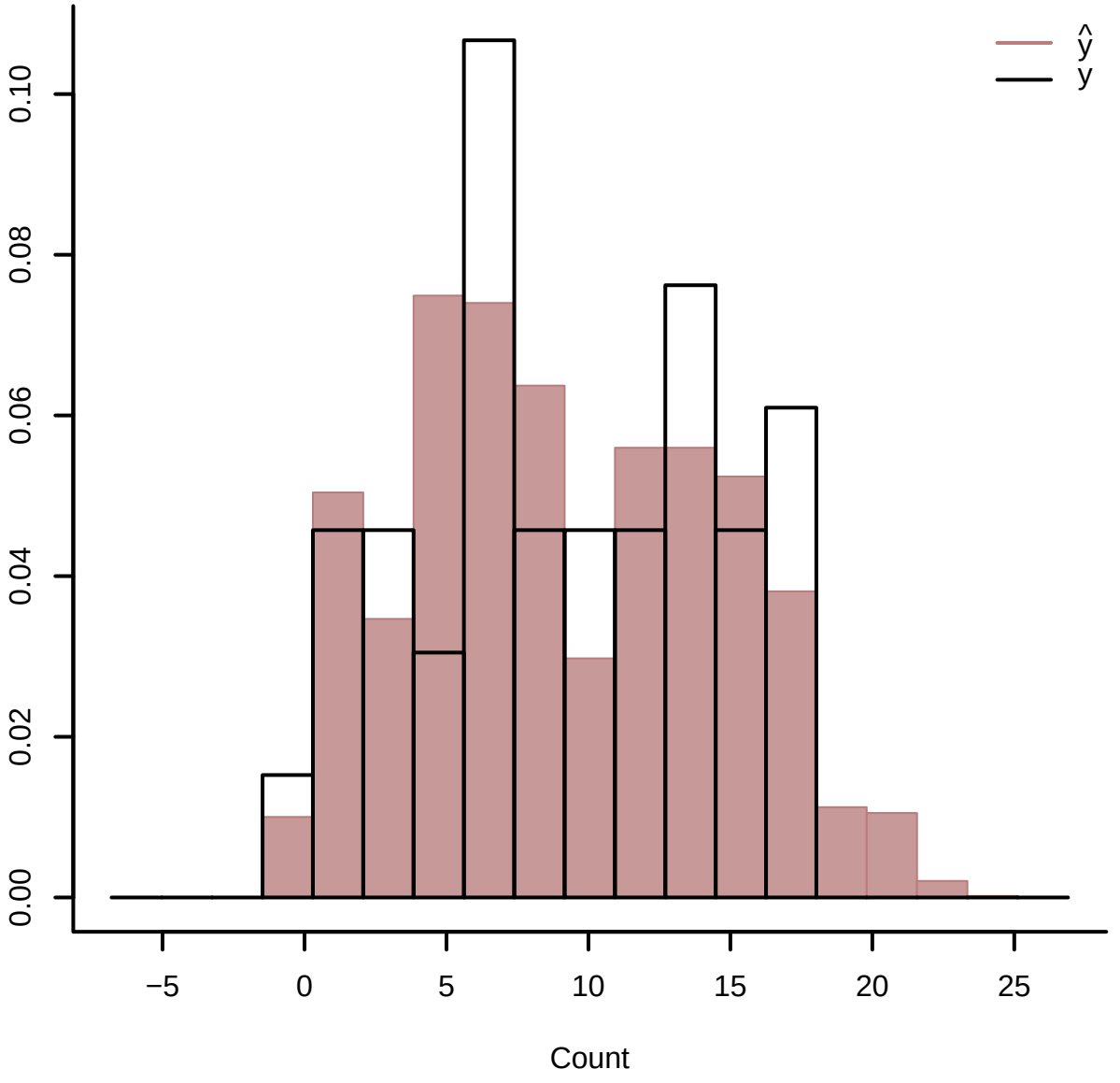
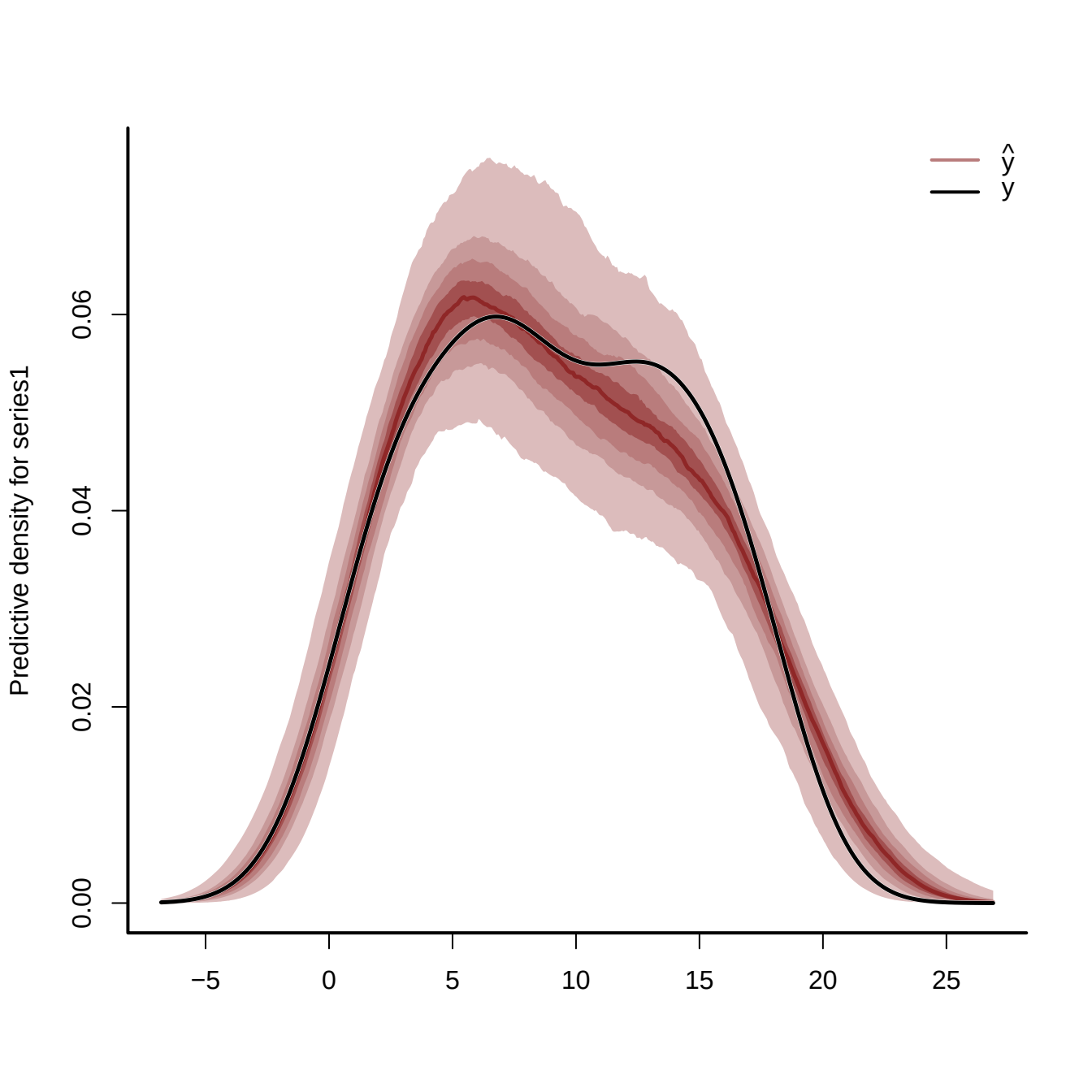
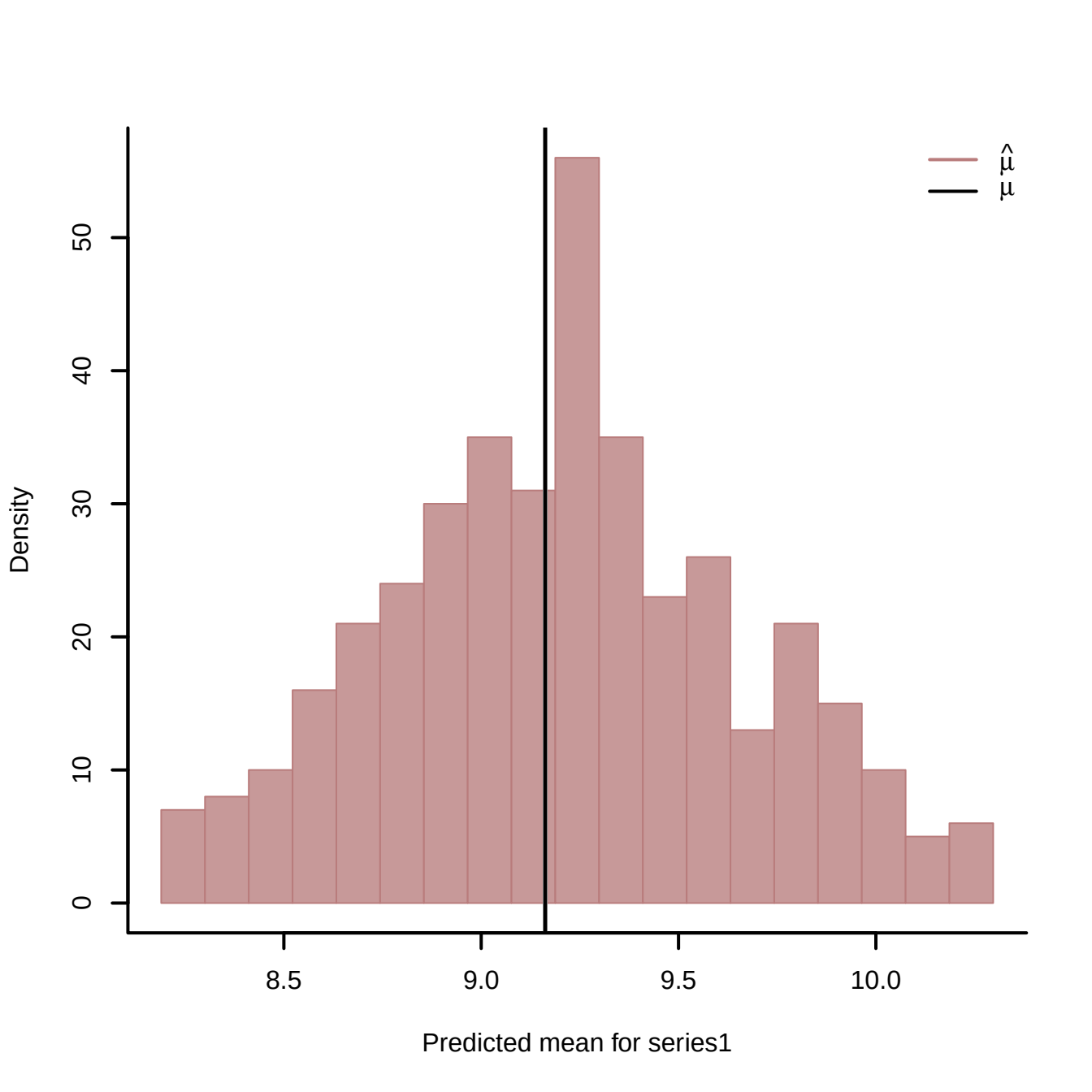
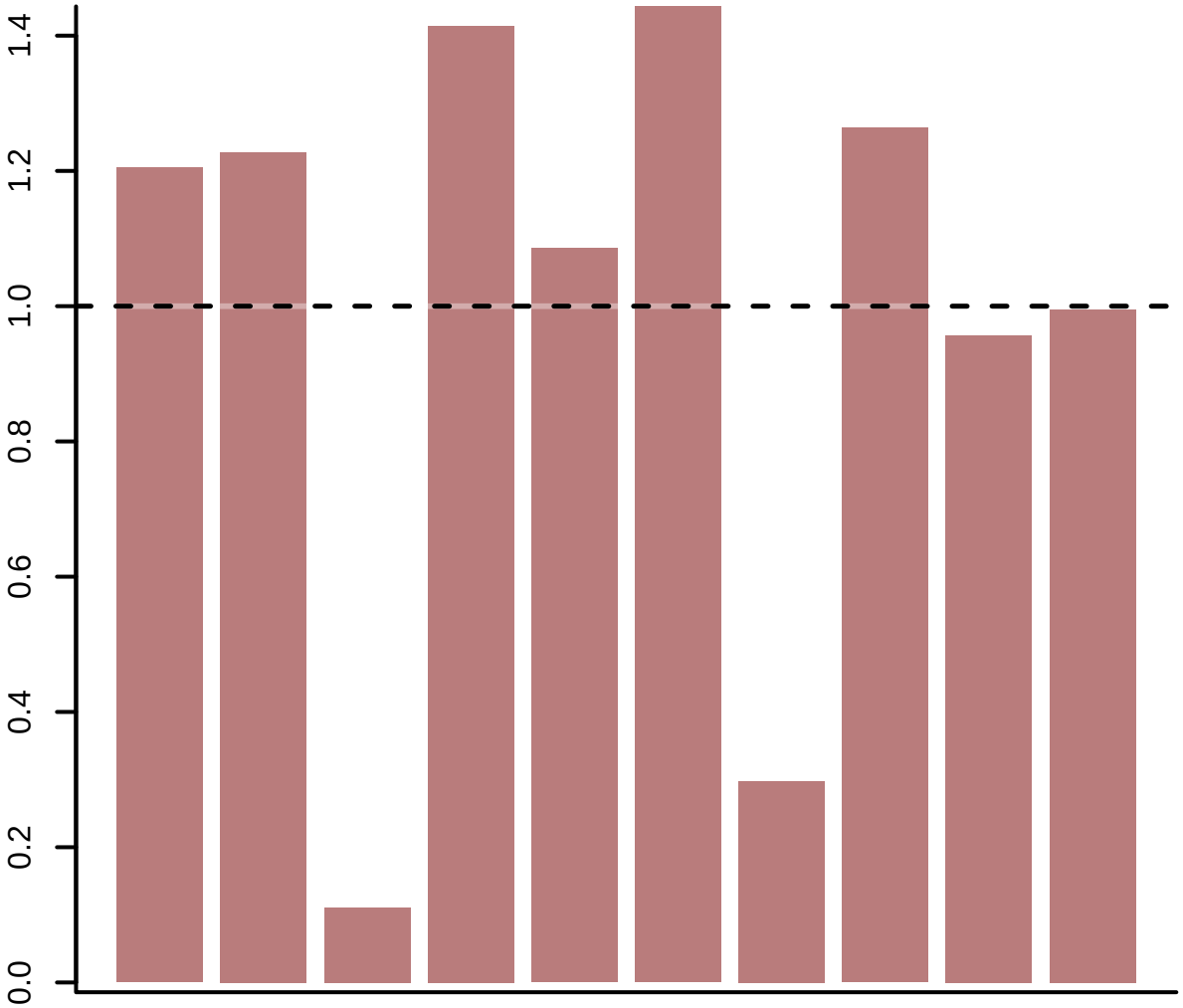
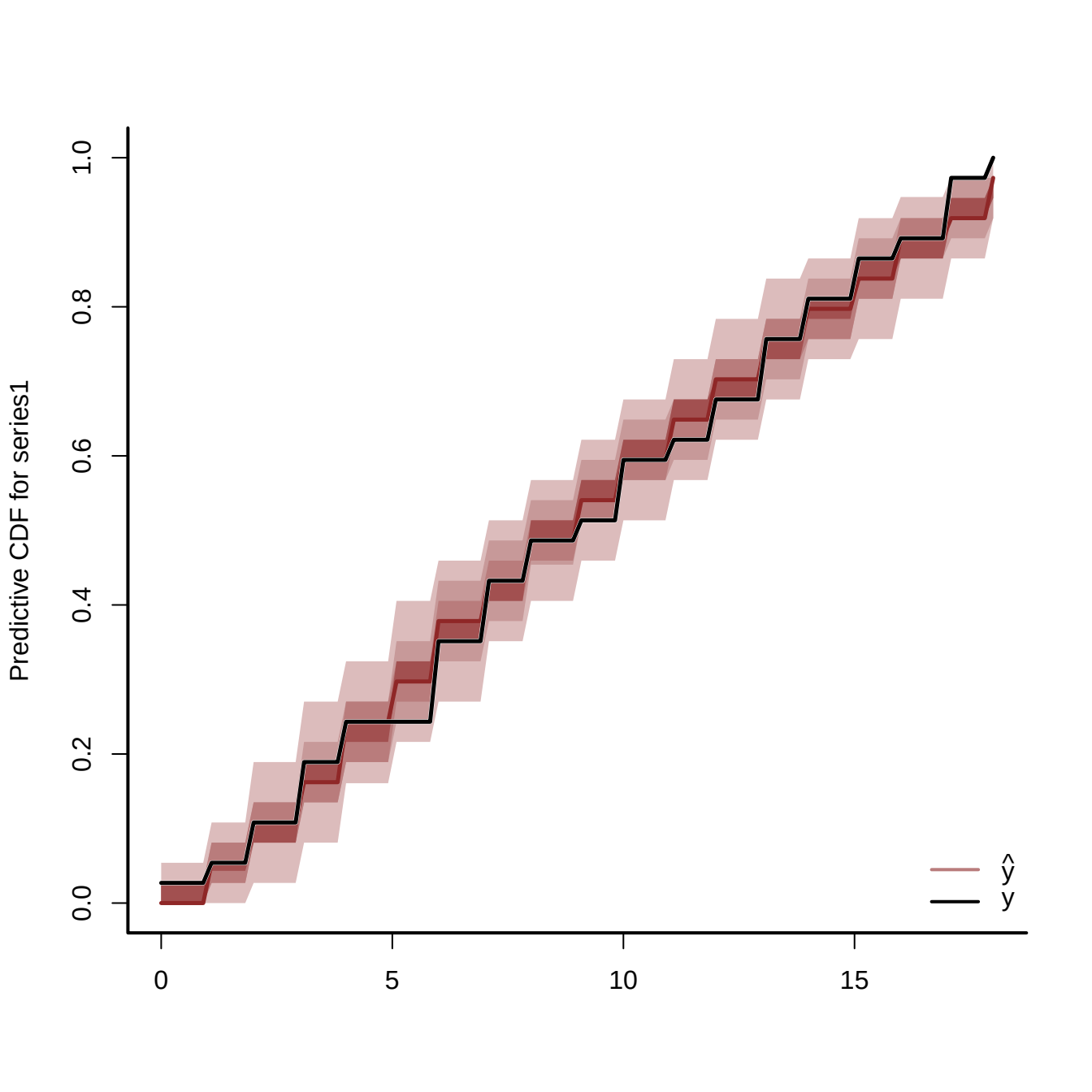
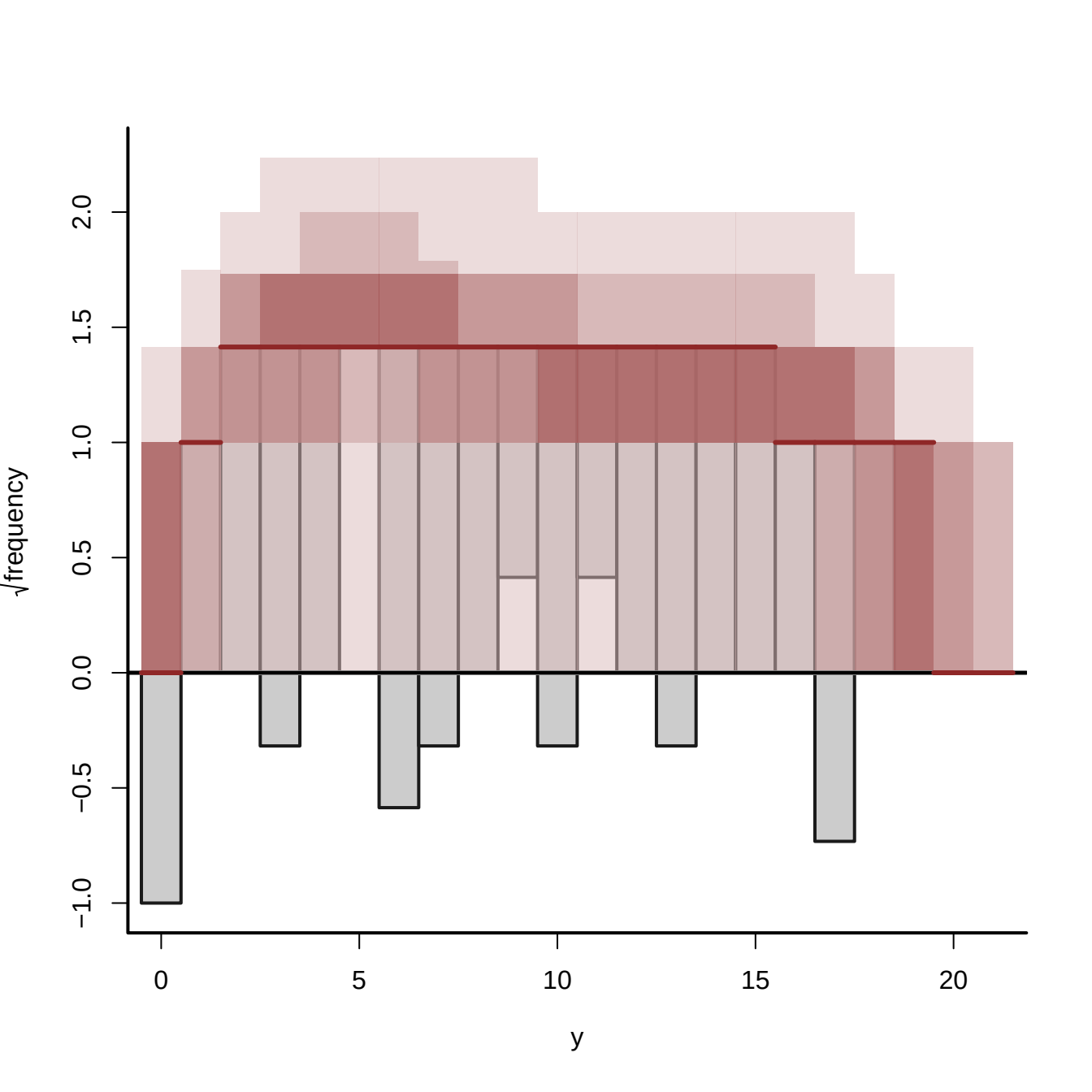

ŷ
y
0.00
0.02
0.04
0.06
0.08
0.10
−5
0
5
10
15
20
25
Count

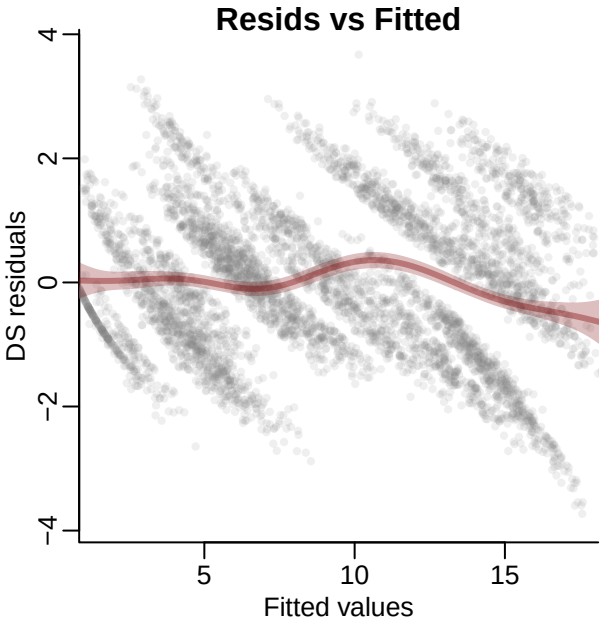

ŷ
y
Predictive density for series1
0.00
0.02
0.04
0.06
−5
0
5
10
15
20
25

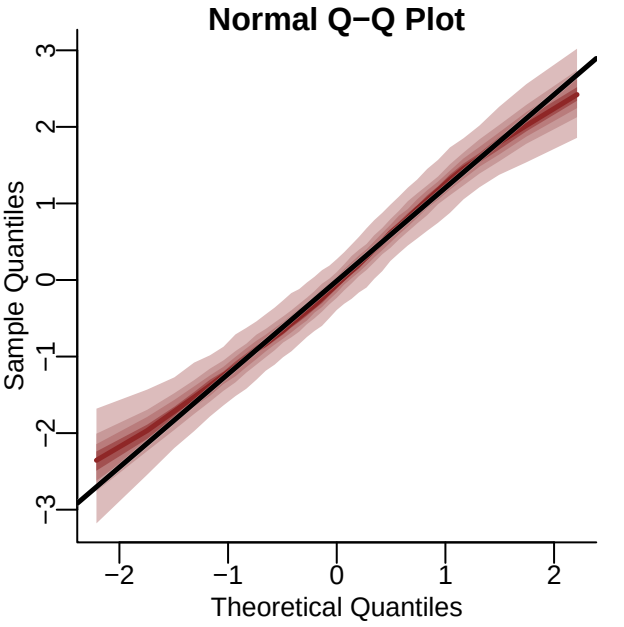

μ̂
μ
Density
0
10
20
30
40
50
8.5
9.0
9.5
10.0
Predicted mean for series1

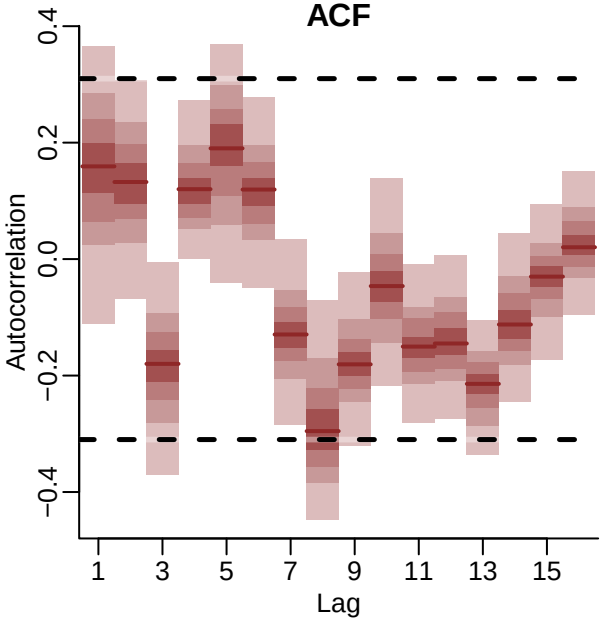

0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Predictive PIT for series1

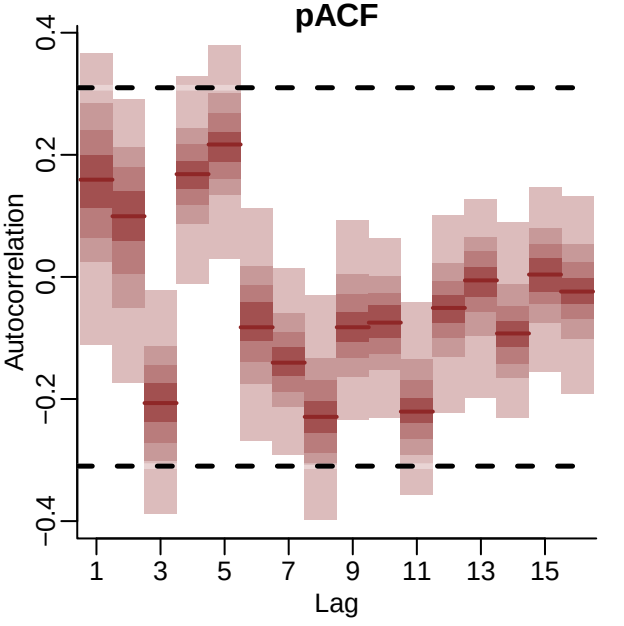

Predictive CDF for series1
0.0
0.2
0.4
0.6
0.8
1.0
0
5
10
15
ŷ
y

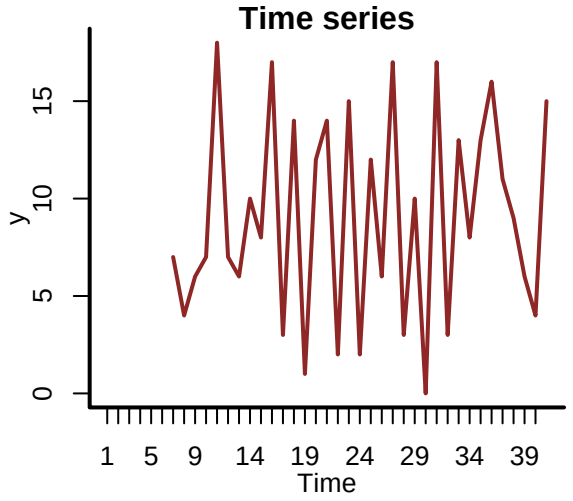

√frequency
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
0
5
10
15
20
y

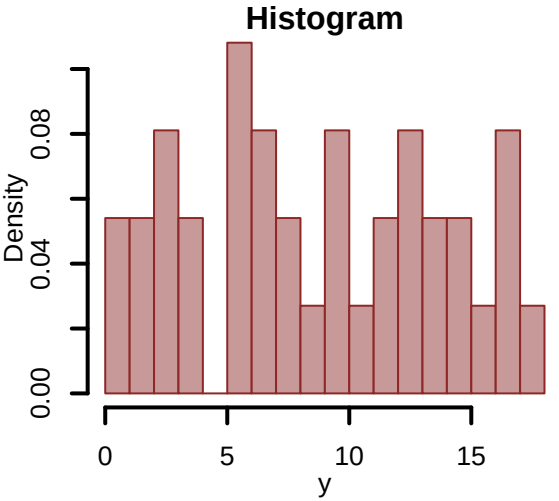

Resids vs Fitted
DS residuals
Fitted values
4
2
0
−2
−4
5
10
15

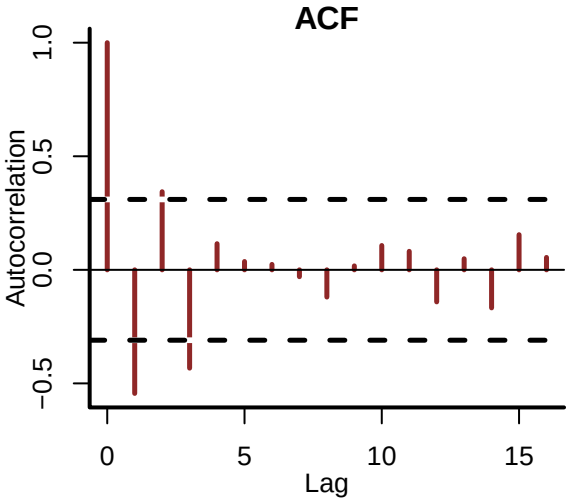

Normal Q−Q Plot
Sample Quantiles
Theoretical Quantiles
3
2
1
0
−1
−2
−3
−2
−1
0
1
2

