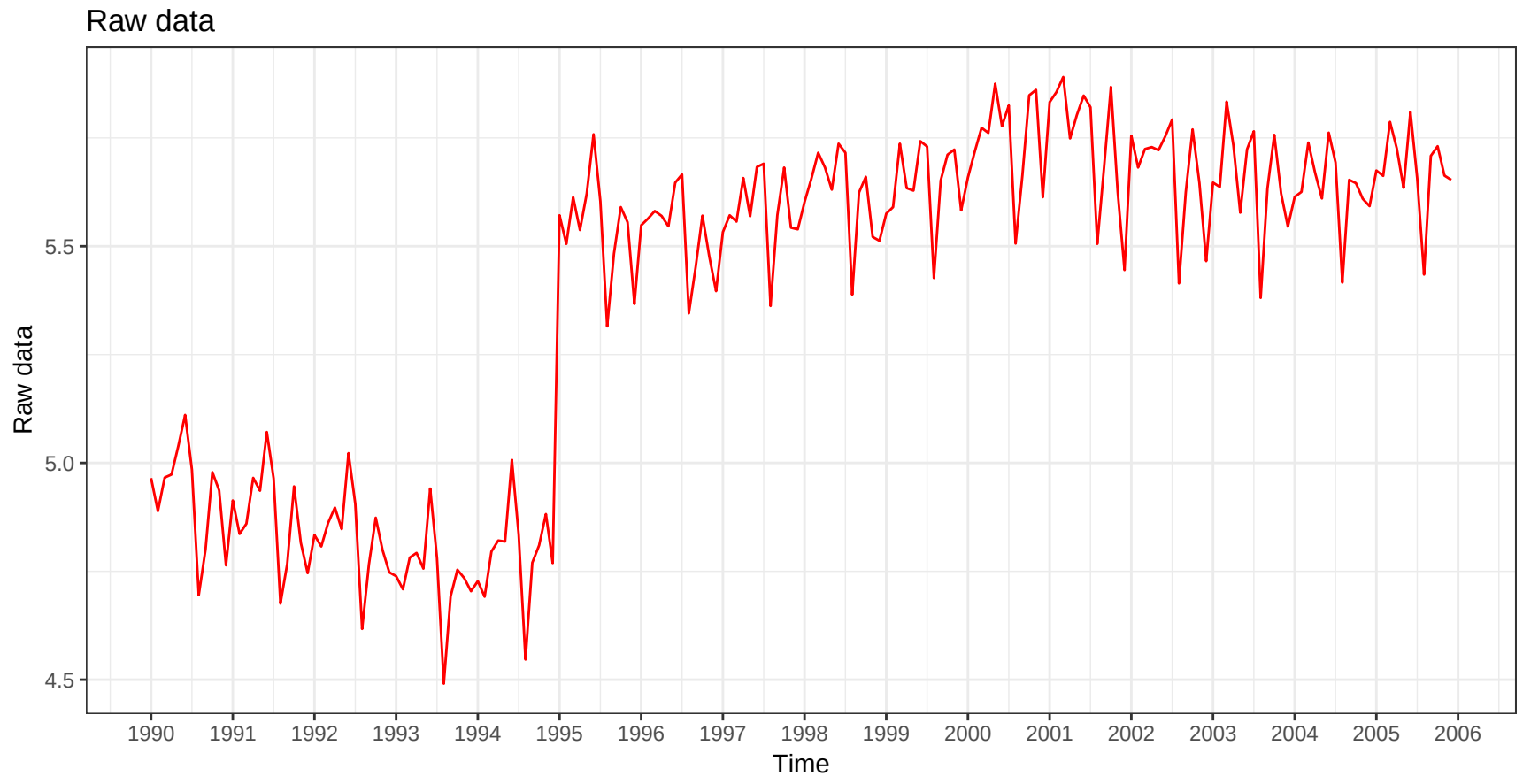


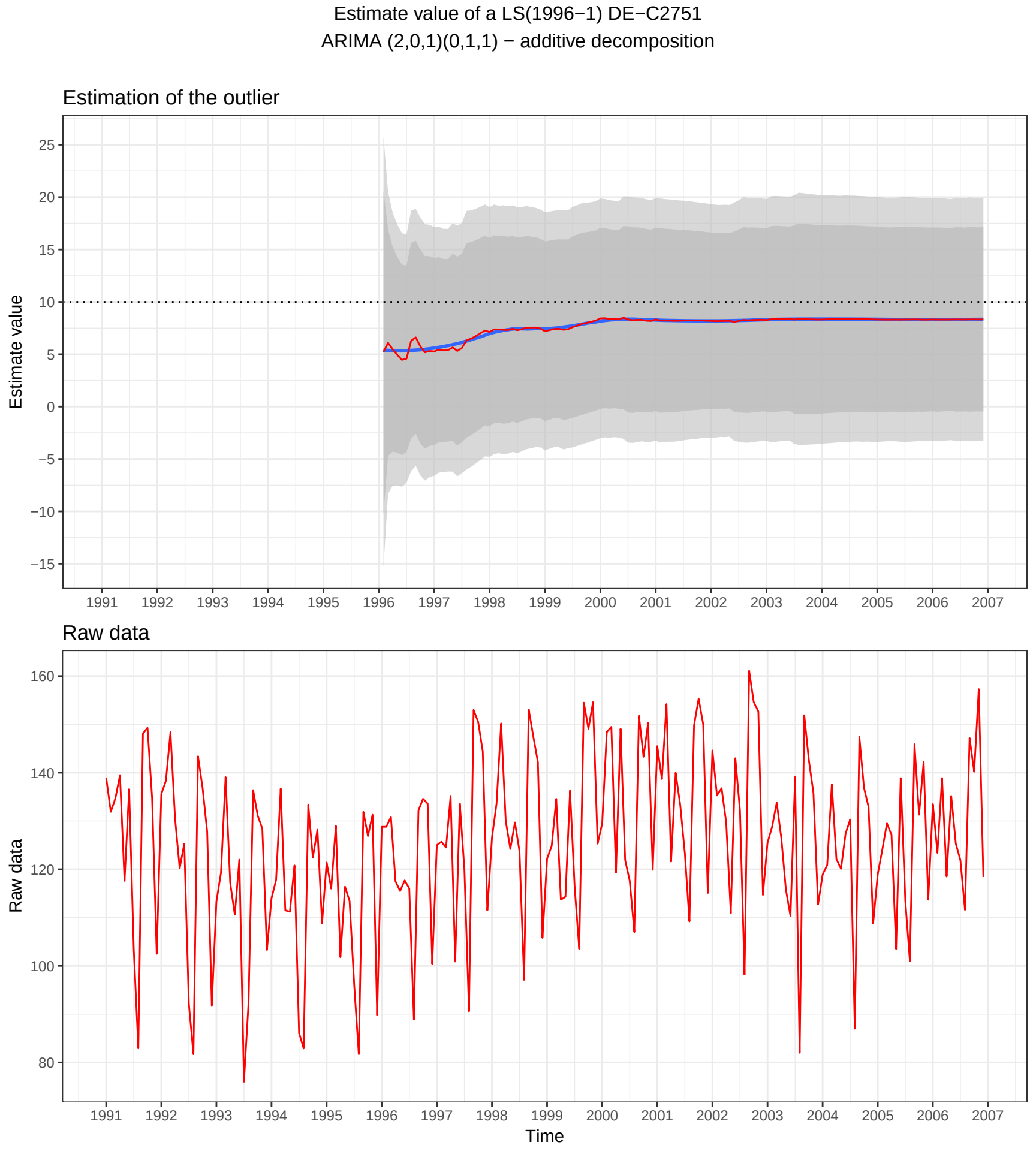


Estimate value of a LS(1995−1) FR−C2733

ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

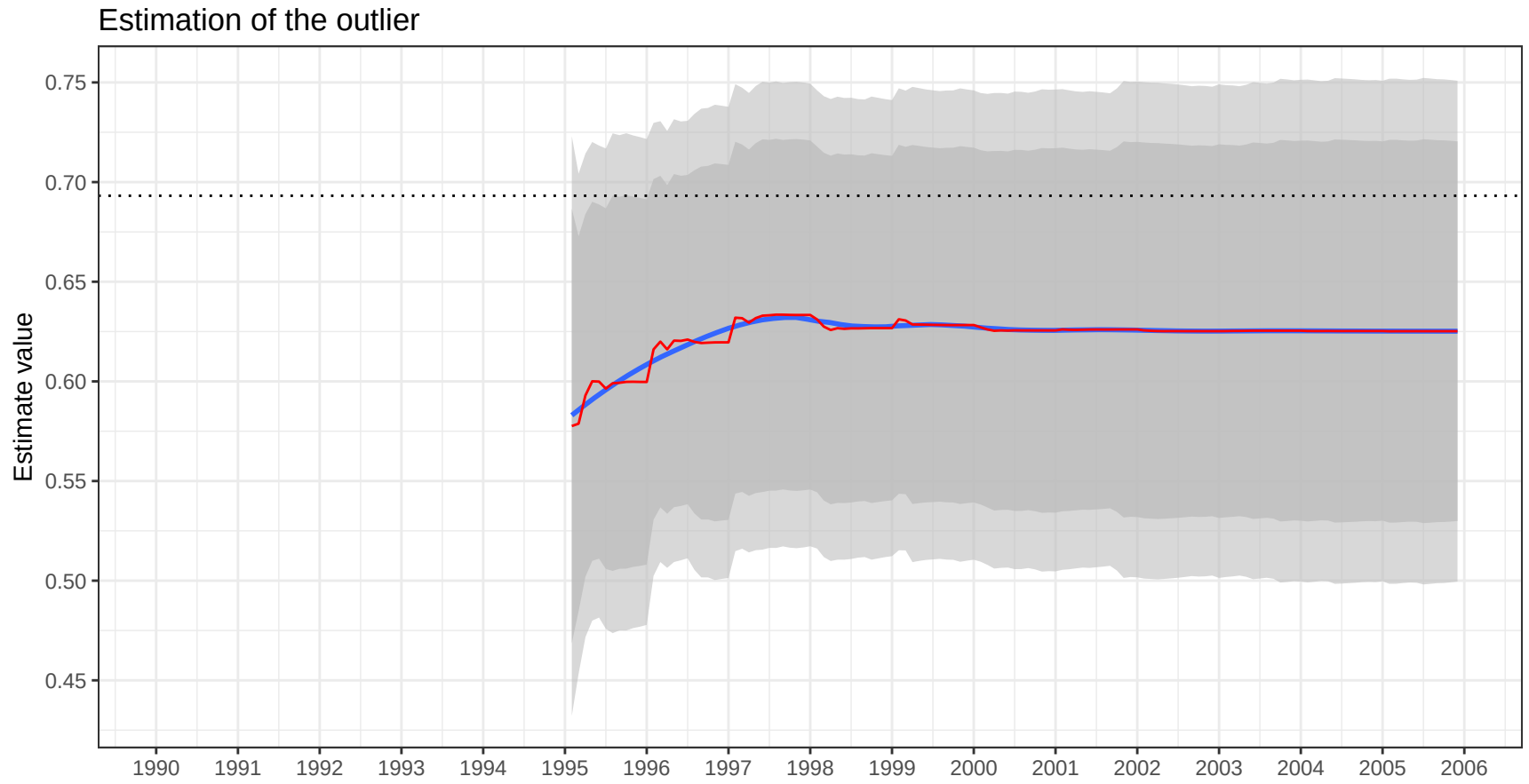


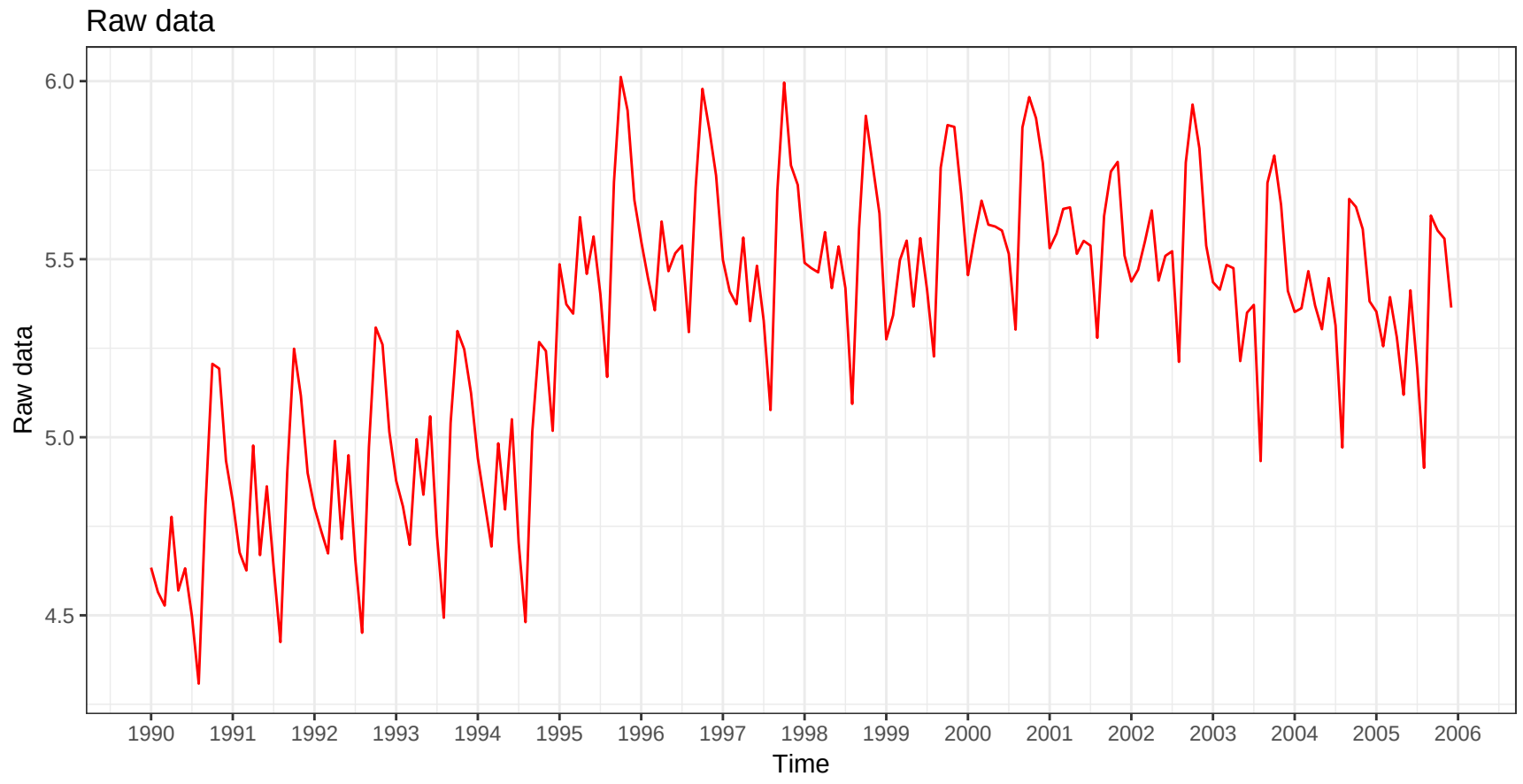



Estimate value of a LS(1996−1) DE−C2751
ARIMA (2,0,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
25
20
15
10
5
0
−5
−10
−15
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
160
140
120
100
80
Time

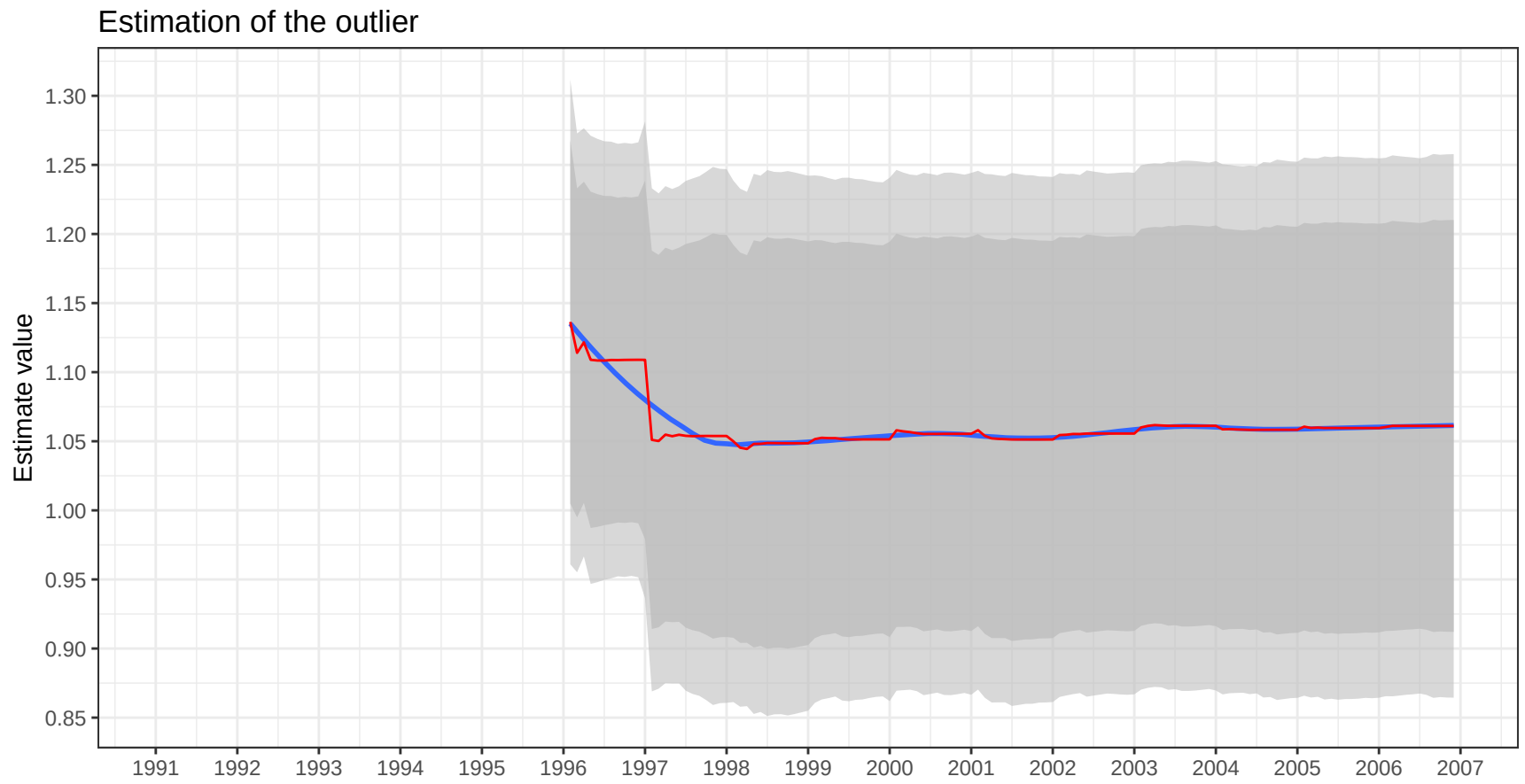
Estimate value of a LS(1995−1) FR−C2751

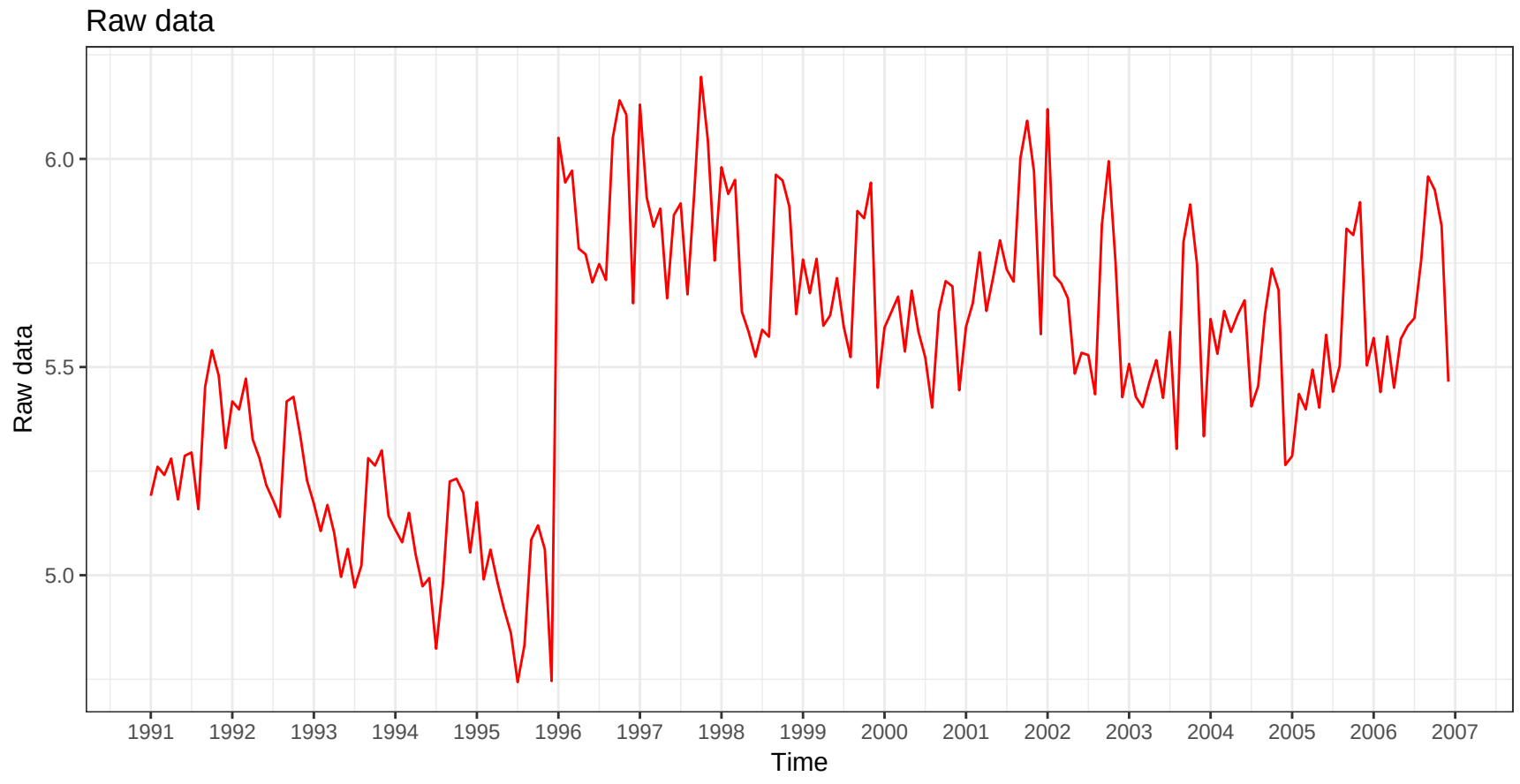
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

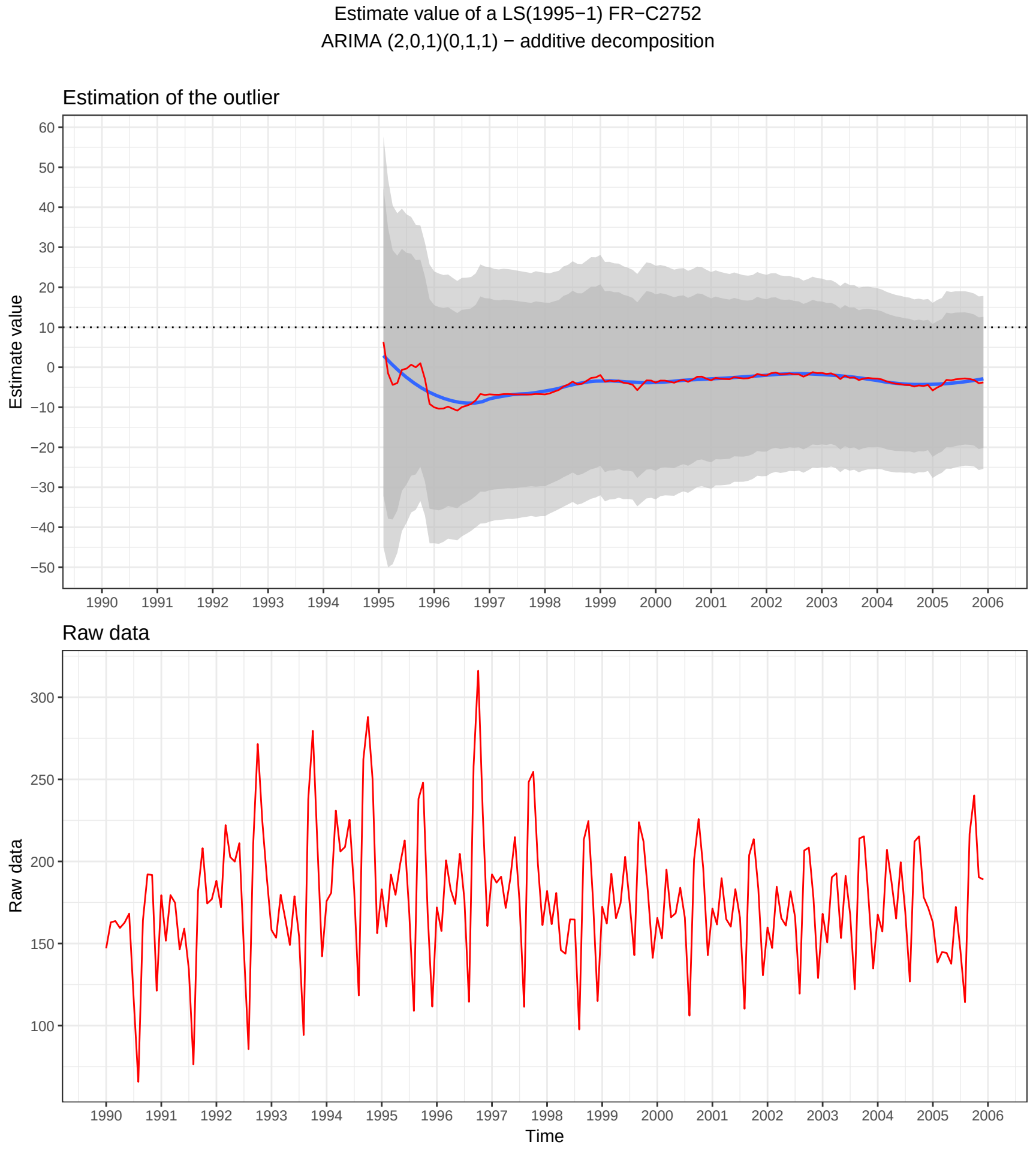


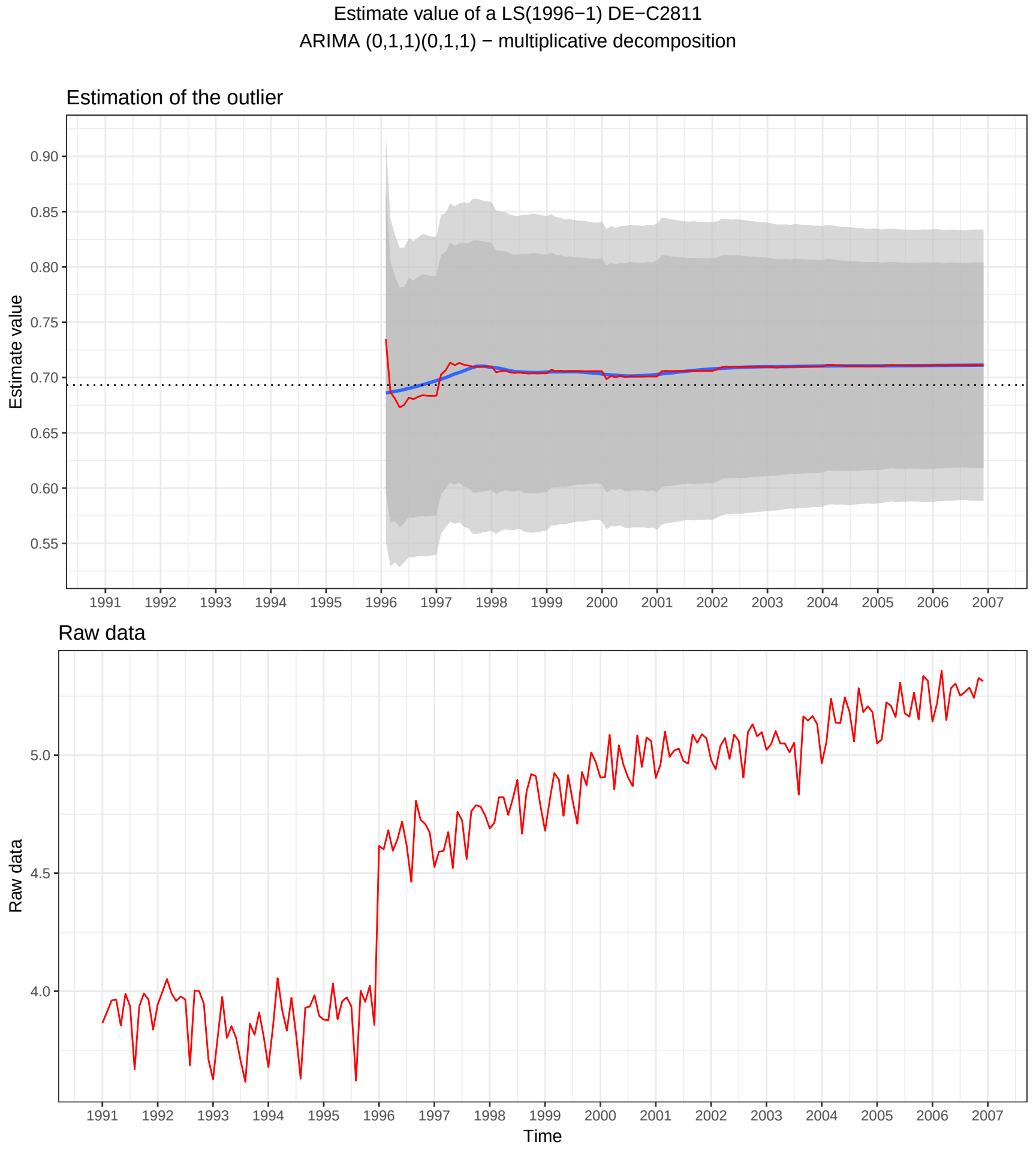


Estimate value of a LS(1996−1) DE−C2752
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

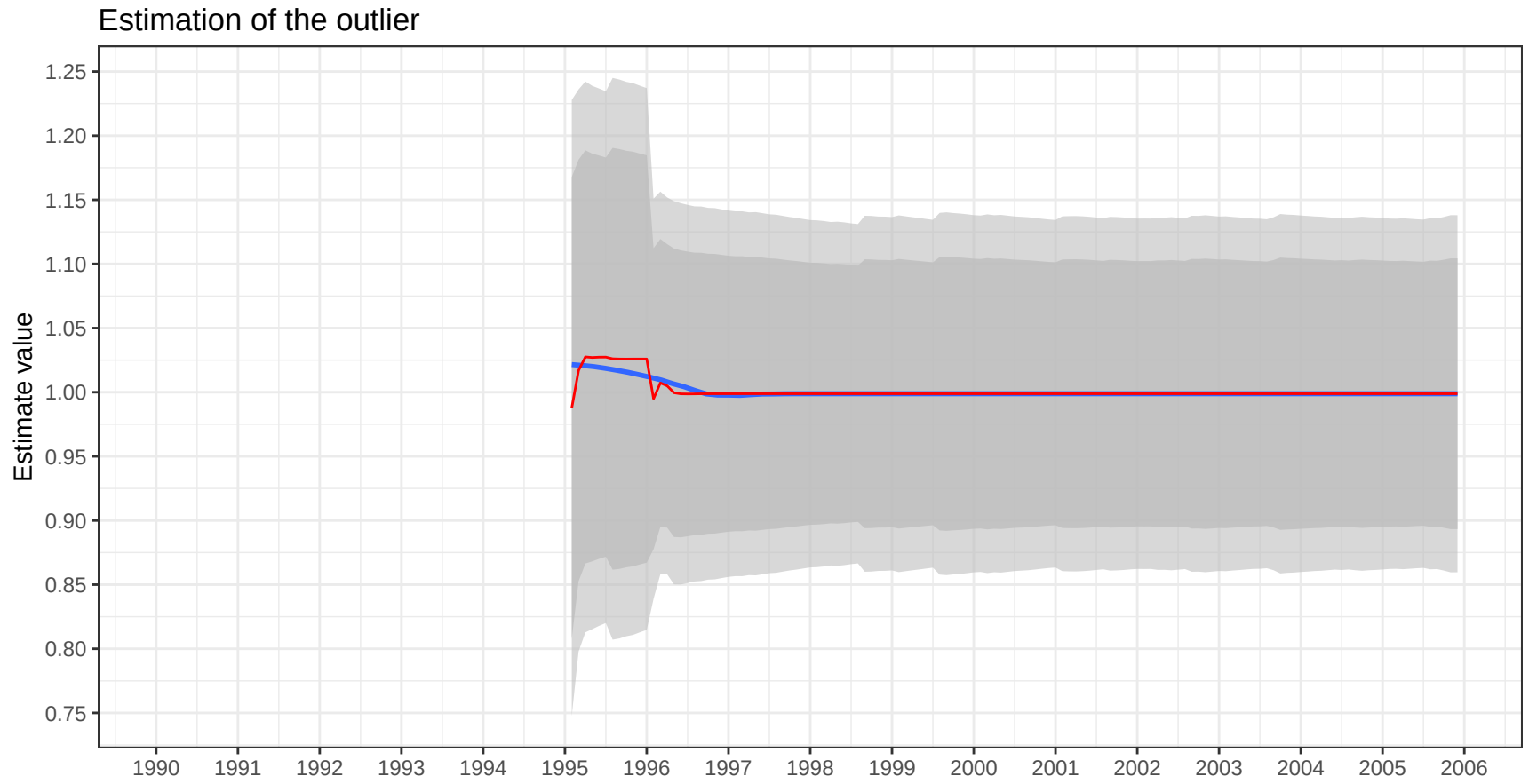


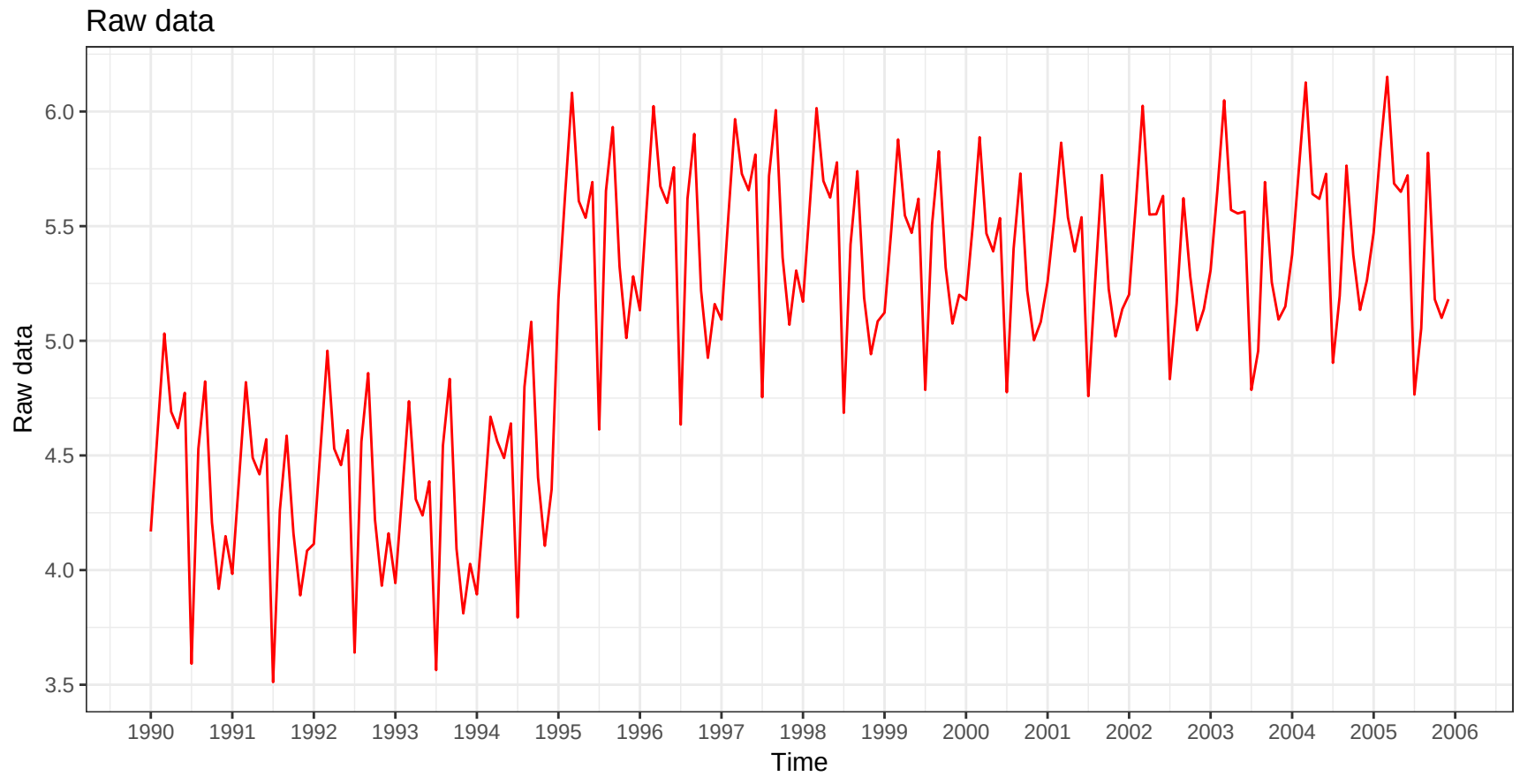



Estimate value of a LS(1995−1) FR−C2752
ARIMA (2,0,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
60
50
40
30
20
10
0
−10
−20
−30
−40
−50
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
300
250
200
150
100
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Time

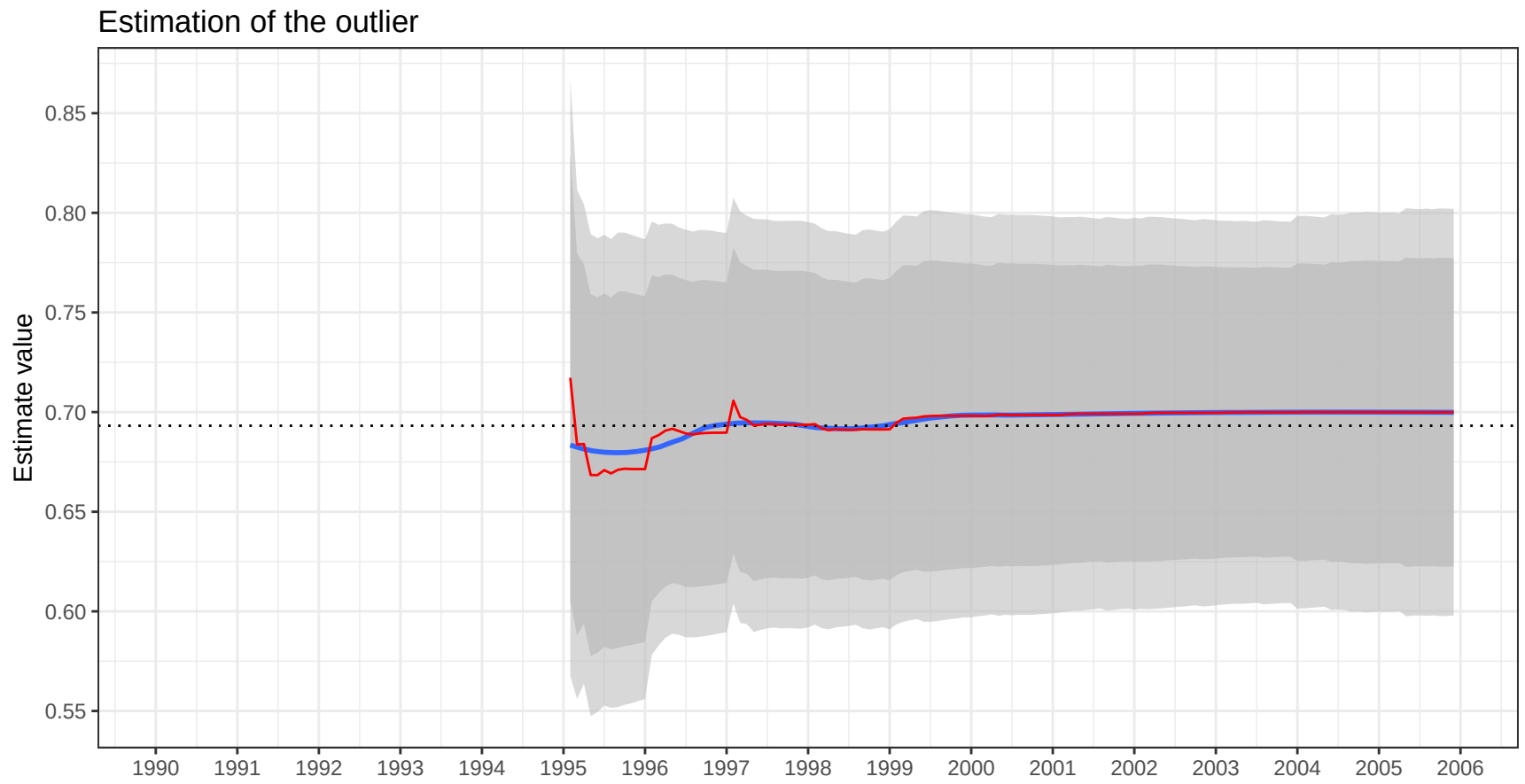

Estimate value of a LS(1996−1) DE−C2811
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0.55
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
5.0
4.5
4.0
Time

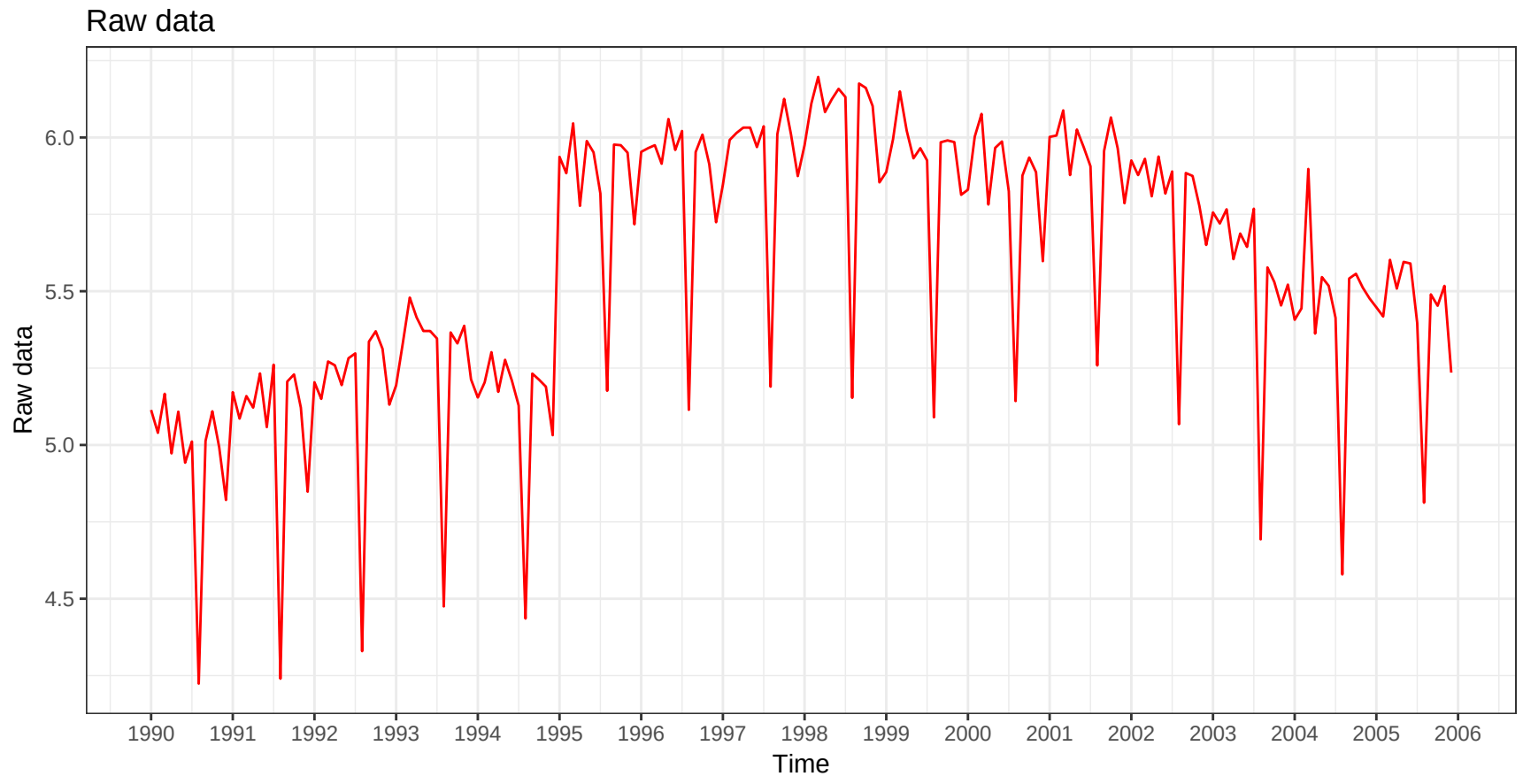
Estimate value of a LS(1995−1) FR−C2811
ARIMA (0,1,1)(0,1,0) − multiplicative decomposition



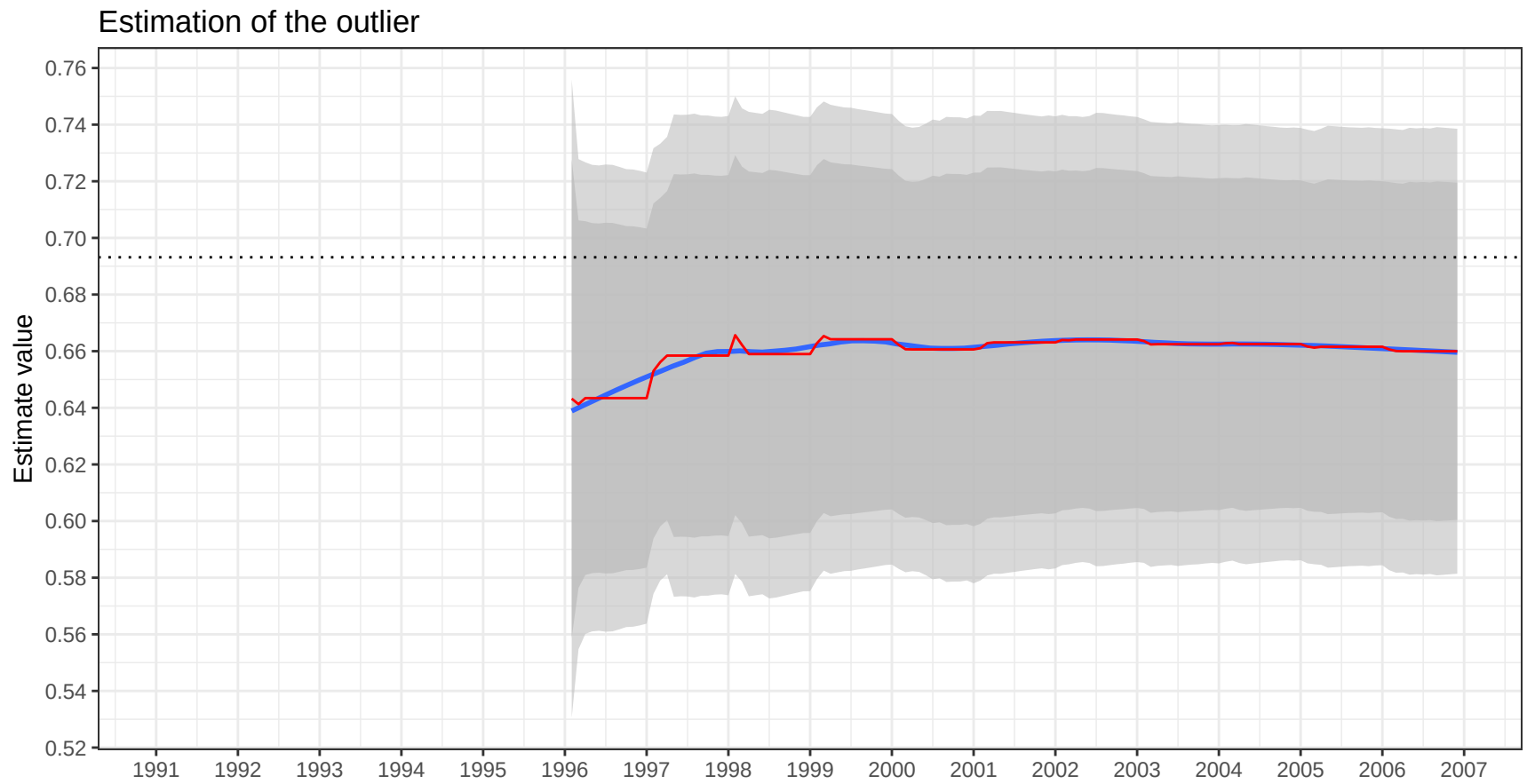


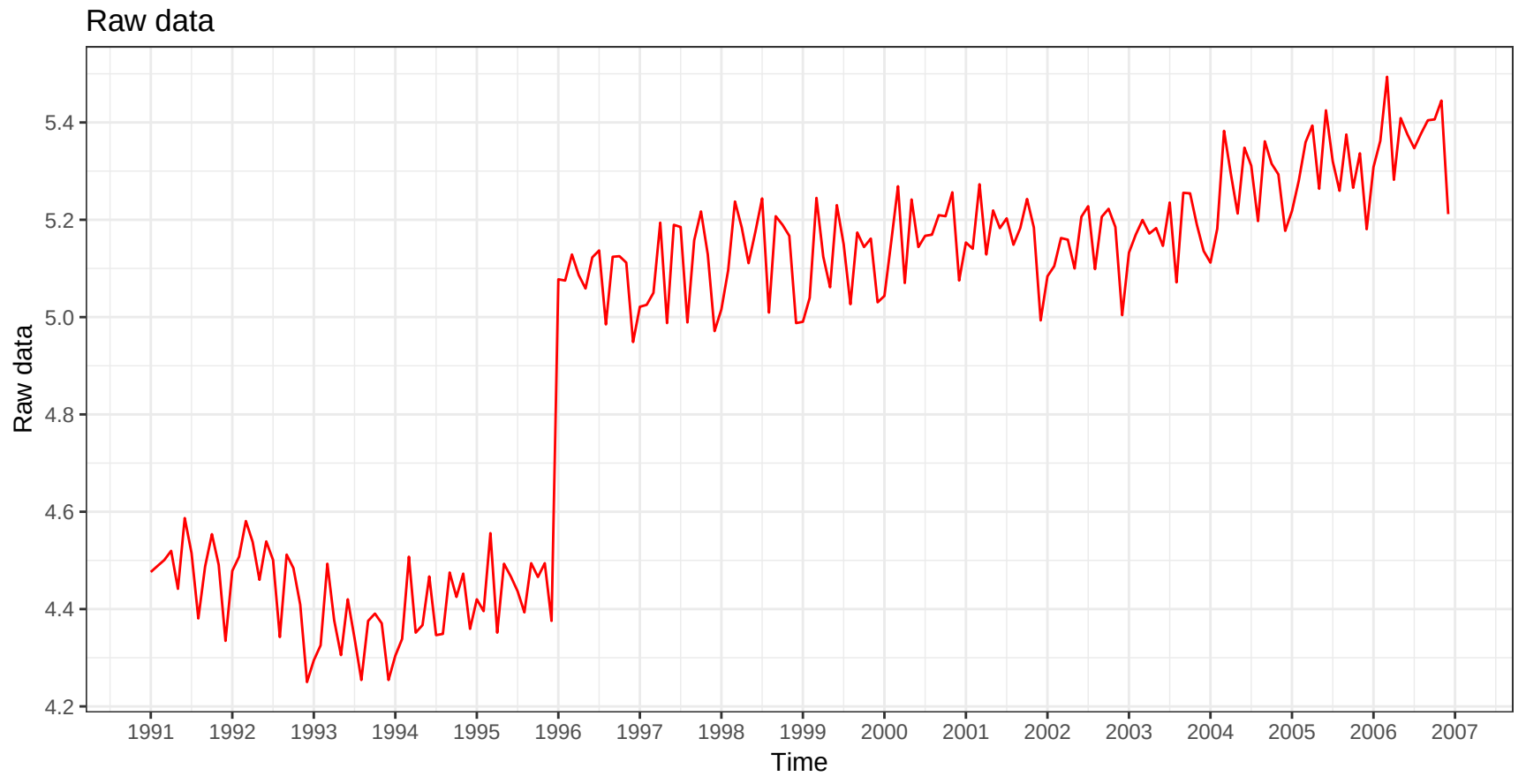
Estimate value of a LS(1995−1) IT−C2811
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition





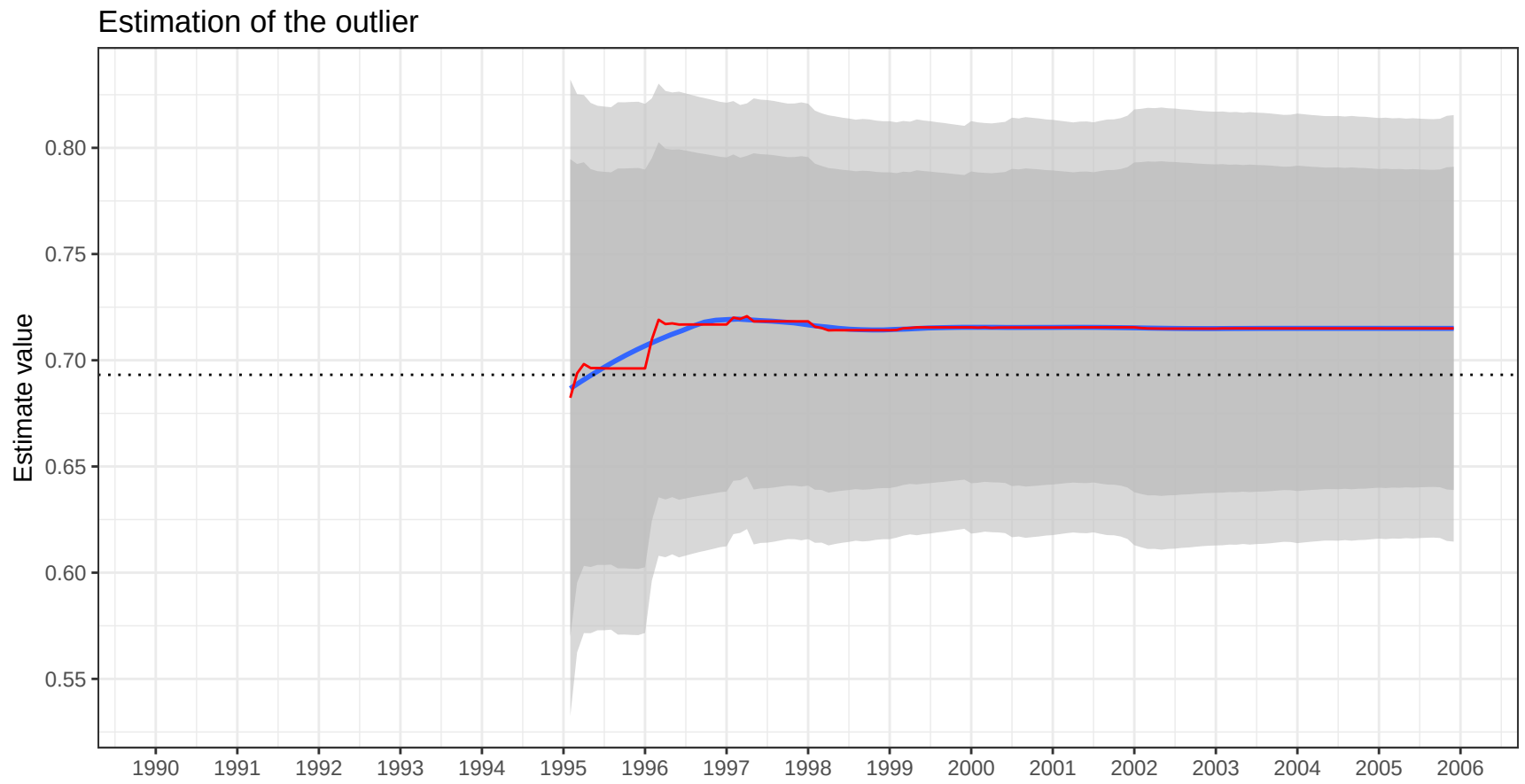
Estimate value of a LS(1996−1) DE−C2812
ARIMA (2,1,0)(0,1,1) − multiplicative decomposition

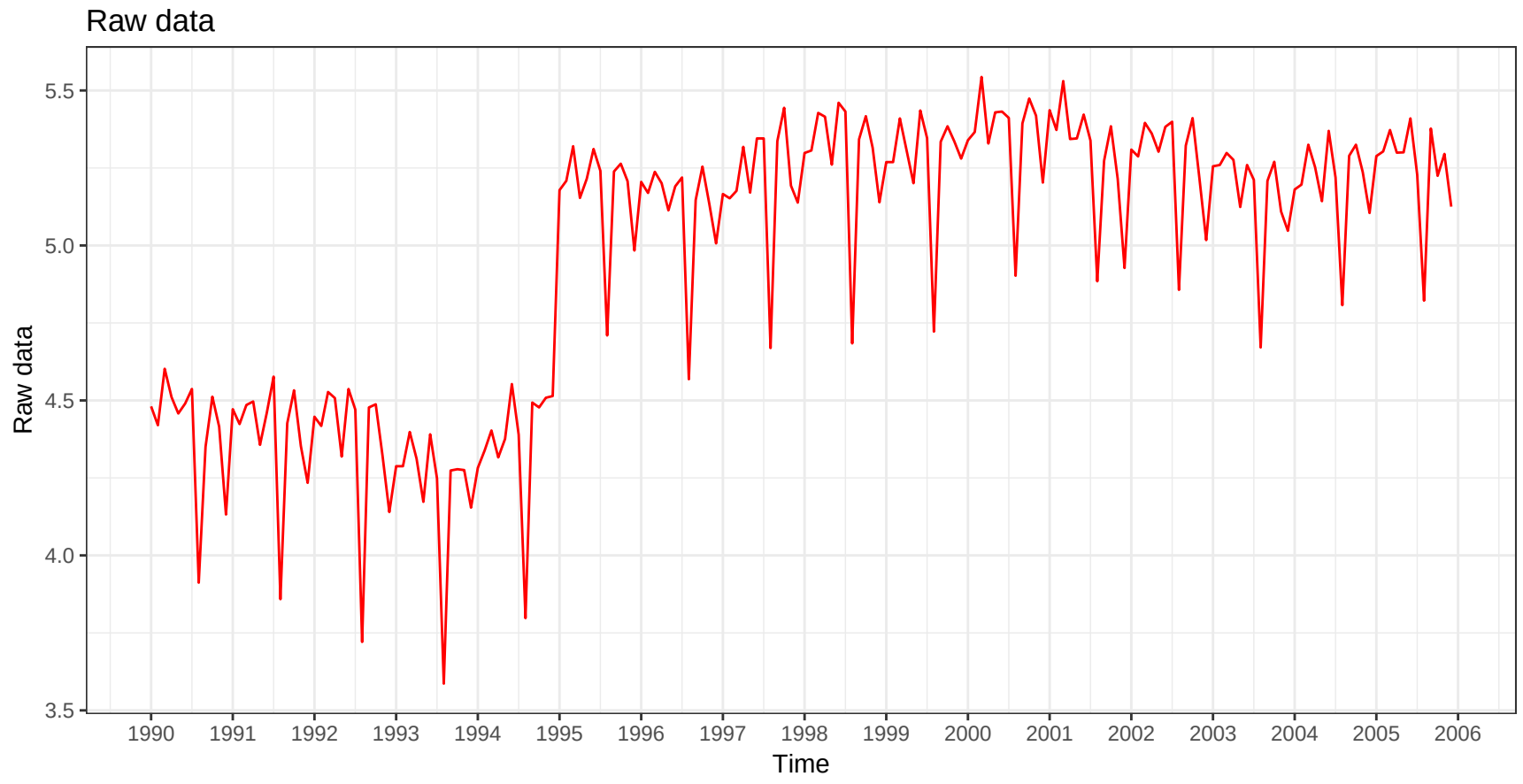




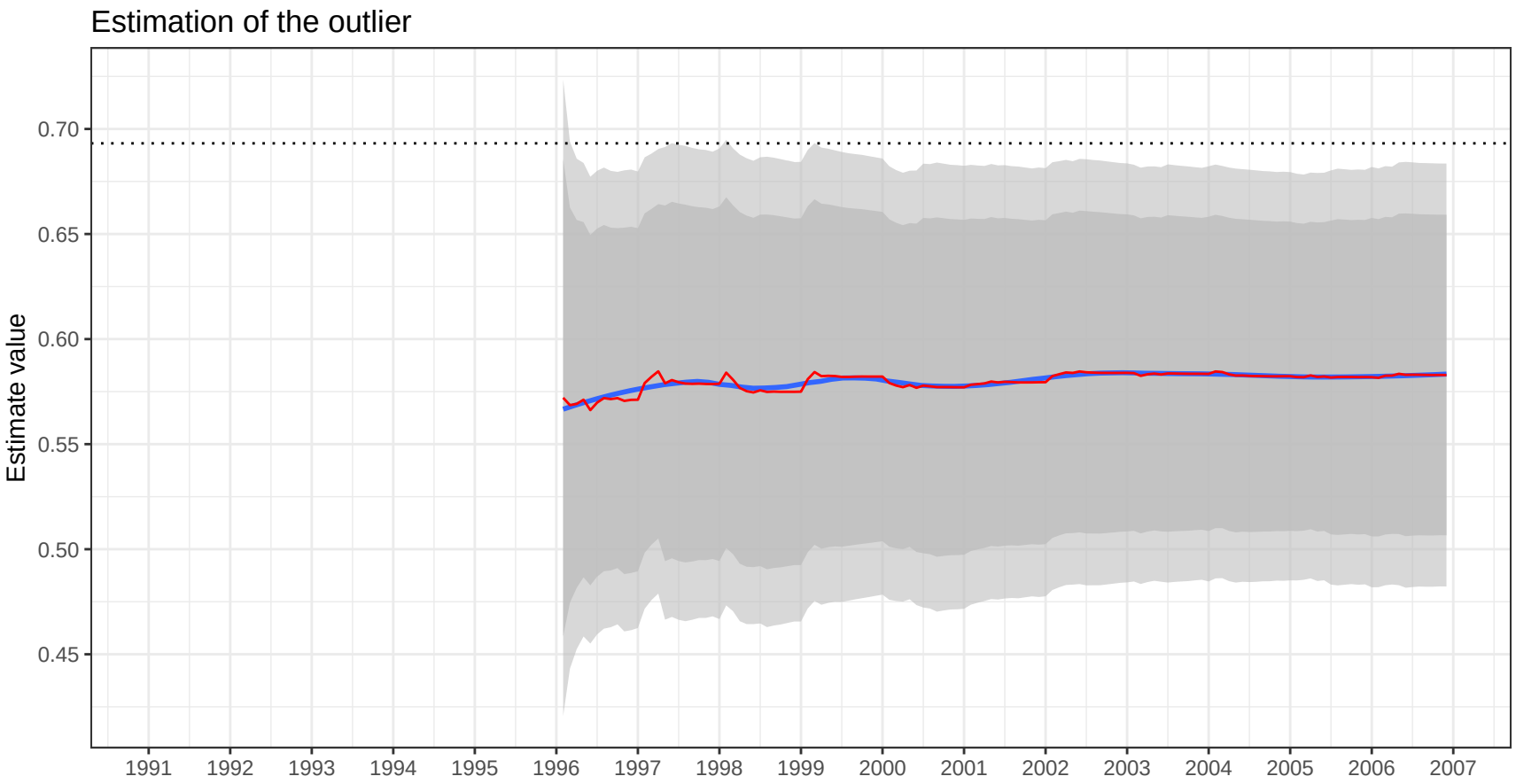
Estimate value of a LS(1995−1) FR−C2812

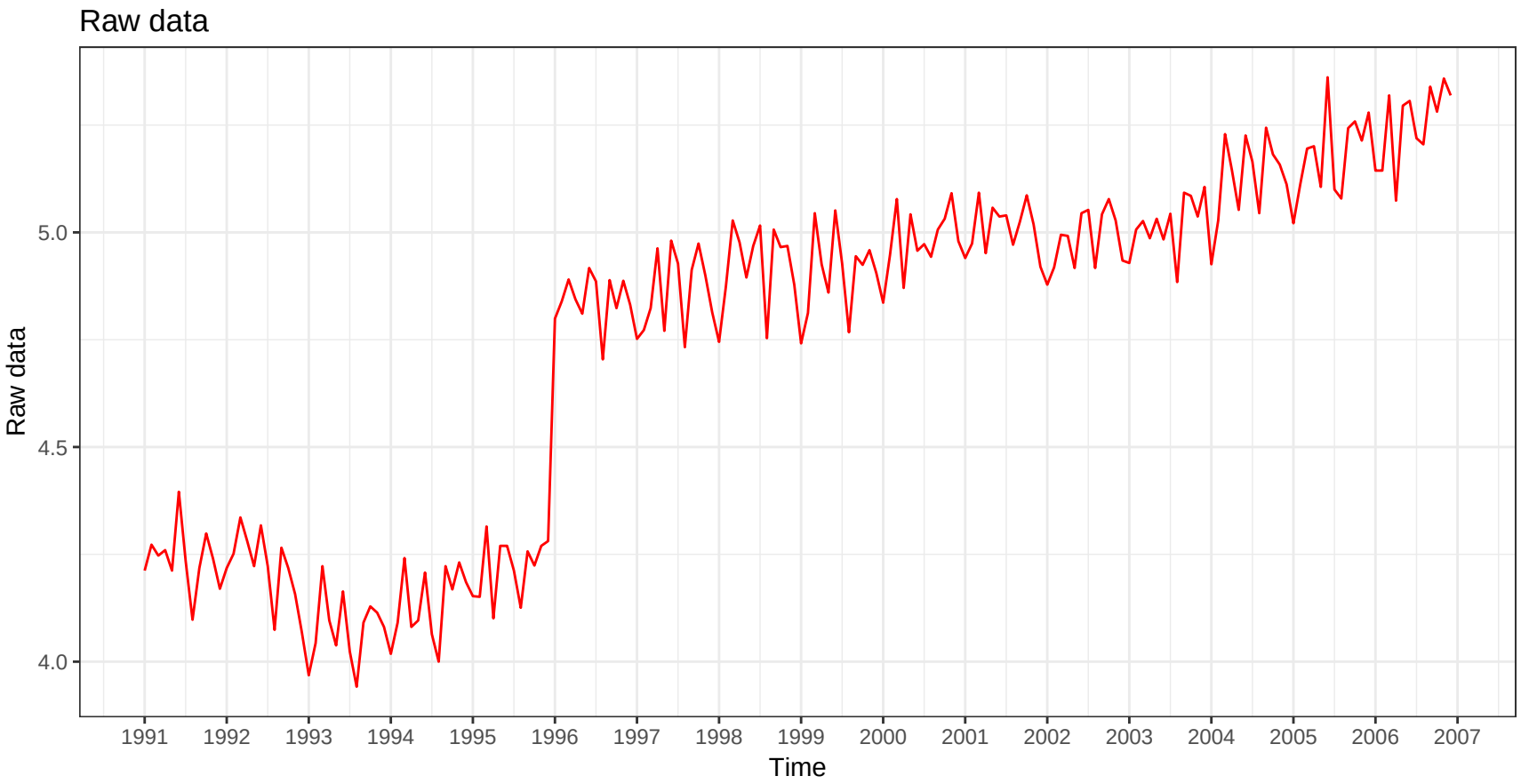
ARIMA (3,1,1)(0,1,1) − multiplicative decomposition



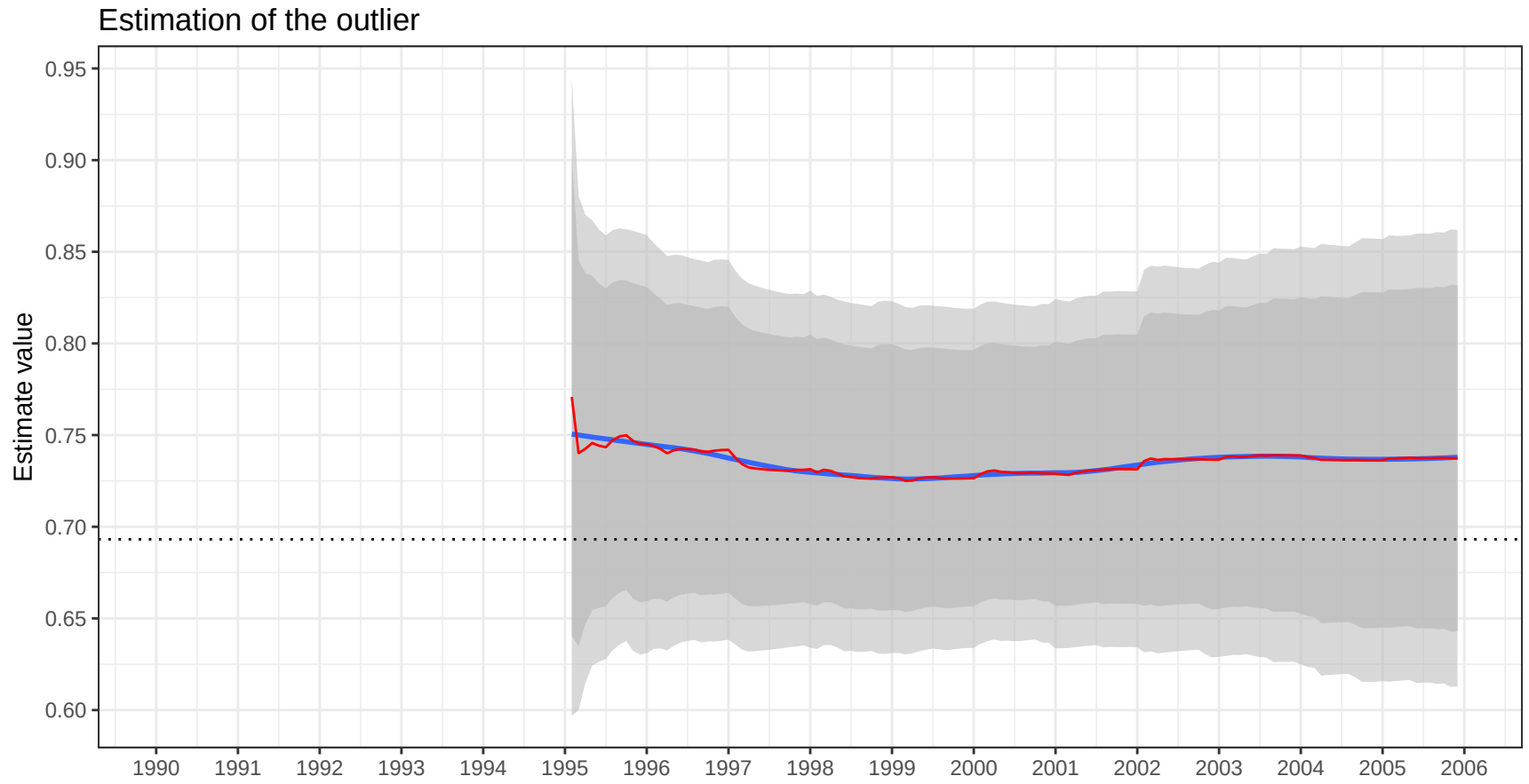


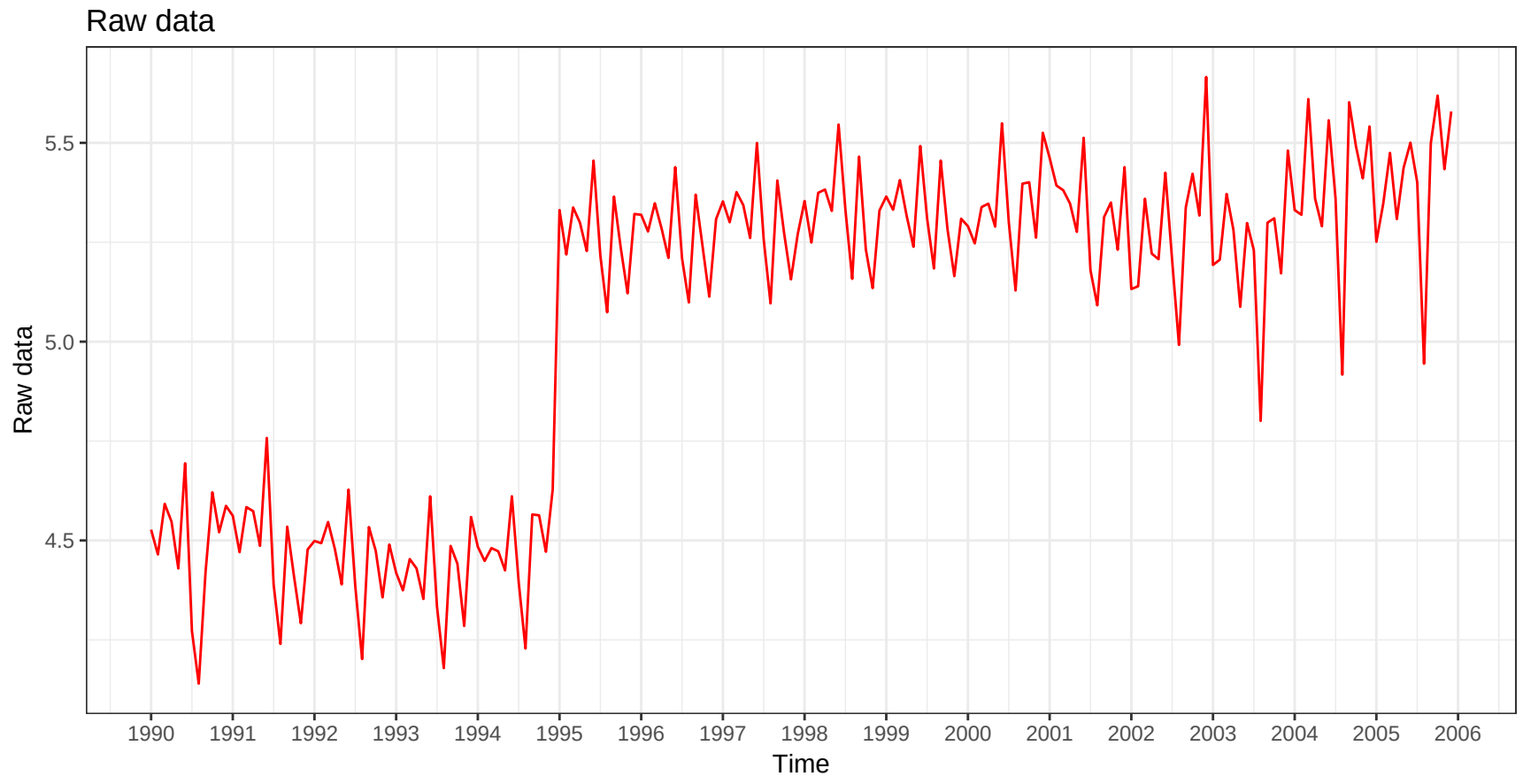
Estimate value of a LS(1996−1) DE−C2813
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition



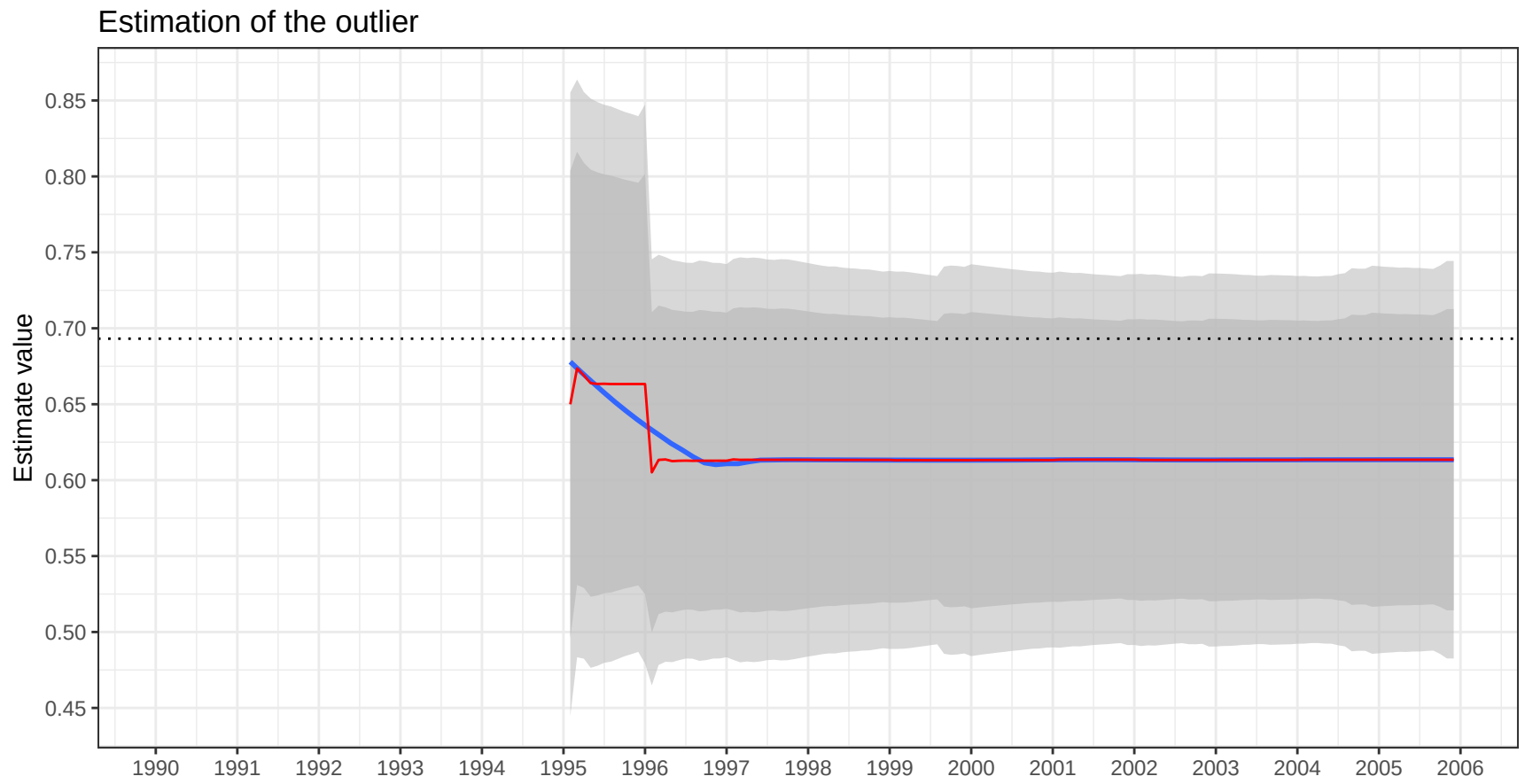


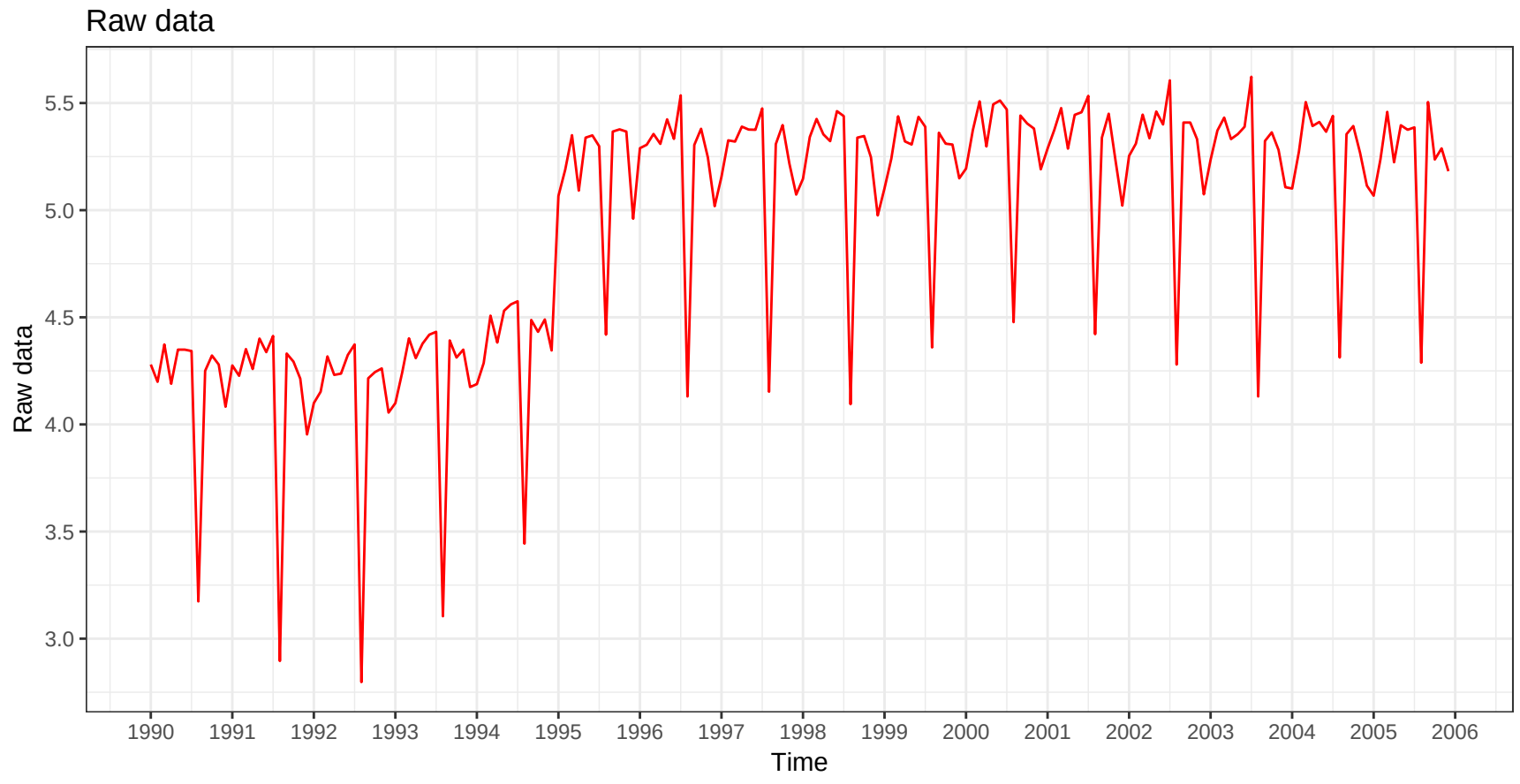
Estimate value of a LS(1995−1) FR−C2813
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition



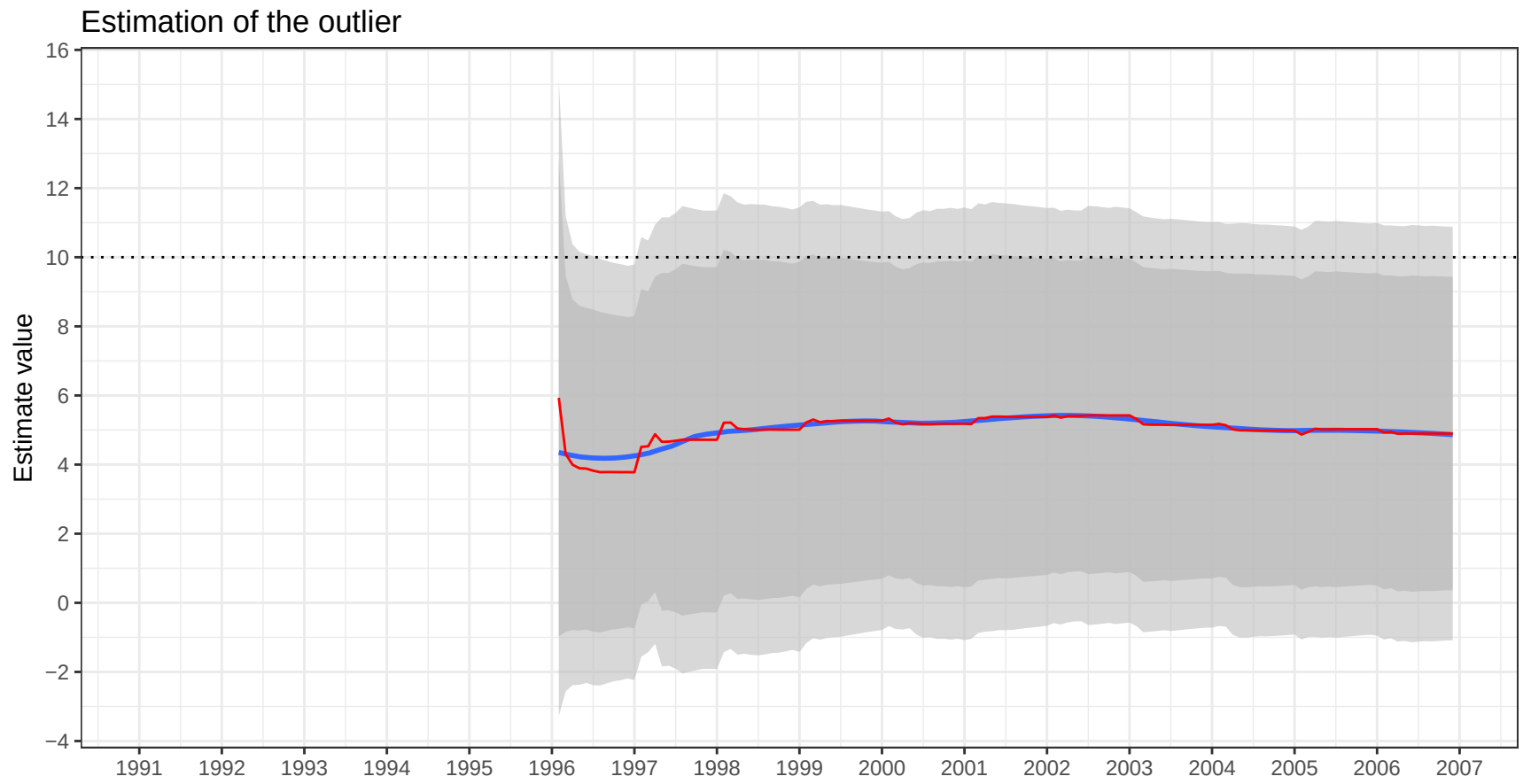


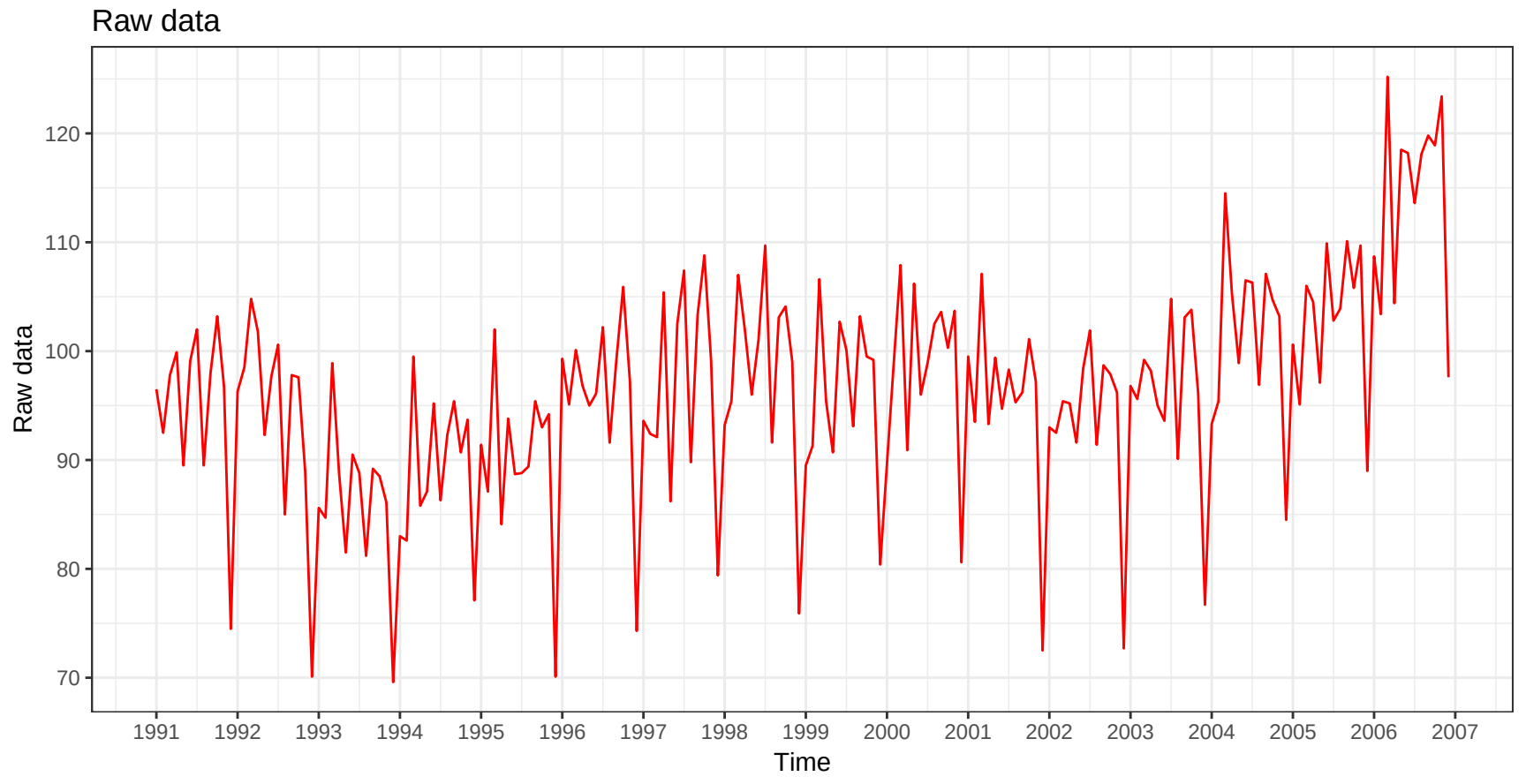
Estimate value of a LS(1995−1) IT−C2813
ARIMA (0,1,1)(1,1,1) − multiplicative decomposition





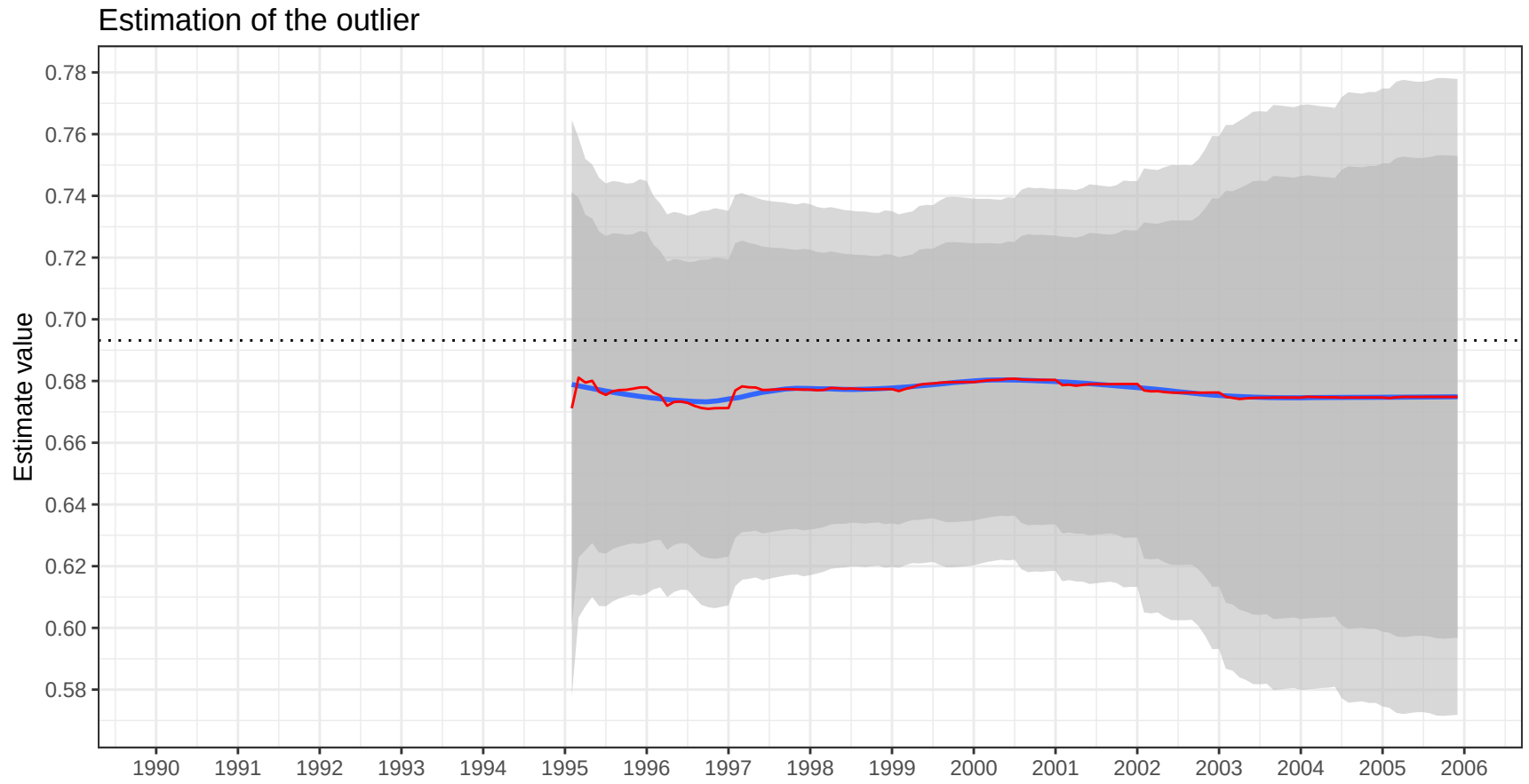
Estimate value of a LS(1996−1) DE−C2814
ARIMA (0,1,2)(0,1,1) − additive decomposition

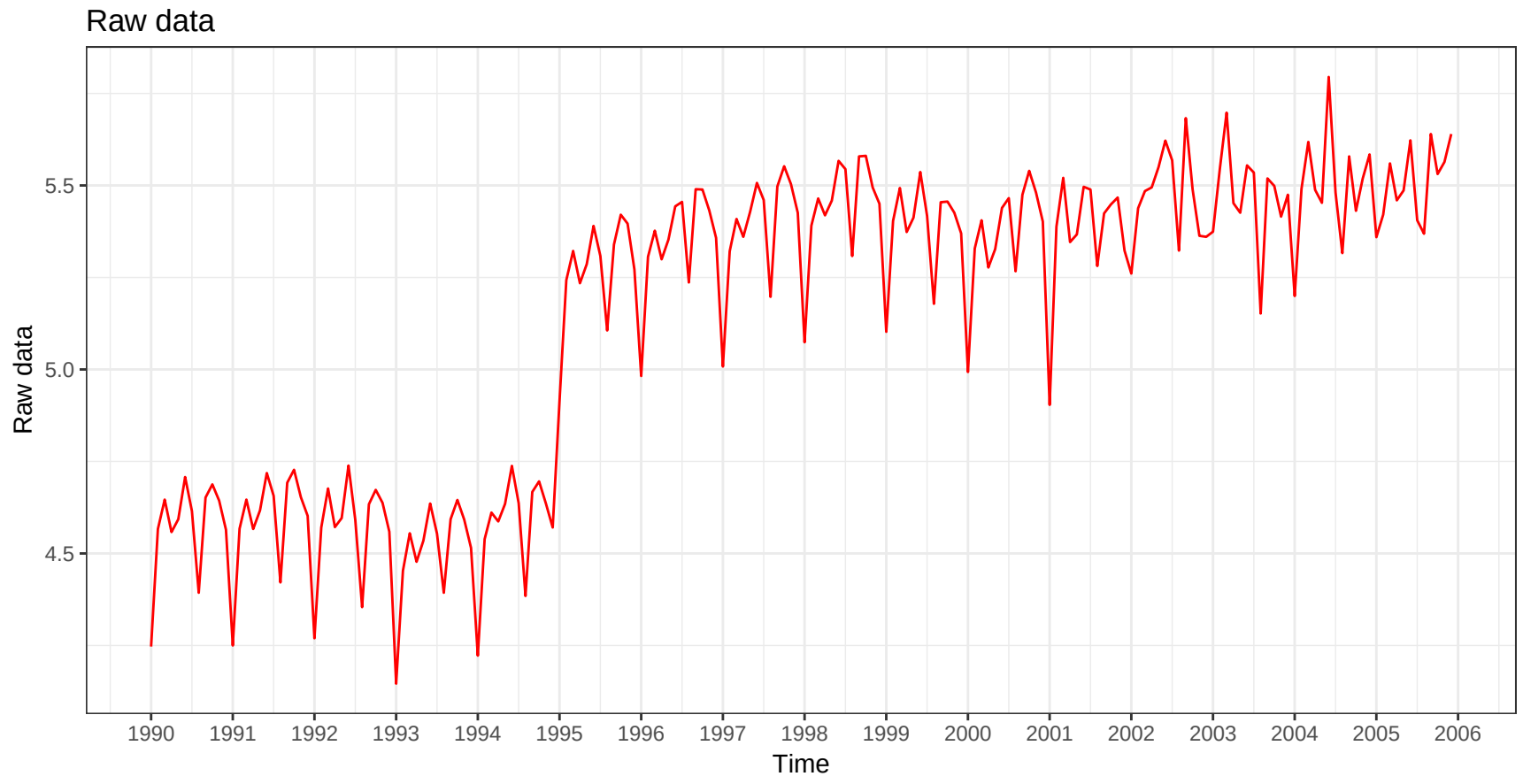


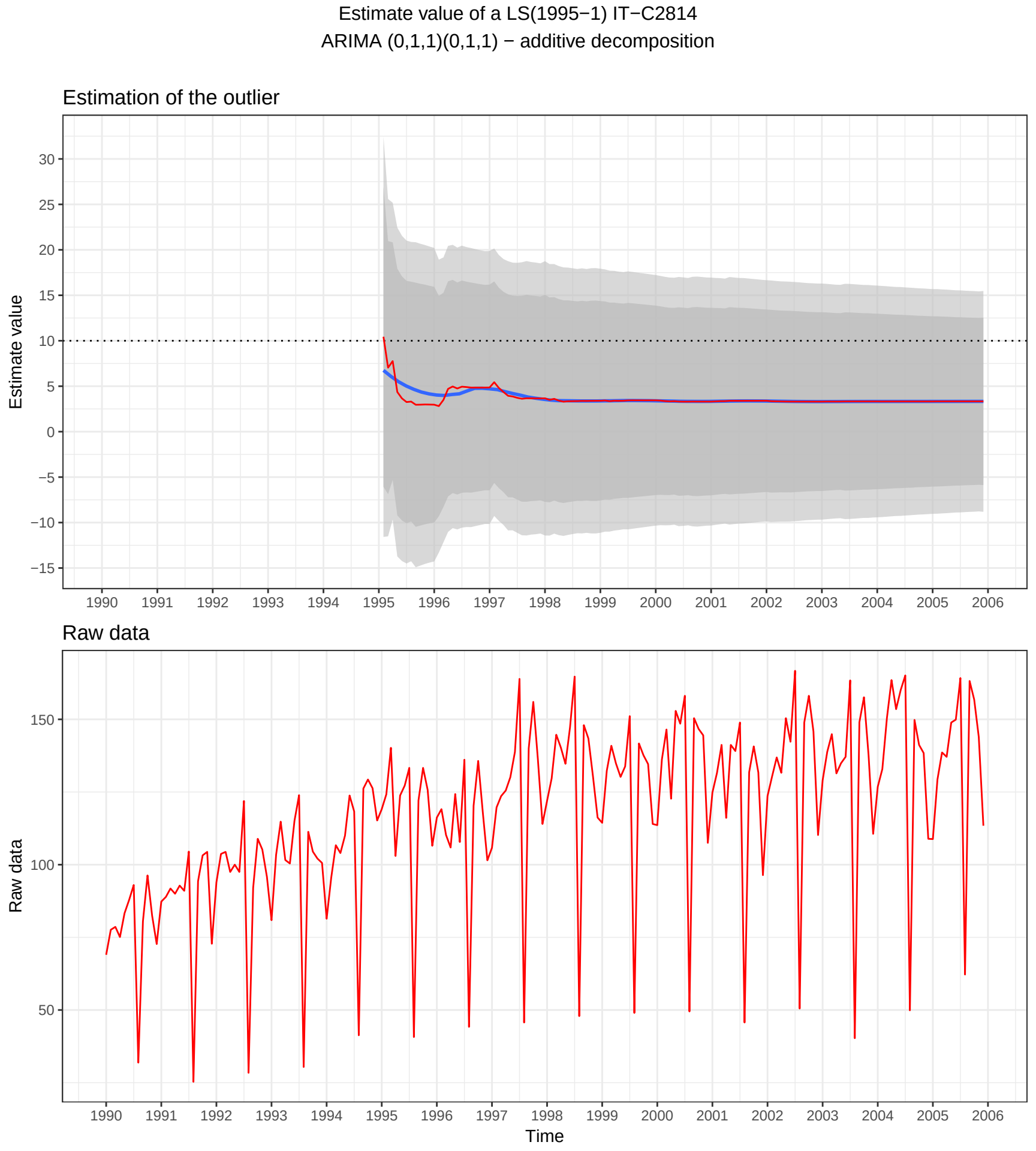


Estimate value of a LS(1995−1) FR−C2814

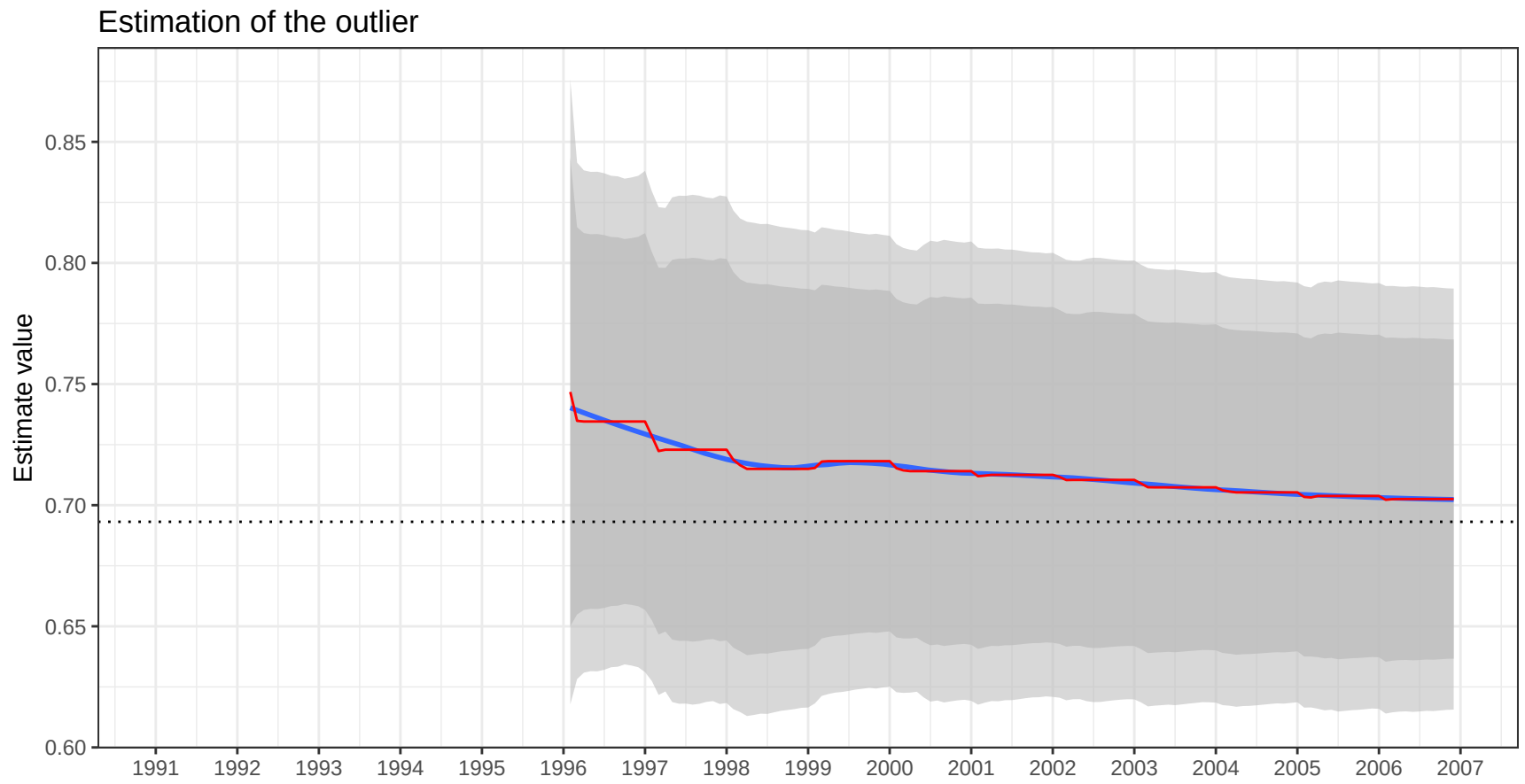
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

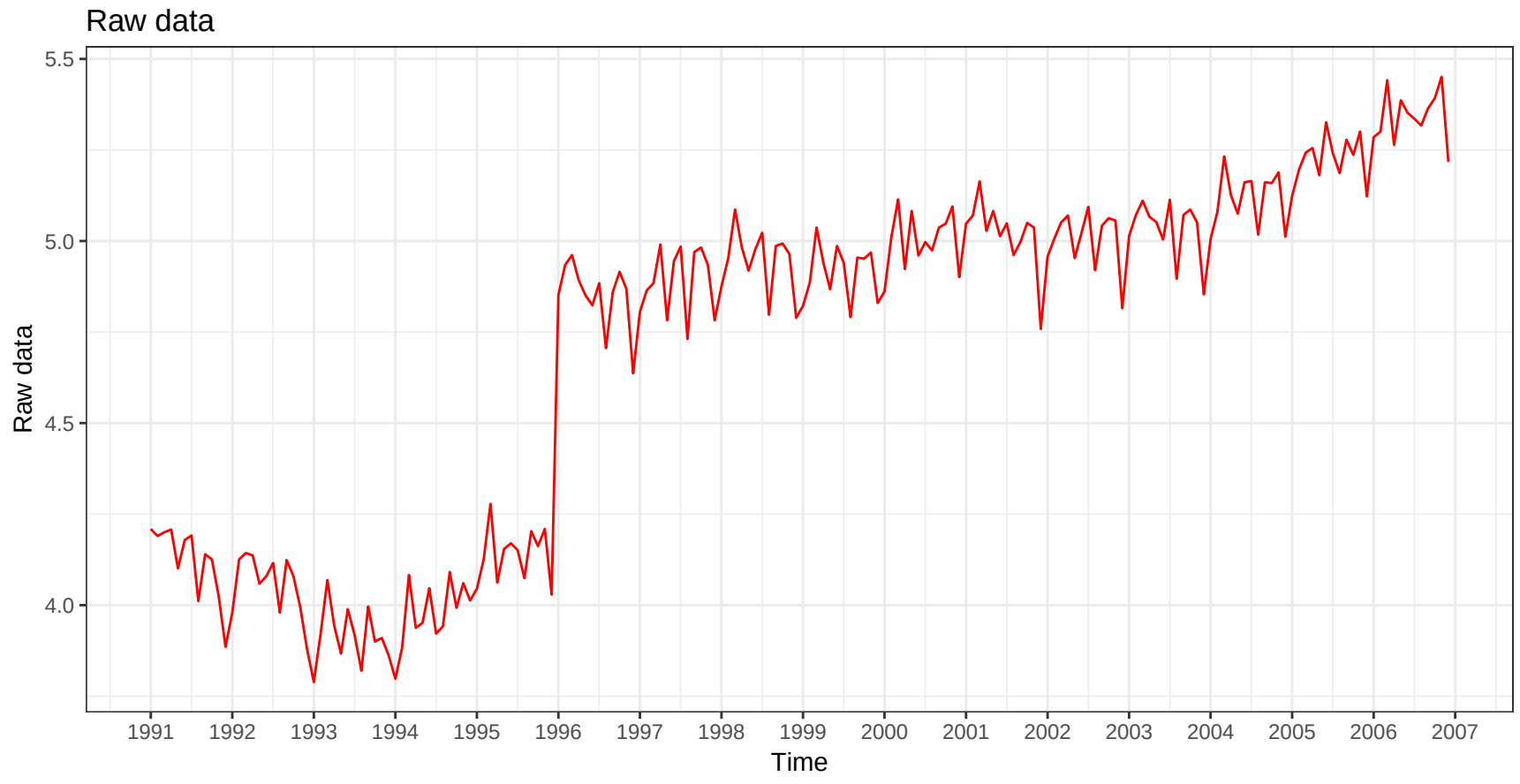


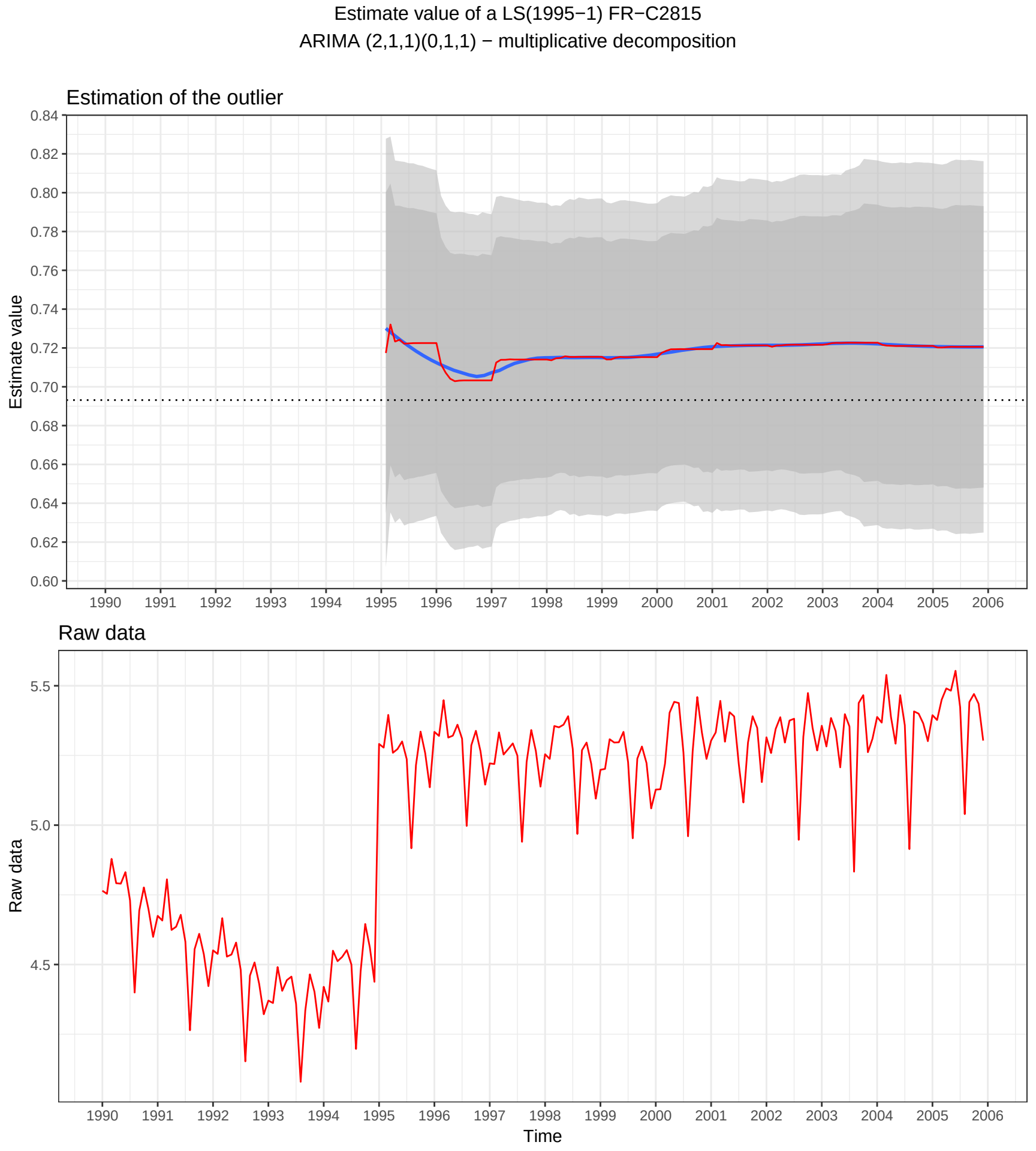



Estimate value of a LS(1995−1) IT−C2814
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
30
25
20
15
10
5
0
−5
−10
−15
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
150
100
50
Time

Estimate value of a LS(1996−1) DE−C2815
ARIMA (2,1,0)(0,1,1) − multiplicative decomposition

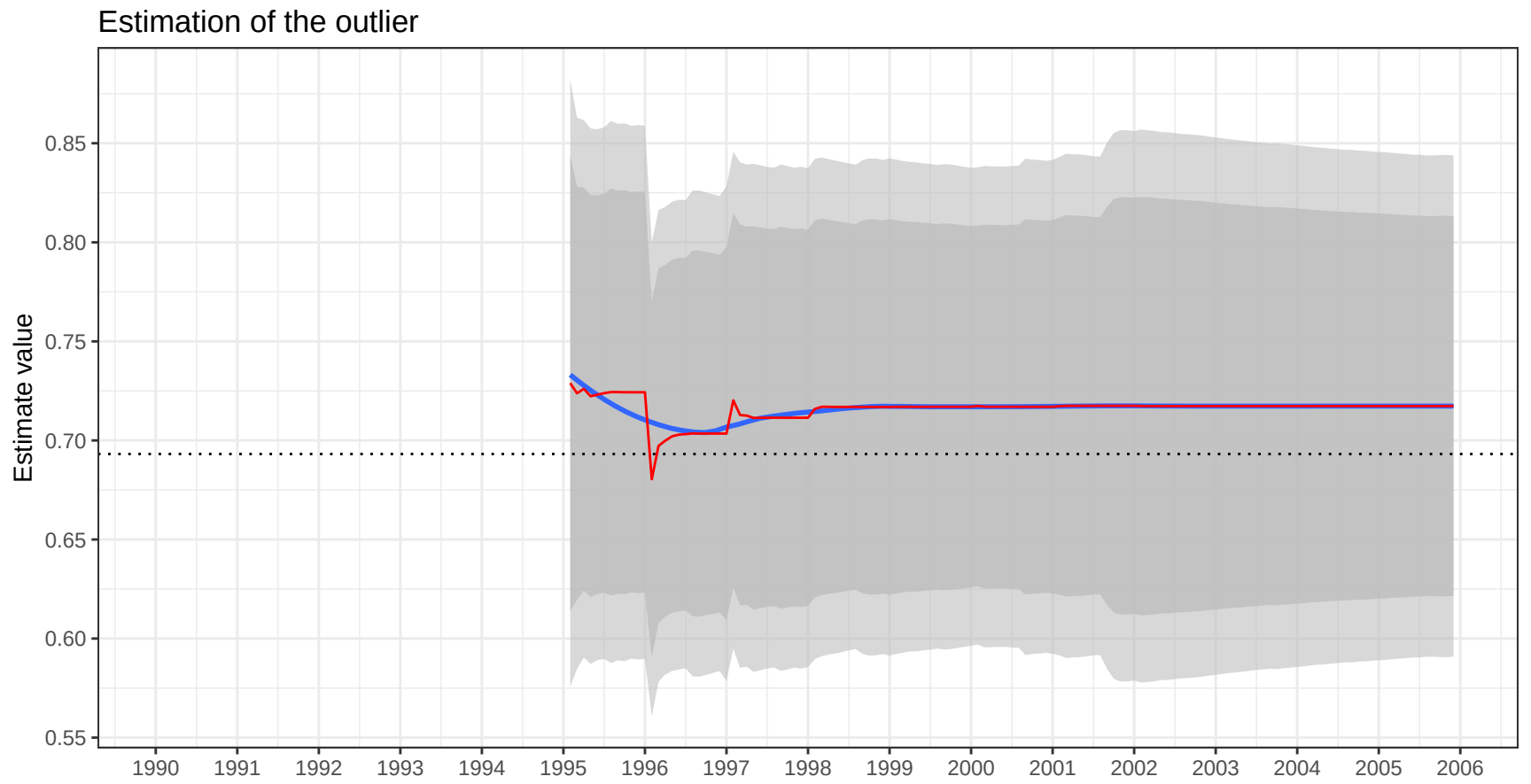


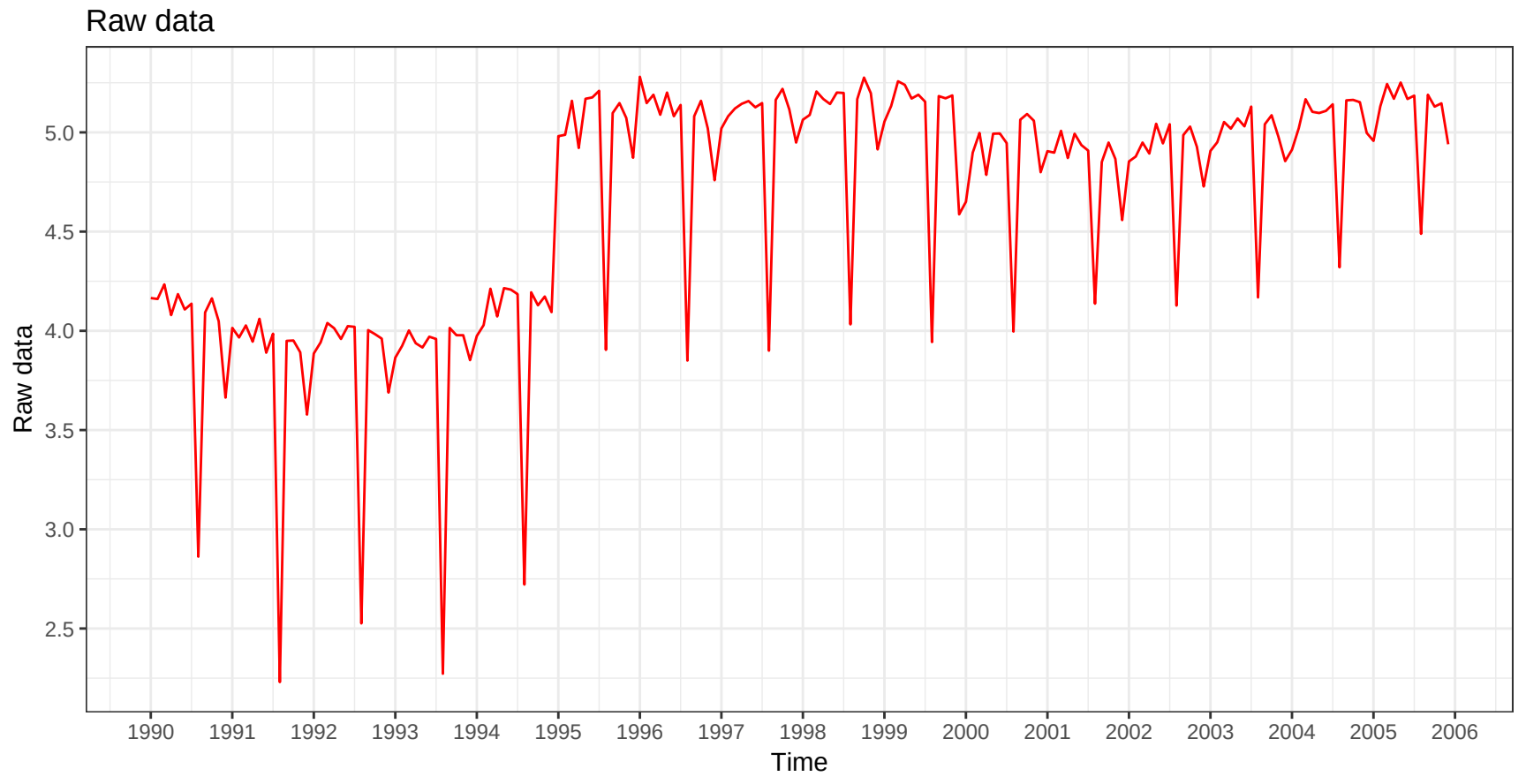



Estimate value of a LS(1995−1) FR−C2815
ARIMA (2,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.84
0.82
0.80
0.78
0.76
0.74
0.72
0.70
0.68
0.66
0.64
0.62
0.60
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
5.5
5.0
4.5
Time

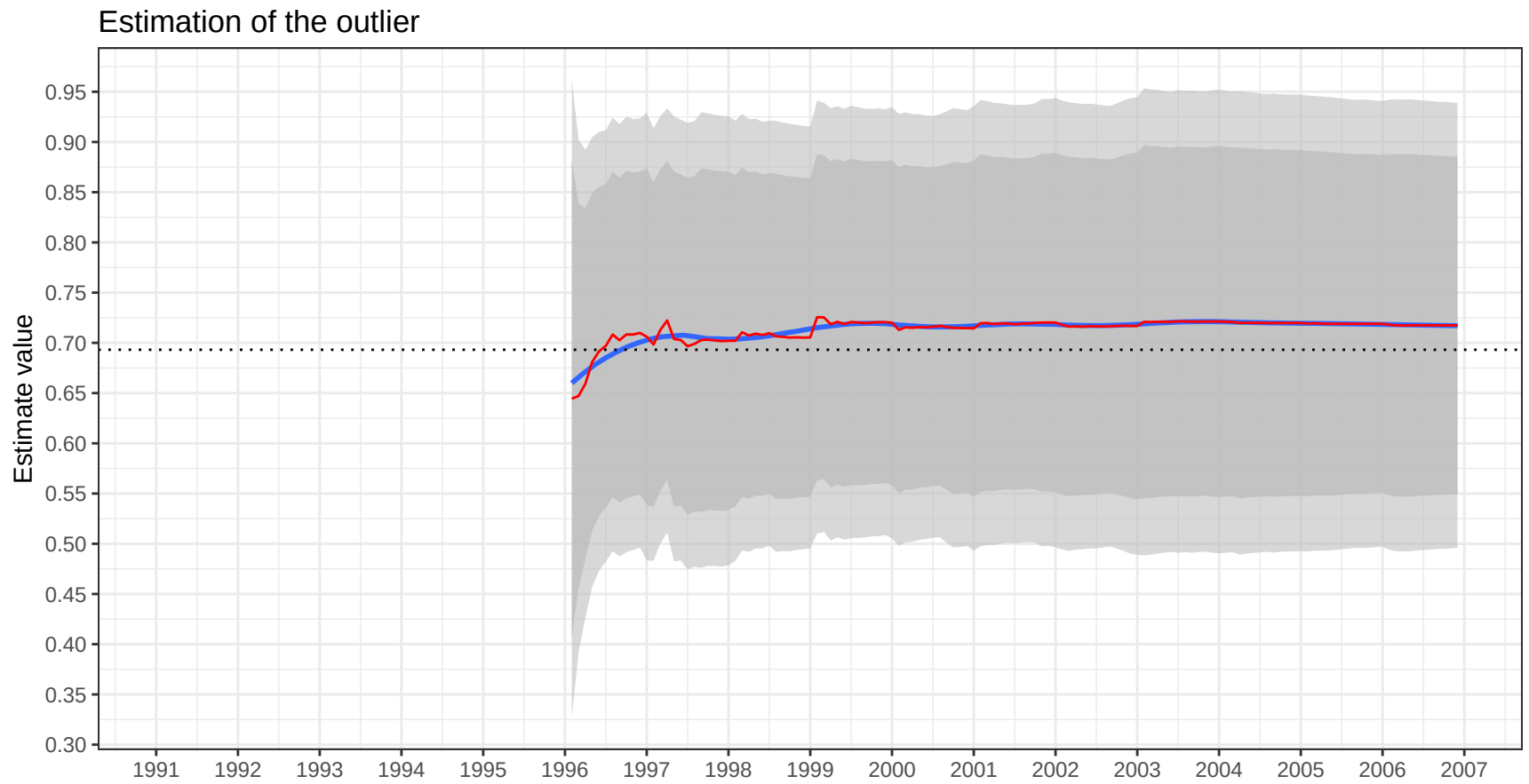
Estimate value of a LS(1995−1) IT−C2815

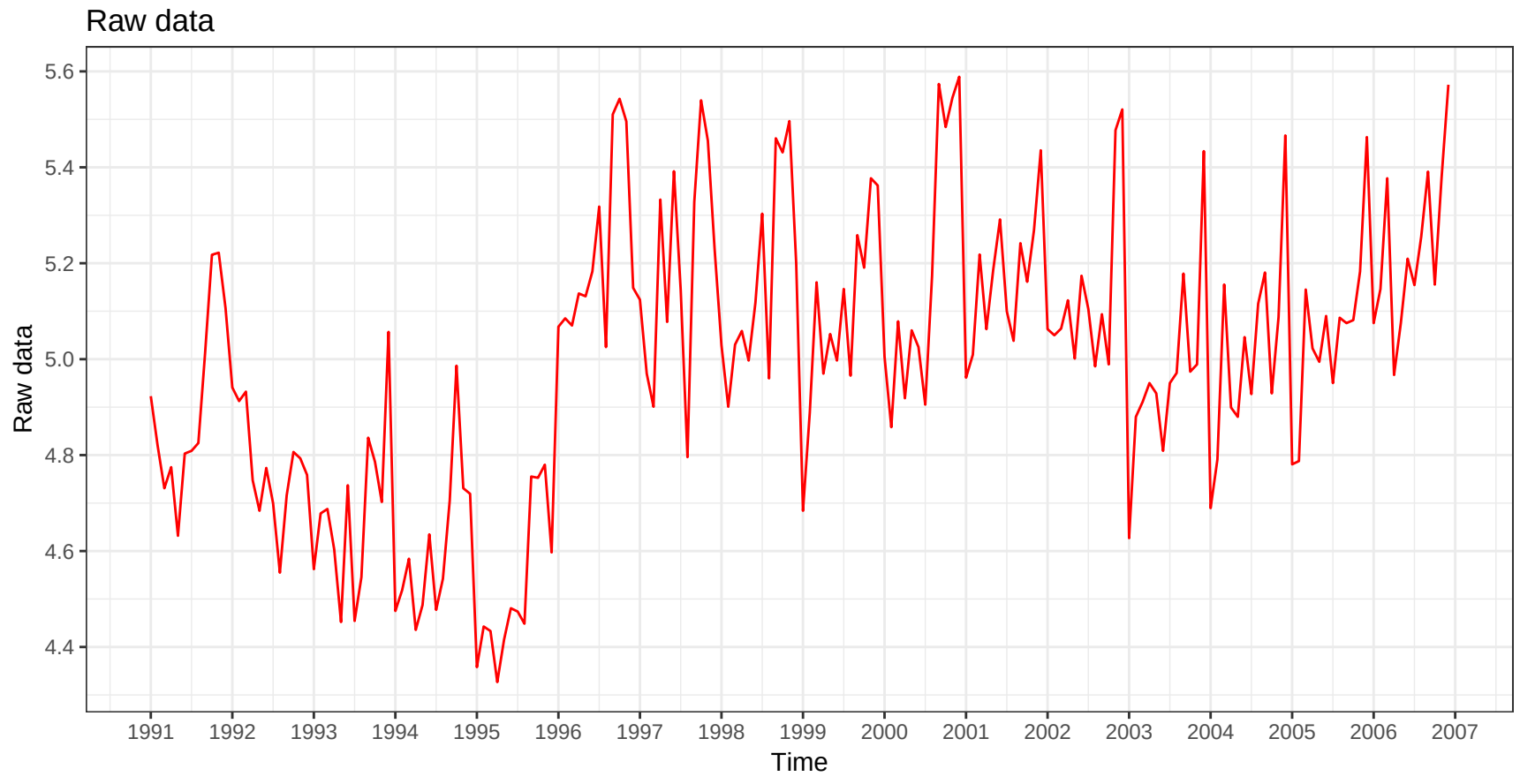
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

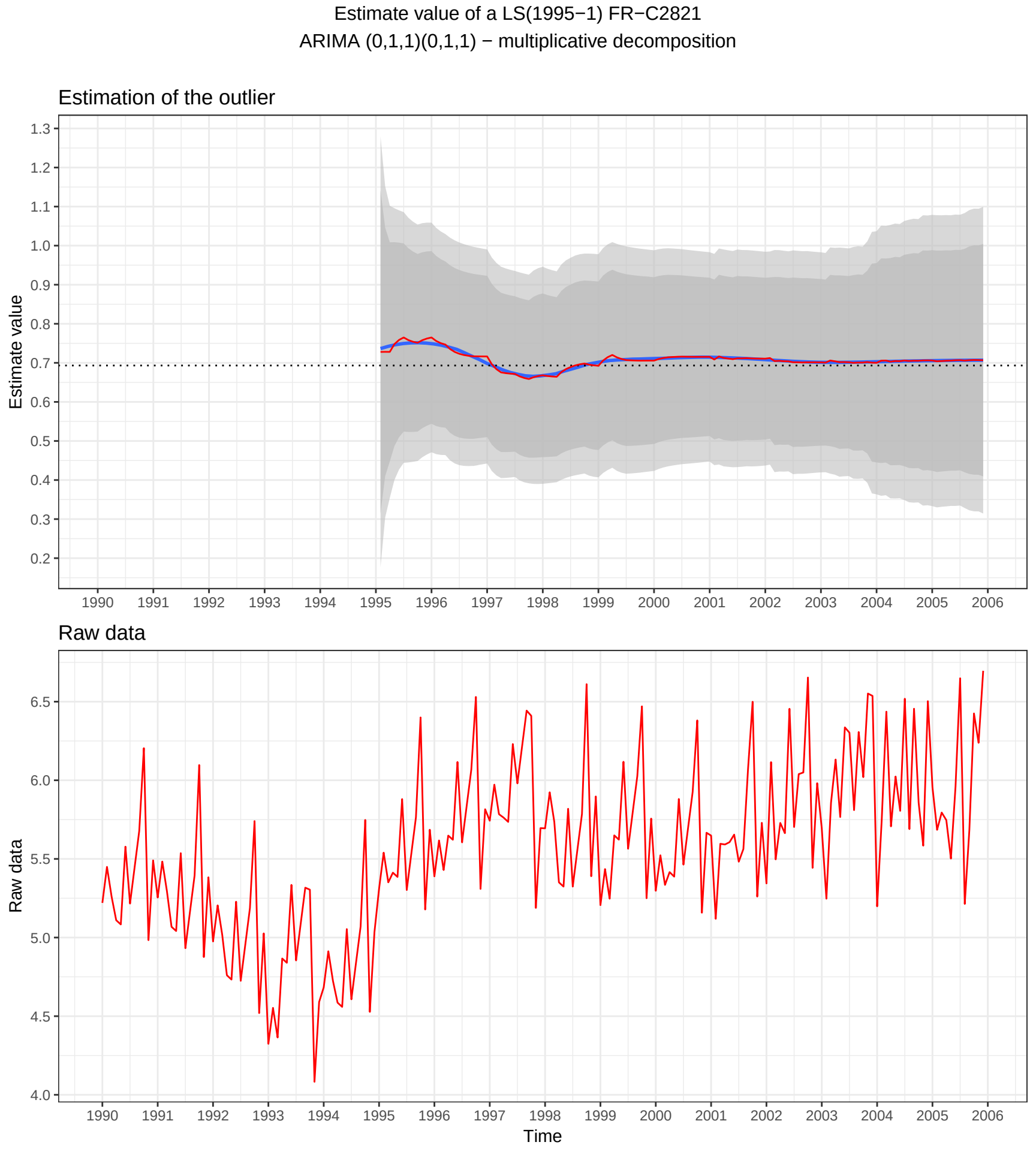


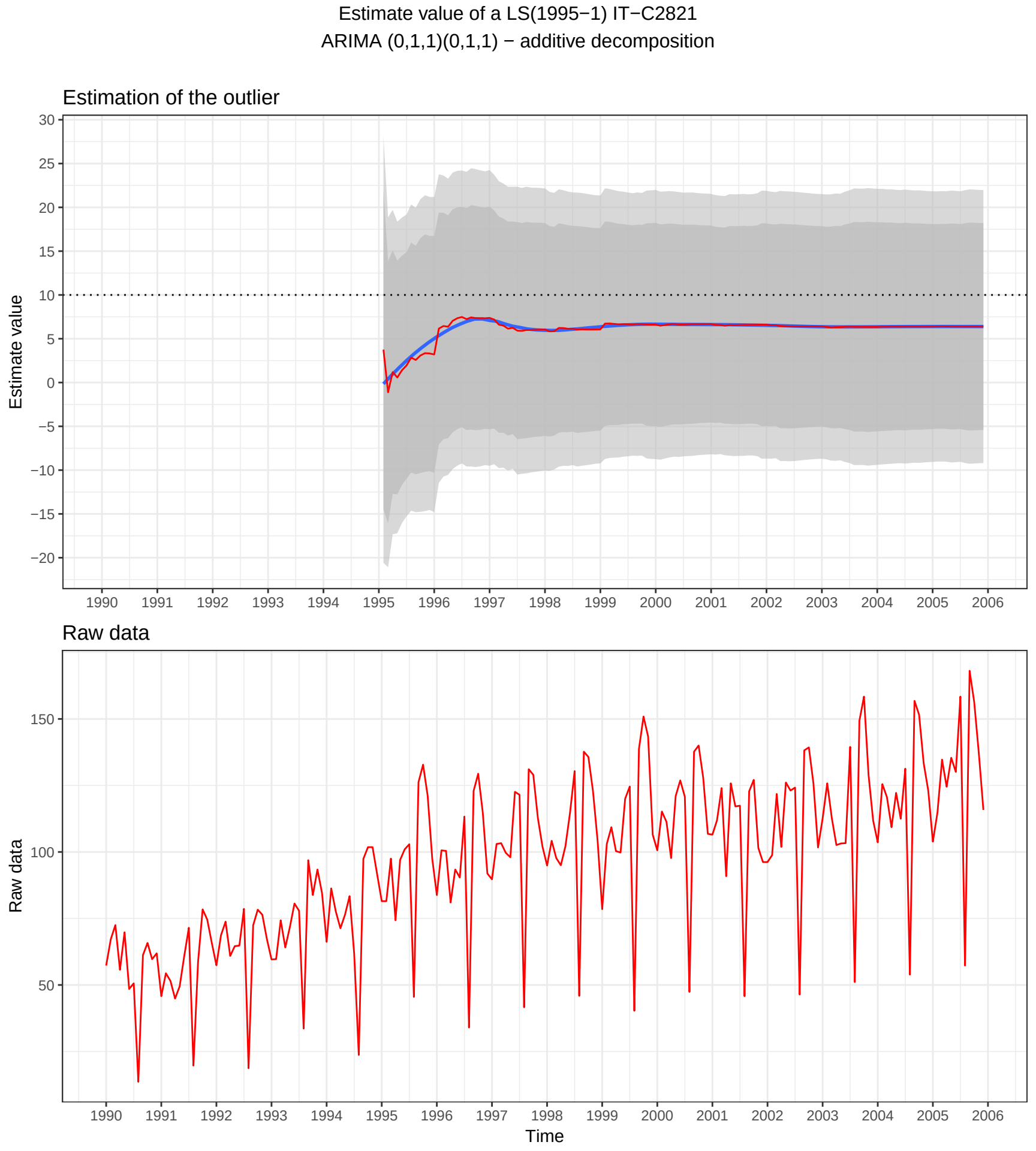


Estimate value of a LS(1996−1) DE−C2821
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

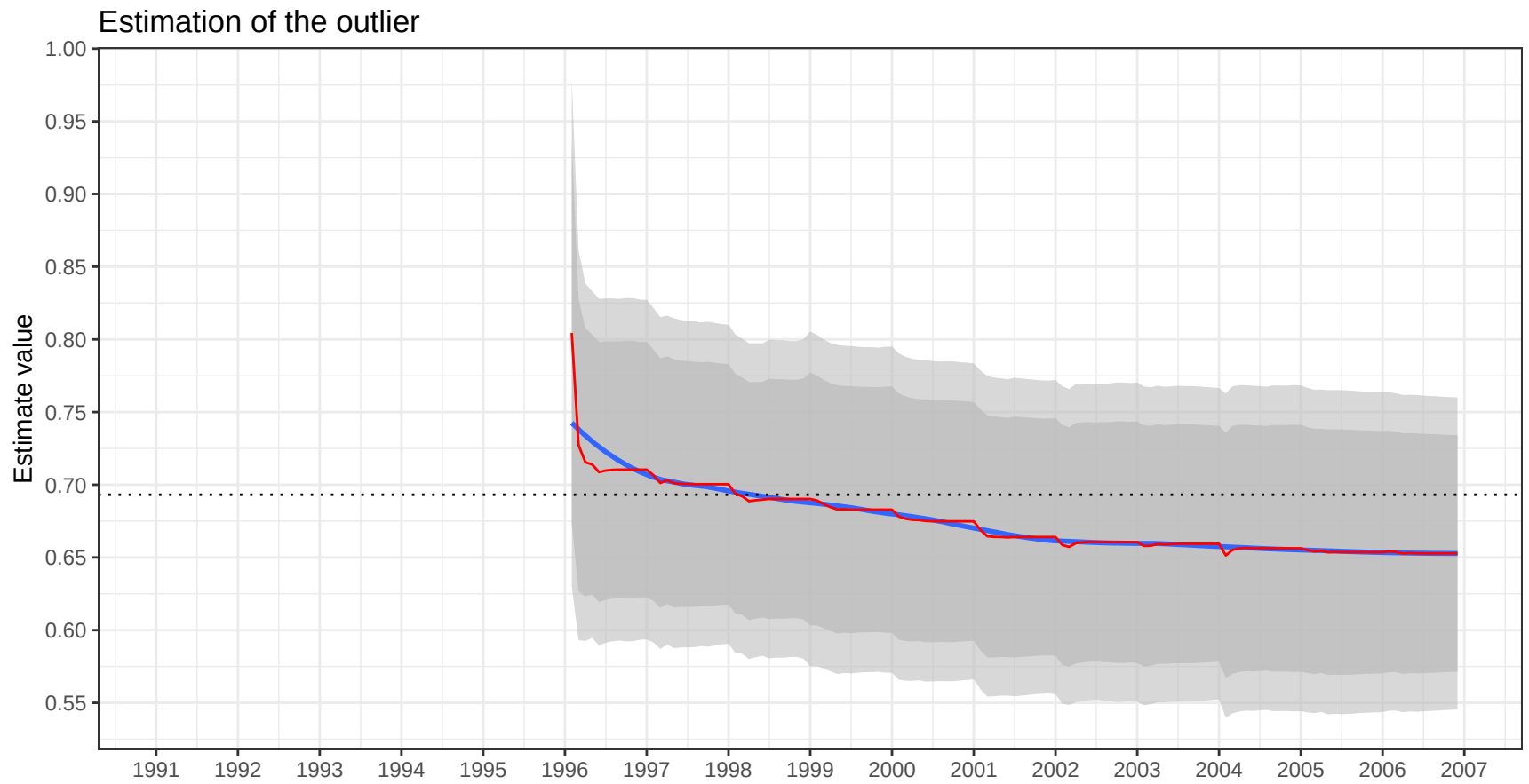


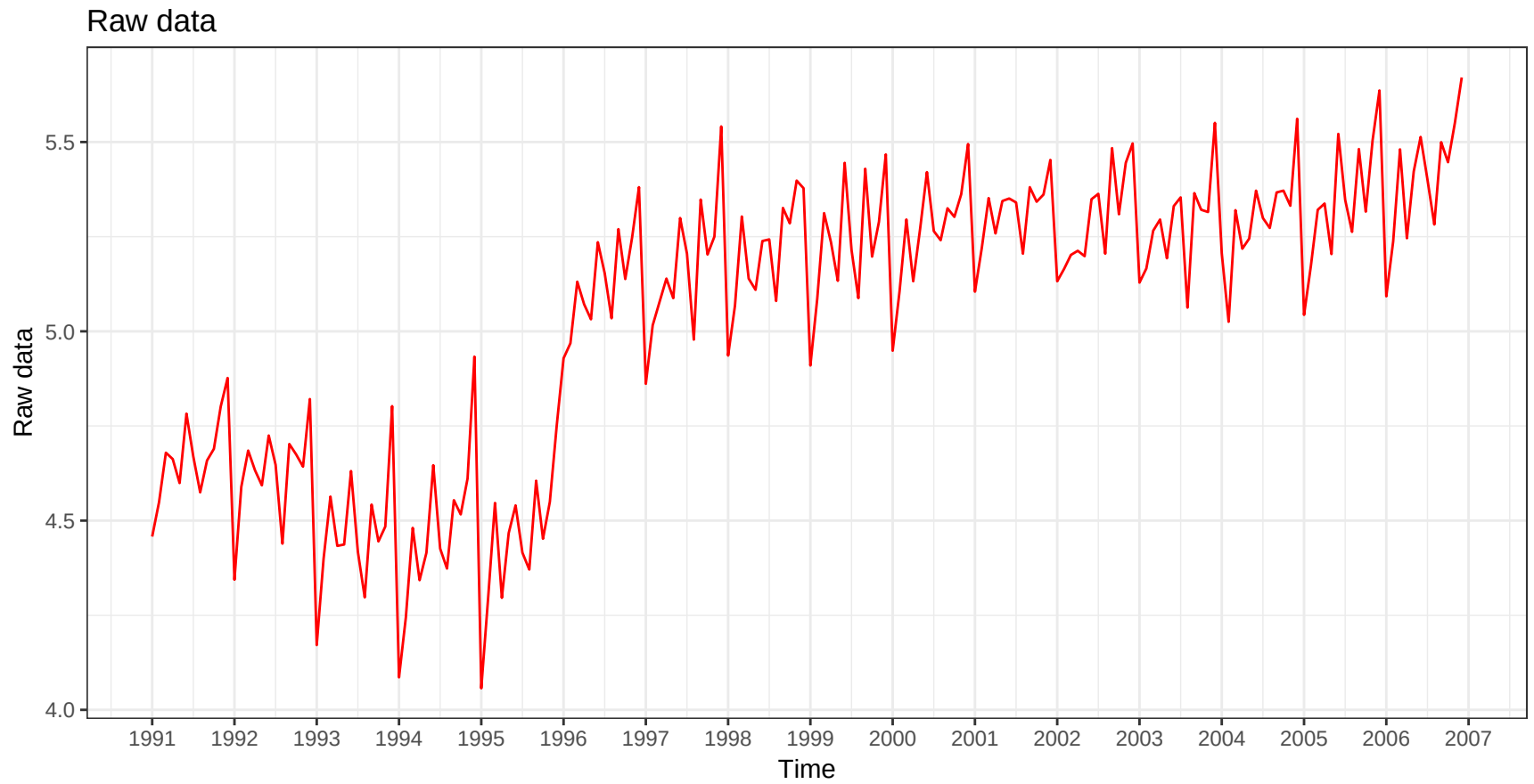


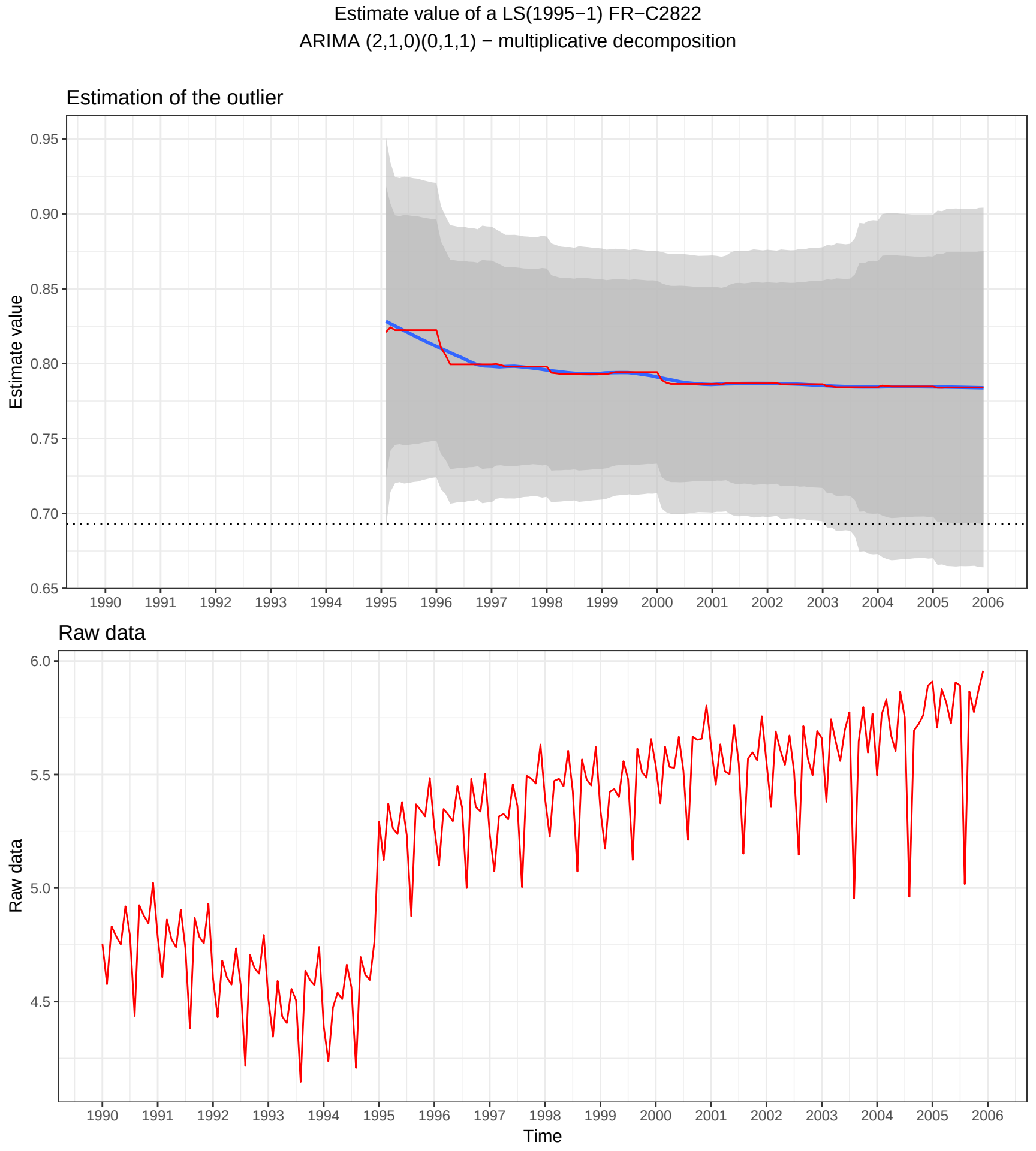

Estimate value of a LS(1995−1) FR−C2821
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
6.5
6.0
5.5
5.0
4.5
4.0
Time

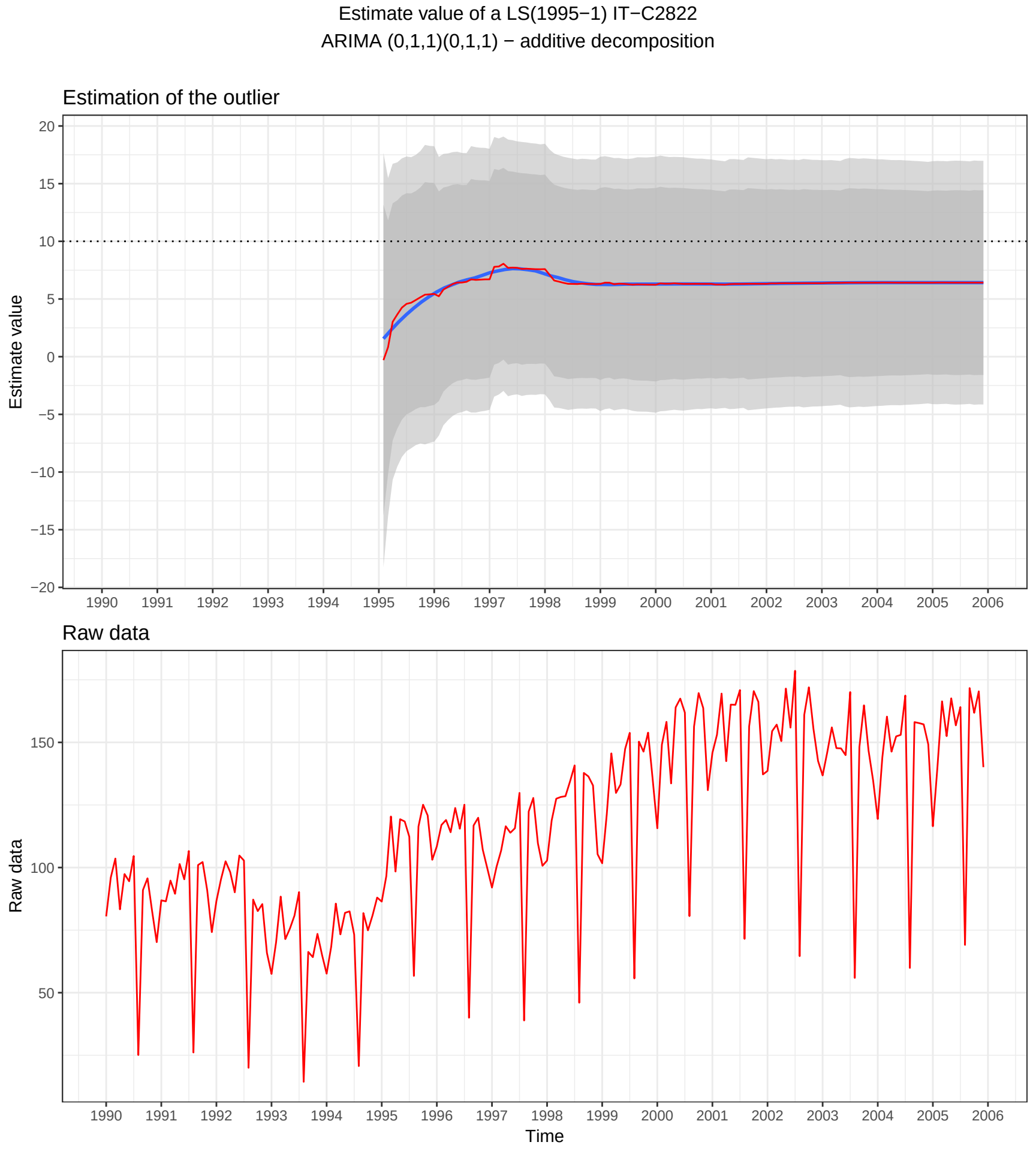

Estimate value of a LS(1995−1) IT−C2821
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
30
25
20
15
10
5
0
−5
−10
−15
−20
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
150
100
50
Time

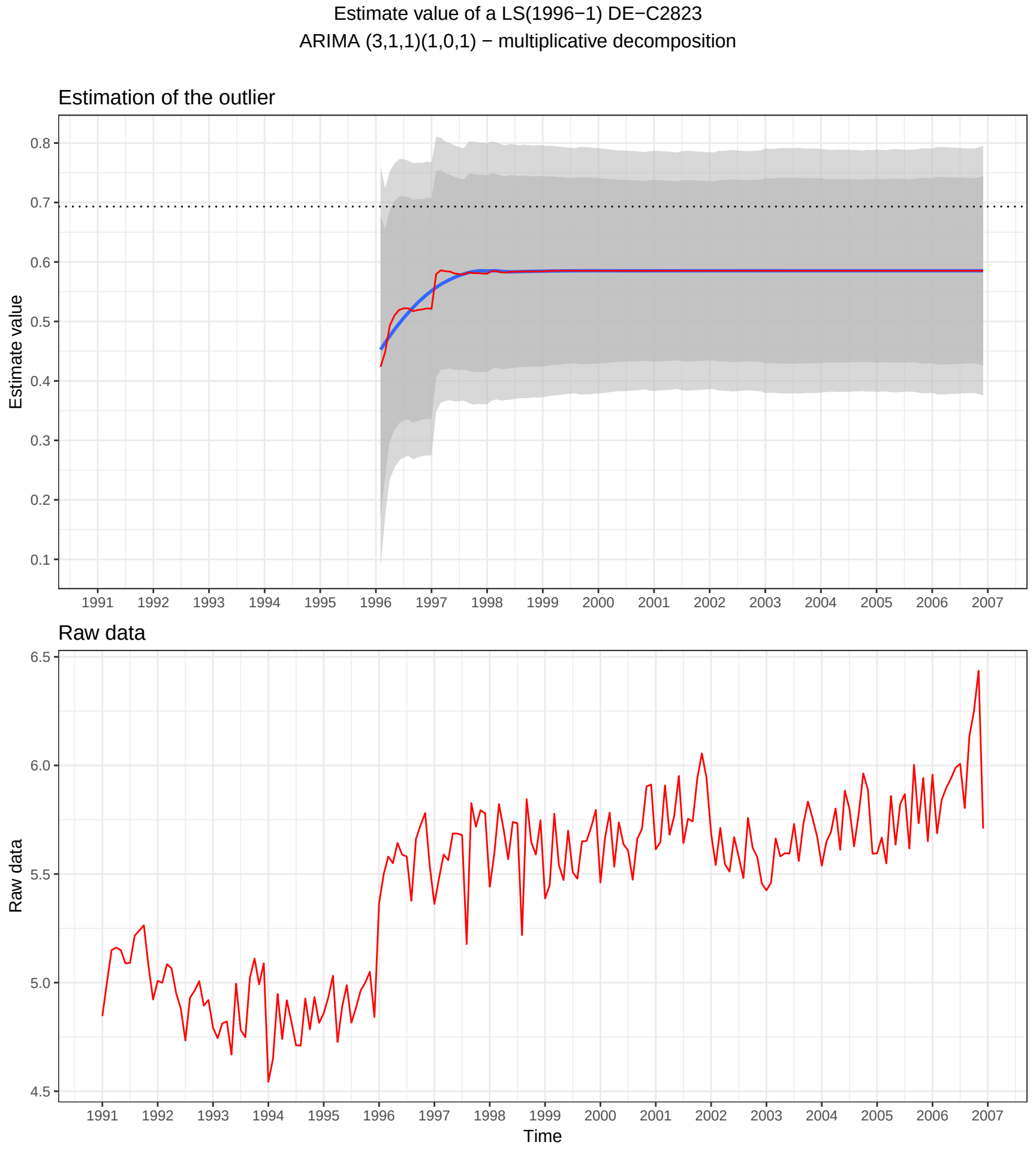
Estimate value of a LS(1996−1) DE−C2822
ARIMA (0,1,2)(0,1,1) − multiplicative decomposition