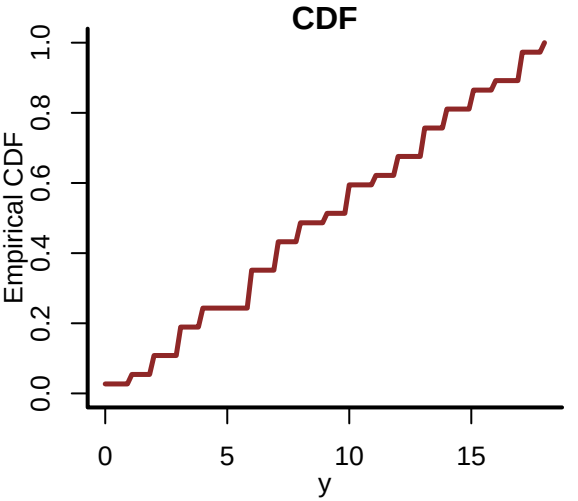

ACF
Autocorrelation
Lag
0.4
0.2
0.0
−0.2
−0.4
1
3
5
7
9
11
13
15

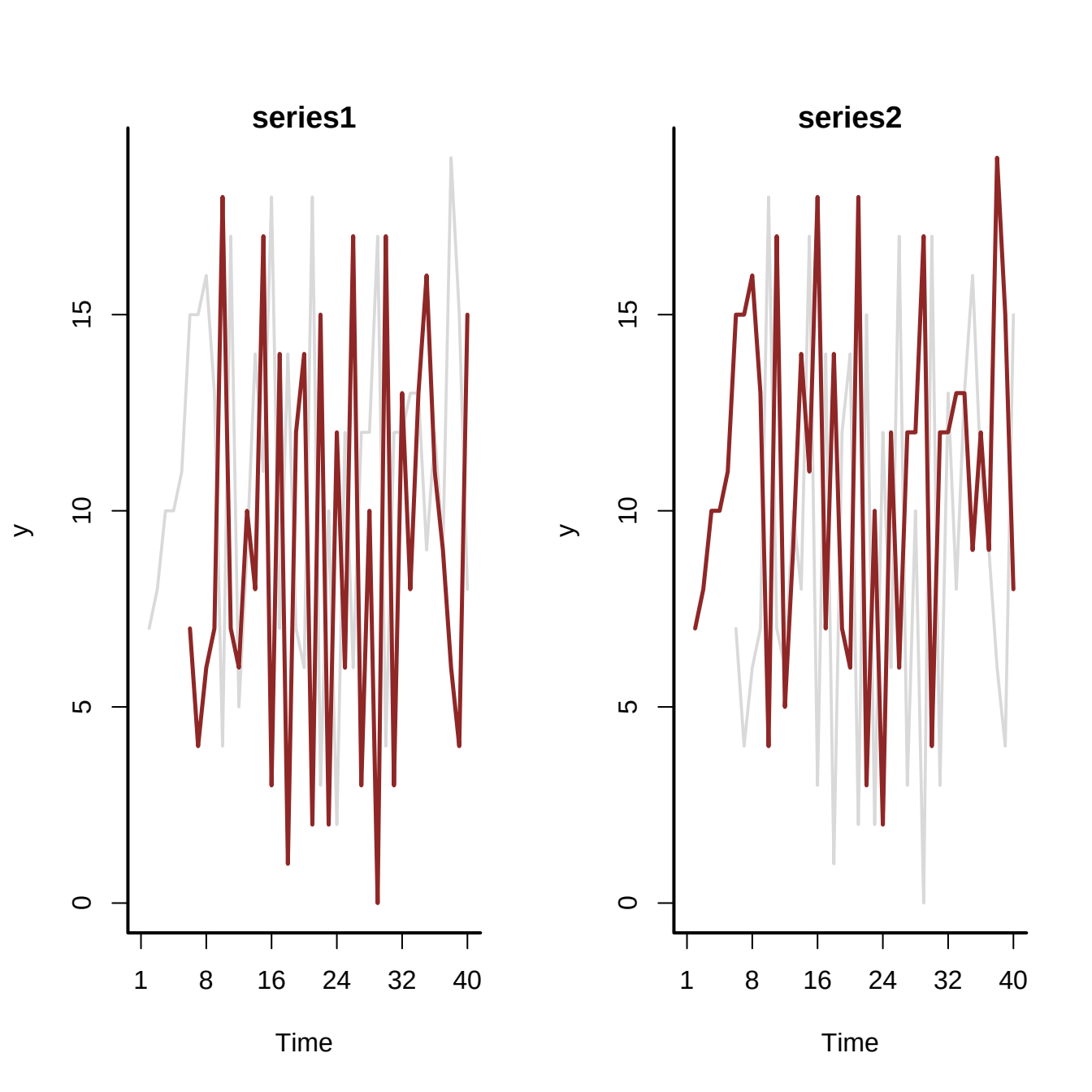

pACF
Autocorrelation
Lag
0.4
0.2
0.0
−0.2
−0.4
1
3
5
7
9
11
13
15

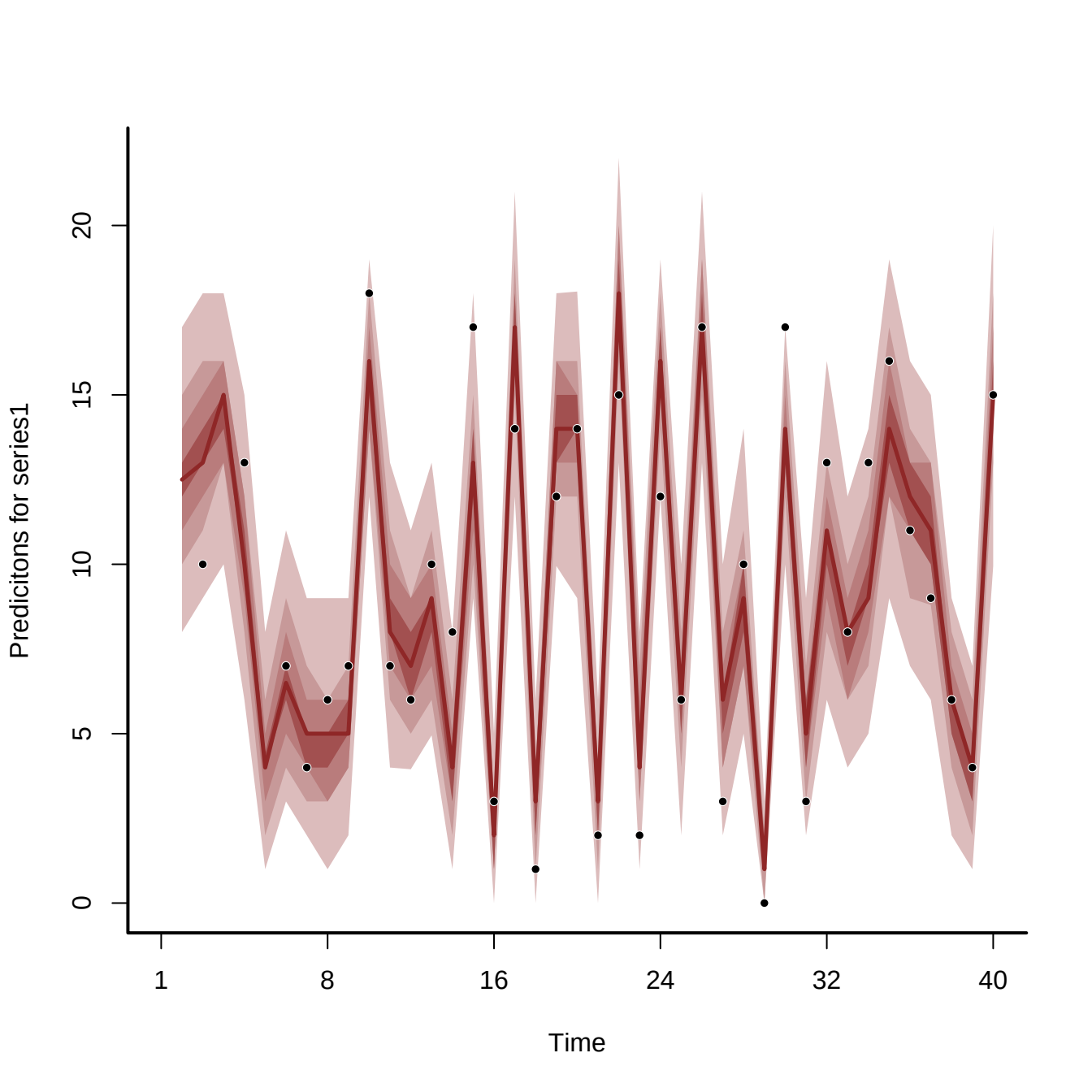

Time series
y
0
5
10
15
1
5
9
14
19
24
29
34
39
Time

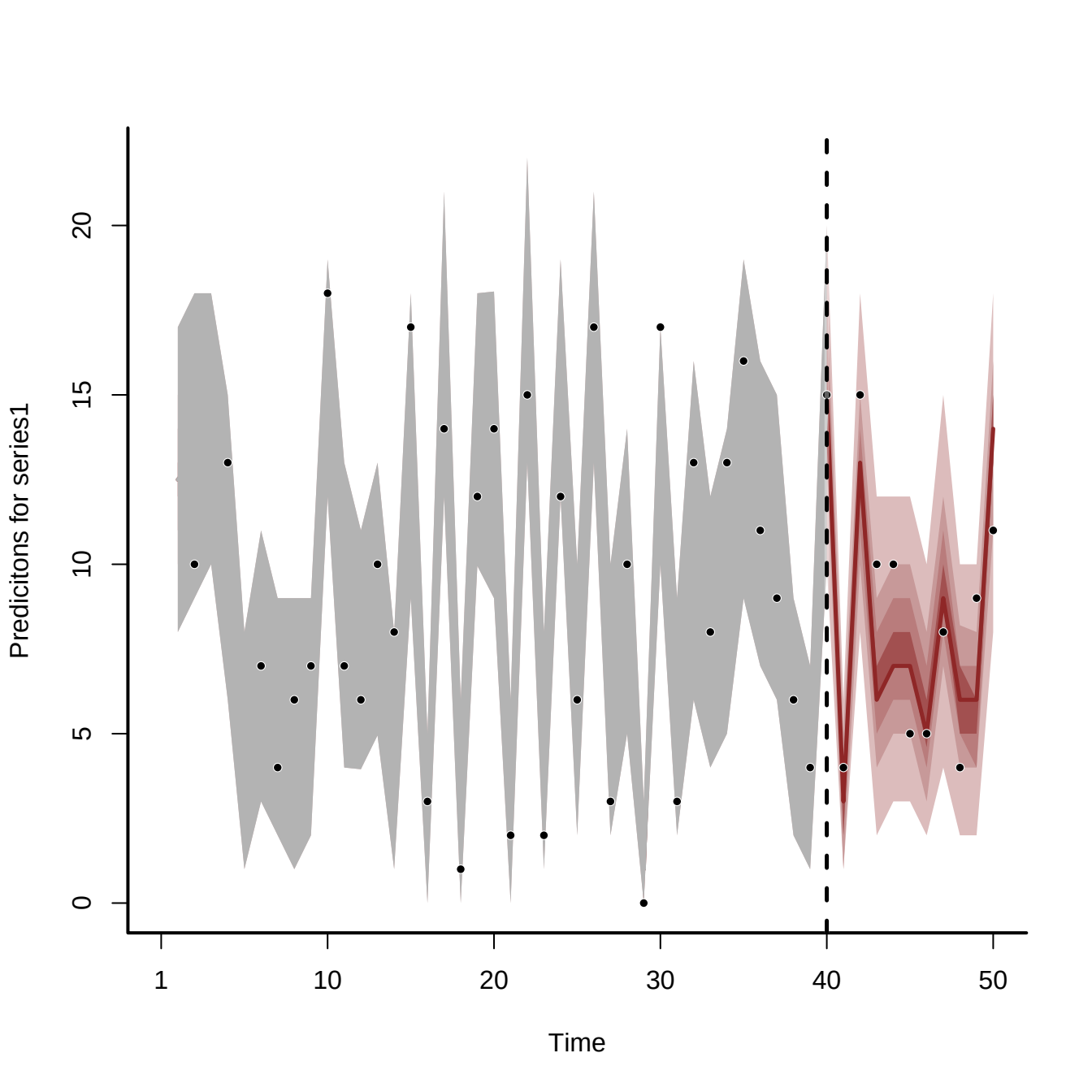

Histogram
Density
0.00
0.04
0.08
0
5
10
15
y

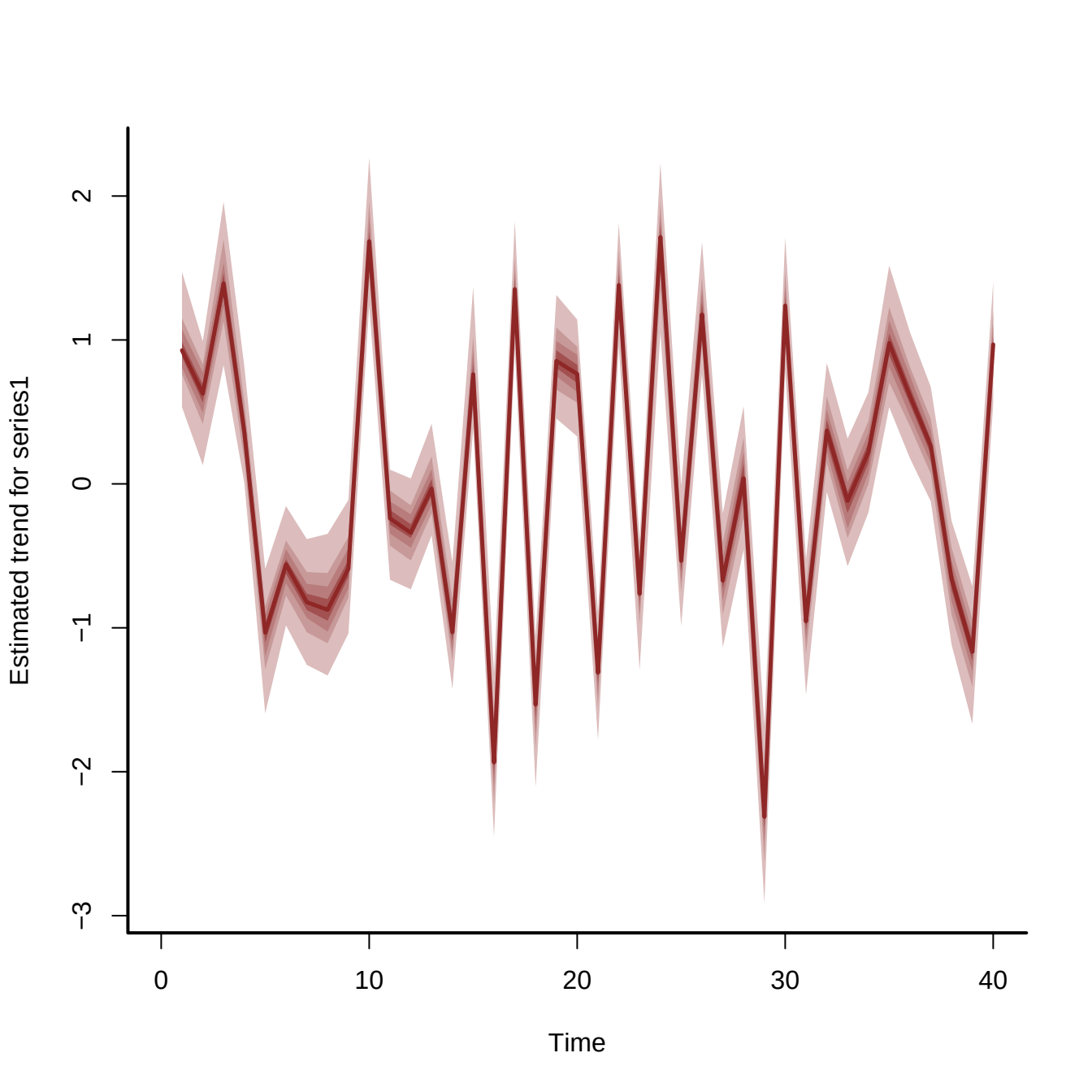

ACF
Autocorrelation
−0.5
0.0
0.5
1.0
0
5
10
15
Lag

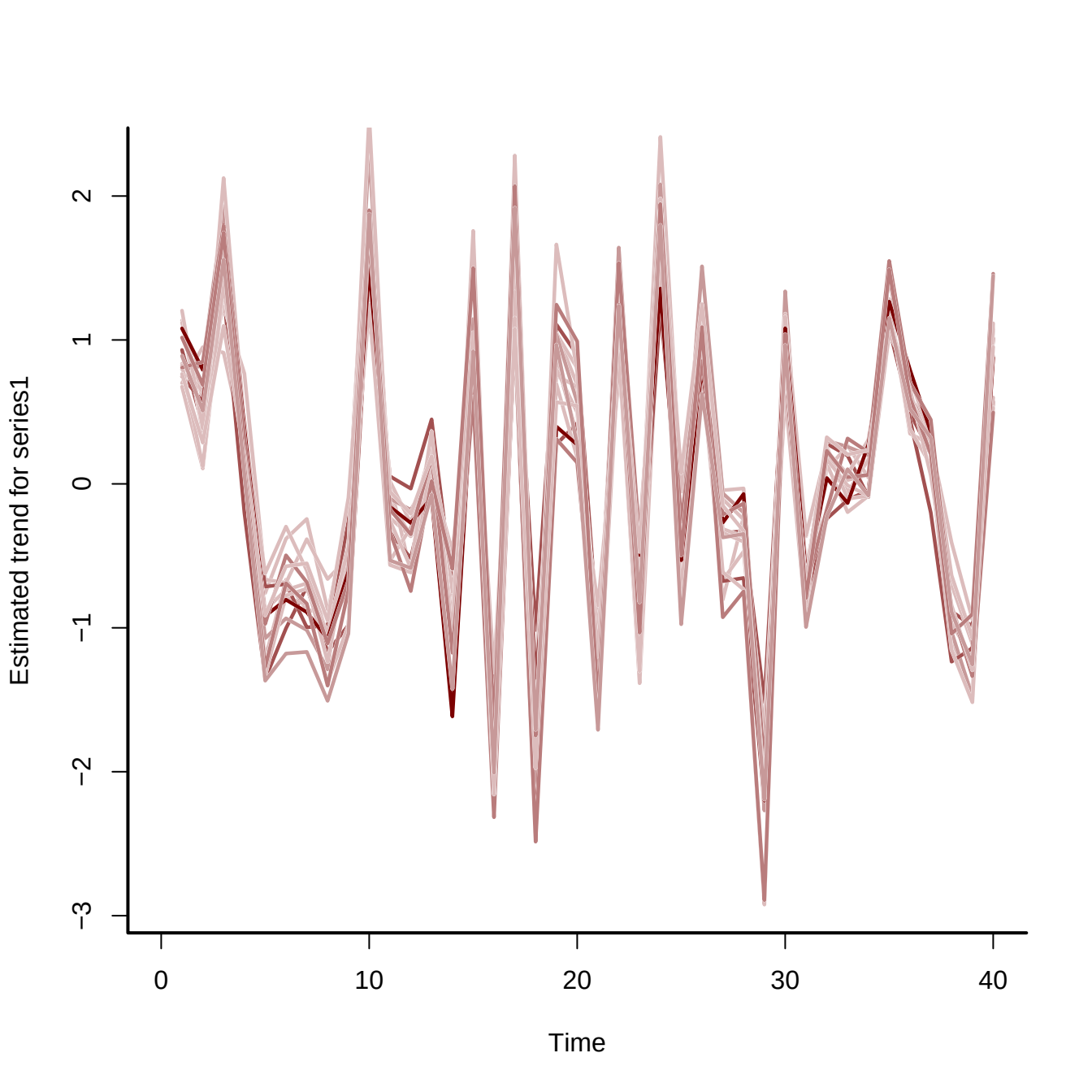

CDF
Empirical CDF
0.0
0.2
0.4
0.6
0.8
1.0
0
5
10
15
y

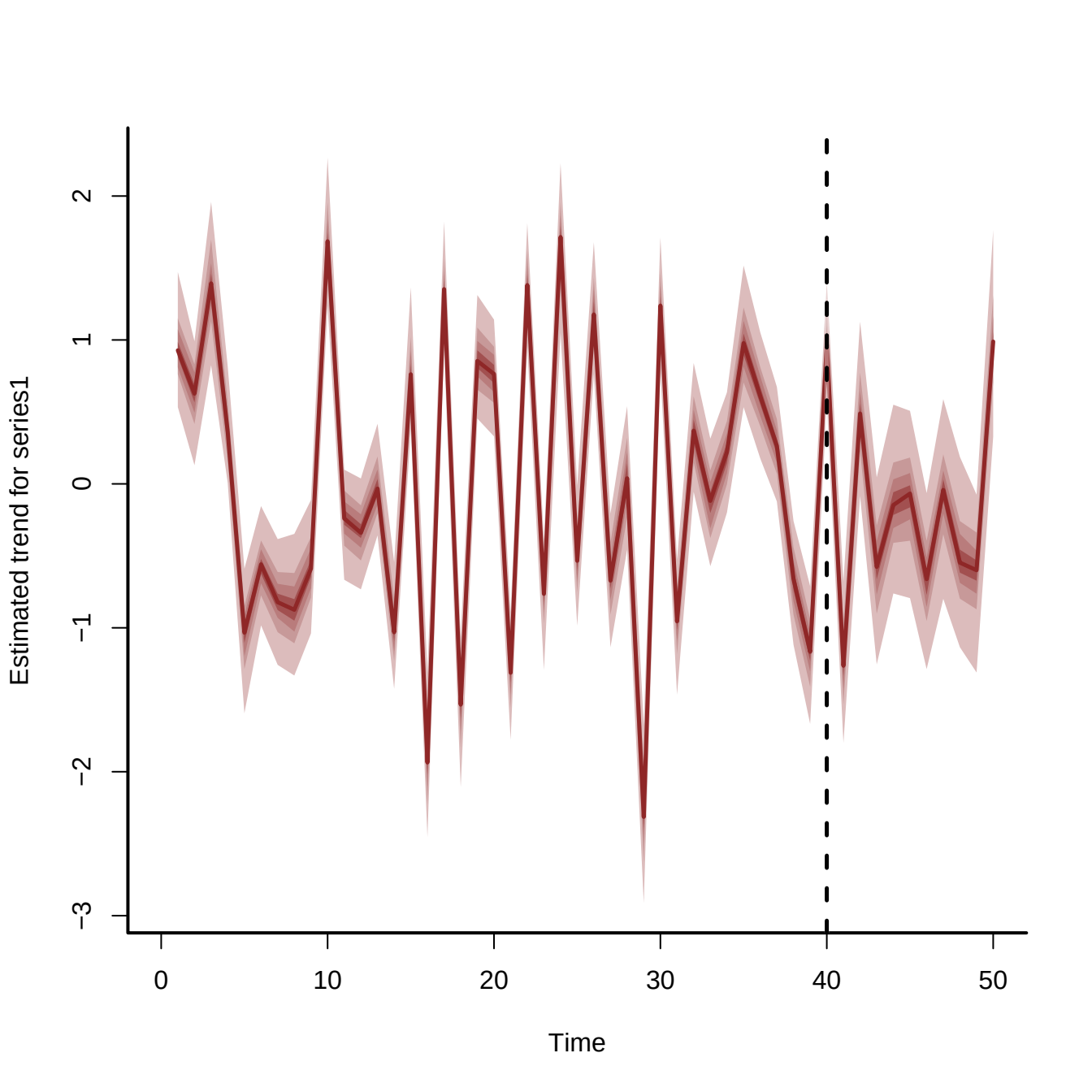

series1
series2
y
Time
0
5
10
15
1
8
16
24
32
40

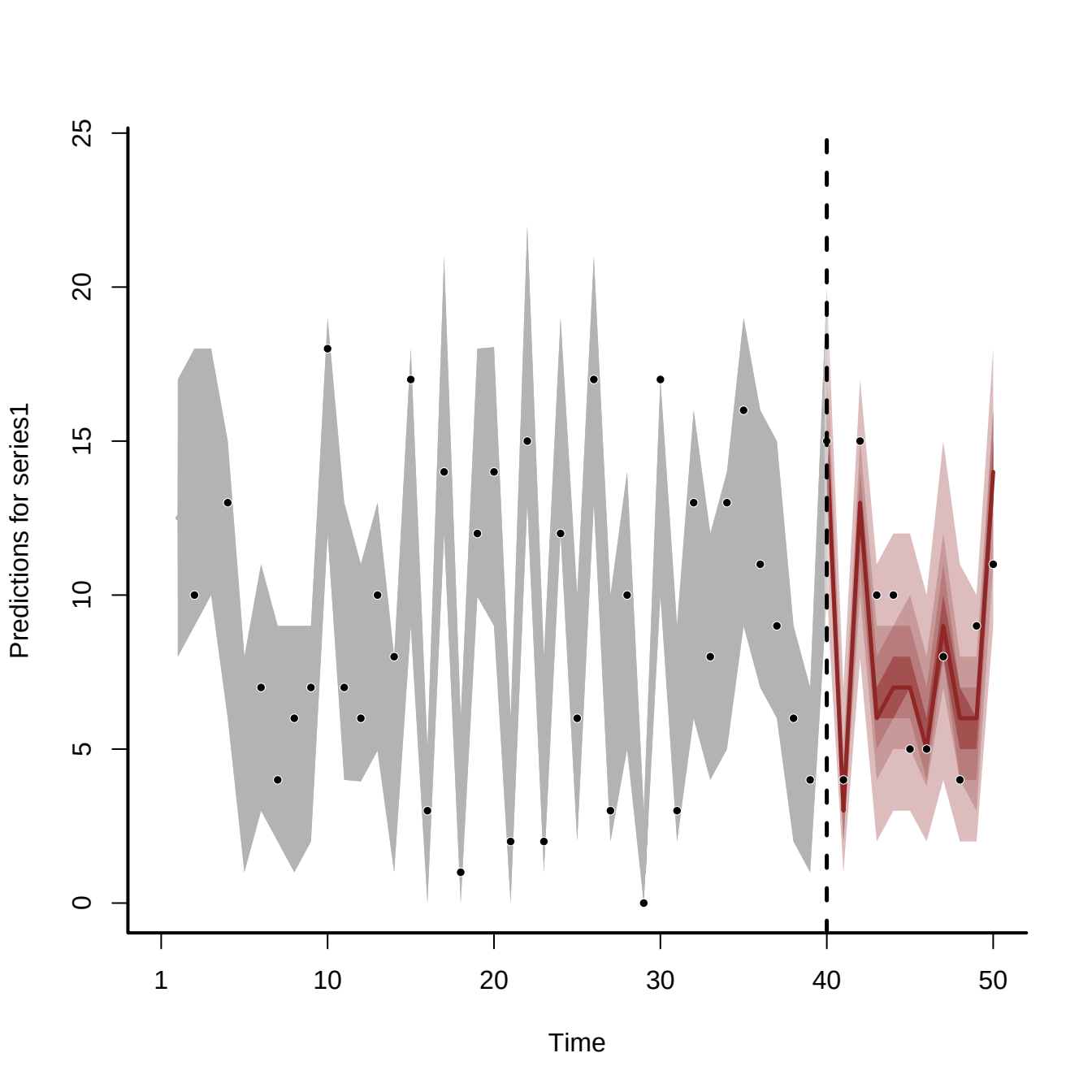

Predicitons for series1
0
5
10
15
20
1
8
16
24
32
40
Time

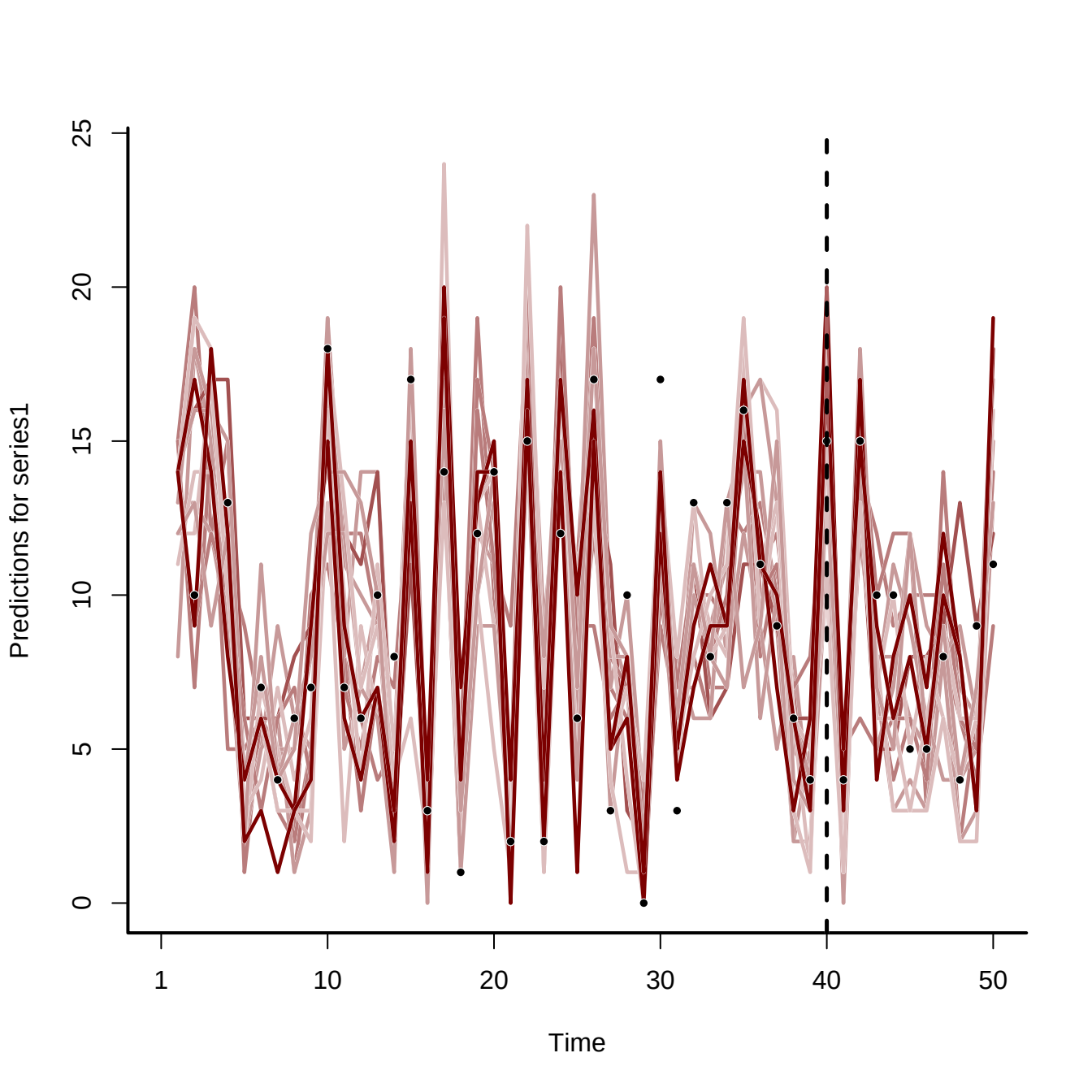

Predicitons for series1
0
5
10
15
20
1
10
20
30
40
50
Time

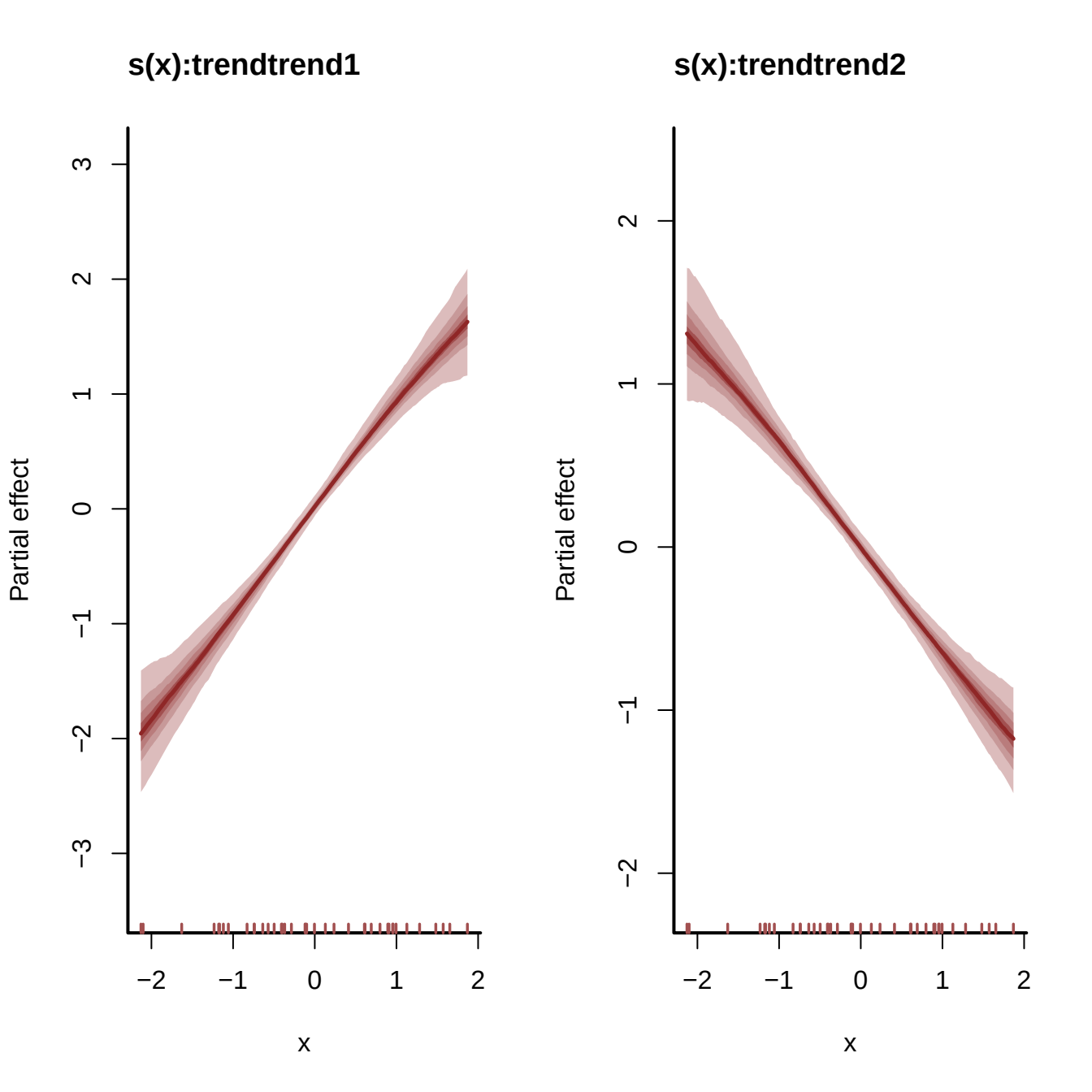

Estimated trend for series1
2
1
0
−1
−2
−3
0
10
20
30
40
Time

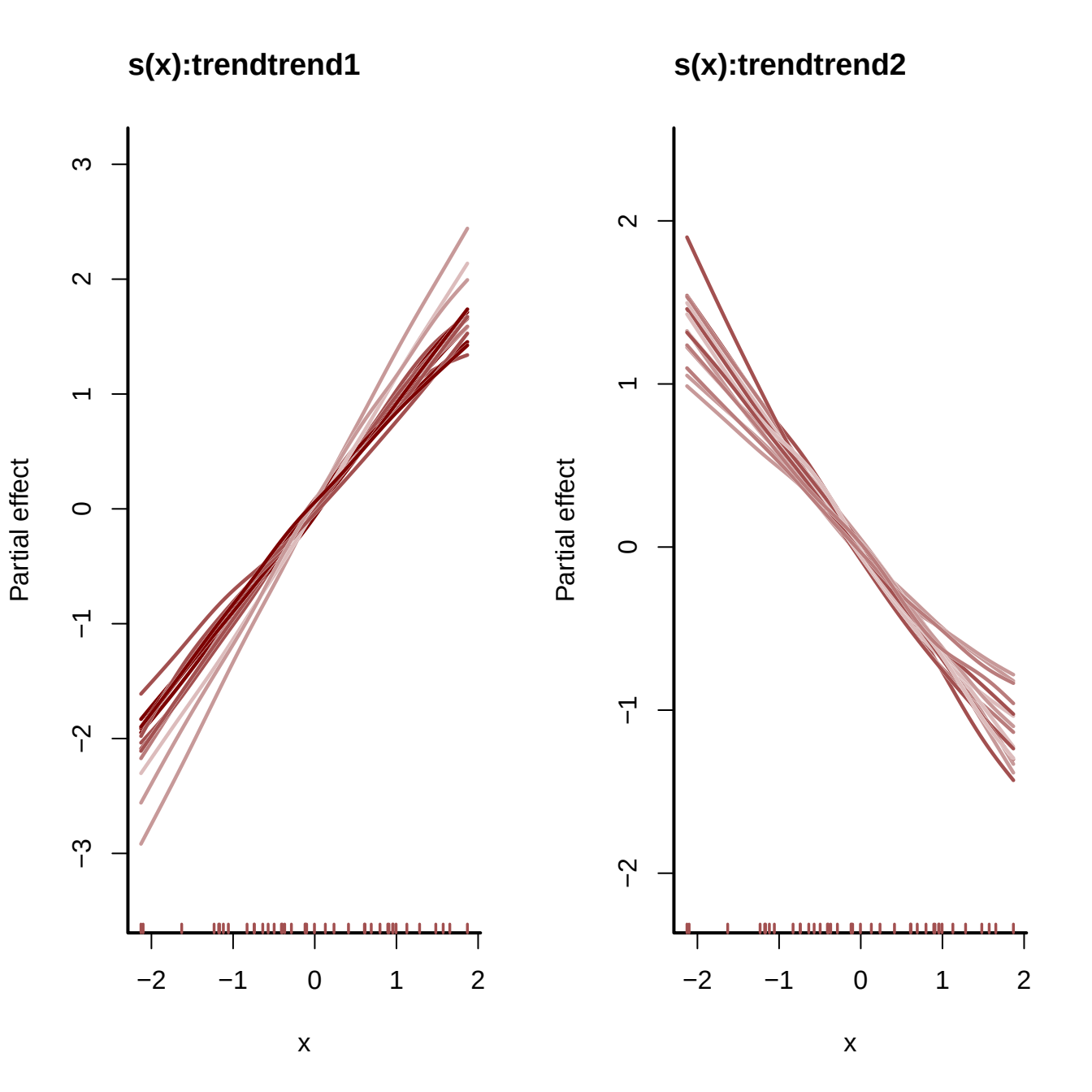

Estimated trend for series1
2
1
0
−1
−2
−3
0
10
20
30
40
Time

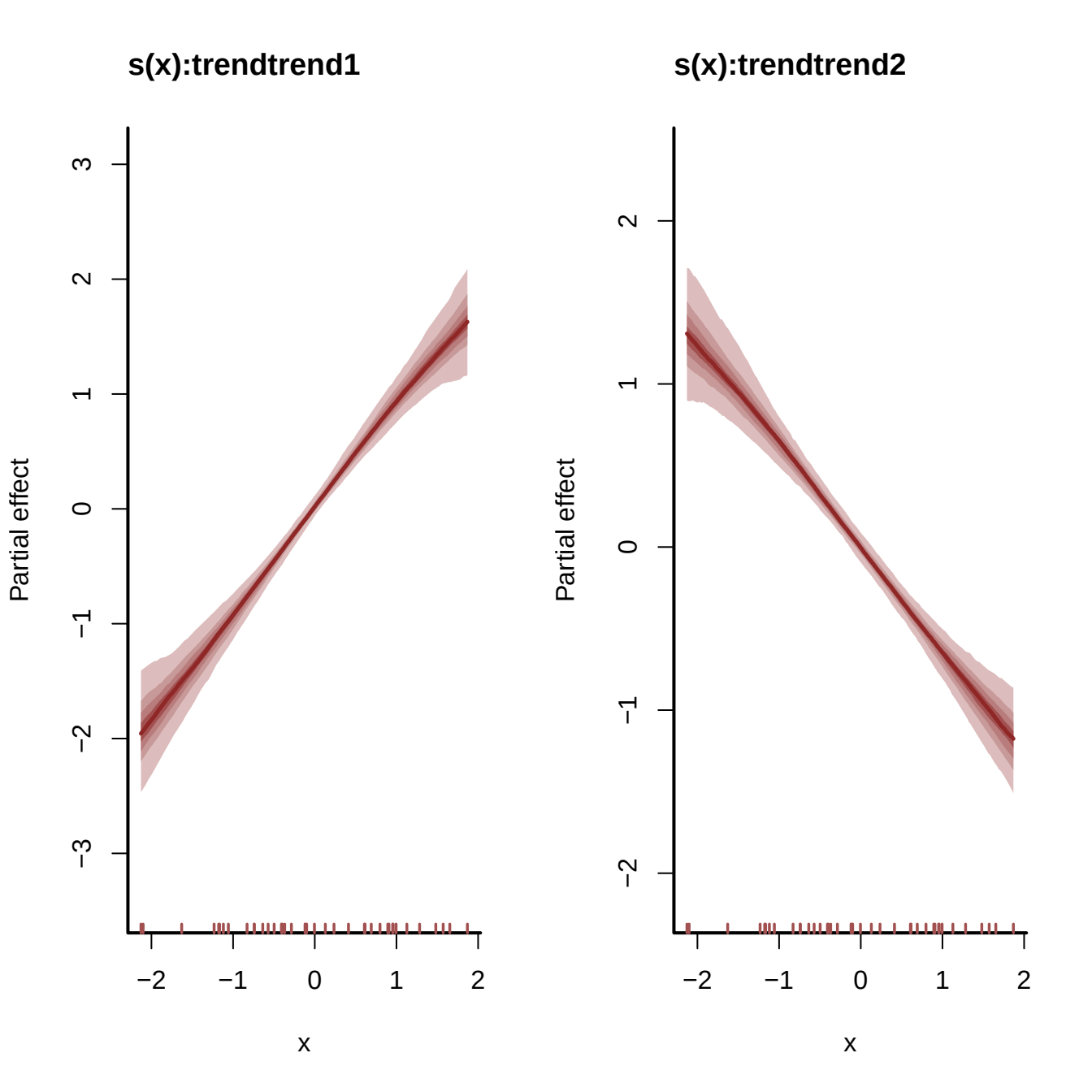

Estimated trend for series1
2
1
0
−1
−2
−3
0
10
20
30
40
50
Time

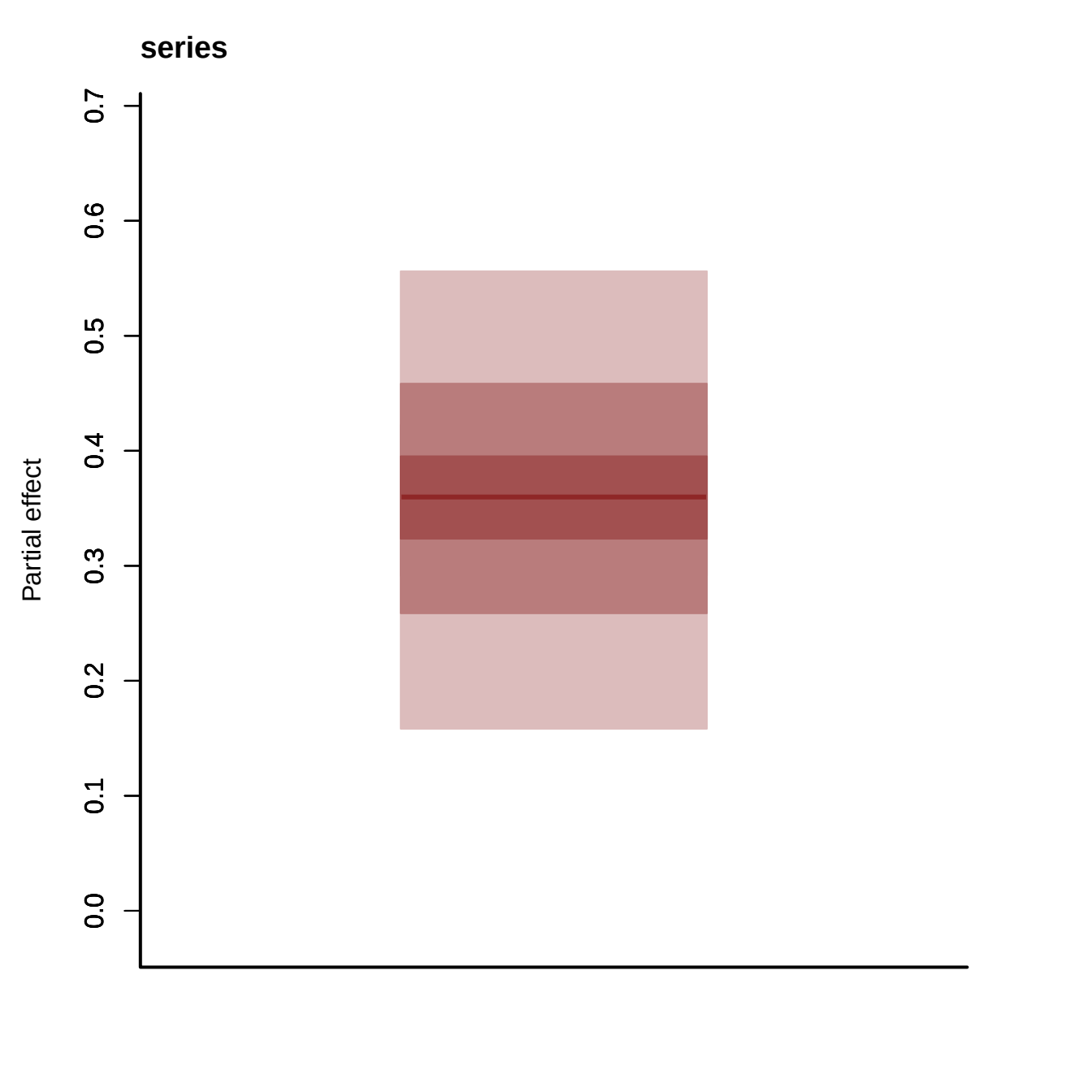

Predictions for series1
0
5
10
15
20
25
1
10
20
30
40
50
Time

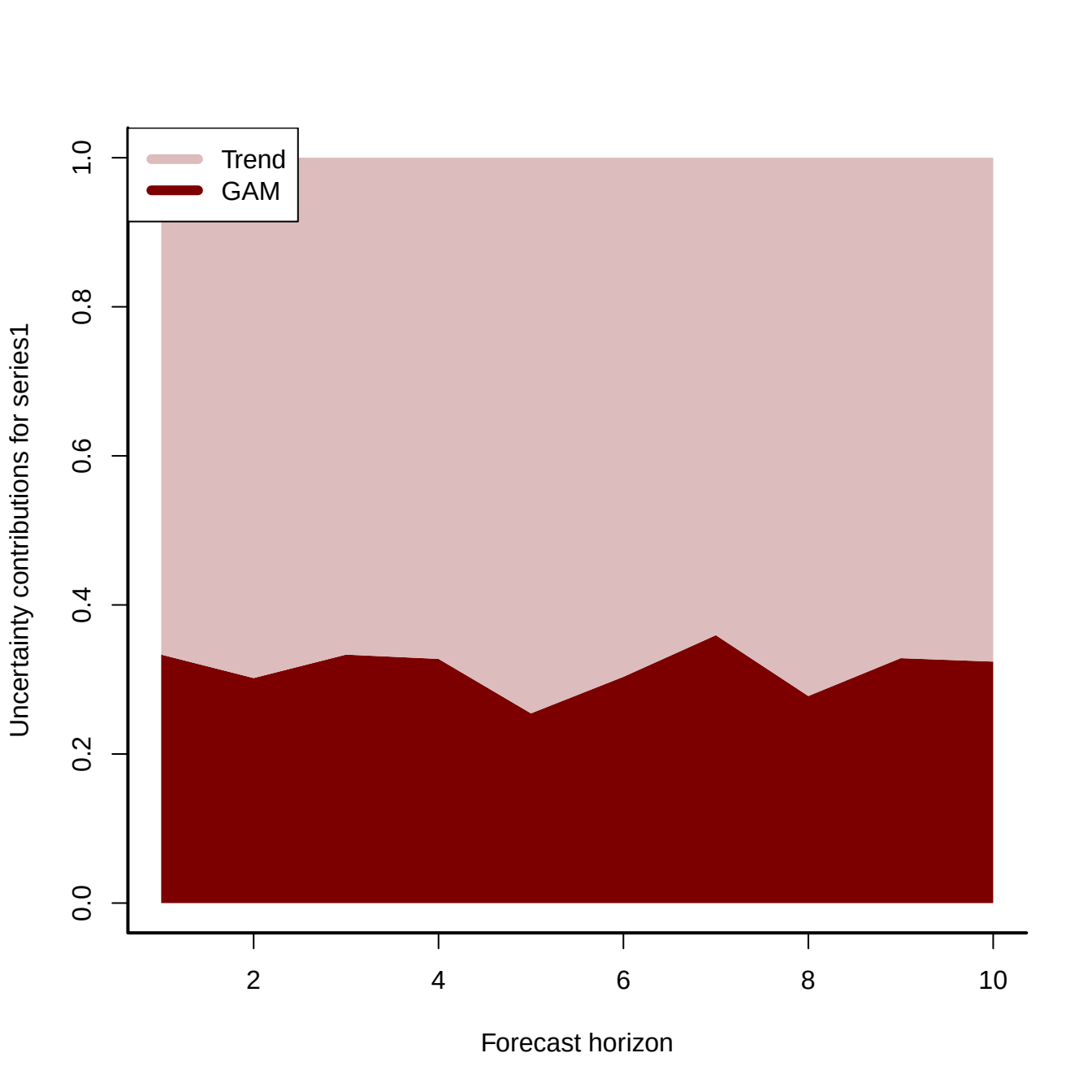

Predictions for series1
0
5
10
15
20
25
1
10
20
30
40
50
Time

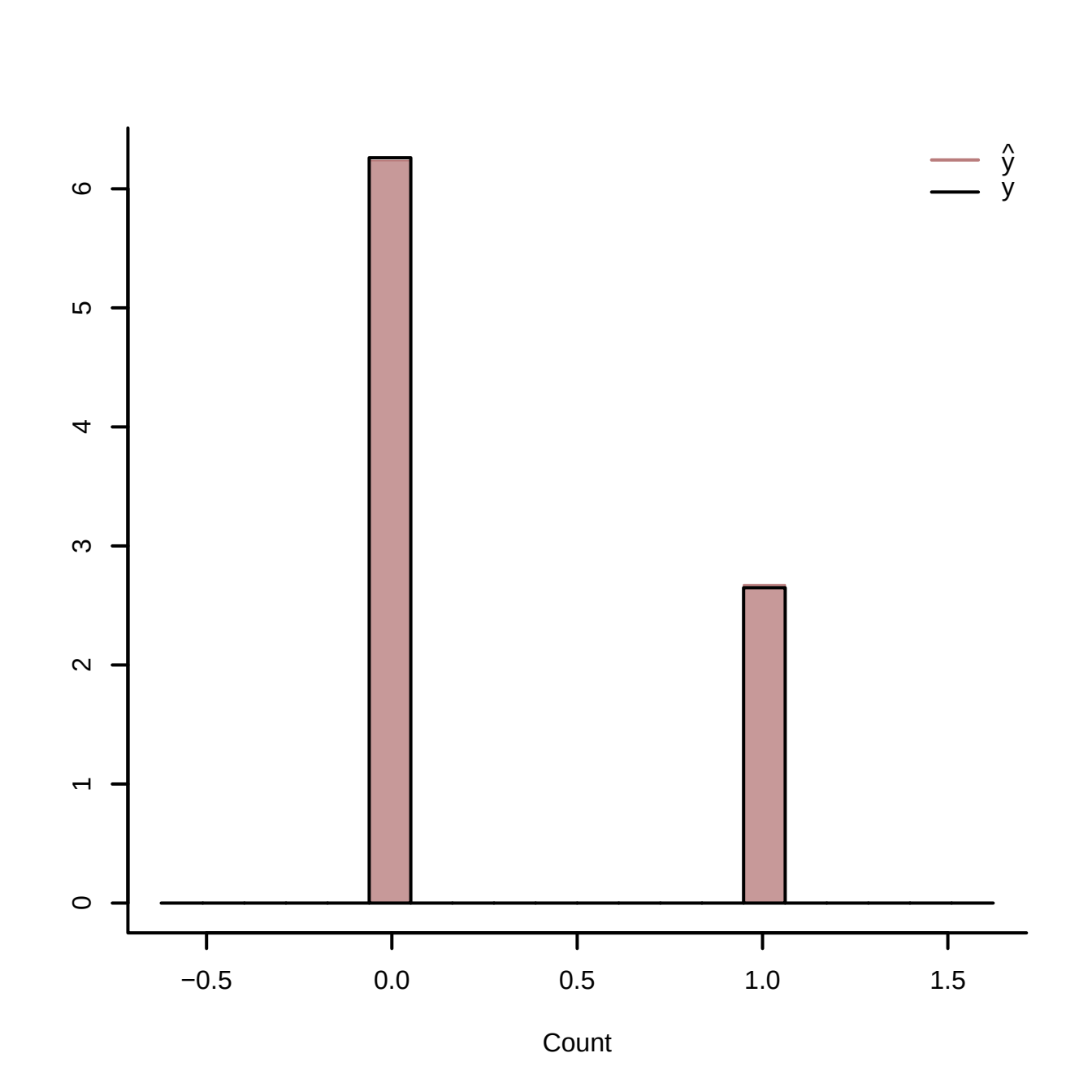

s(x):trendtrend1
Partial effect
3
2
1
0
−1
−2
−3
−2
−1
0
1
2
x
s(x):trendtrend2
Partial effect
2
1
0
−1
−2
−2
−1
0
1
2
x