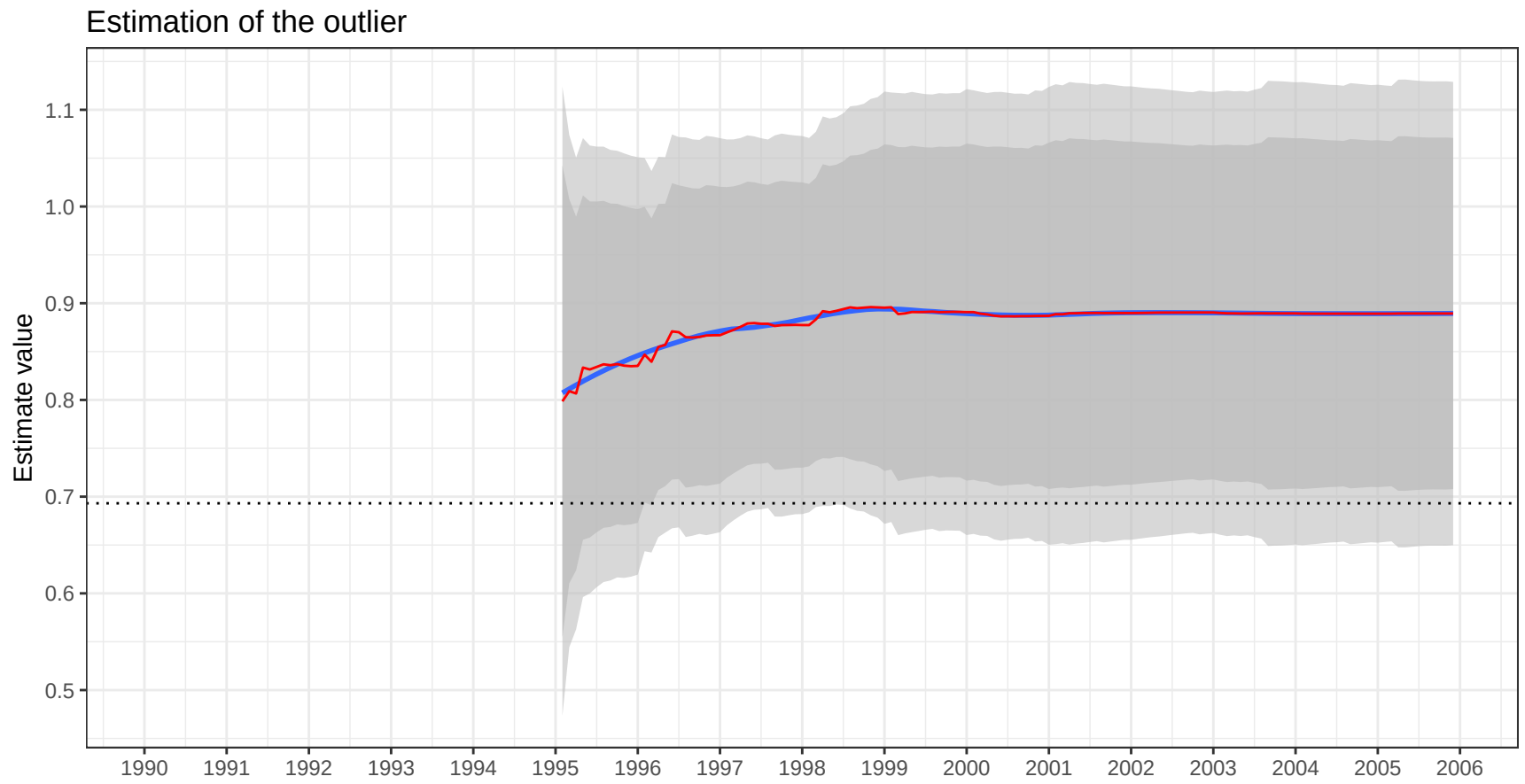

Estimate value of a LS(1995−1) FR−C2822
ARIMA (2,1,0)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.95
0.90
0.85
0.80
0.75
0.70
0.65
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
6.0
5.5
5.0
4.5
Time

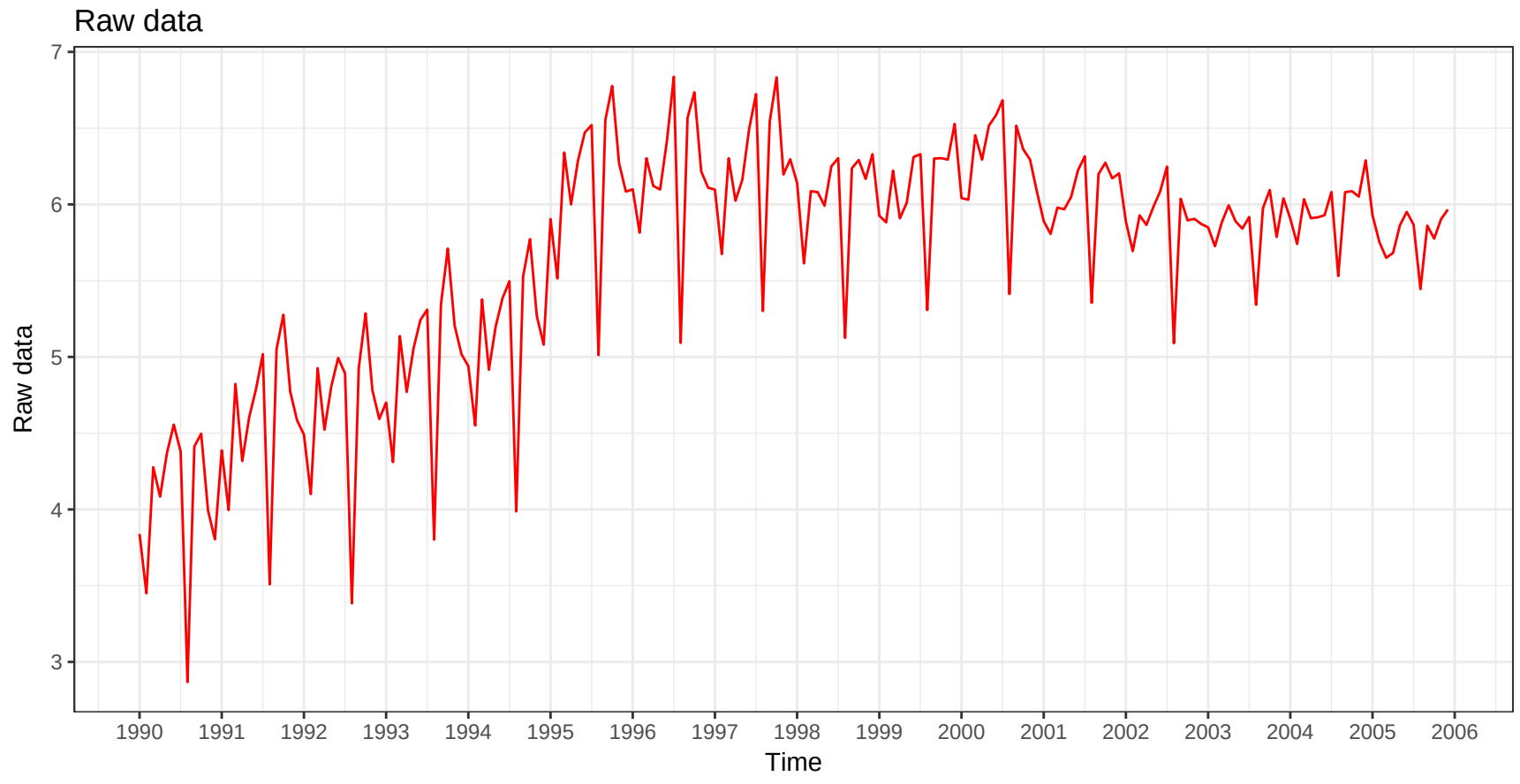

Estimate value of a LS(1995−1) IT−C2822
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
20
15
10
5
0
−5
−10
−15
−20
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
150
100
50
Time


Estimate value of a LS(1996−1) DE−C2823
ARIMA (3,1,1)(1,0,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
6.5
6.0
5.5
5.0
4.5
Time

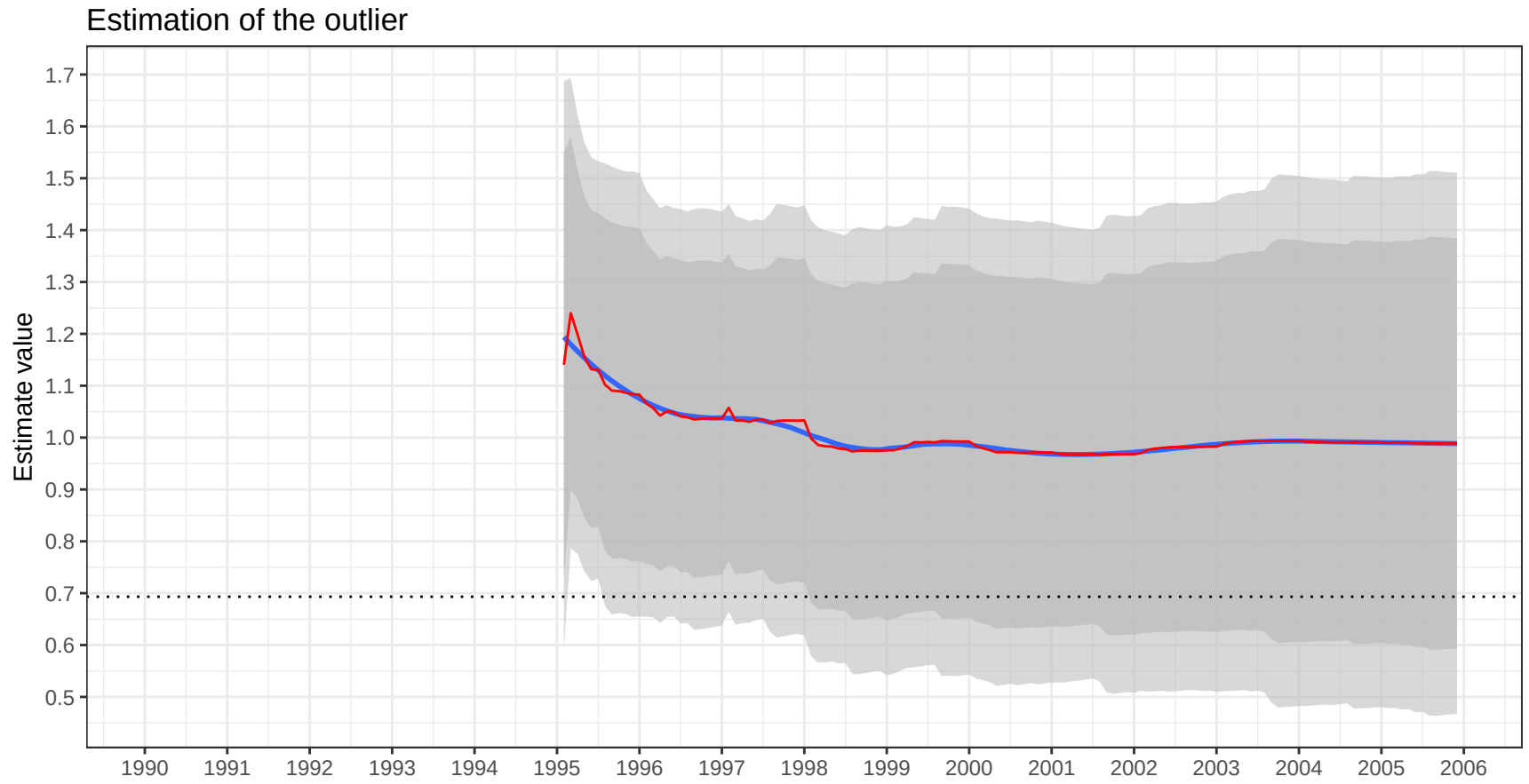
Estimate value of a LS(1995−1) FR−C2823

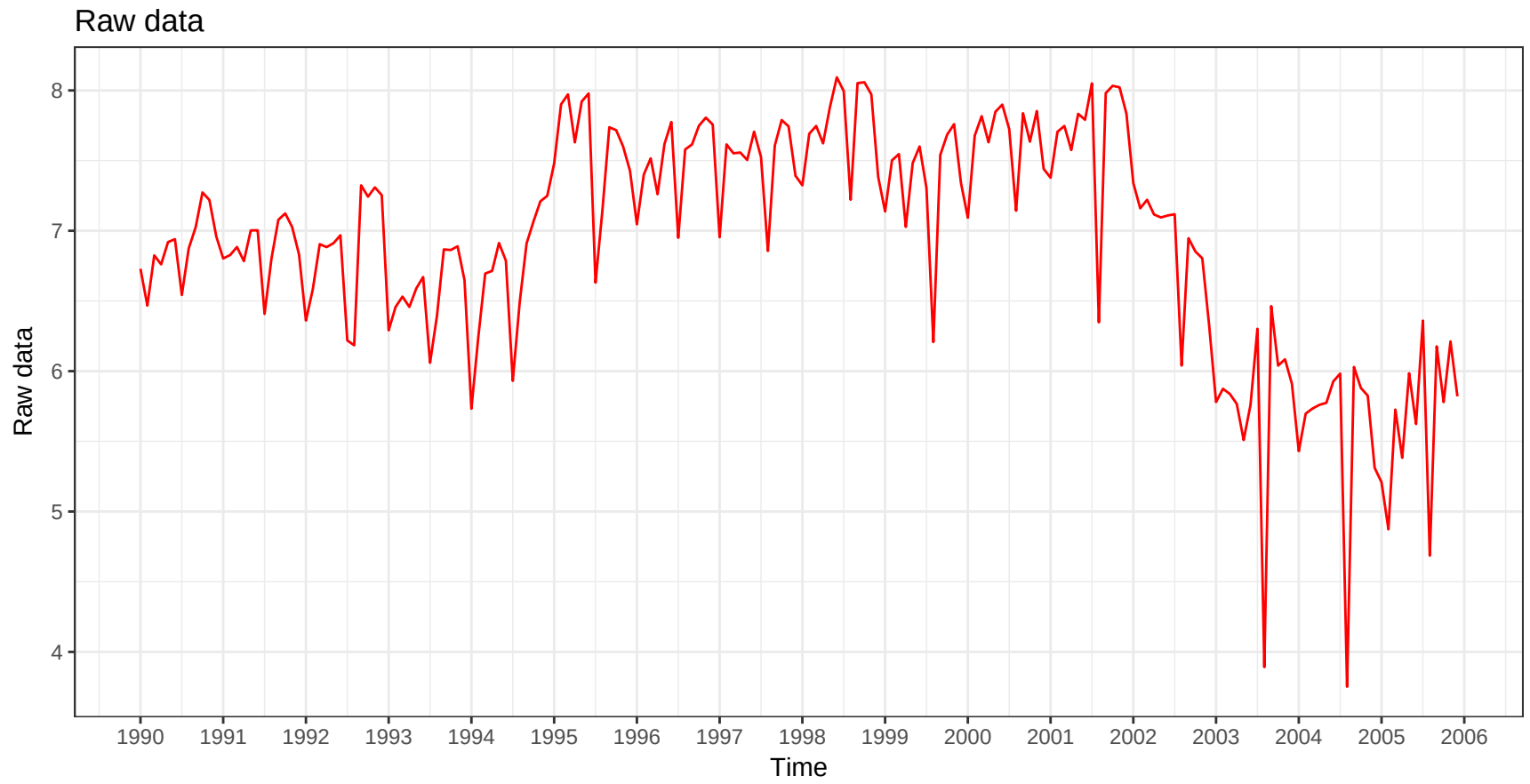
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

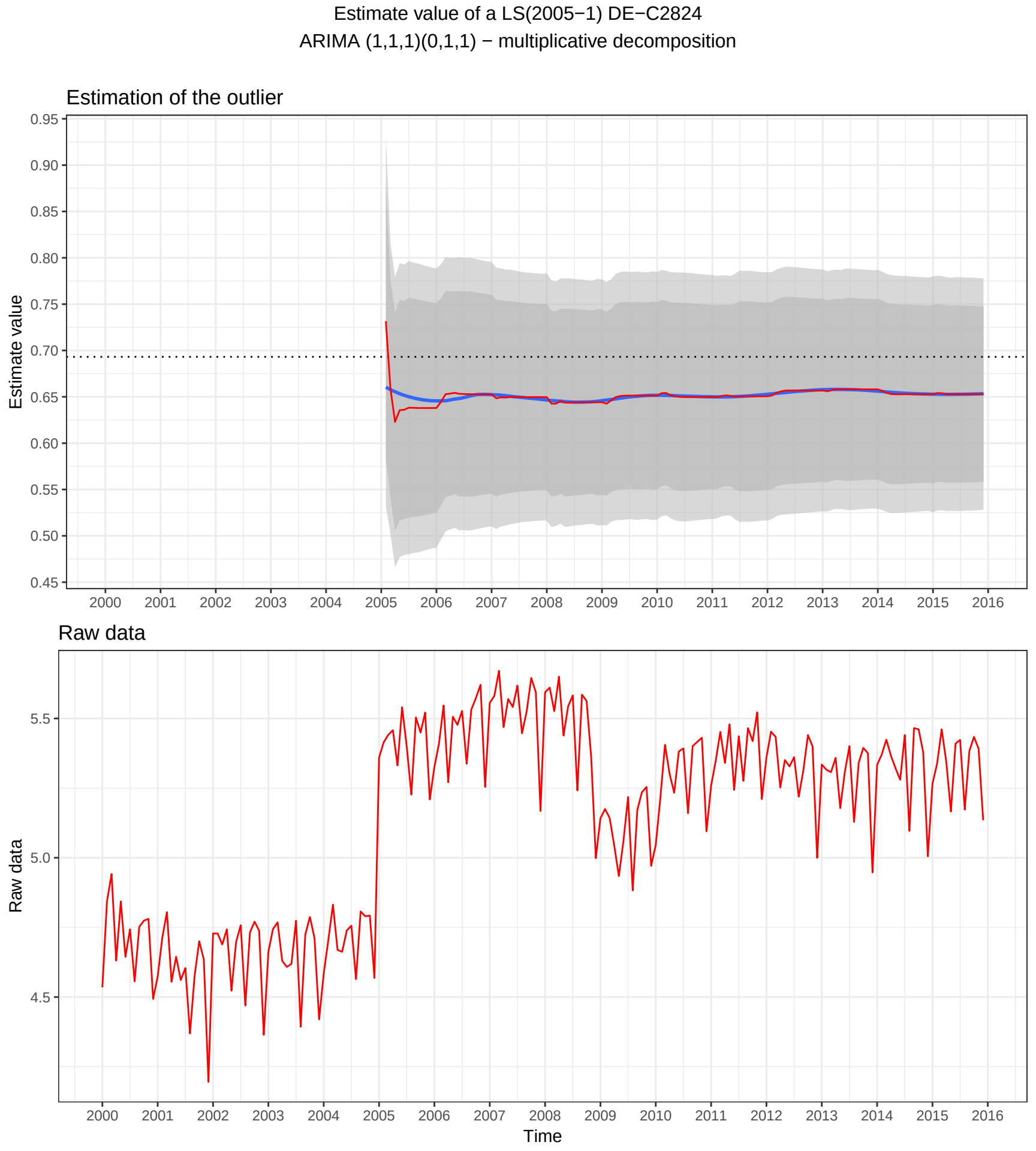




Estimate value of a LS(1995−1) IT−C2823
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

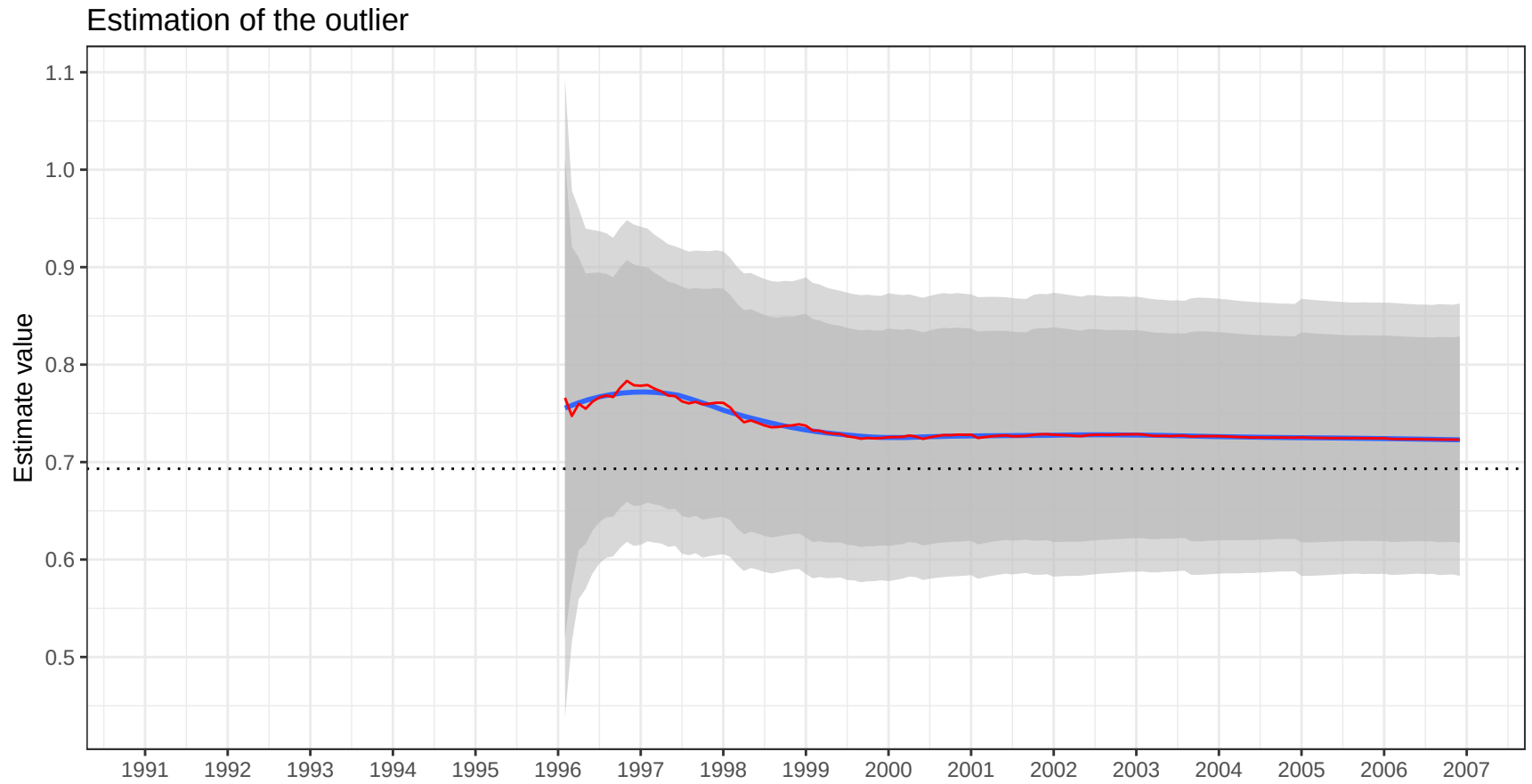


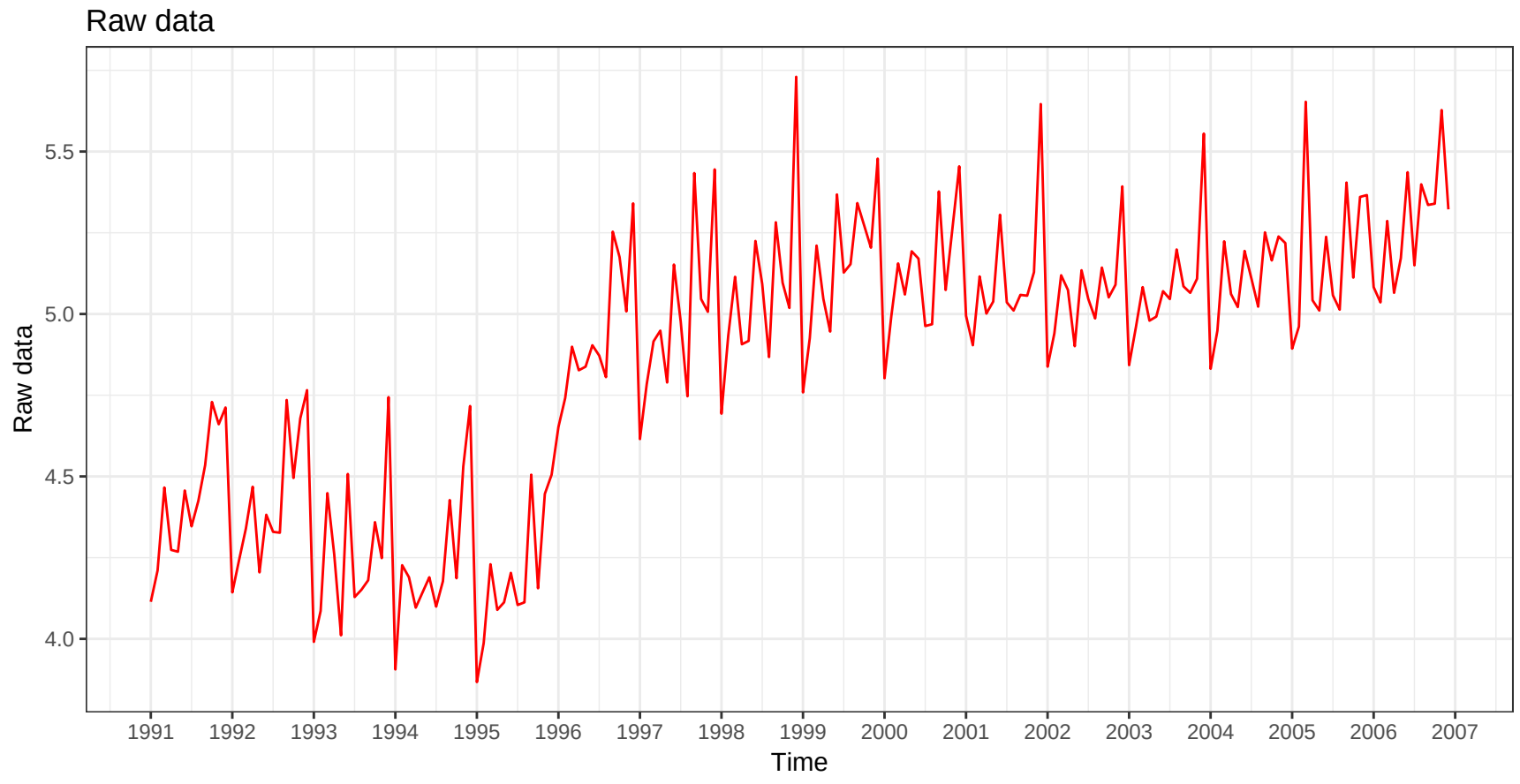



Estimate value of a LS(2005−1) DE−C2824
ARIMA (1,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.95
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
0.45
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
Raw data
Raw data
5.5
5.0
4.5
Time

Estimate value of a LS(1996−1) DE−C2825

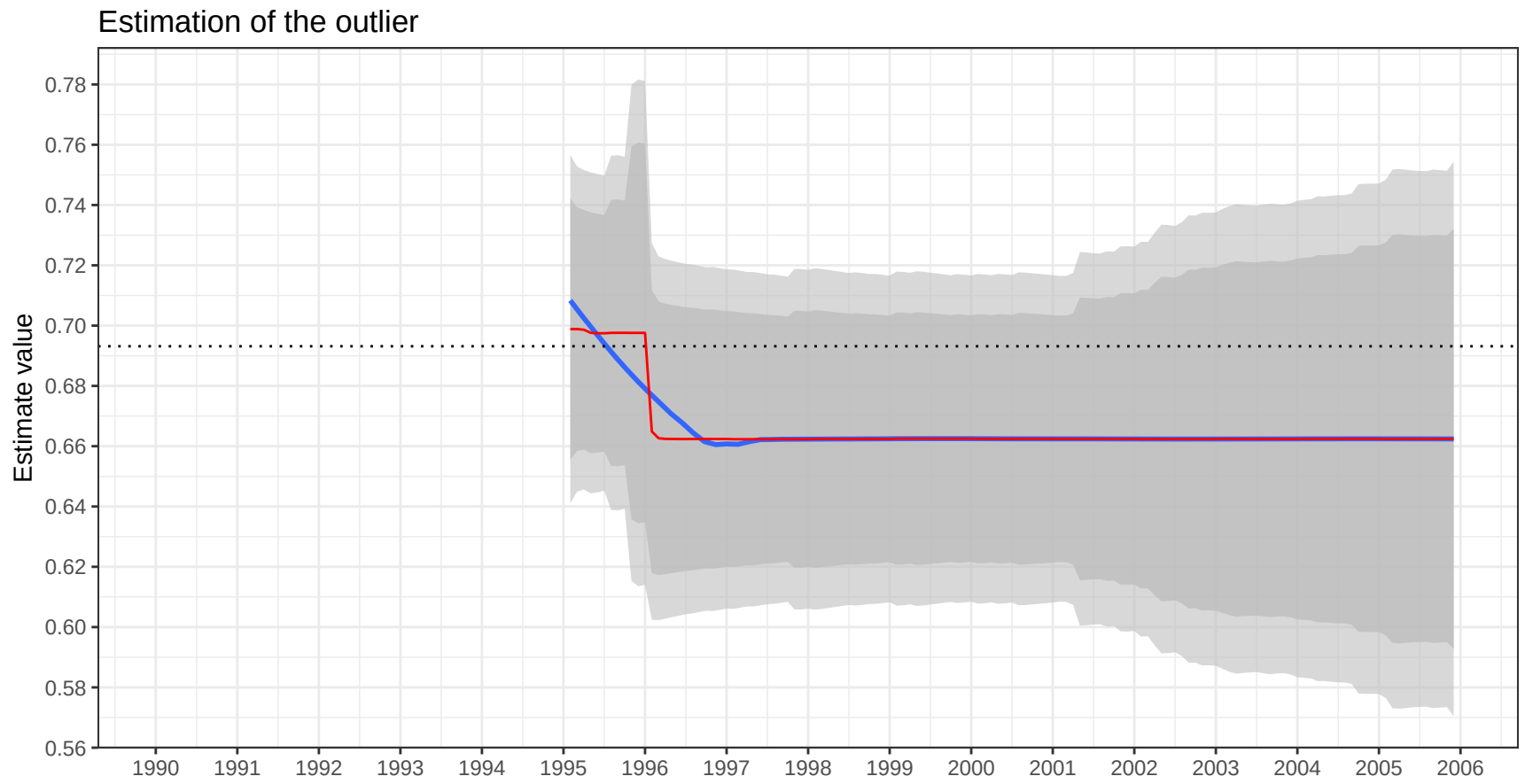
ARIMA (1,1,1)(0,1,1) − multiplicative decomposition

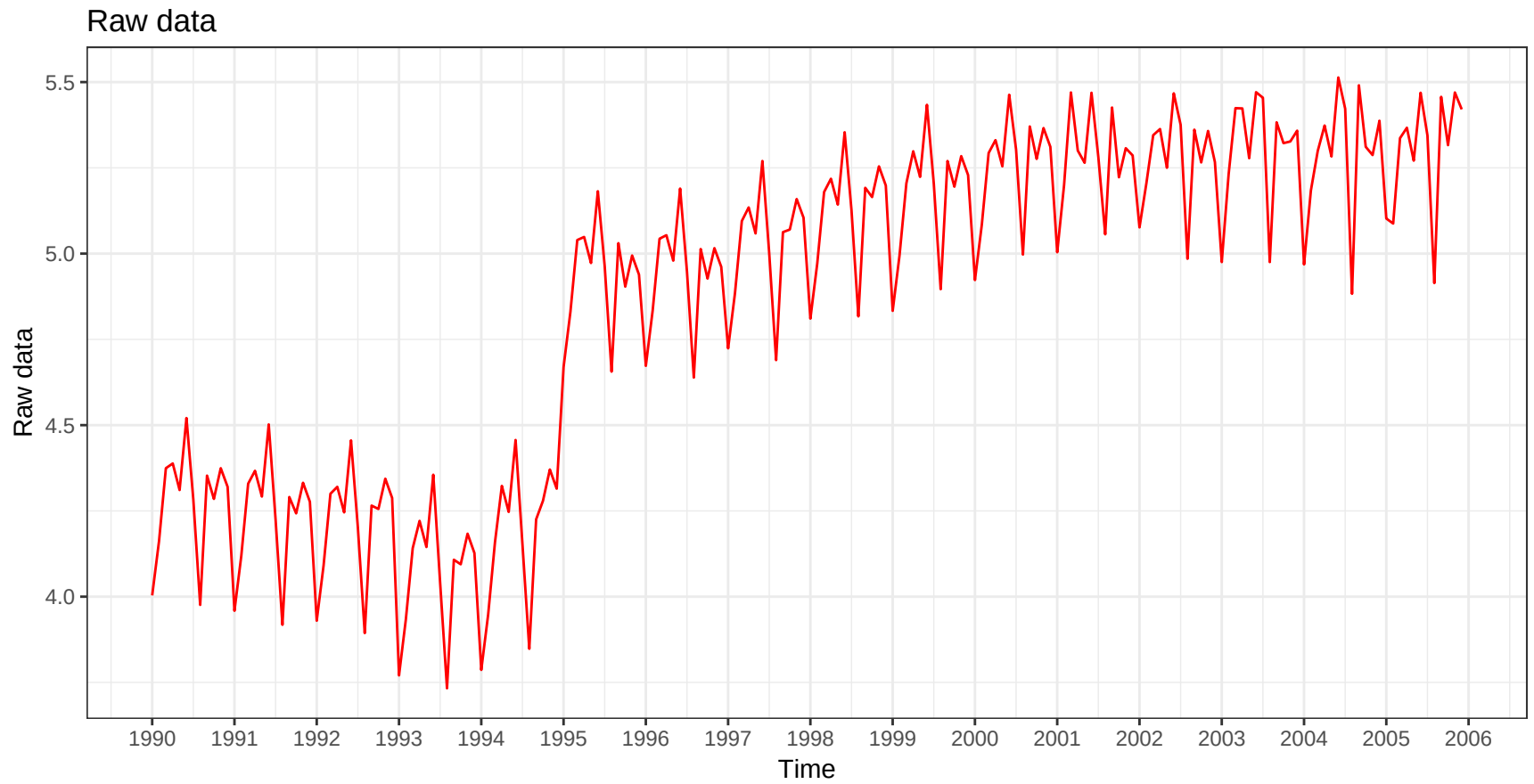




Estimate value of a LS(1995−1) FR−C2825

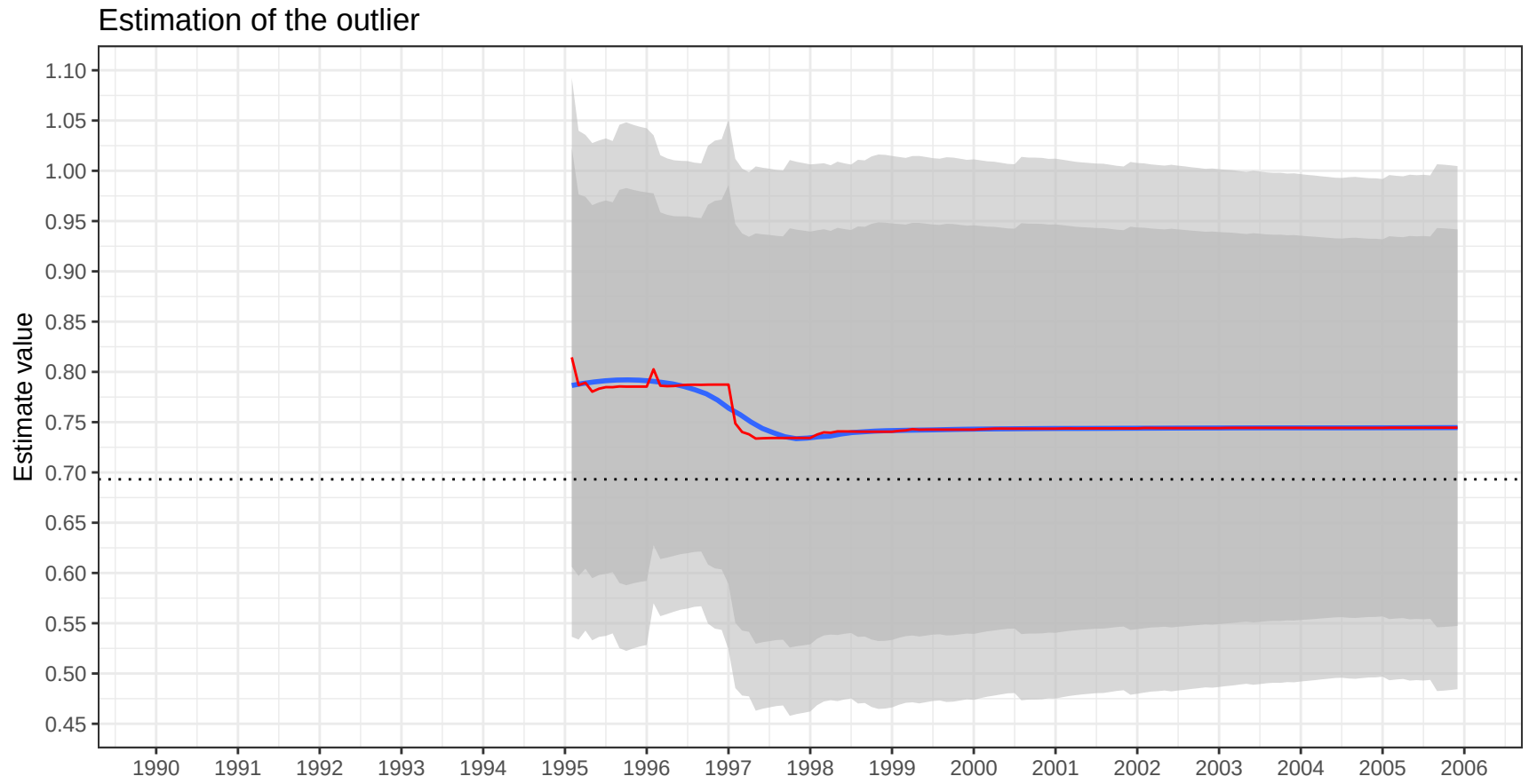
ARIMA (0,1,1)(1,1,1) − multiplicative decomposition

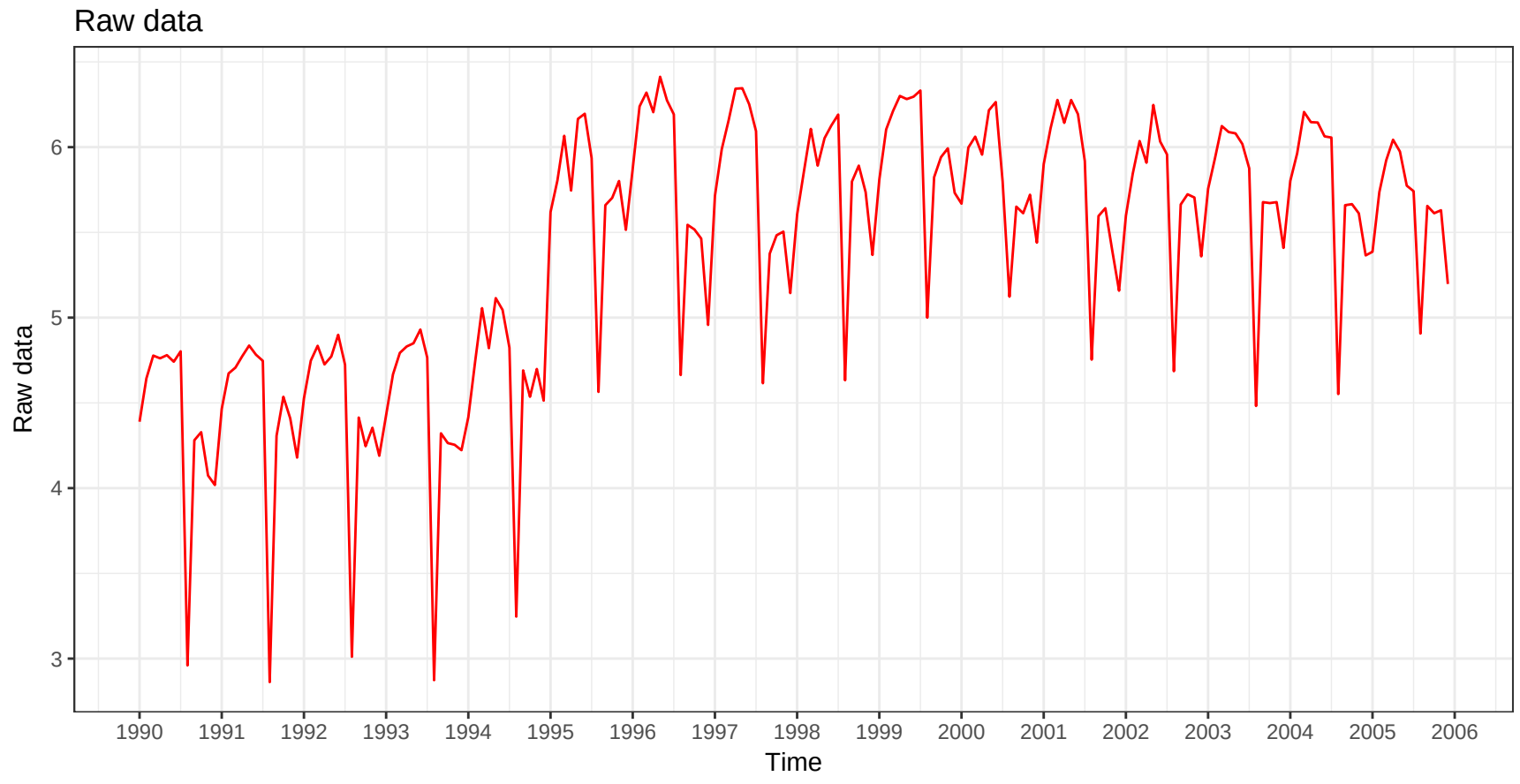


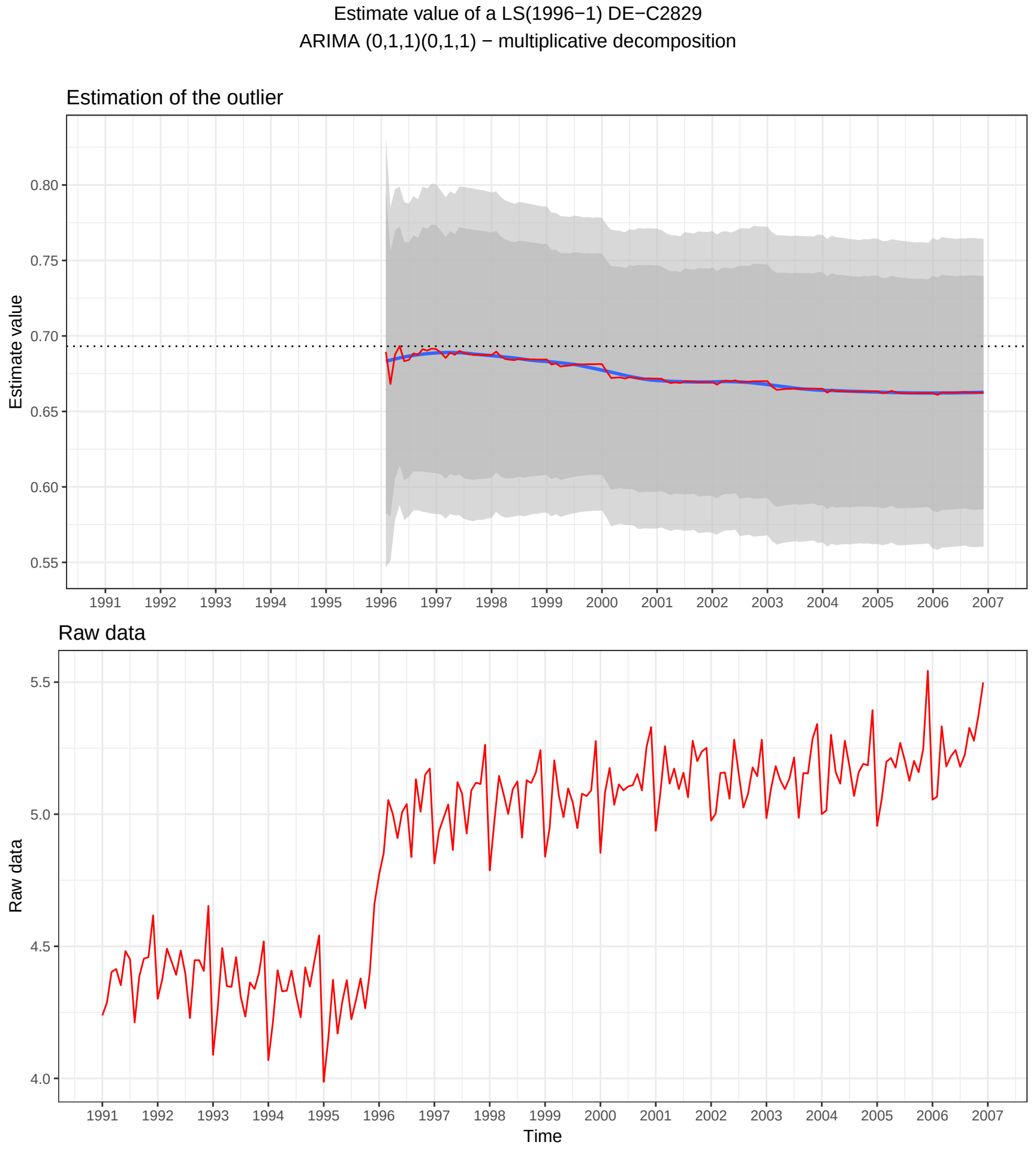


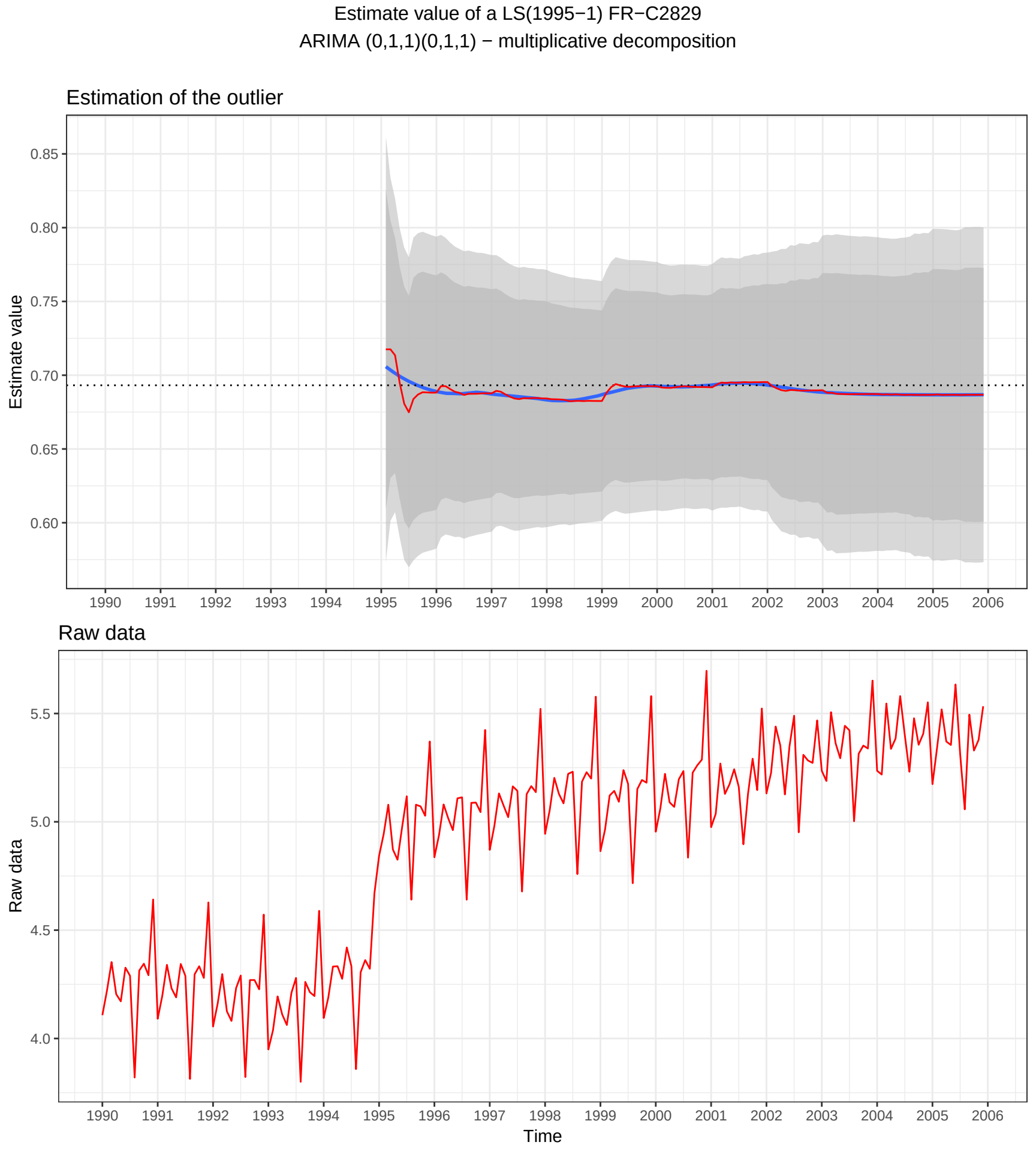
Estimate value of a LS(1995−1) IT−C2825

ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

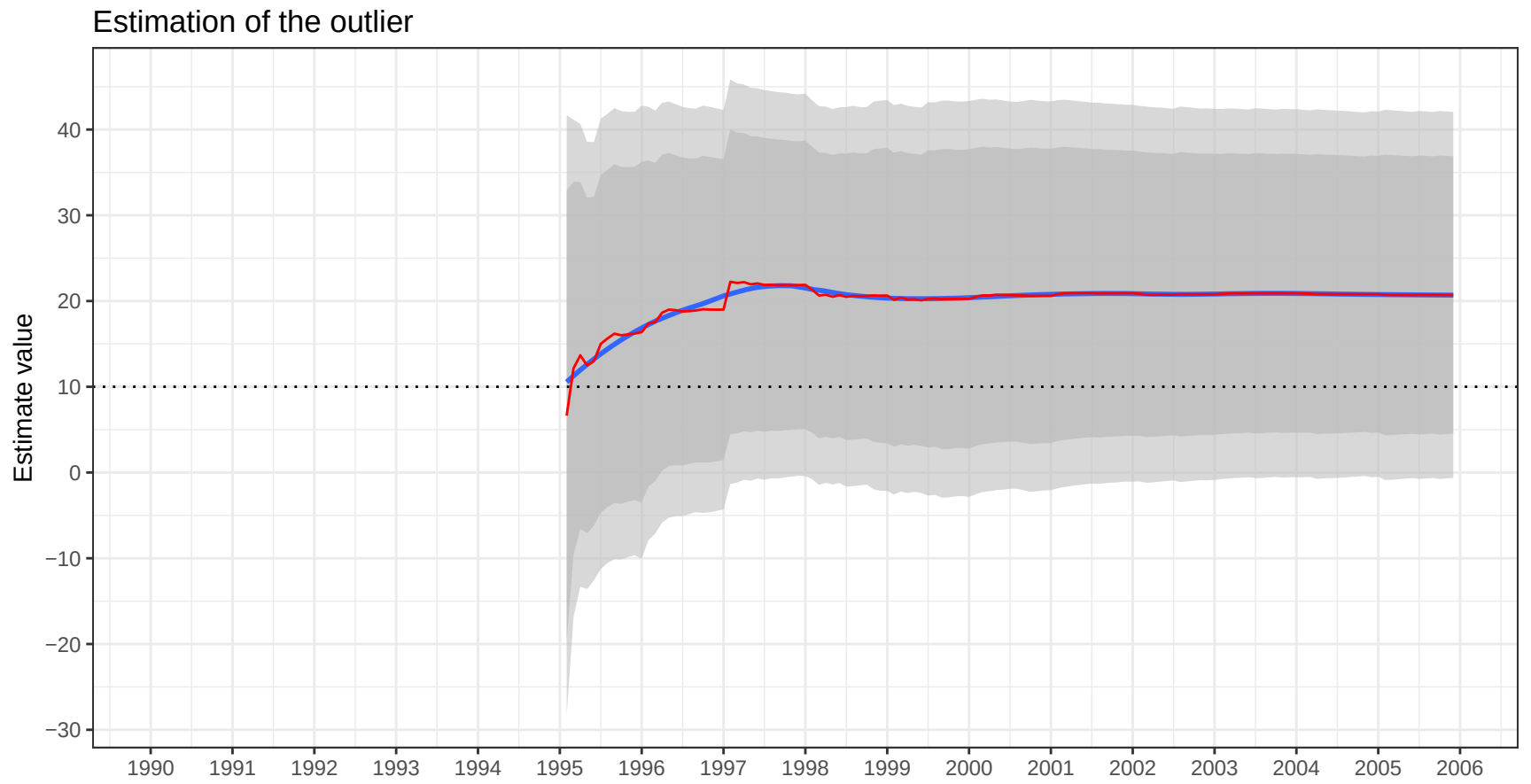


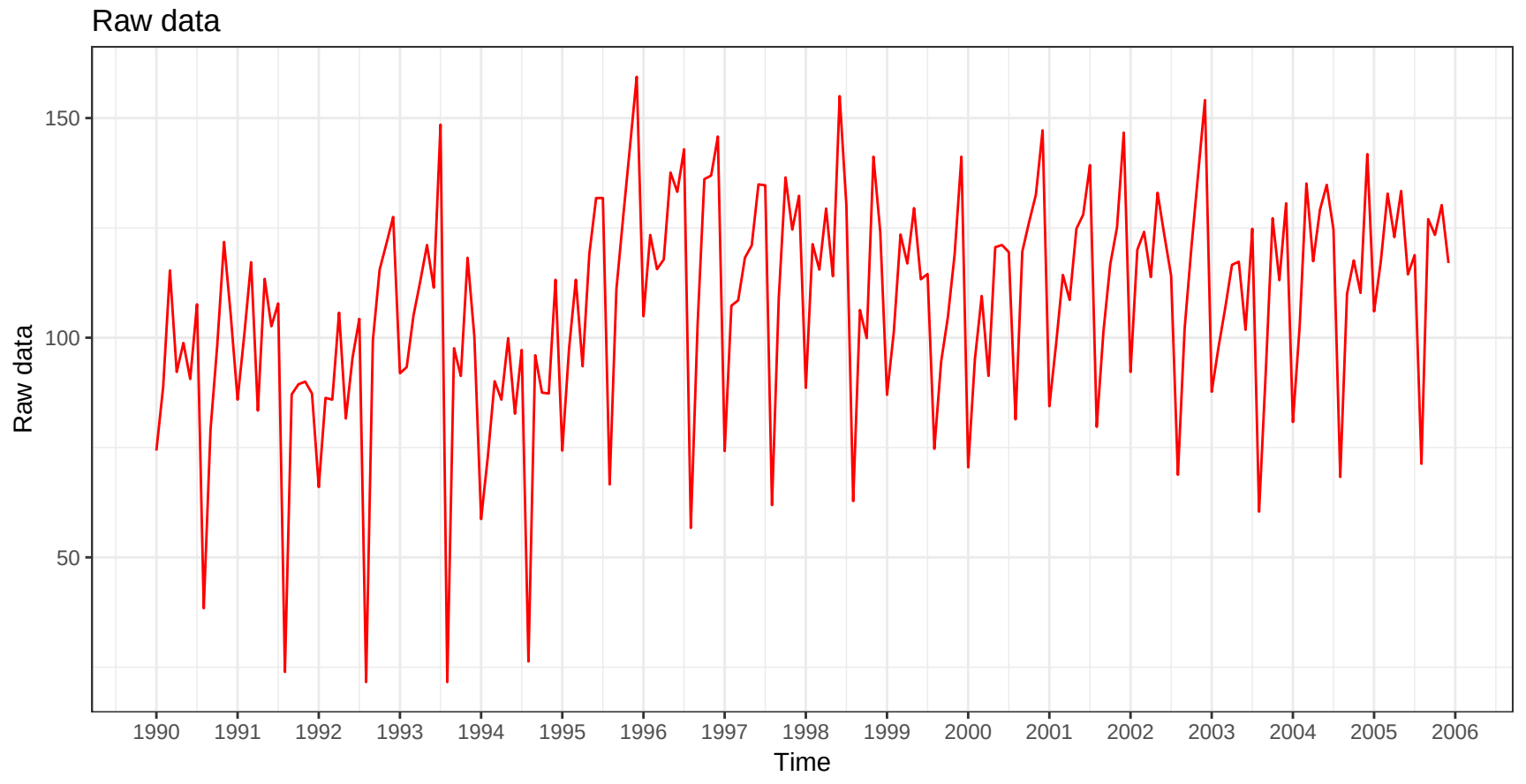



Estimate value of a LS(1996−1) DE−C2829
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.80
0.75
0.70
0.65
0.60
0.55
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
5.5
5.0
4.5
4.0
Time

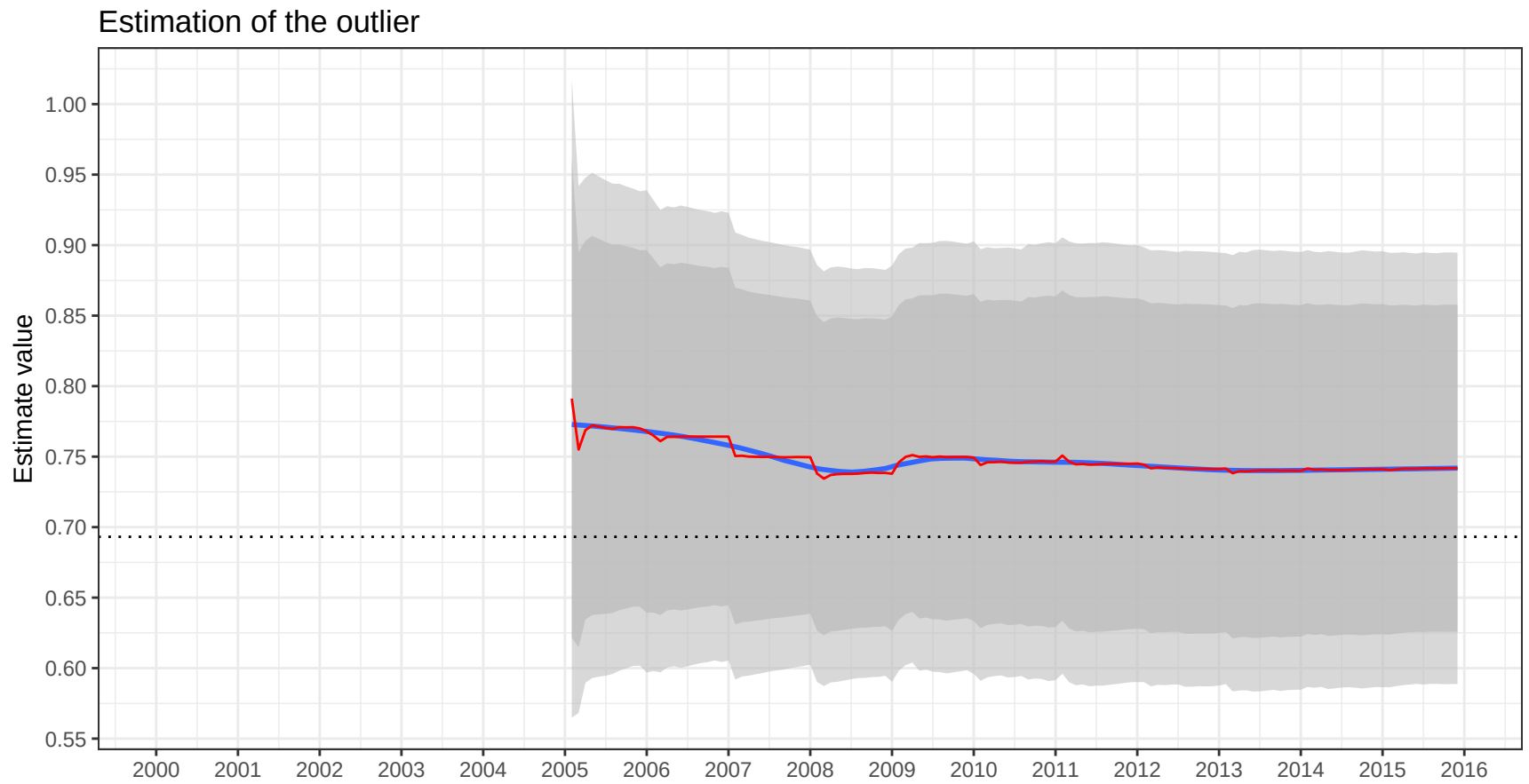

Estimate value of a LS(1995−1) FR−C2829
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.85
0.80
0.75
0.70
0.65
0.60
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
5.5
5.0
4.5
4.0
Time

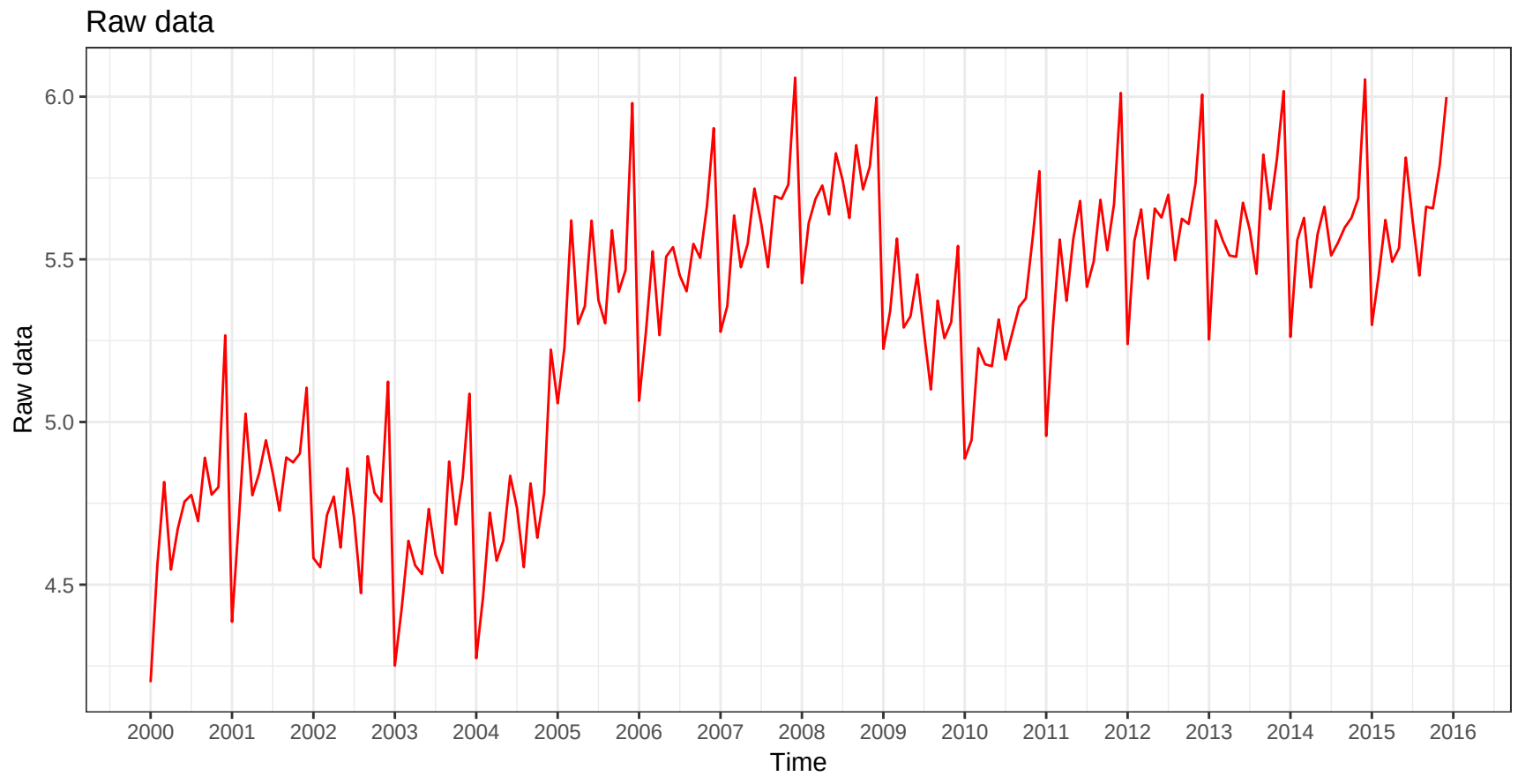
Estimate value of a LS(1995−1) IT−C2829
ARIMA (0,1,1)(0,1,1) − additive decomposition





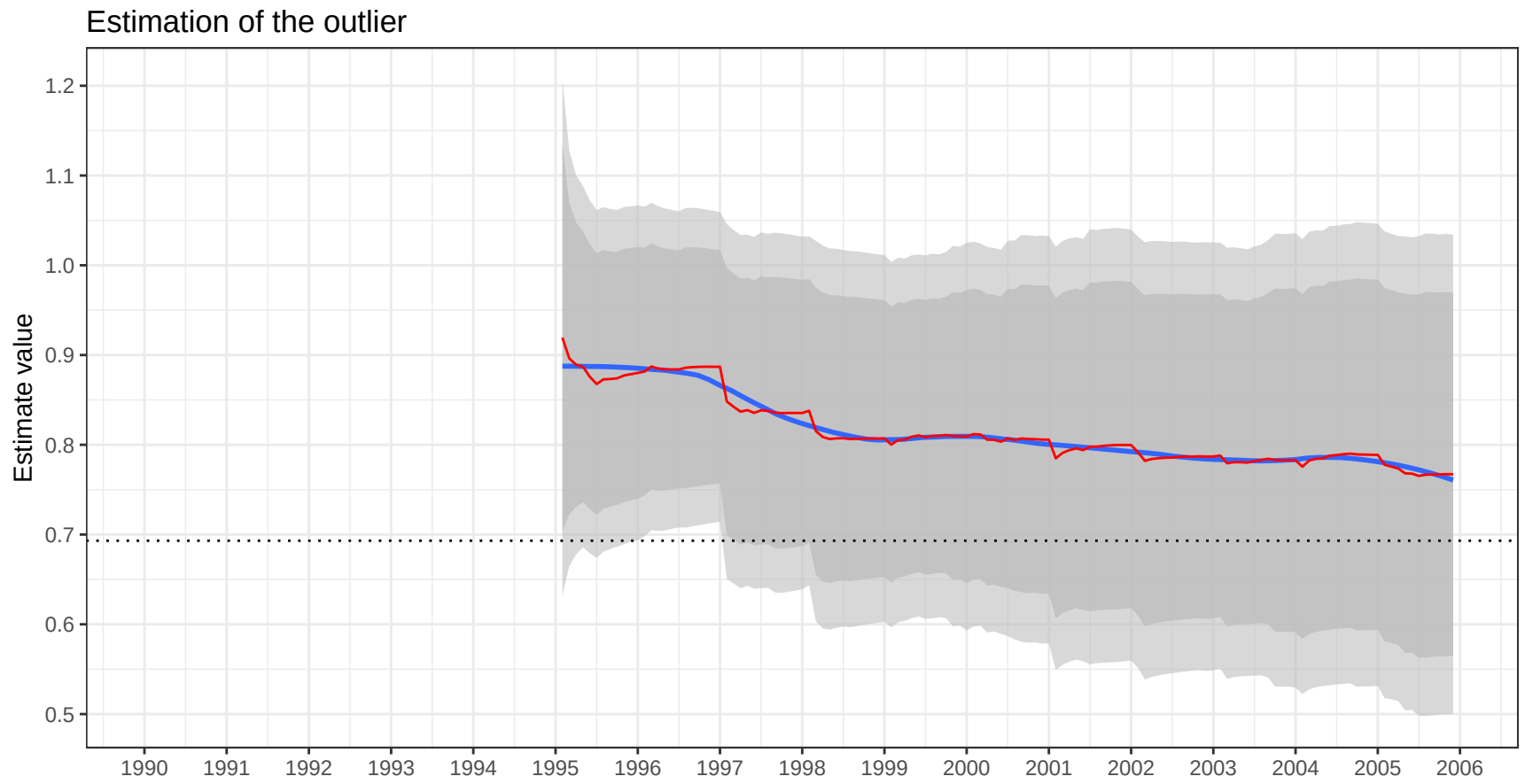
Estimate value of a LS(2005−1) DE−C2841
ARIMA (3,1,1)(0,1,1) − multiplicative decomposition

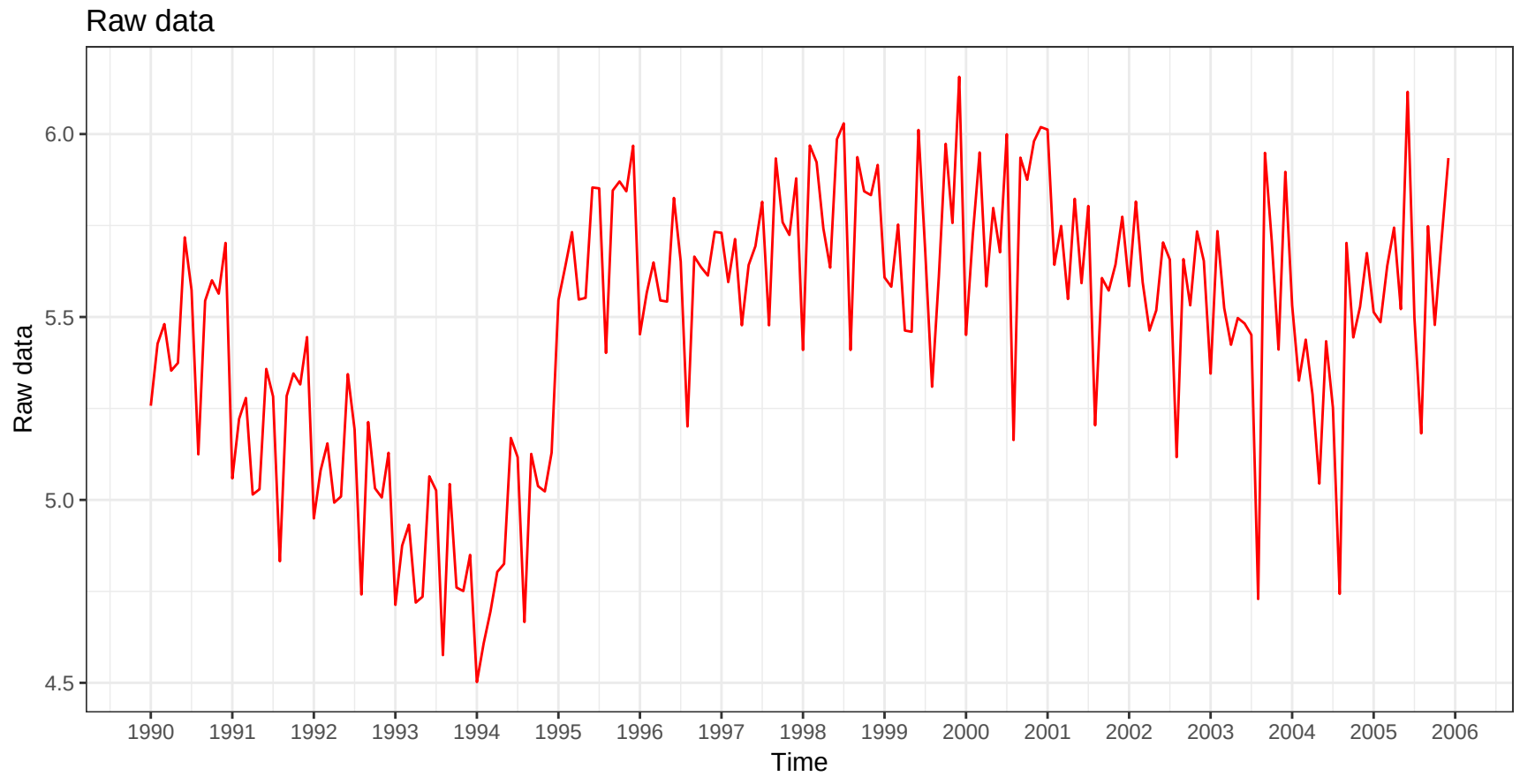


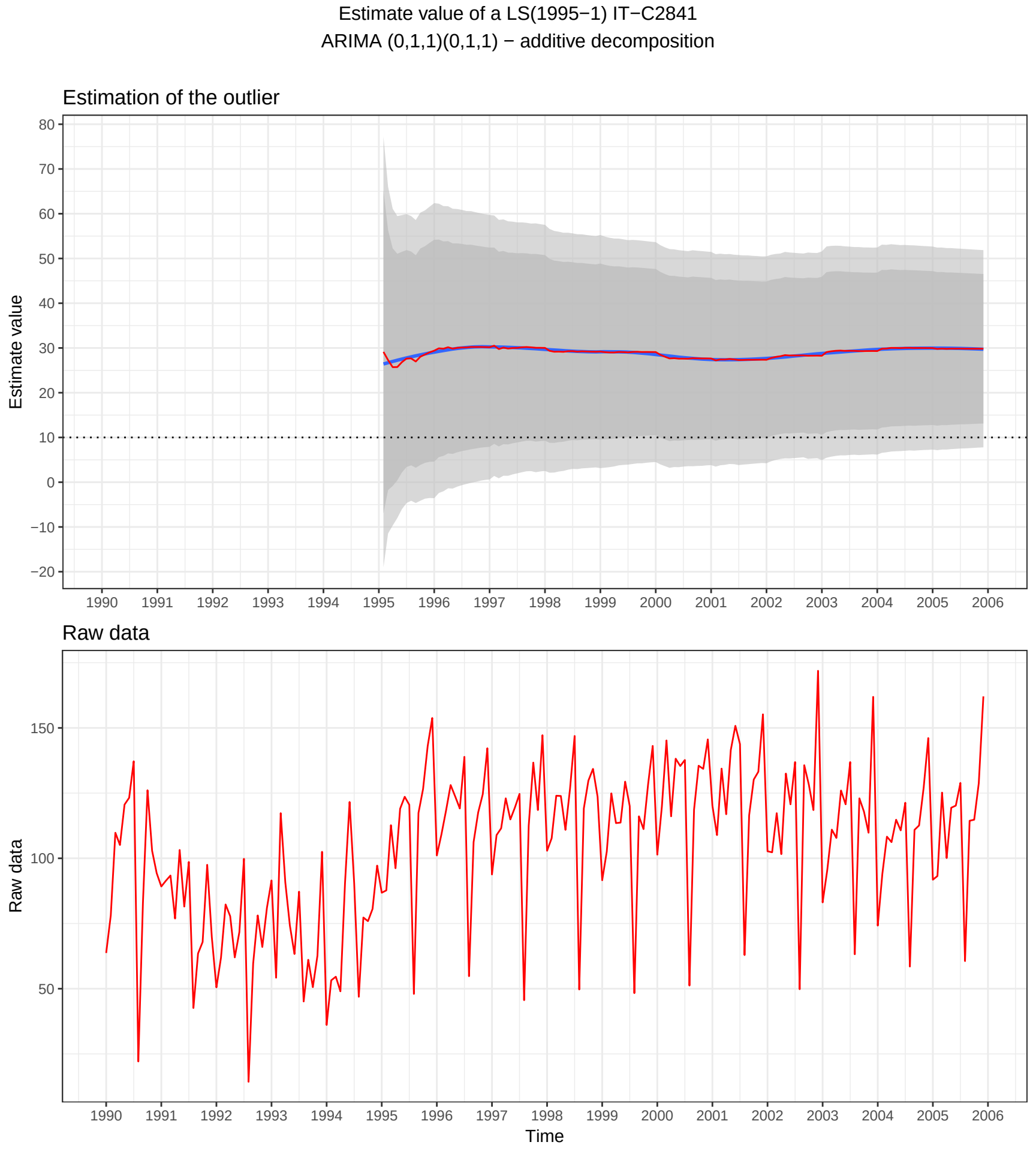


Estimate value of a LS(1995−1) FR−C2841

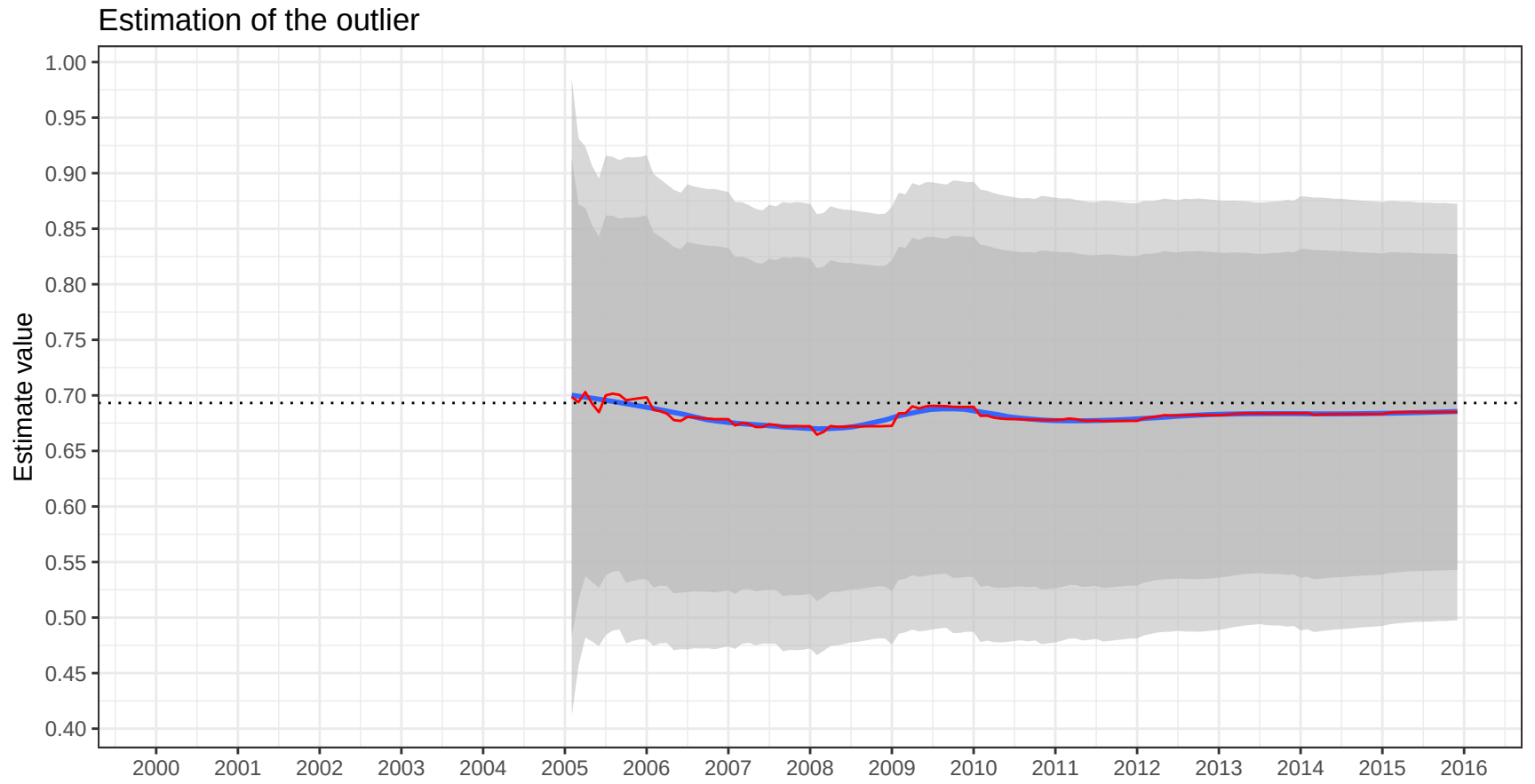
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