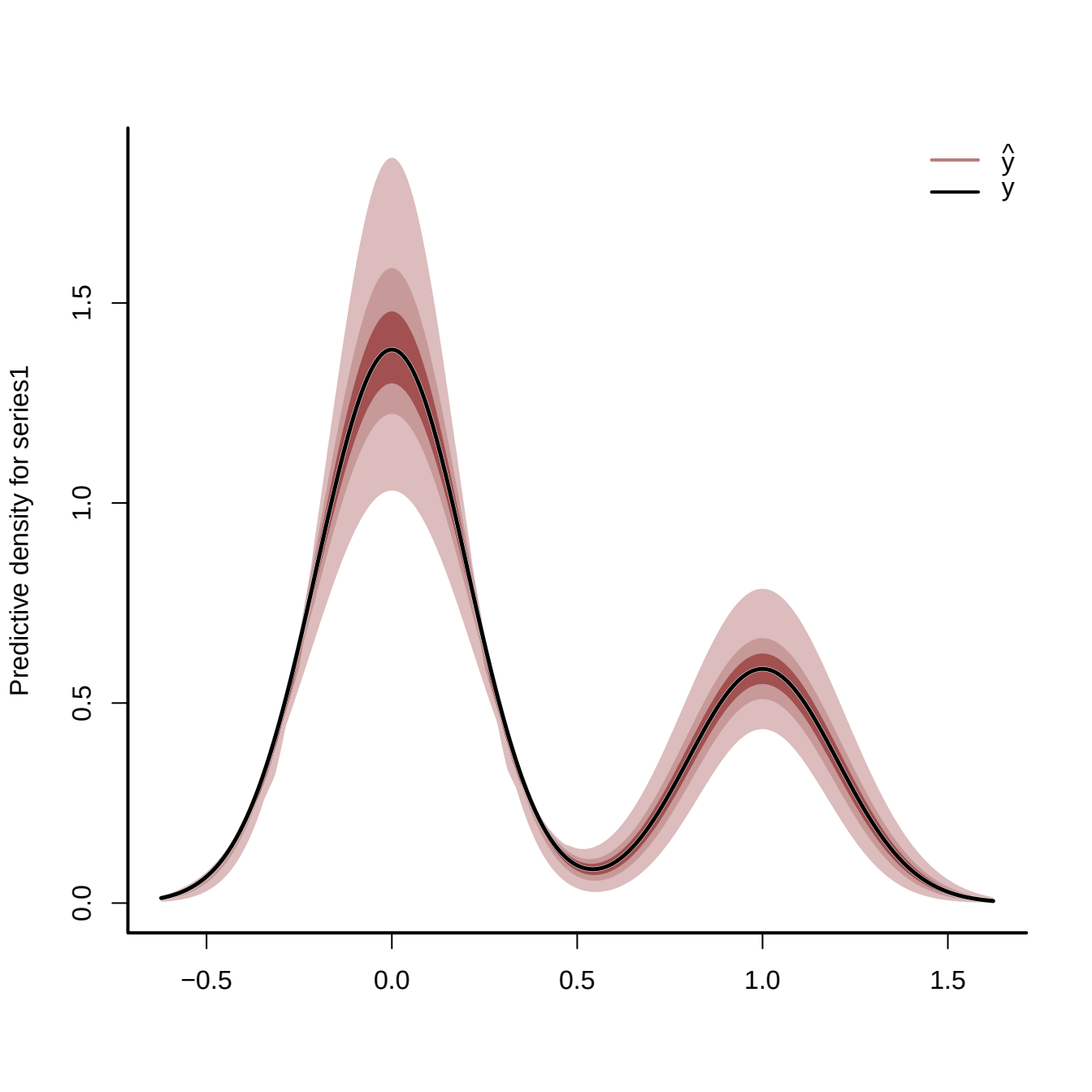

s(x):trendtrend1
Partial effect
3
2
1
0
−1
−2
−3
−2
−1
0
1
2
x
s(x):trendtrend2
Partial effect
2
1
0
−1
−2
−2
−1
0
1
2
x

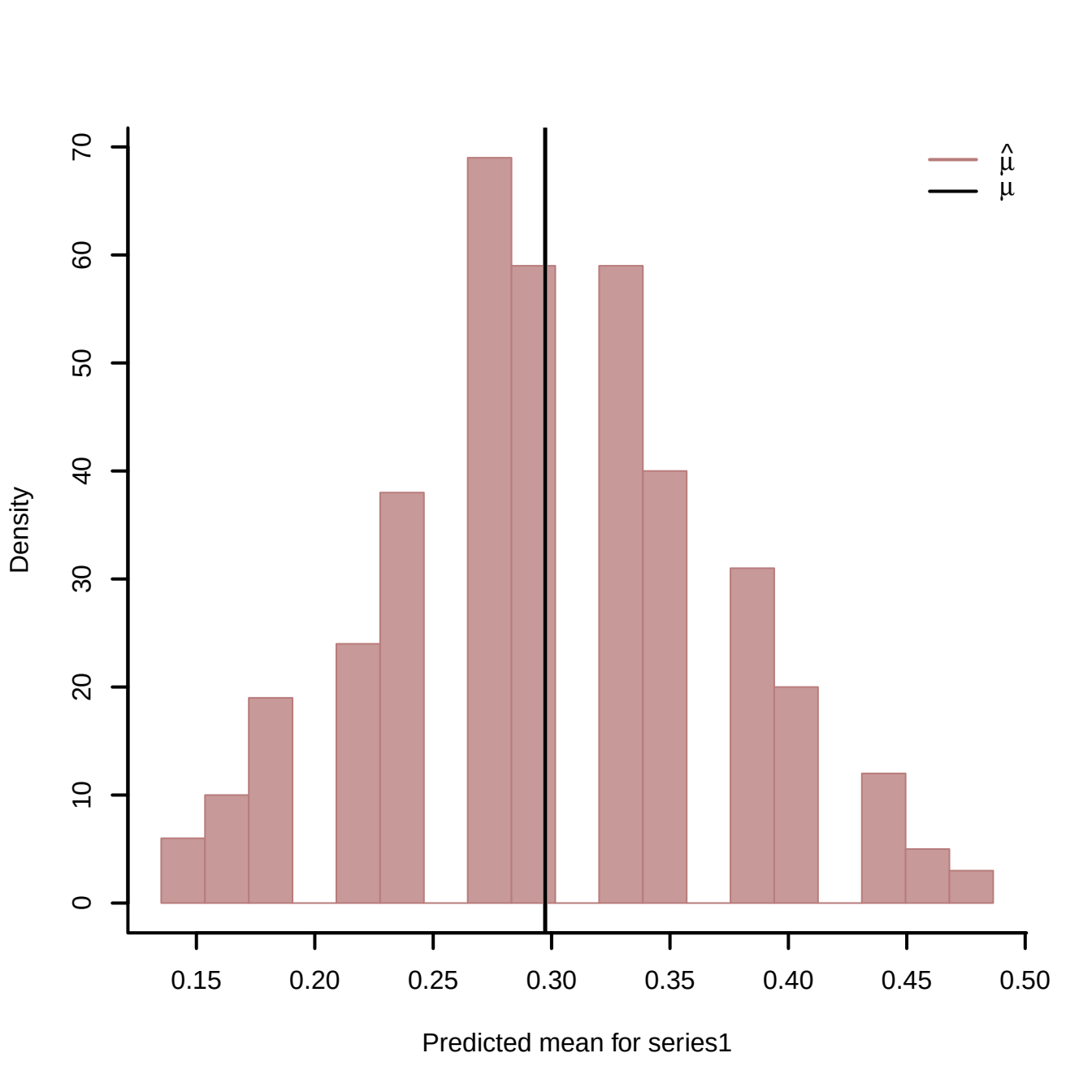

s(x):trendtrend1
Partial effect
3
2
1
0
−1
−2
−3
−2
−1
0
1
2
x
s(x):trendtrend2
Partial effect
2
1
0
−1
−2
−2
−1
0
1
2
x

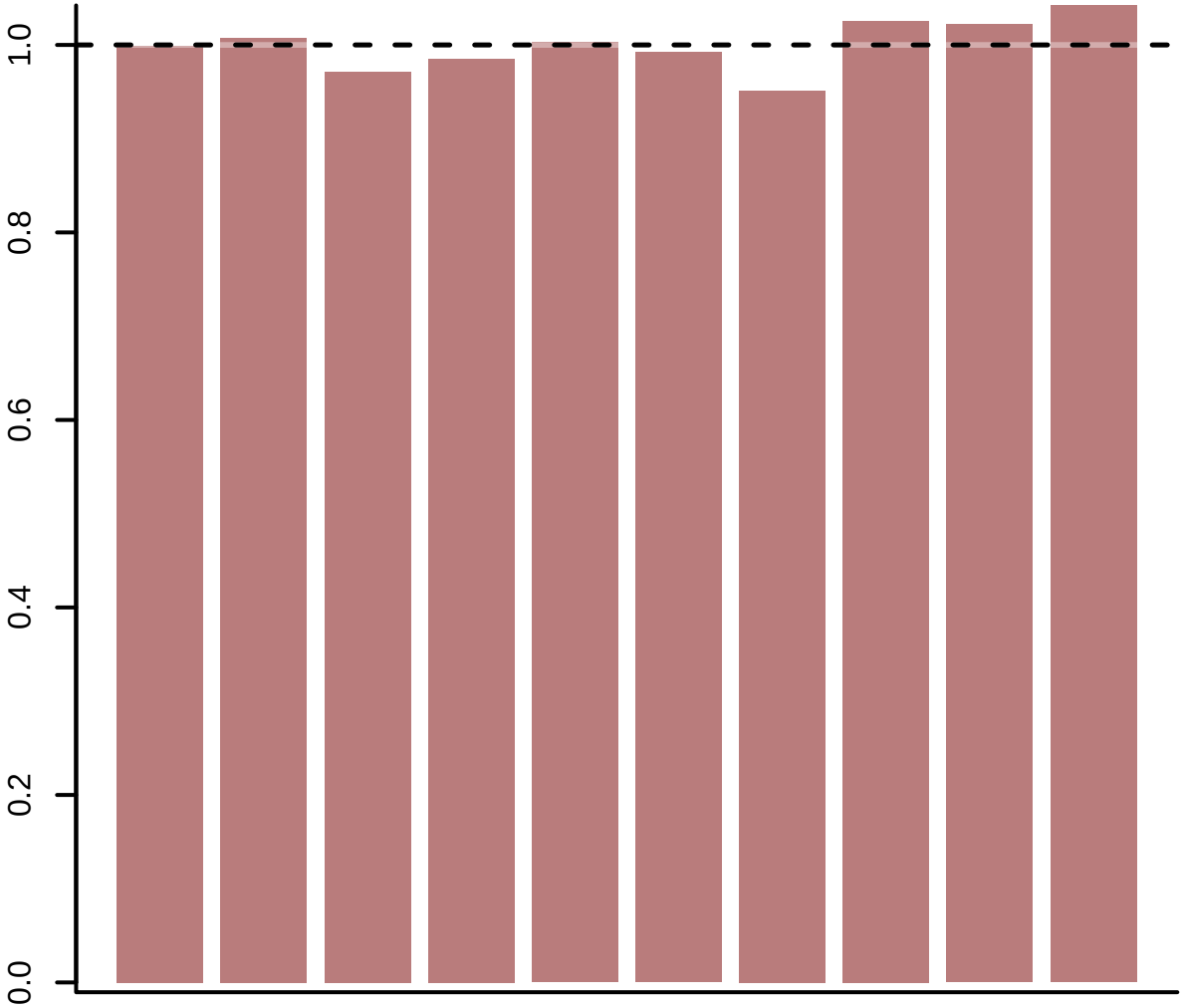

series
Partial effect
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7

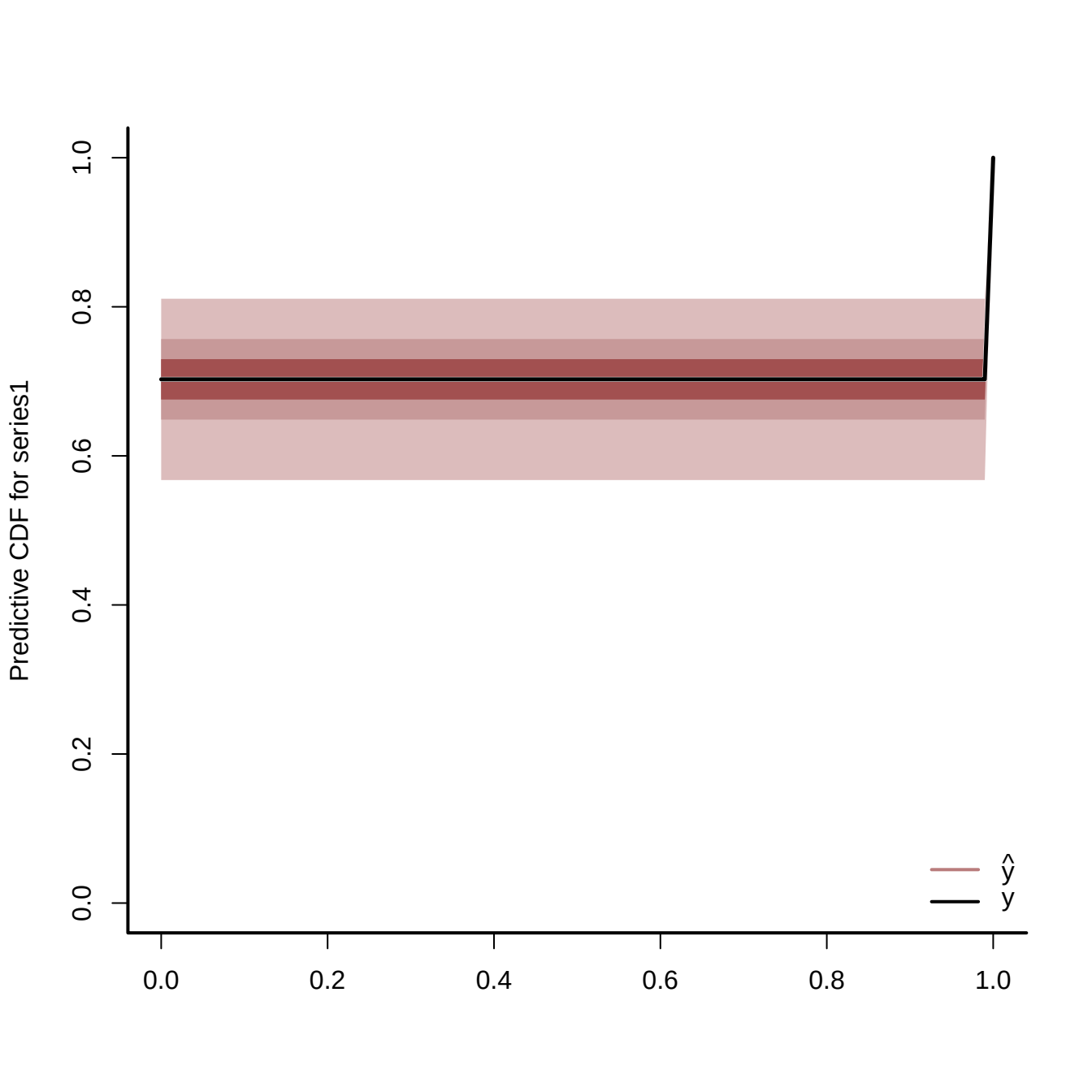

Trend
GAM
Uncertainty contributions for series1
0.0
0.2
0.4
0.6
0.8
1.0
2
4
6
8
10
Forecast horizon

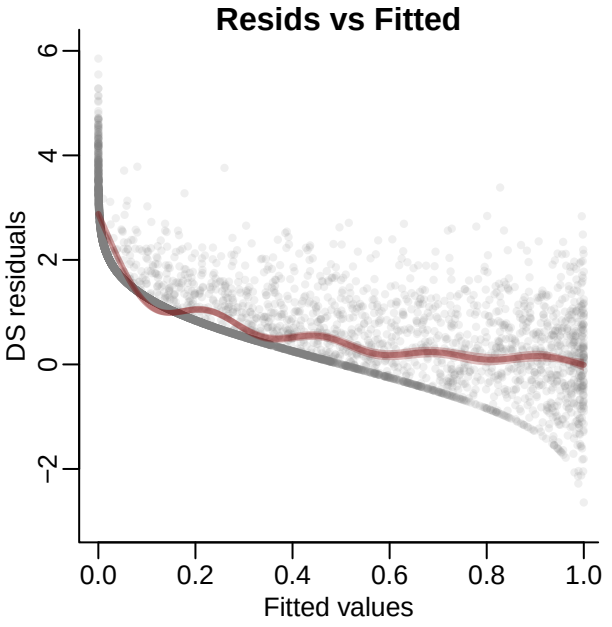

y>
y
0
1
2
3
4
5
6
−0.5
0.0
0.5
1.0
1.5
Count

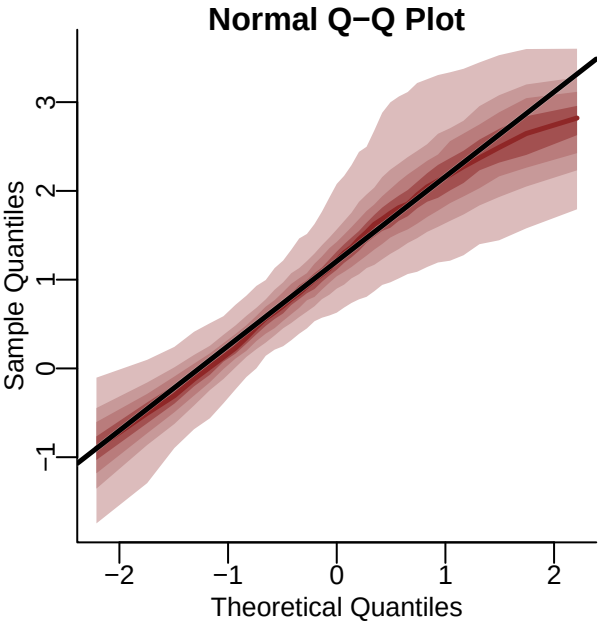

ŷ
y
Predictive density for series1
0.0
0.5
1.0
1.5
−0.5
0.0
0.5
1.0
1.5

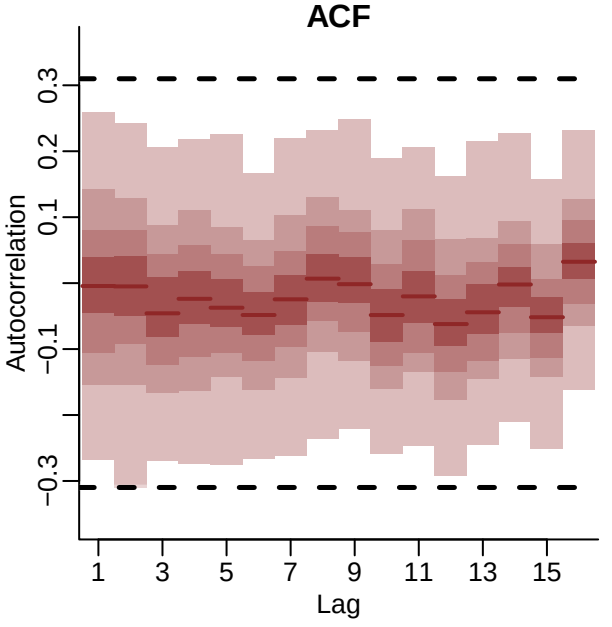

Density
0
10
20
30
40
50
60
70
0.15
0.20
0.25
0.30
0.35
0.40
0.45
0.50
Predicted mean for series1
μ̂
μ