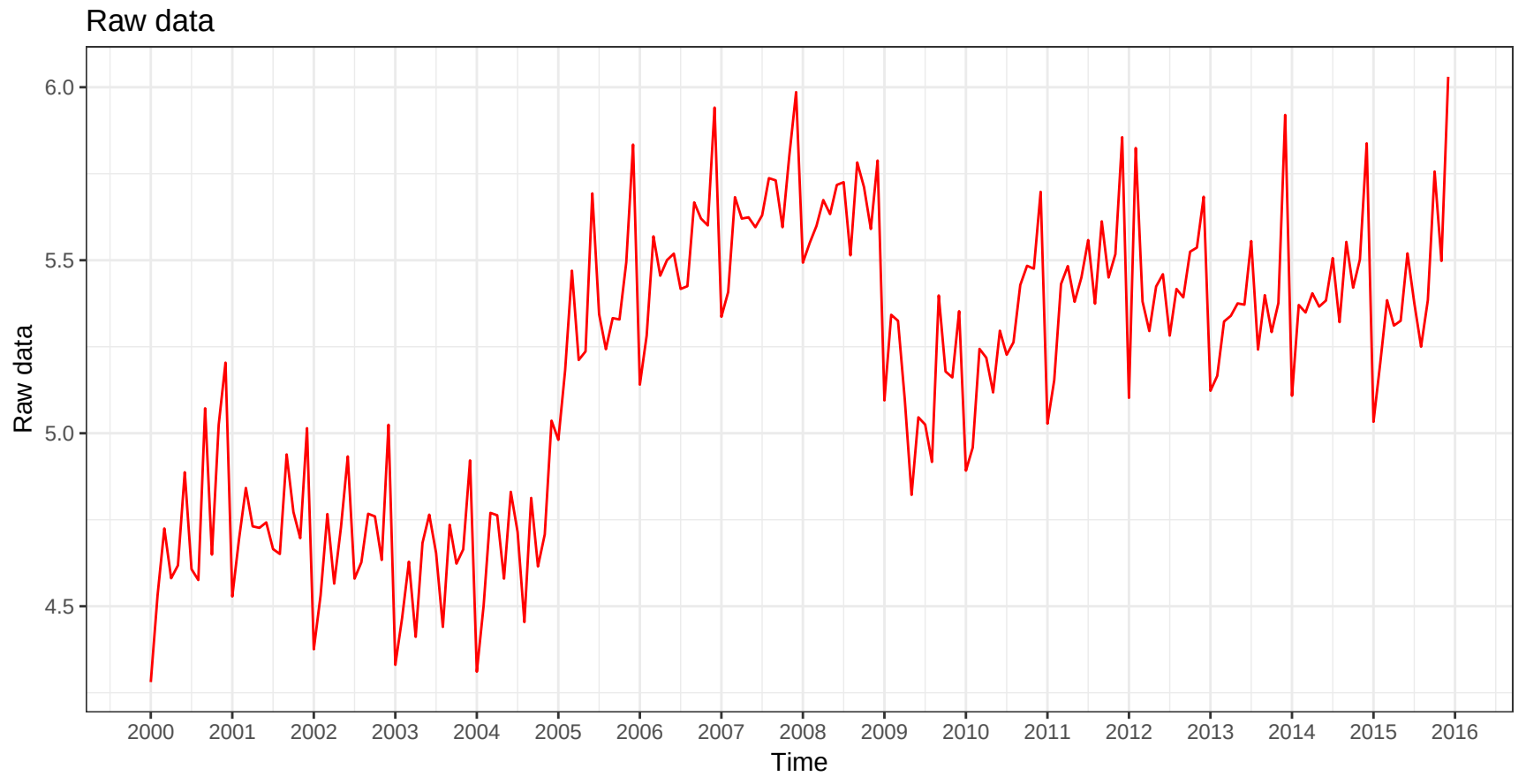


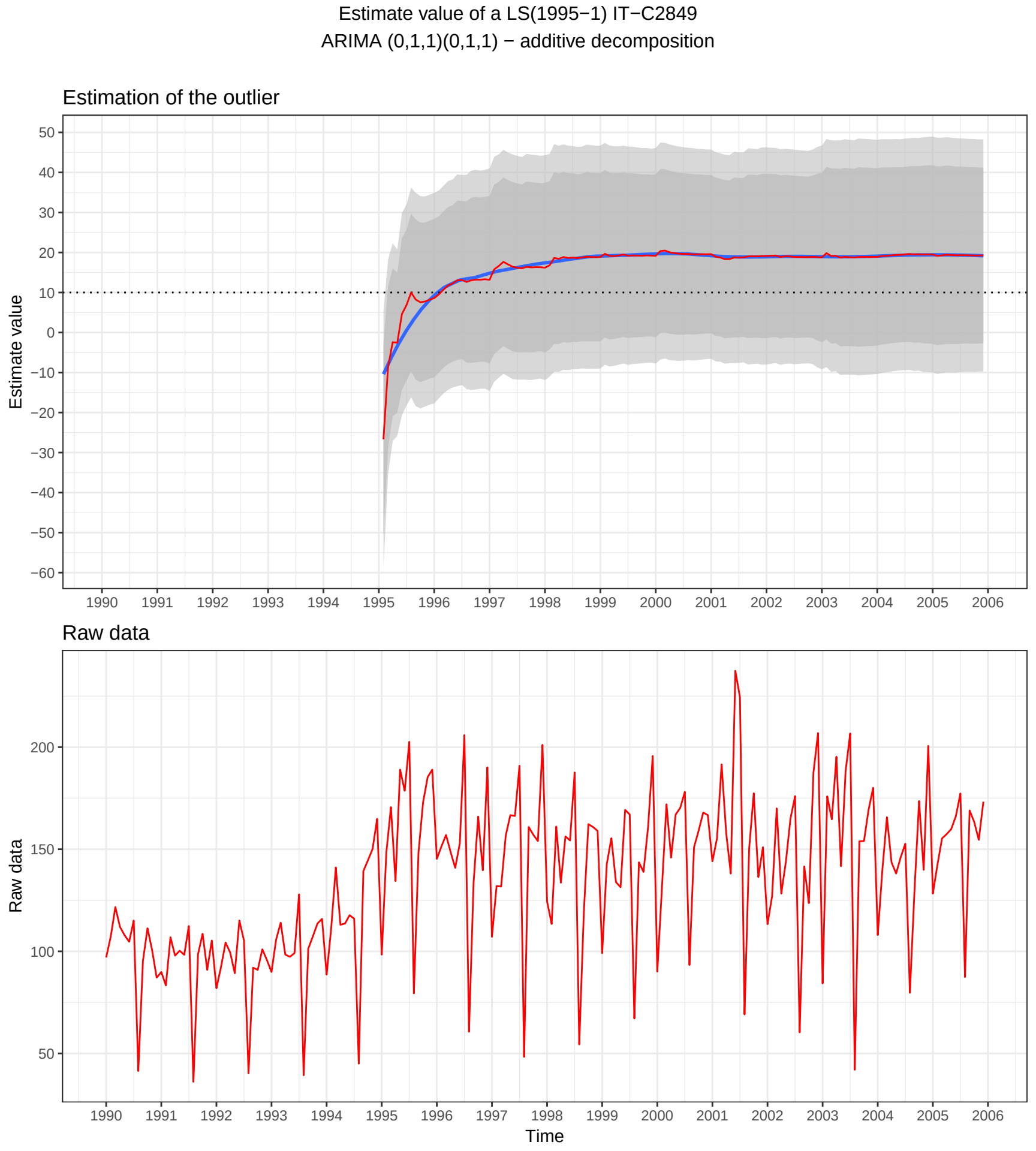


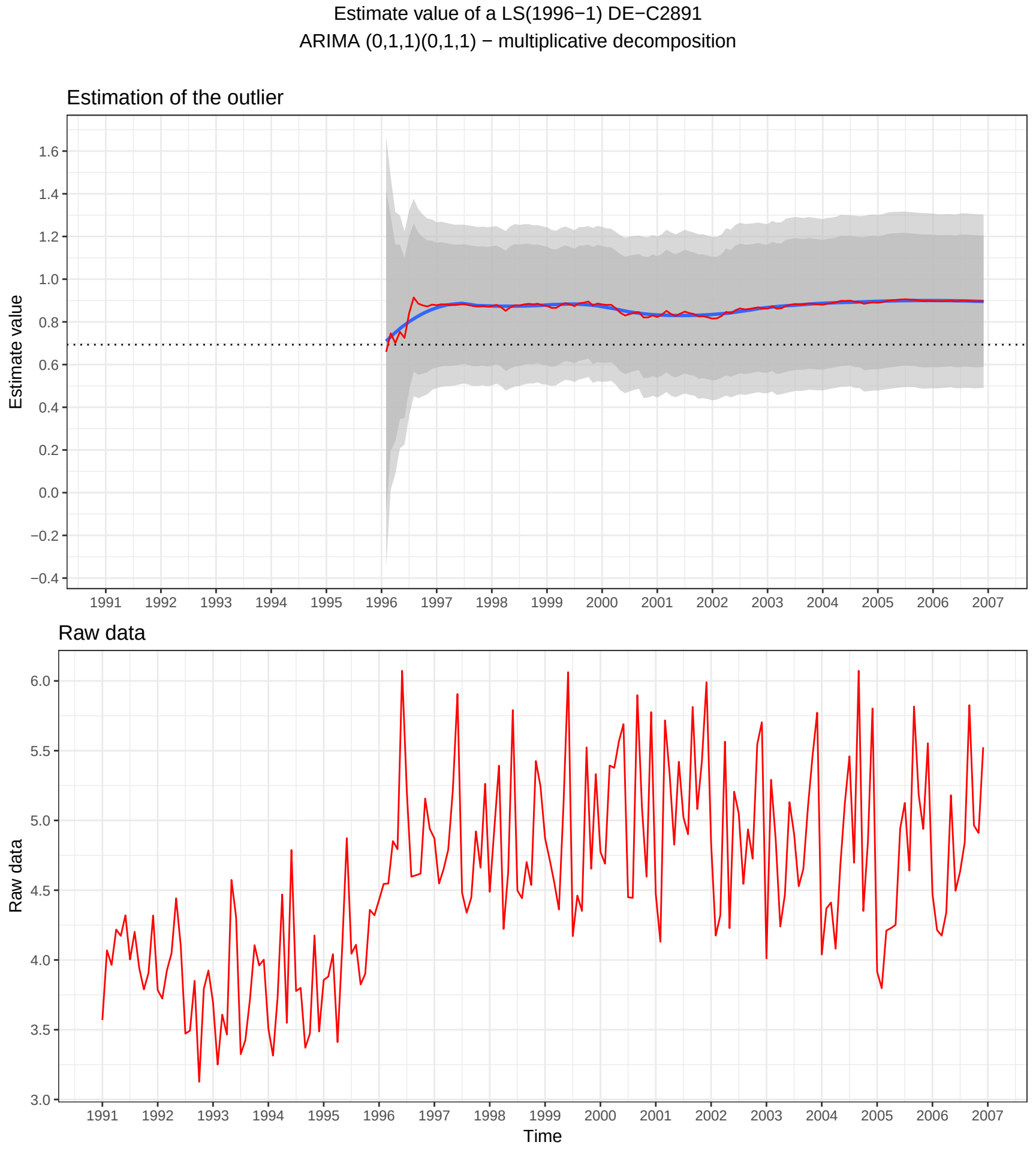

Estimate value of a LS(1995−1) IT−C2841
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
80
70
60
50
40
30
20
10
0
−10
−20
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
150
100
50
Time

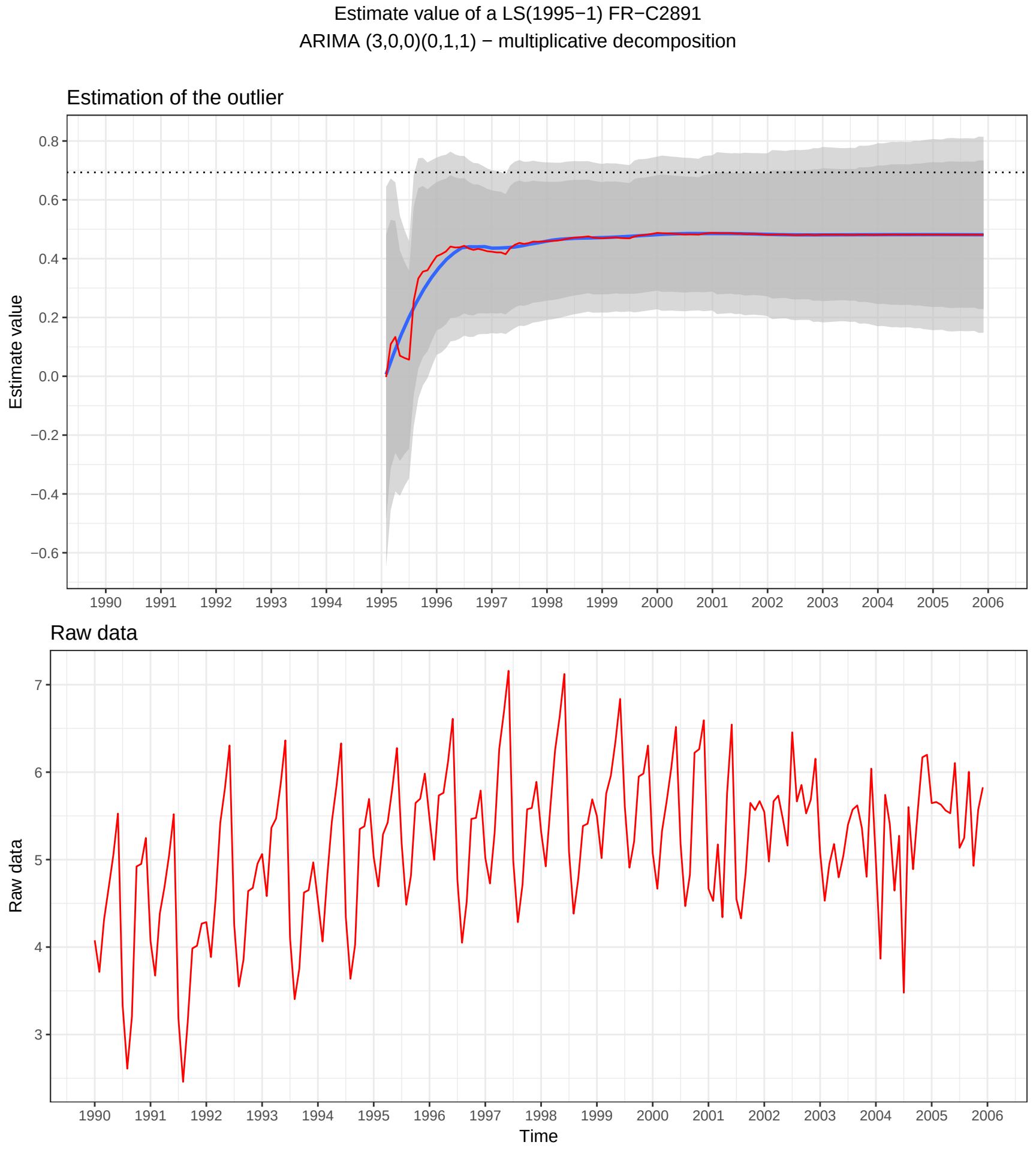
Estimate value of a LS(2005−1) DE−C2849
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

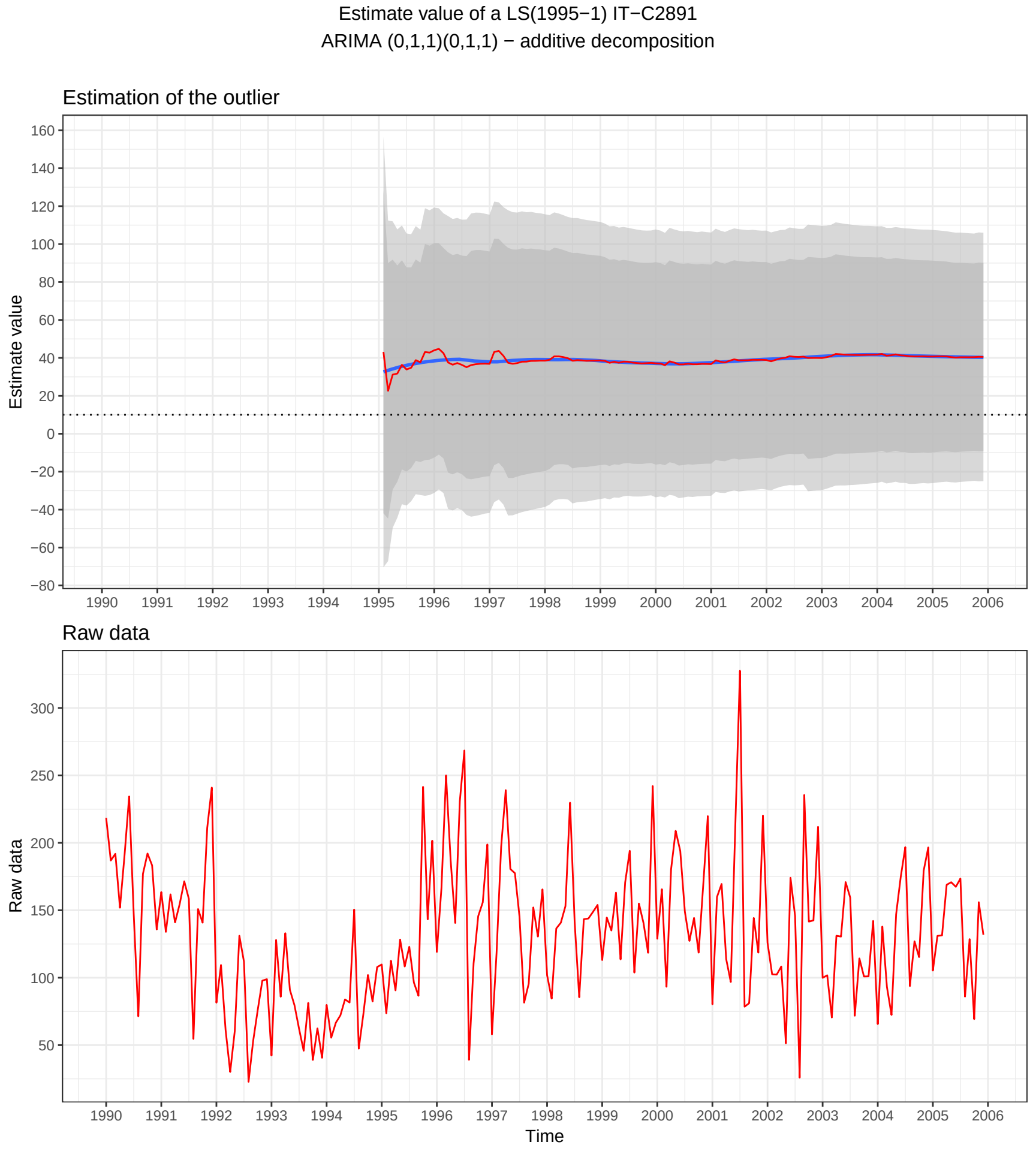





Estimate value of a LS(1995−1) IT−C2849
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
50
40
30
20
10
0
−10
−20
−30
−40
−50
−60
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
200
150
100
50
Time

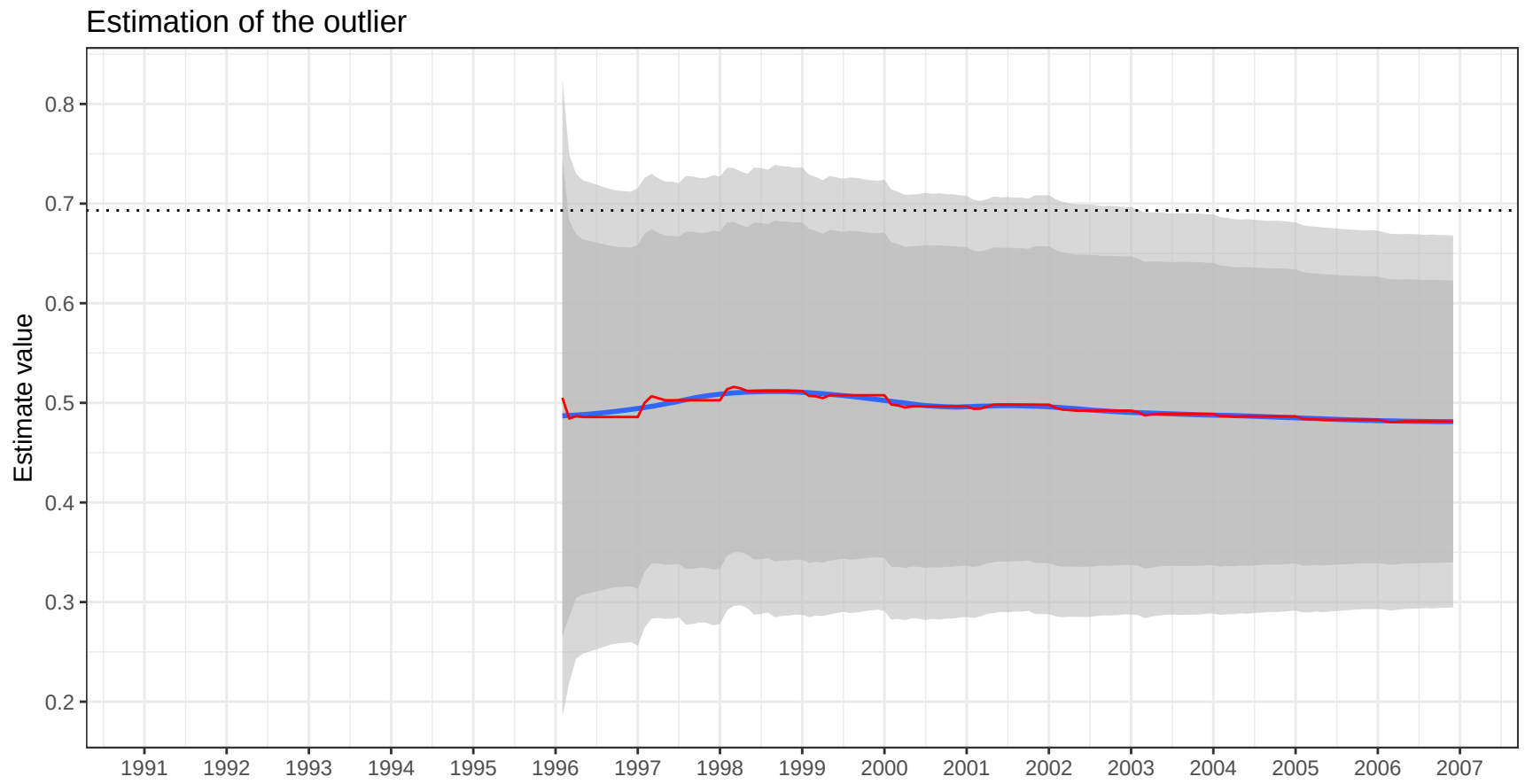

Estimate value of a LS(1996−1) DE−C2891
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
6.0
5.5
5.0
4.5
4.0
3.5
3.0
Time

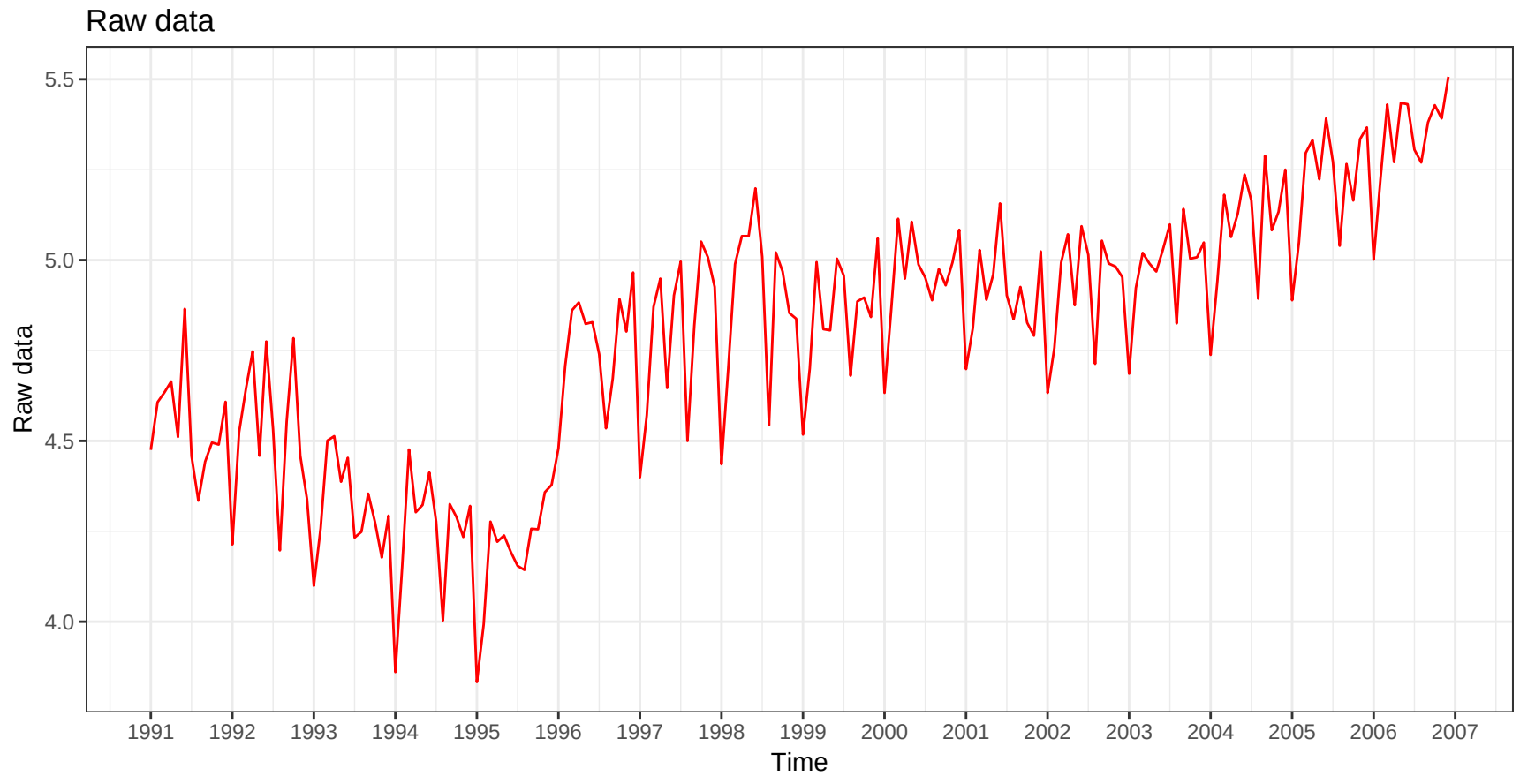

Estimate value of a LS(1995−1) FR−C2891
ARIMA (3,0,0)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
7
6
5
4
3
Time


Estimate value of a LS(1995−1) IT−C2891
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
160
140
120
100
80
60
40
20
0
−20
−40
−60
−80
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
300
250
200
150
100
50
Time

Estimate value of a LS(1996−1) DE−C2892

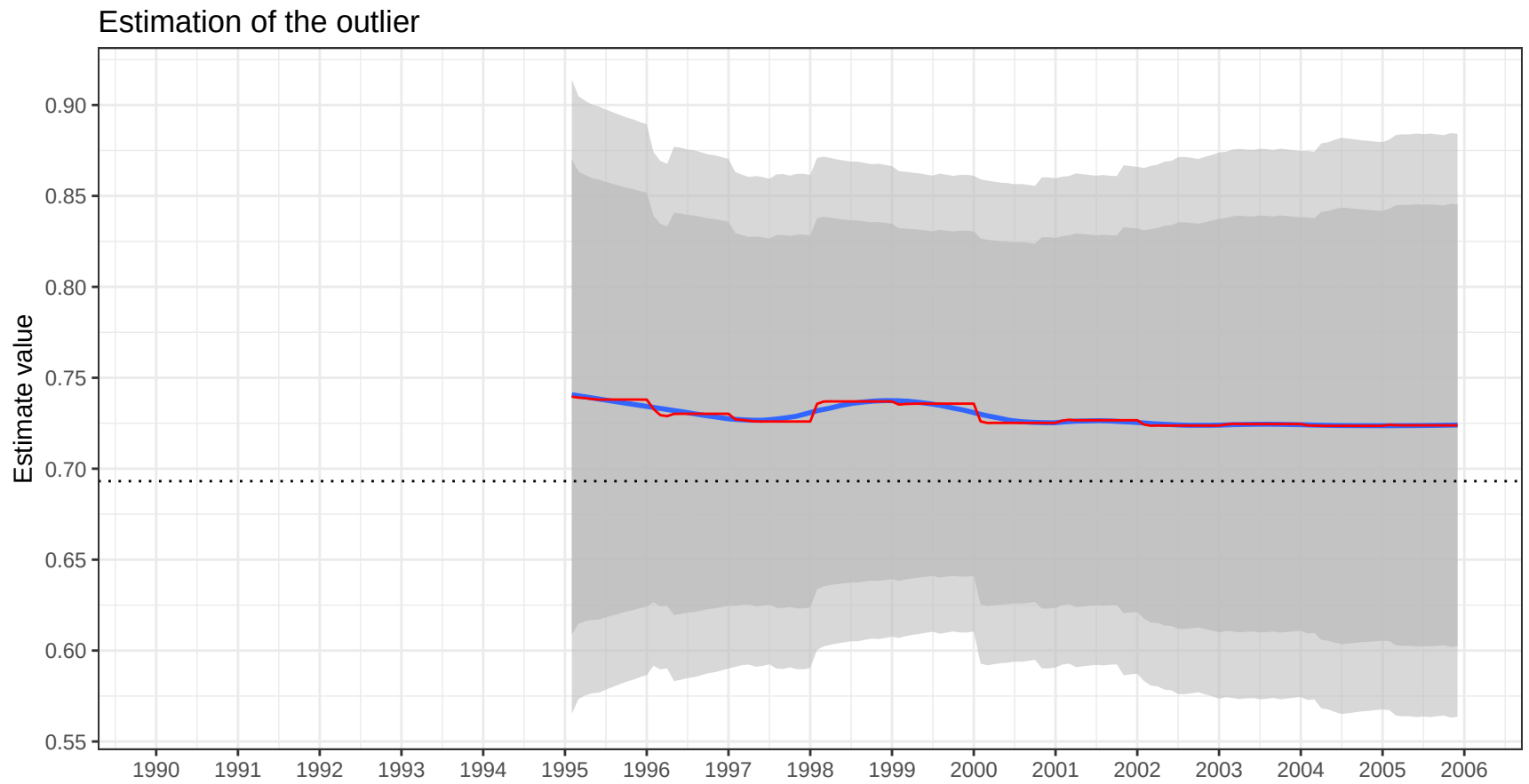
ARIMA (3,1,0)(0,1,1) − multiplicative decomposition

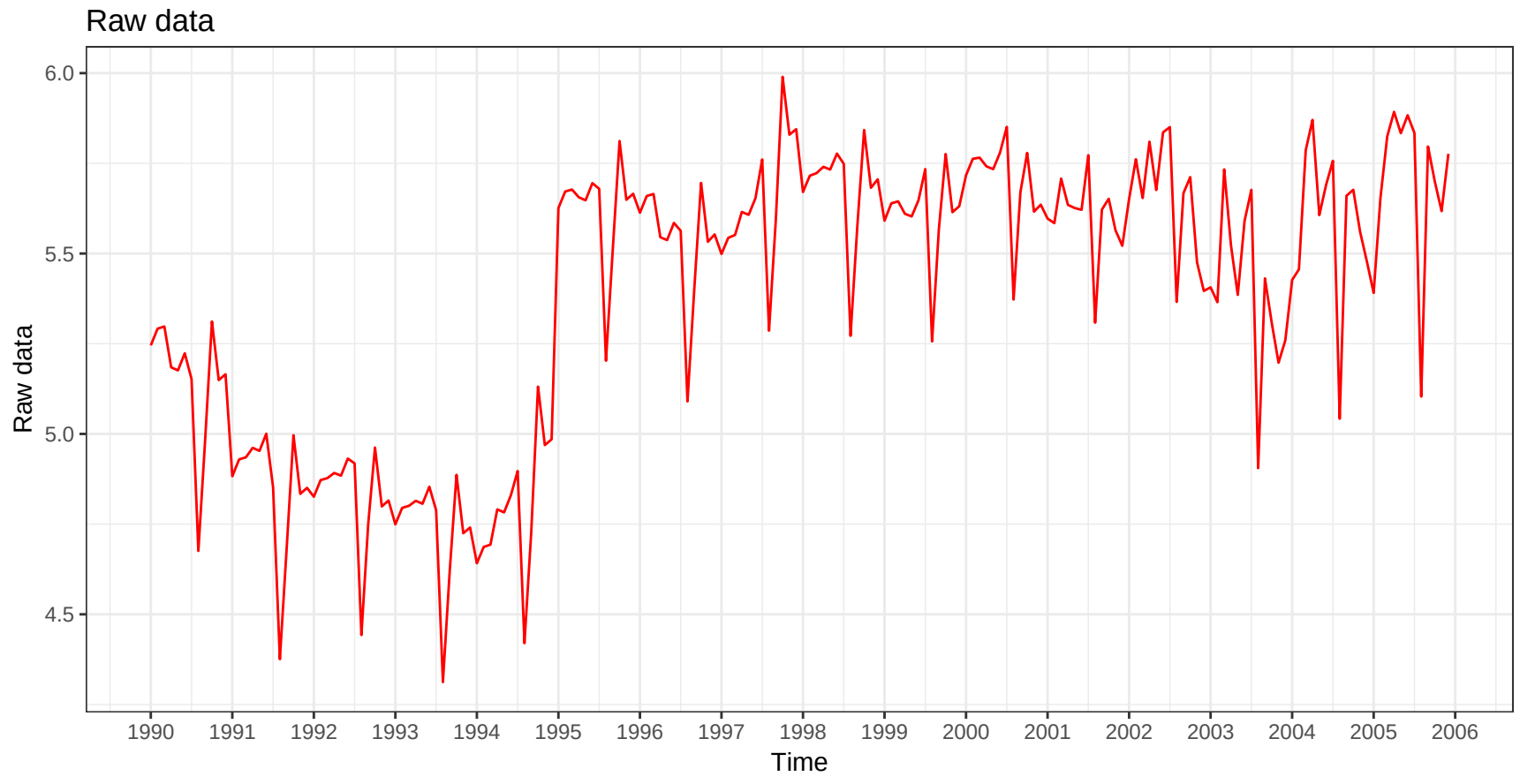




Estimate value of a LS(1995−1) FR−C2892

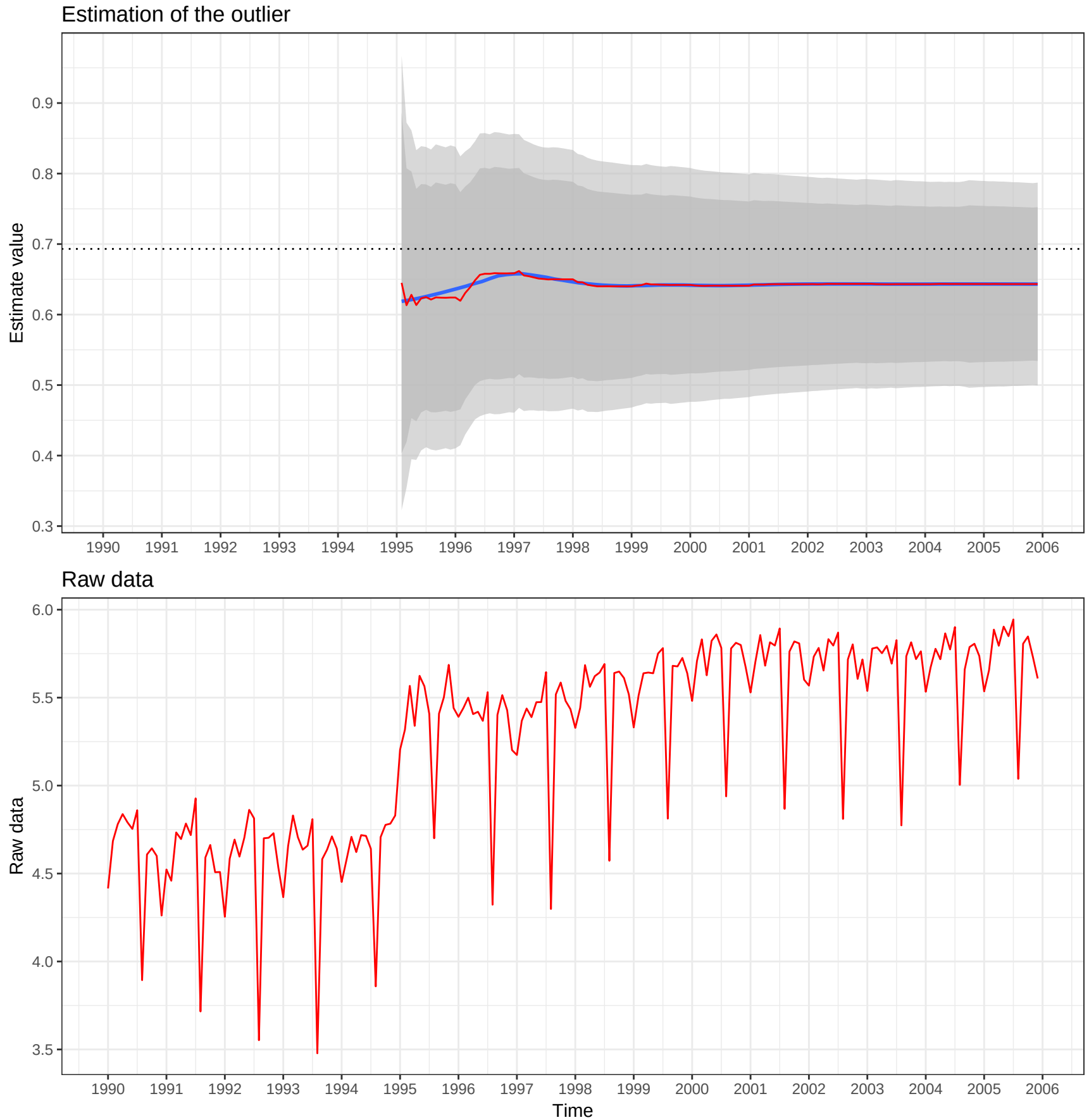
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition



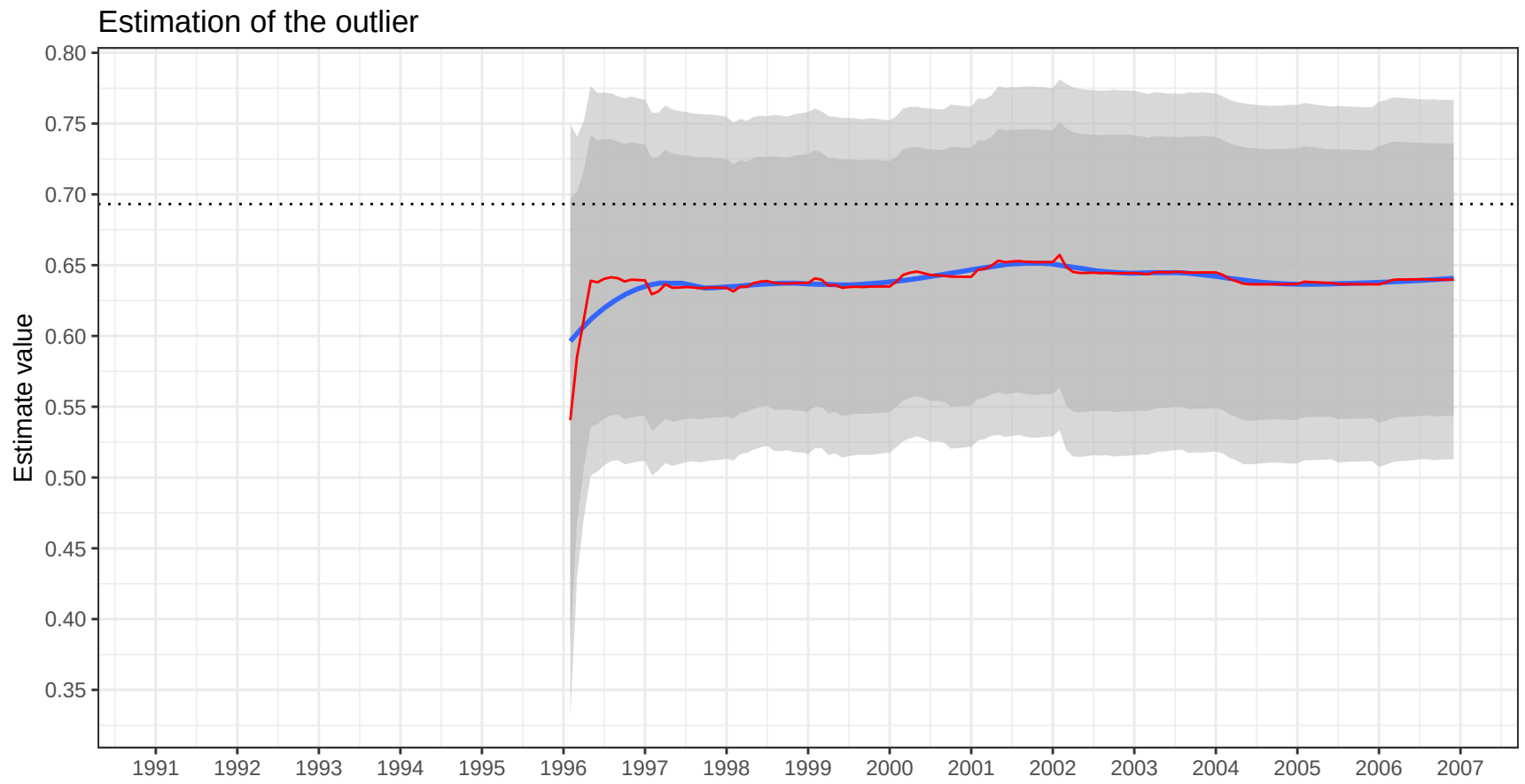


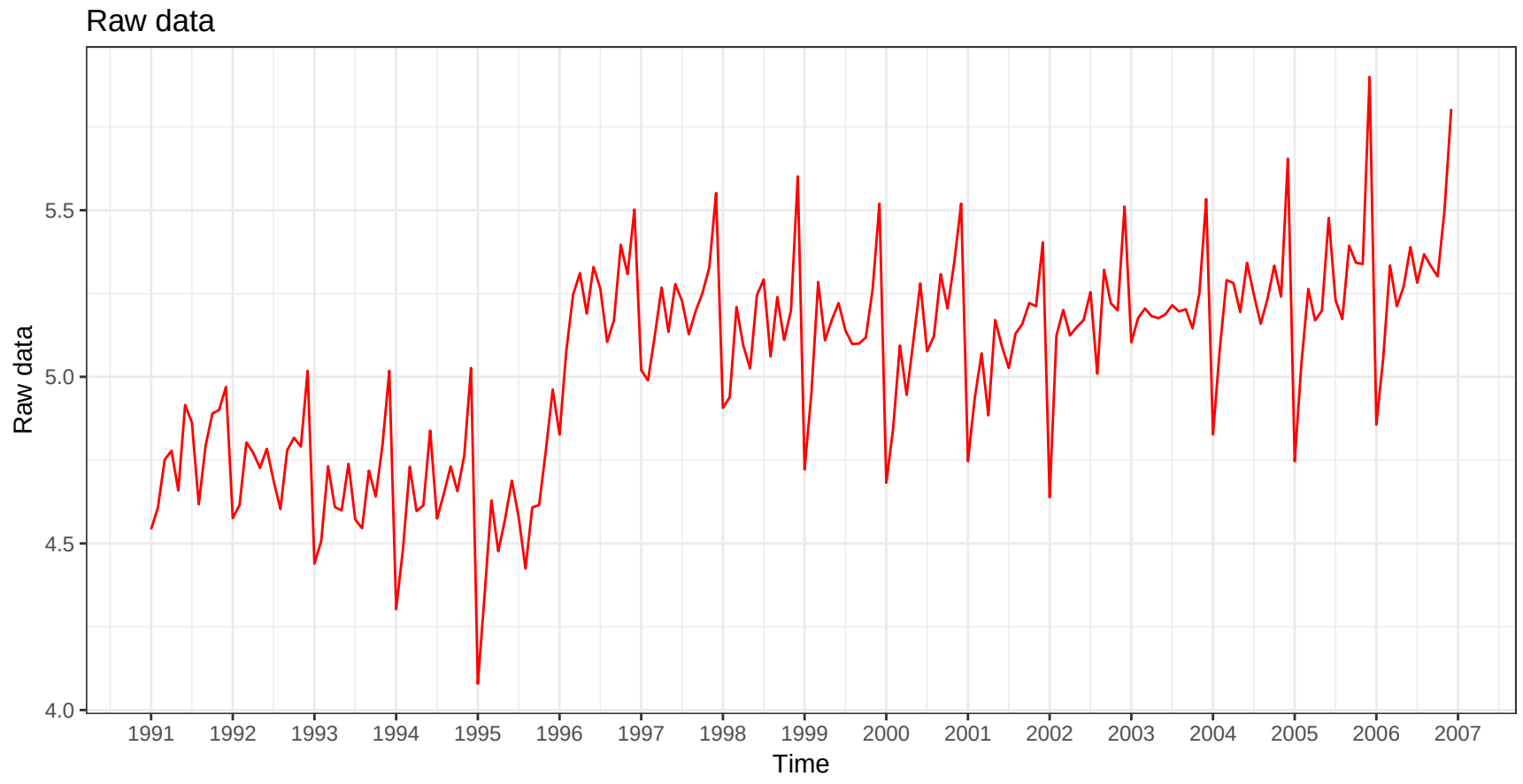
Estimate value of a LS(1995−1) IT−C2892

ARIMA (3,1,1)(0,1,1) − multiplicative decomposition



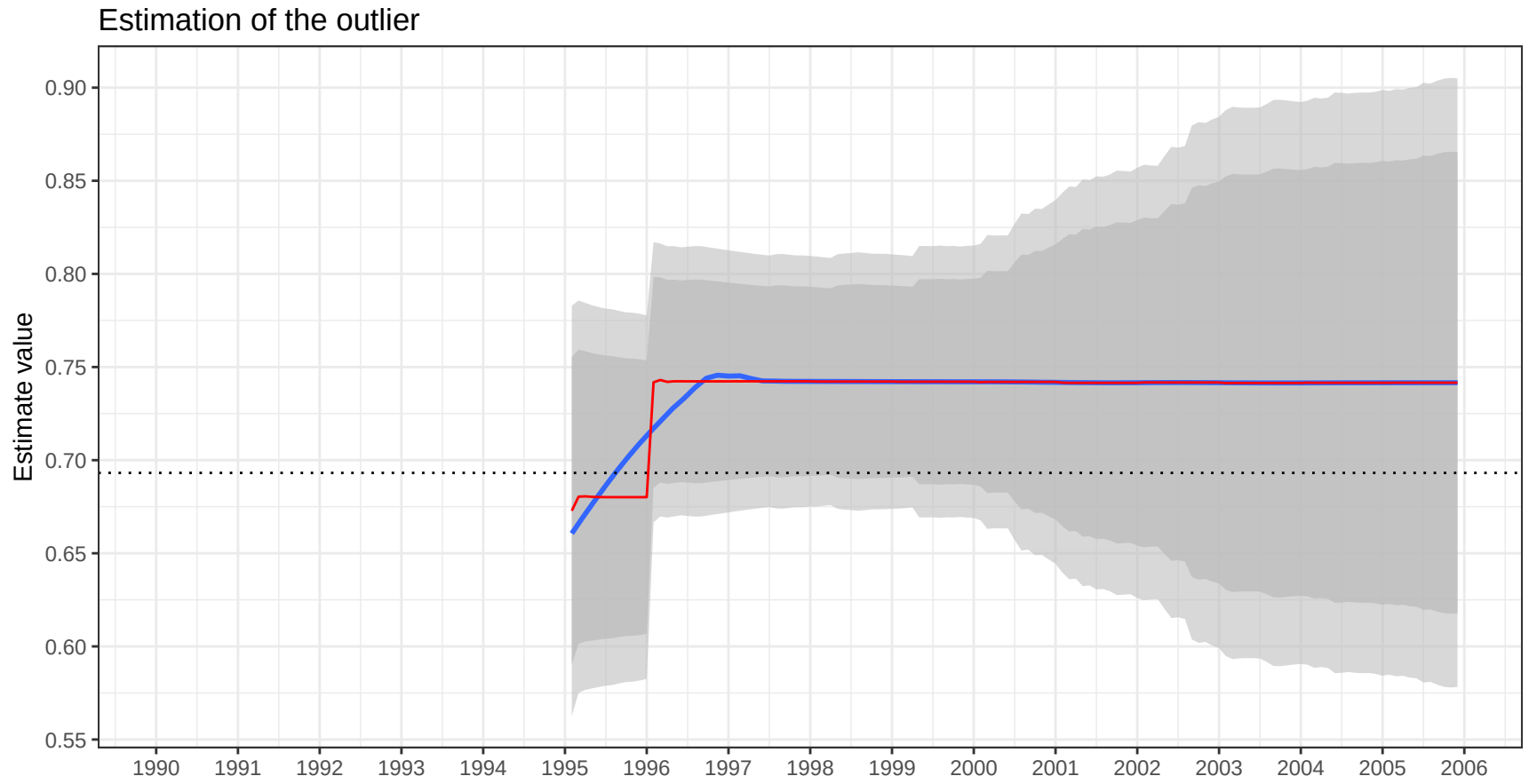
Estimate value of a LS(1996−1) DE−C2893
ARIMA (0,1,2)(0,1,1) − multiplicative decomposition

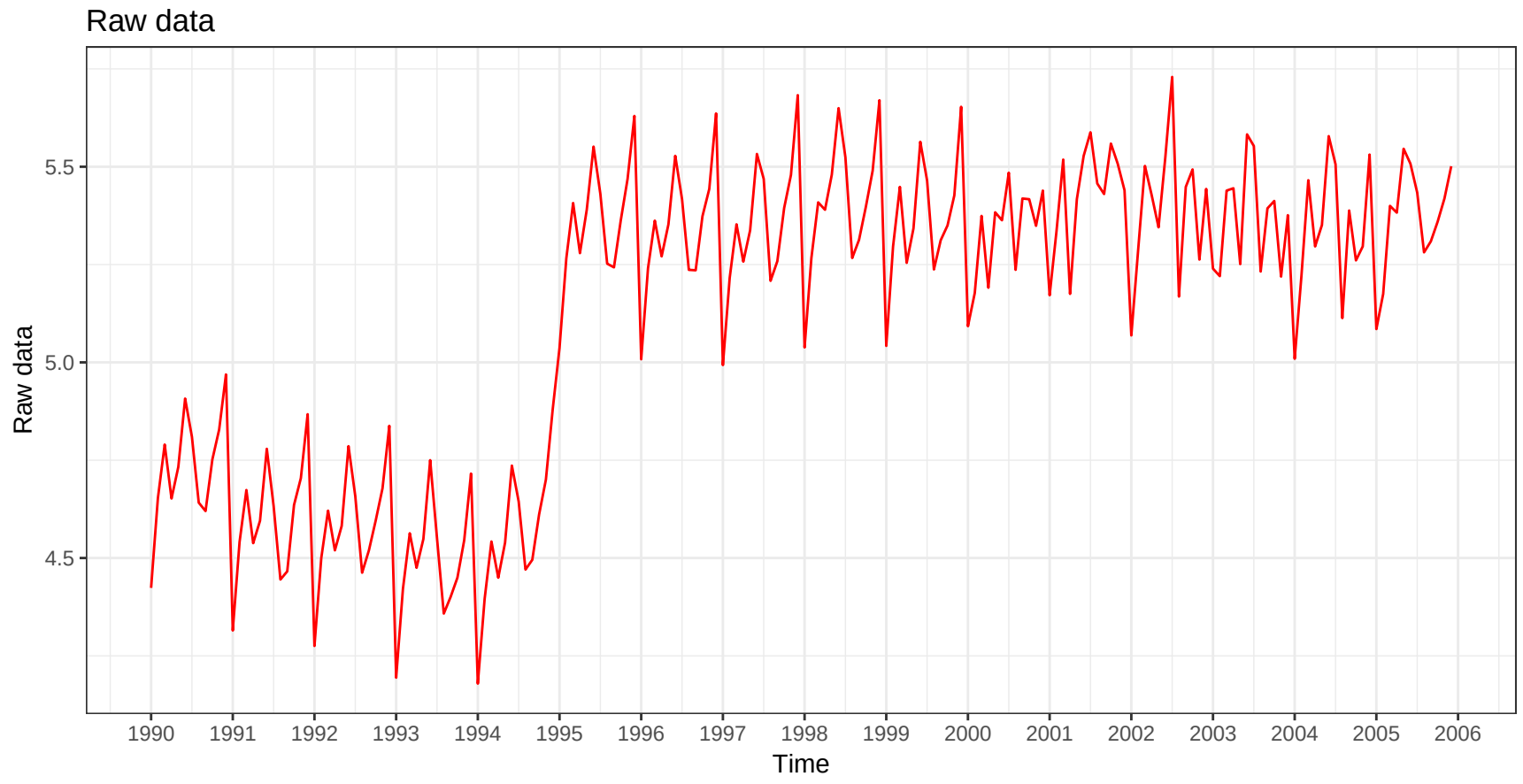




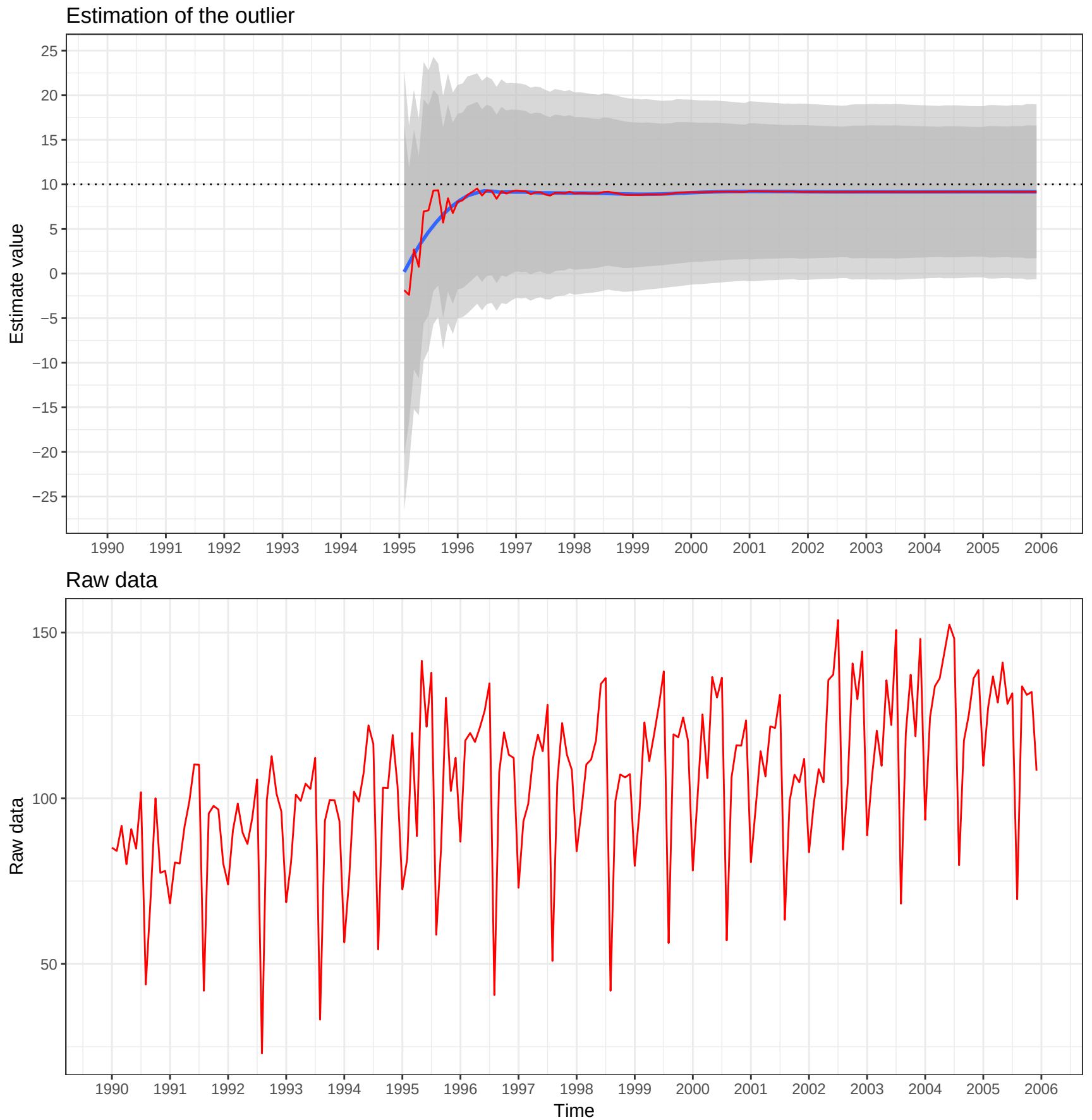
Estimate value of a LS(1995−1) FR−C2893

ARIMA (0,1,1)(1,1,1) − multiplicative decomposition

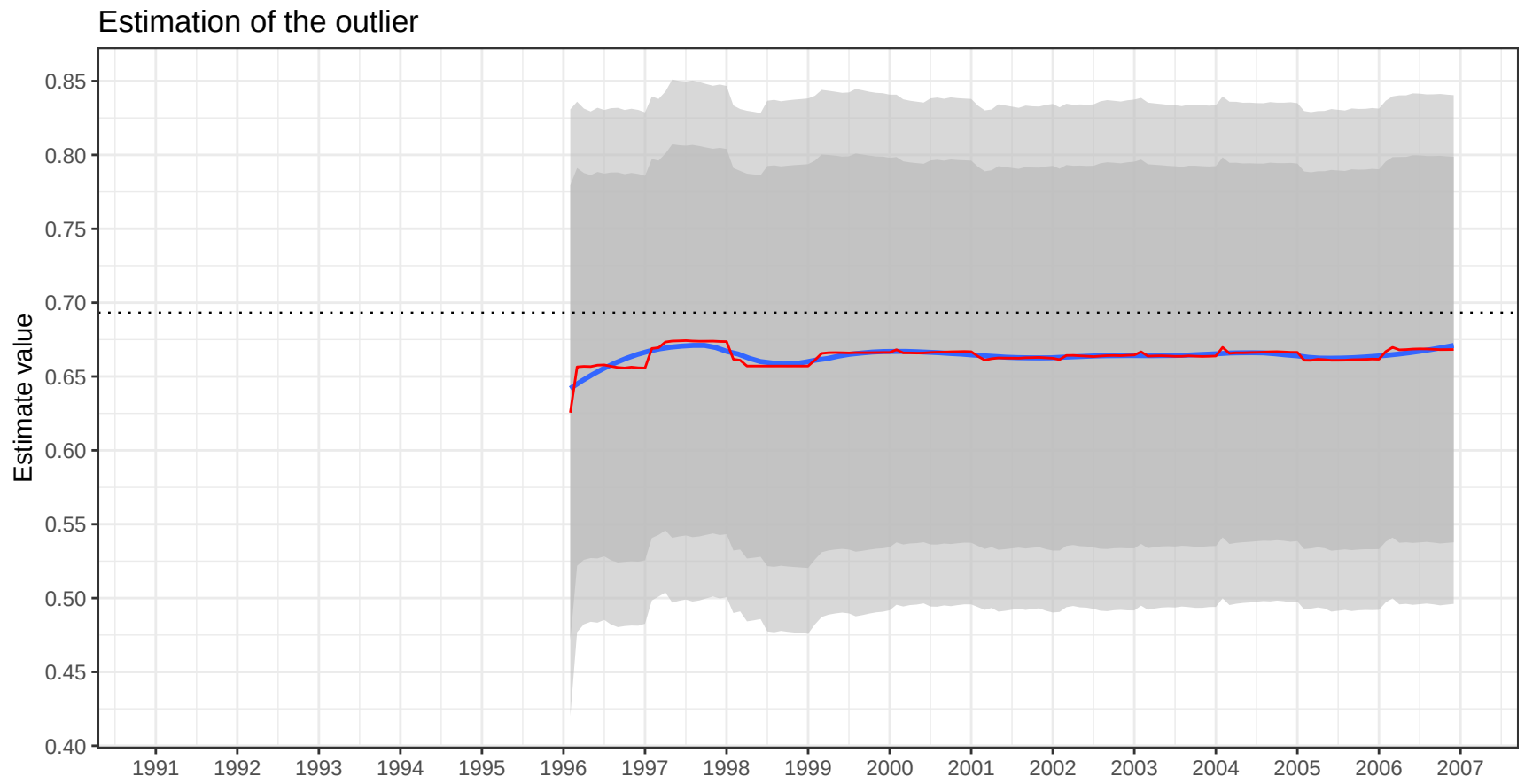


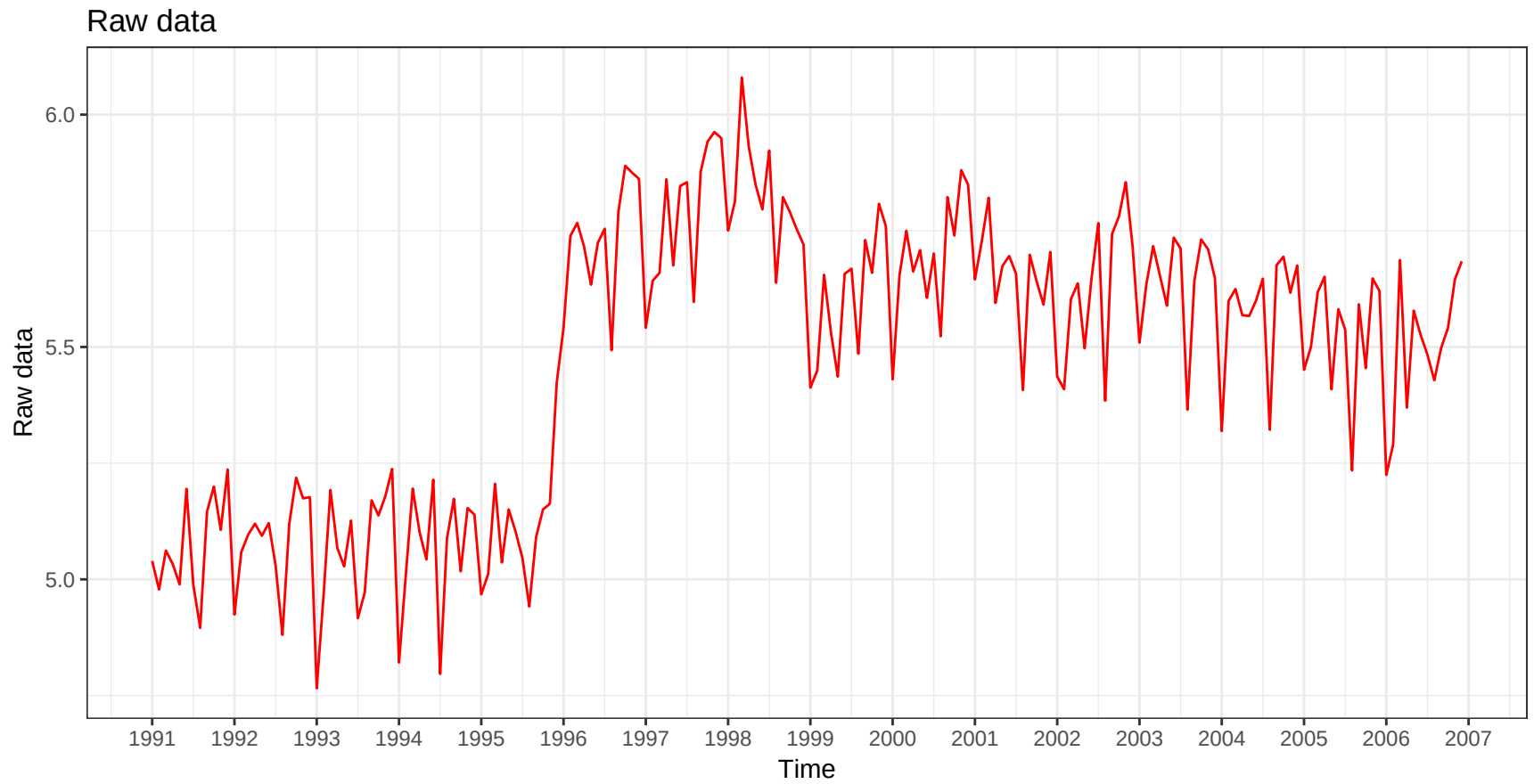


Estimate value of a LS(1995−1) IT−C2893
ARIMA (2,0,0)(0,1,1) − additive decomposition

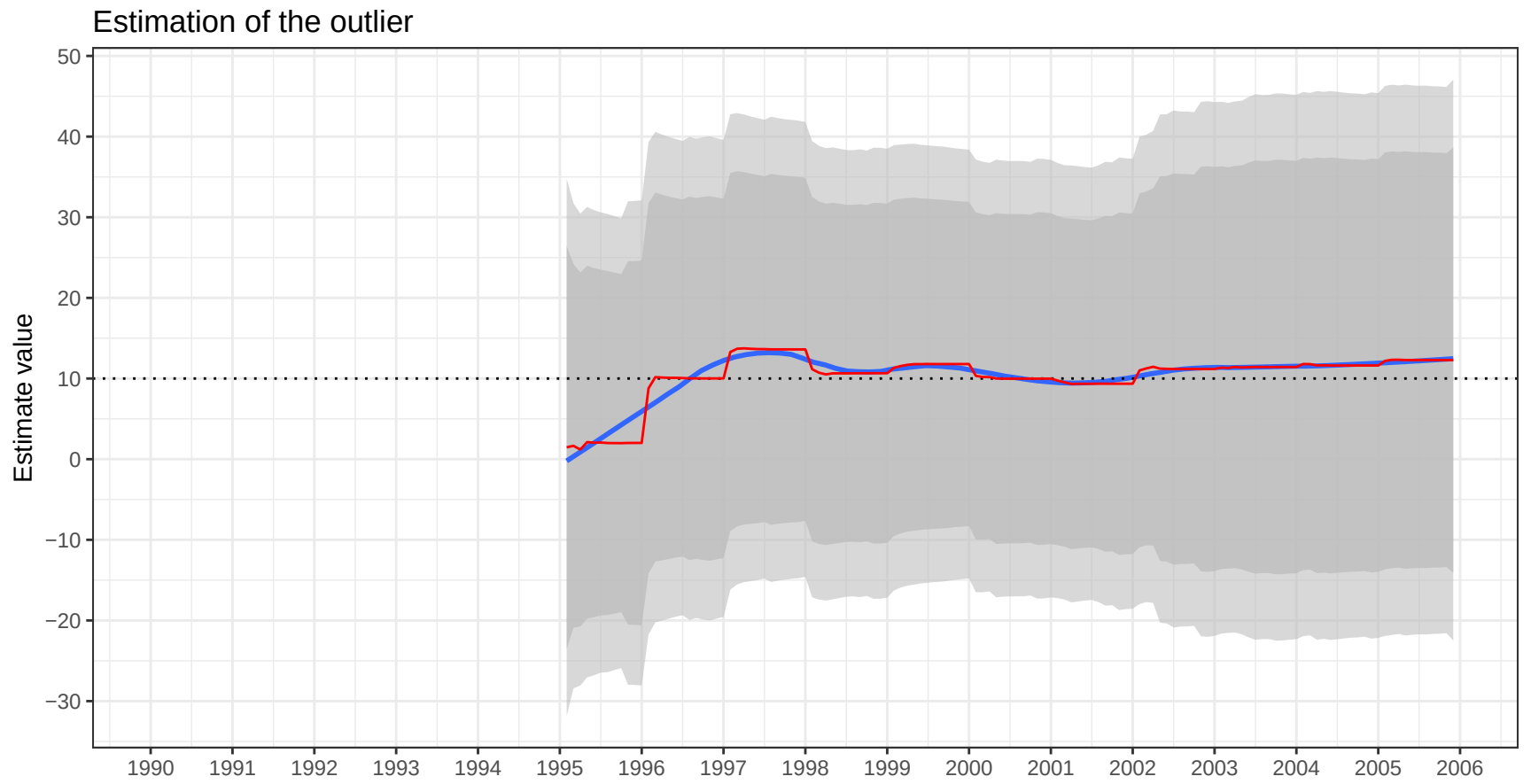


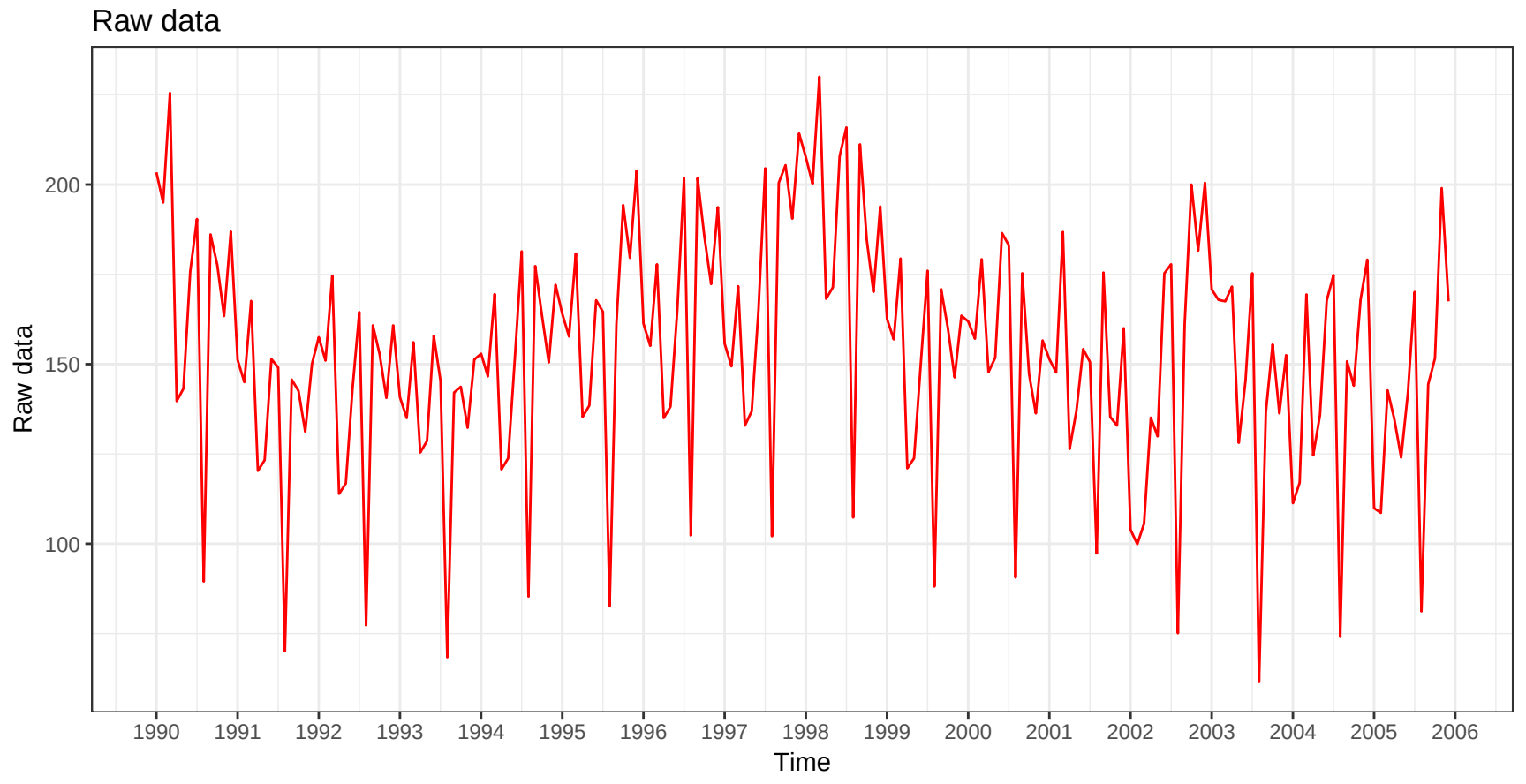
Estimate value of a LS(1996−1) DE−C2894
ARIMA (3,1,1)(0,1,1) − multiplicative decomposition



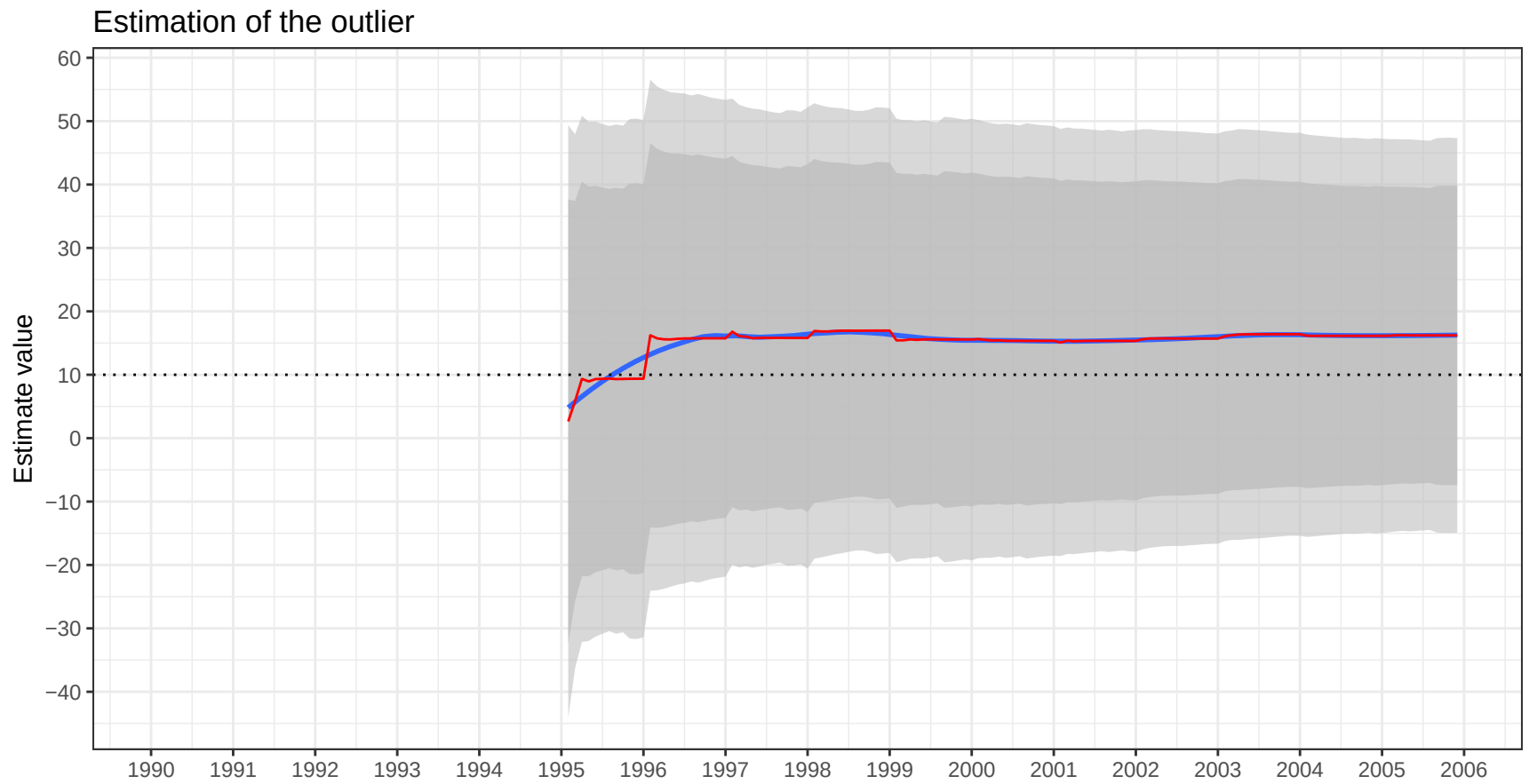


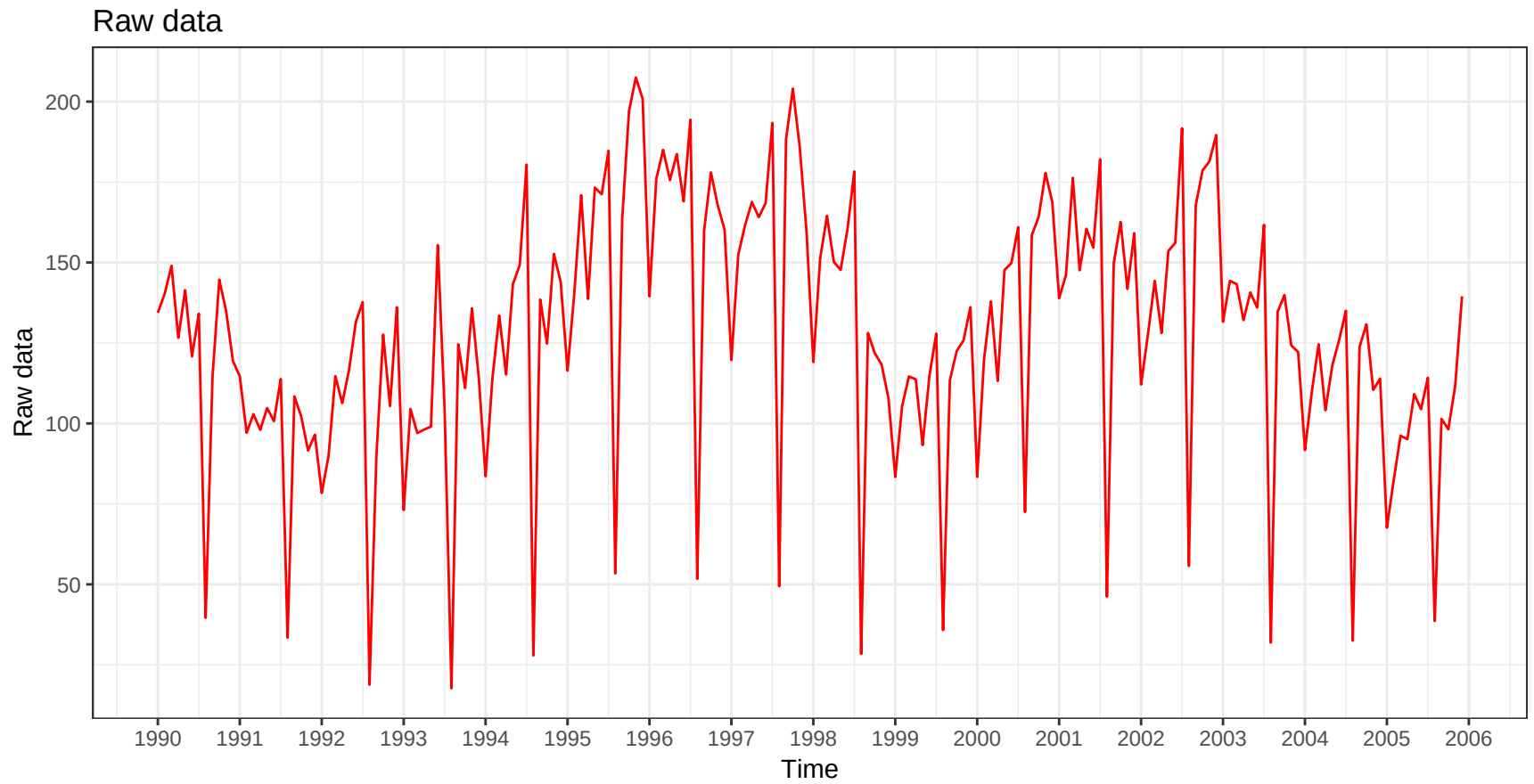
Estimate value of a LS(1995−1) FR−C2894
ARIMA (0,1,1)(0,1,1) − additive decomposition





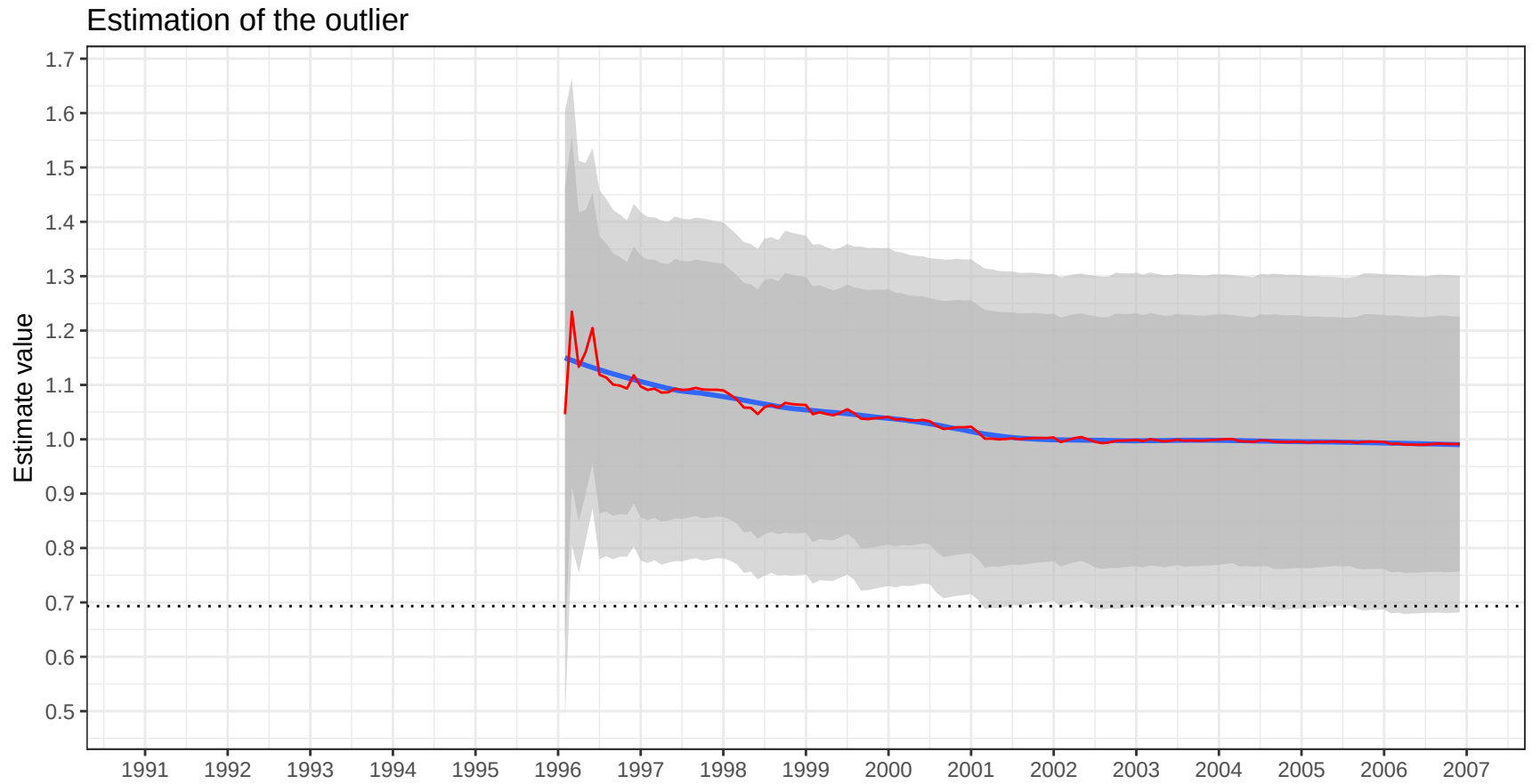
Estimate value of a LS(1995−1) IT−C2894
ARIMA (0,1,1)(0,1,1) − additive decomposition

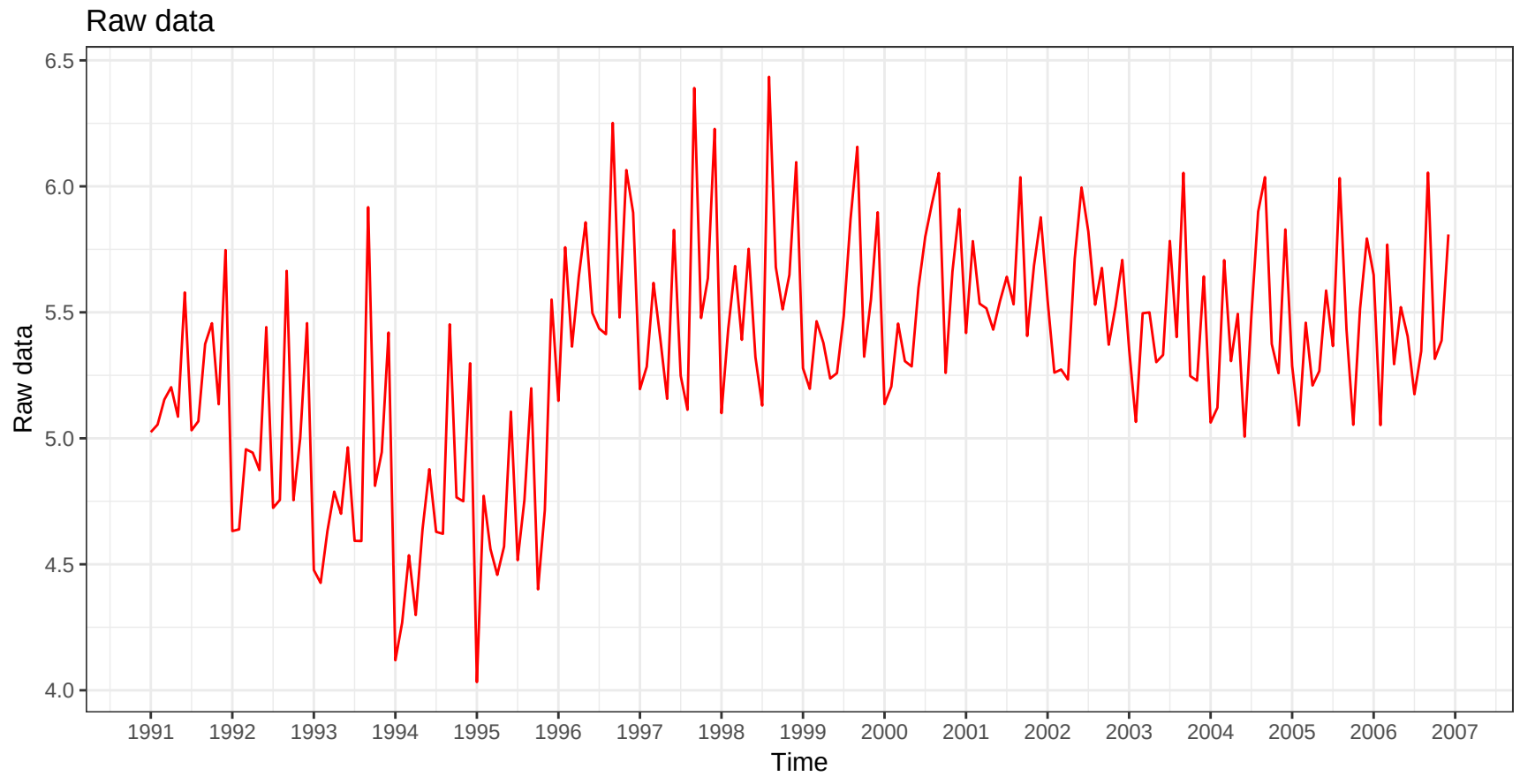




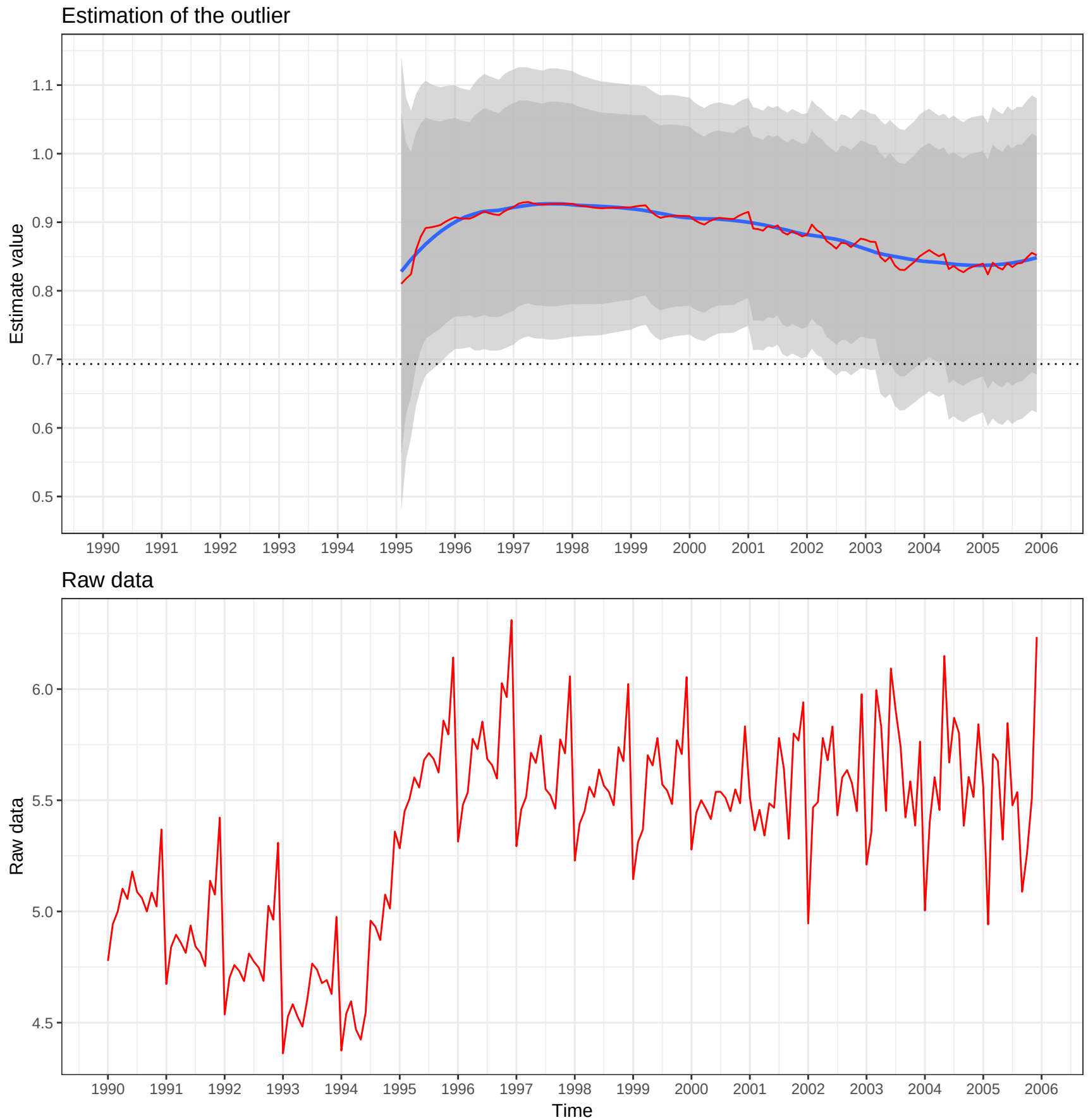
Estimate value of a LS(1996−1) DE−C2895

ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

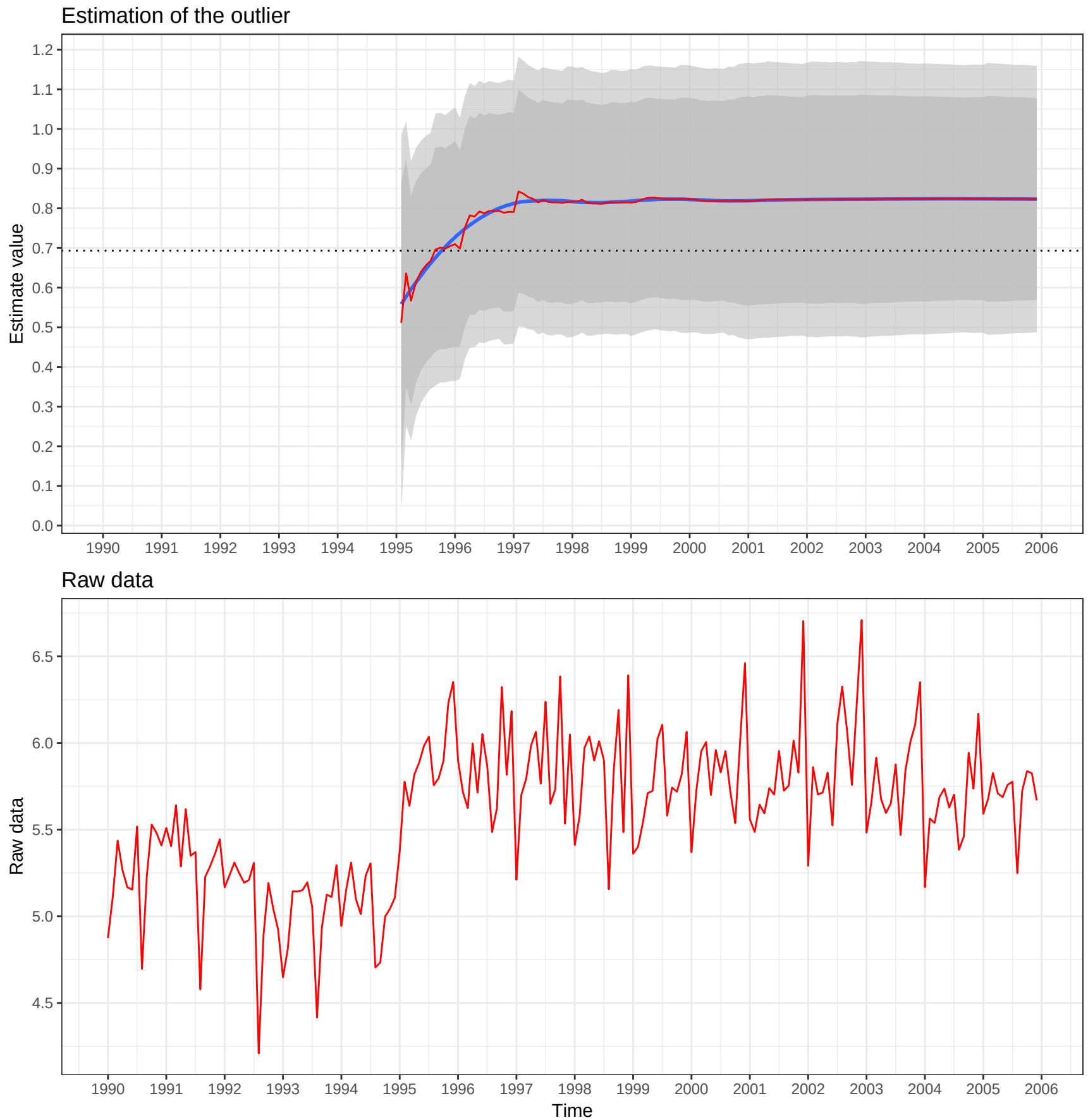


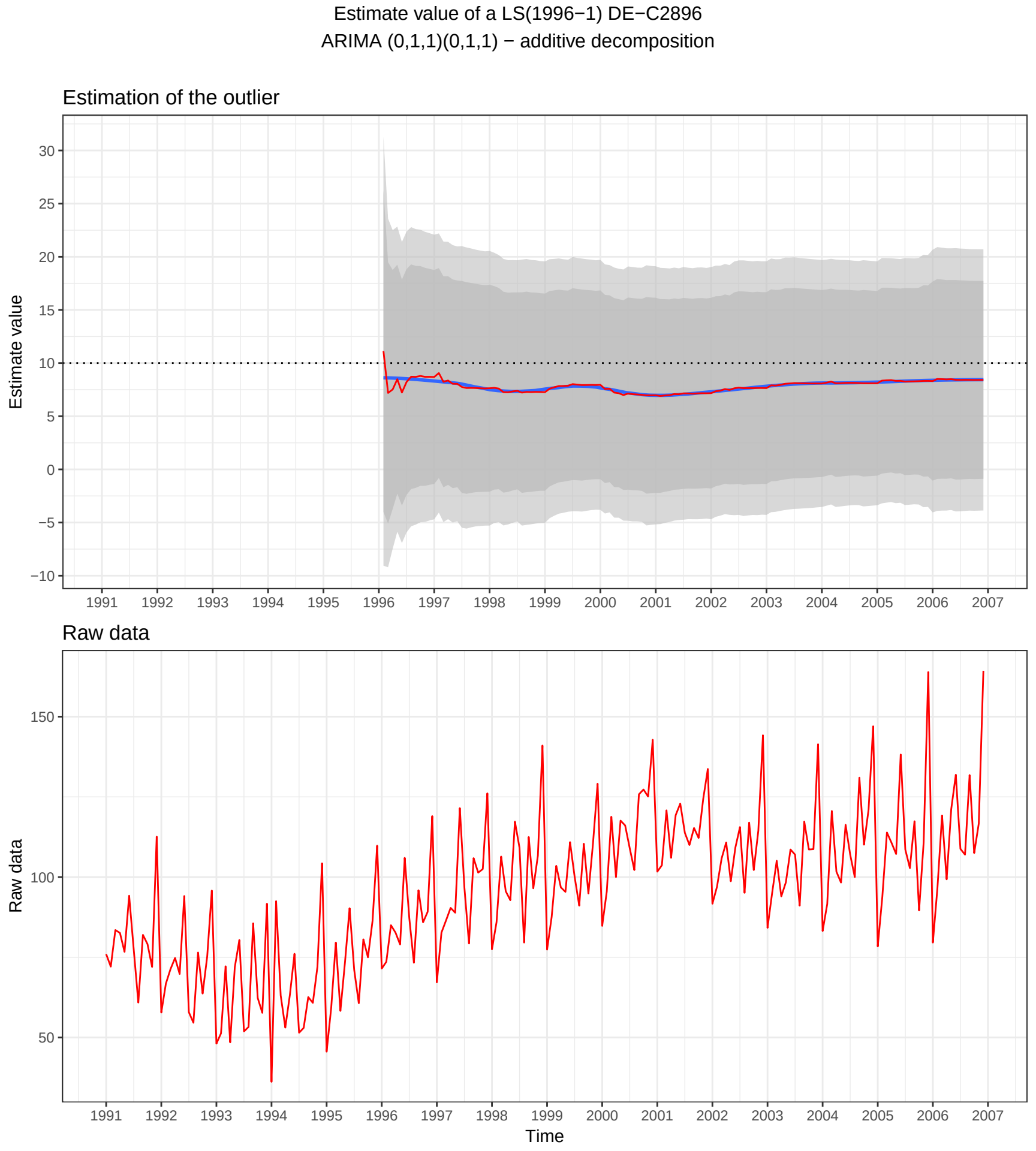


Estimate value of a LS(1995−1) FR−C2895
ARIMA (1,0,1)(0,1,1) − multiplicative decomposition



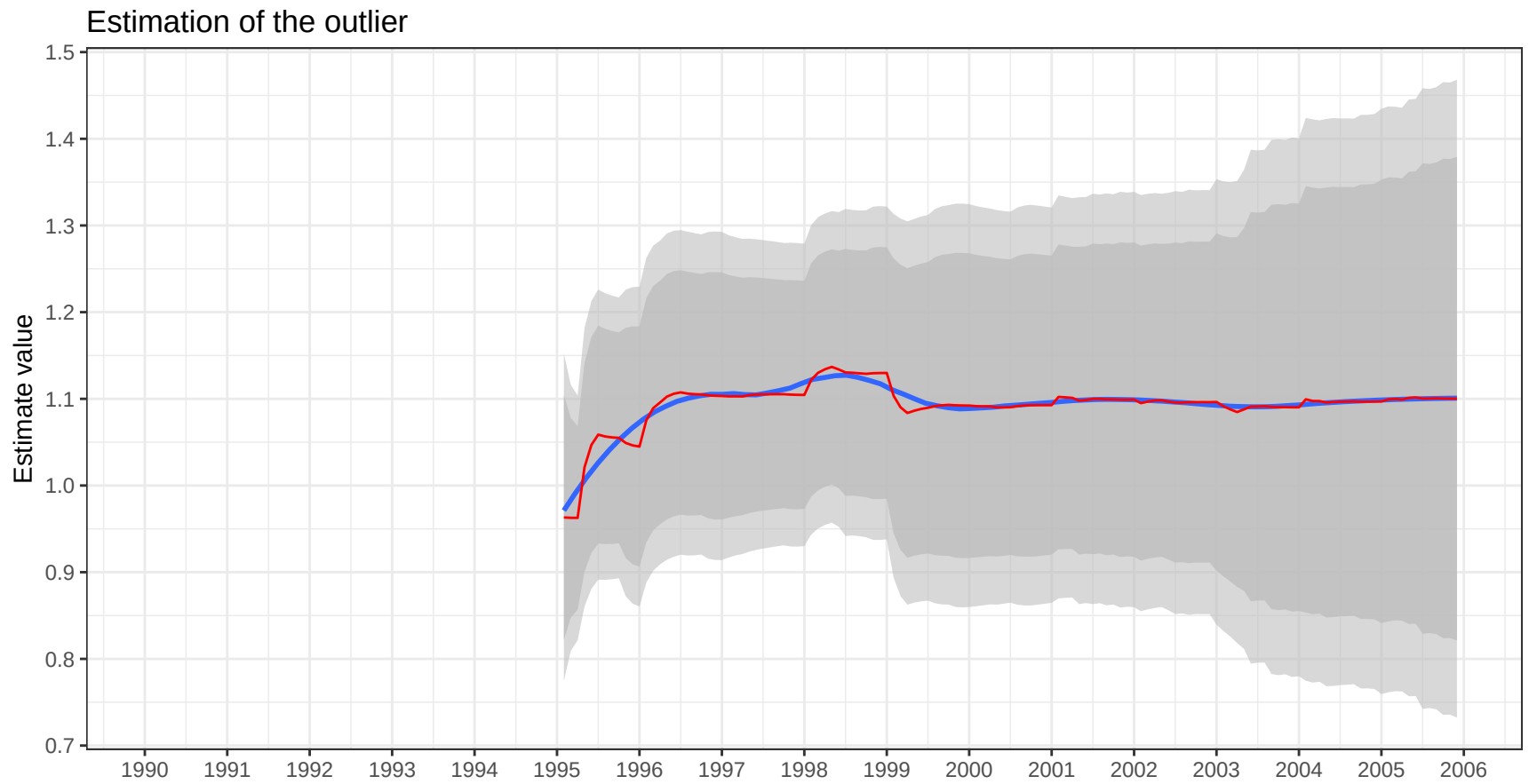
Estimate value of a LS(1995−1) IT−C2895
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

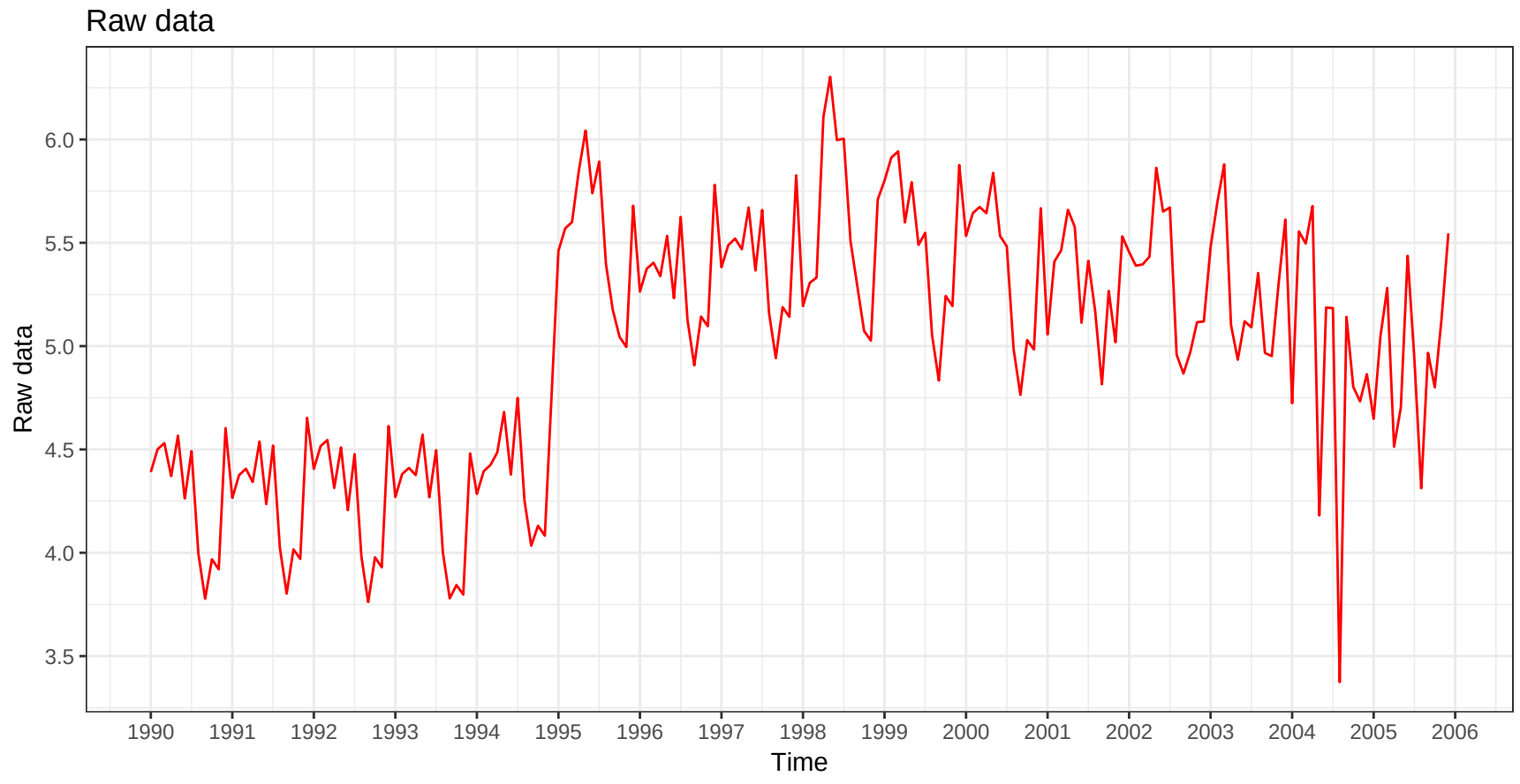


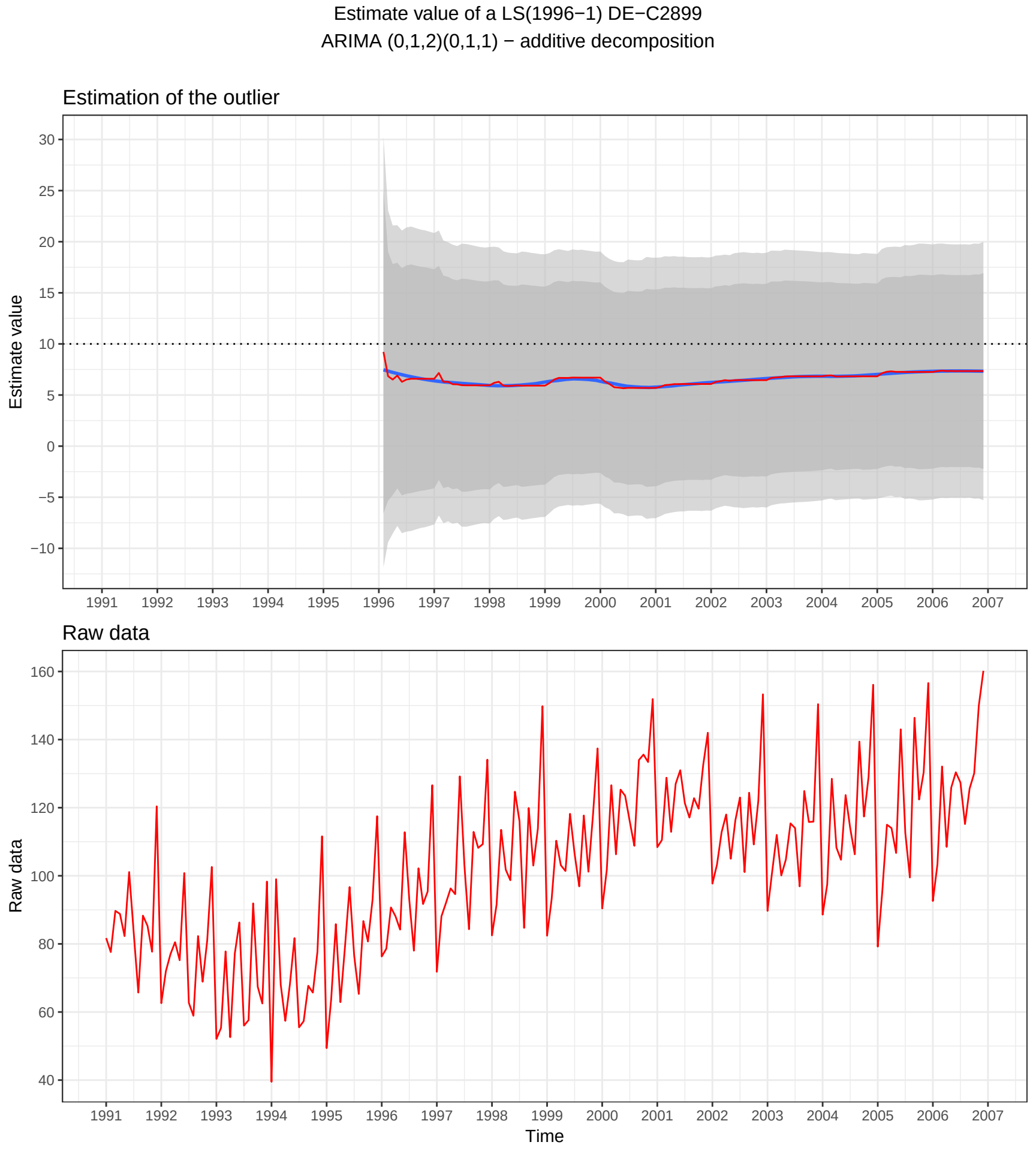

Estimate value of a LS(1996−1) DE−C2896
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
30
25
20
15
10
5
0
−5
−10
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
150
100
50
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Time

Estimate value of a LS(1995−1) FR−C2896

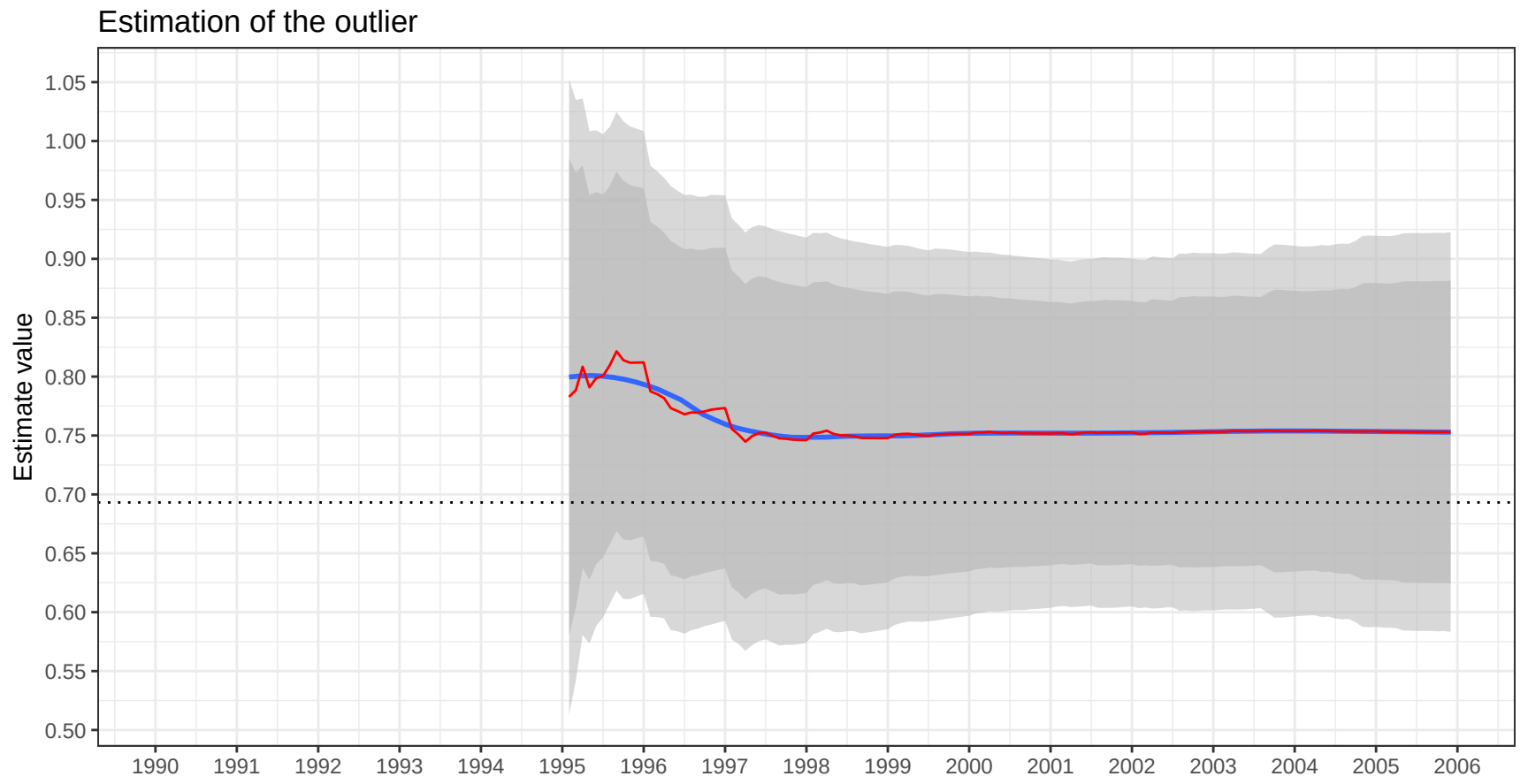
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

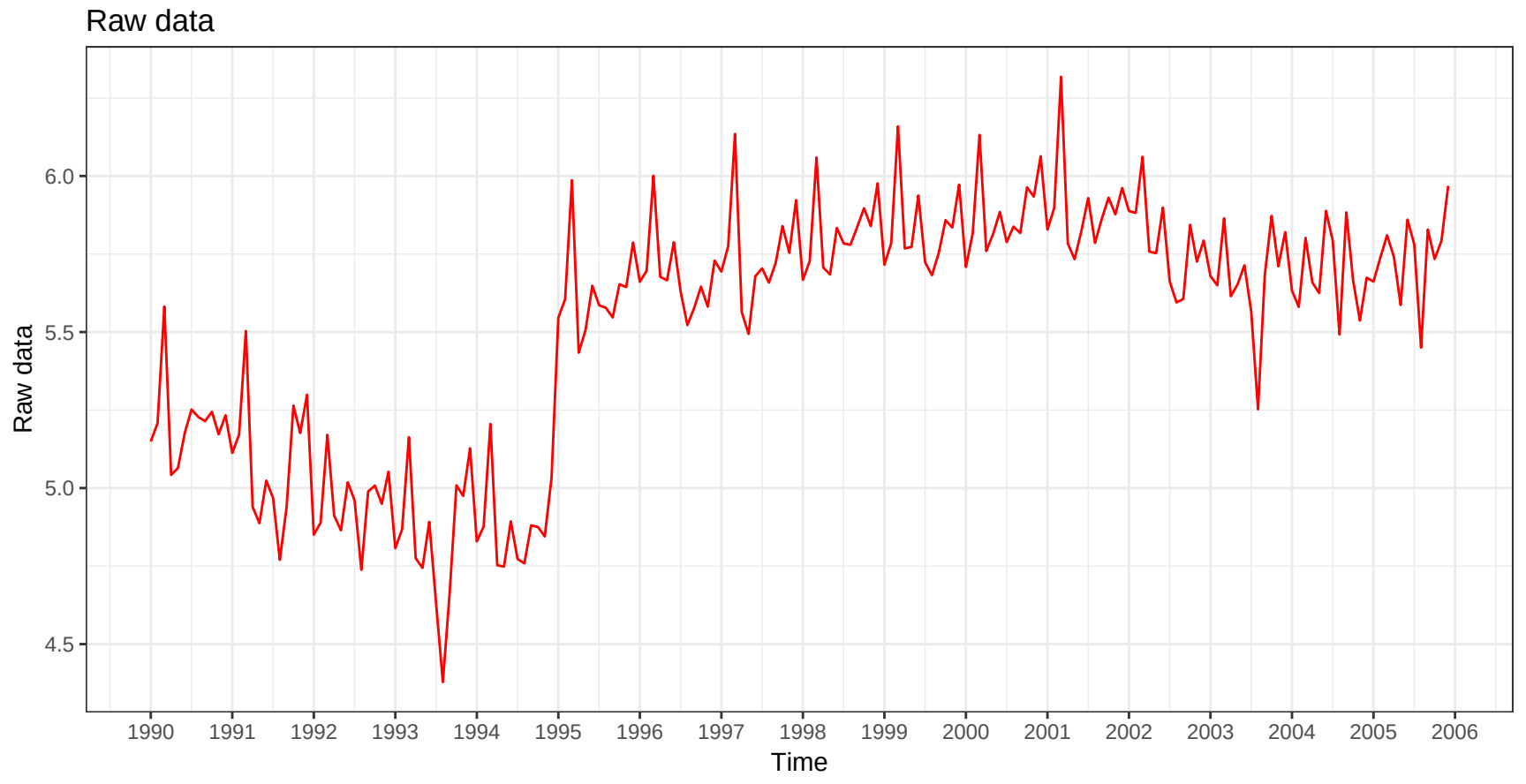


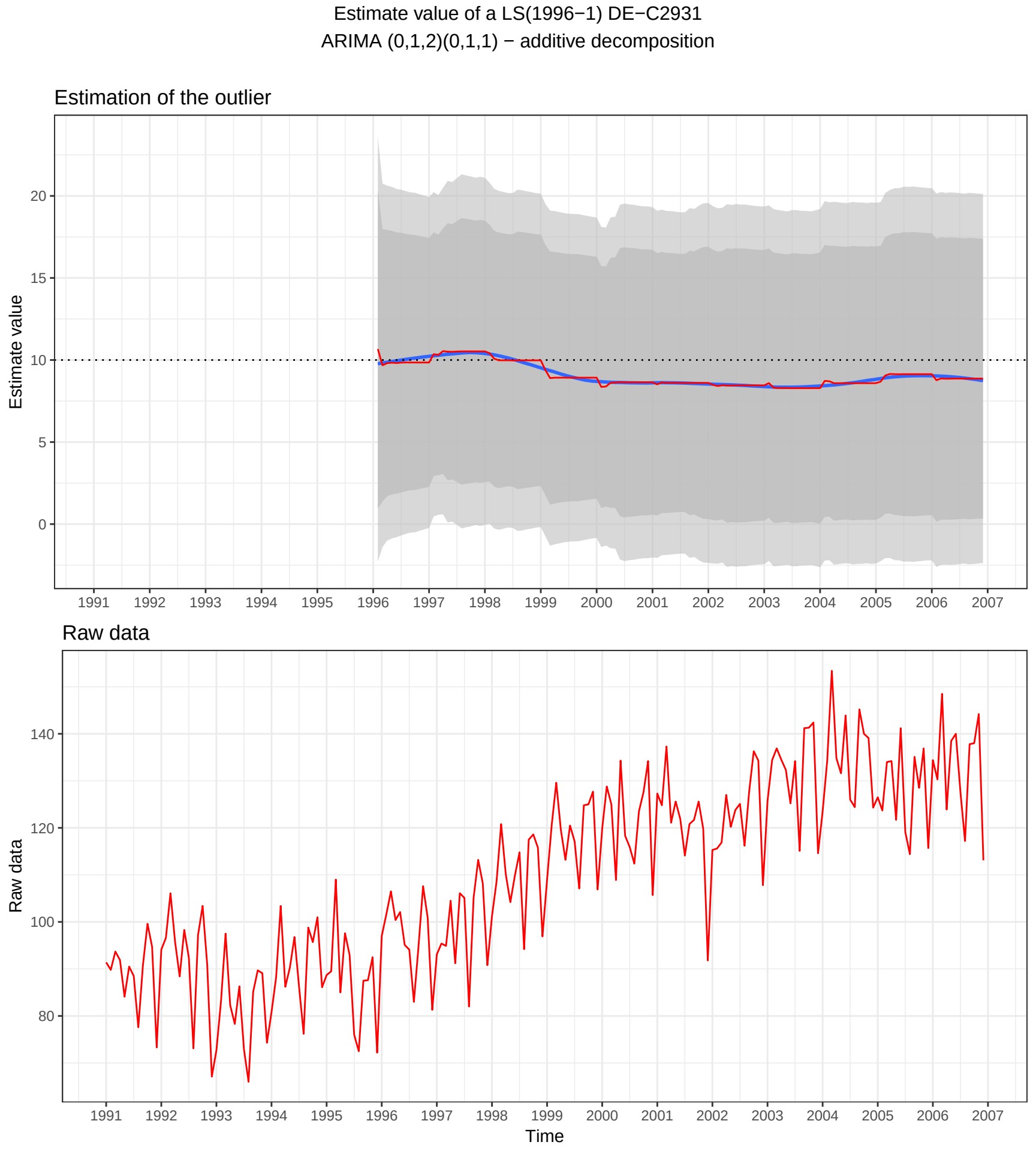



Estimate value of a LS(1996−1) DE−C2899
ARIMA (0,1,2)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
30
25
20
15
10
5
0
−5
−10
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
160
140
120
100
80
60
40
Time

Estimate value of a LS(1995−1) FR−C2899
ARIMA (2,1,1)(0,1,1) − multiplicative decomposition

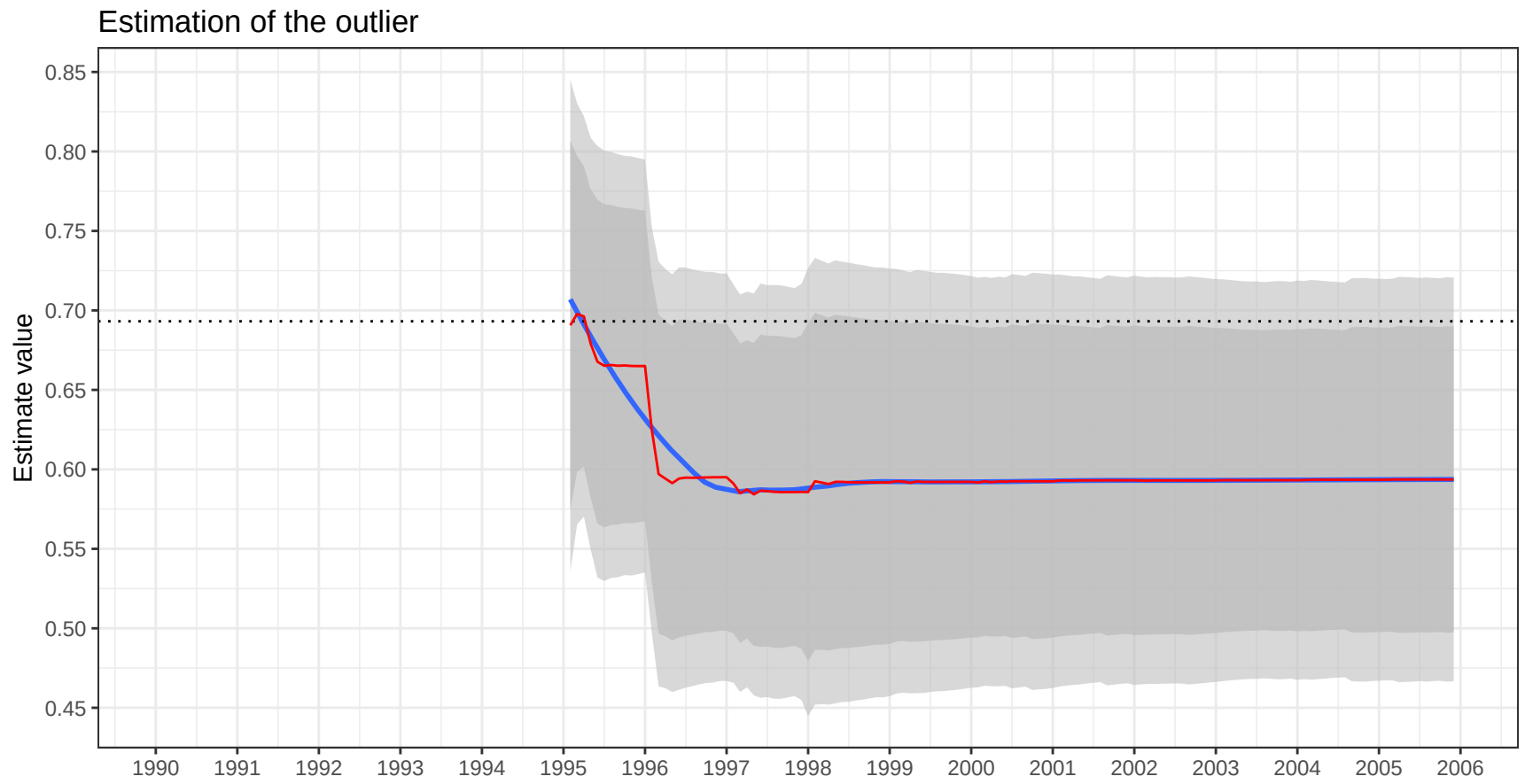


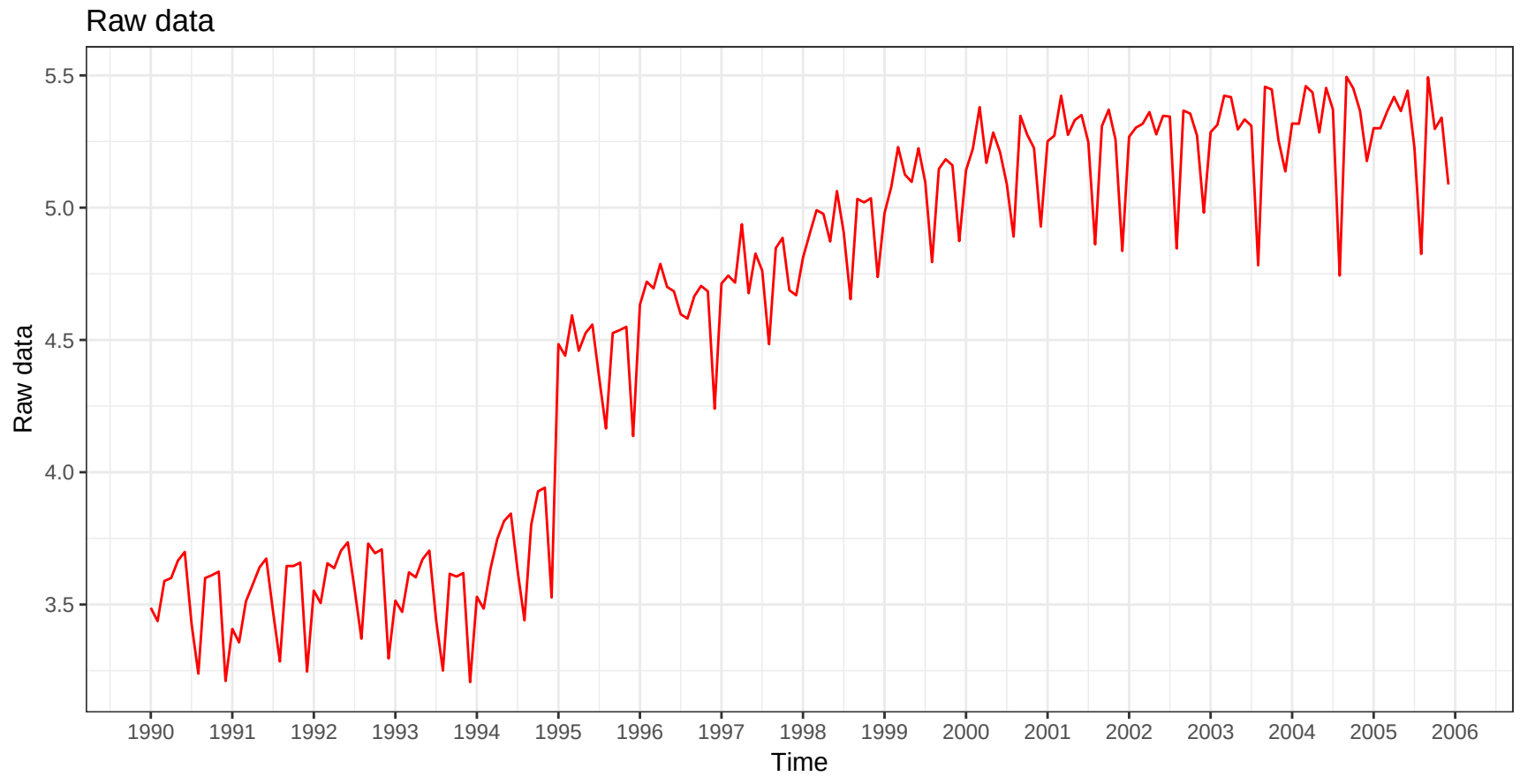



Estimate value of a LS(1996−1) DE−C2931
ARIMA (0,1,2)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
20
15
10
5
0
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
140
120
100
80
Time

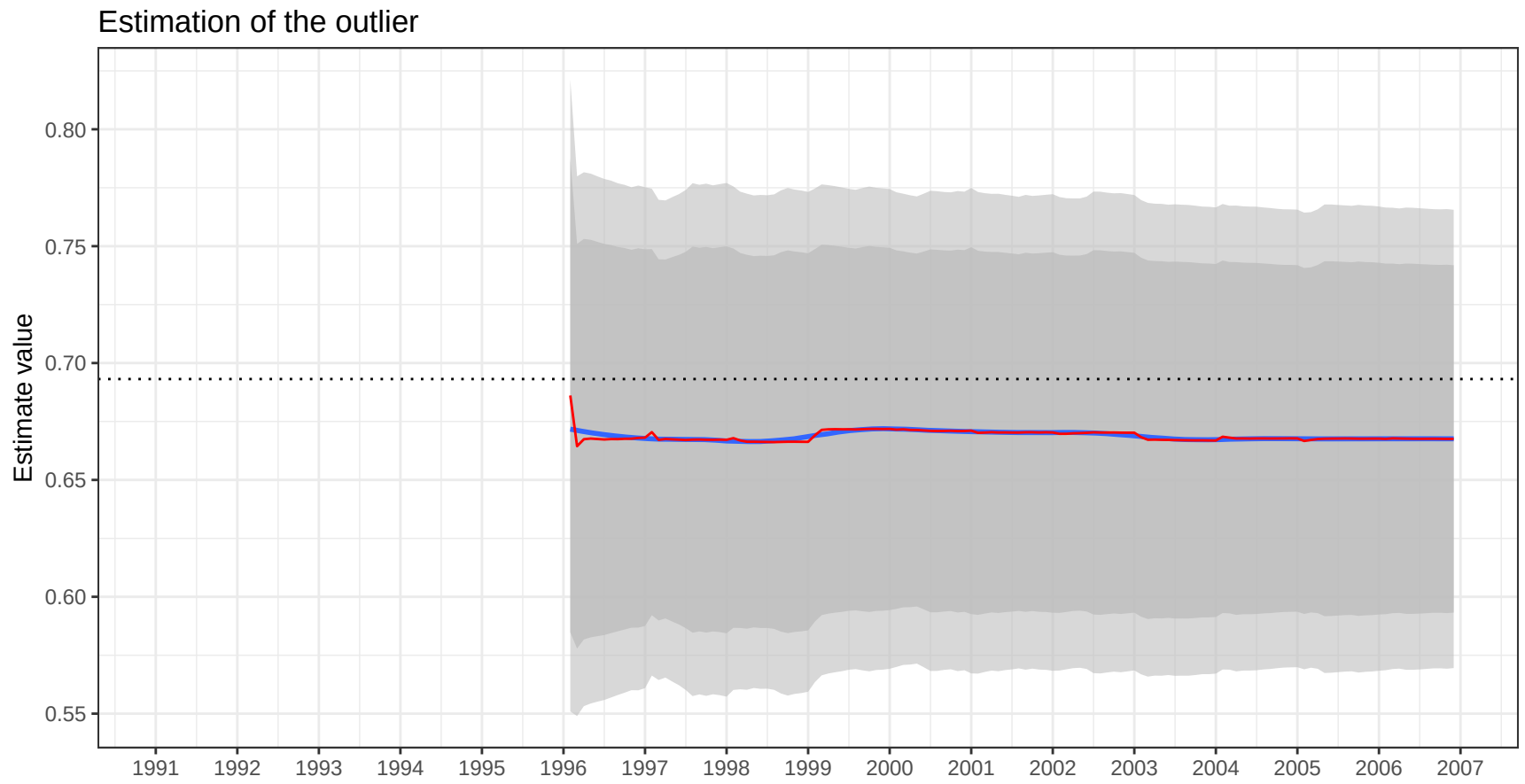
Estimate value of a LS(1995−1) FR−C2931

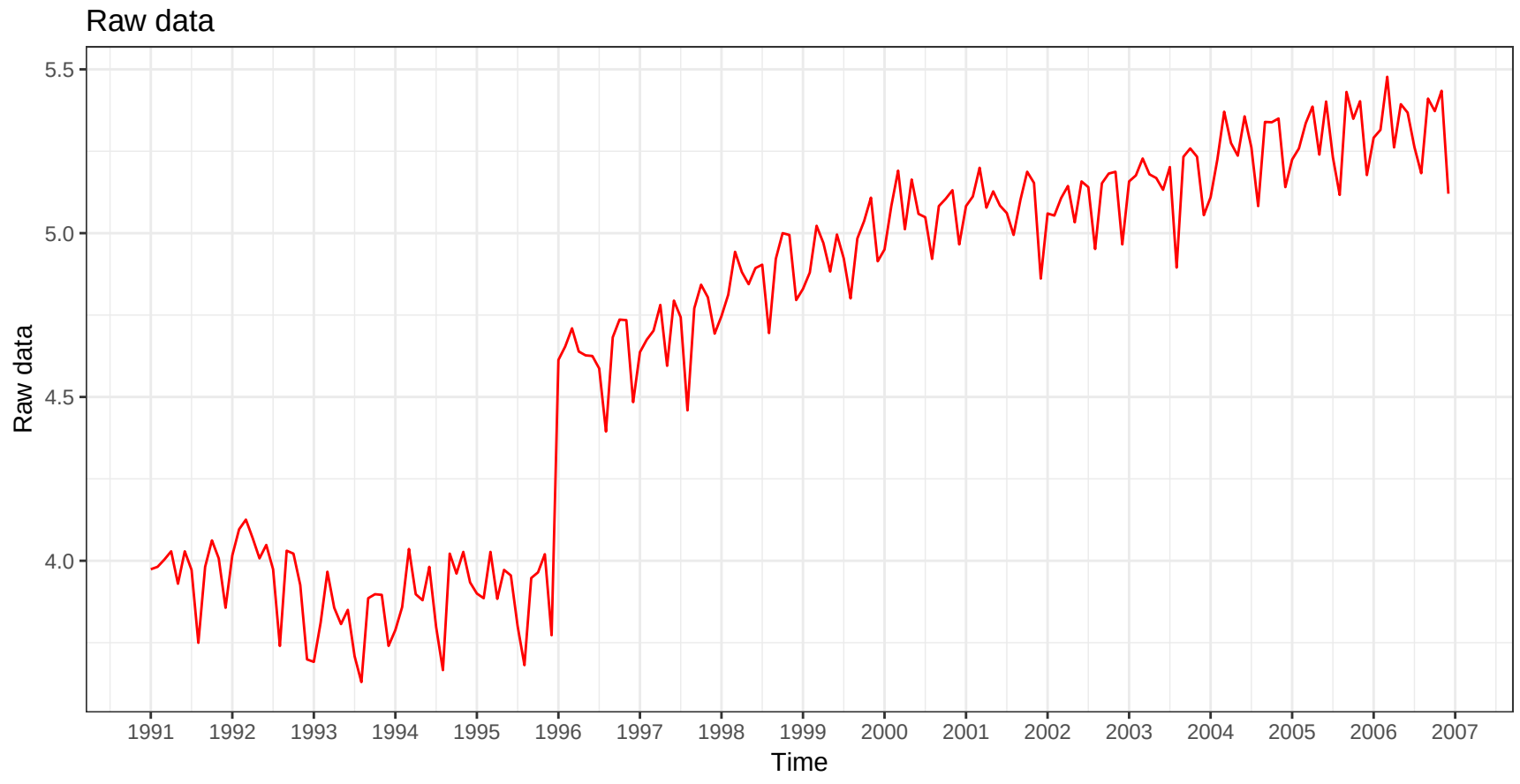
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition





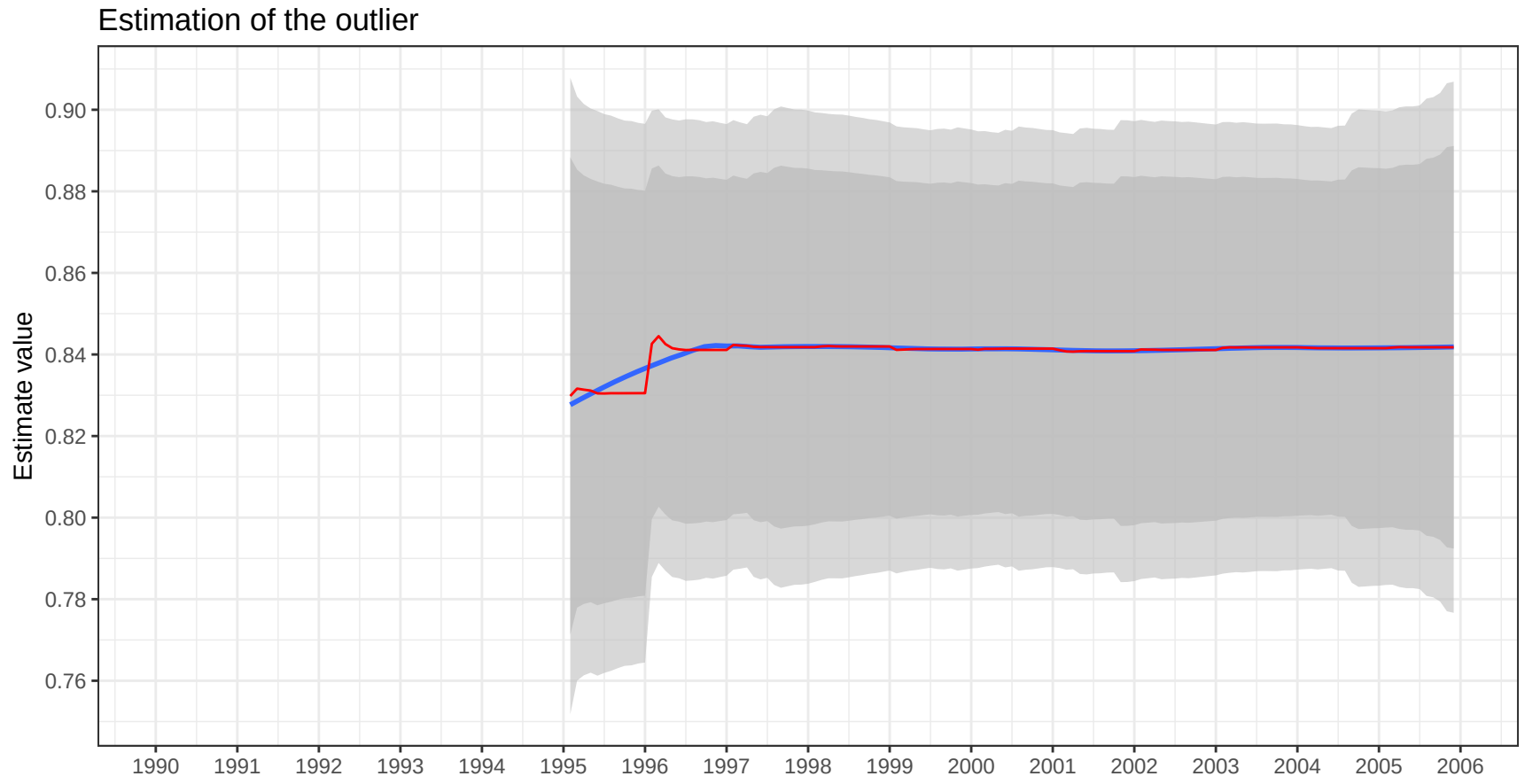
Estimate value of a LS(1996−1) DE−C2932
ARIMA (3,1,1)(0,1,1) − multiplicative decomposition

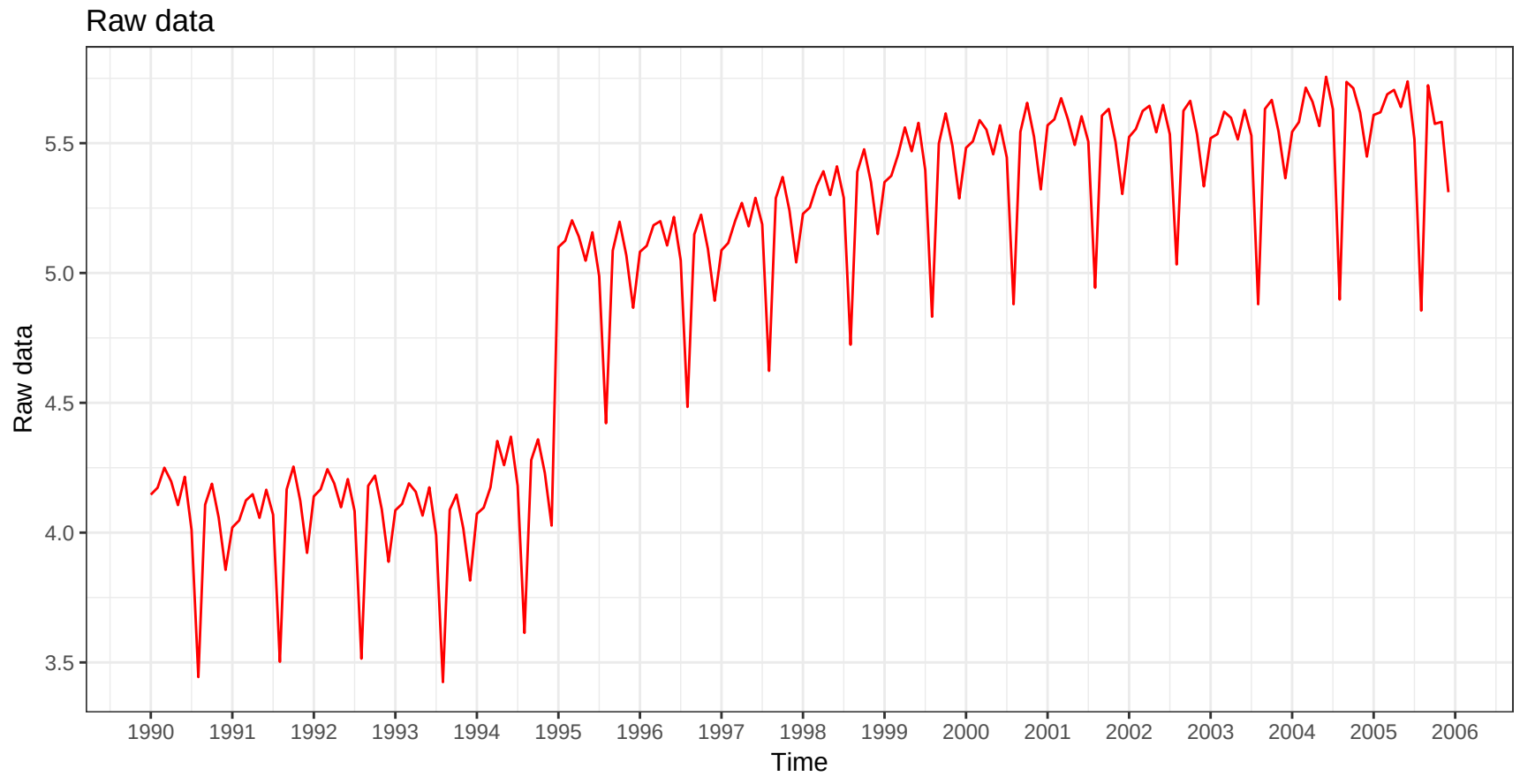


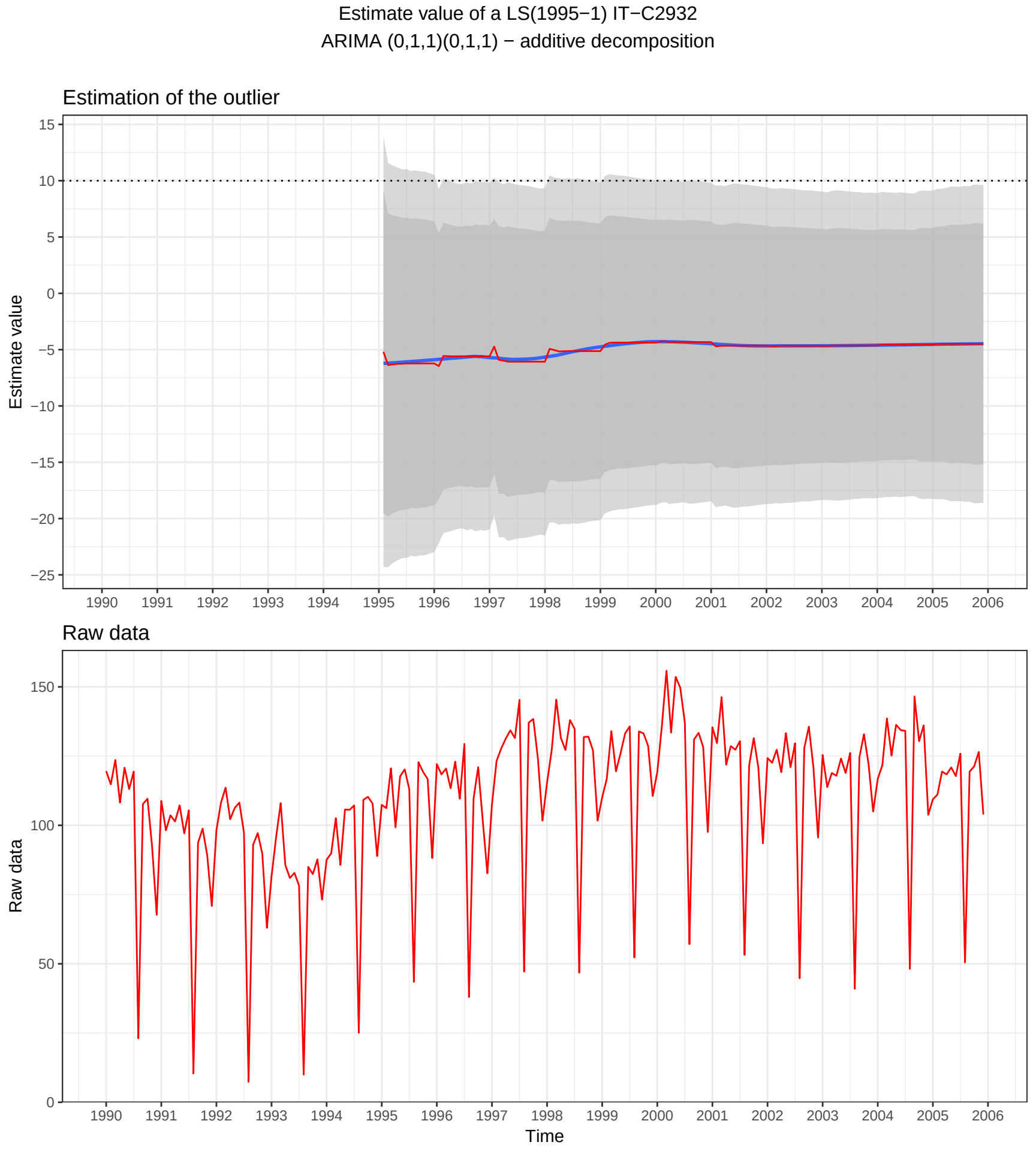


Estimate value of a LS(1995−1) FR−C2932

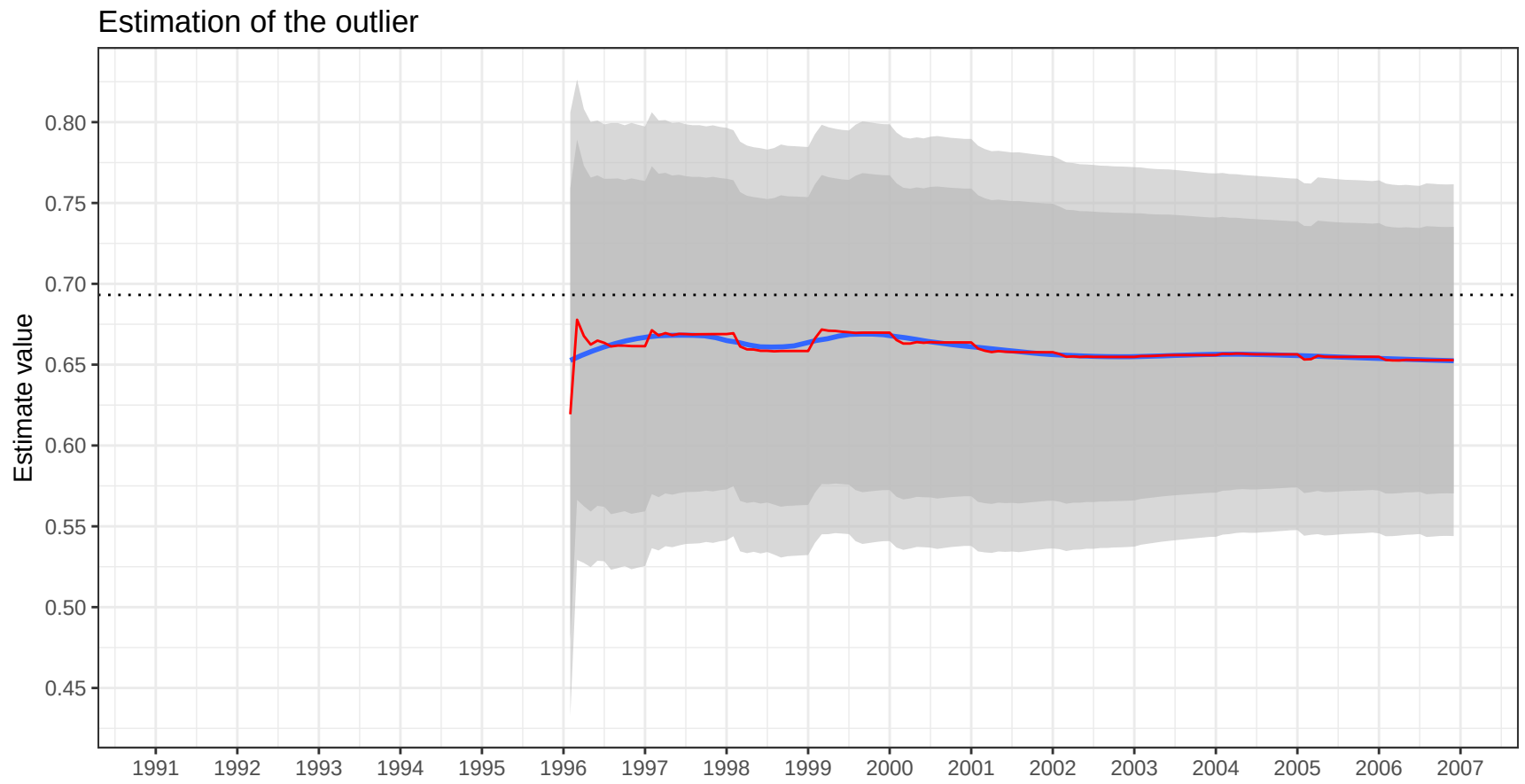
ARIMA (0,1,1)(1,1,1) − multiplicative decomposition