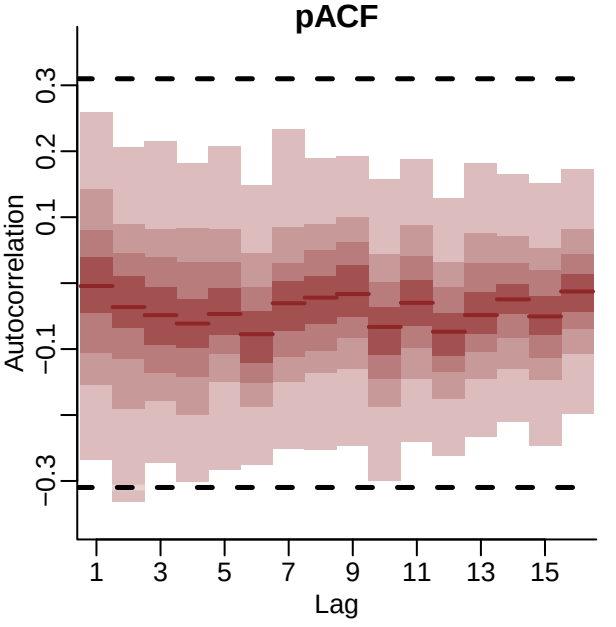

0.0
0.2
0.4
0.6
0.8
1.0
Predictive PIT for series1

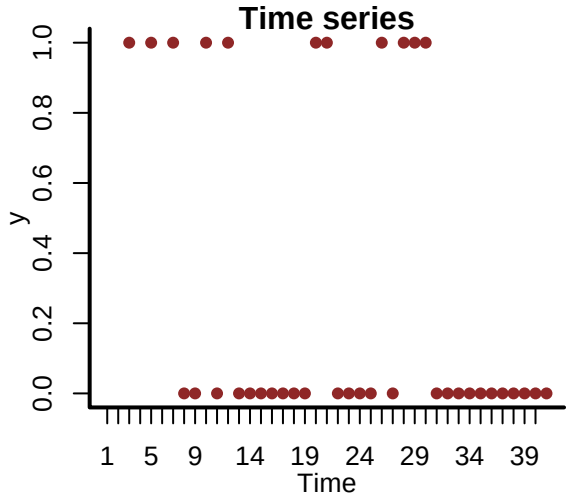

Predictive CDF for series1
0.0
0.2
0.4
0.6
0.8
1.0
0.0
0.2
0.4
0.6
0.8
1.0
ŷ
y

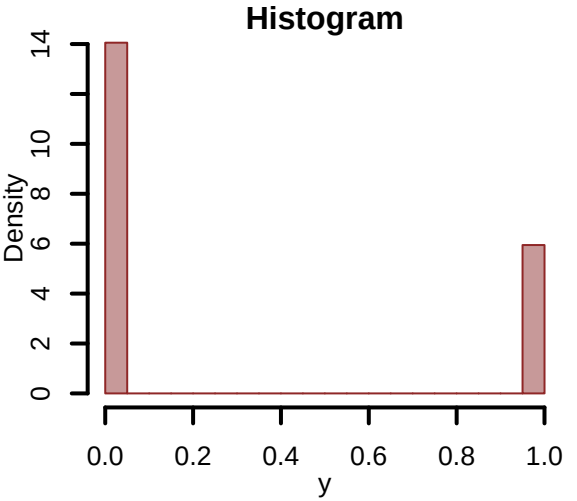

Resids vs Fitted
DS residuals
6
4
2
0
−2
0.0
0.2
0.4
0.6
0.8
1.0
Fitted values

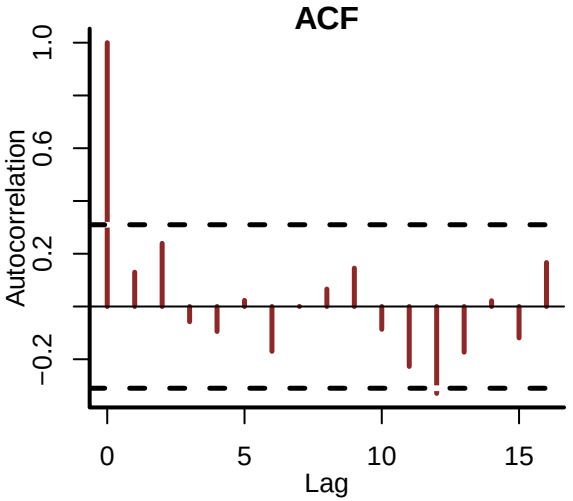

Normal Q−Q Plot
Sample Quantiles
3
2
1
0
−1
−2
−1
0
1
2
Theoretical Quantiles

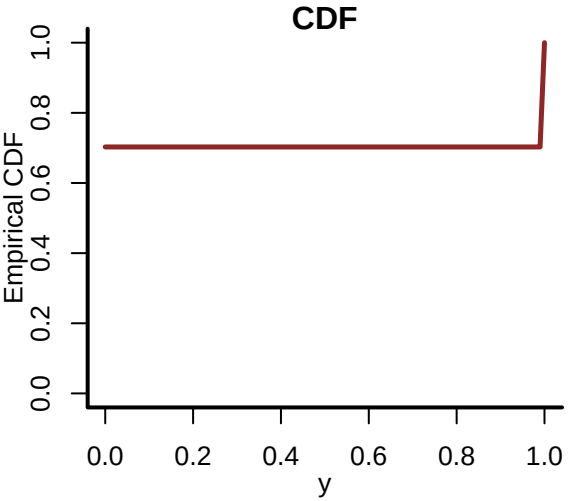

ACF
Autocorrelation
0.3
0.2
0.1
−0.1
−0.3
1
3
5
7
9
11
13
15
Lag

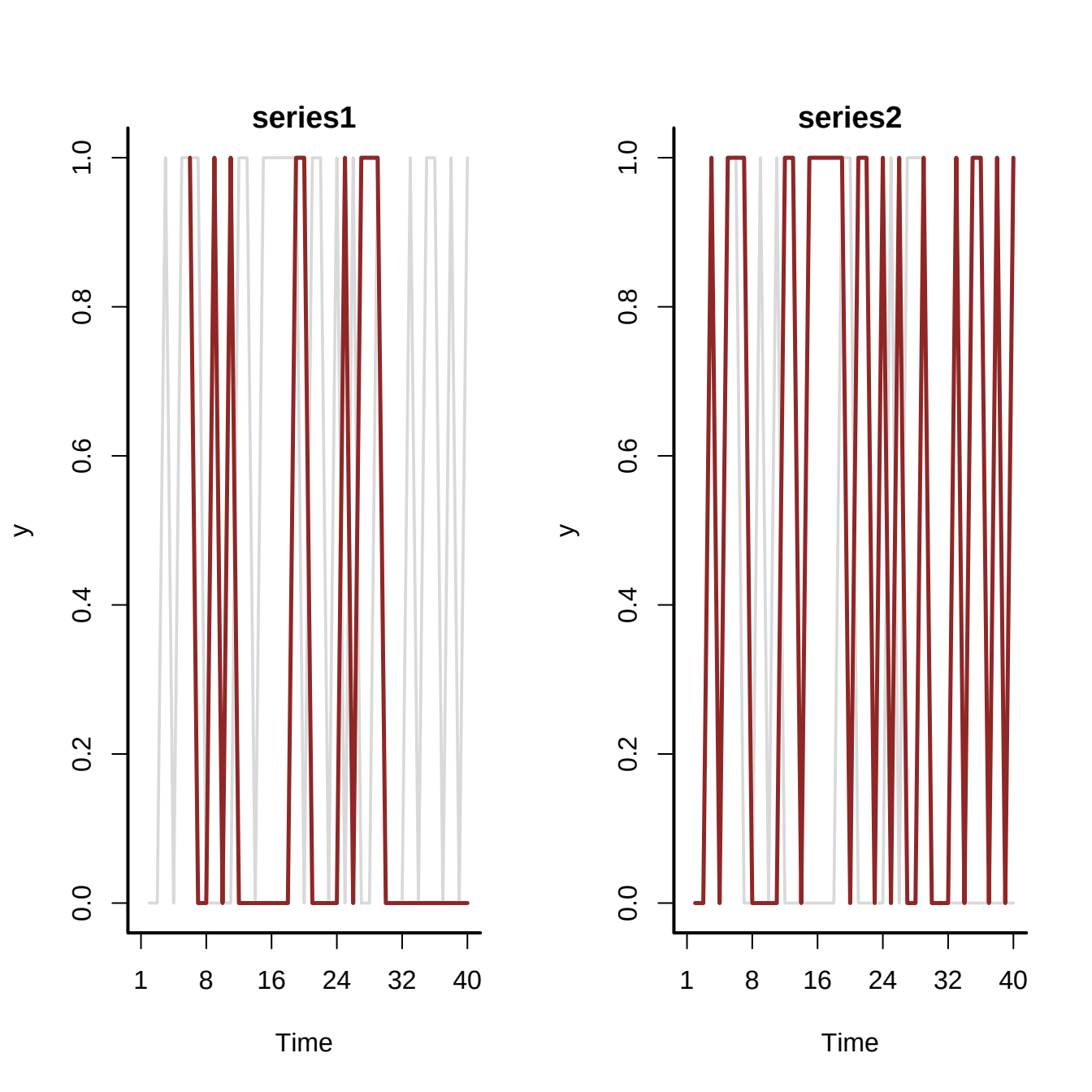

pACF
Autocorrelation
0.3
0.2
0.1
−0.1
−0.3
1
3
5
7
9
11
13
15
Lag

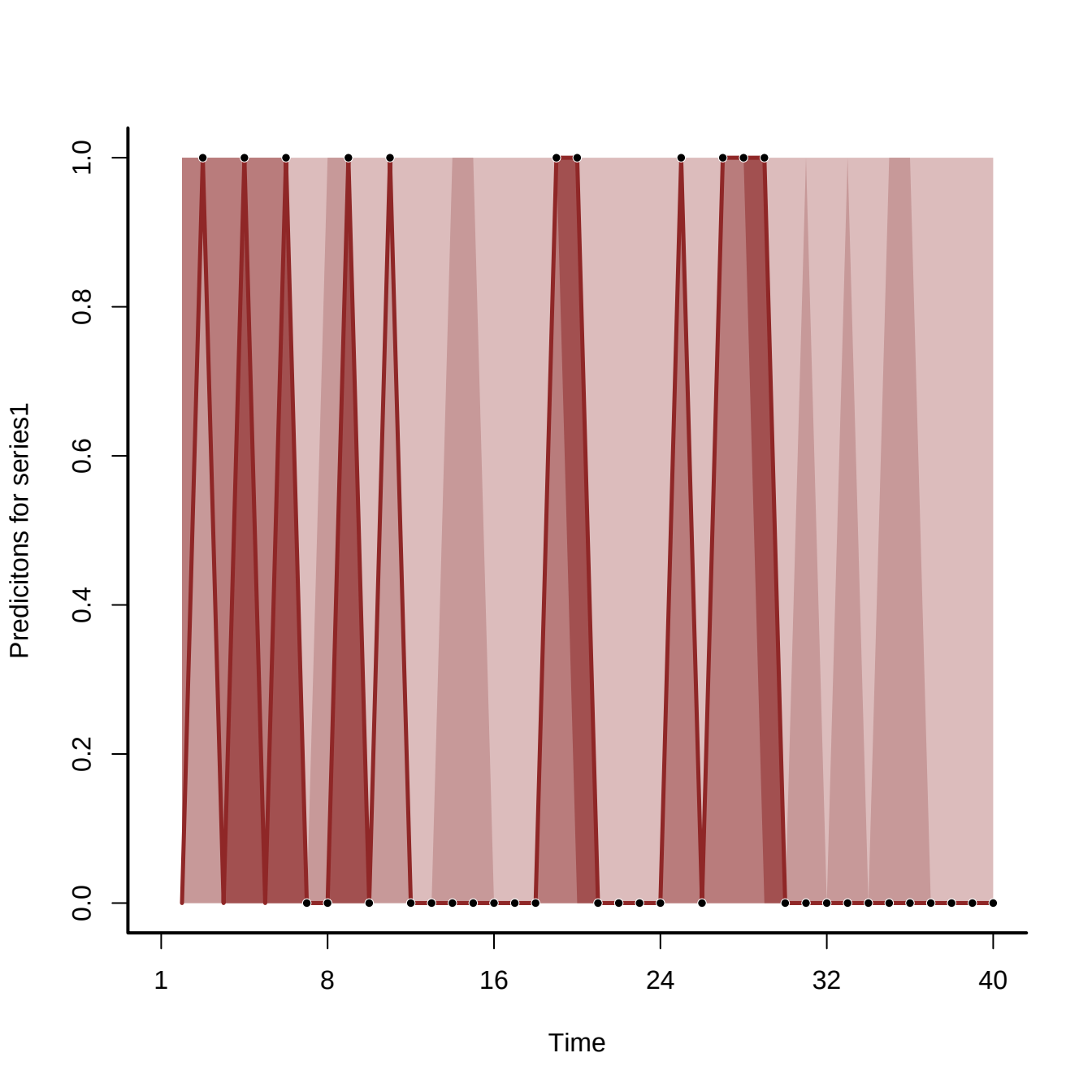

Time series
y
0.0
0.2
0.4
0.6
0.8
1.0
1
5
9
14
19
24
29
34
39
Time

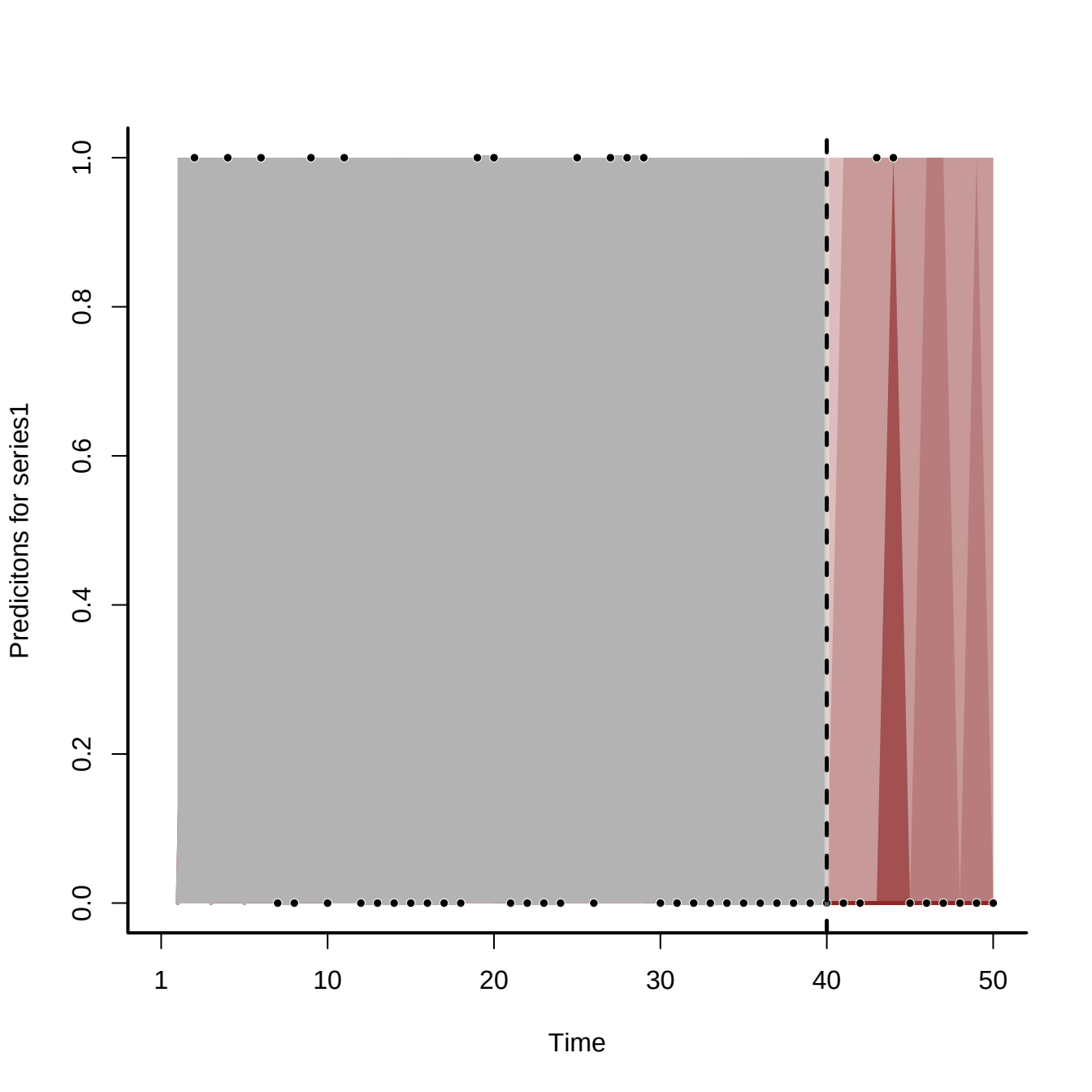

Histogram
Density
0
2
4
6
8
10
14
0.0
0.2
0.4
0.6
0.8
1.0
y

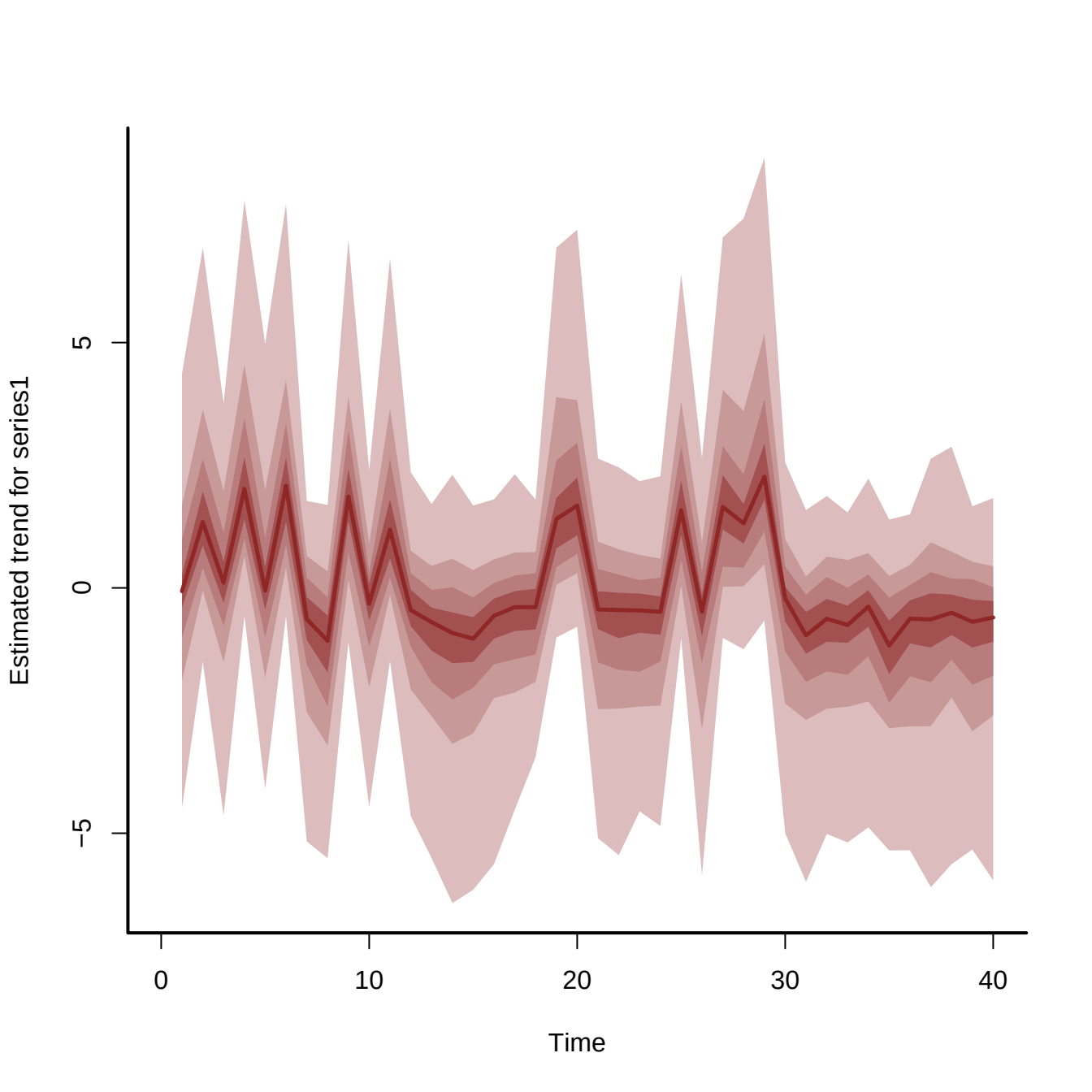

ACF
Autocorrelation
−0.2
0.2
0.6
1.0
0
5
10
15
Lag

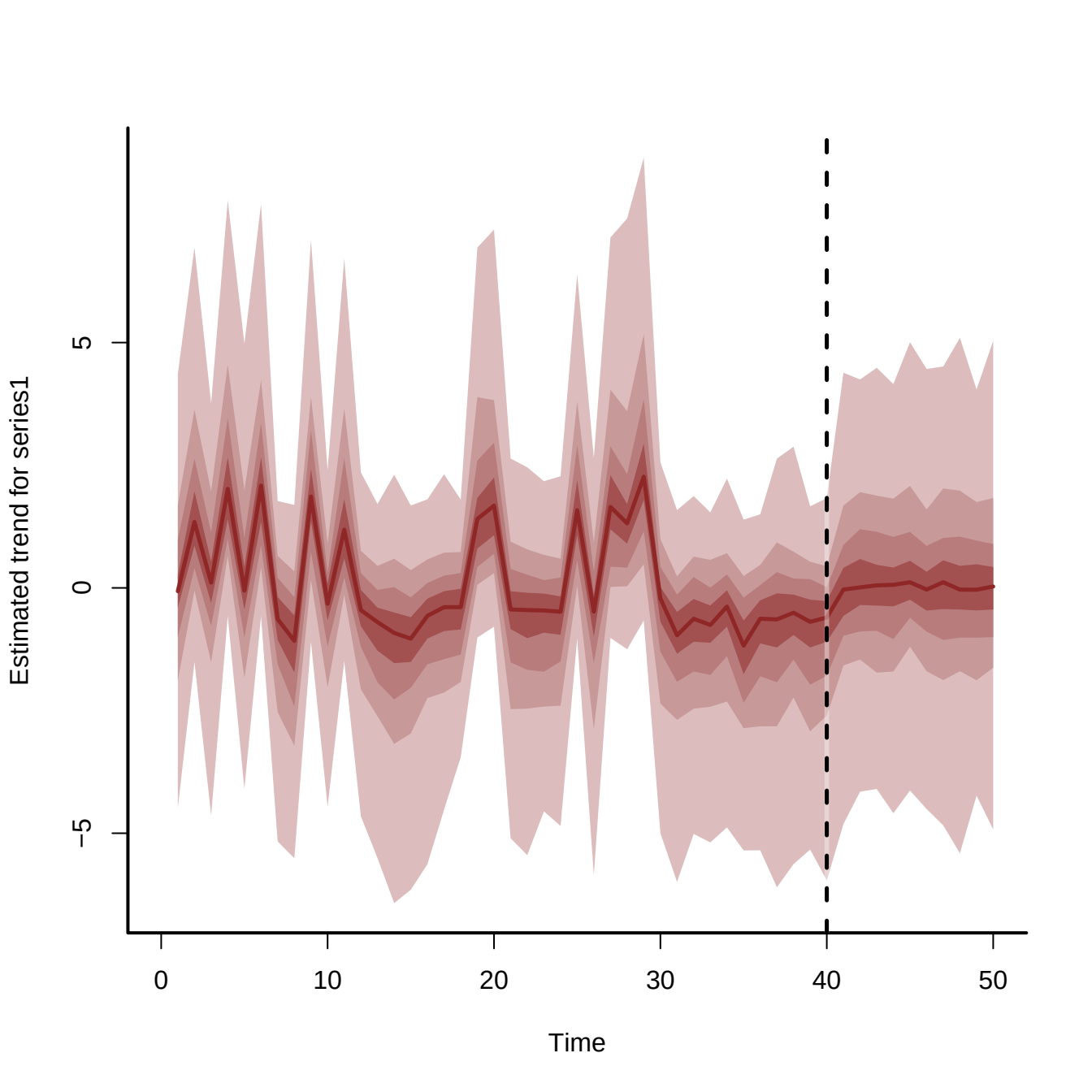

CDF
Empirical CDF
0.0
0.2
0.4
0.6
0.8
1.0
0.0
0.2
0.4
0.6
0.8
1.0
y

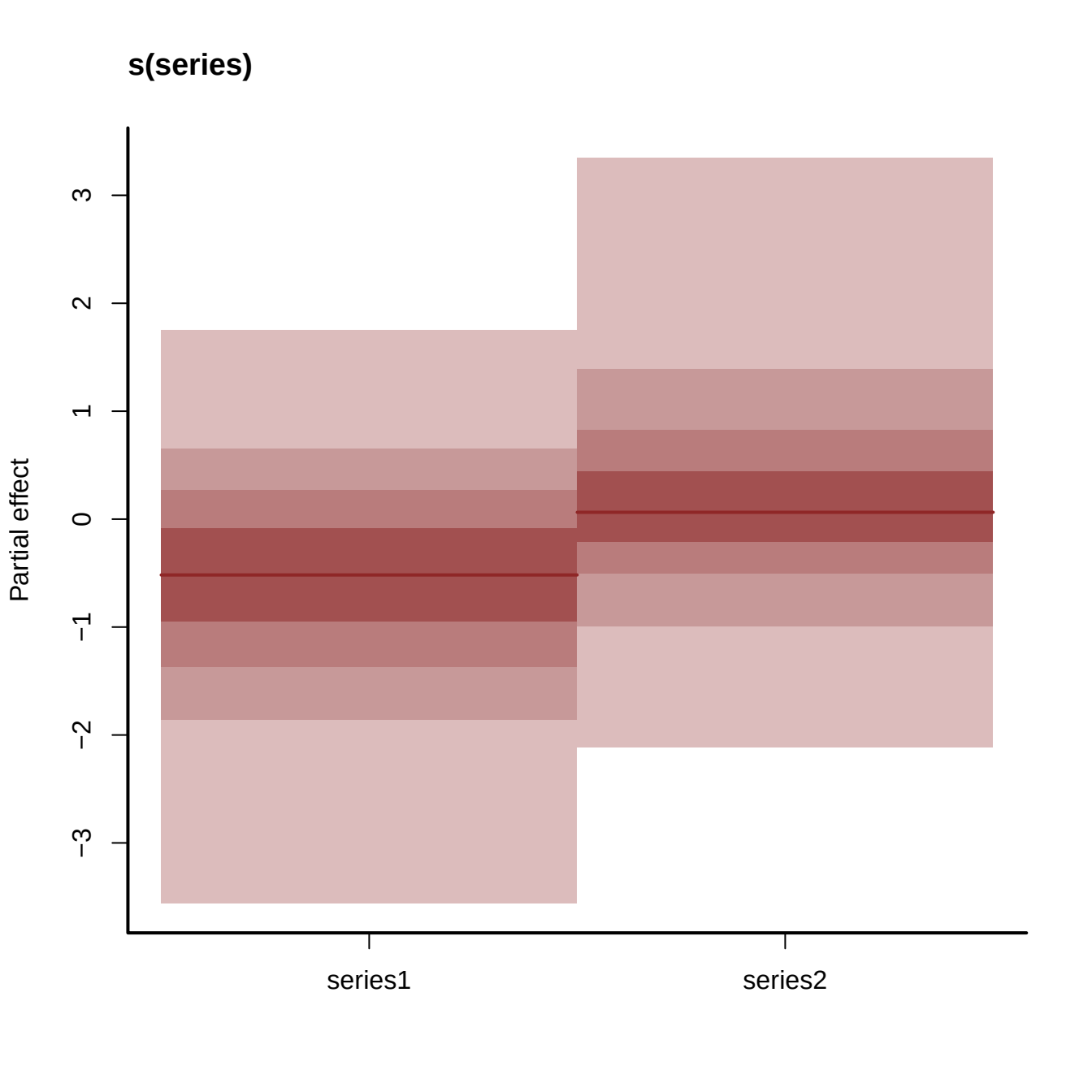

series1
series2
y
Time
0.0
0.2
0.4
0.6
0.8
1.0
1
8
16
24
32
40

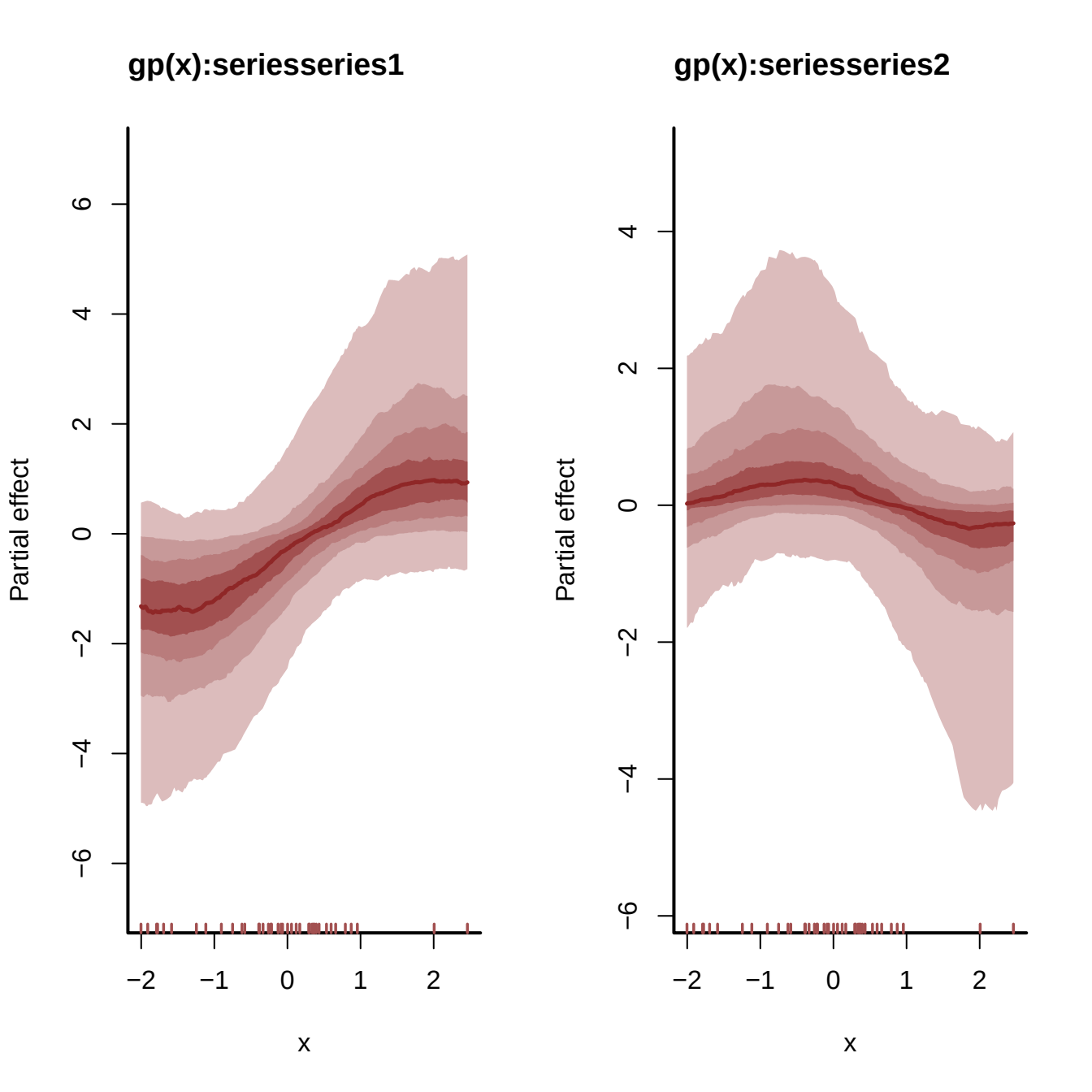

Predicitons for series1
0.0
0.2
0.4
0.6
0.8
1.0
1
8
16
24
32
40
Time

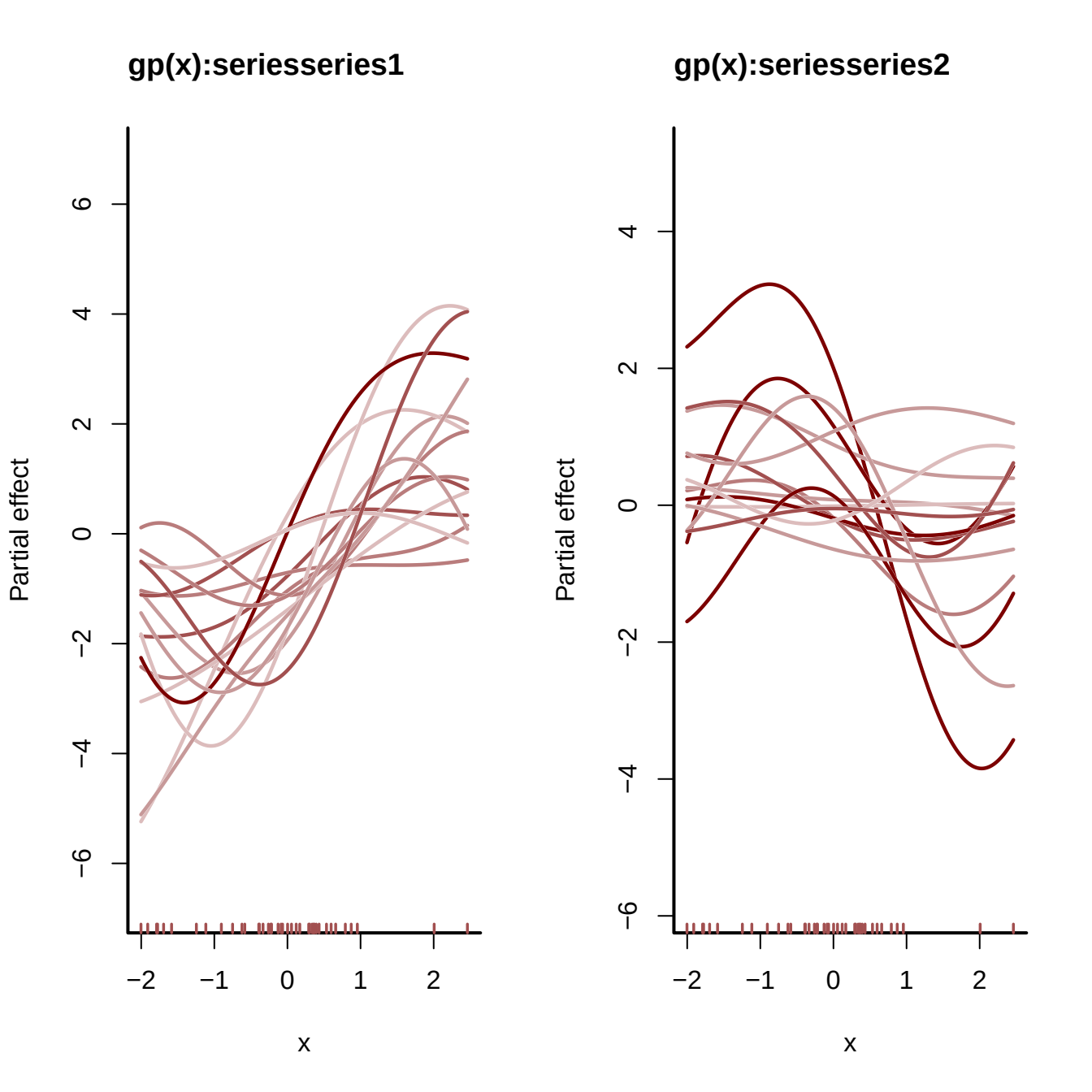

Predicitons for series1
0.0
0.2
0.4
0.6
0.8
1.0
1
10
20
30
40
50
Time

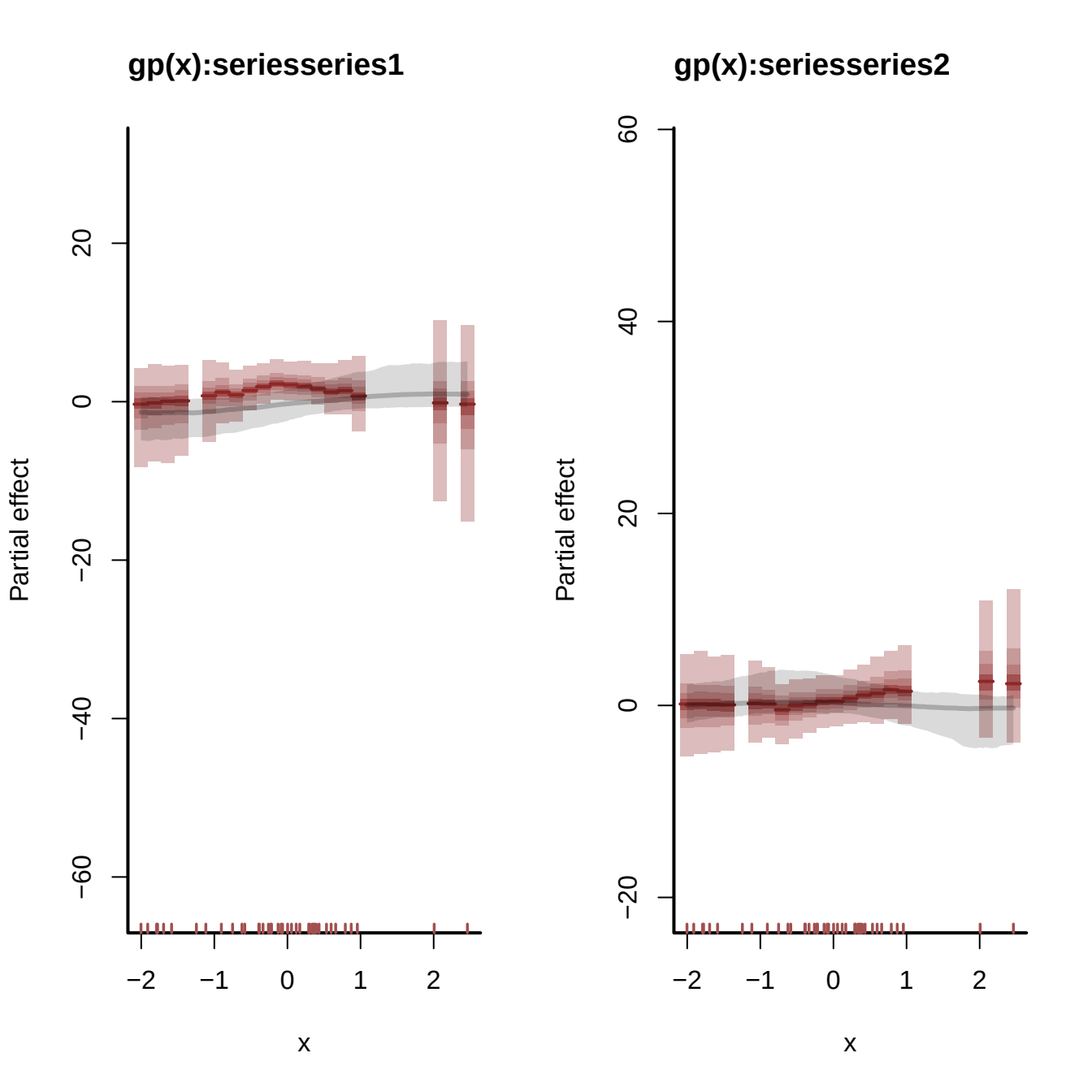

Estimated trend for series1
5
0
−5
0
10
20
30
40
Time

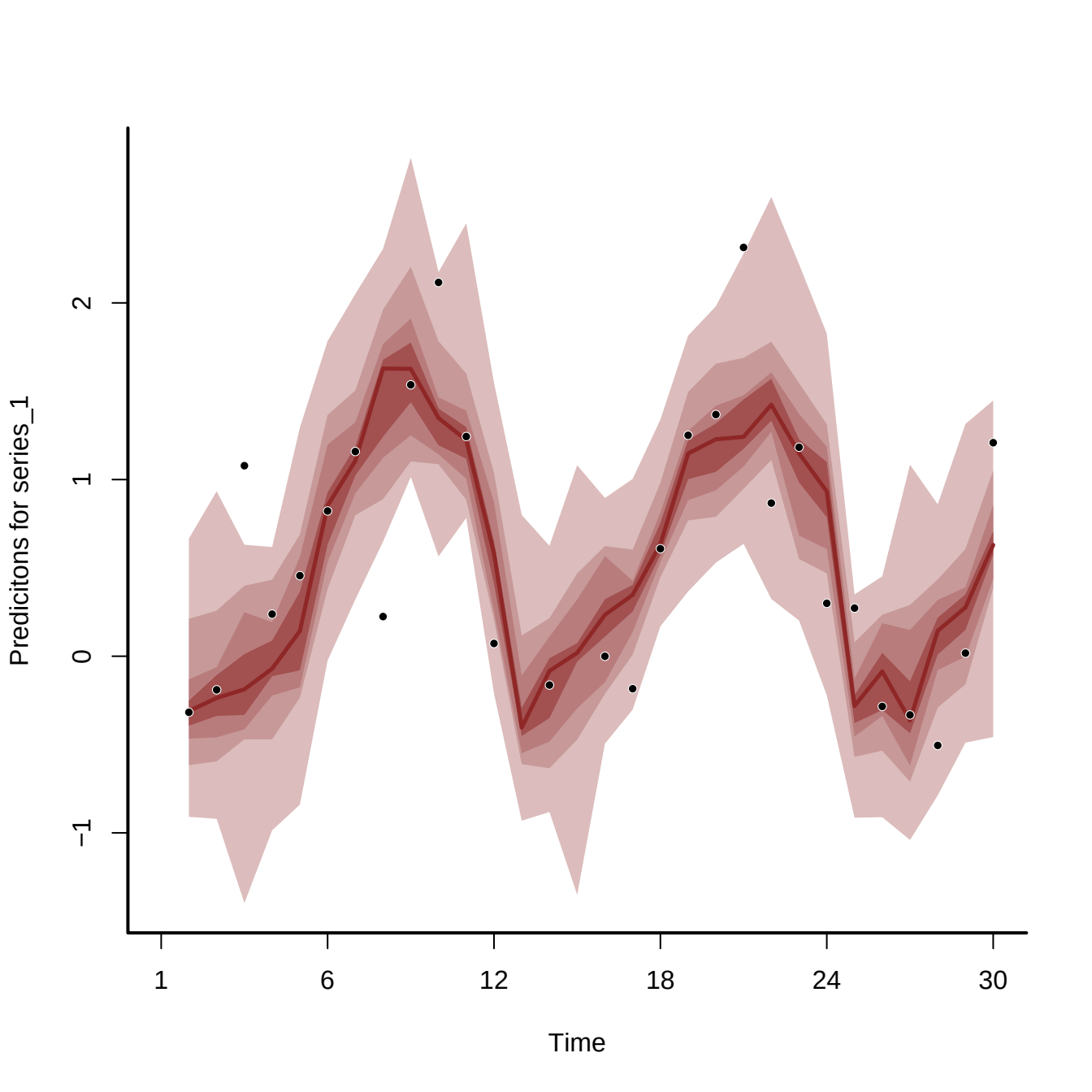

Estimated trend for series1
5
0
−5
0
10
20
30
40
50
Time

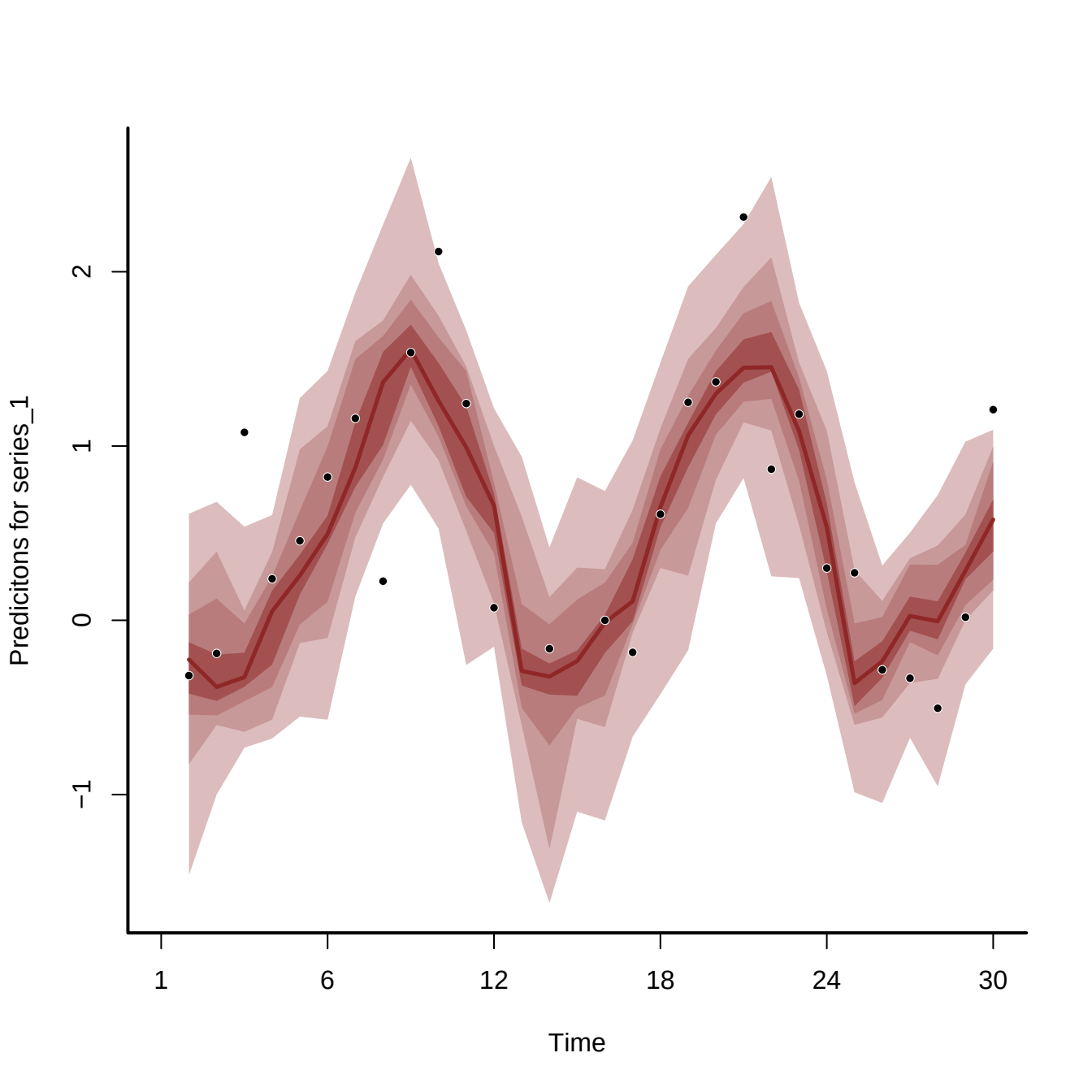

s(series)
Partial effect
3
2
1
0
−1
−2
−3
series1
series2

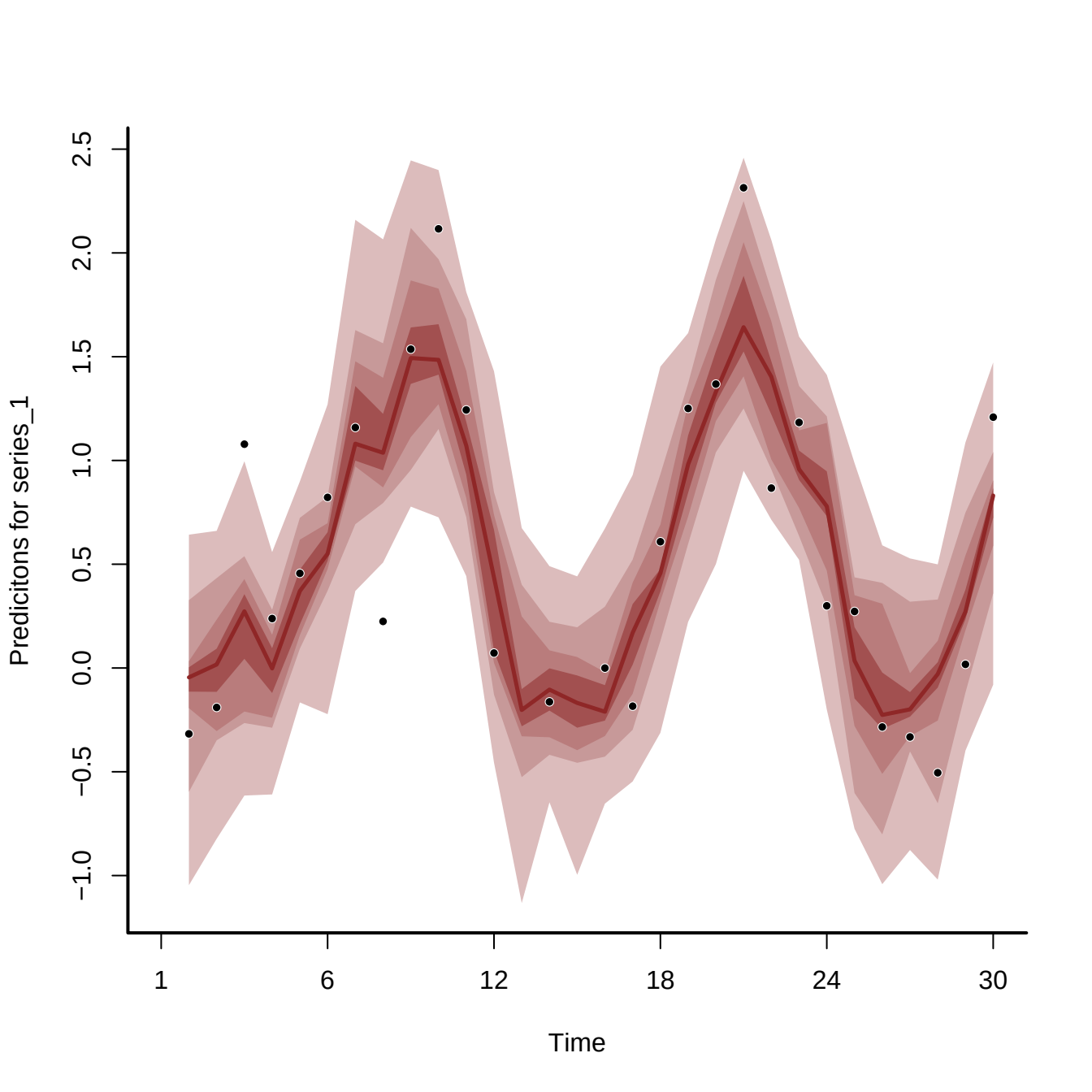

gp(x):seriesseries1
gp(x):seriesseries2
Partial effect
Partial effect
6
4
2
0
−2
−4
−6
4
2
0
−2
−4
−6
−2
−1
0
1
2
−2
−1
0
1
2
x
x

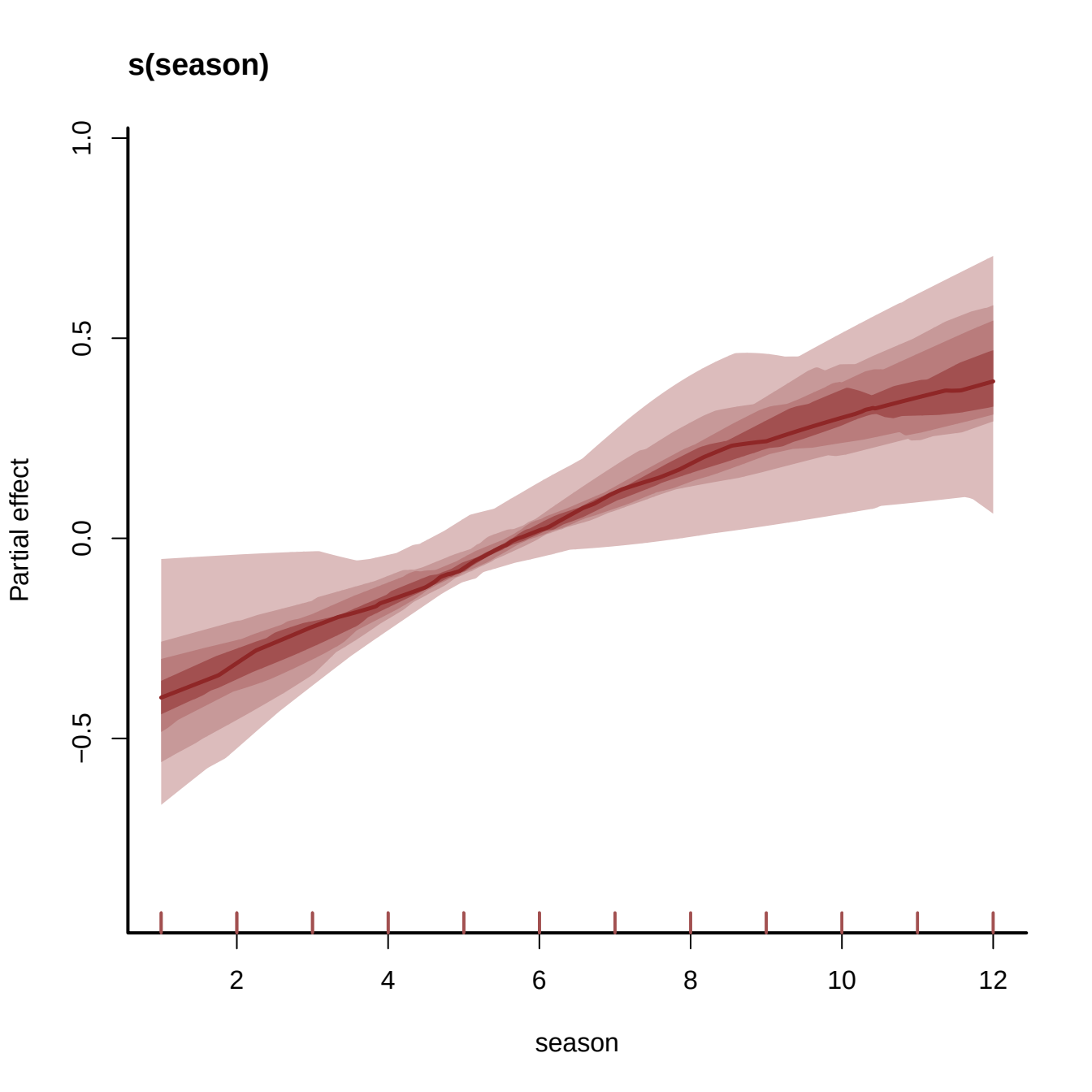

gp(x):seriesseries1
gp(x):seriesseries2
Partial effect
Partial effect
6
4
2
0
−2
−4
−6
4
2
0
−2
−4
−6
−2
−1
0
1
2
−2
−1
0
1
2
x
x

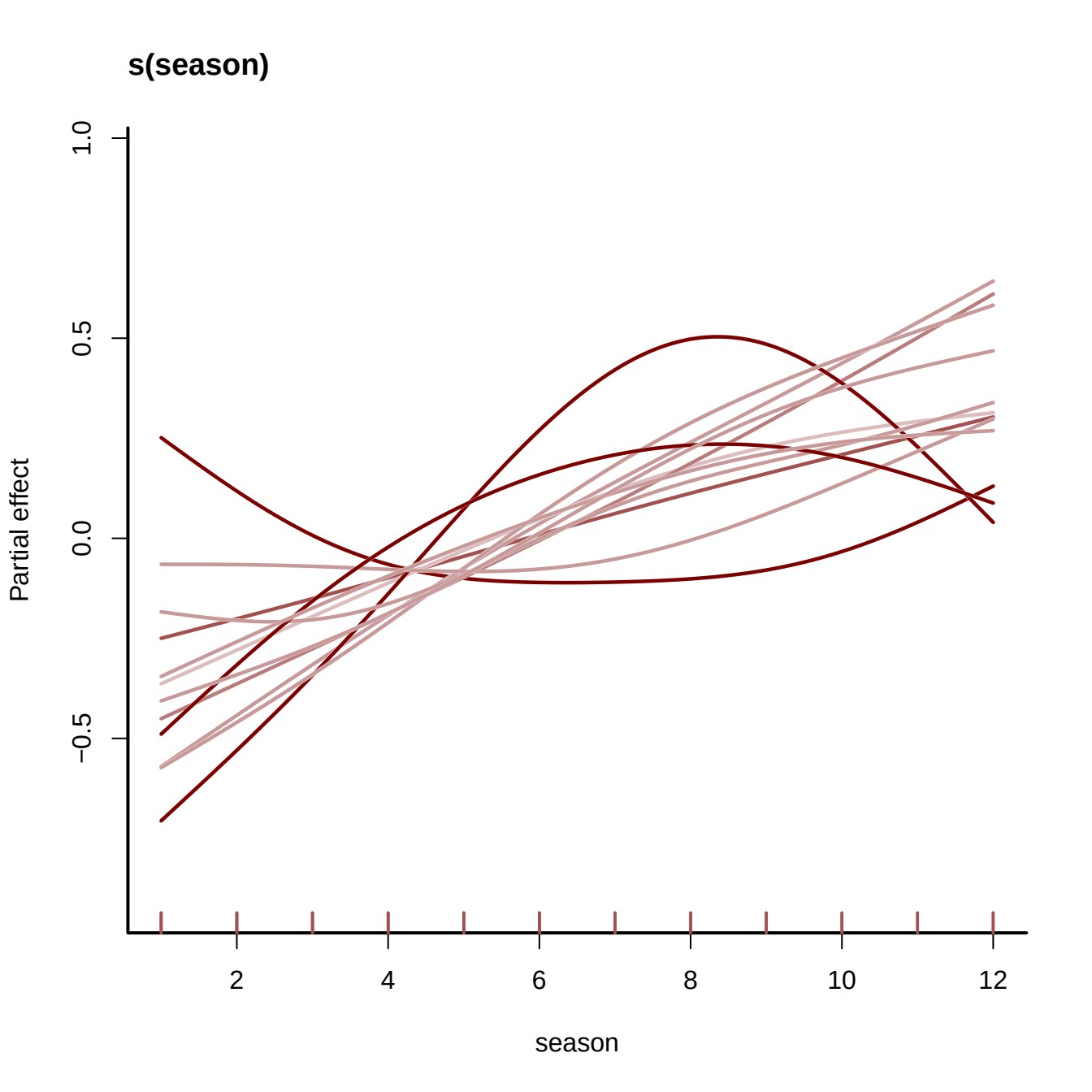

gp(x):seriesseries1
Partial effect
20
0
−20
−40
−60
−2
−1
0
1
2
x
gp(x):seriesseries2
Partial effect
60
40
20
0
−20
−2
−1
0
1
2
x

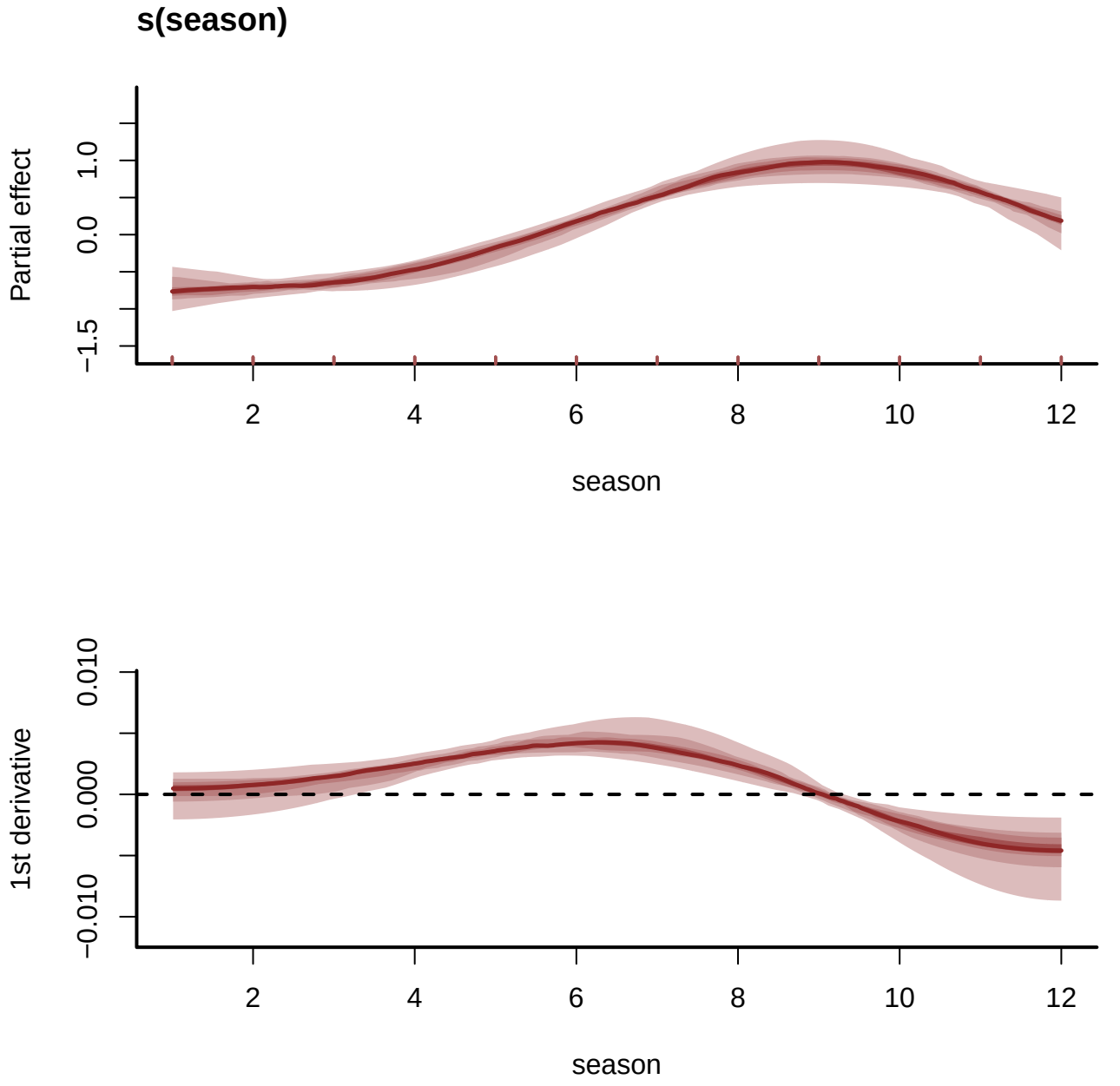

Predicitons for series_1
2
1
0
−1
1
6
12
18
24
30
Time

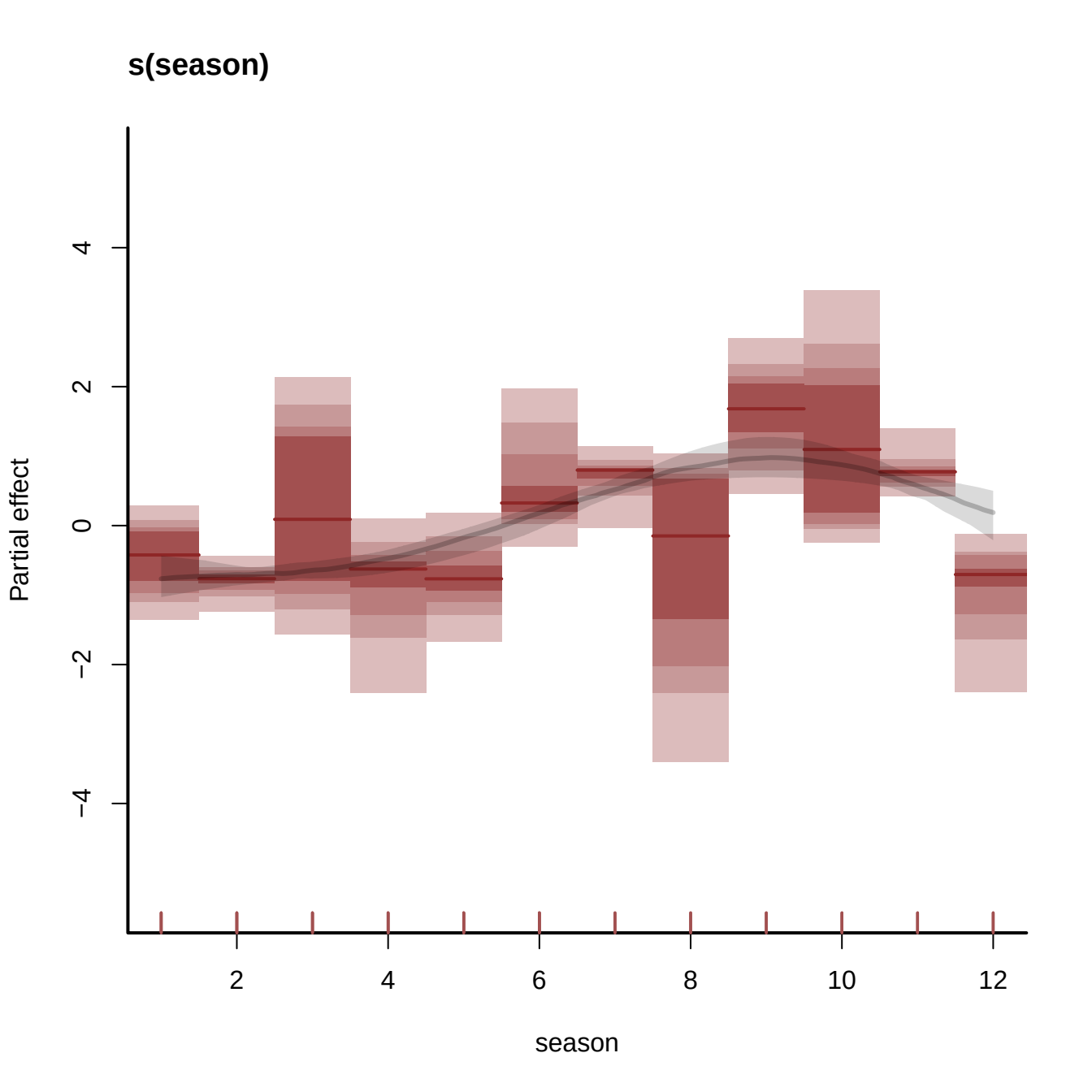

Predicitons for series_1
2
1
0
−1
1
6
12
18
24
30
Time

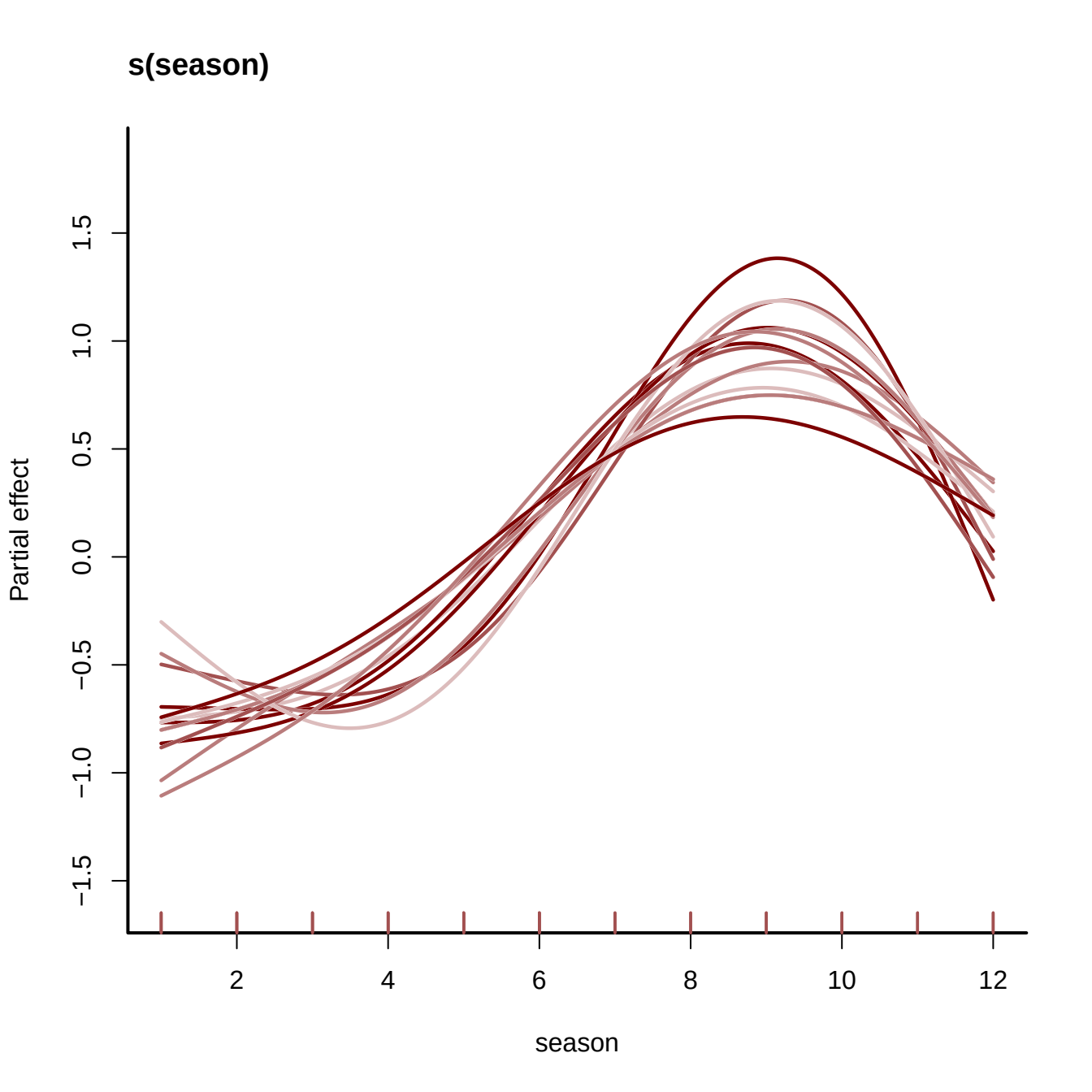

Predicitons for series_1
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
1
6
12
18
24
30
Time

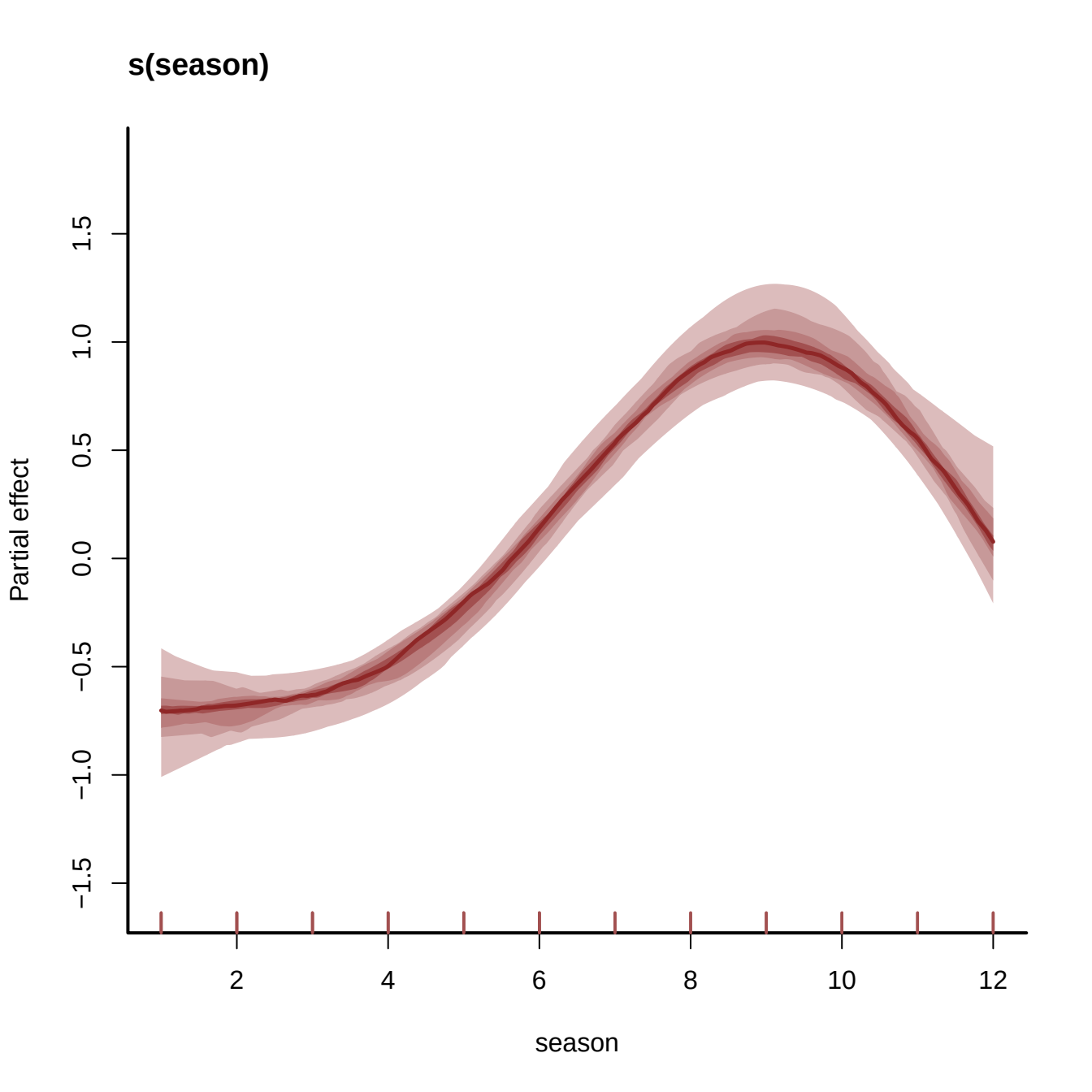

s(season)
Partial effect
1.0
0.5
0.0
−0.5
2
4
6
8
10
12
season

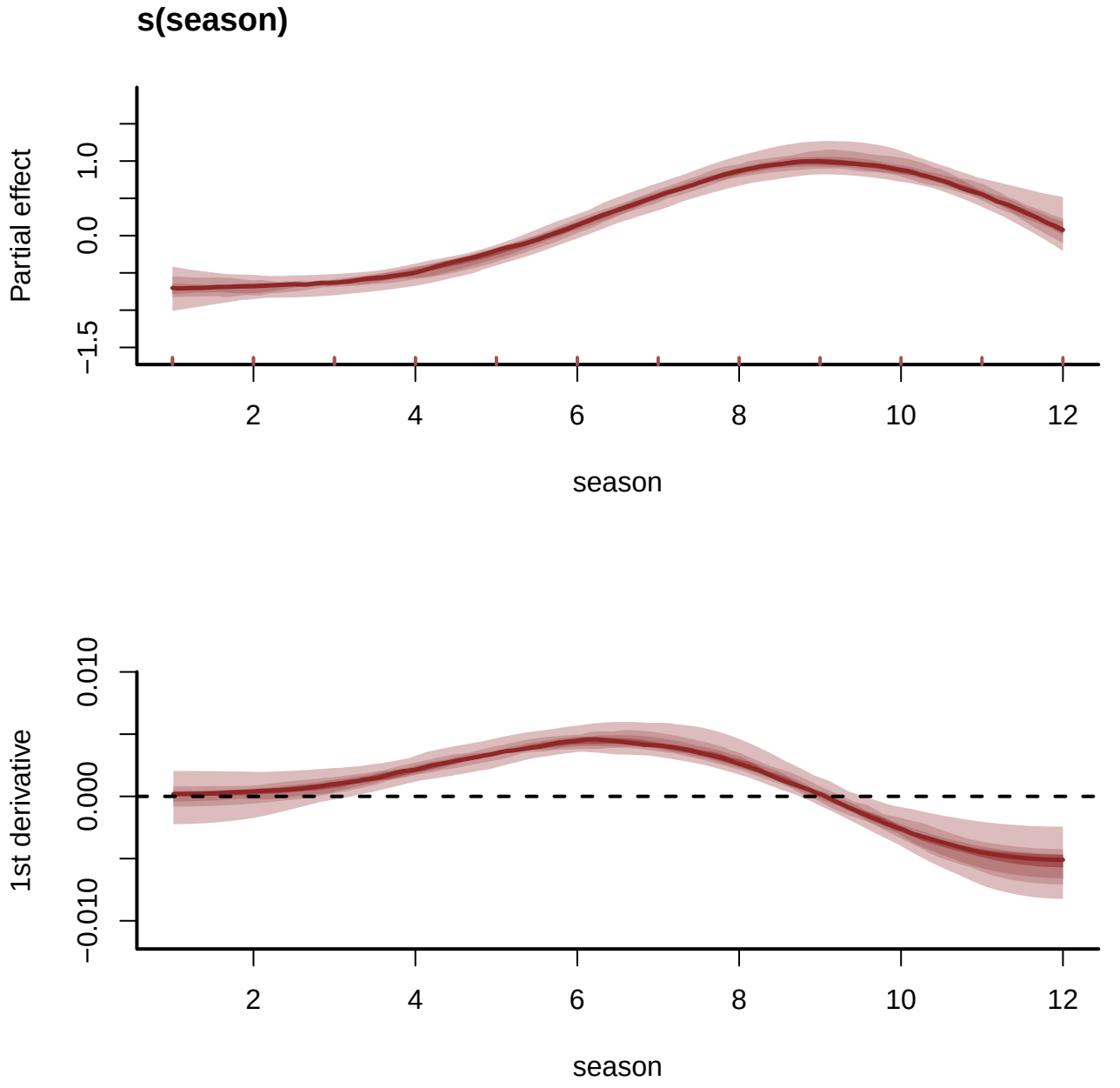

s(season)
Partial effect
1.0
0.5
0.0
−0.5
2
4
6
8
10
12
season

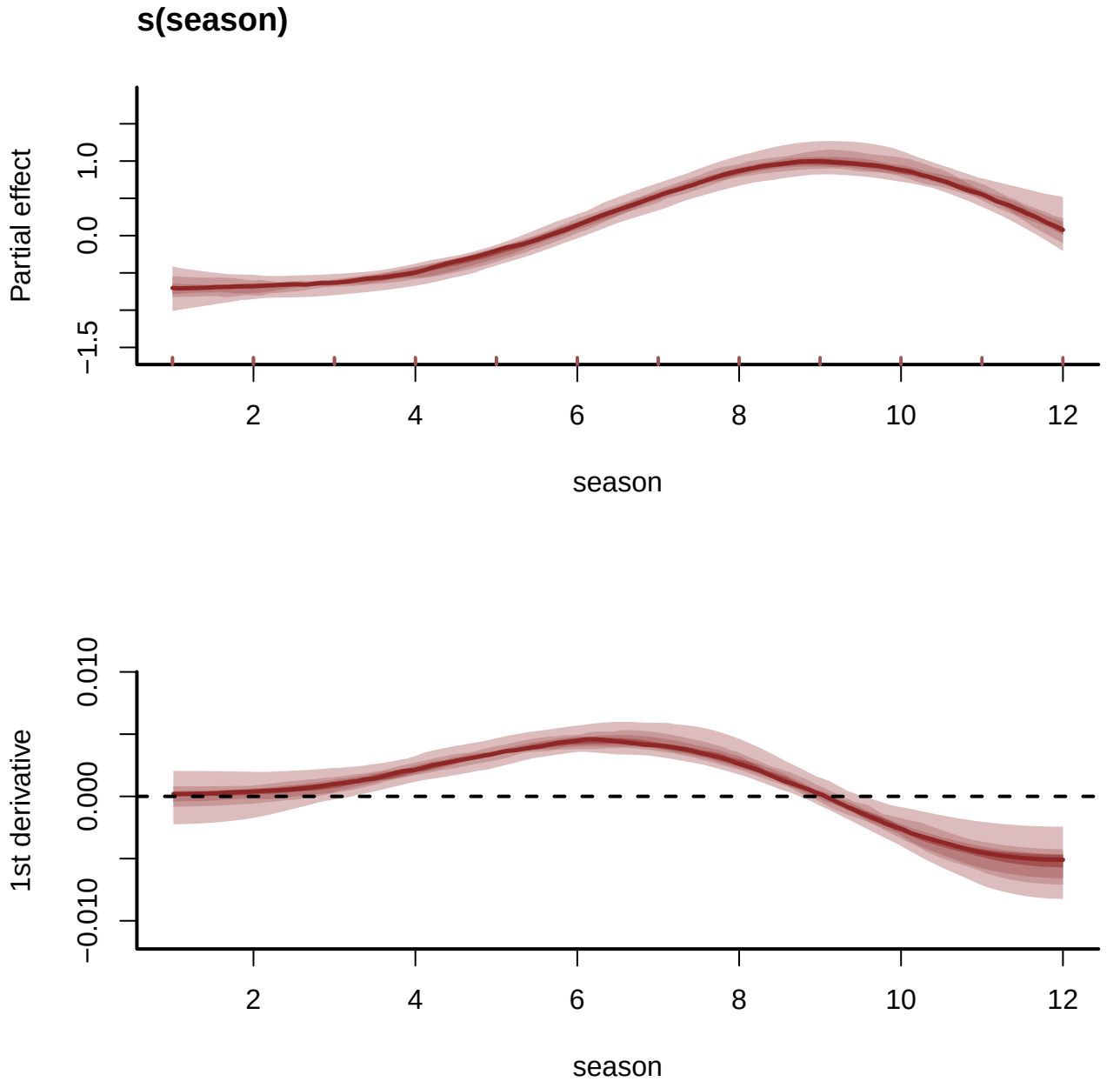

s(season)
Partial effect
−1.5
0.0
1.0
2
4
6
8
10
12
season
1st derivative
−0.010
0.000
0.010
2
4
6
8
10
12
season

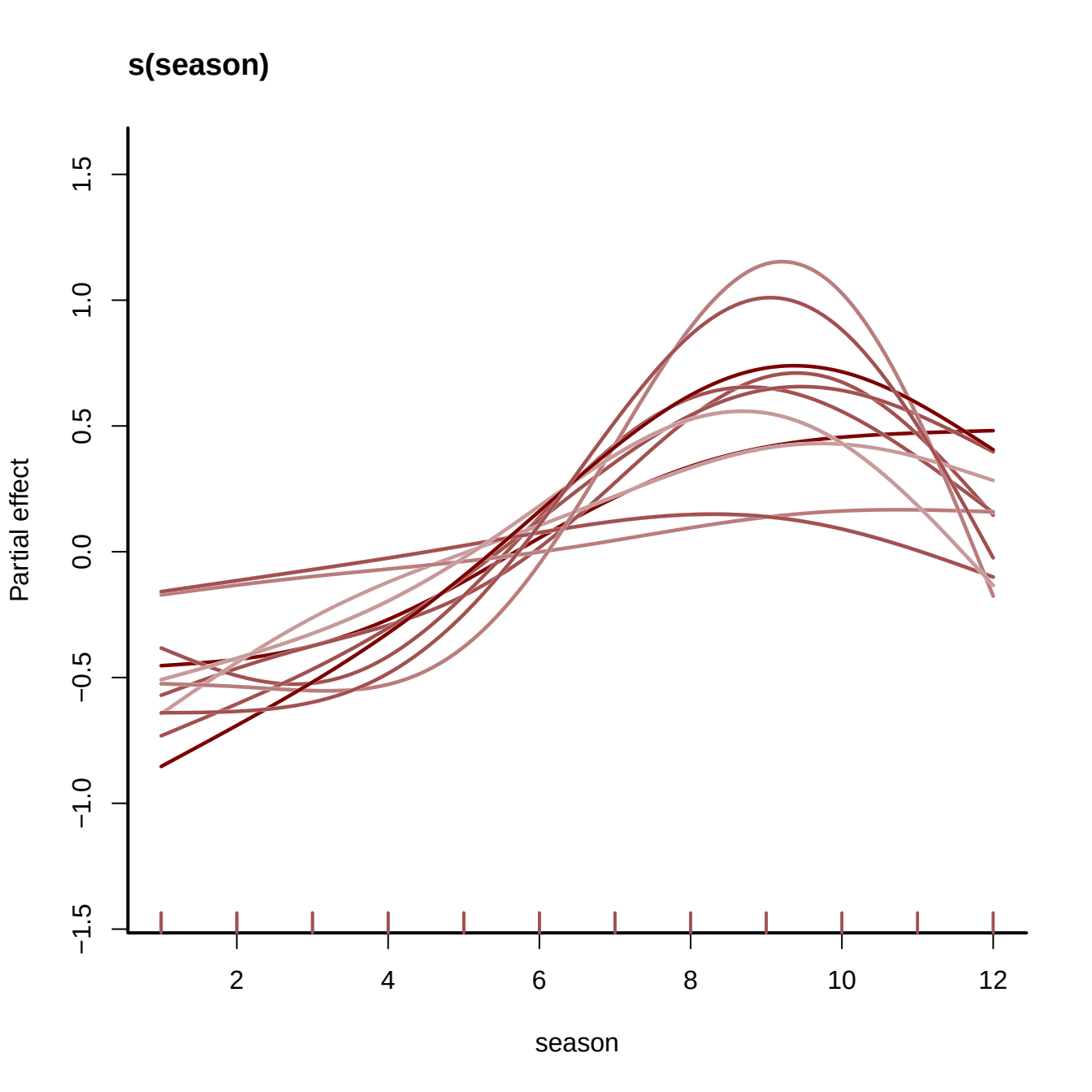

s(season)
Partial effect
4
2
0
−2
−4
2
4
6
8
10
12
season

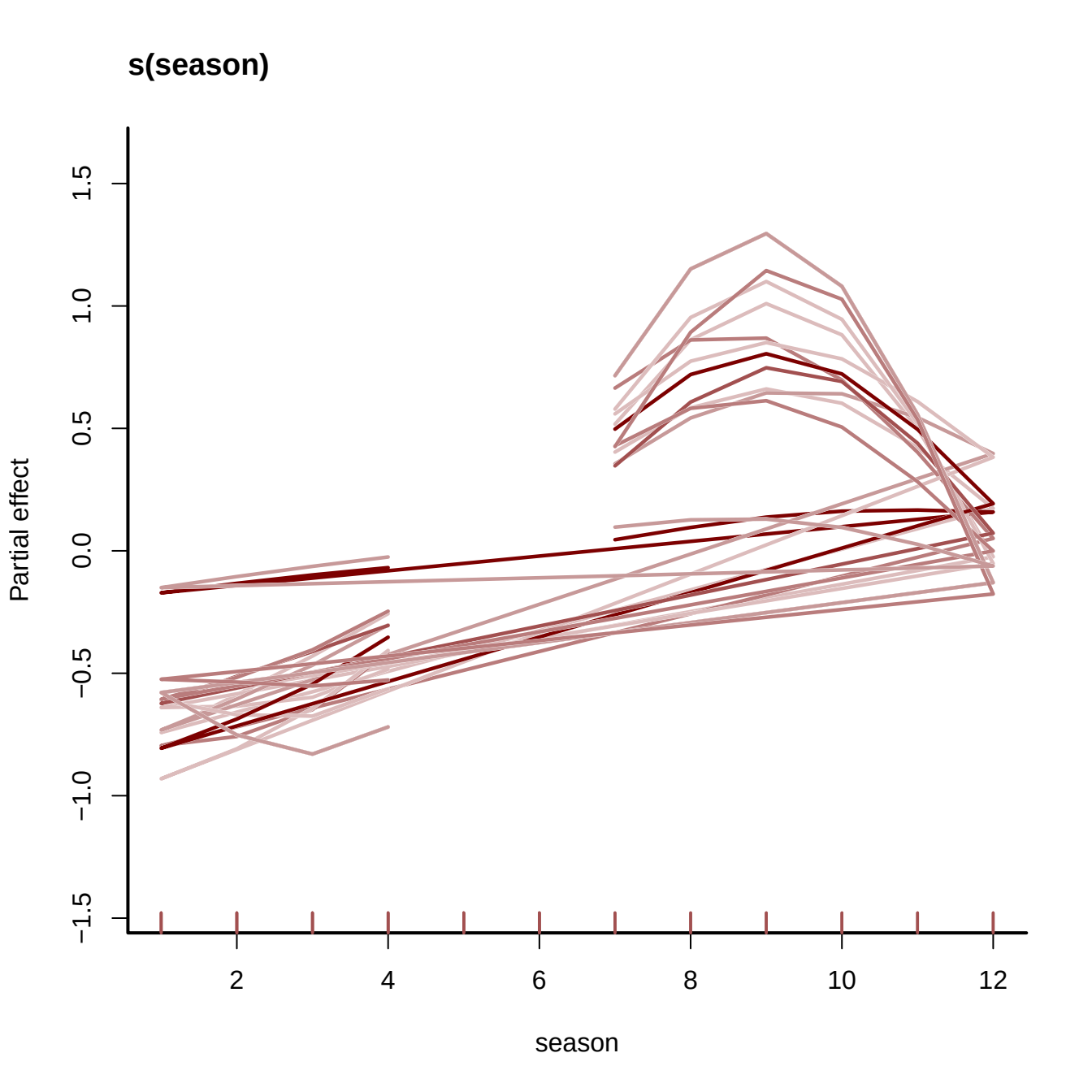

s(season)
Partial effect
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
2
4
6
8
10
12
season

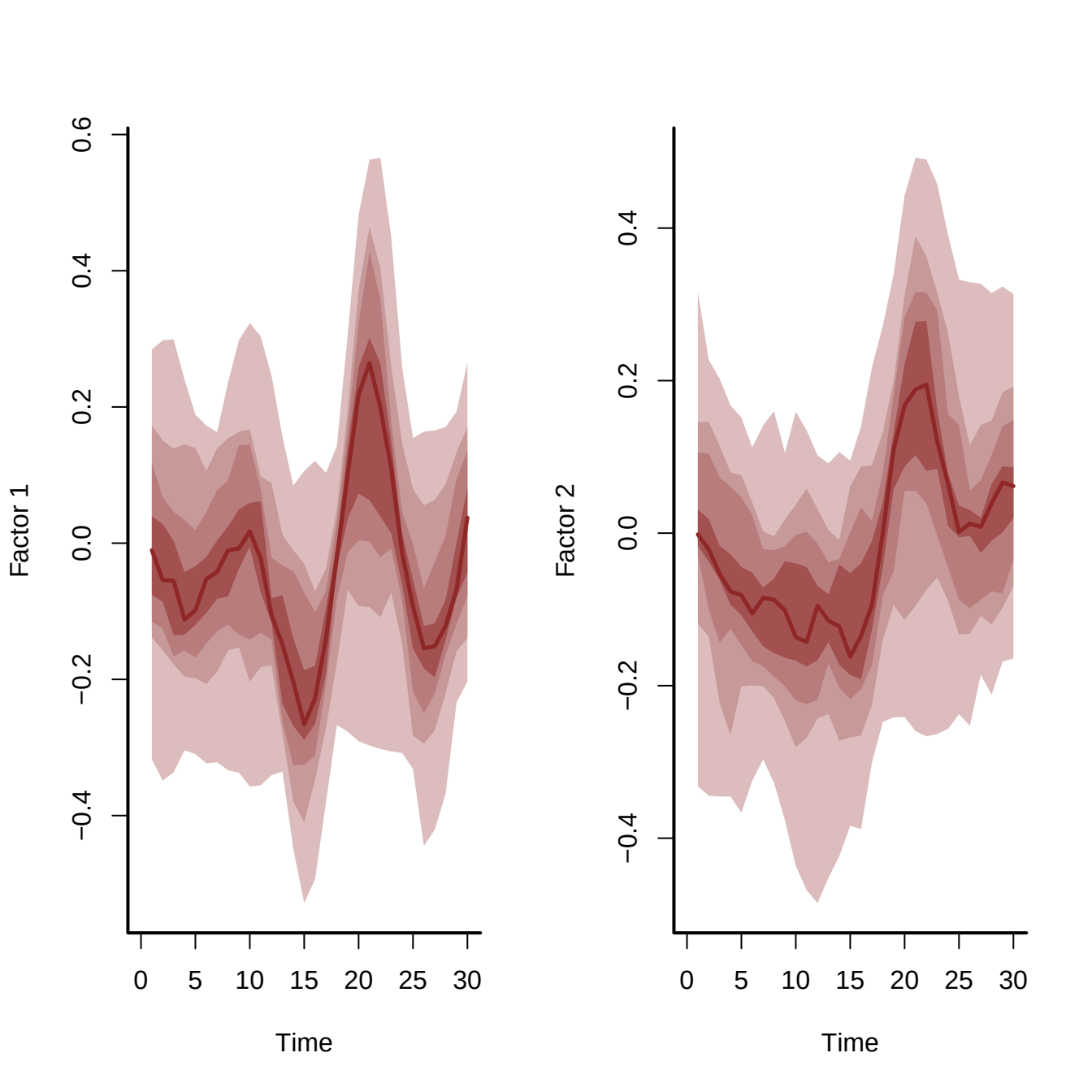

s(season)
Partial effect
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
2
4
6
8
10
12
season

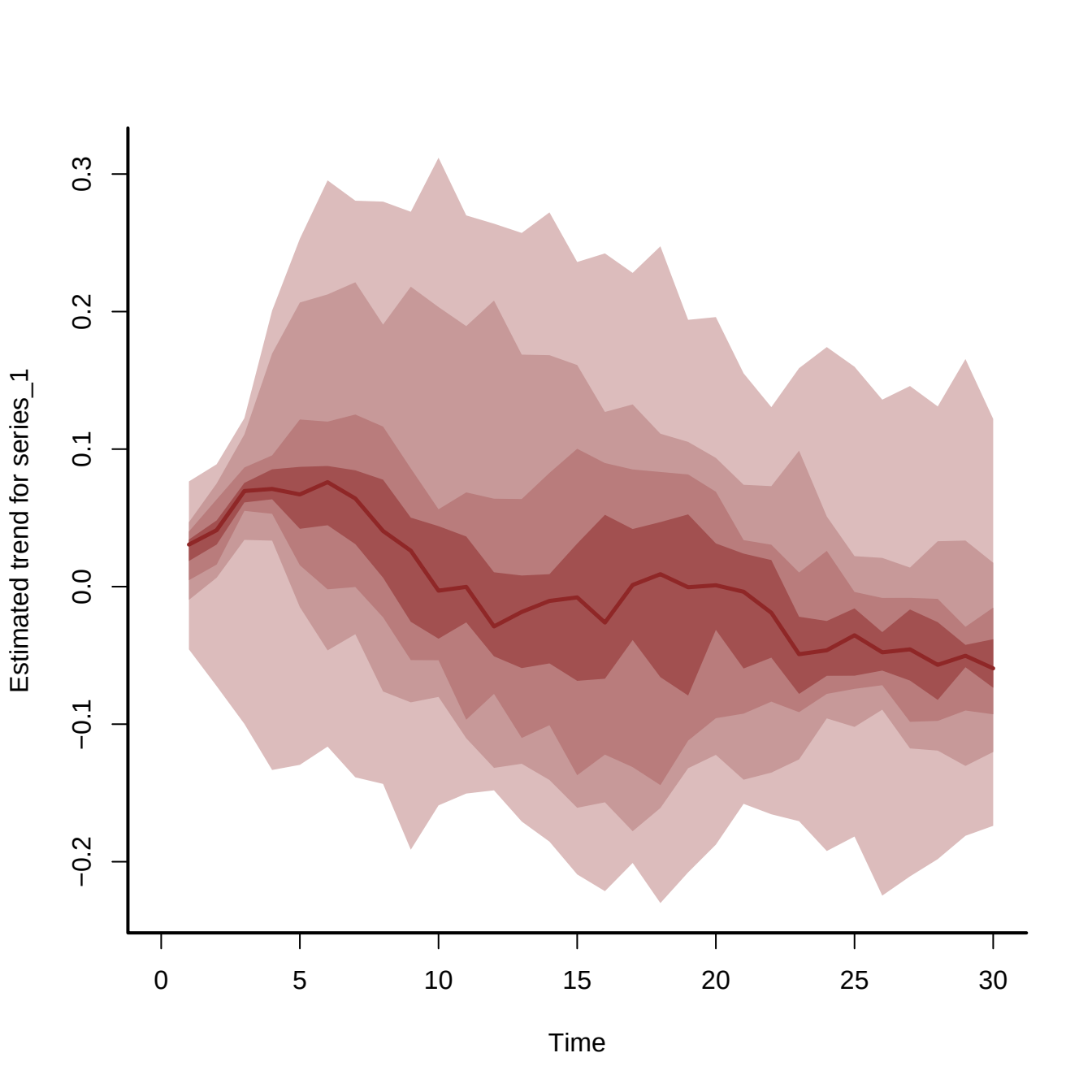

s(season)
Partial effect
1.0
0.0
−1.5
2
4
6
8
10
12
season
1st derivative
0.010
0.000
−0.010
2
4
6
8
10
12
season