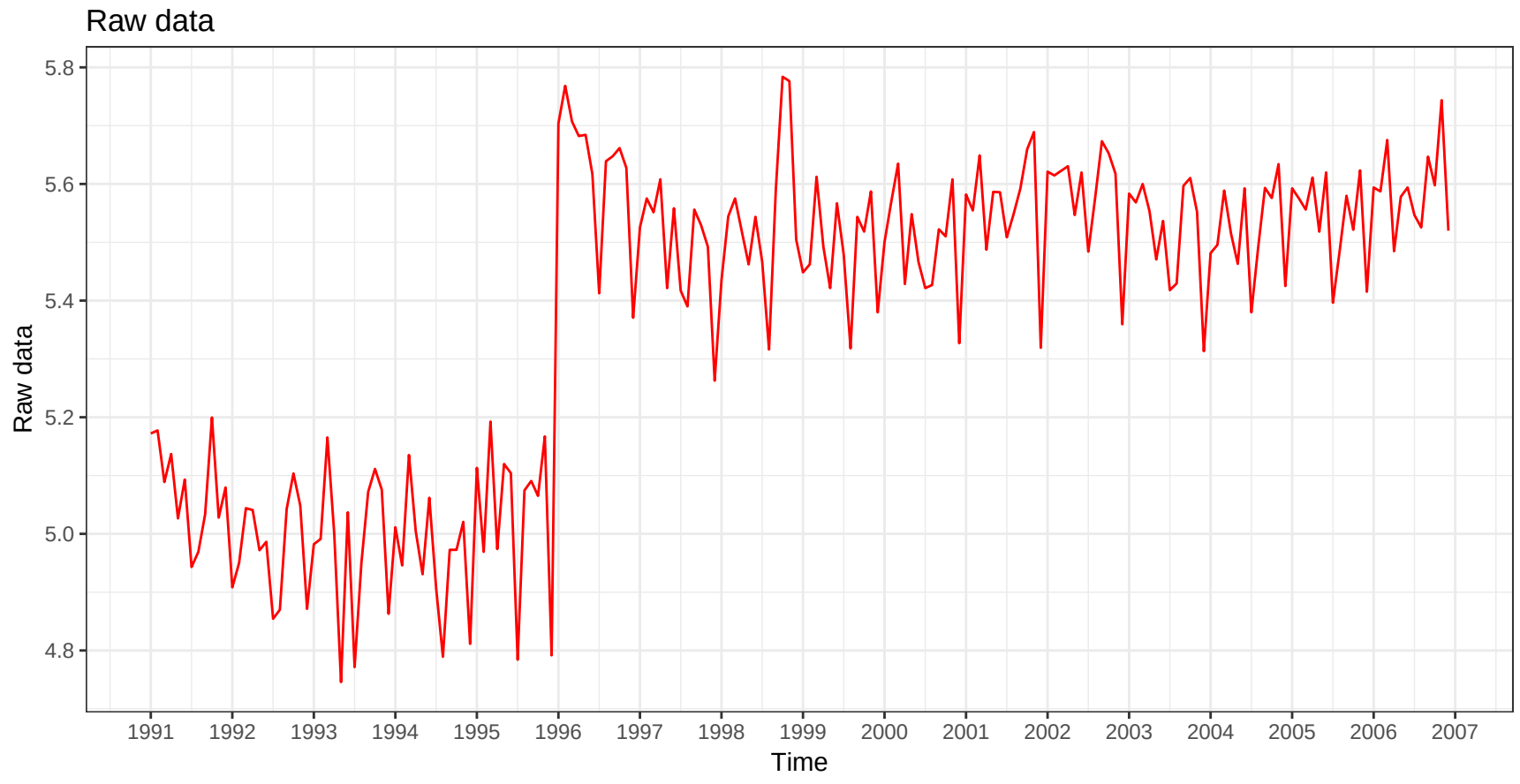


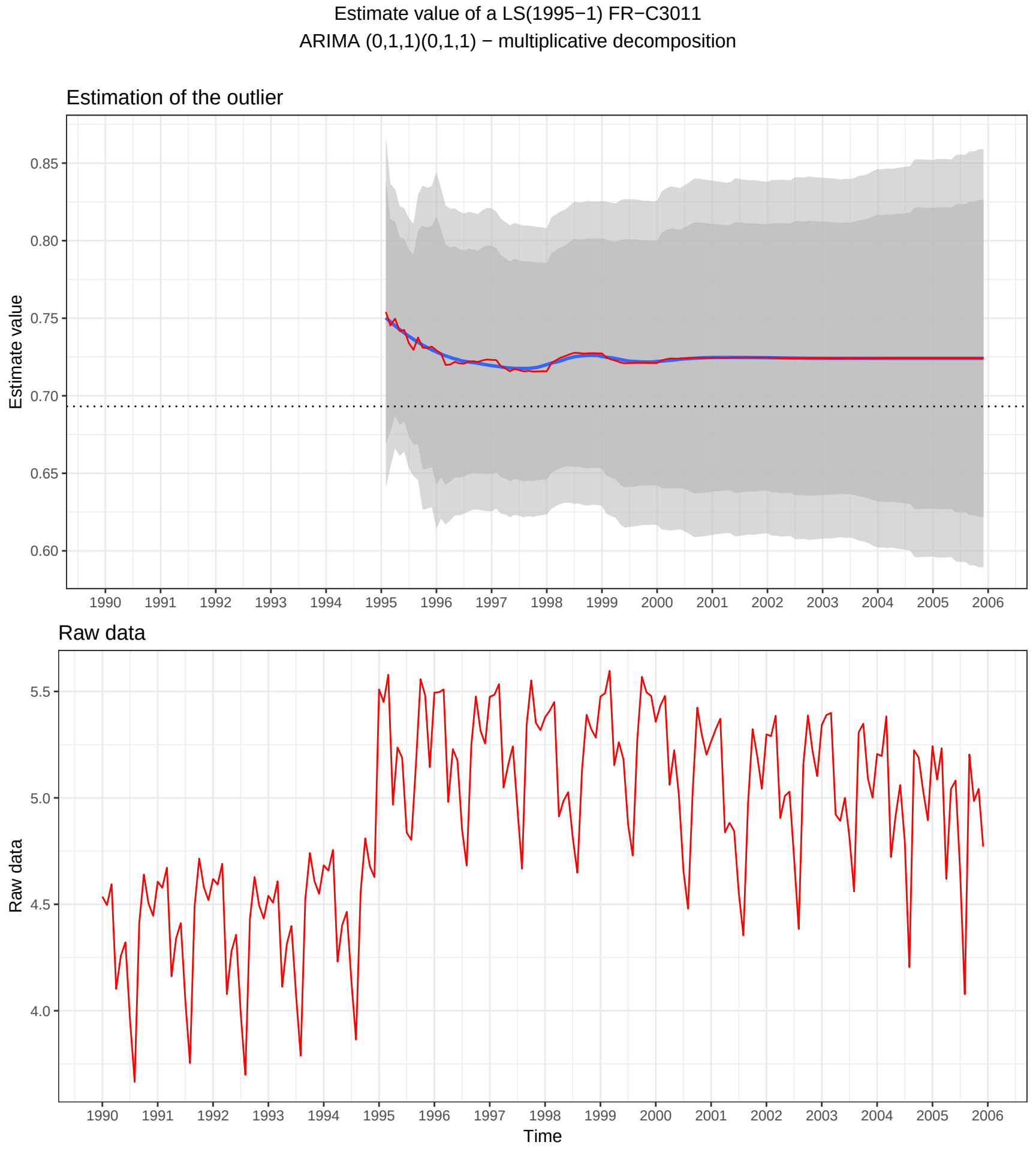


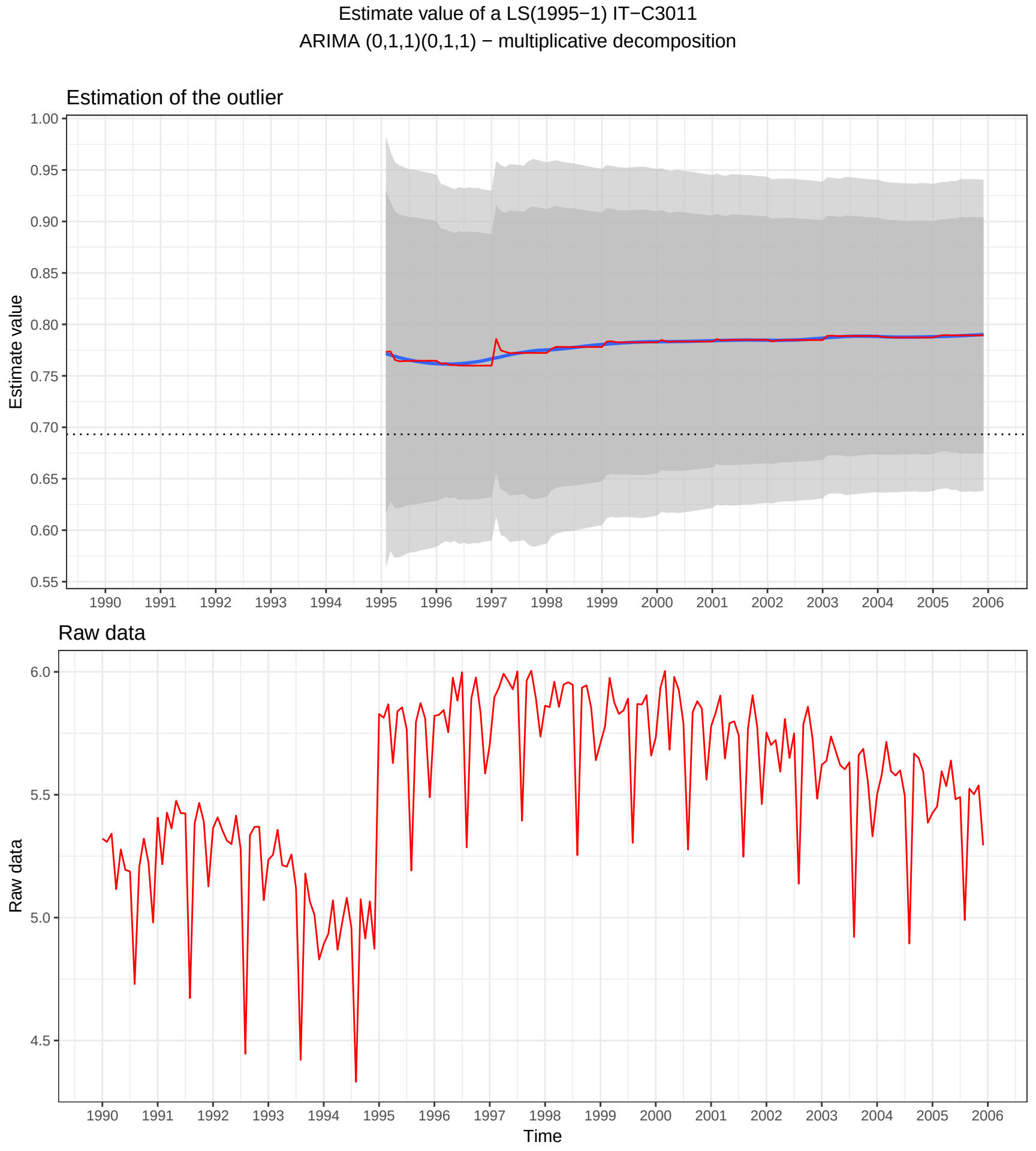

Estimate value of a LS(1995−1) IT−C2932
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
15
10
5
0
−5
−10
−15
−20
−25
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
150
100
50
0
Time

Estimate value of a LS(1996−1) DE−C3011
ARIMA (1,1,1)(0,1,1) − multiplicative decomposition

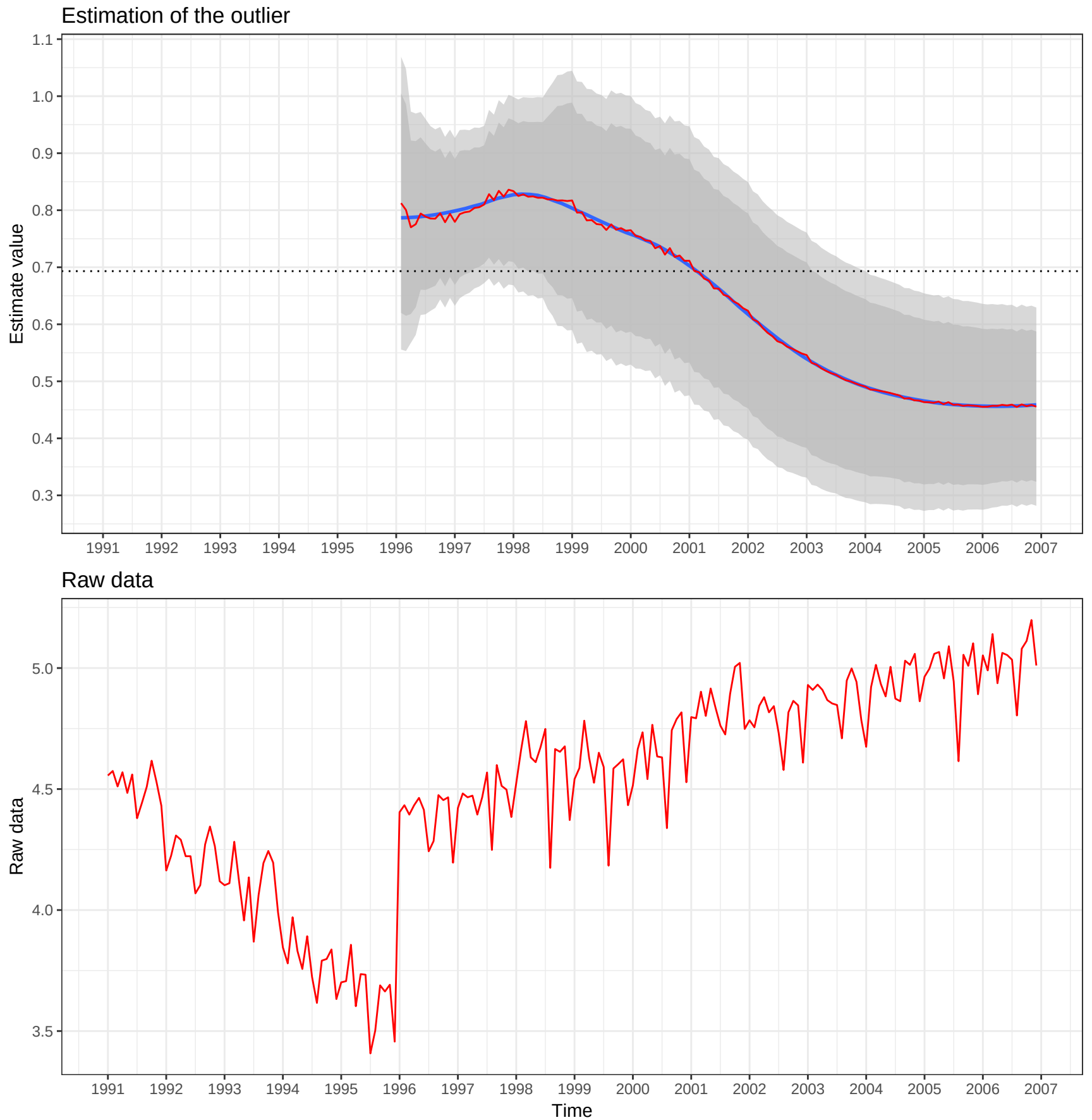





Estimate value of a LS(1995−1) FR−C3011
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.85
0.80
0.75
0.70
0.65
0.60
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
5.5
5.0
4.5
4.0
Time

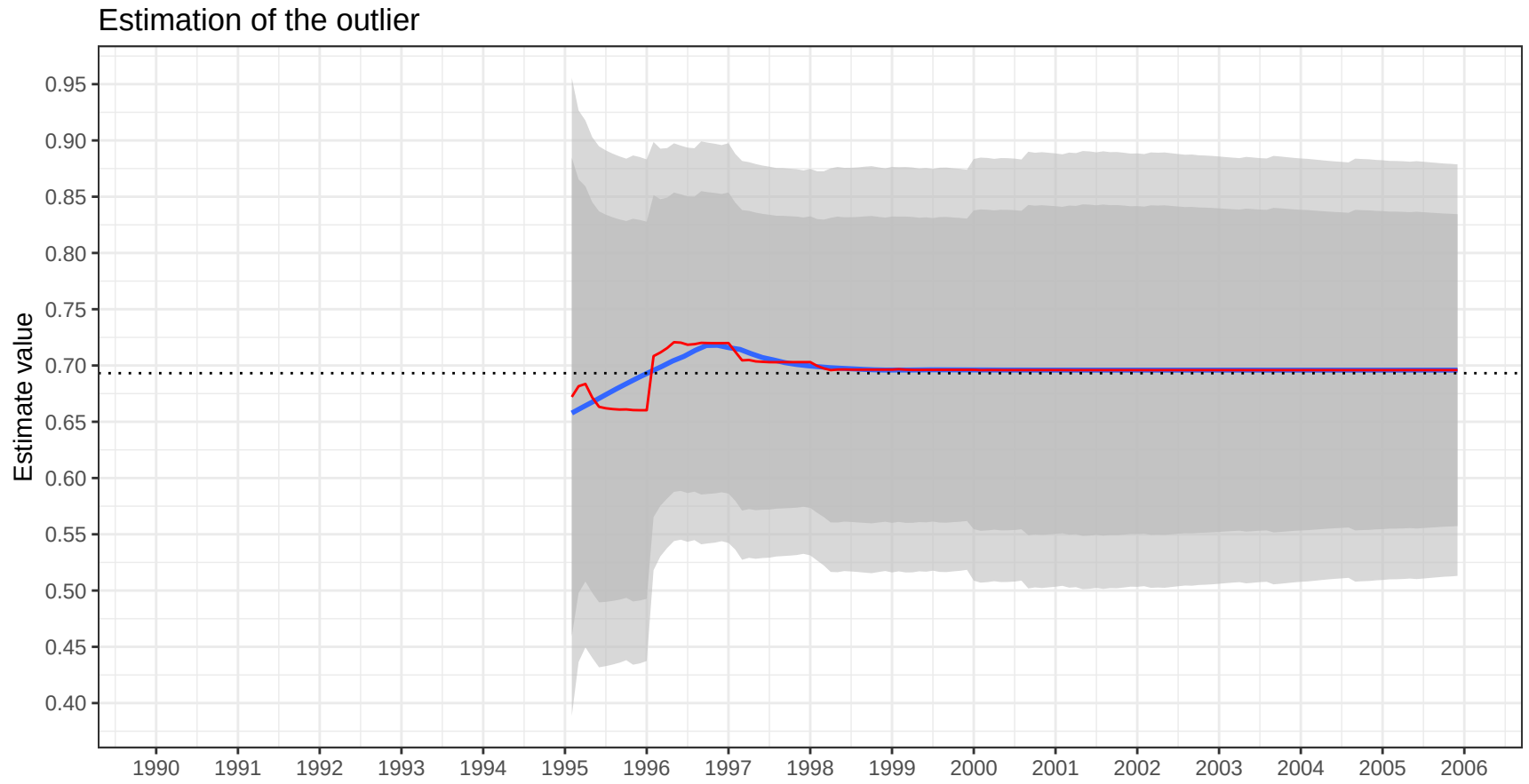

Estimate value of a LS(1995−1) IT−C3011
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
1.00
0.95
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0.55
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
6.0
5.5
5.0
4.5
Time

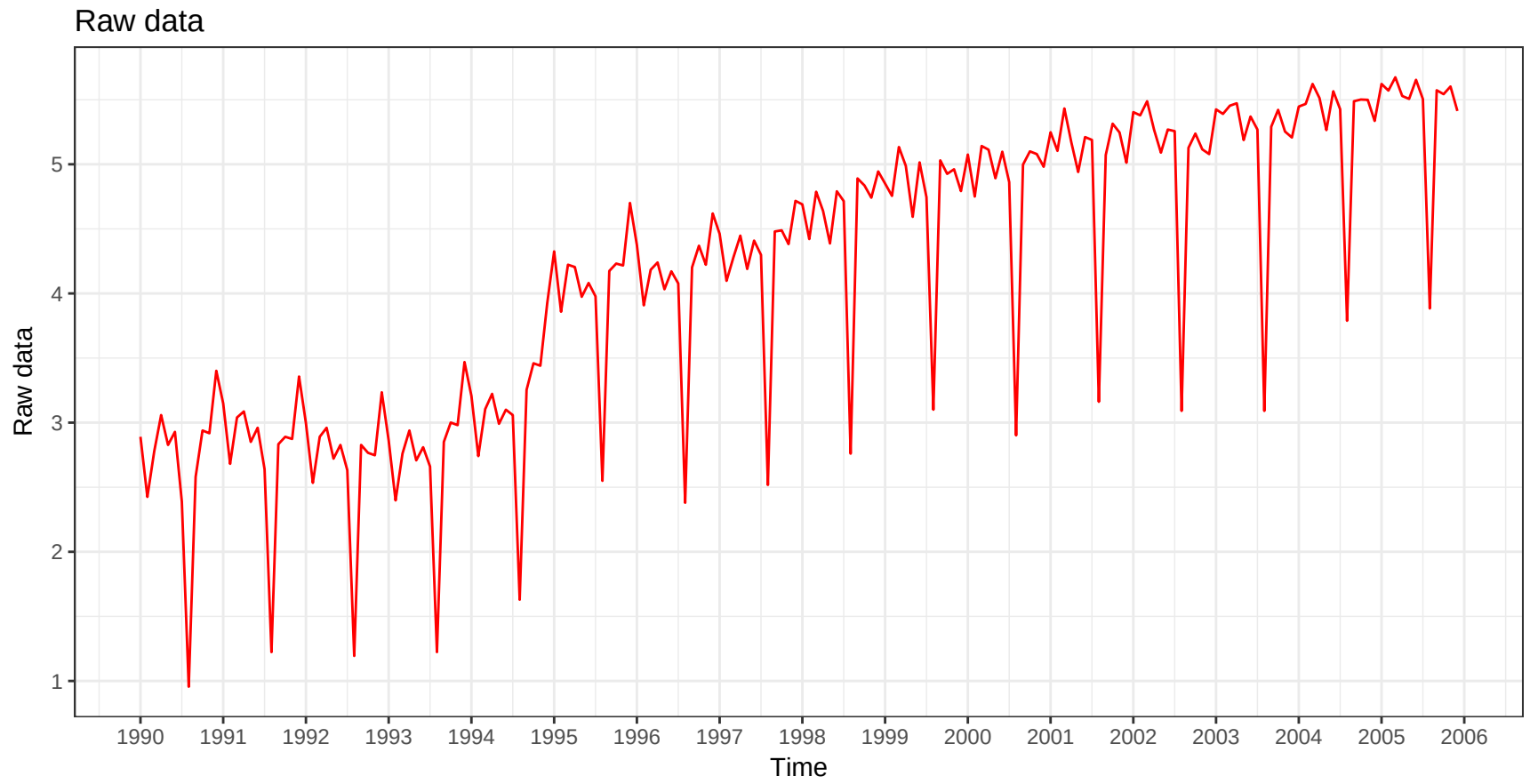
Estimate value of a LS(1996−1) DE−C3012
ARIMA (0,1,2)(1,1,1) − multiplicative decomposition

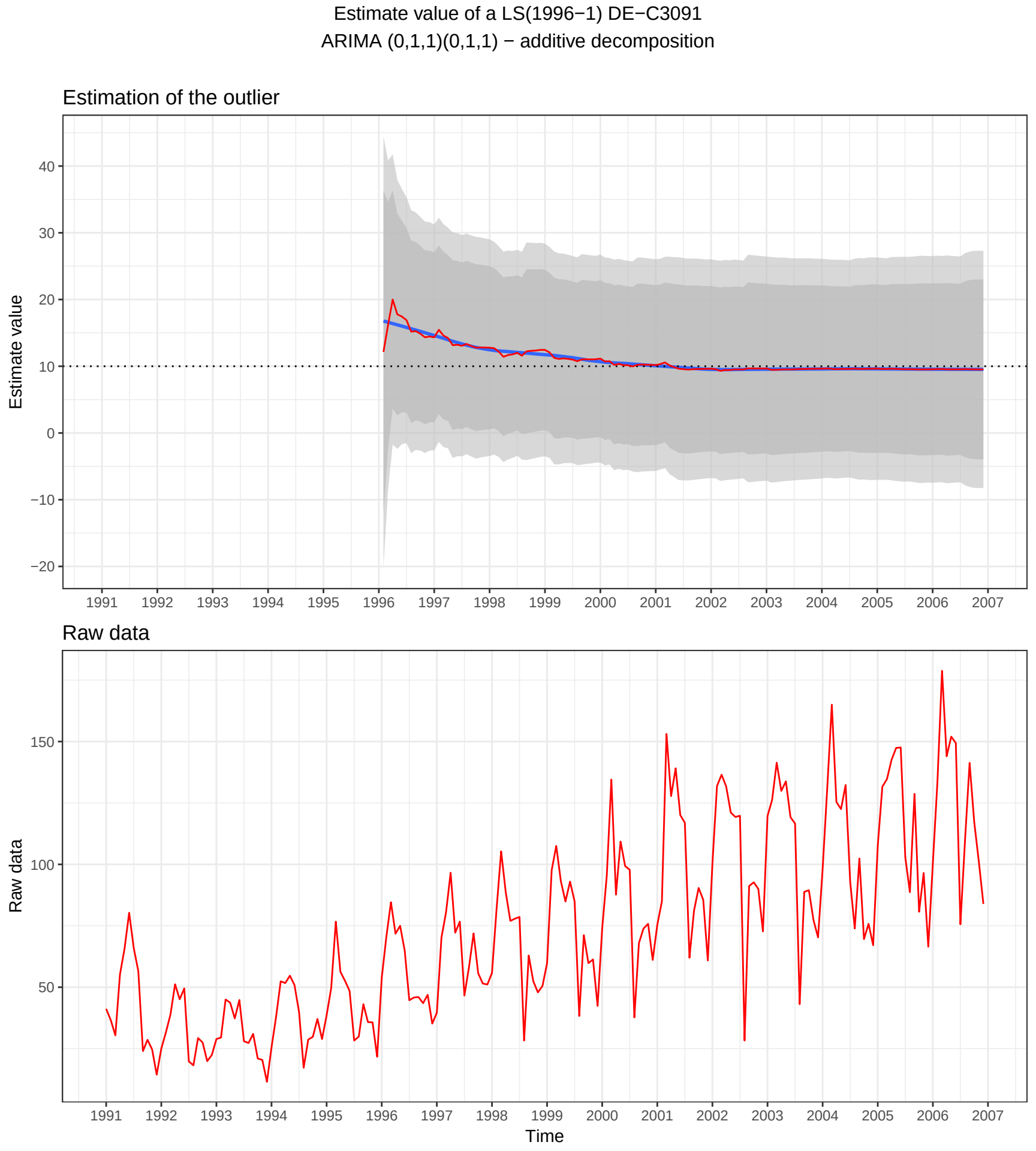


Estimate value of a LS(1995−1) FR−C3012

ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

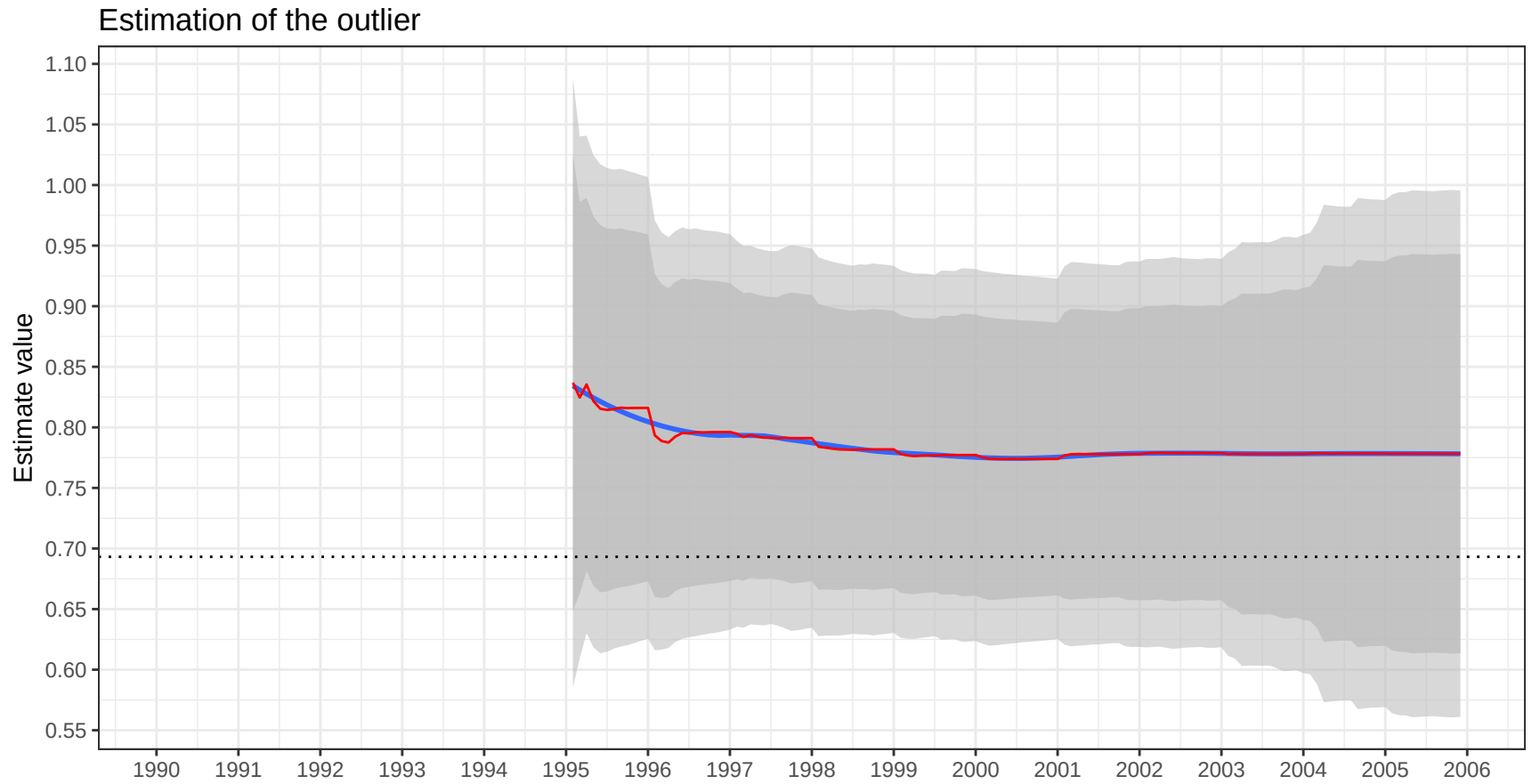


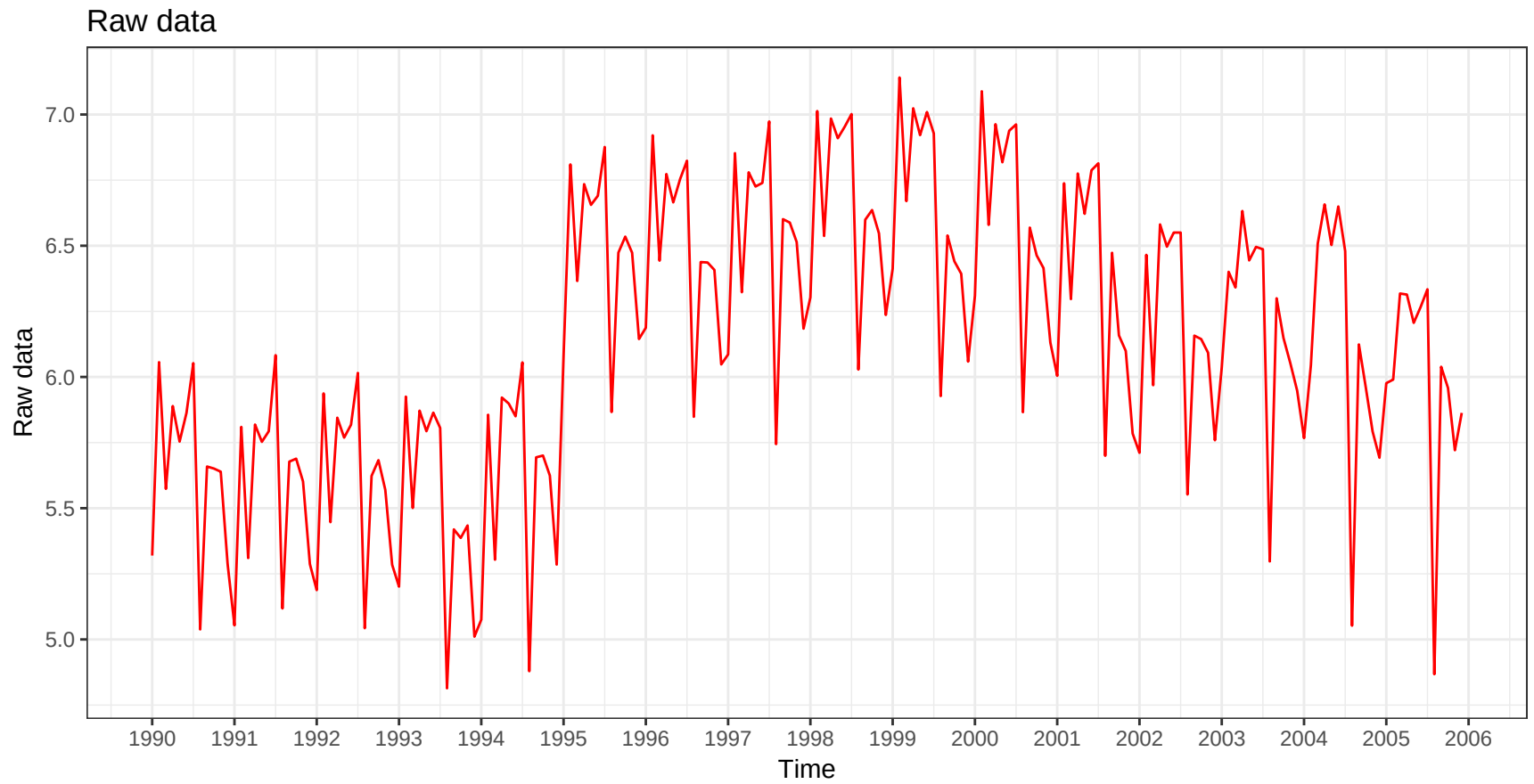



Estimate value of a LS(1996−1) DE−C3091
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
40
30
20
10
0
−10
−20
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
150
100
50
Time

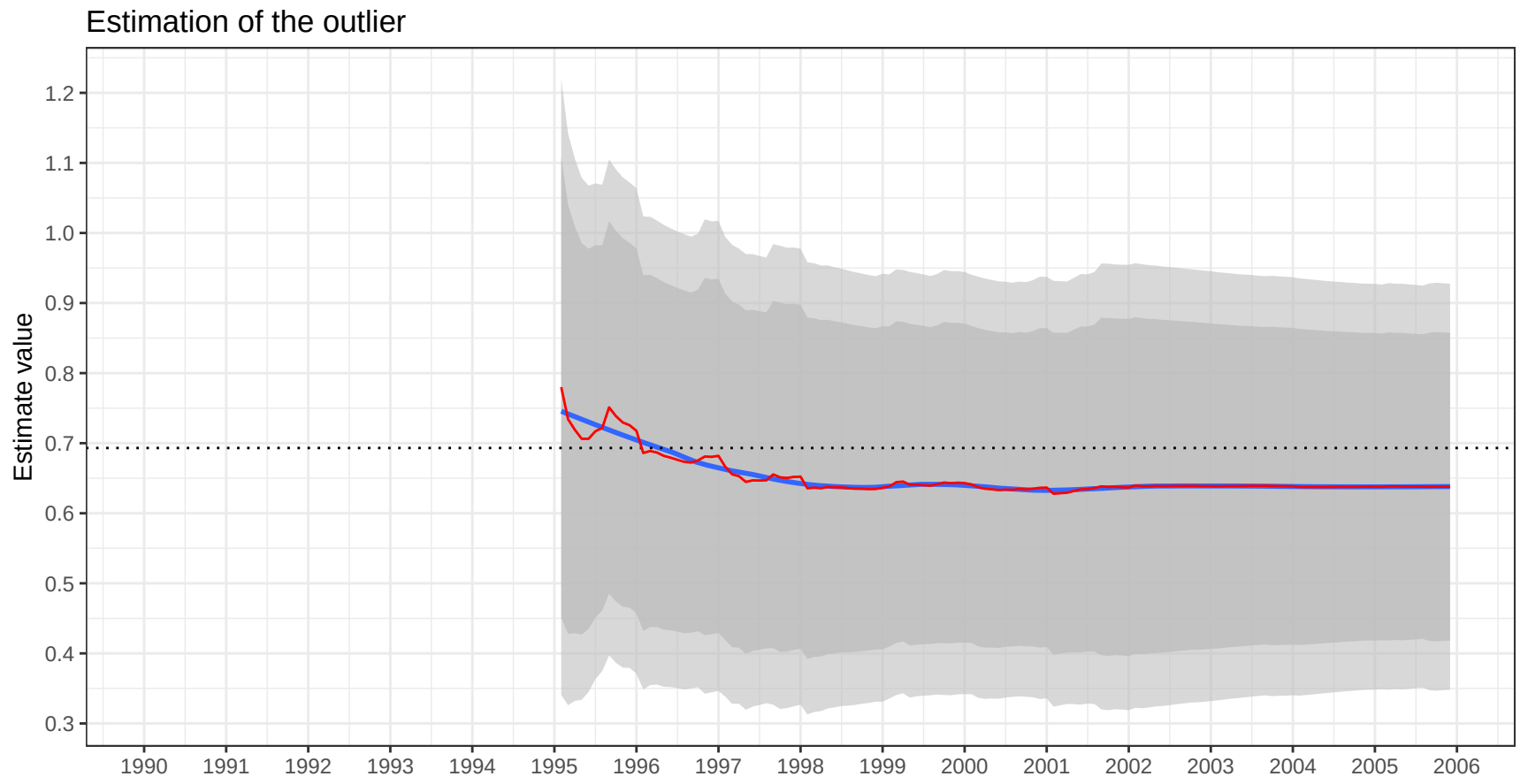
Estimate value of a LS(1995−1) FR−C3091

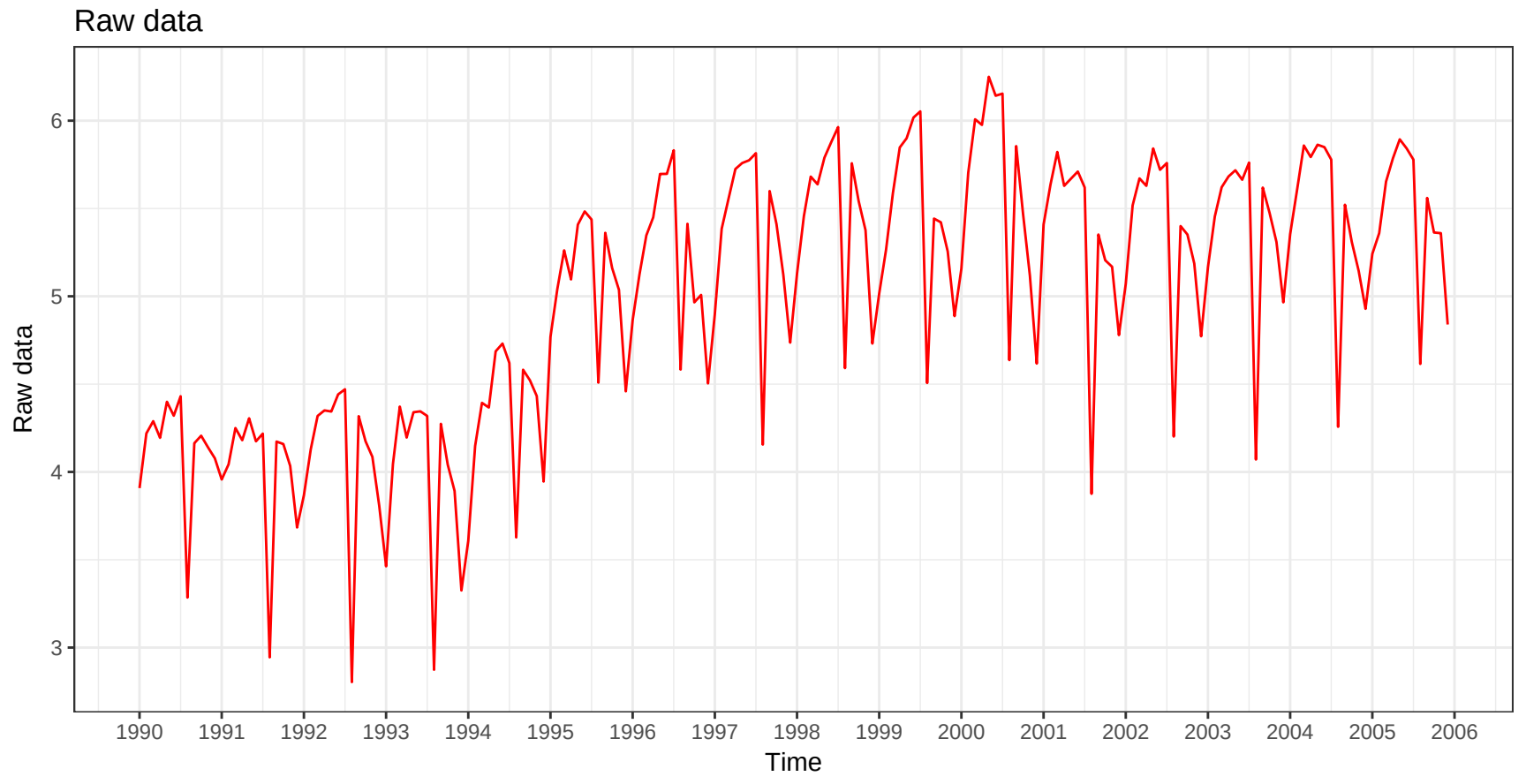
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

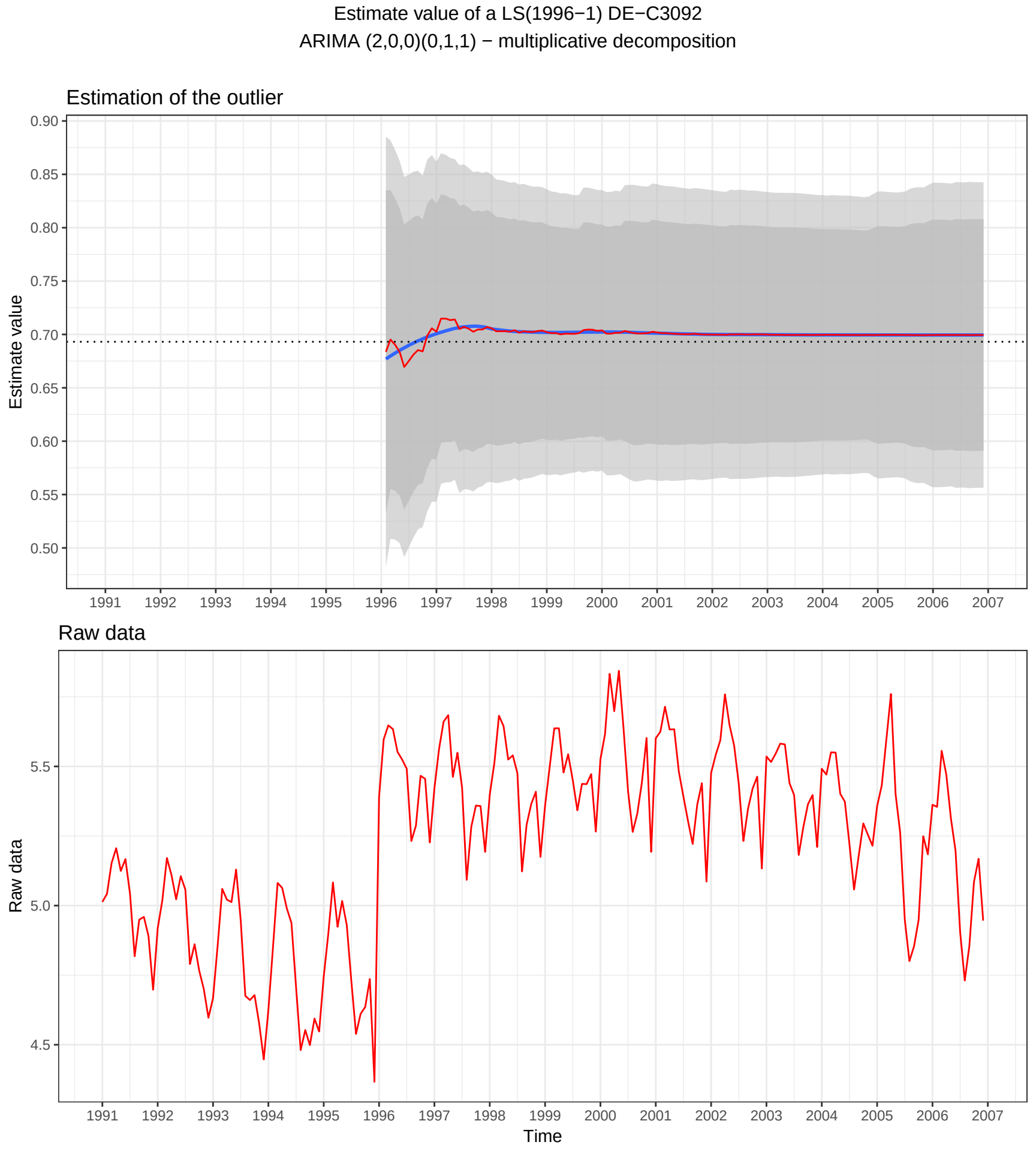




Estimate value of a LS(1995−1) IT−C3091
ARIMA (1,1,1)(0,1,1) − multiplicative decomposition

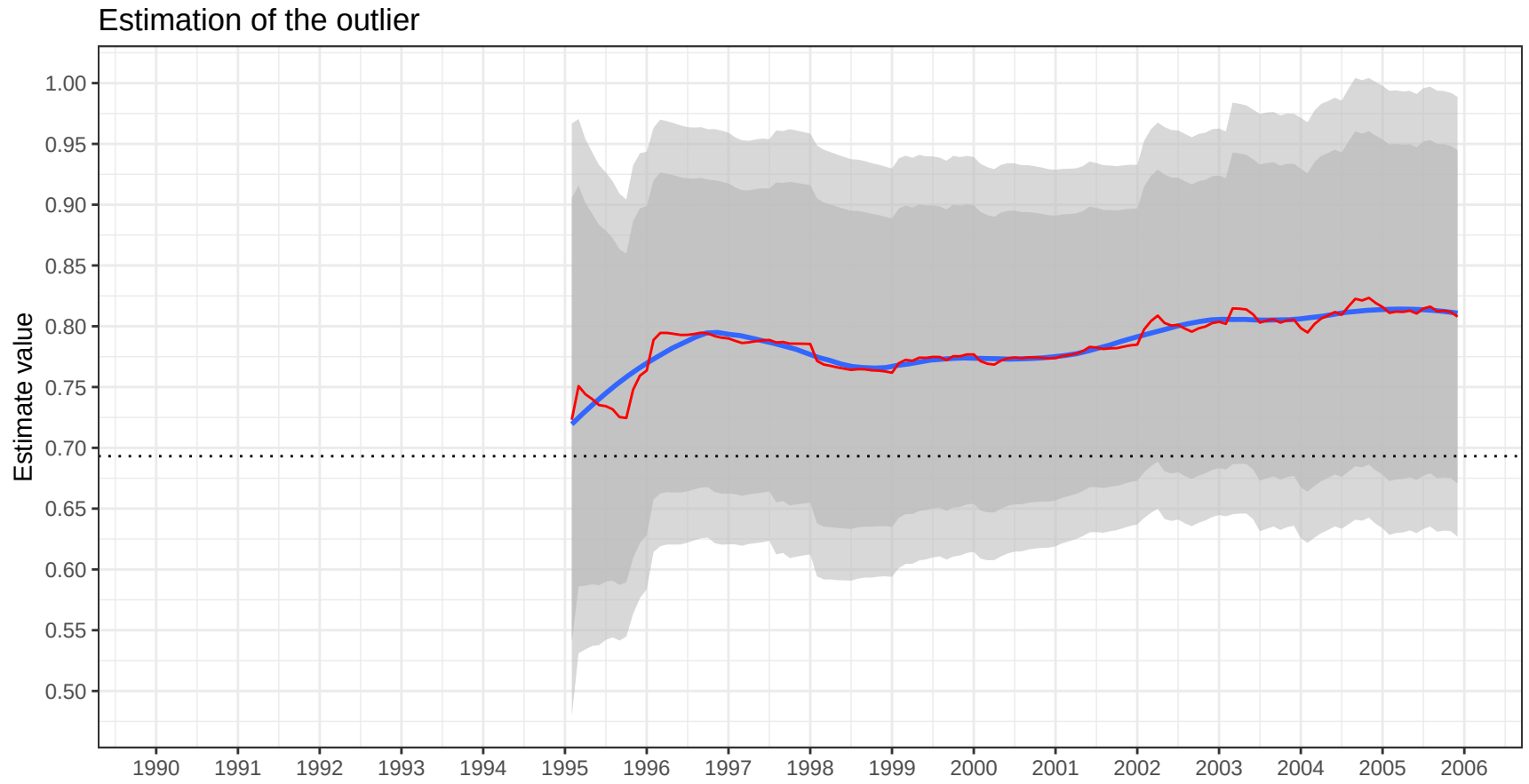


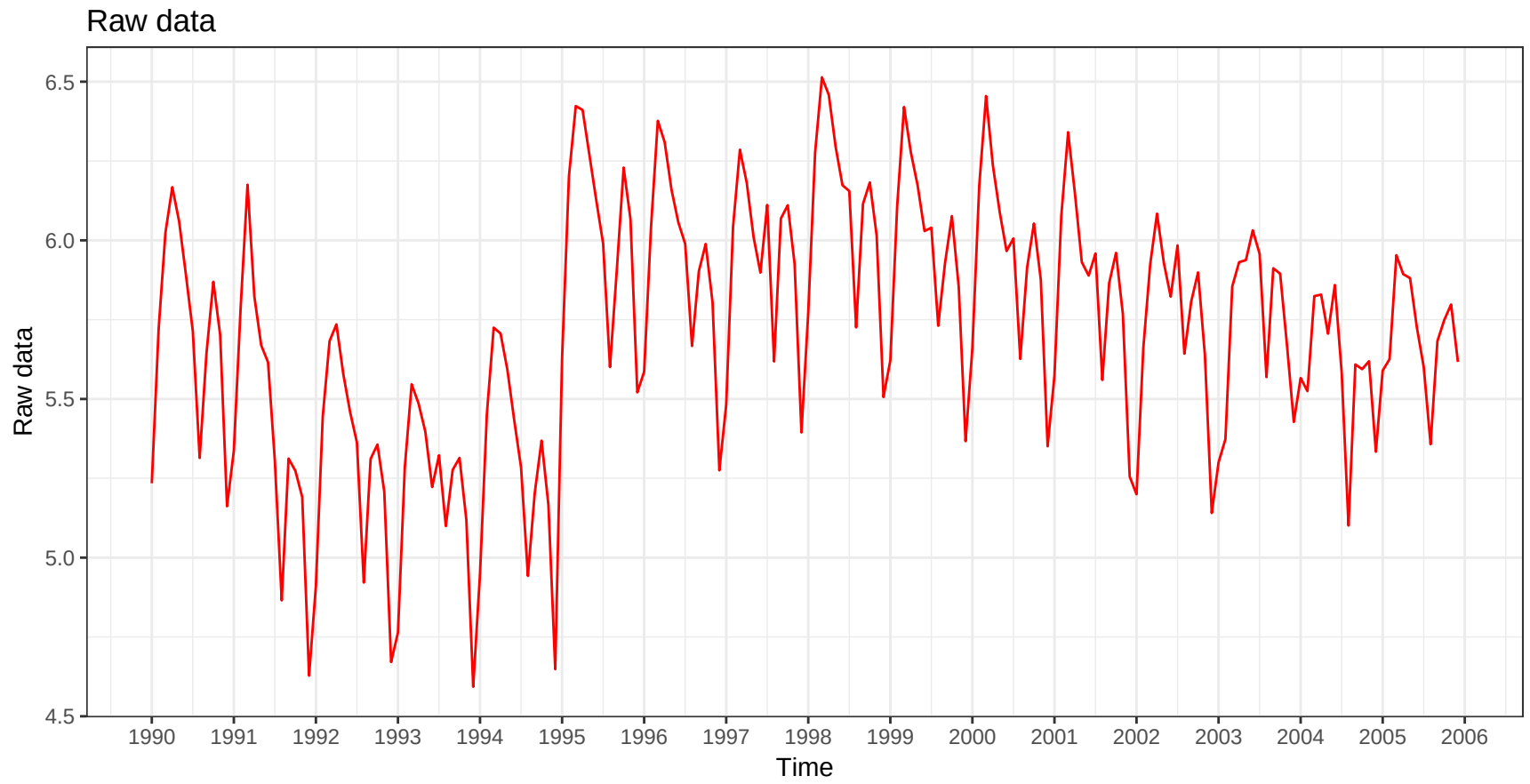



Estimate value of a LS(1996−1) DE−C3092
ARIMA (2,0,0)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
5.5
5.0
4.5
Time

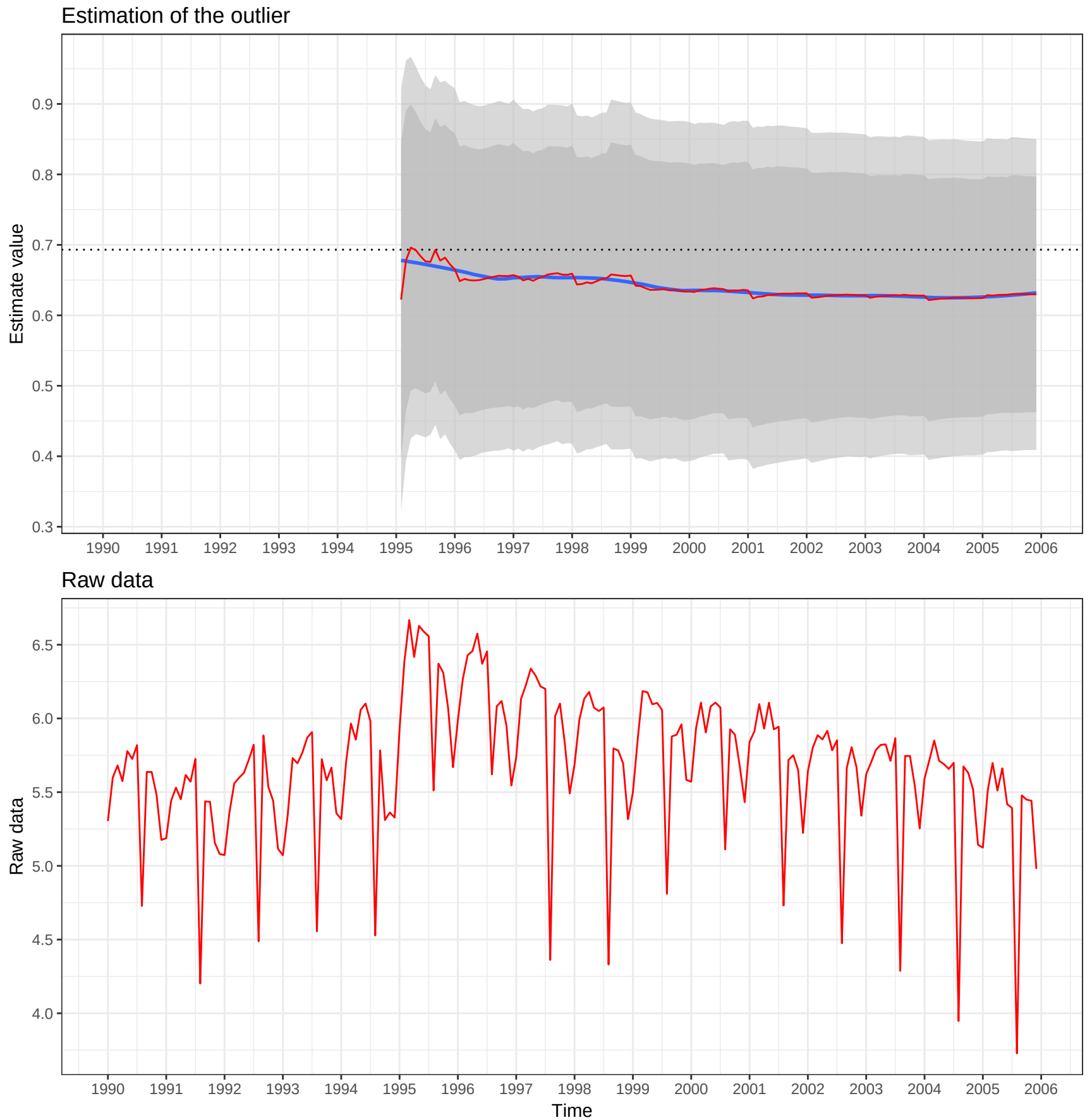
Estimate value of a LS(1995−1) FR−C3092

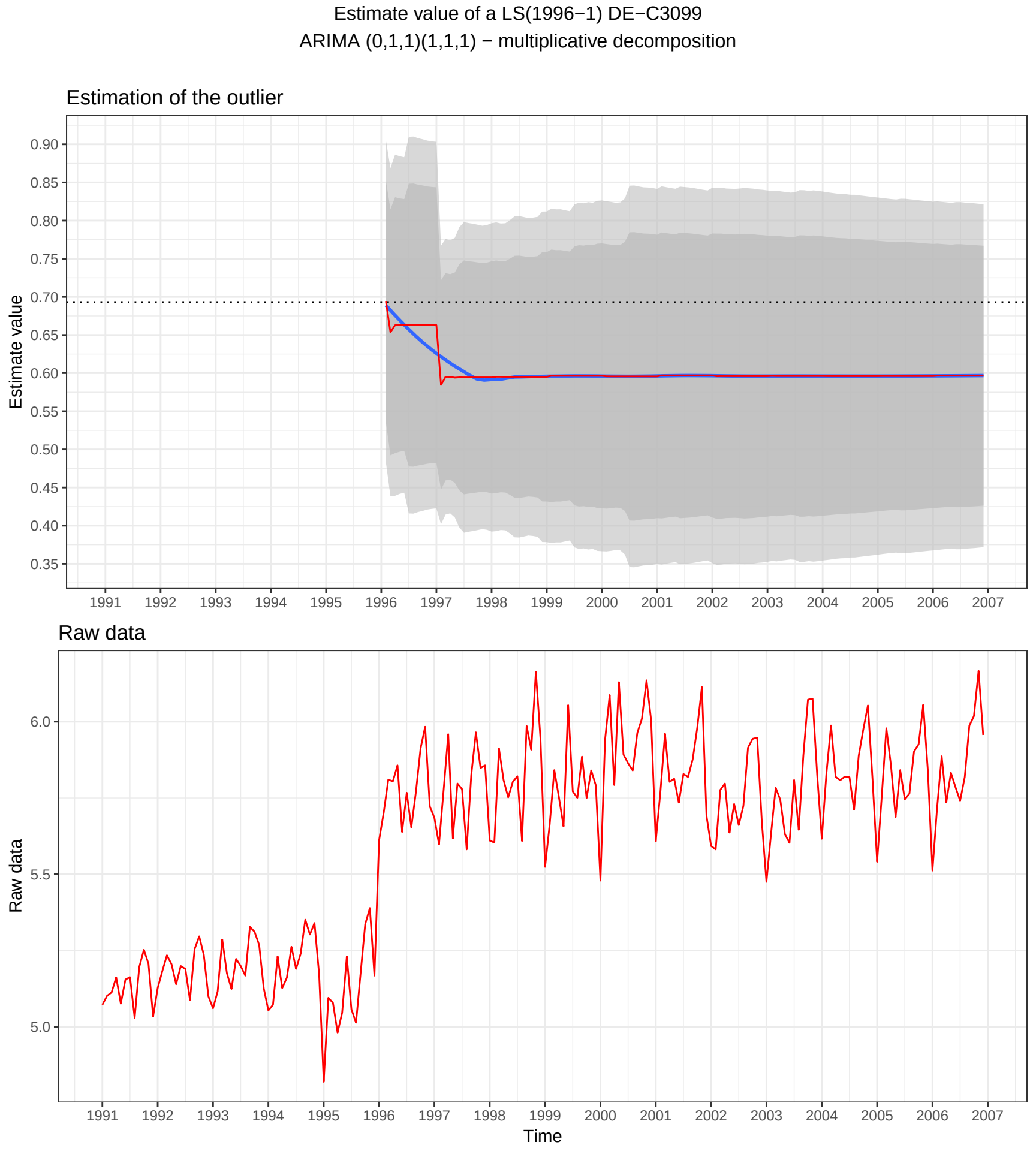
ARIMA (1,0,1)(1,1,1) − multiplicative decomposition

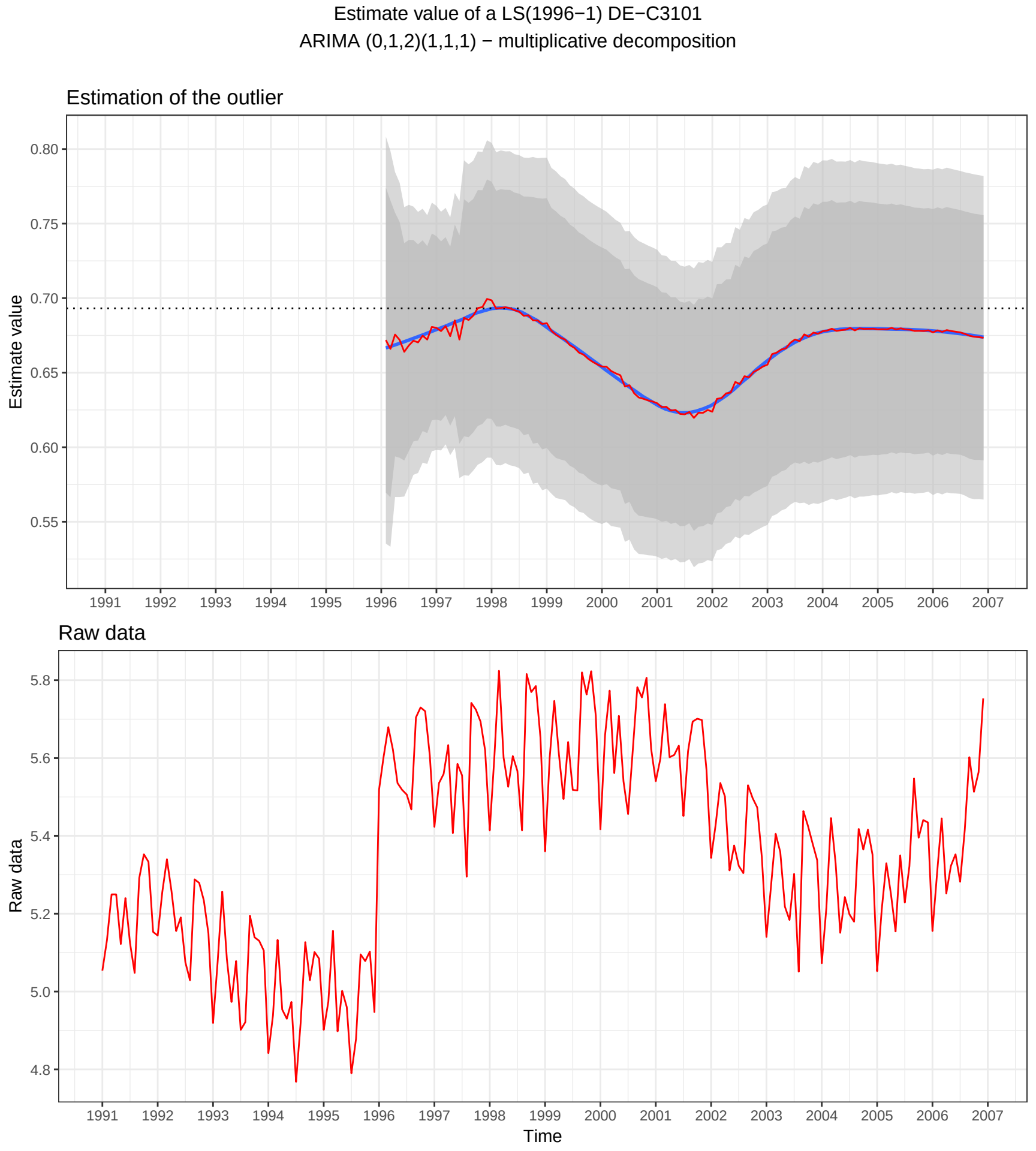


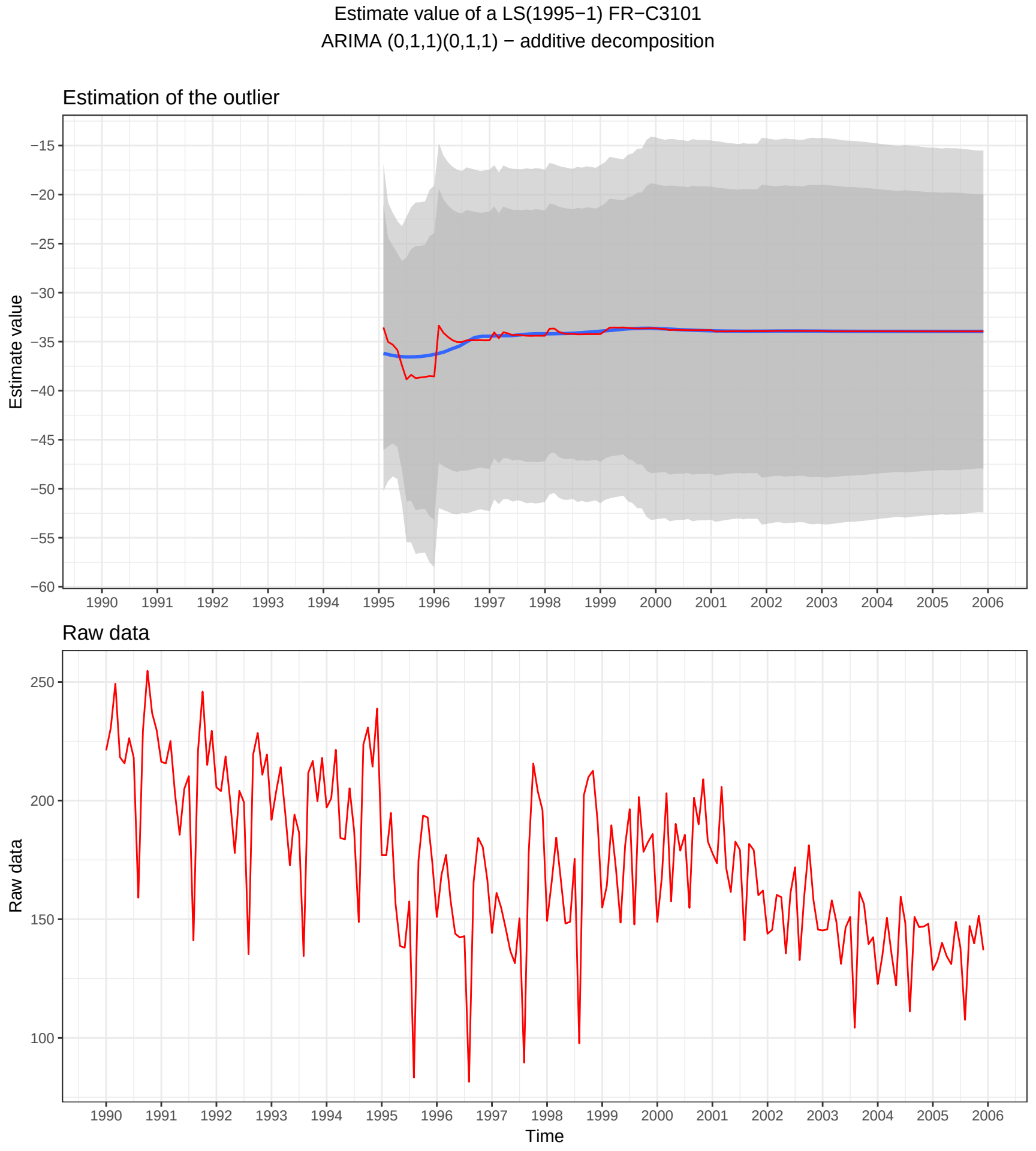


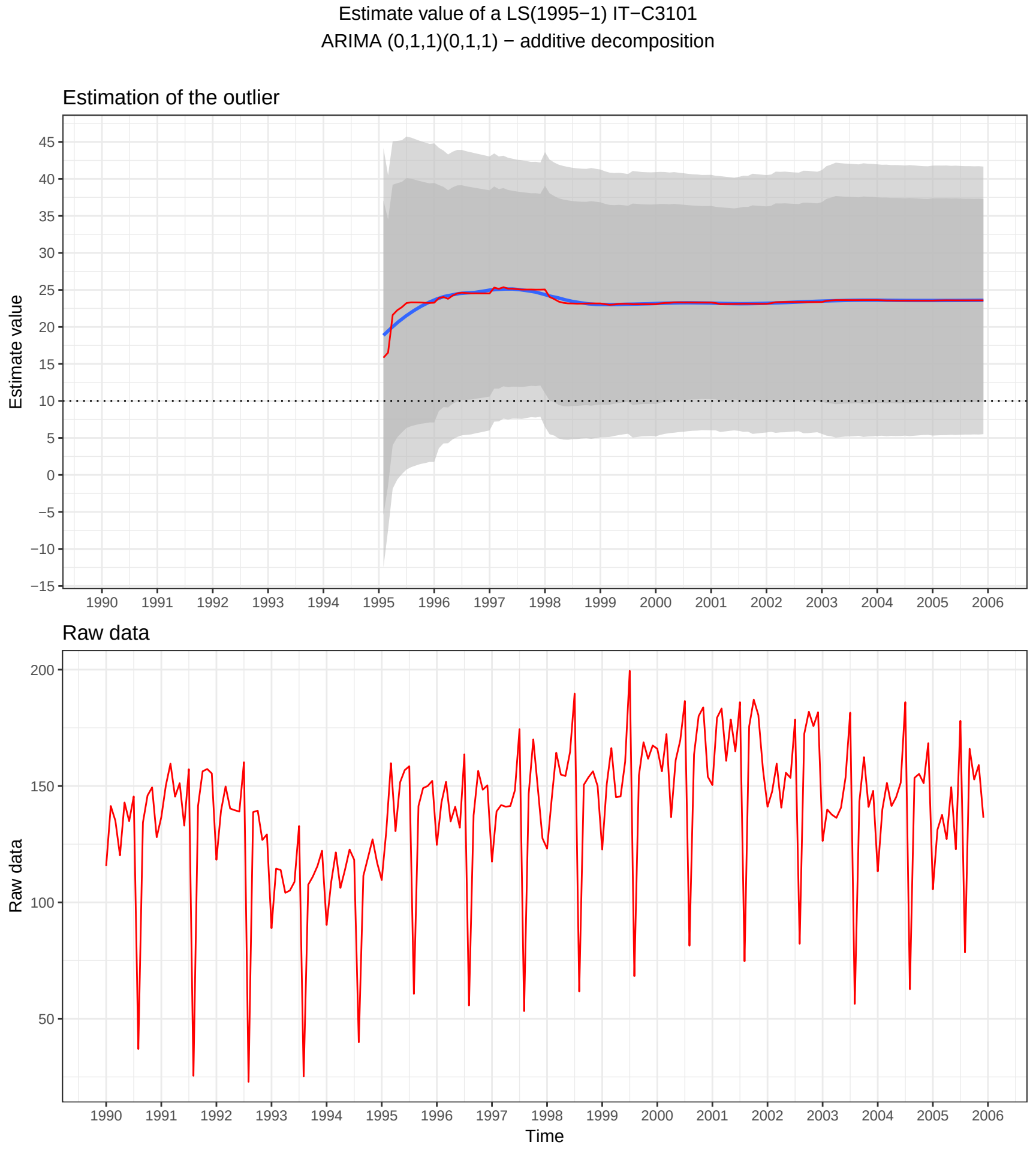
Estimate value of a LS(1995−1) IT−C3092
ARIMA (1,1,1)(0,1,1) − multiplicative decomposition