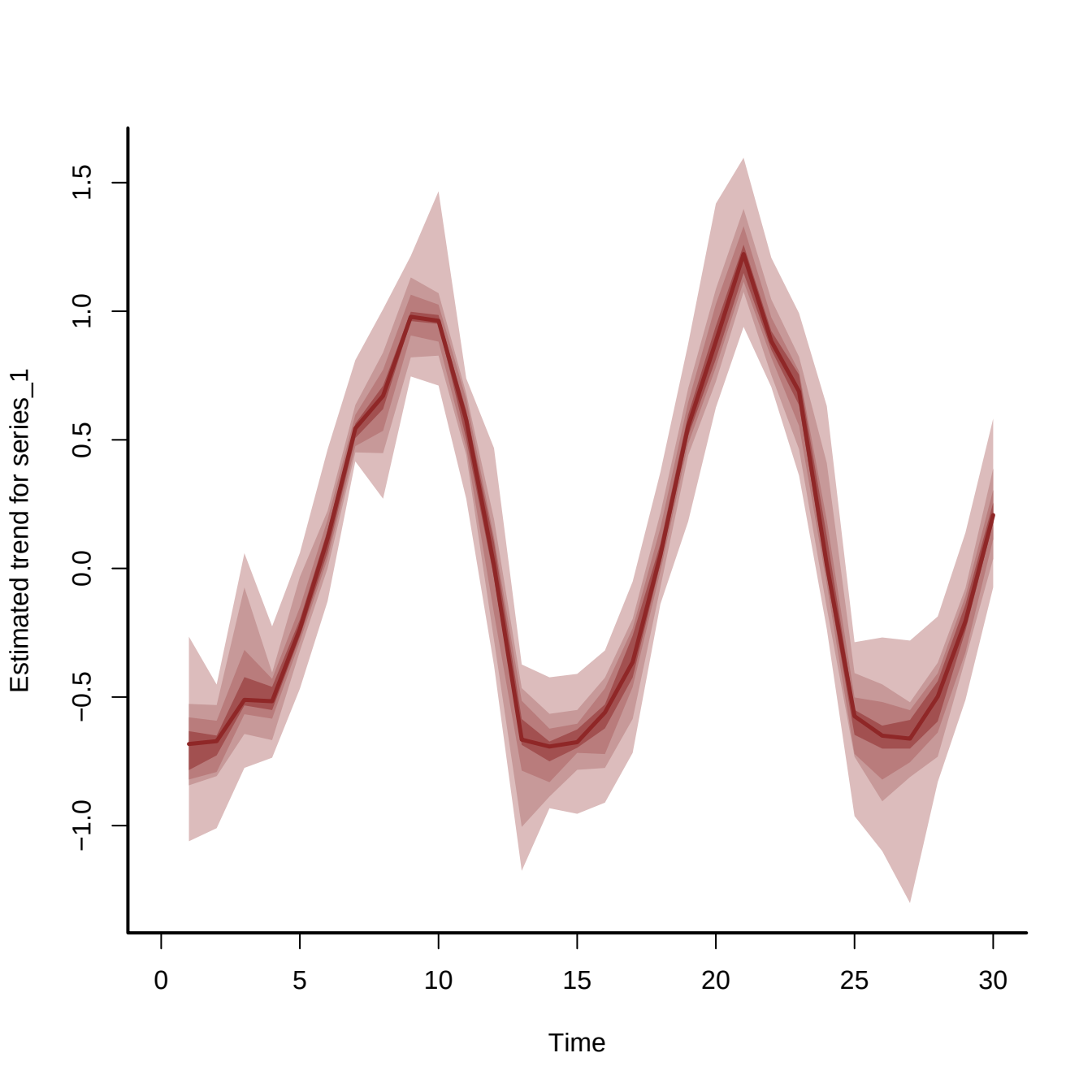

s(season)
Partial effect
1.0
0.0
−1.5
2
4
6
8
10
12
season
1st derivative
0.010
0.000
−0.010
2
4
6
8
10
12
season

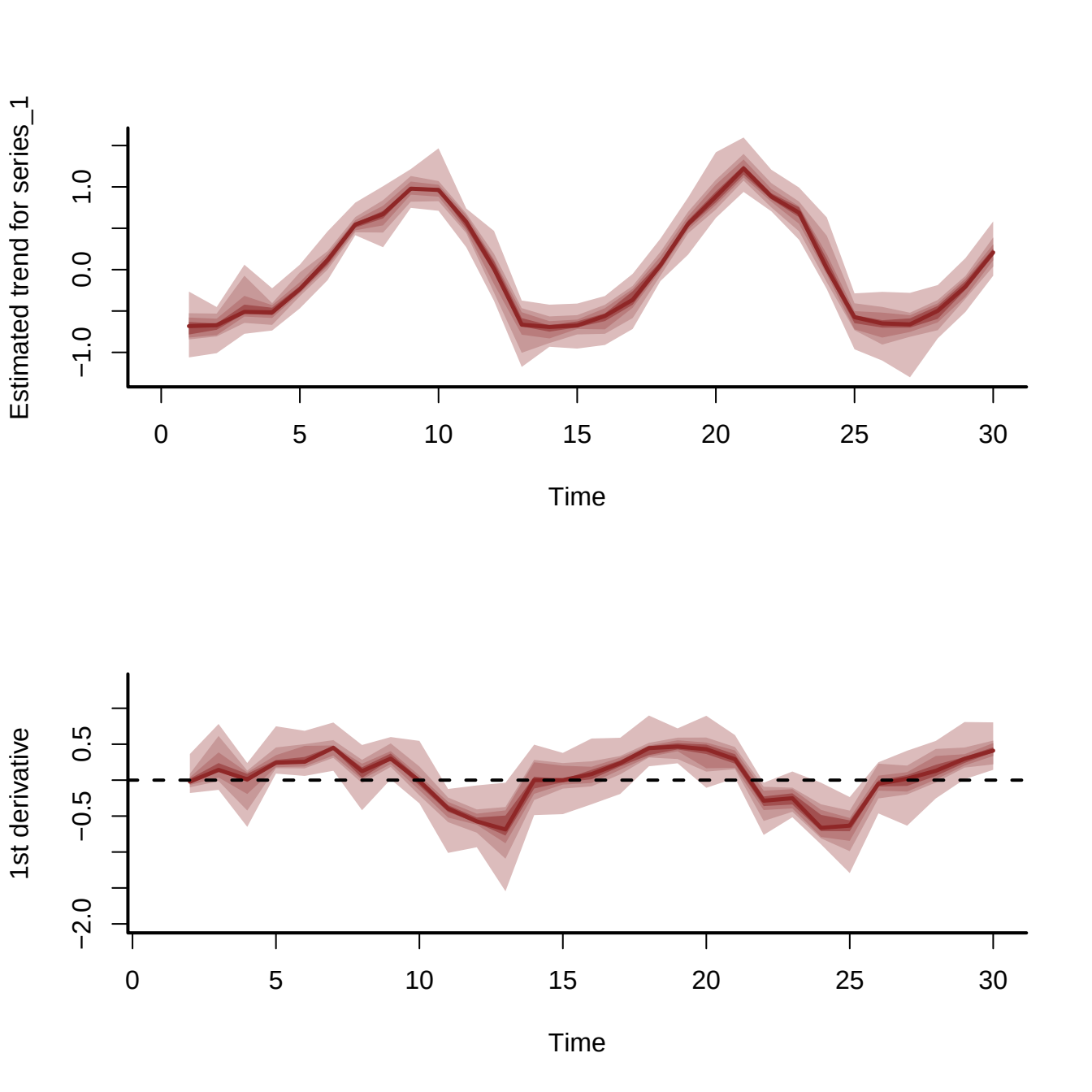

s(season)
Partial effect
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
2
4
6
8
10
12
season

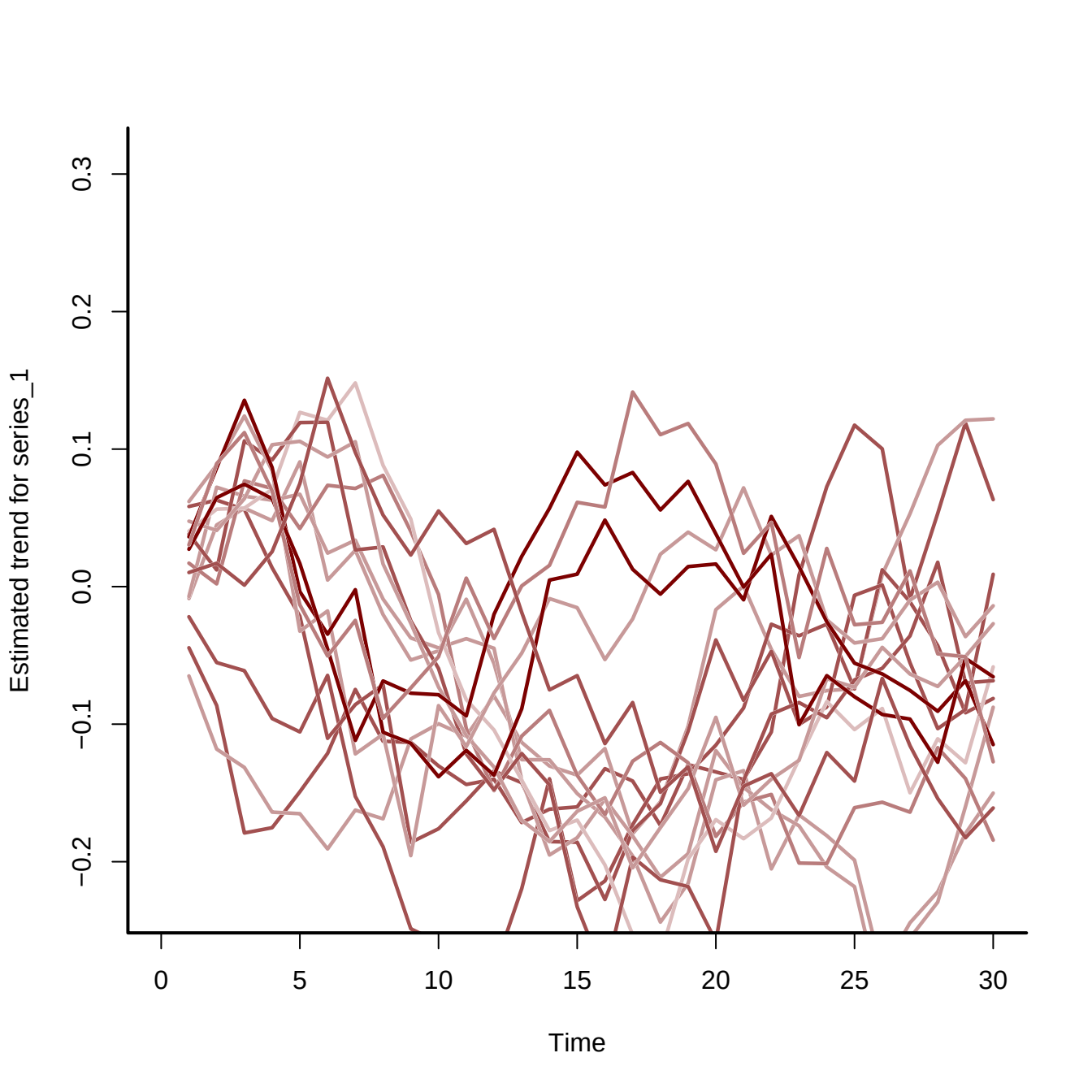

s(season)
Partial effect
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
2
4
6
8
10
12
season

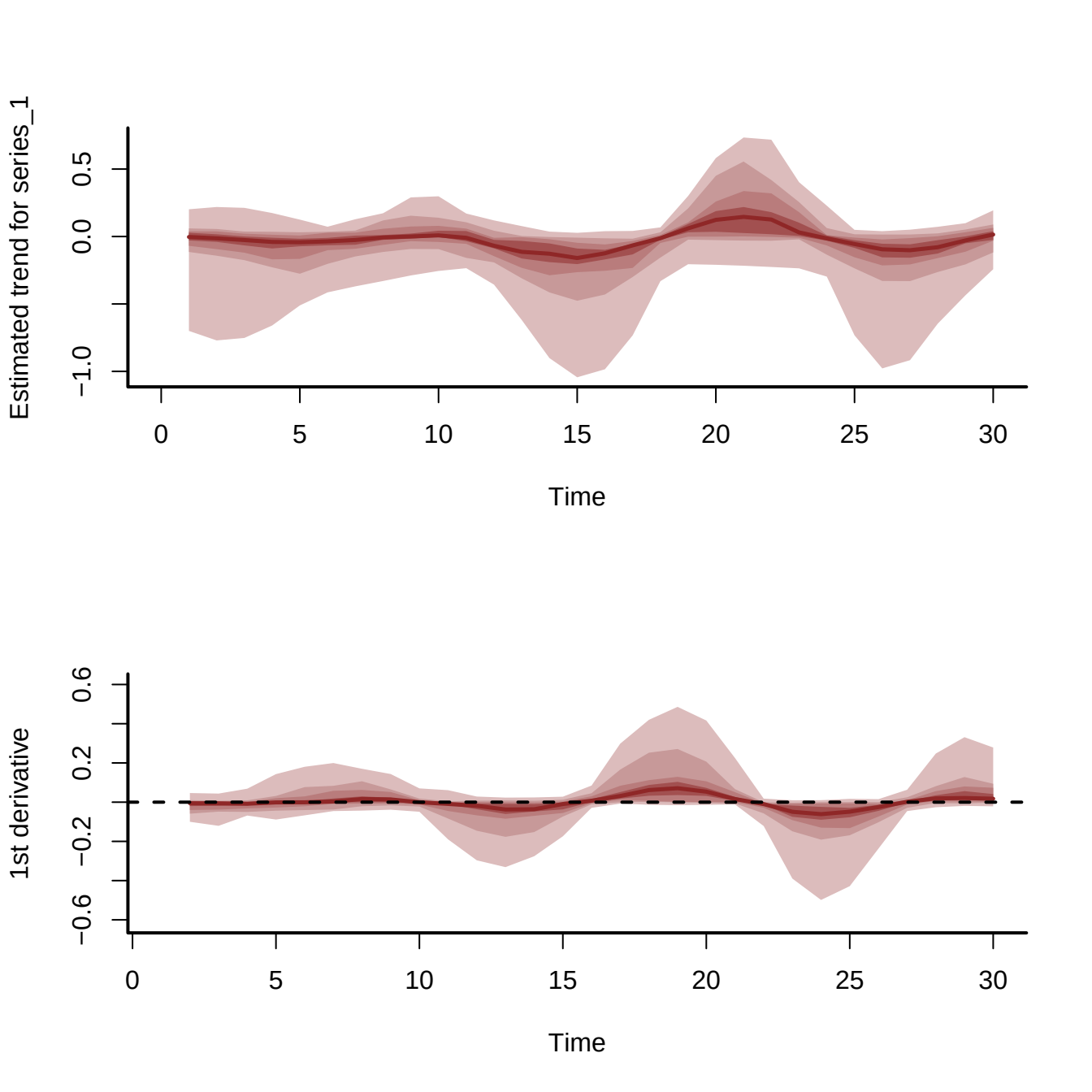

Factor 1
0.6
0.4
0.2
0.0
−0.2
−0.4
0
5
10
15
20
25
30
Time
Factor 2
0.4
0.2
0.0
−0.2
−0.4
0
5
10
15
20
25
30
Time

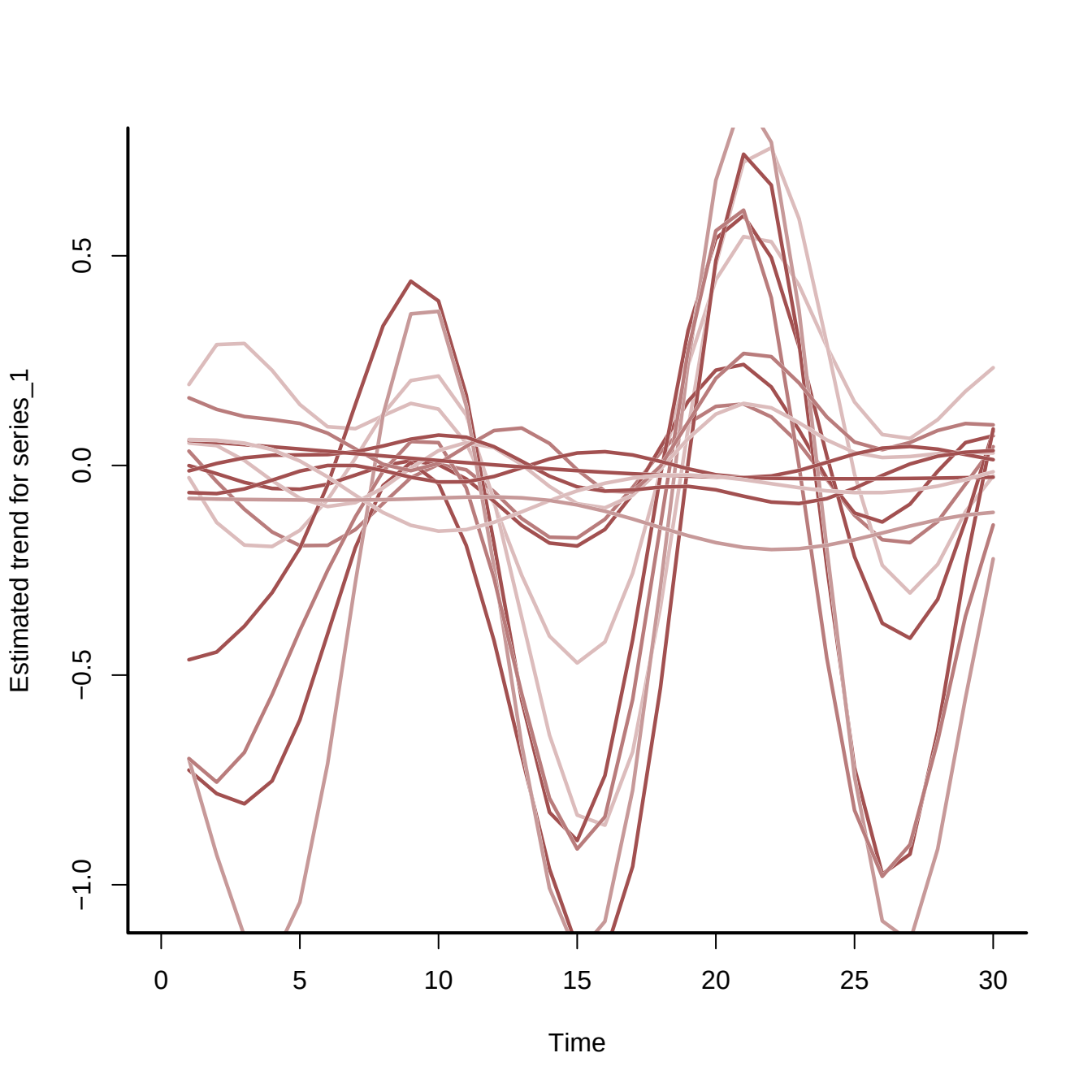

Estimated trend for series_1
0.3
0.2
0.1
0.0
−0.1
−0.2
0
5
10
15
20
25
30
Time

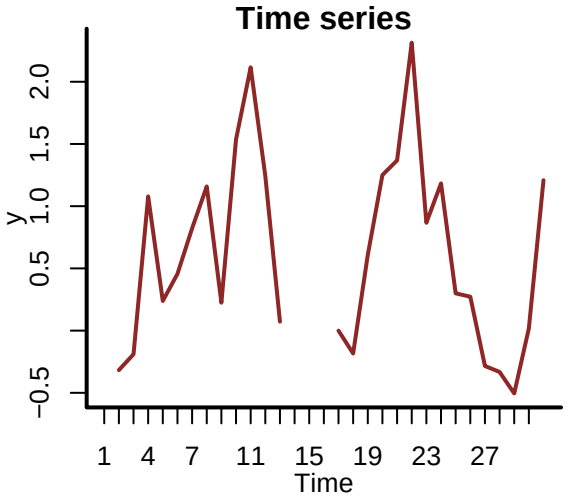

Estimated trend for series_1
1.5
1.0
0.5
0.0
−0.5
−1.0
0
5
10
15
20
25
30
Time

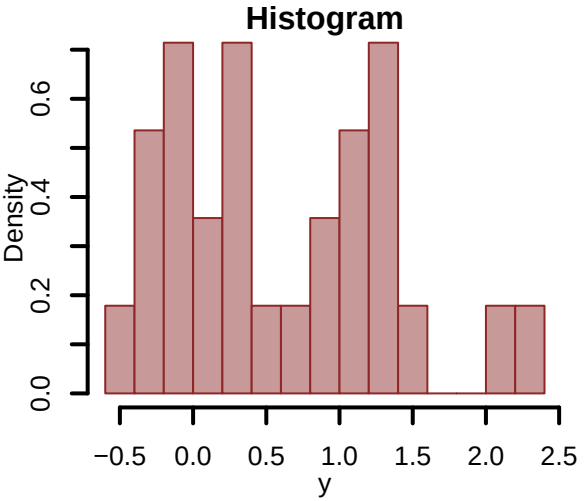

Estimated trend for series_1
−1.0
0.0
1.0
0
5
10
15
20
25
30
Time
1st derivative
−2.0
−0.5
0.5
0
5
10
15
20
25
30
Time

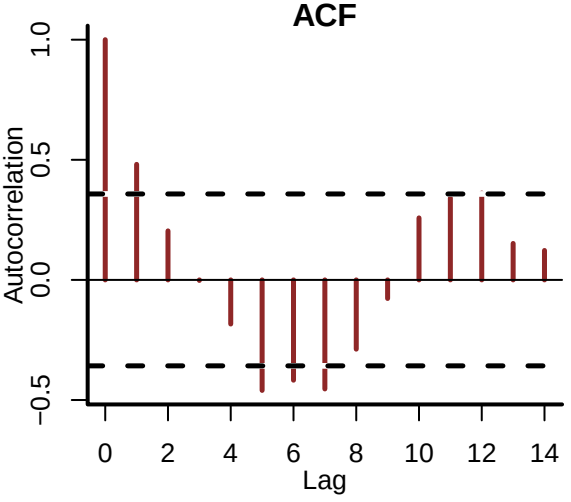

Estimated trend for series_1
0.3
0.2
0.1
0.0
−0.1
−0.2
0
5
10
15
20
25
30
Time

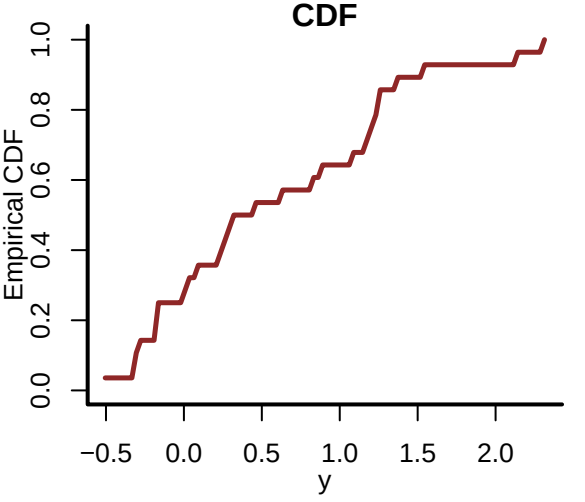

Estimated trend for series_1
−1.0
0.0
0.5
0
5
10
15
20
25
30
Time
1st derivative
−0.6
−0.2
0.2
0.6
0
5
10
15
20
25
30
Time

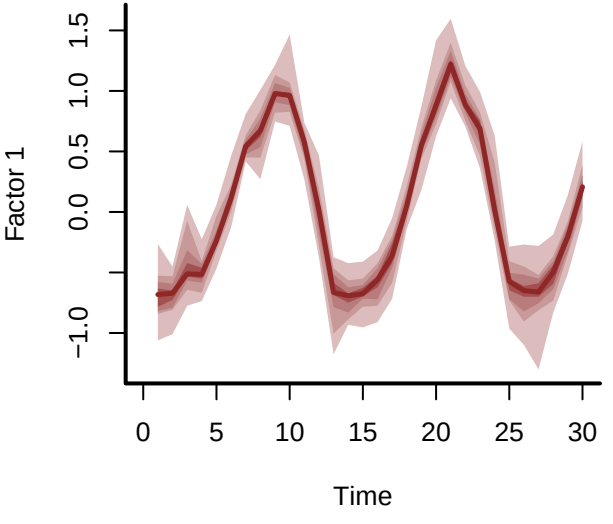

Estimated trend for series_1
0.5
0.0
−0.5
−1.0
0
5
10
15
20
25
30
Time

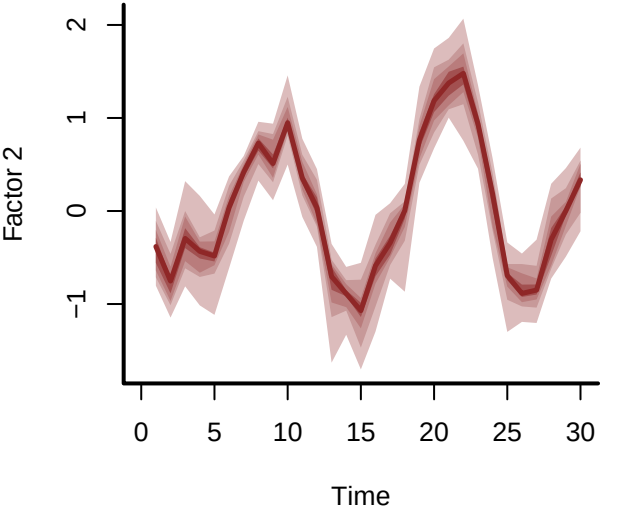

Time series
y
−0.5
0.5
1.0
1.5
2.0
1
4
7
11
15
19
23
27
Time

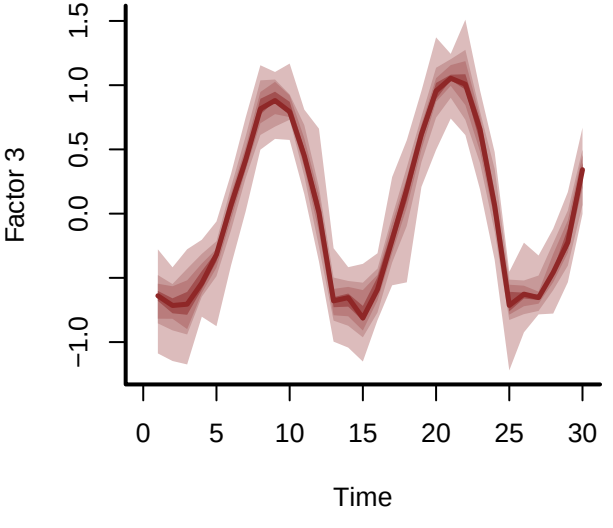

Histogram
Density
0.0
0.2
0.4
0.6
−0.5
0.0
0.5
1.0
1.5
2.0
2.5
y

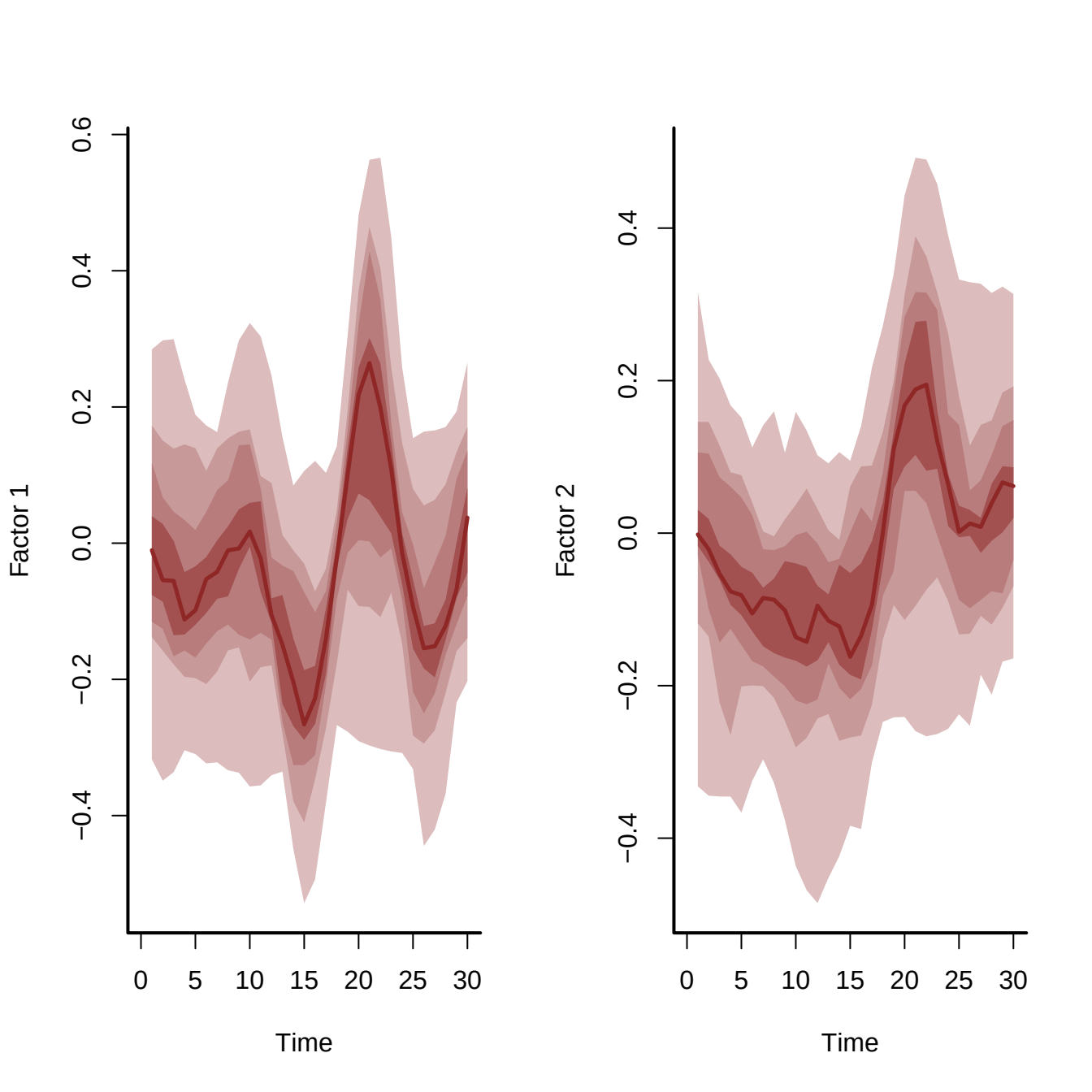

ACF
Autocorrelation
−0.5
0.0
0.5
1.0
0
2
4
6
8
10
12
14
Lag

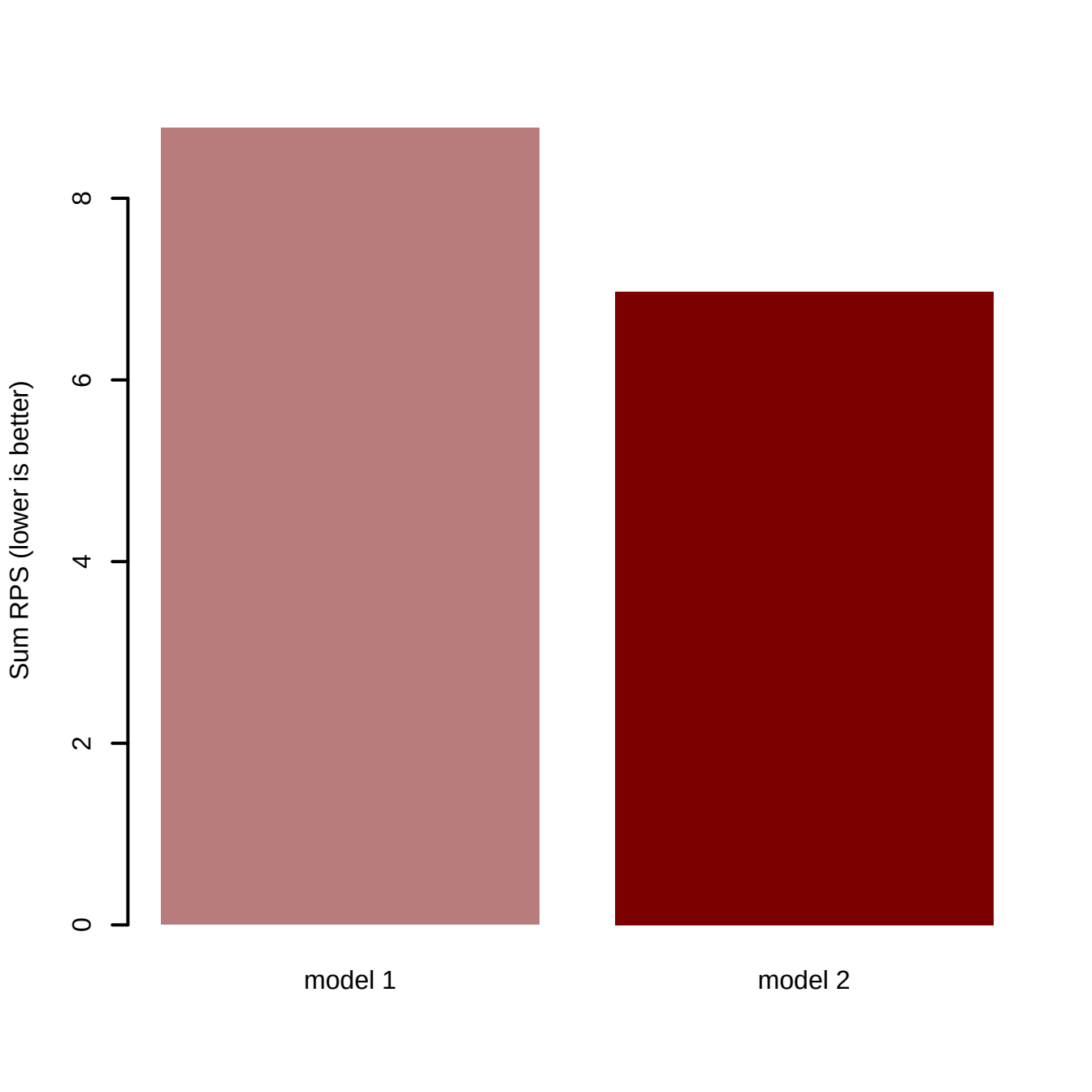

CDF
Empirical CDF
0.0
0.2
0.4
0.6
0.8
1.0
−0.5
0.0
0.5
1.0
1.5
2.0
y

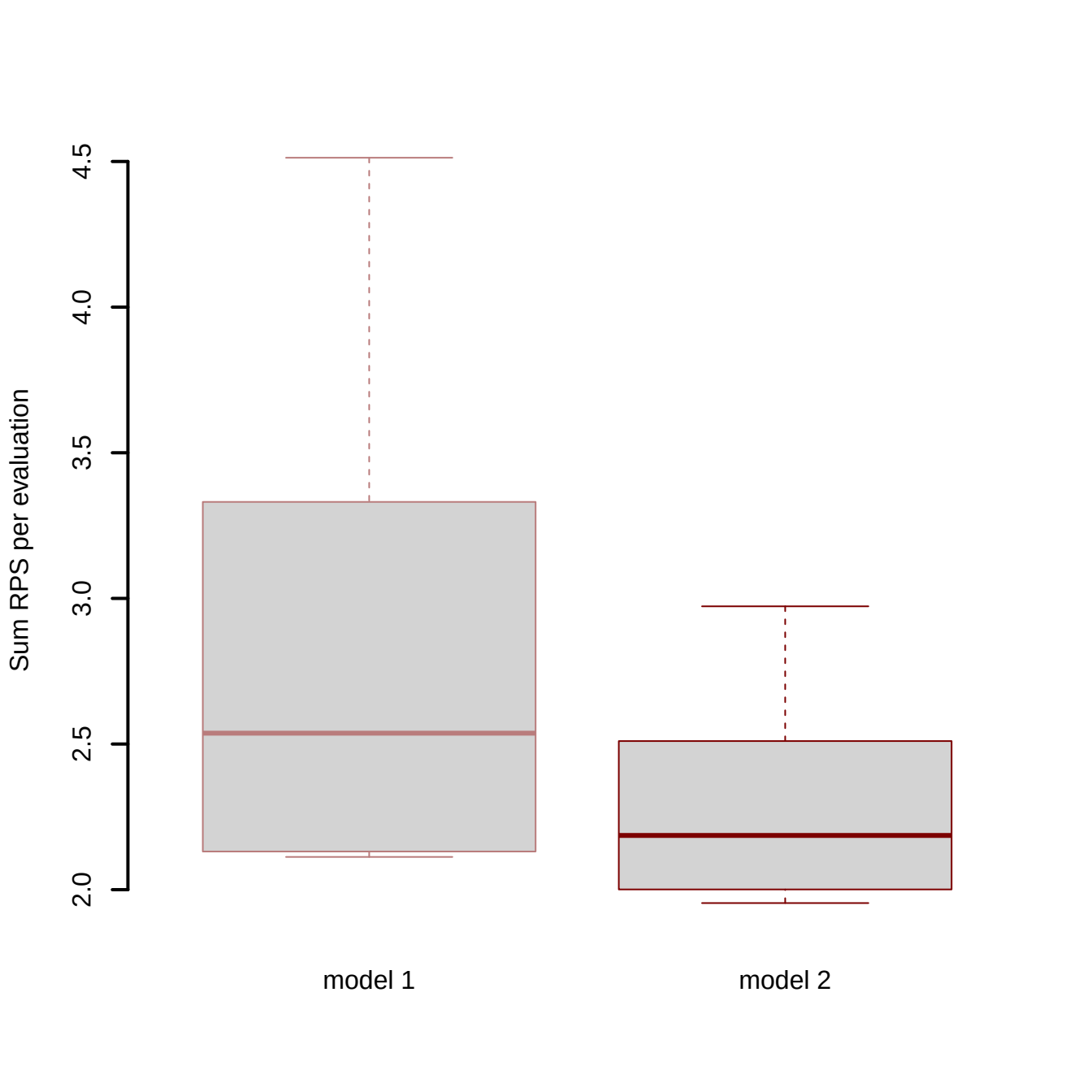

Factor 1
−1.0
0.0
0.5
1.0
1.5
0
5
10
15
20
25
30
Time

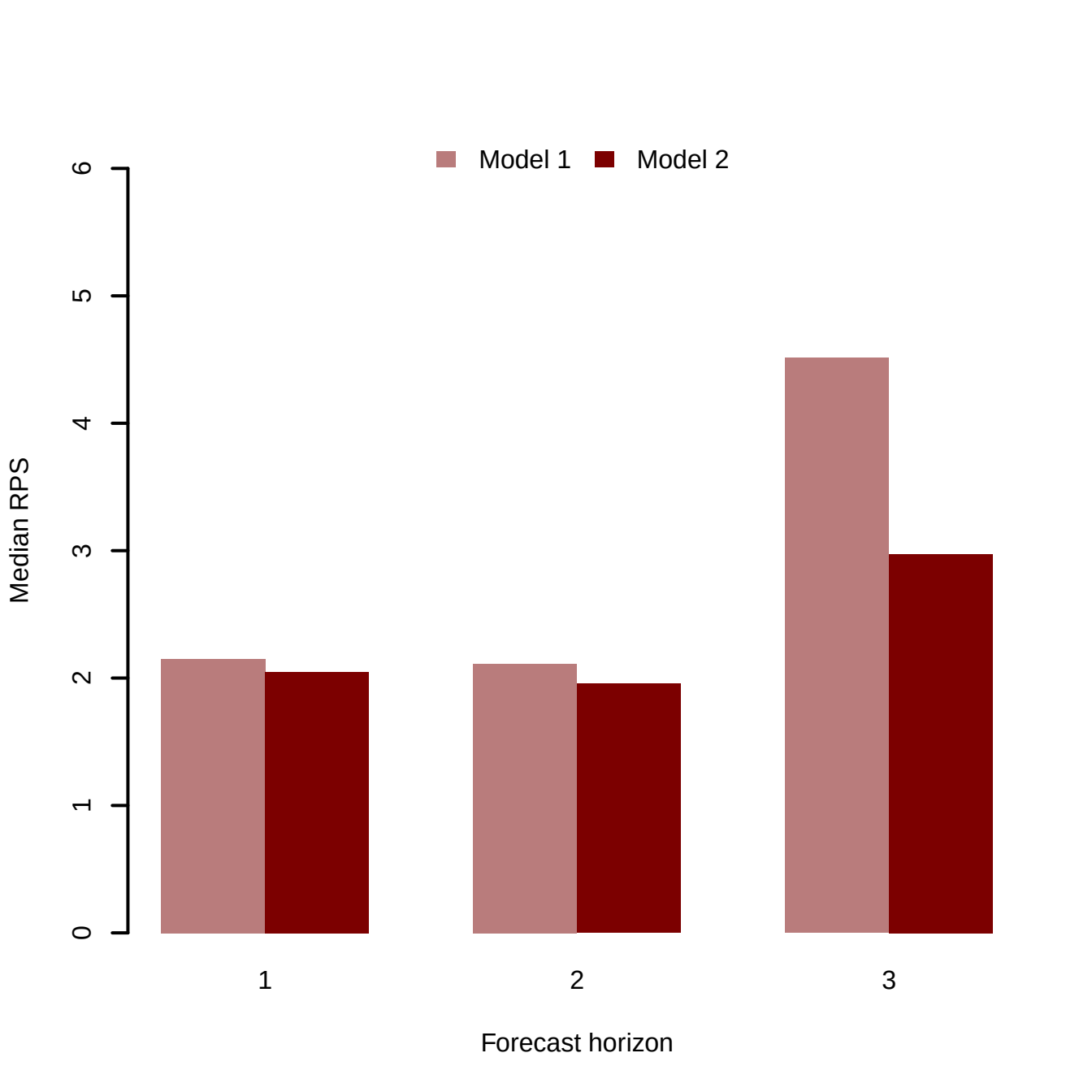

Factor 2
−1
0
1
2
0
5
10
15
20
25
30
Time

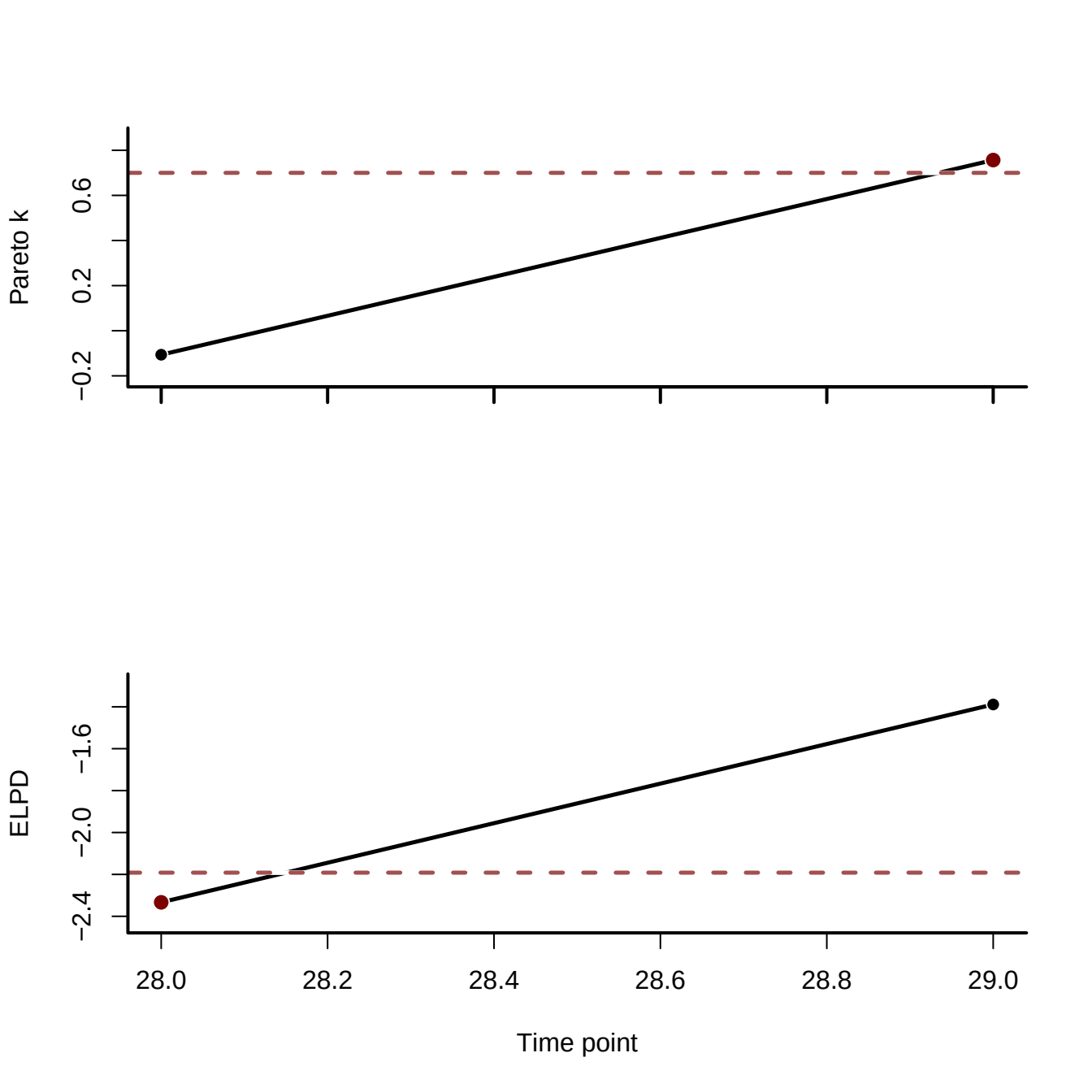

Factor 3
−1.0
0.0
0.5
1.0
1.5
0
5
10
15
20
25
30
Time

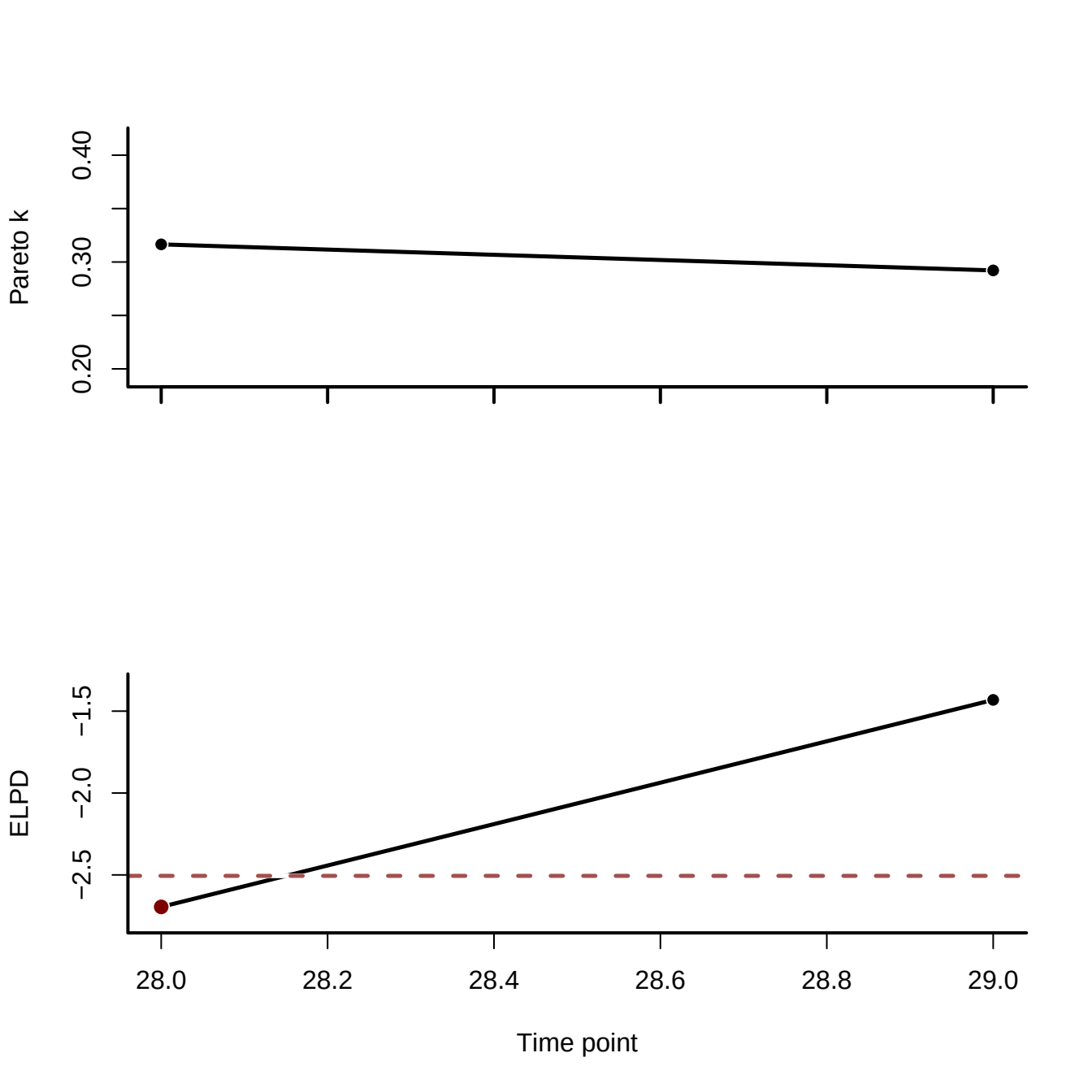

Factor 1
0.6
0.4
0.2
0.0
−0.2
−0.4
0
5
10
15
20
25
30
Time
Factor 2
0.4
0.2
0.0
−0.2
−0.4
0
5
10
15
20
25
30
Time

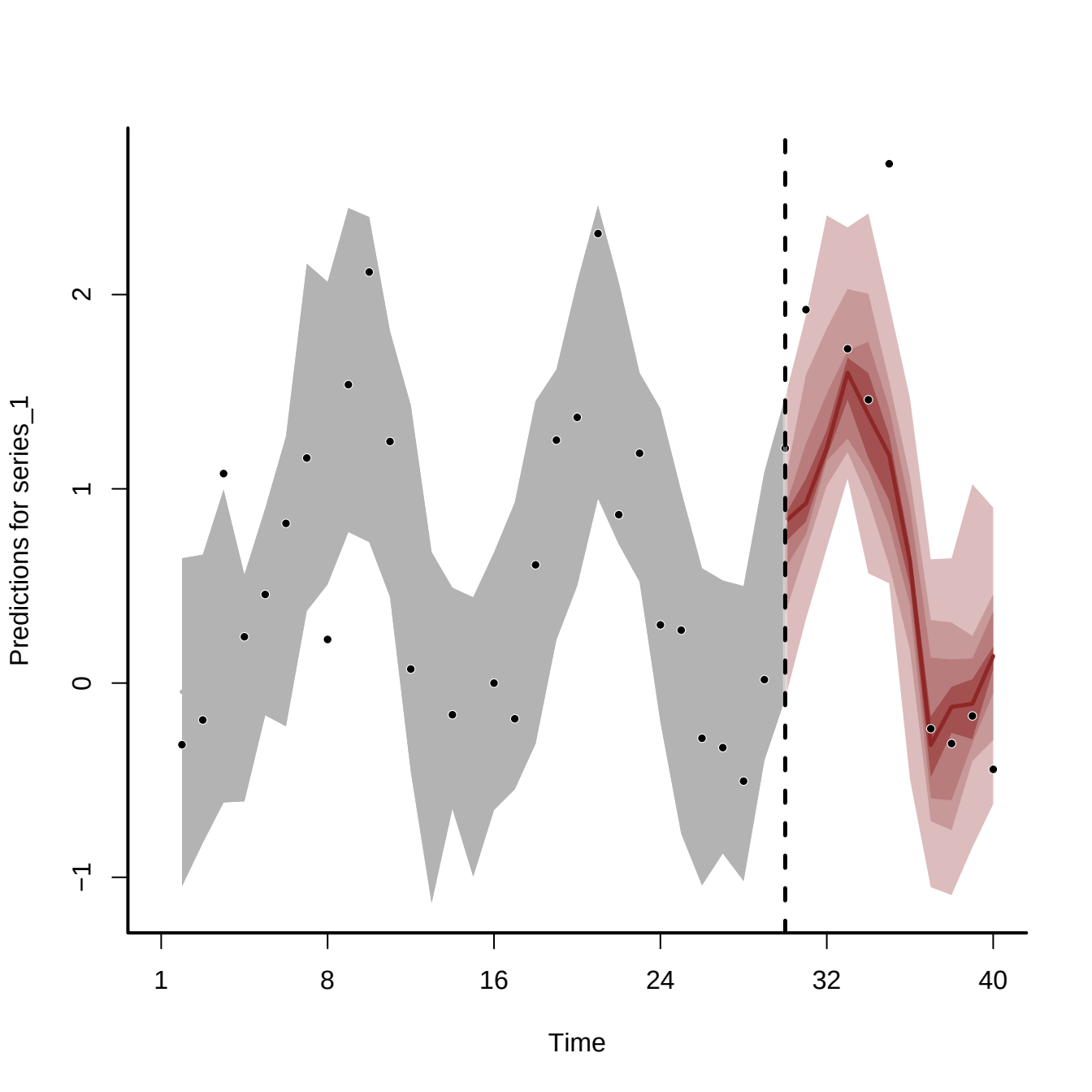

Sum RPS (lower is better)
0
2
4
6
8
model 1
model 2

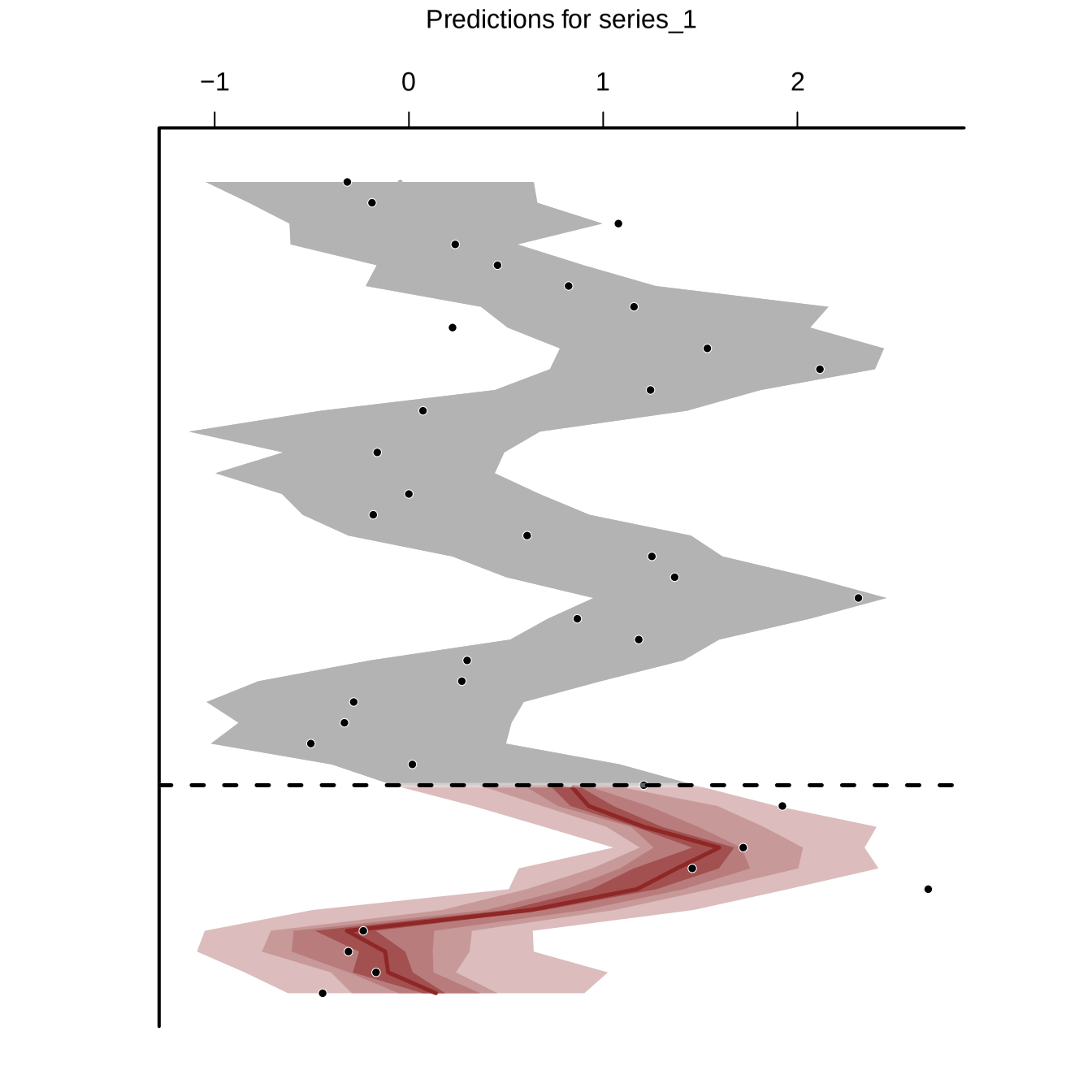

Sum RPS per evaluation
2.0
2.5
3.0
3.5
4.0
4.5
model 1
model 2

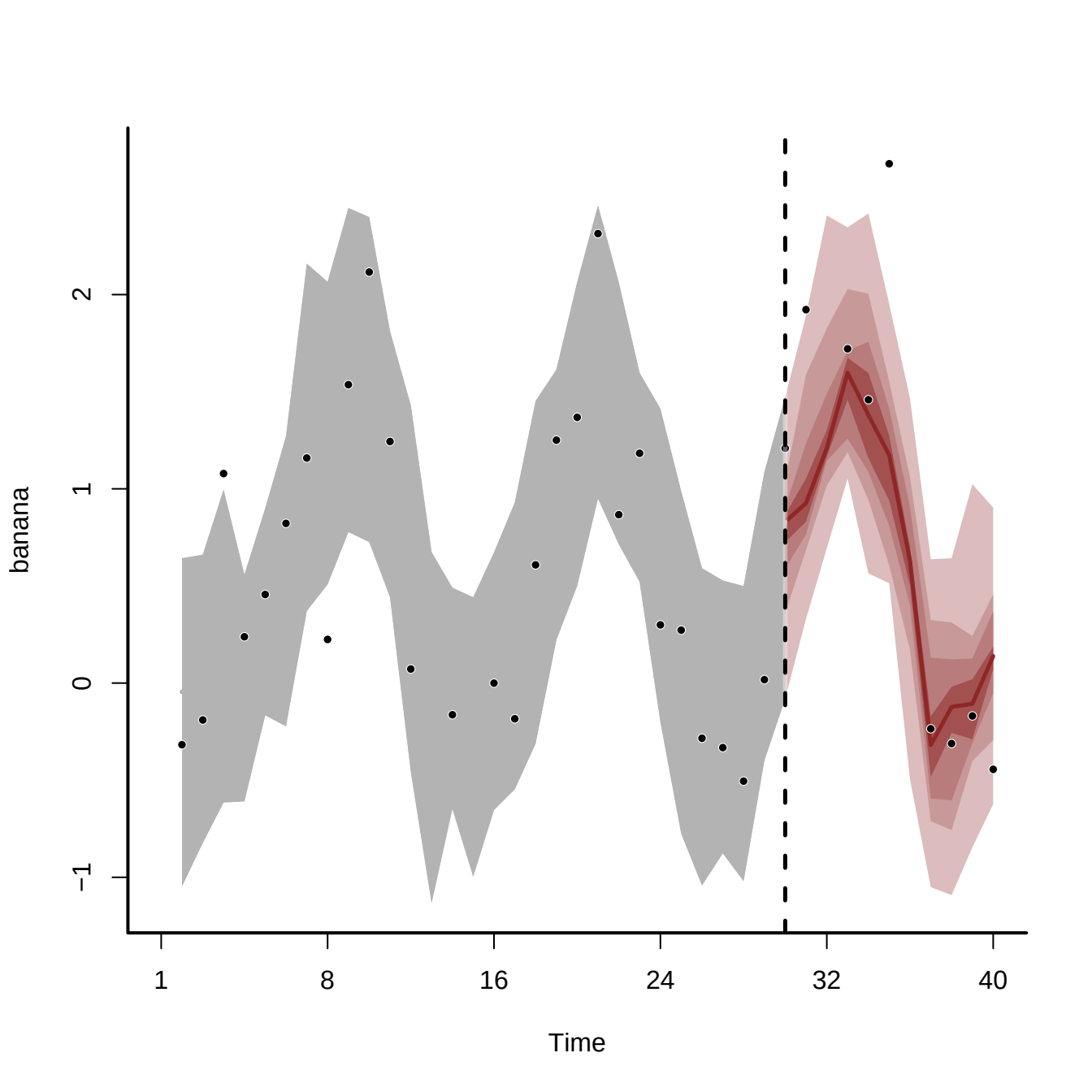

Model 1
Model 2
Median RPS
0
1
2
3
4
5
6
1
2
3
Forecast horizon

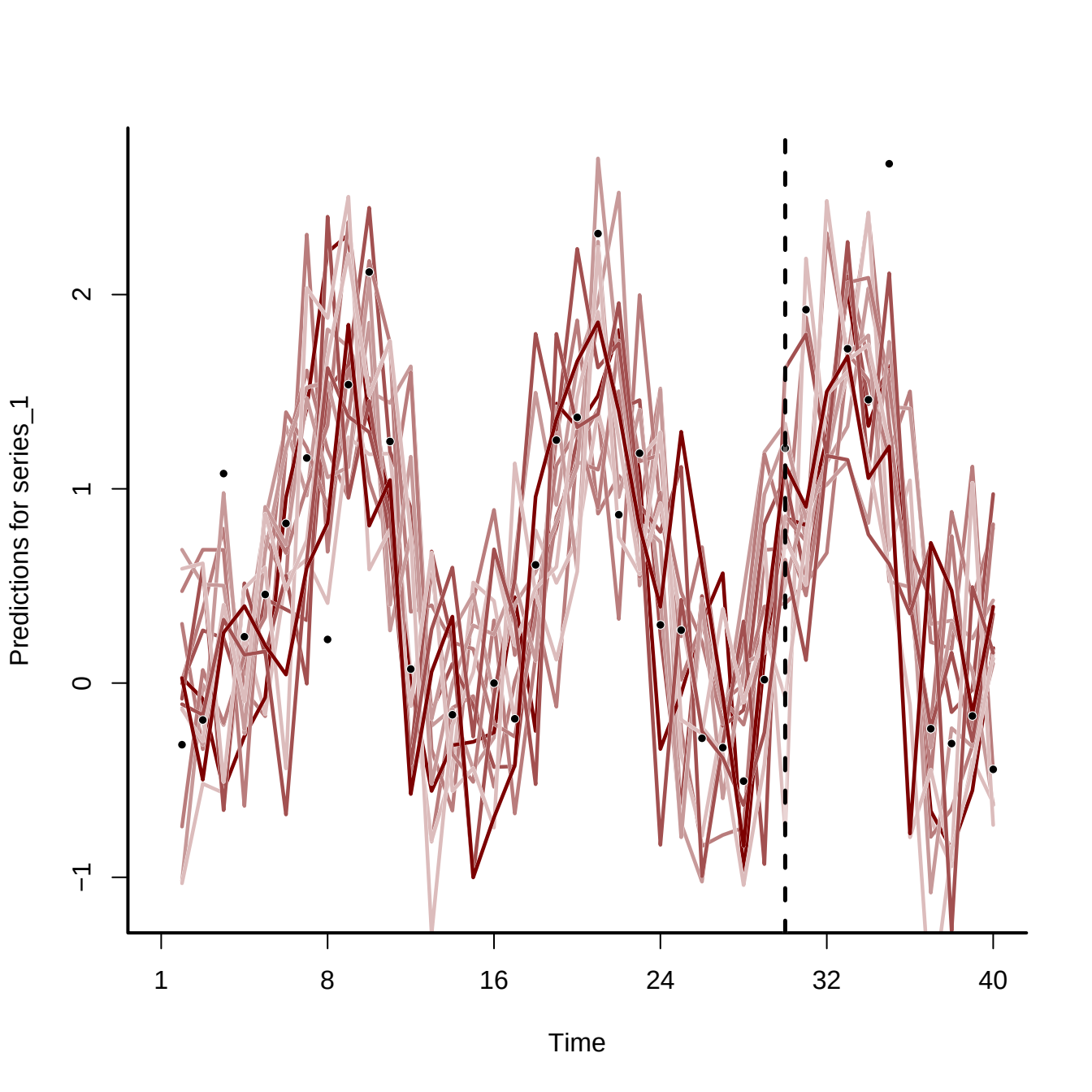

Pareto k
−0.2
0.2
0.6
ELPD
−2.4
−2.0
−1.6
28.0
28.2
28.4
28.6
28.8
29.0
Time point

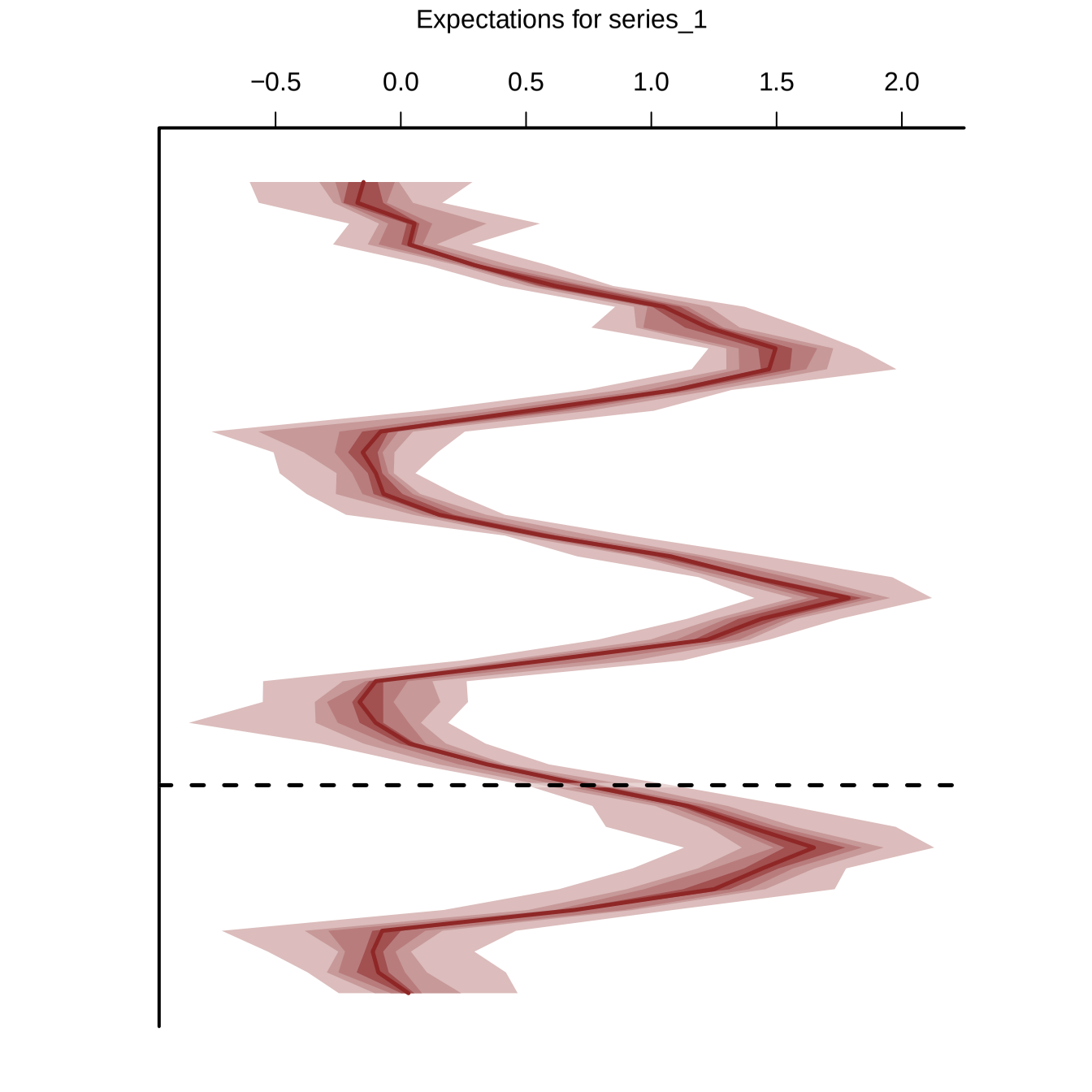

Pareto k
0.20
0.30
0.40
ELPD
−2.5
−2.0
−1.5
28.0
28.2
28.4
28.6
28.8
29.0
Time point