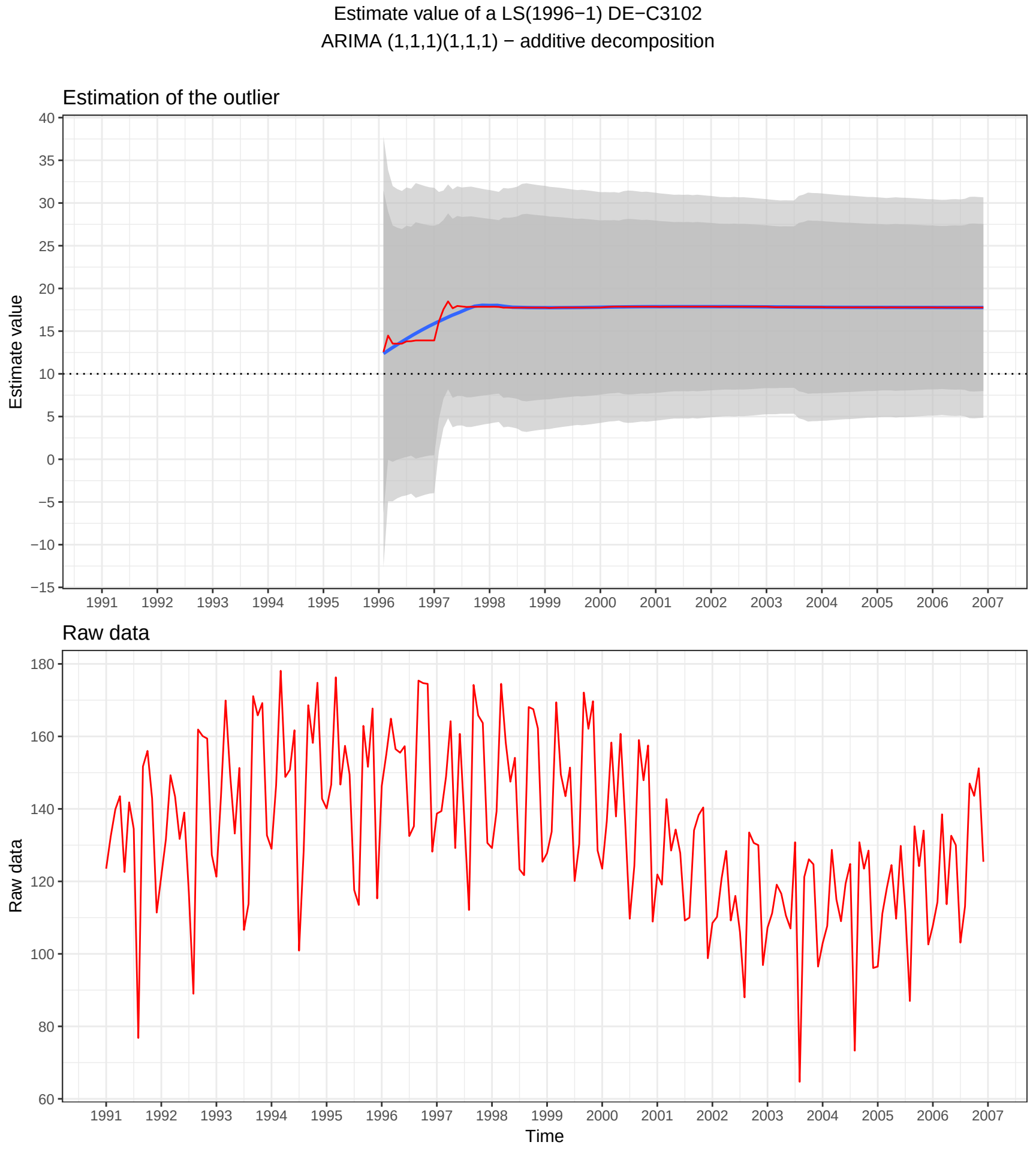


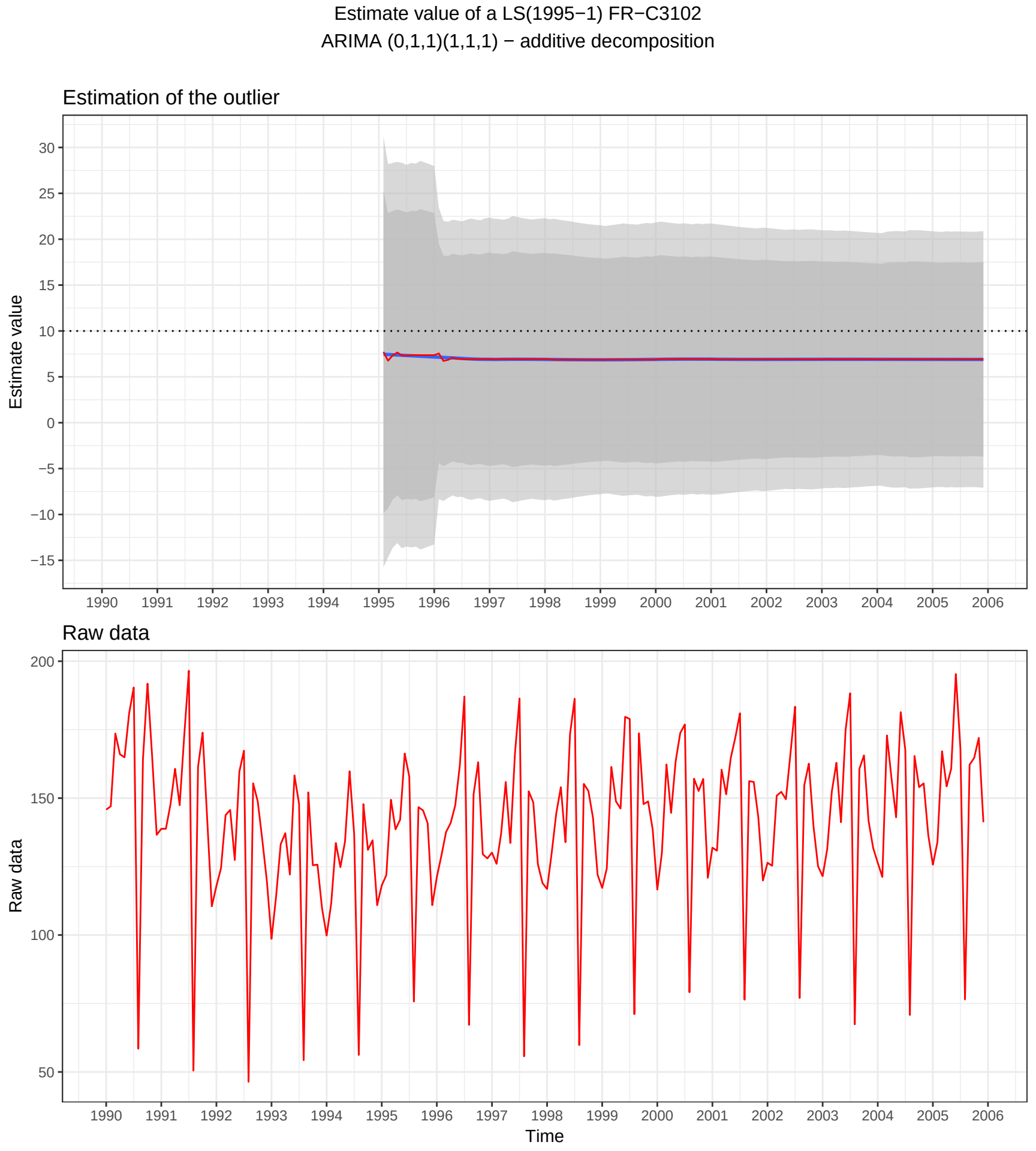

Estimate value of a LS(1996−1) DE−C3099
ARIMA (0,1,1)(1,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
0.45
0.40
0.35
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
6.0
5.5
5.0
Time

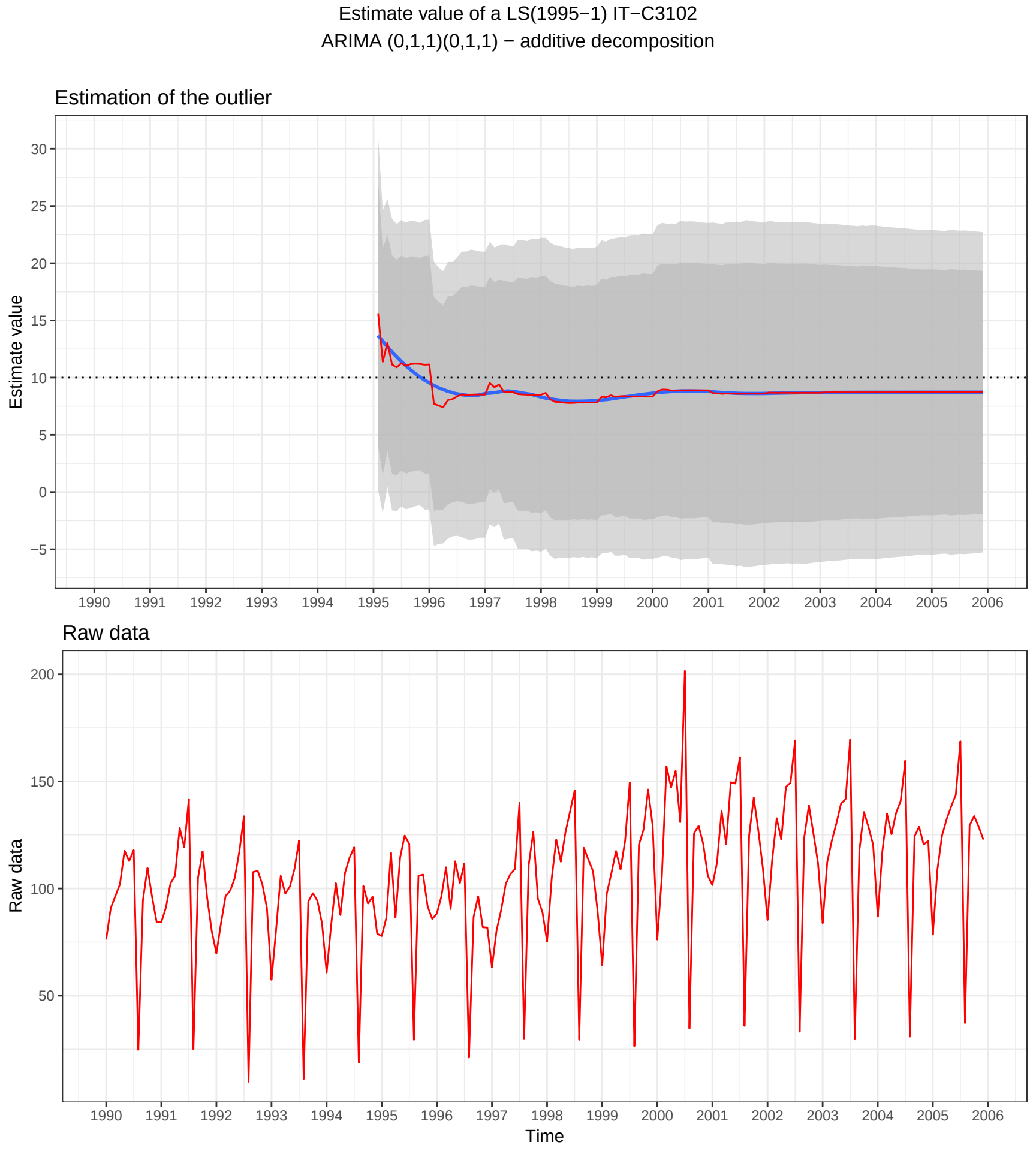

Estimate value of a LS(1996−1) DE−C3101
ARIMA (0,1,2)(1,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.80
0.75
0.70
0.65
0.60
0.55
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
5.8
5.6
5.4
5.2
5.0
4.8
Time

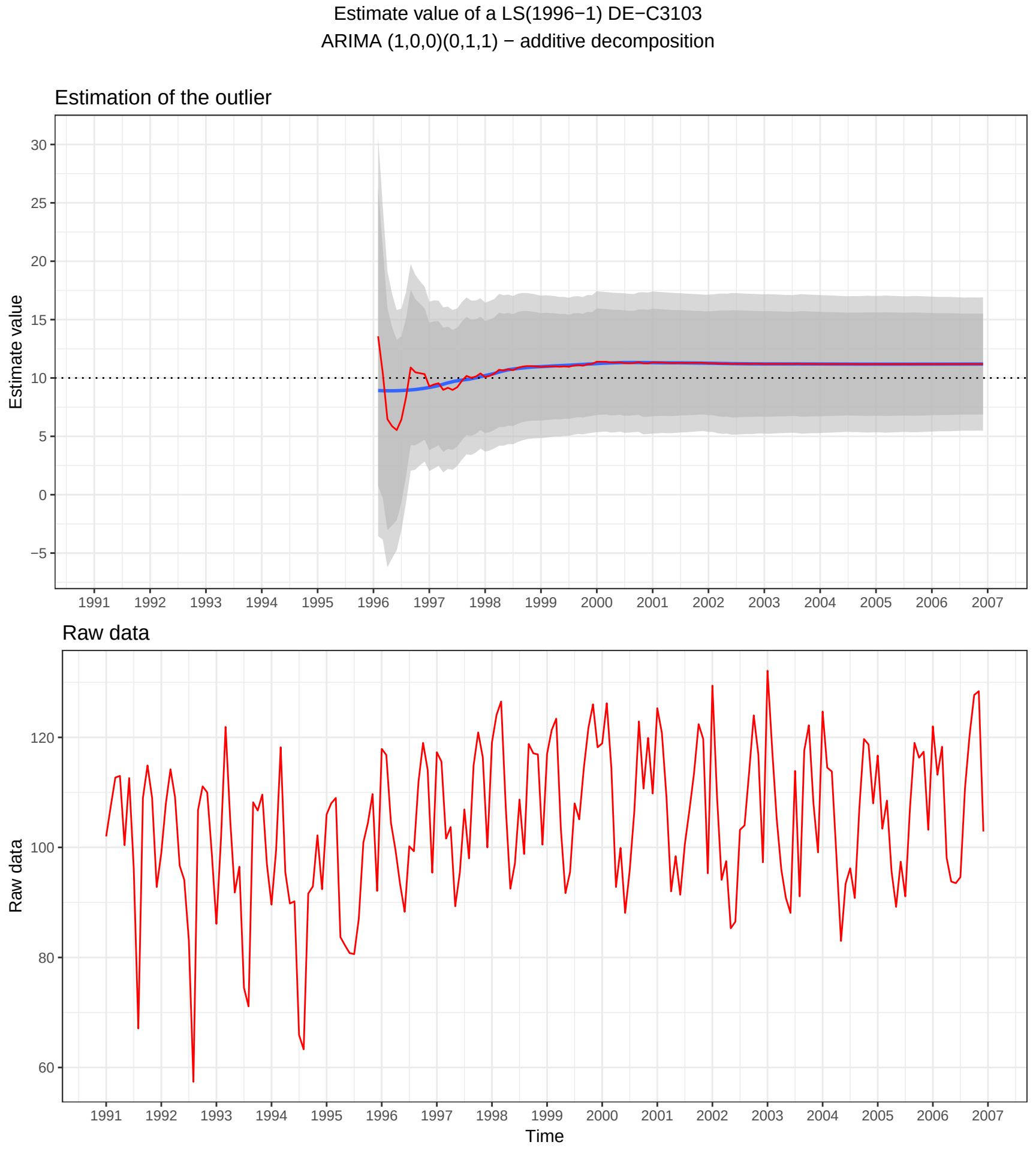

Estimate value of a LS(1995−1) FR−C3101
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
−15
−20
−25
−30
−35
−40
−45
−50
−55
−60
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
250
200
150
100
Time

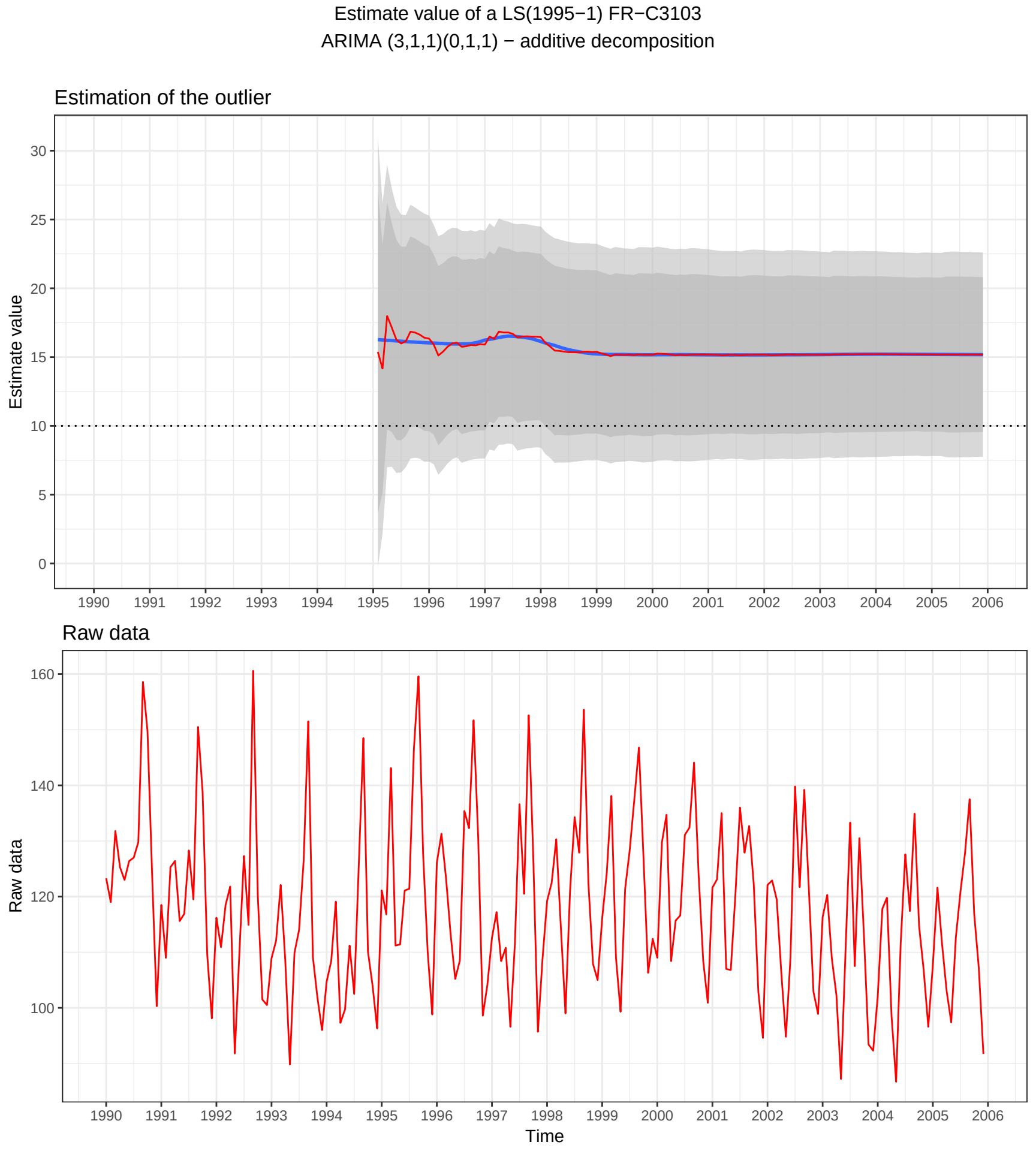

Estimate value of a LS(1995−1) IT−C3101
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
45
40
35
30
25
20
15
10
5
0
−5
−10
−15
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
200
150
100
50
Time


Estimate value of a LS(1996−1) DE−C3102
ARIMA (1,1,1)(1,1,1) − additive decomposition
Estimation of the outlier
Estimate value
40
35
30
25
20
15
10
5
0
−5
−10
−15
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
180
160
140
120
100
80
60
Time

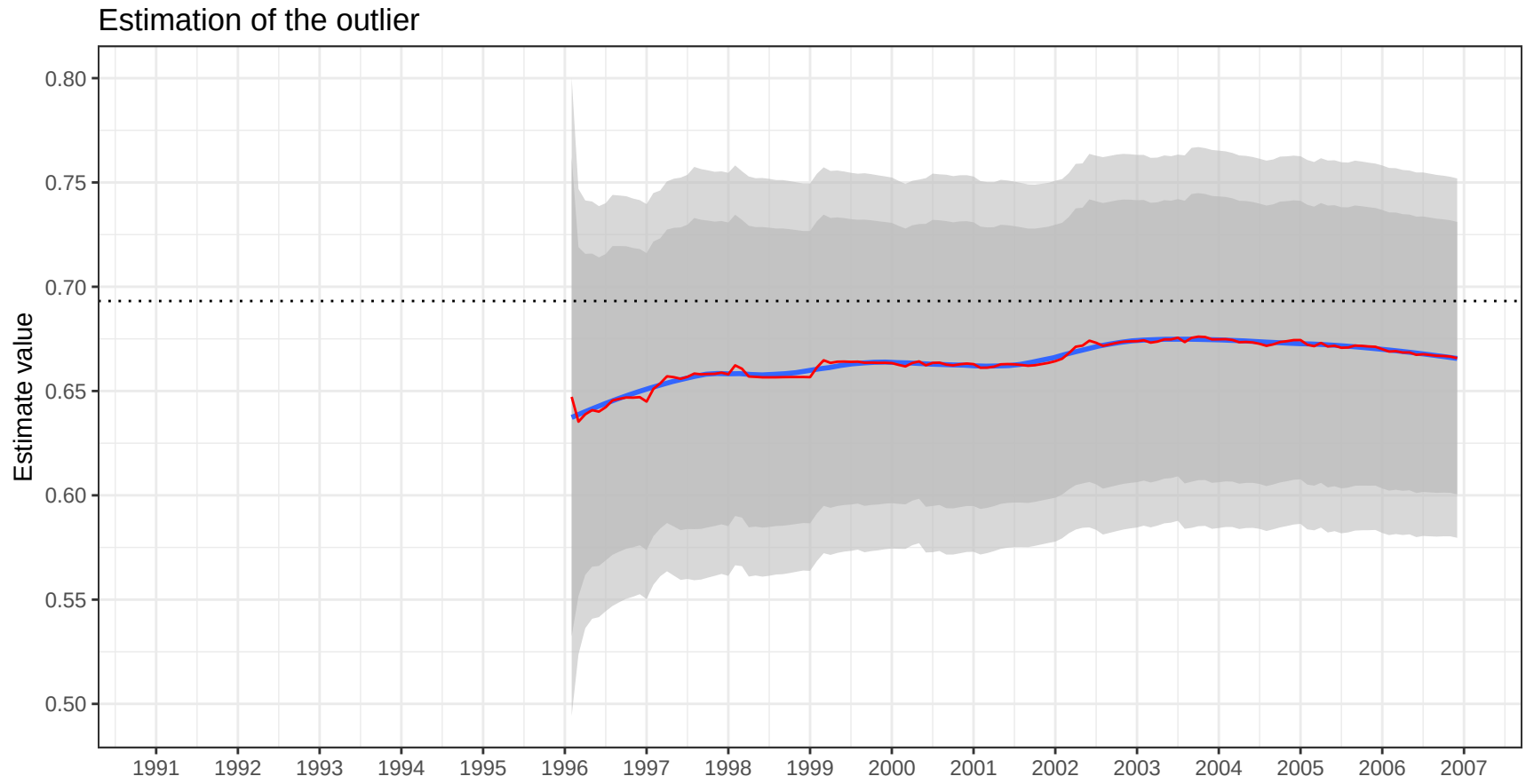

Estimate value of a LS(1995−1) FR−C3102
ARIMA (0,1,1)(1,1,1) − additive decomposition
Estimation of the outlier
Estimate value
30
25
20
15
10
5
0
−5
−10
−15
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
200
150
100
50
Time

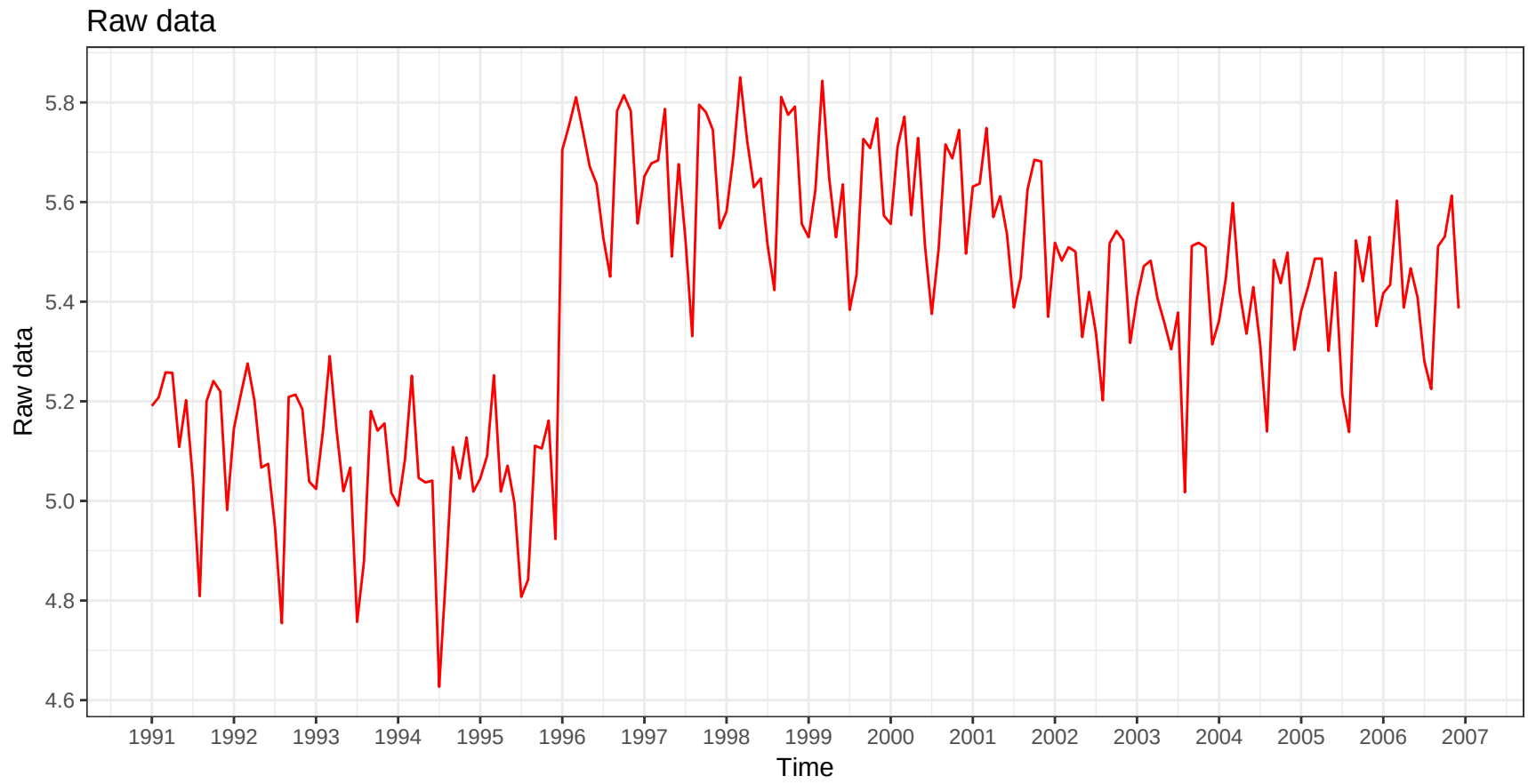

Estimate value of a LS(1995−1) IT−C3102
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
30
25
20
15
10
5
0
−5
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
200
150
100
50
Time


Estimate value of a LS(1996−1) DE−C3103
ARIMA (1,0,0)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
30
25
20
15
10
5
0
−5
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
120
100
80
60
Time

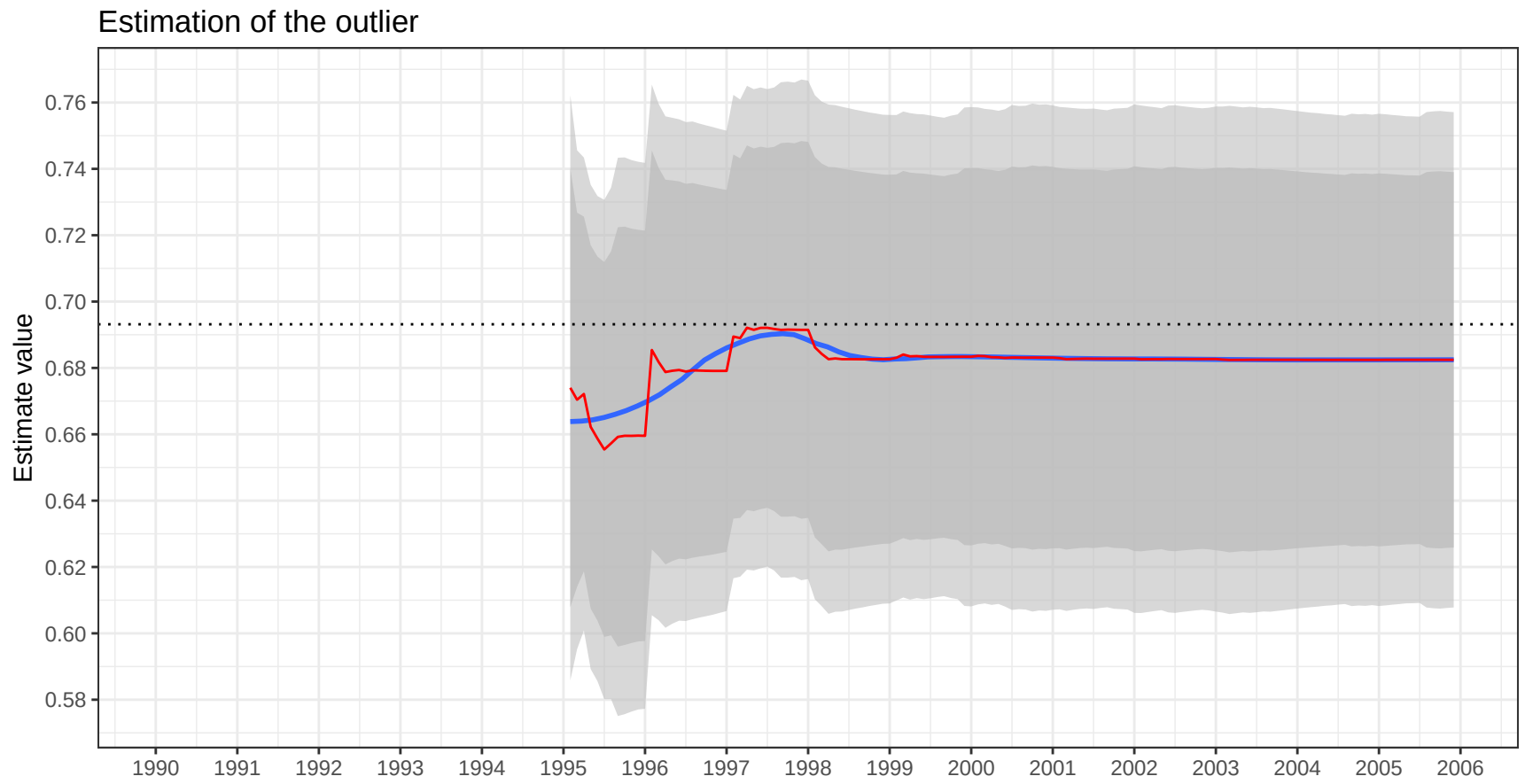

Estimate value of a LS(1995−1) FR−C3103
ARIMA (3,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
30
25
20
15
10
5
0
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
160
140
120
100
Time

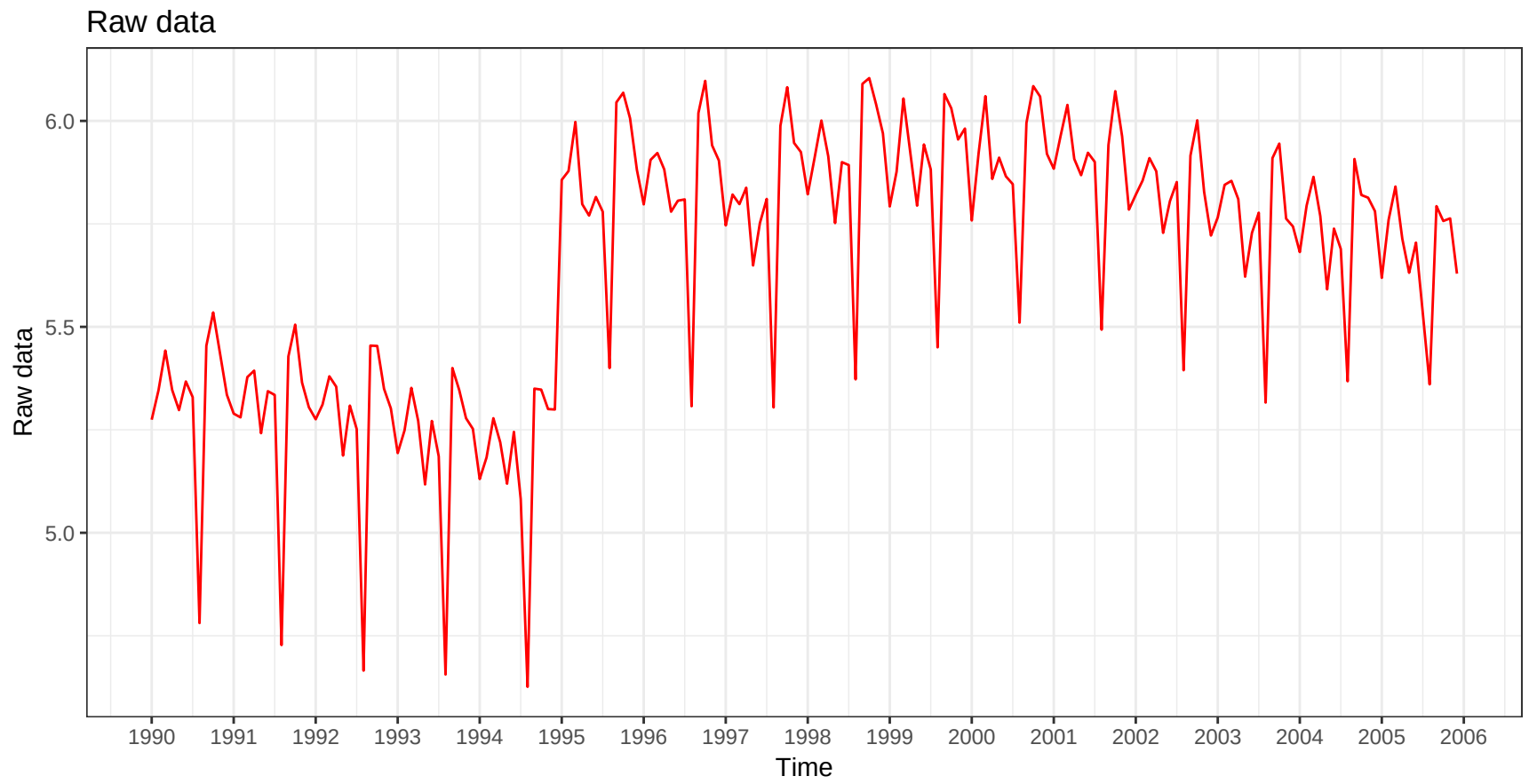
Estimate value of a LS(1996−1) DE−C3109
ARIMA (3,0,1)(0,1,1) − multiplicative decomposition

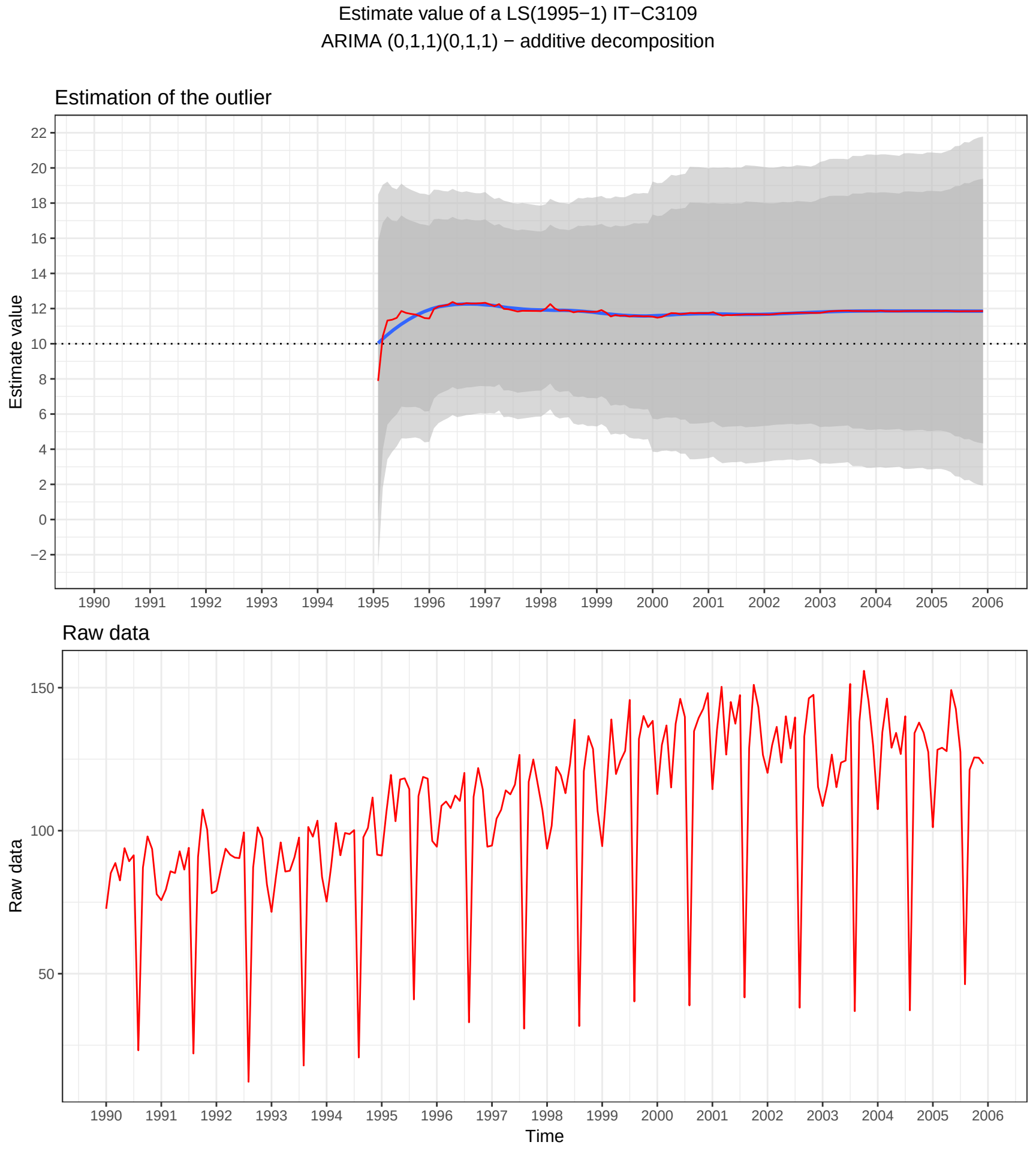




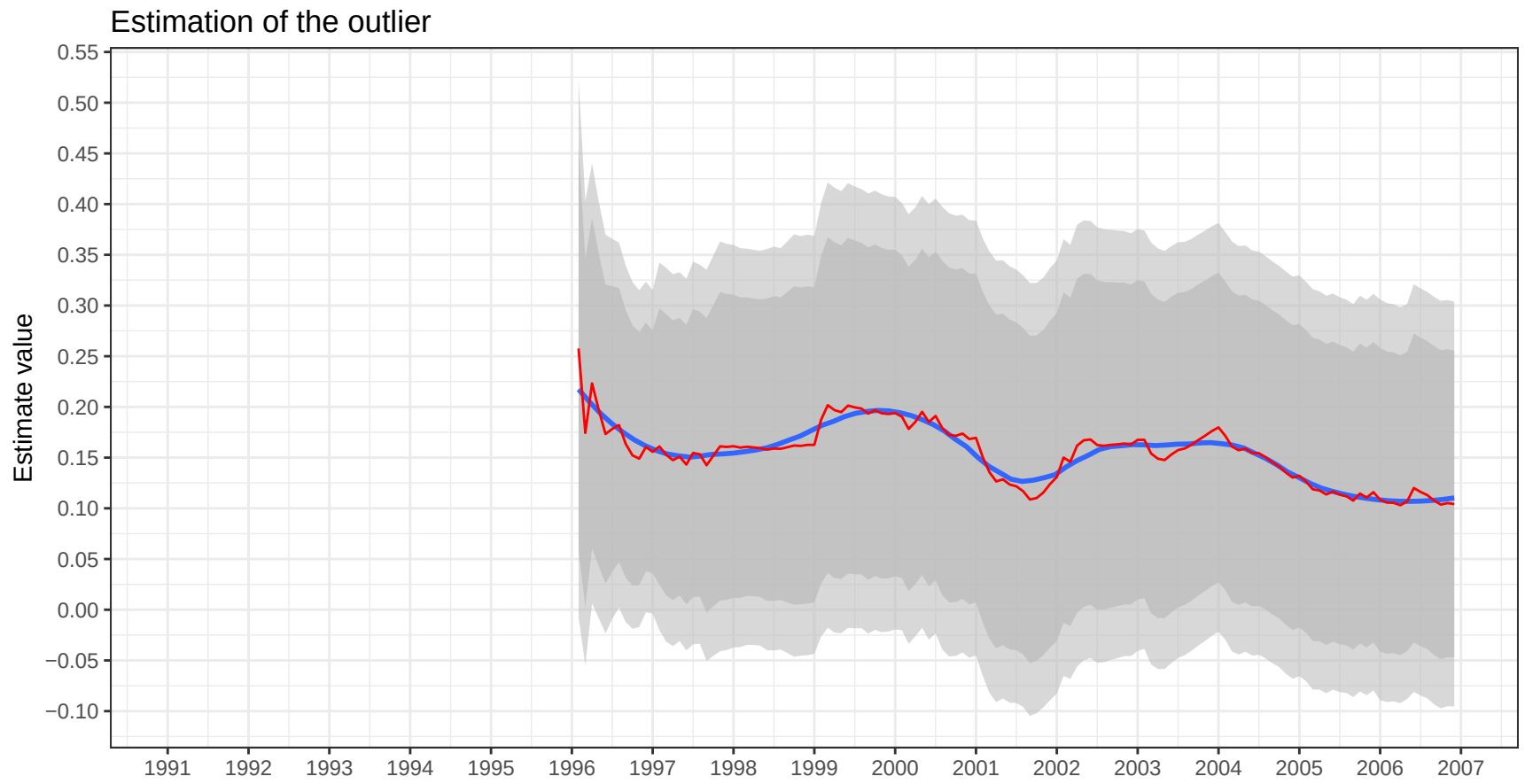
Estimate value of a LS(1995−1) FR−C3109
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

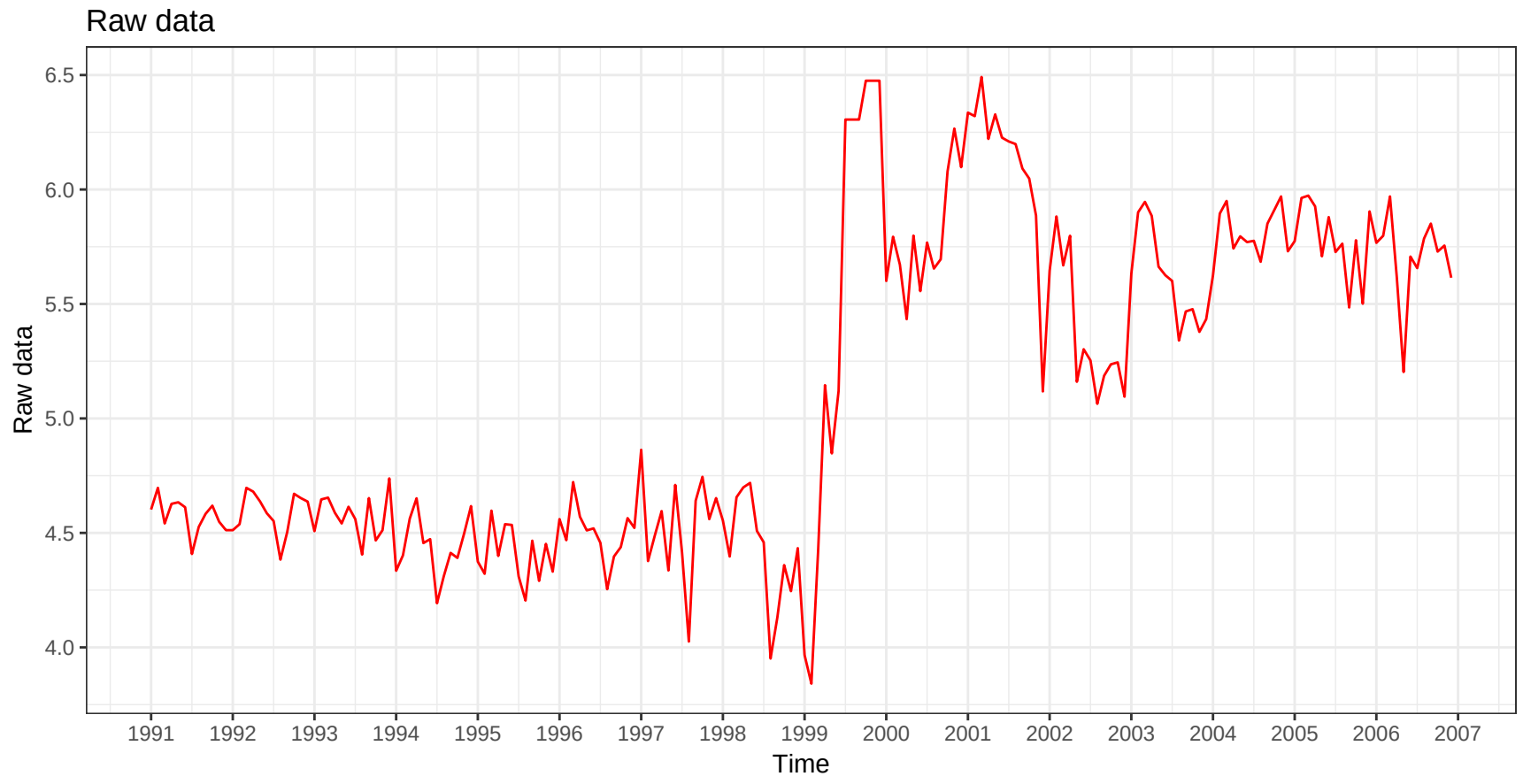




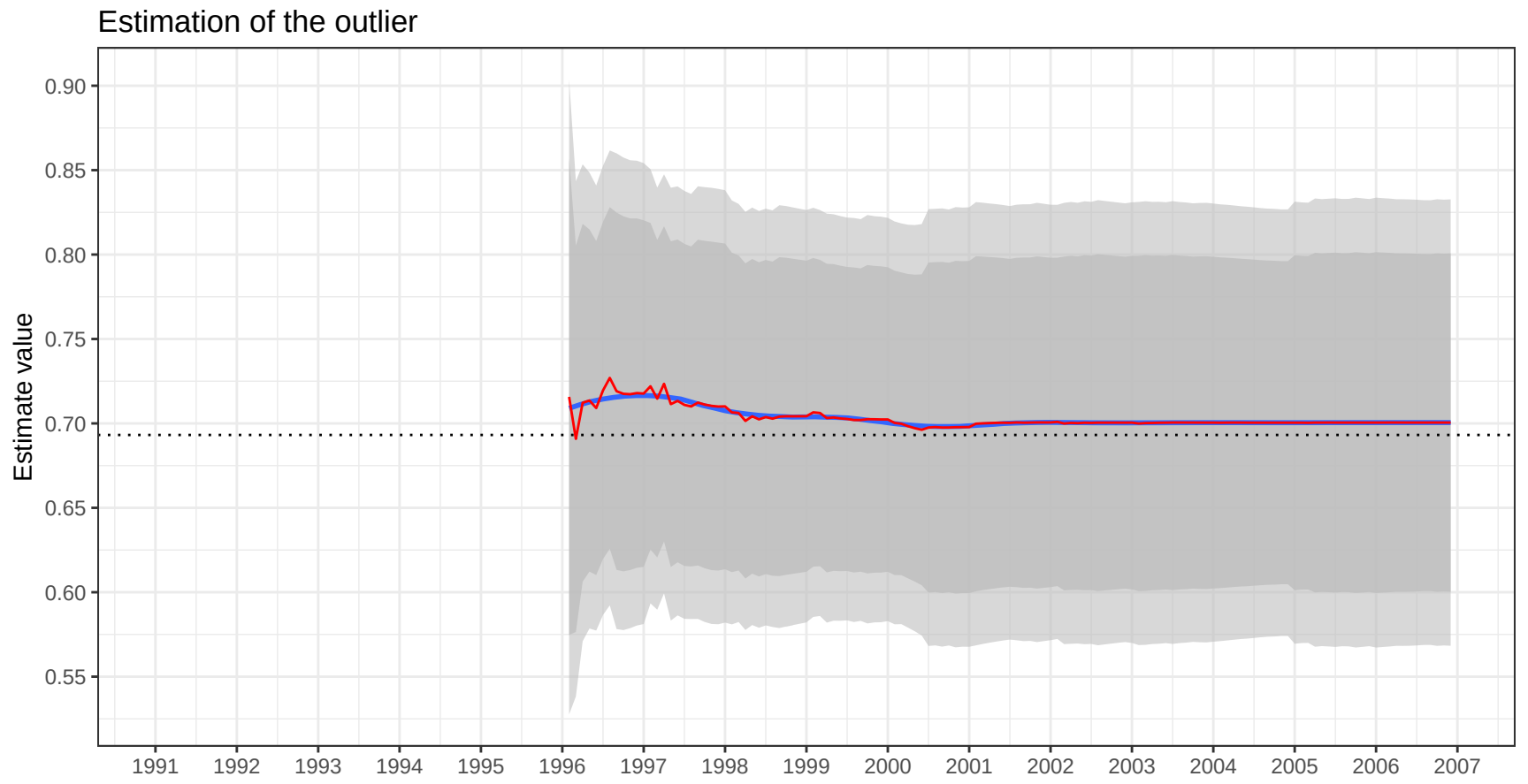

Estimate value of a LS(1995−1) IT−C3109
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
22
20
18
16
14
12
10
8
6
4
2
0
−2
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
150
100
50
Time

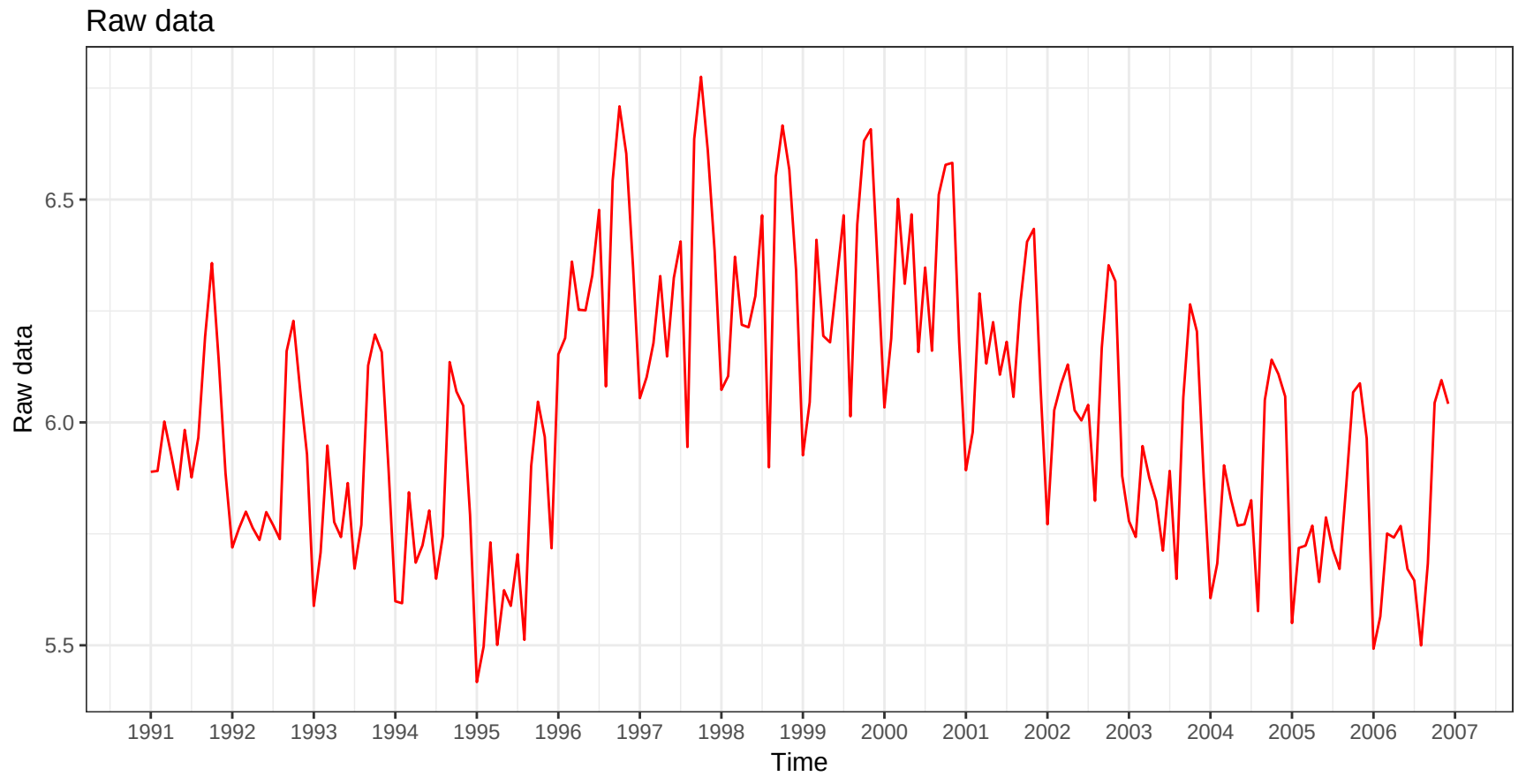
Estimate value of a LS(1996−1) DE−C3211
ARIMA (2,1,1)(0,1,1) − multiplicative decomposition

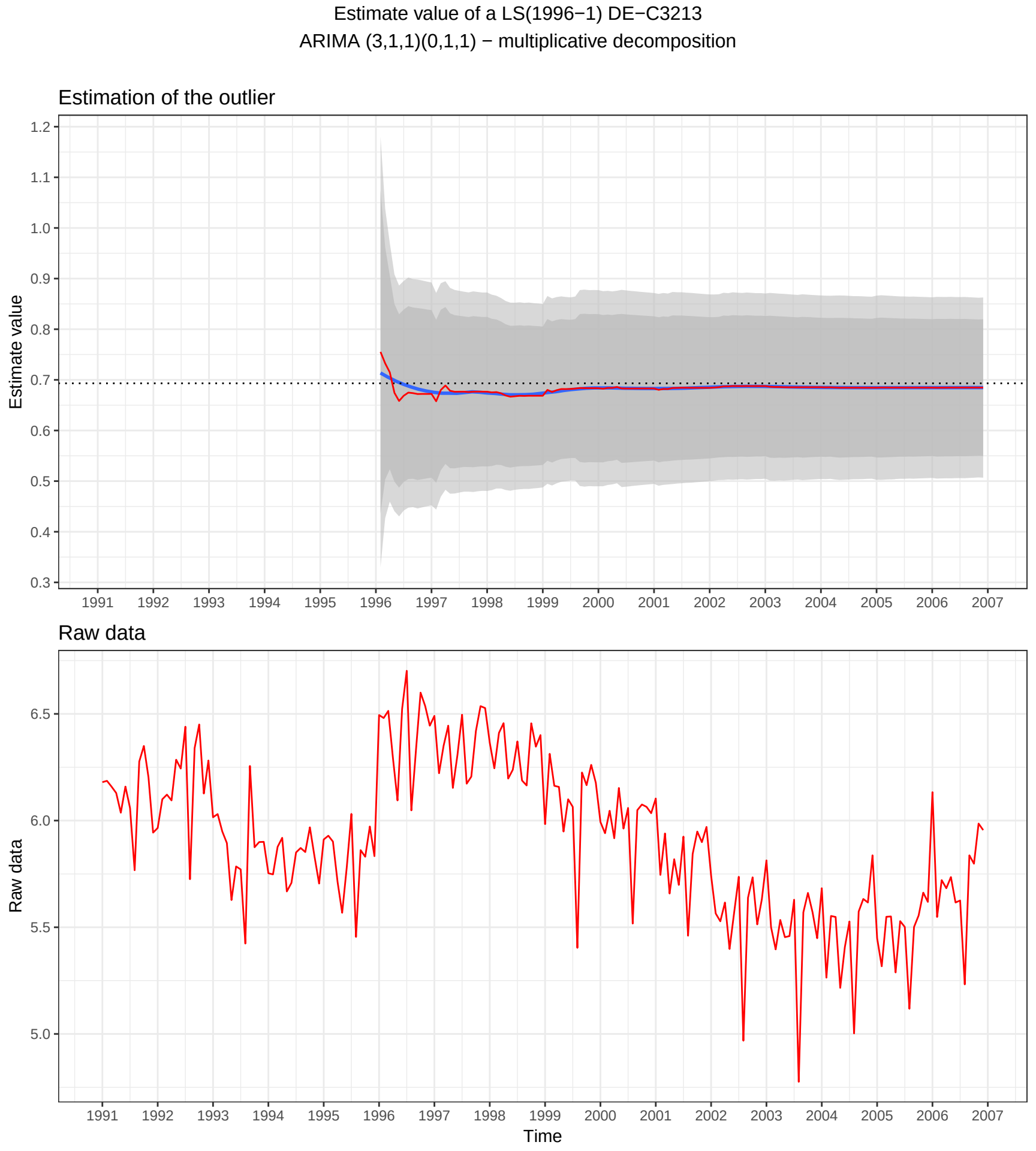


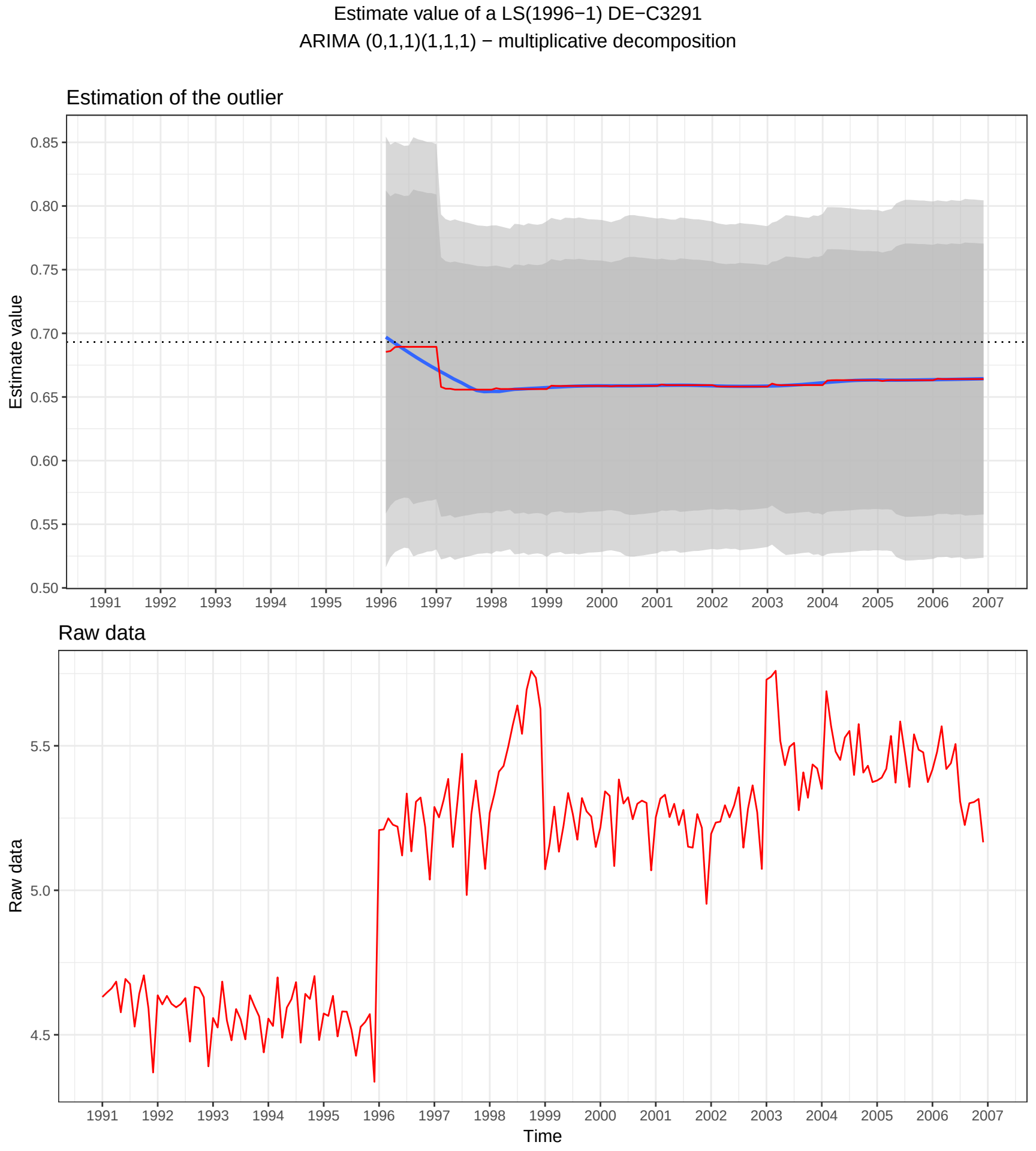


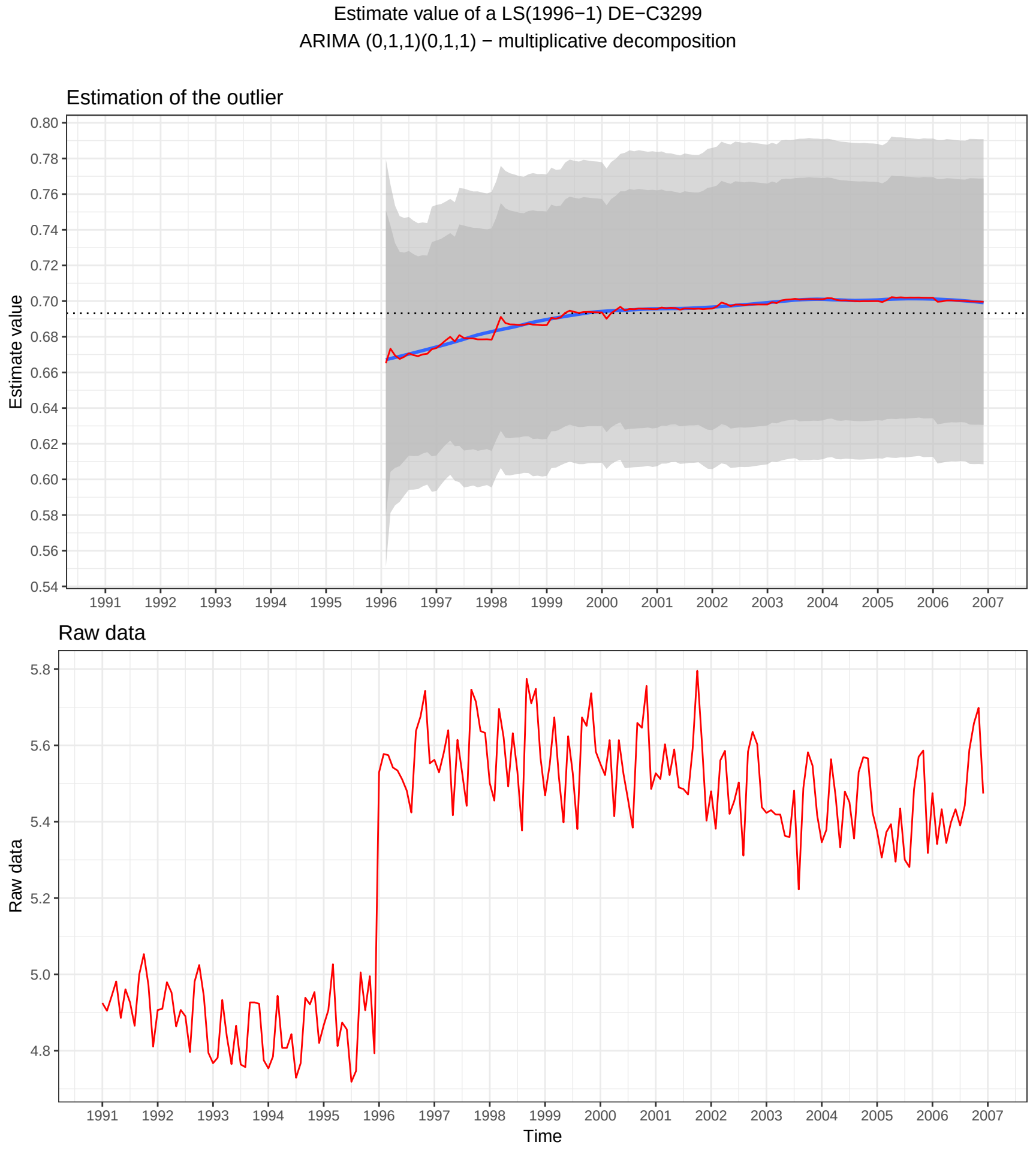
Estimate value of a LS(1996−1) DE−C3212
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

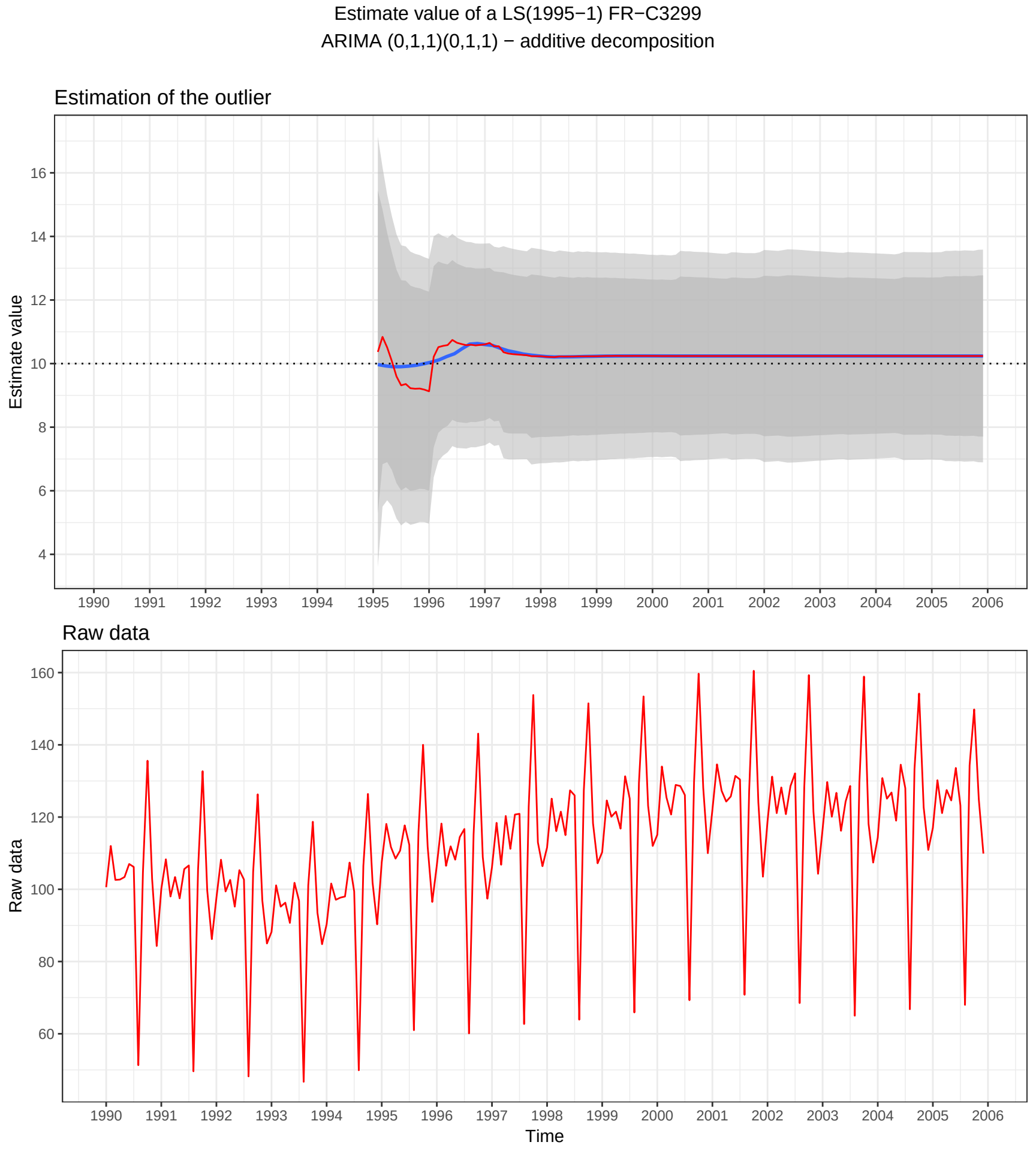





Estimate value of a LS(1996−1) DE−C3213
ARIMA (3,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
6.5
6.0
5.5
5.0
Time

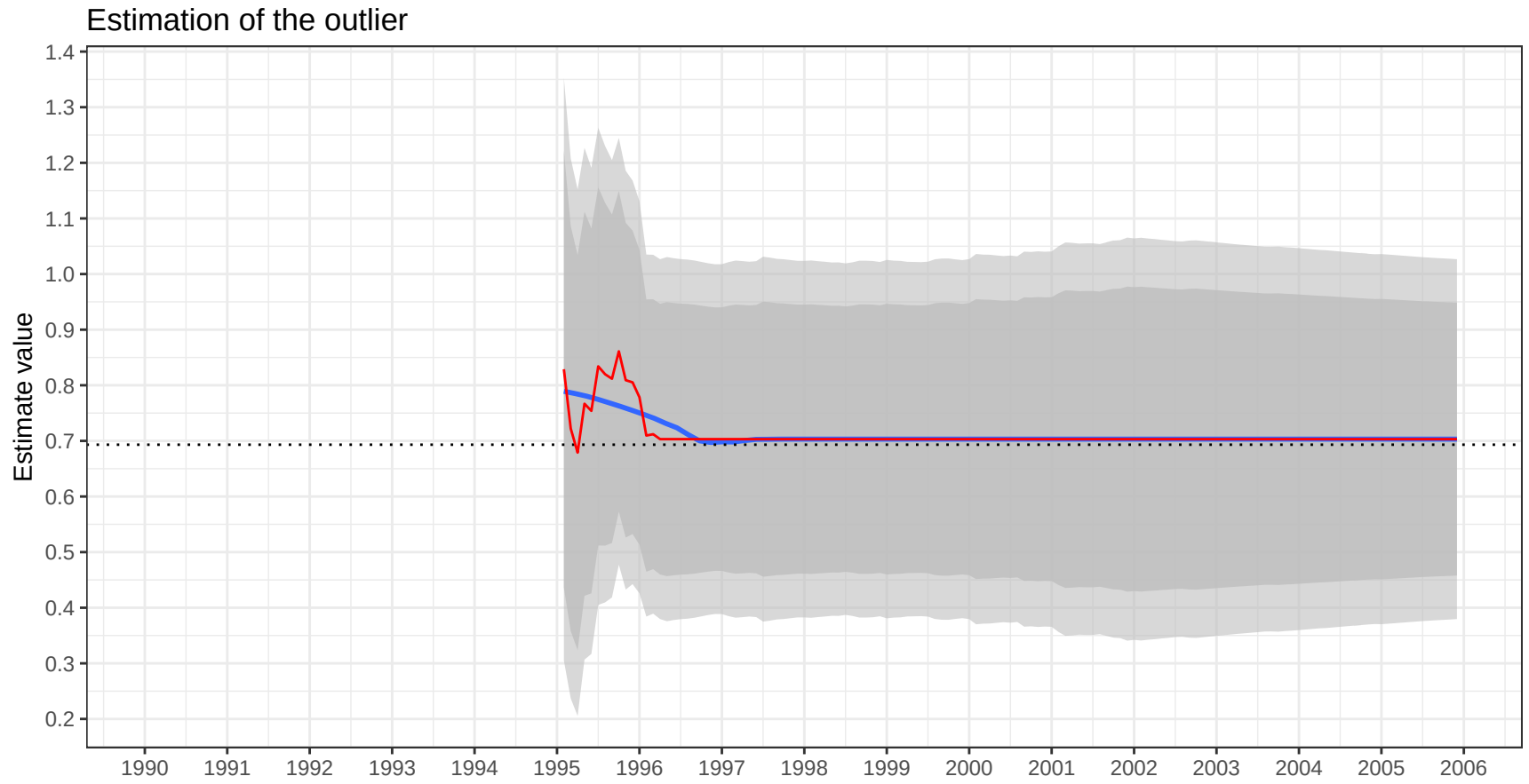

Estimate value of a LS(1996−1) DE−C3291
ARIMA (0,1,1)(1,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
5.5
5.0
4.5
Time

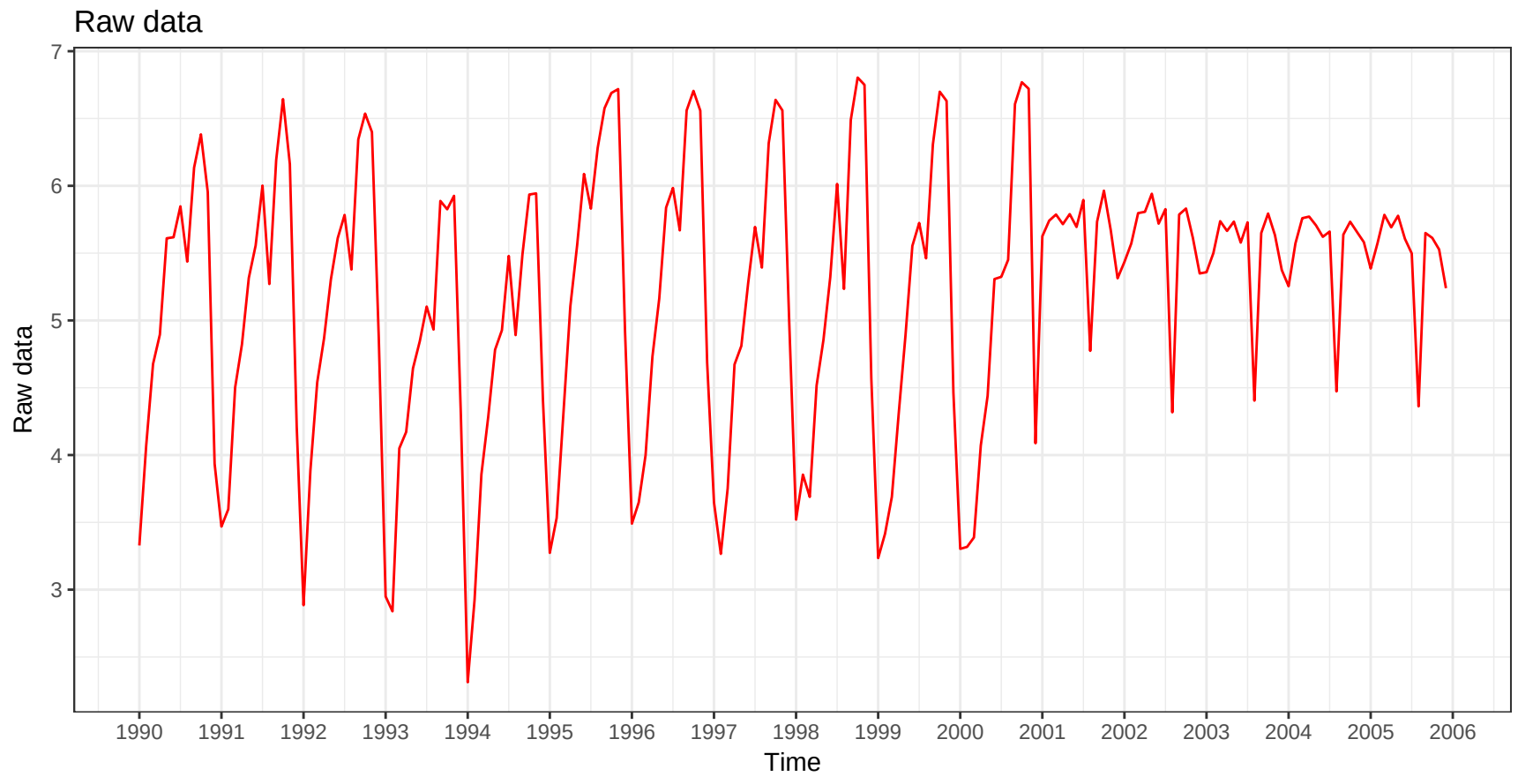

Estimate value of a LS(1996−1) DE−C3299
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.80
0.78
0.76
0.74
0.72
0.70
0.68
0.66
0.64
0.62
0.60
0.58
0.56
0.54
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
5.8
5.6
5.4
5.2
5.0
4.8
Time

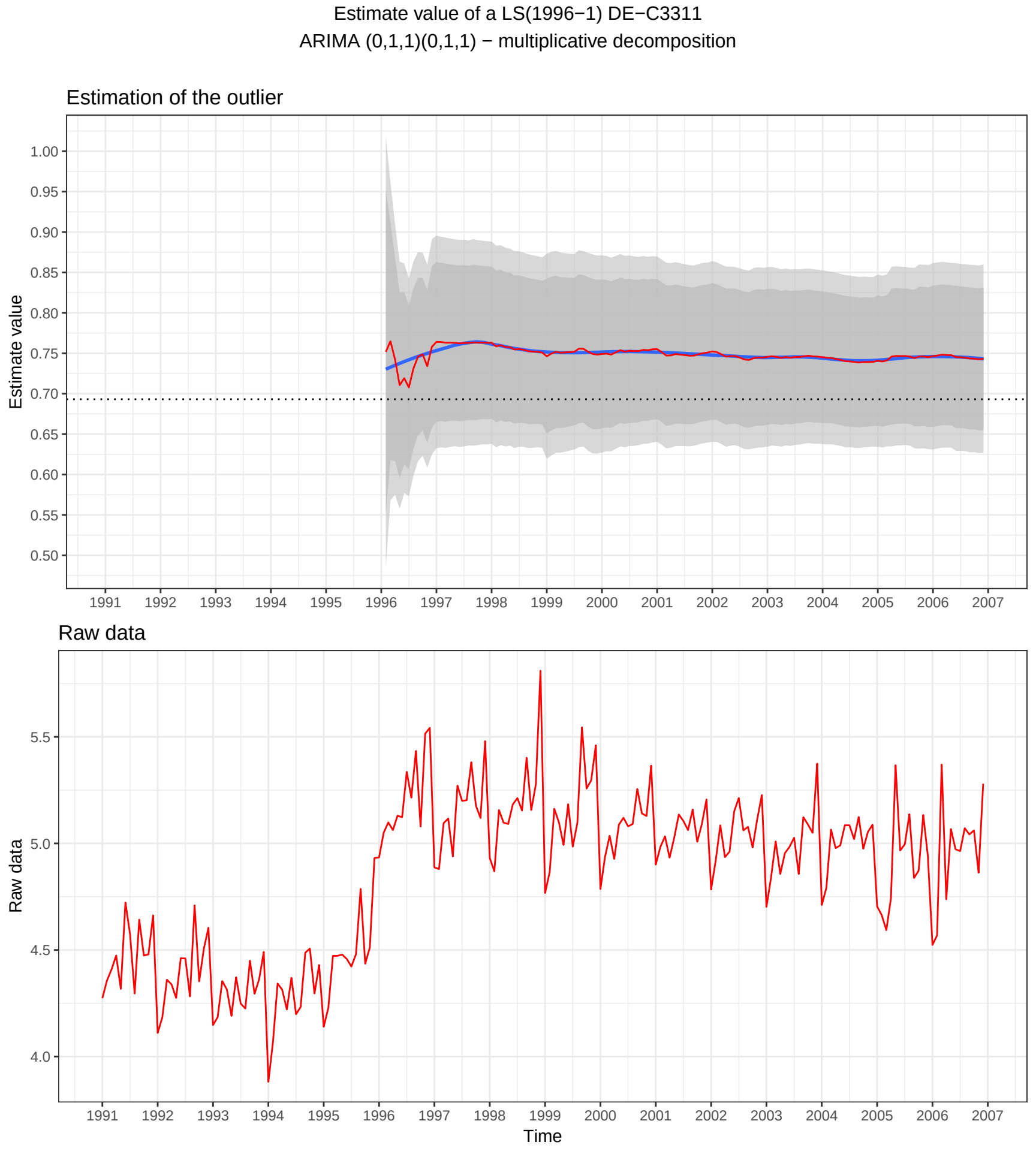

Estimate value of a LS(1995−1) FR−C3299
ARIMA (0,1,1)(0,1,1) − additive decomposition
Estimation of the outlier
Estimate value
16
14
12
10
8
6
4
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
160
140
120
100
80
60
Time

Estimate value of a LS(1995−1) IT−C3299

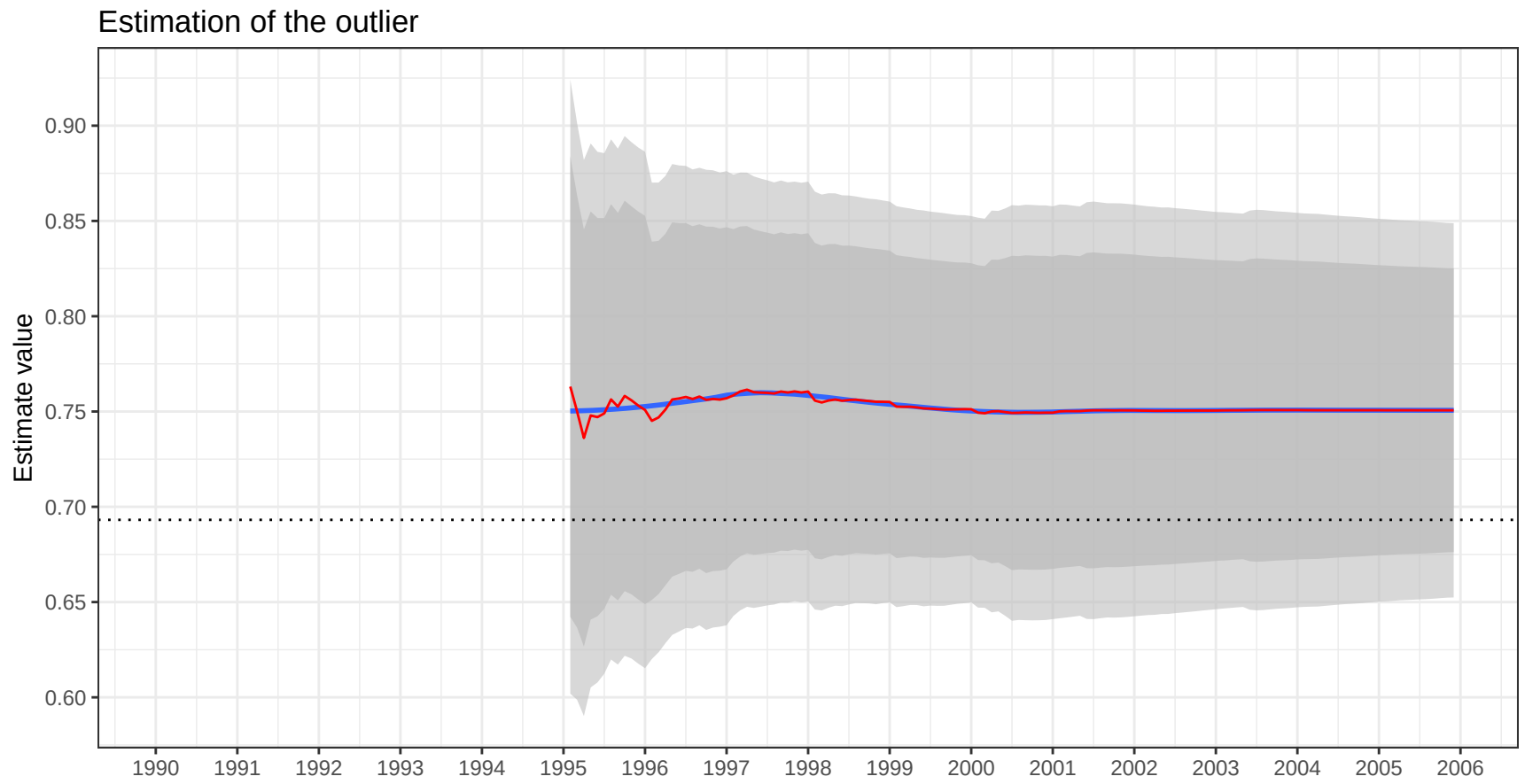
ARIMA (3,0,0)(0,1,0) − multiplicative decomposition

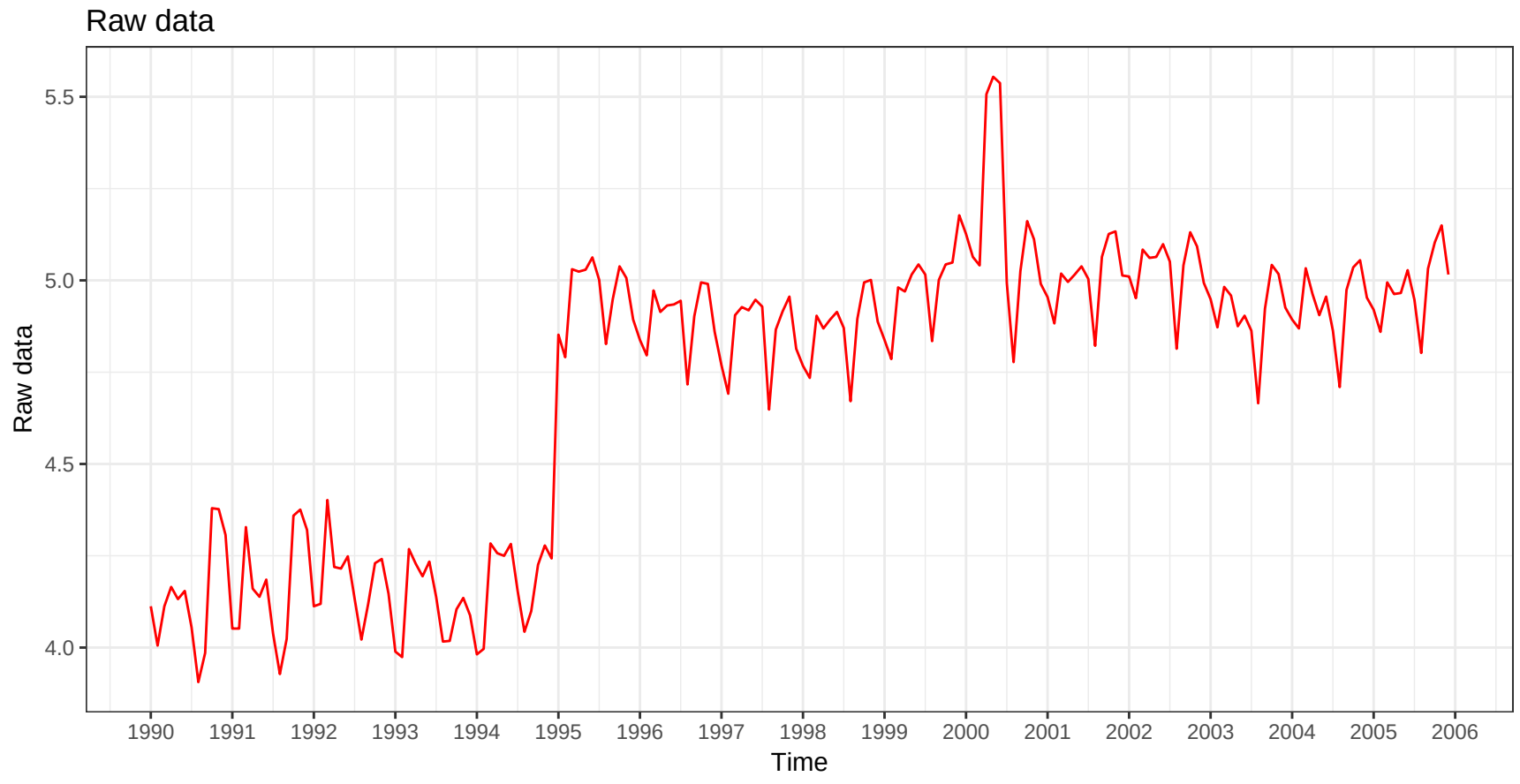


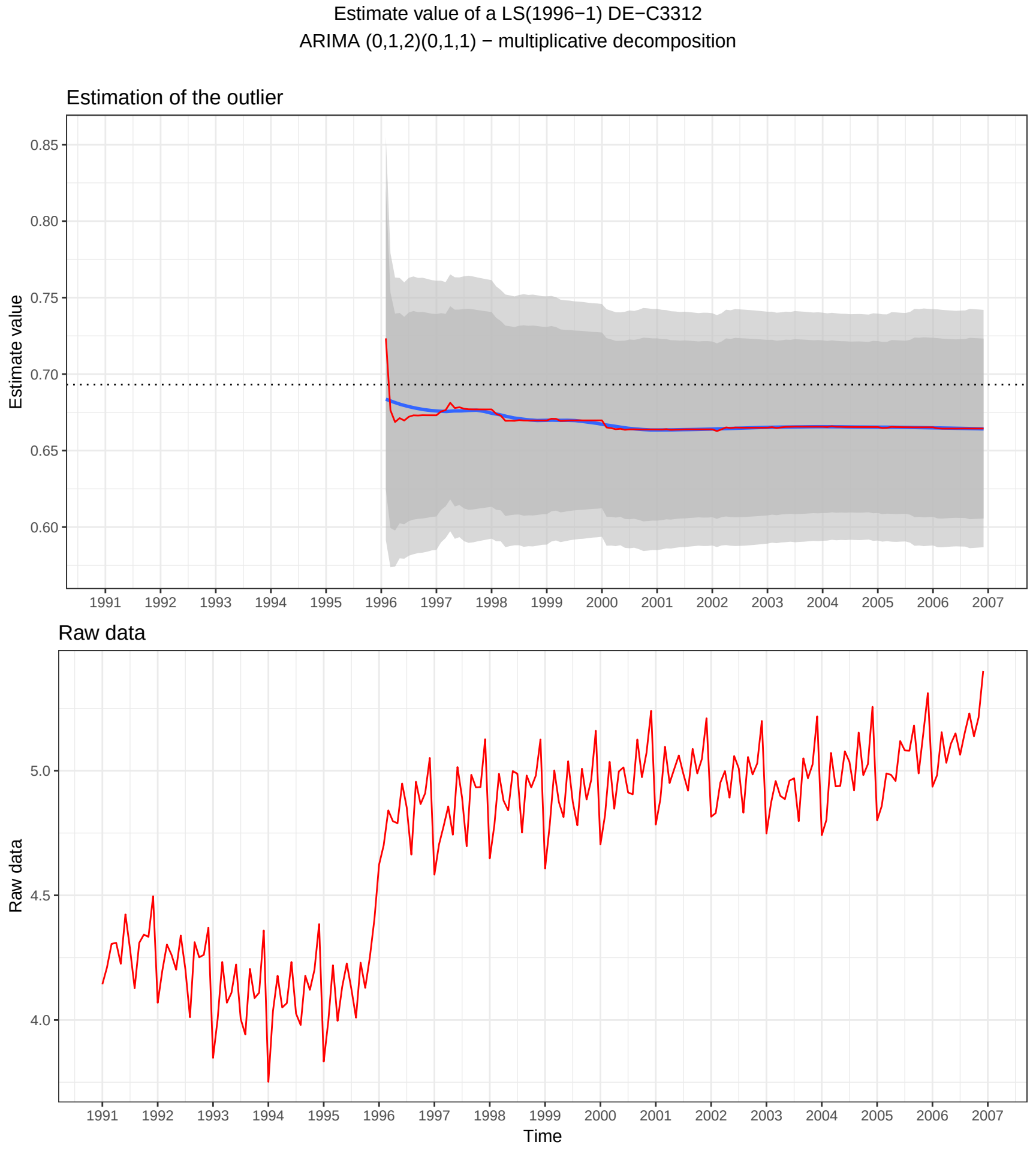


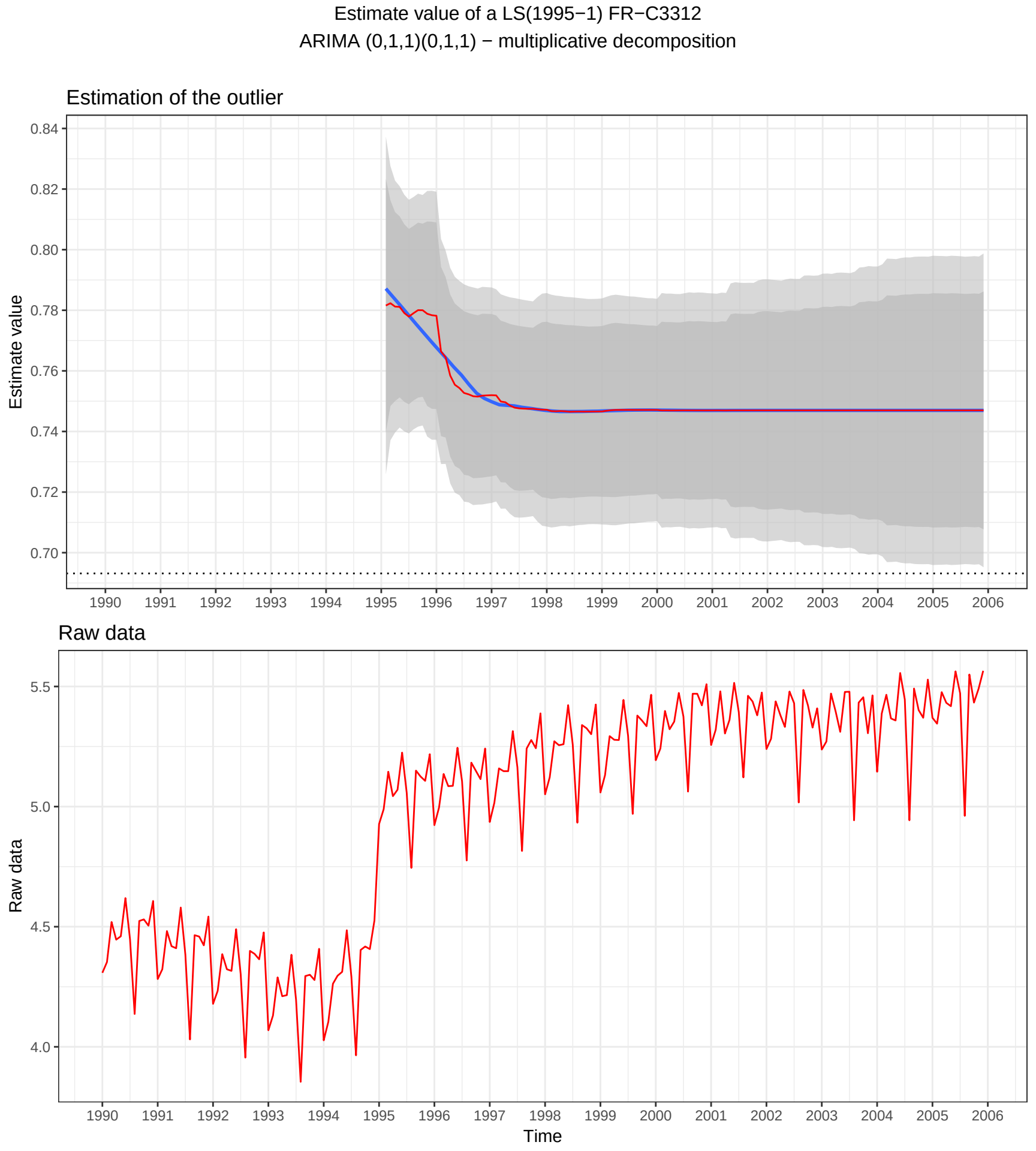

Estimate value of a LS(1996−1) DE−C3311
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
1.00
0.95
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
5.5
5.0
4.5
4.0
Time

Estimate value of a LS(1995−1) FR−C3311
ARIMA (1,1,1)(0,1,1) − multiplicative decomposition

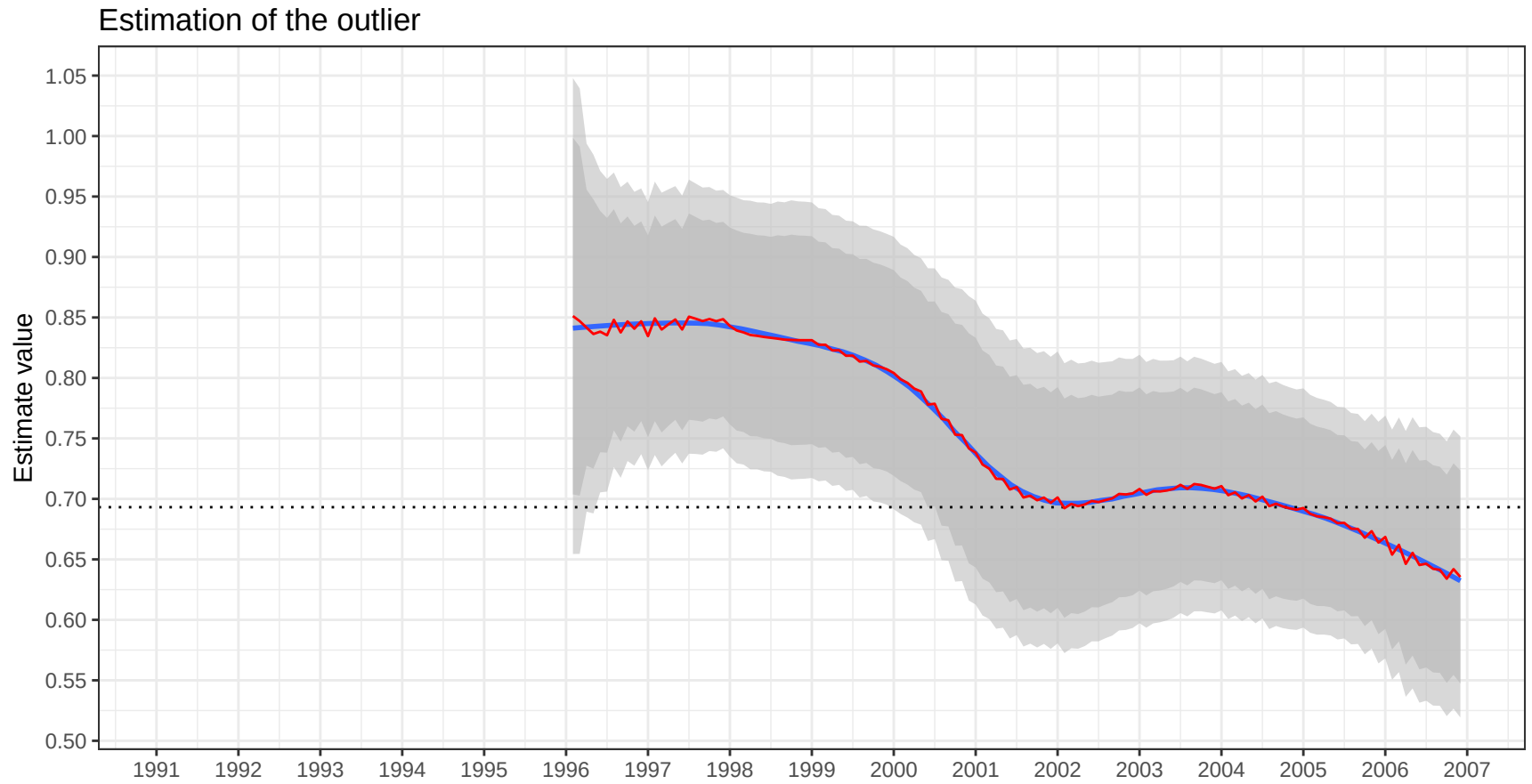


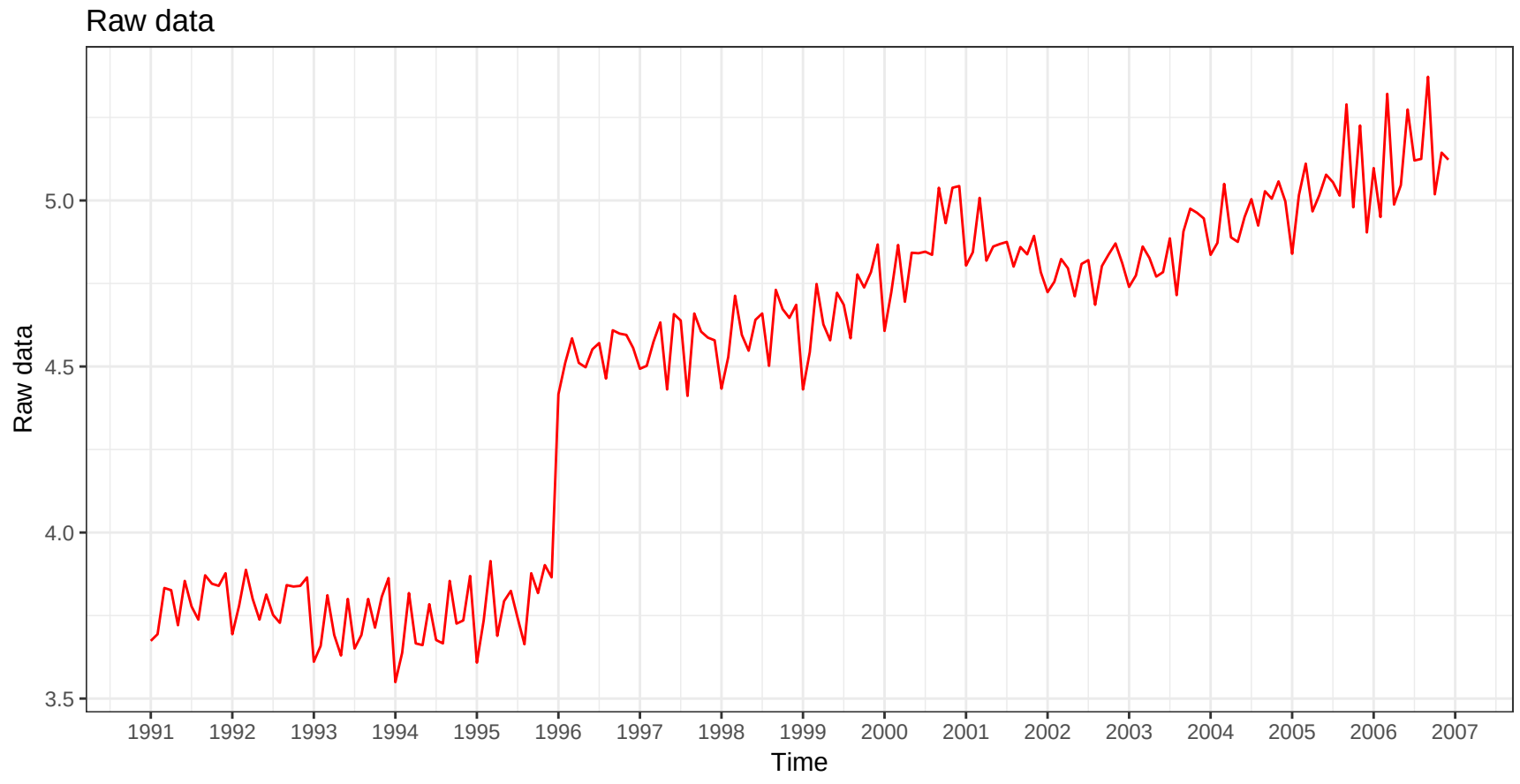



Estimate value of a LS(1996−1) DE−C3312
ARIMA (0,1,2)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.85
0.80
0.75
0.70
0.65
0.60
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Raw data
Raw data
5.0
4.5
4.0
Time


Estimate value of a LS(1995−1) FR−C3312
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.84
0.82
0.80
0.78
0.76
0.74
0.72
0.70
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
5.5
5.0
4.5
4.0
Time

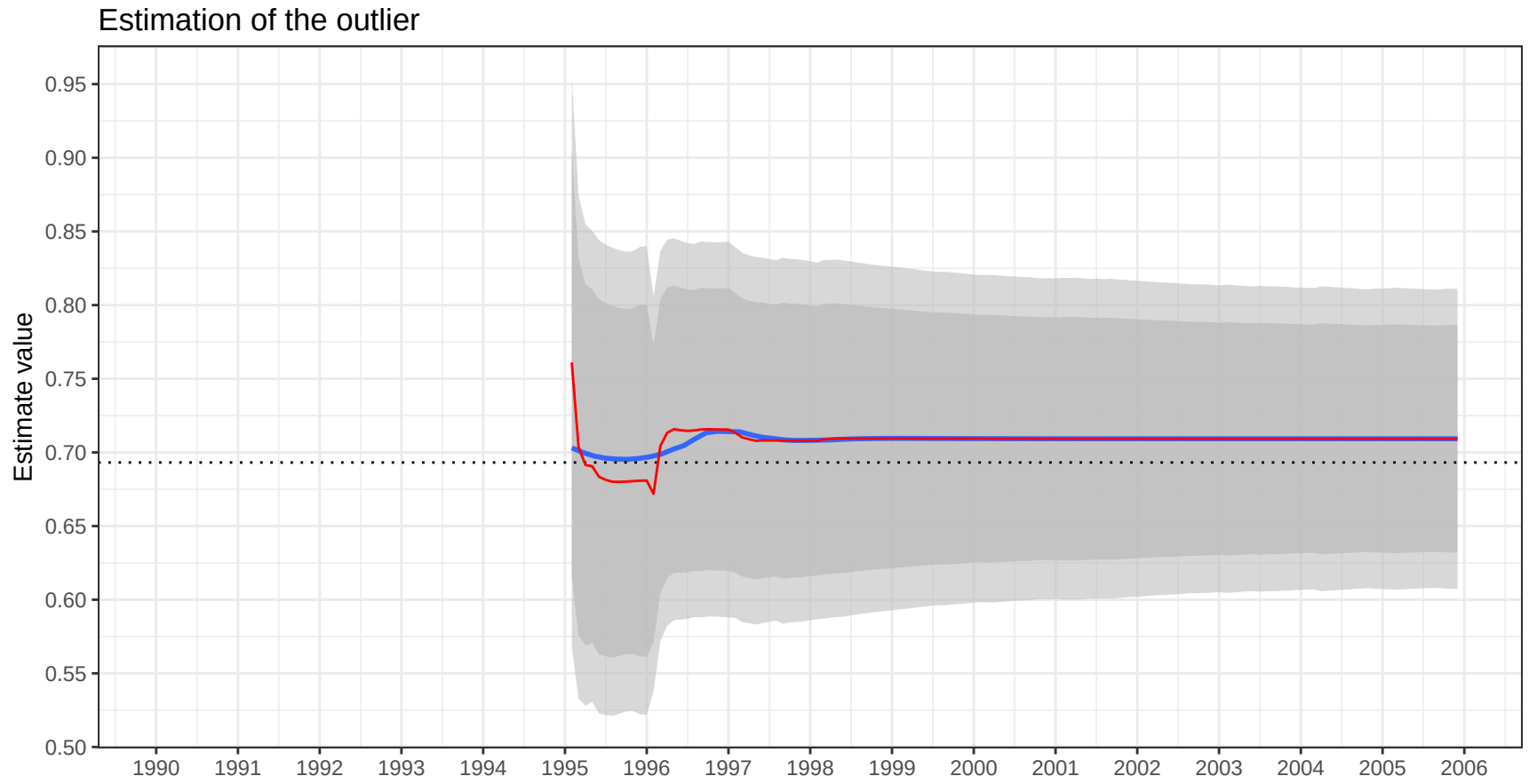
Estimate value of a LS(1996−1) DE−C3313
ARIMA (0,1,2)(1,1,1) − multiplicative decomposition

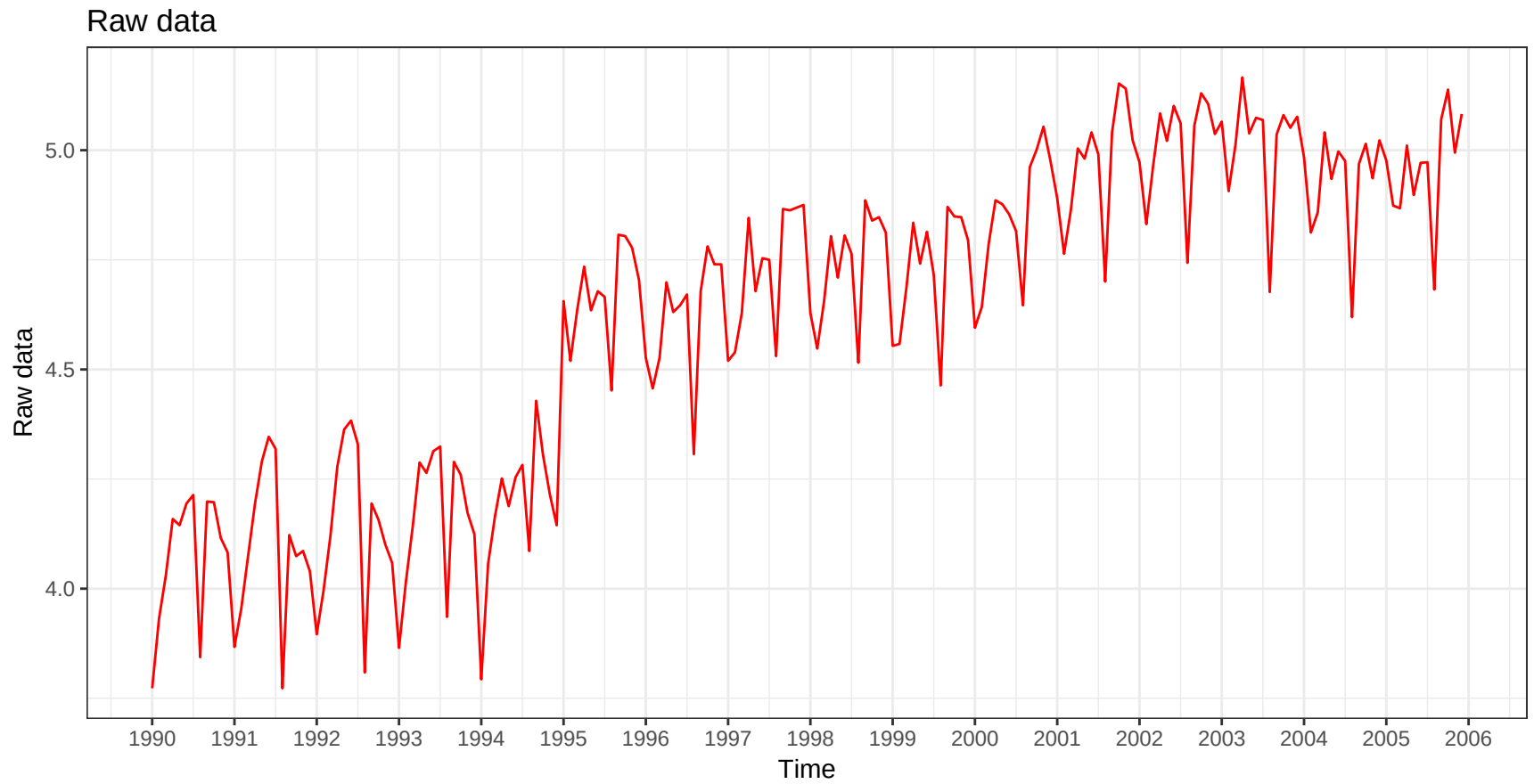




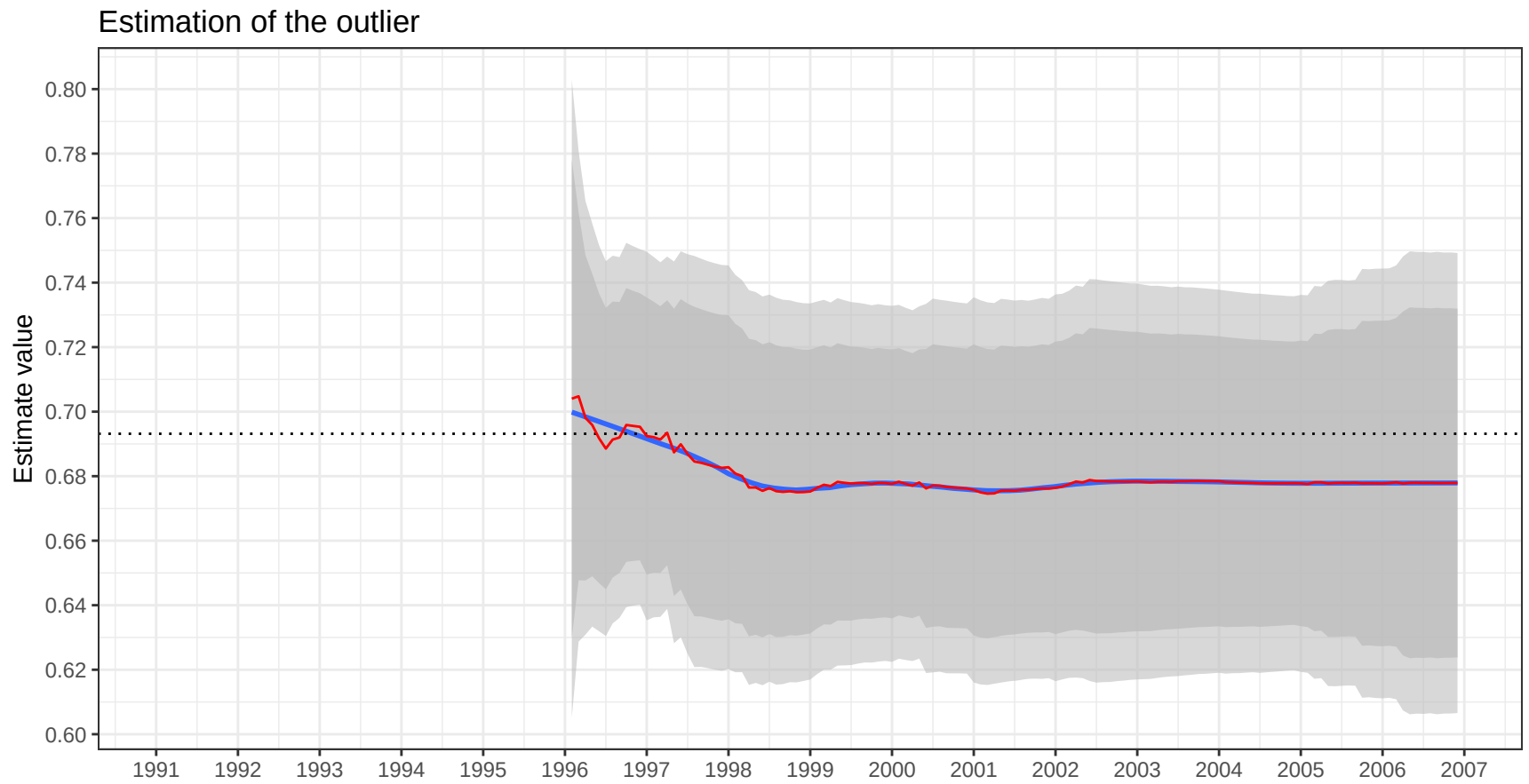
Estimate value of a LS(1995−1) FR−C3313

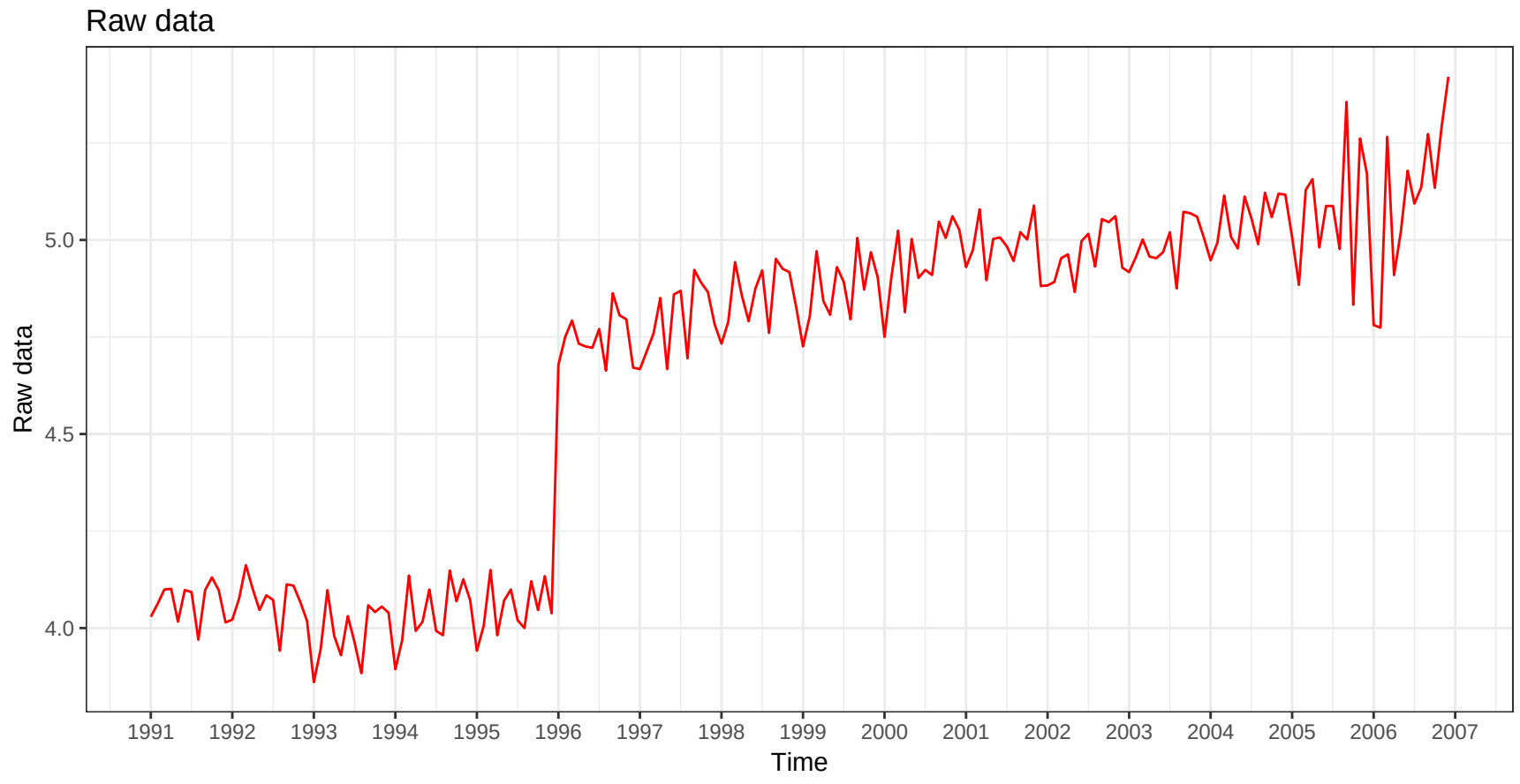
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition





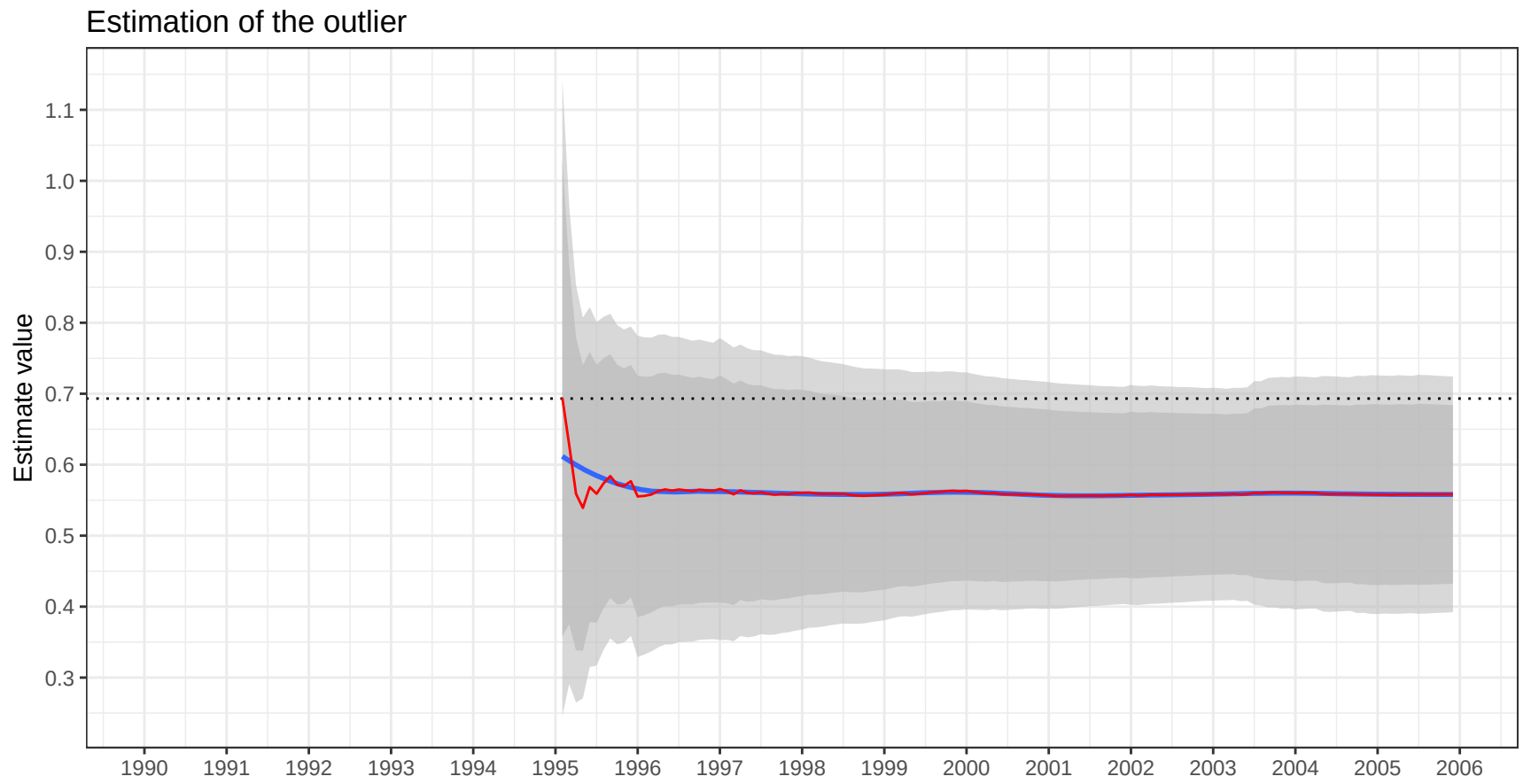
Estimate value of a LS(1996−1) DE−C3314
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

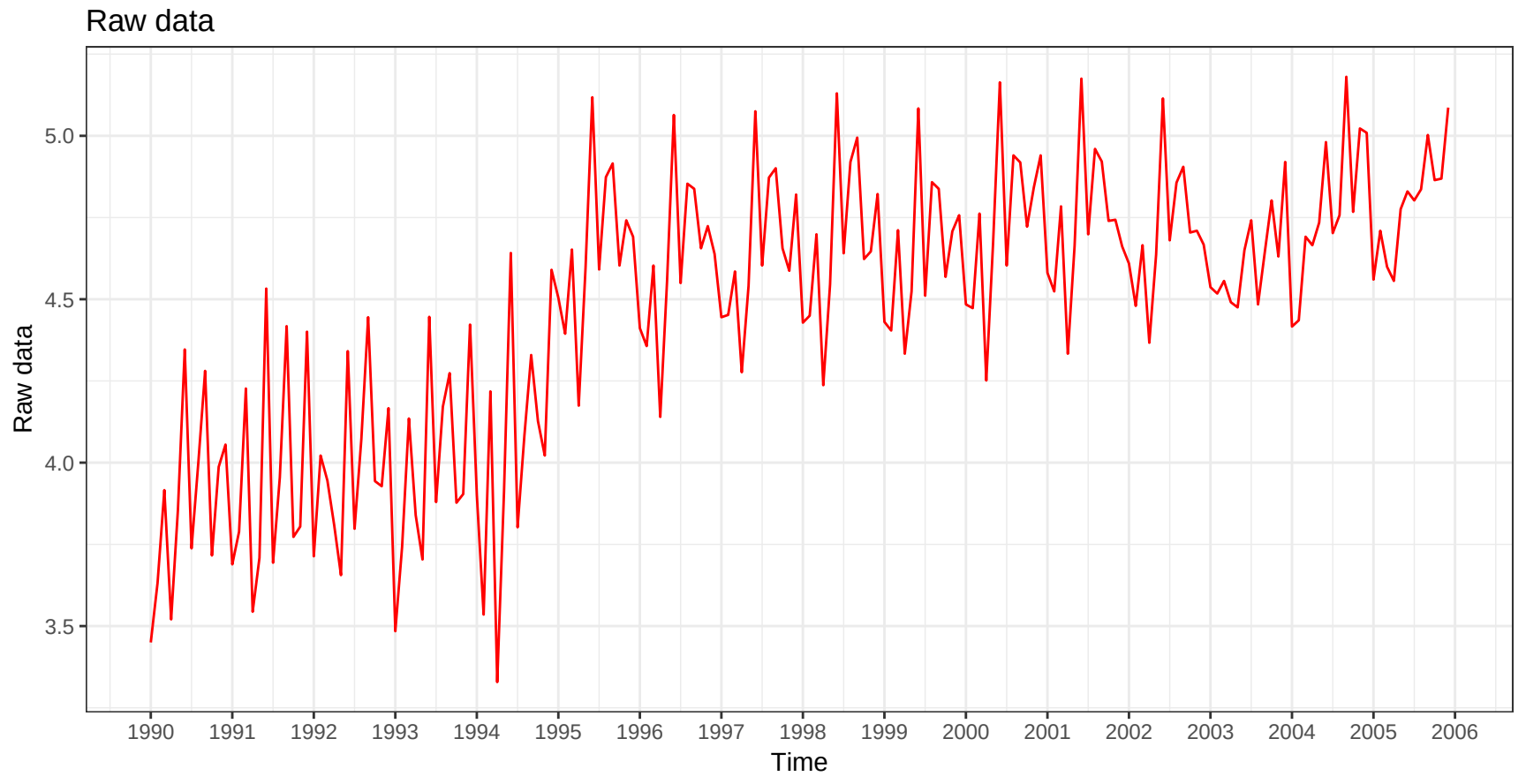


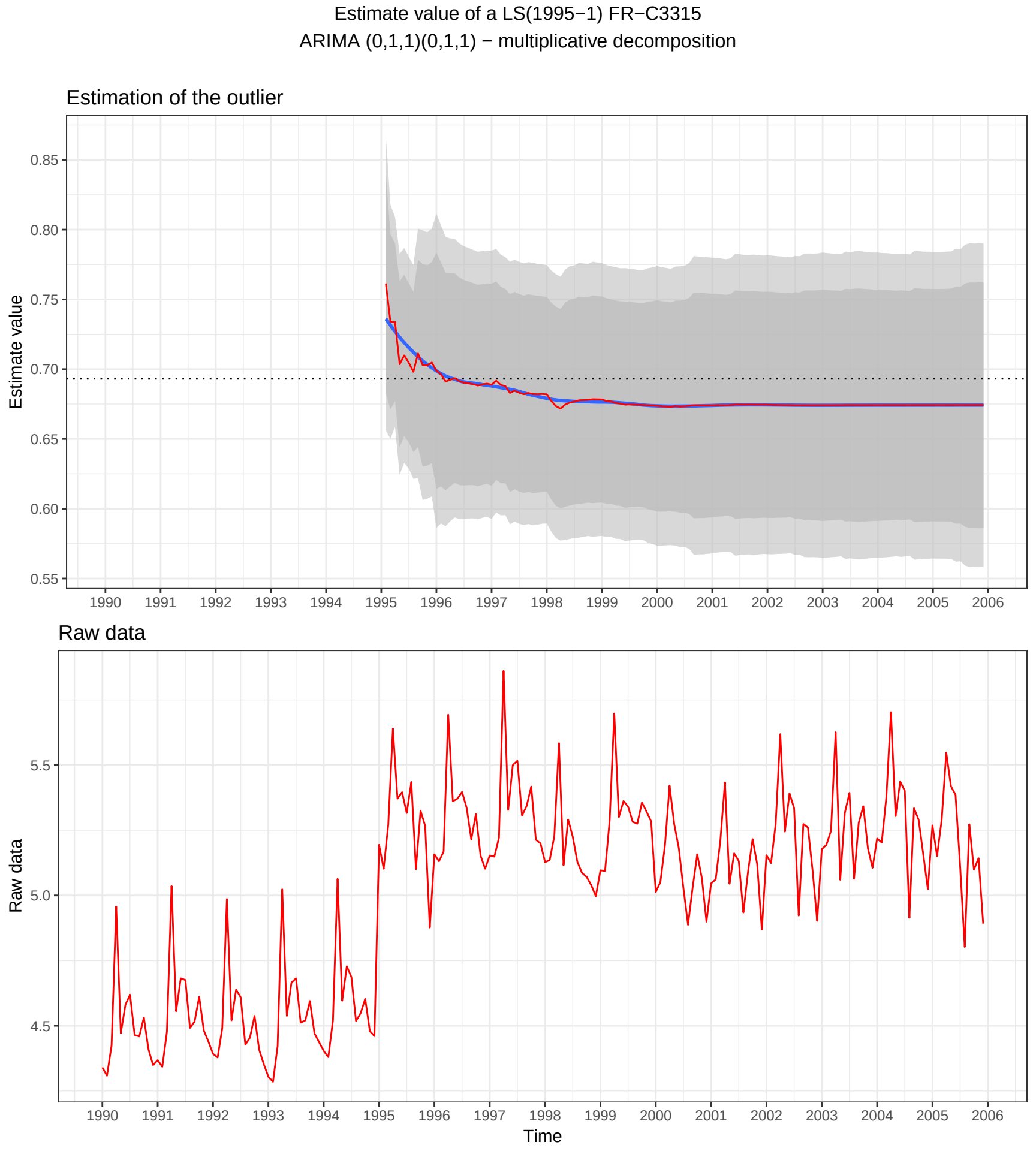


Estimate value of a LS(1995−1) FR−C3314

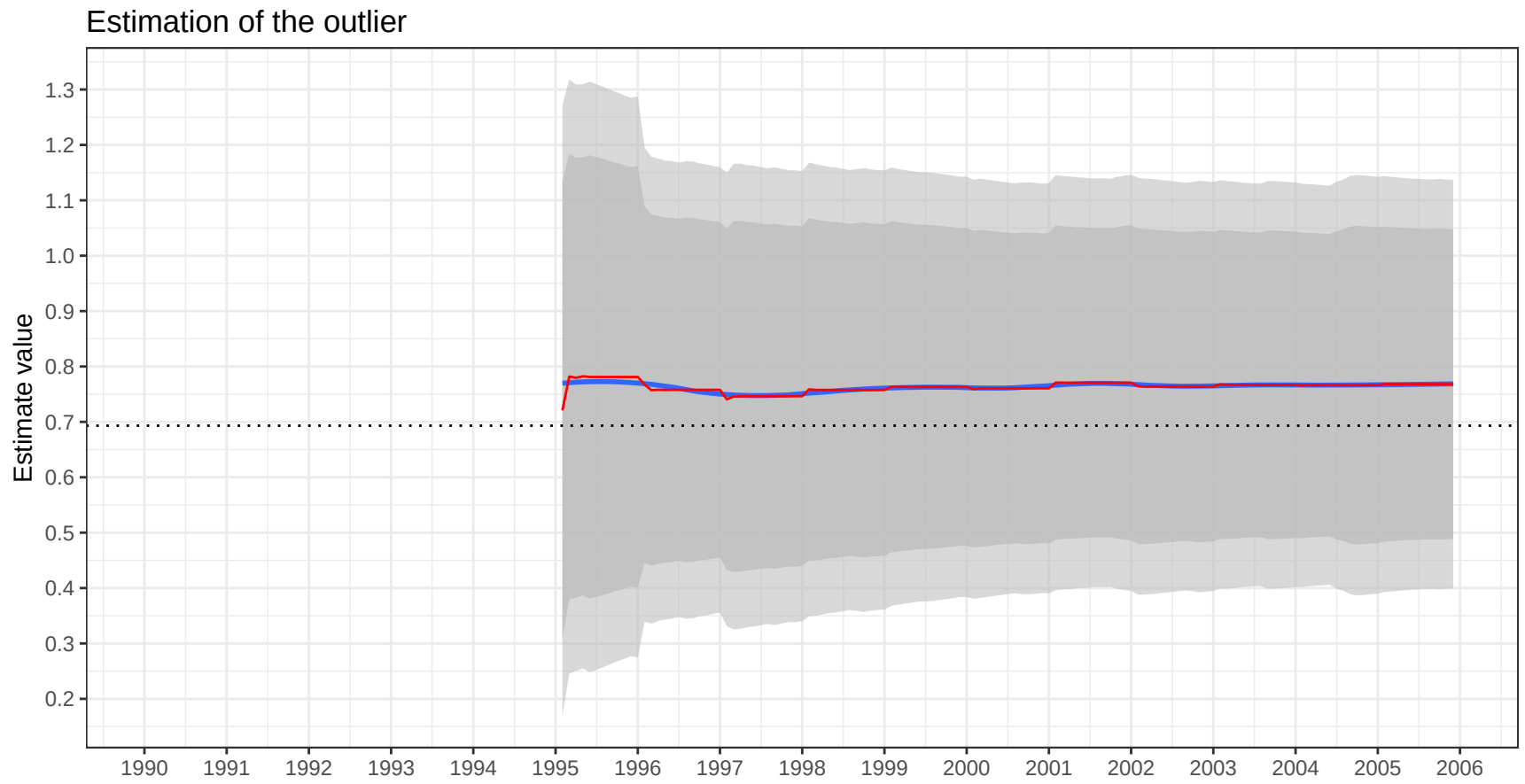
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition

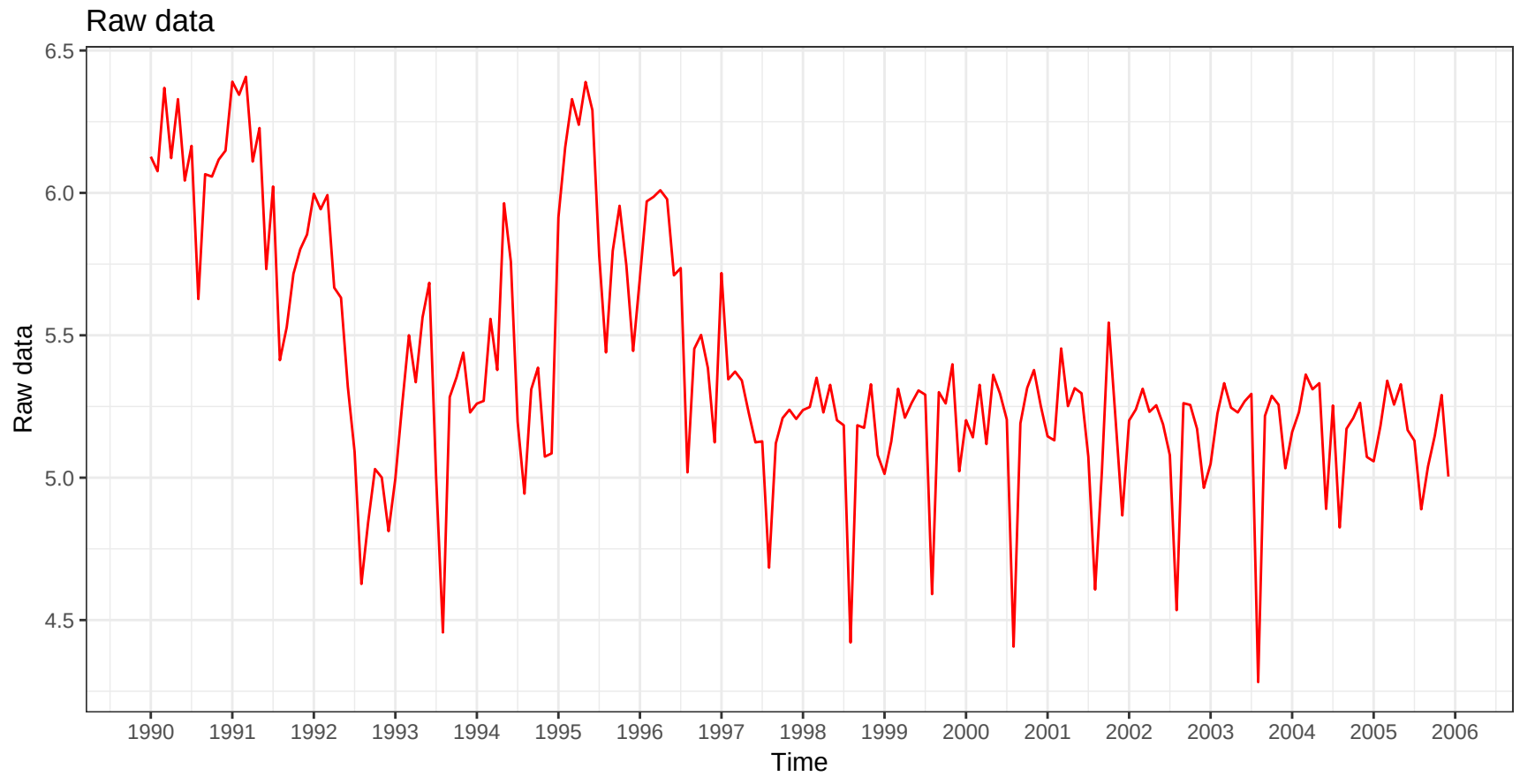


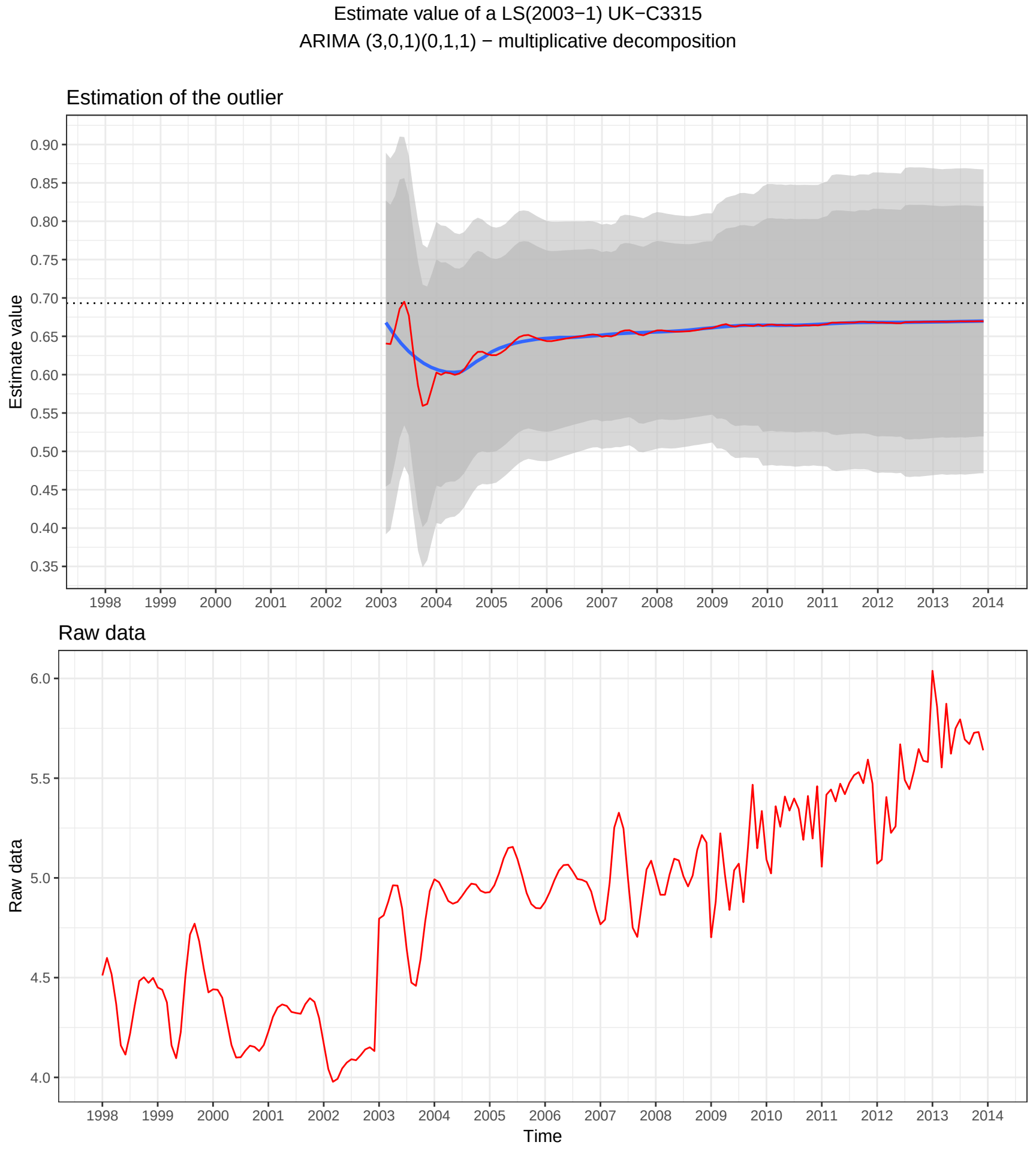



Estimate value of a LS(1995−1) FR−C3315
ARIMA (0,1,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.85
0.80
0.75
0.70
0.65
0.60
0.55
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Raw data
Raw data
5.5
5.0
4.5
Time

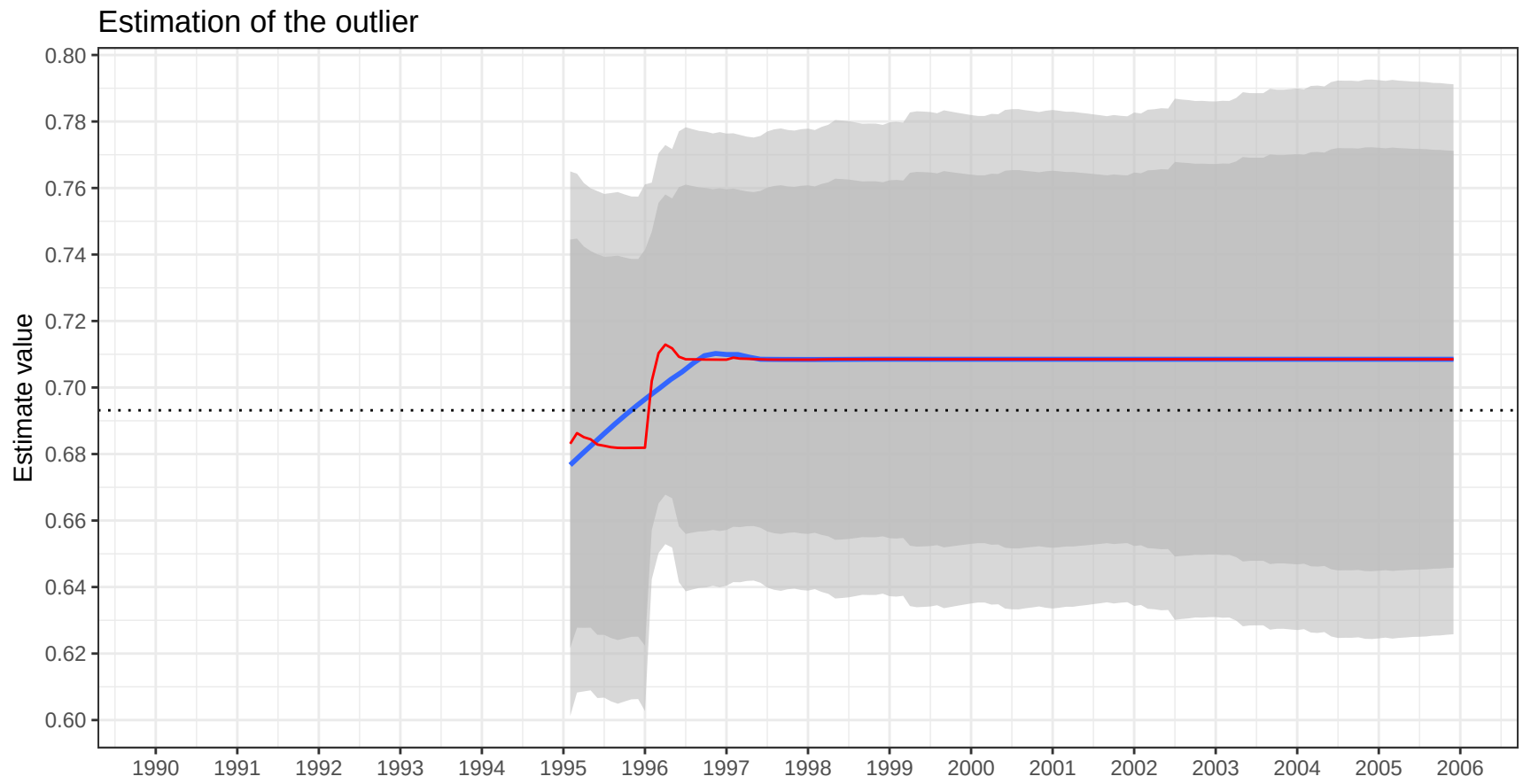
Estimate value of a LS(1995−1) IT−C3315
ARIMA (0,1,1)(1,1,1) − multiplicative decomposition

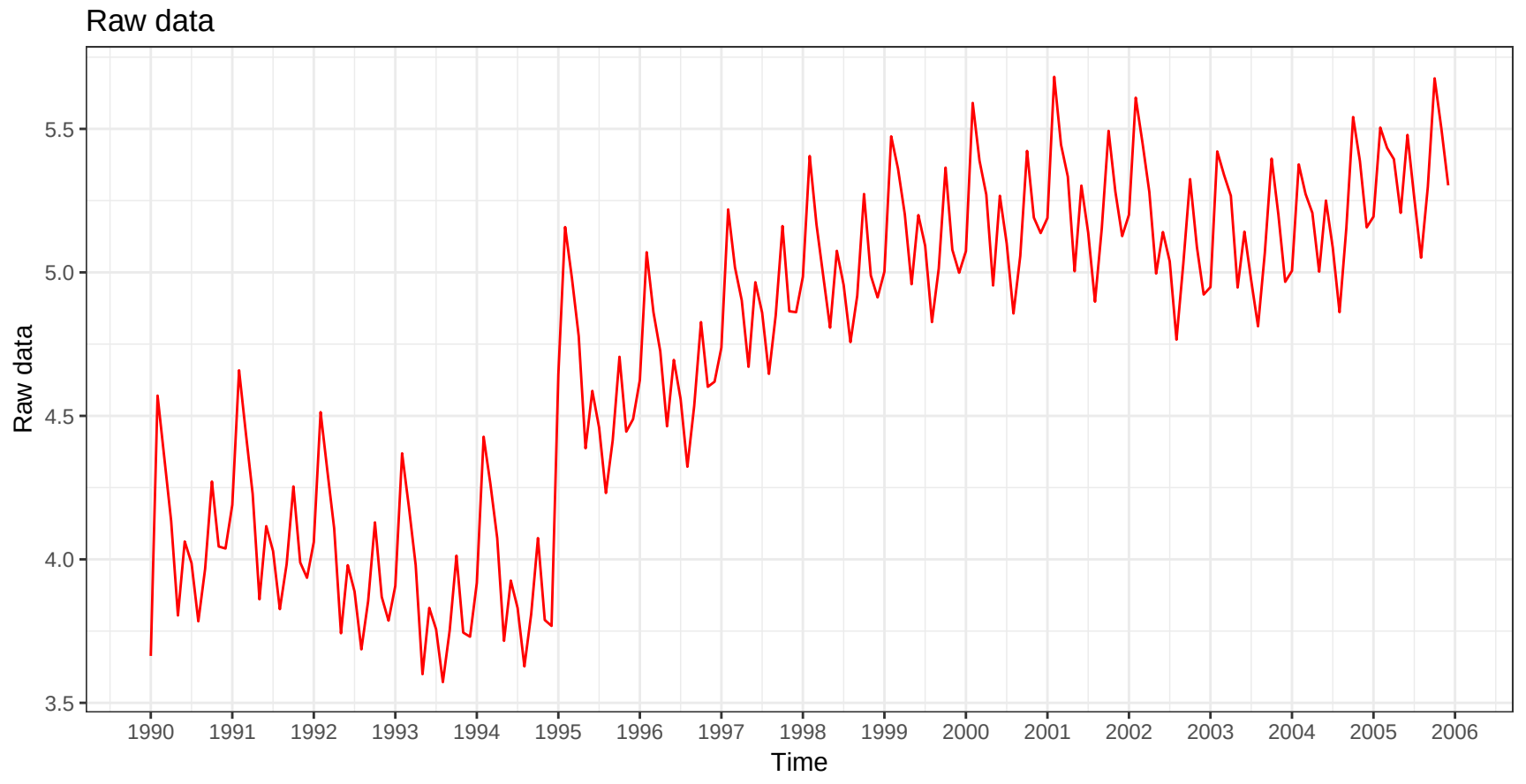


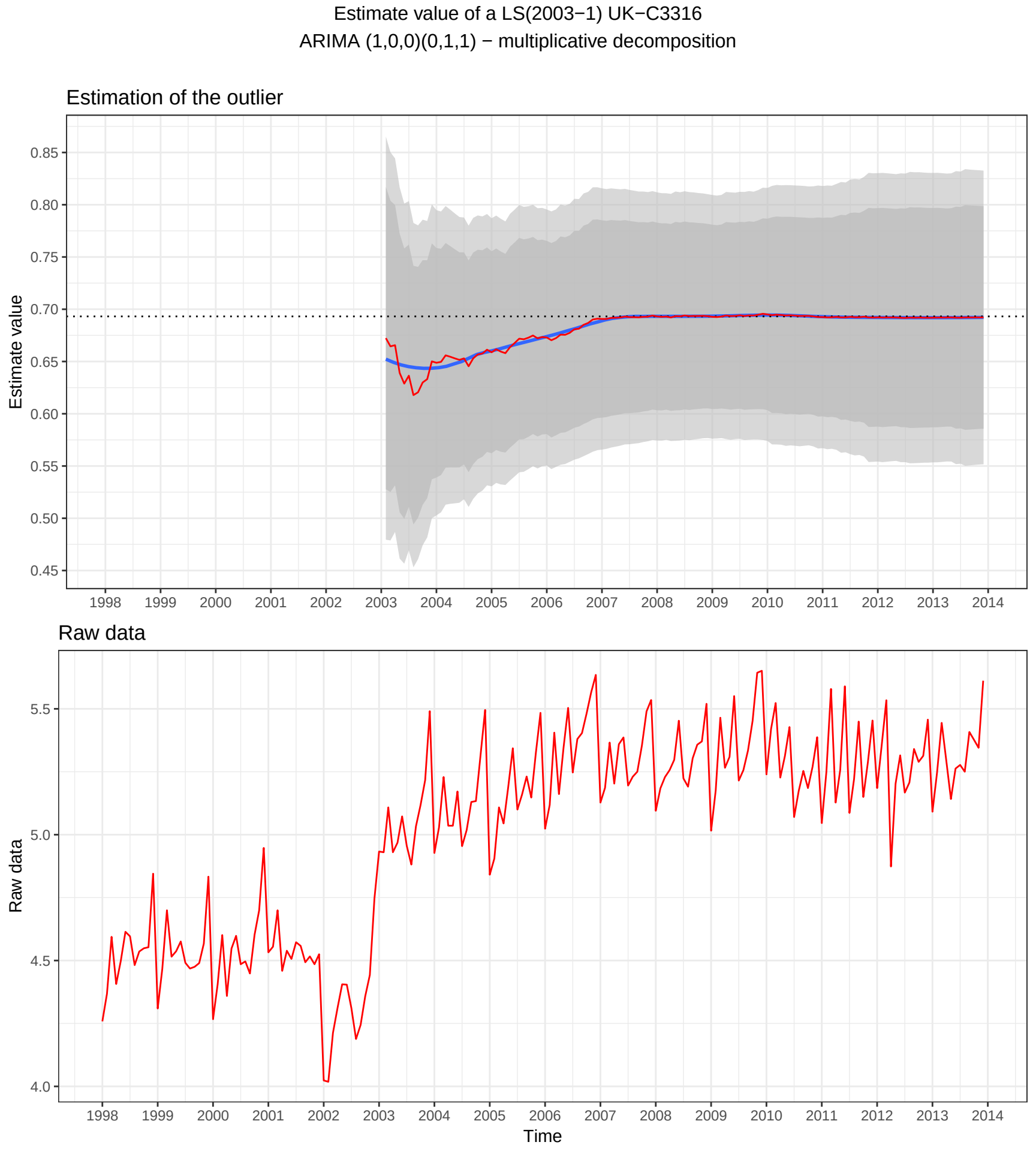



Estimate value of a LS(2003−1) UK−C3315
ARIMA (3,0,1)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
0.45
0.40
0.35
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Raw data
Raw data
6.0
5.5
5.0
4.5
4.0
Time

Estimate value of a LS(1995−1) FR−C3316
ARIMA (1,1,1)(0,1,1) − multiplicative decomposition






Estimate value of a LS(2003−1) UK−C3316
ARIMA (1,0,0)(0,1,1) − multiplicative decomposition
Estimation of the outlier
Estimate value
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
0.45
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Raw data
Raw data
5.5
5.0
4.5
4.0
Time