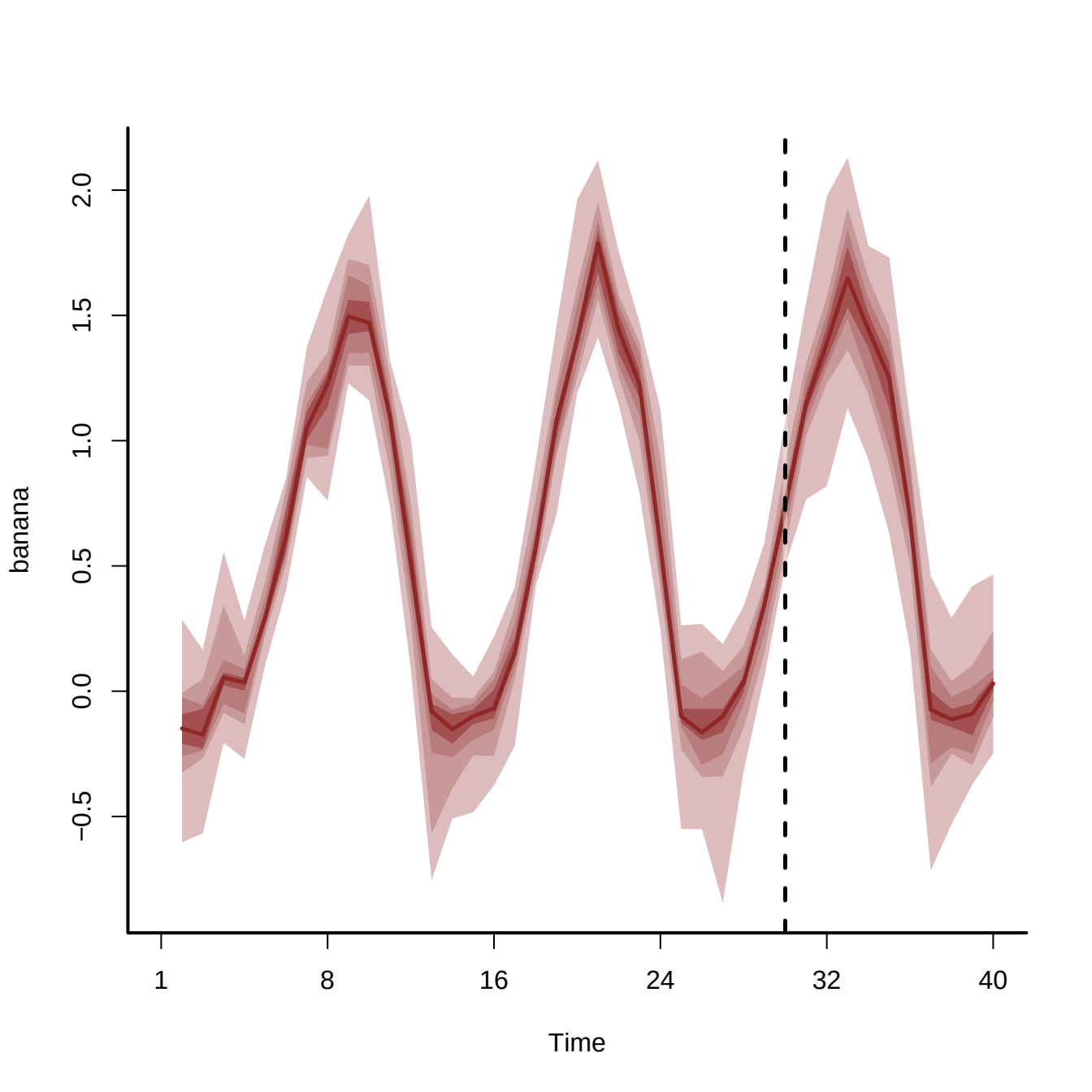

Predictions for series_1
2
1
0
−1
1
8
16
24
32
40
Time

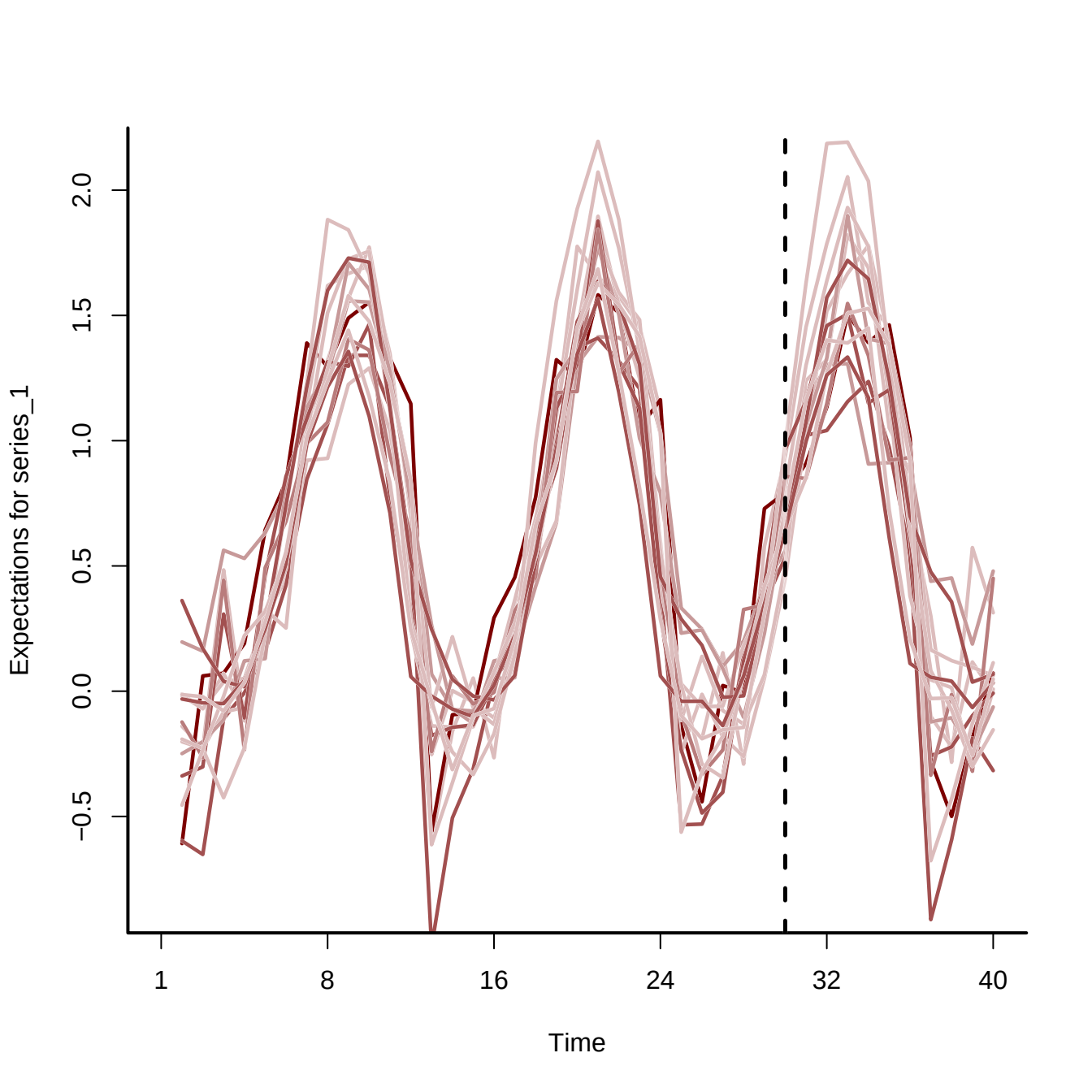

Predictions for series_1
−1
0
1
2

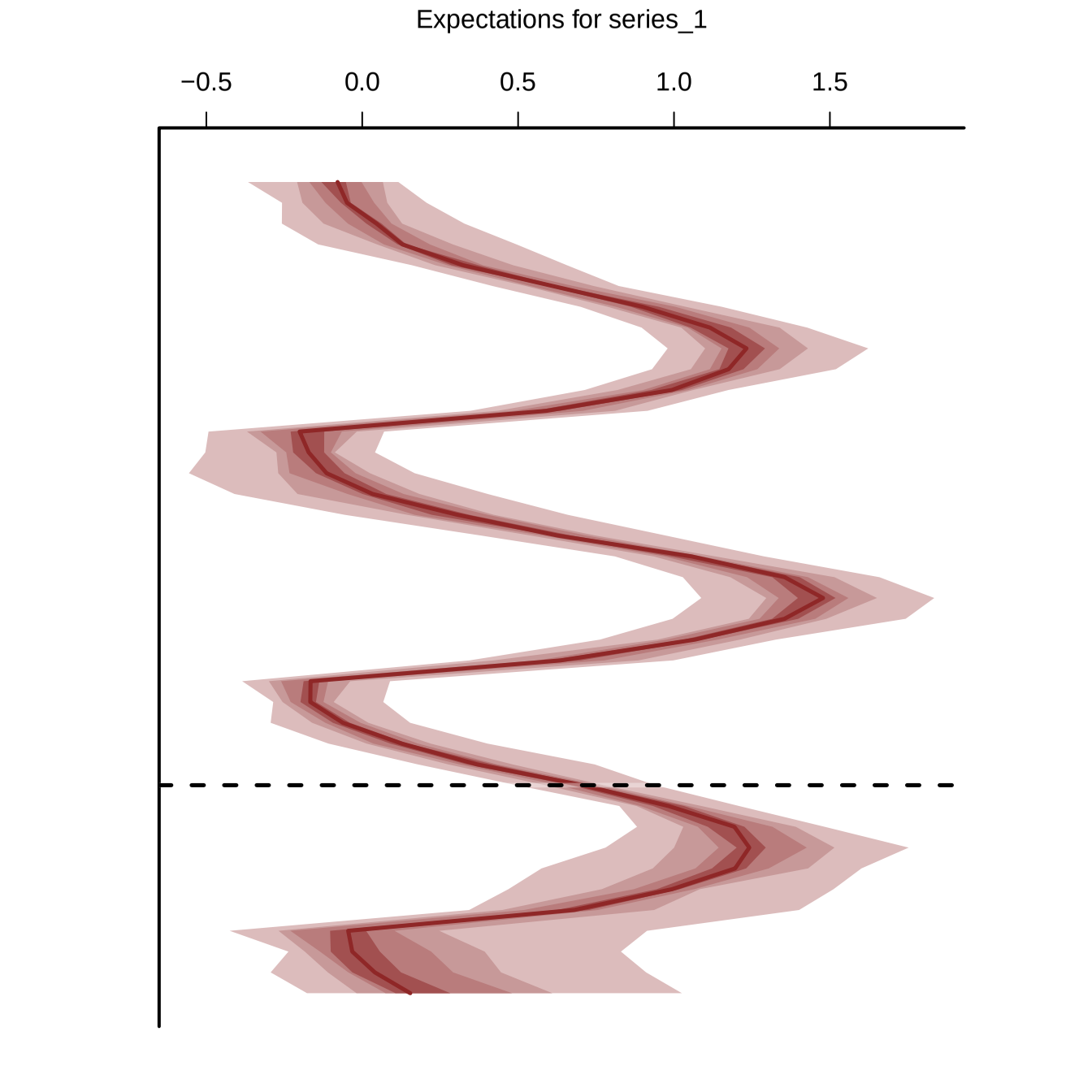

banana
2
1
0
−1
1
8
16
24
32
40
Time

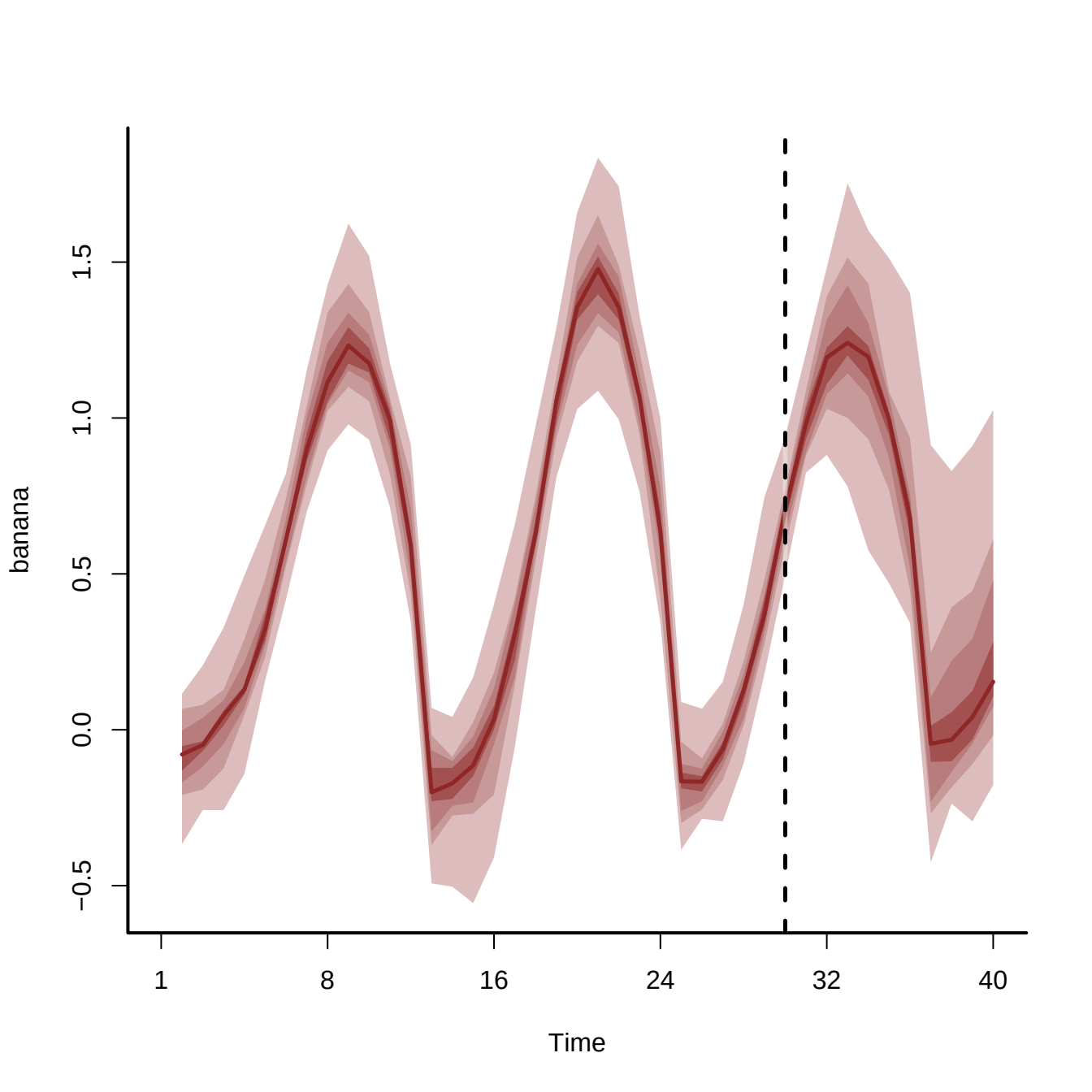

Predictions for series_1
2
1
0
−1
1
8
16
24
32
40
Time

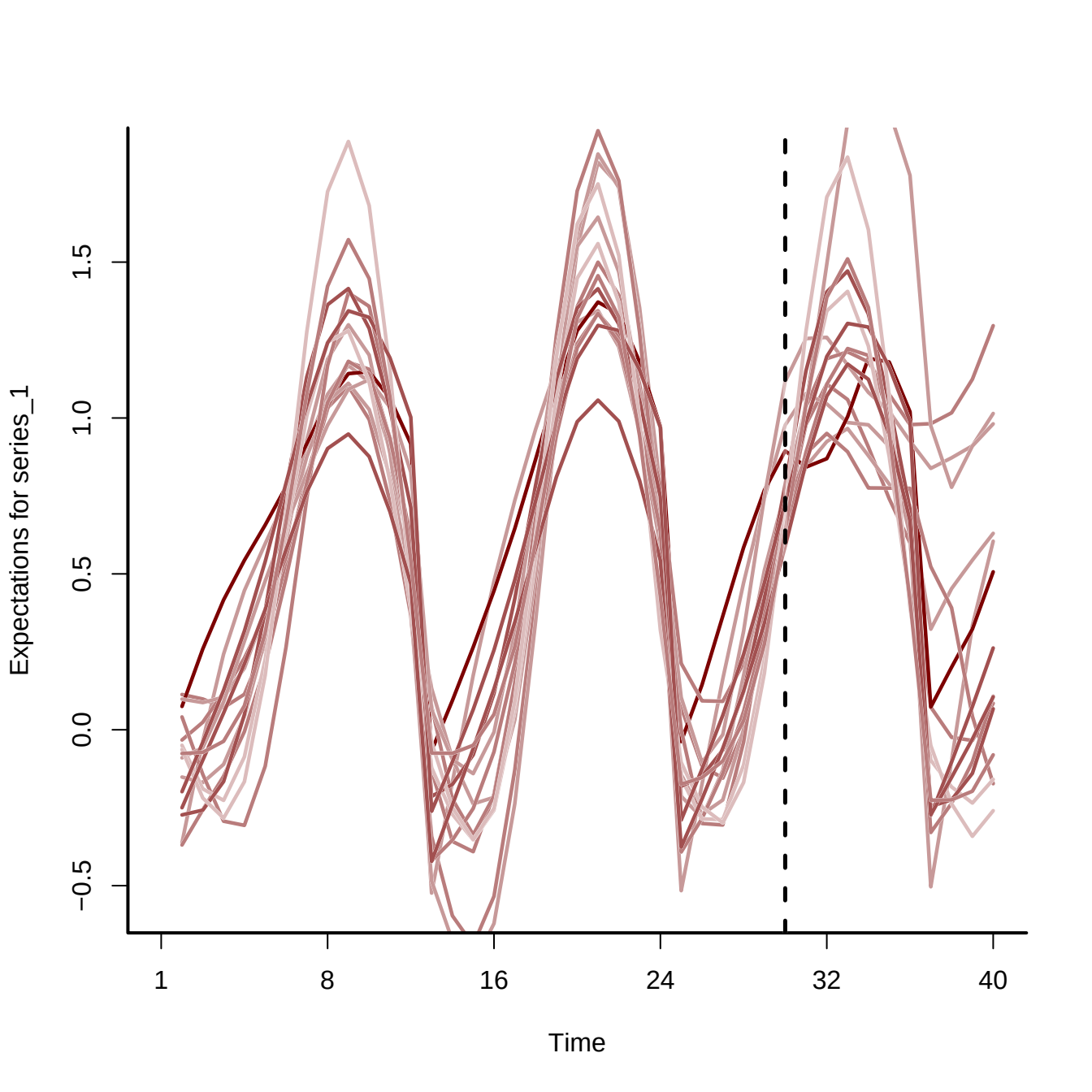

Expectations for series_1
−0.5
0.0
0.5
1.0
1.5
2.0

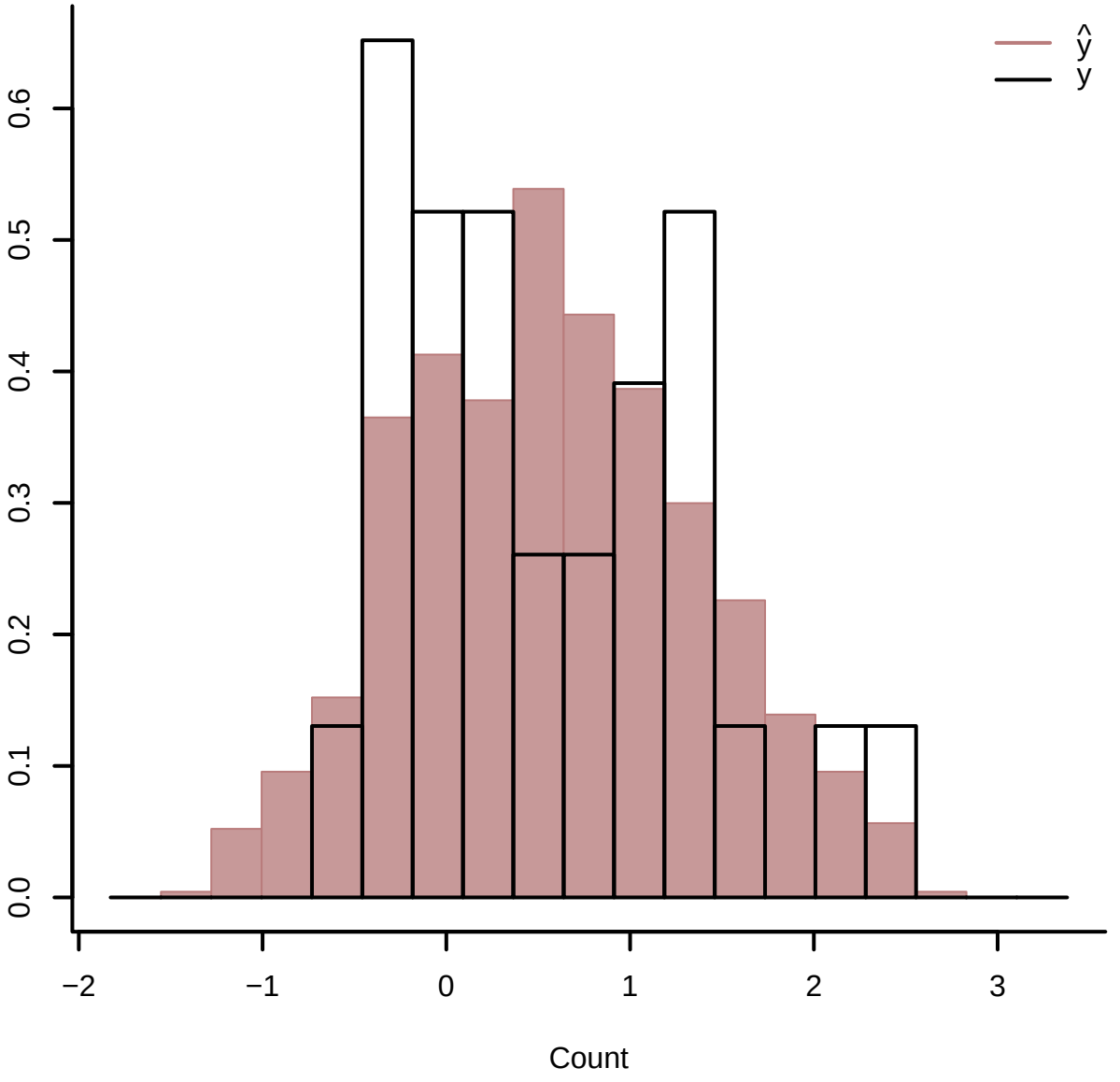

banana
2.0
1.5
1.0
0.5
0.0
−0.5
1
8
16
24
32
40
Time

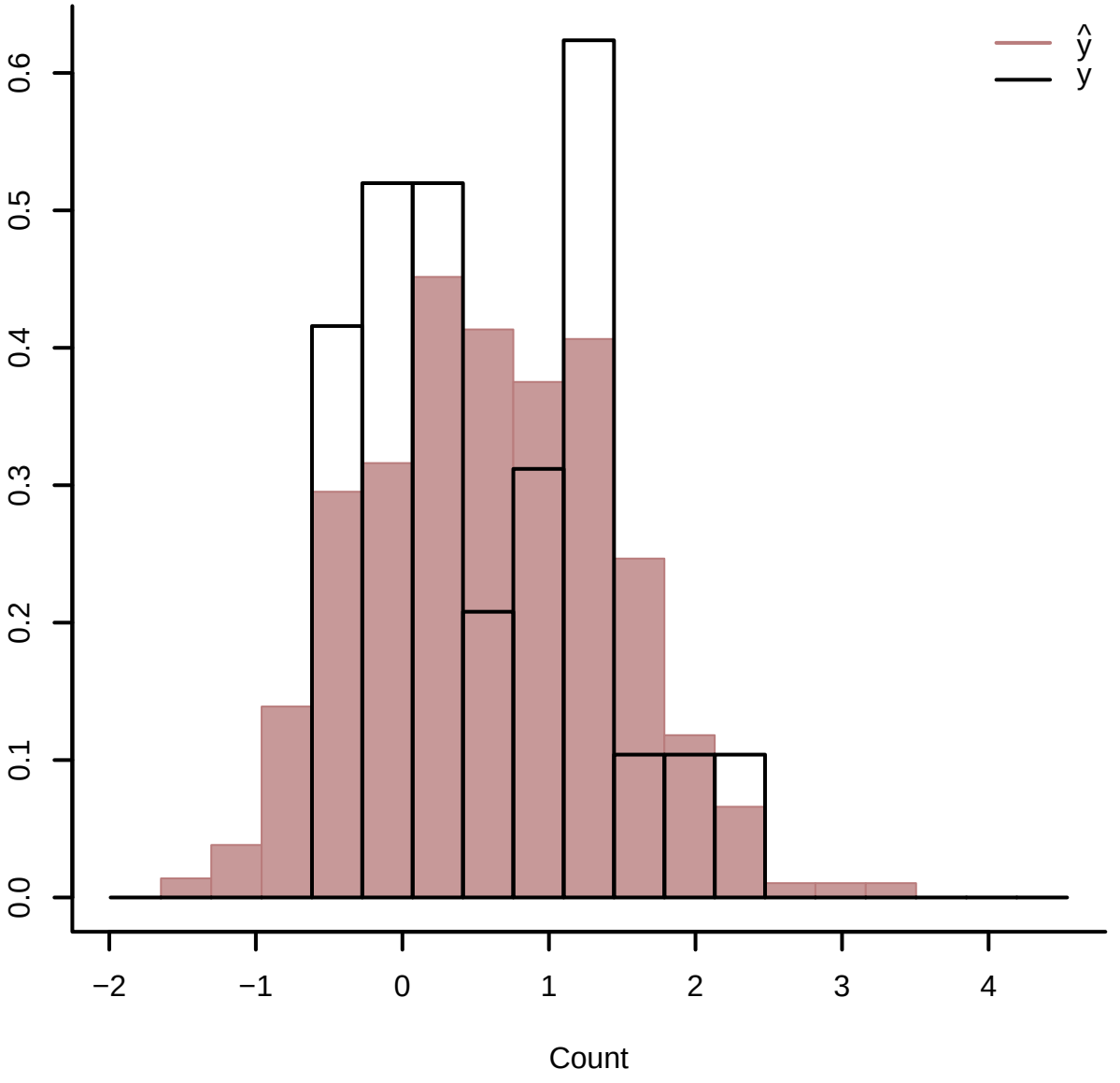

Expectations for series_1
2.0
1.5
1.0
0.5
0.0
−0.5
1
8
16
24
32
40
Time

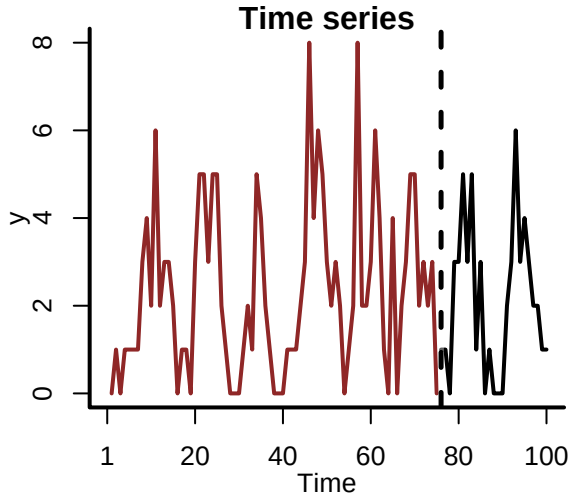

Expectations for series_1
−0.5
0.0
0.5
1.0
1.5

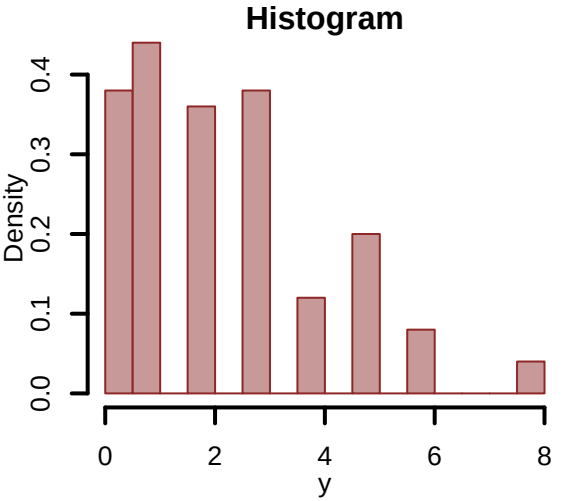

banana
1.5
1.0
0.5
0.0
−0.5
1
8
16
24
32
40
Time

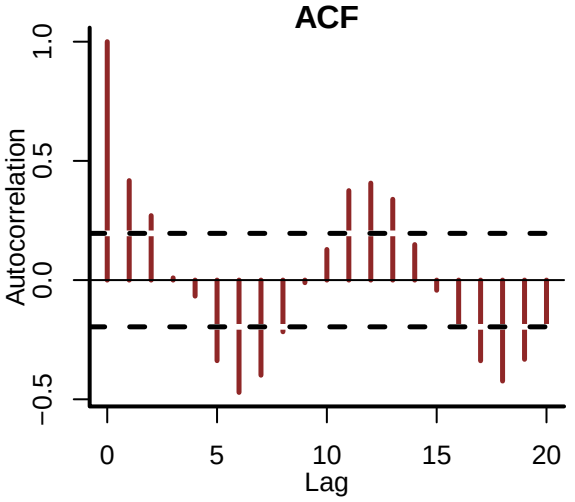

Expectations for series_1
−0.5
0.0
0.5
1.0
1.5
1
8
16
24
32
40
Time

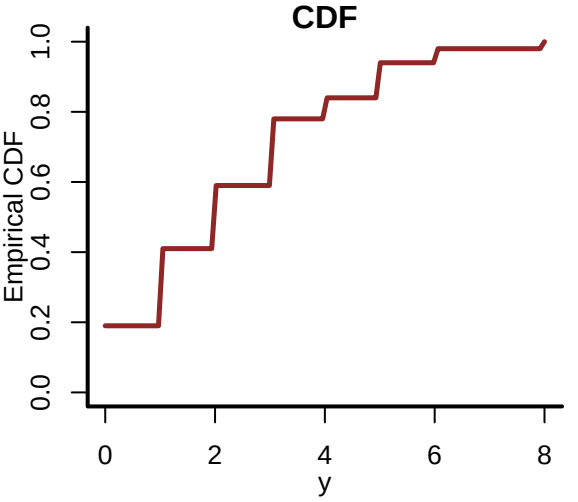

ŷ
y
0.0
0.1
0.2
0.3
0.4
0.5
0.6
−2
−1
0
1
2
3
Count

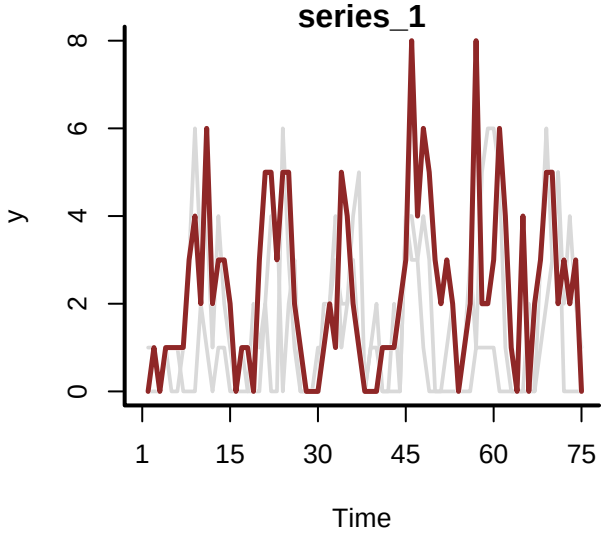

ŷ
y
0.0
0.1
0.2
0.3
0.4
0.5
0.6
−2
−1
0
1
2
3
4
Count

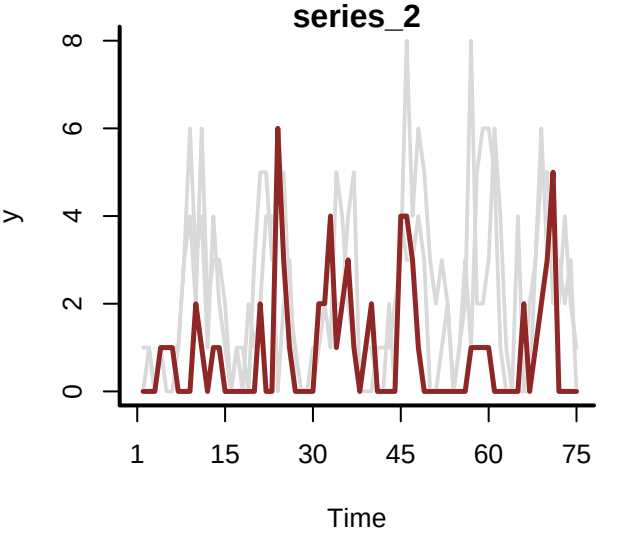

Time series
y
Time
0
2
4
6
8
1
20
40
60
80
100

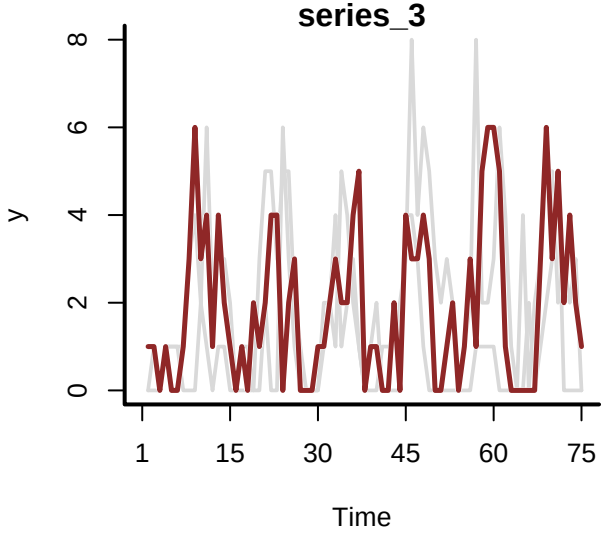

Histogram
Density
y
0.0
0.1
0.2
0.3
0.4
0
2
4
6
8

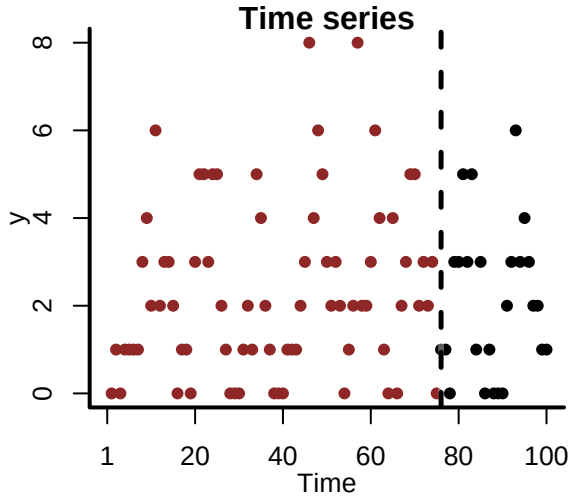

ACF
Autocorrelation
Lag
−0.5
0.0
0.5
1.0
0
5
10
15
20

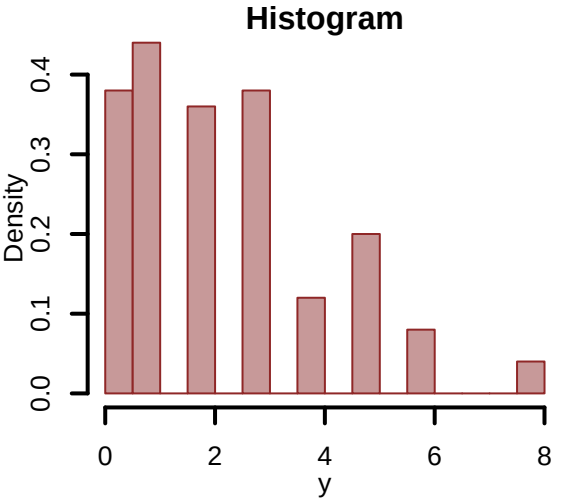

CDF
Empirical CDF
y
0.0
0.2
0.4
0.6
0.8
1.0
0
2
4
6
8

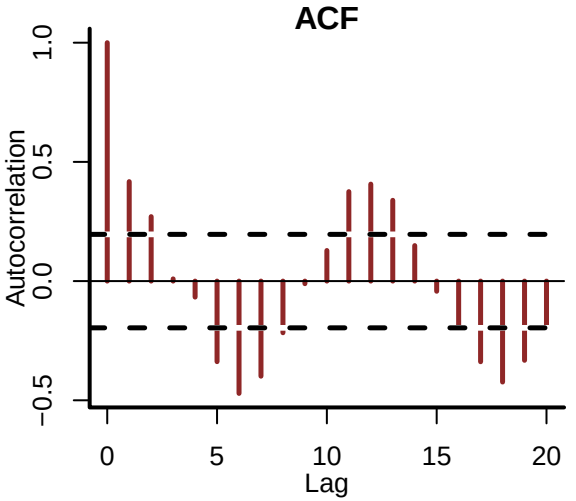

series_1
y
0
2
4
6
8
1
15
30
45
60
75
Time

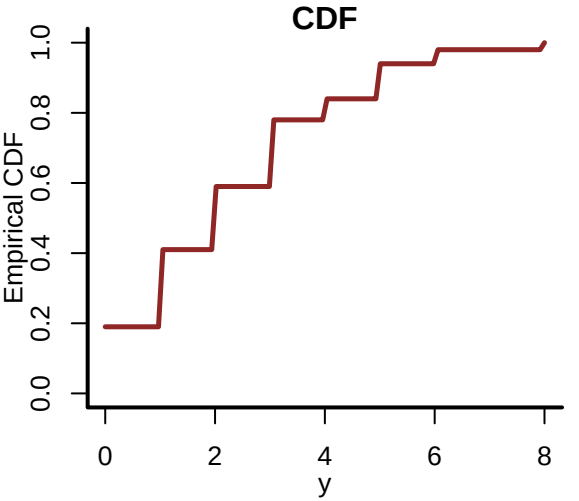

series_2
y
0
2
4
6
8
1
15
30
45
60
75
Time

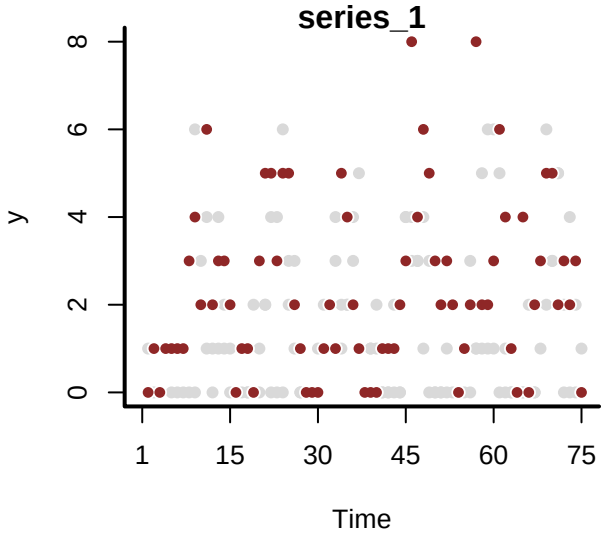

series_3
y
0
2
4
6
8
1
15
30
45
60
75
Time

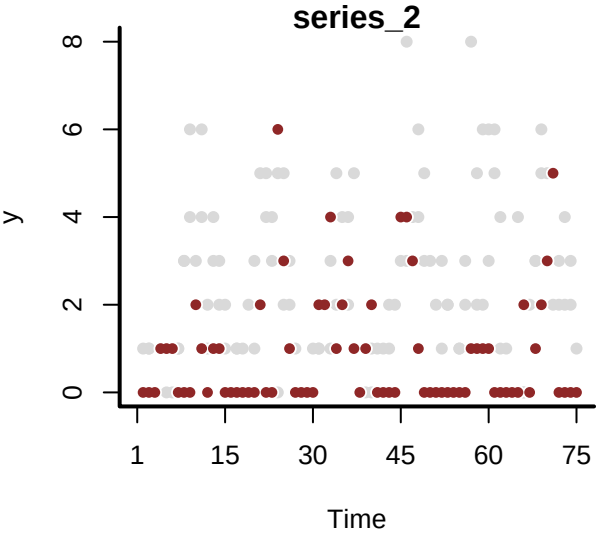

Time series
y
Time
0
2
4
6
8
1
20
40
60
80
100

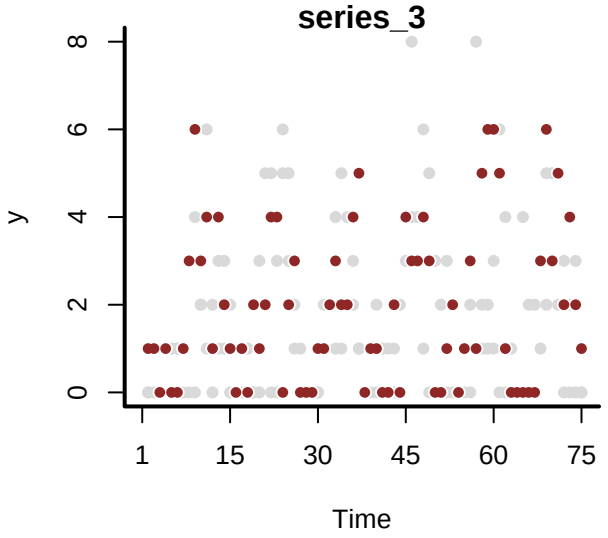

Histogram
Density
y
0.0
0.1
0.2
0.3
0.4
0
2
4
6
8

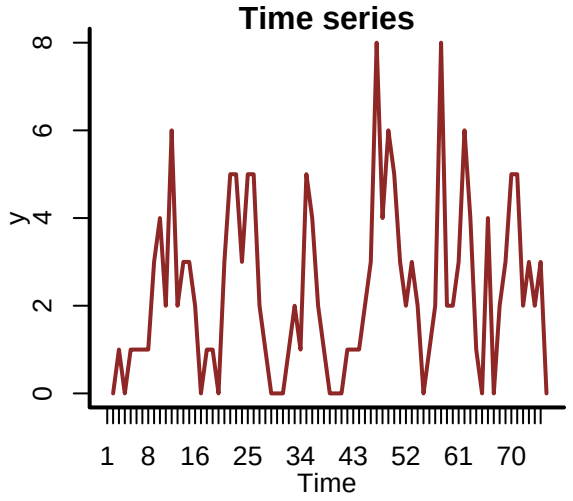

ACF
Autocorrelation
Lag
−0.5
0.0
0.5
1.0
0
5
10
15
20

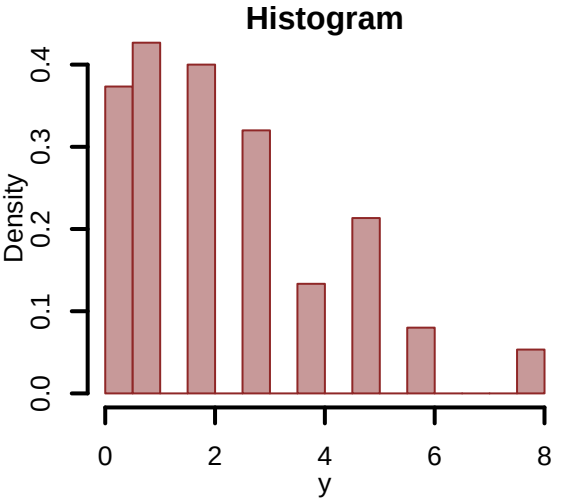

CDF
Empirical CDF
y
0.0
0.2
0.4
0.6
0.8
1.0
0
2
4
6
8

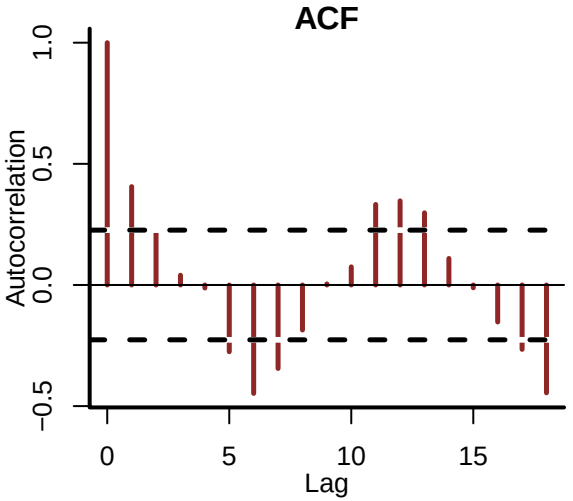

series_1
y
0
2
4
6
8
1
15
30
45
60
75
Time

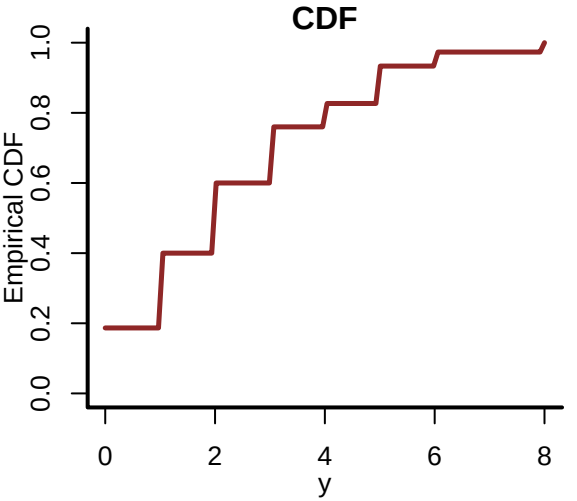

series_2
y
0
2
4
6
8
1
15
30
45
60
75
Time

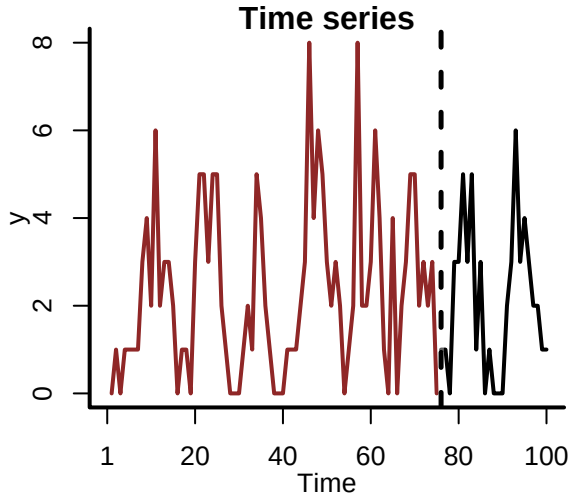

series_3
y
0
2
4
6
8
1
15
30
45
60
75
Time

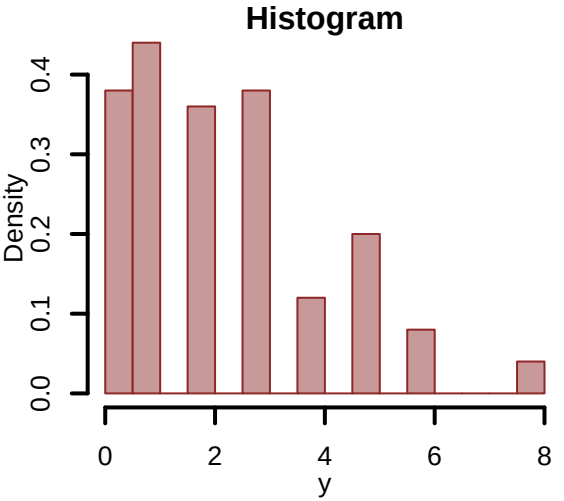

Time series
y
0
2
4
6
8
1
8
16
25
34
43
52
61
70
Time

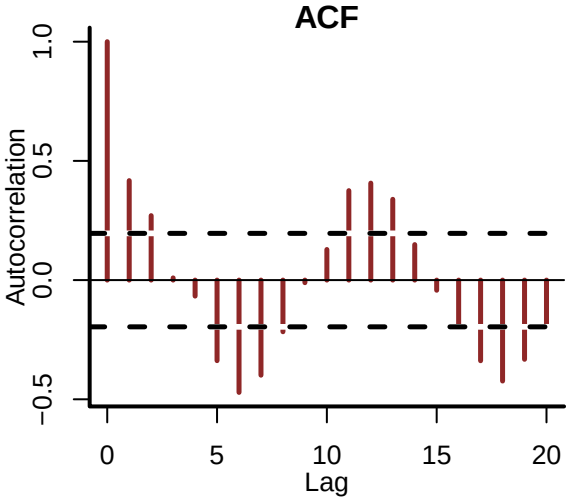

Histogram
Density
0.0
0.1
0.2
0.3
0.4
0
2
4
6
8
y

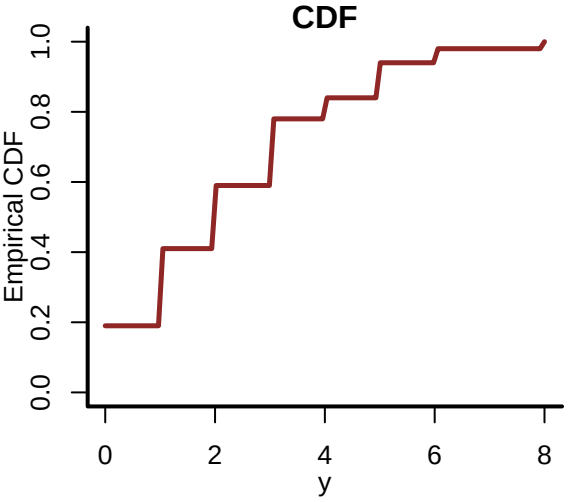

ACF
Autocorrelation
−0.5
0.0
0.5
1.0
0
5
10
15
Lag

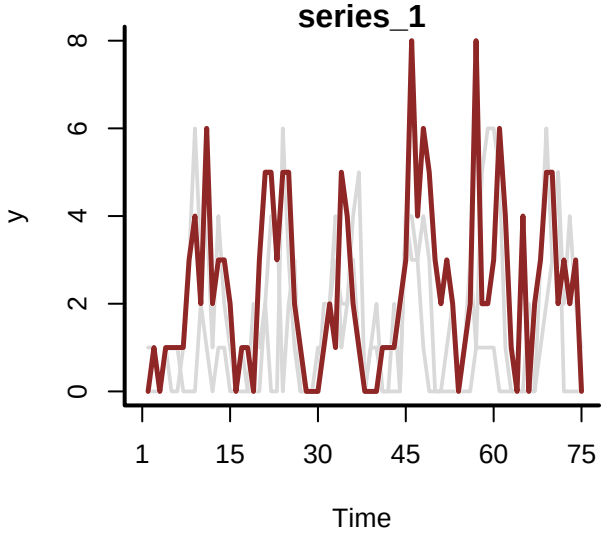

CDF
Empirical CDF
0.0
0.2
0.4
0.6
0.8
1.0
0
2
4
6
8
y

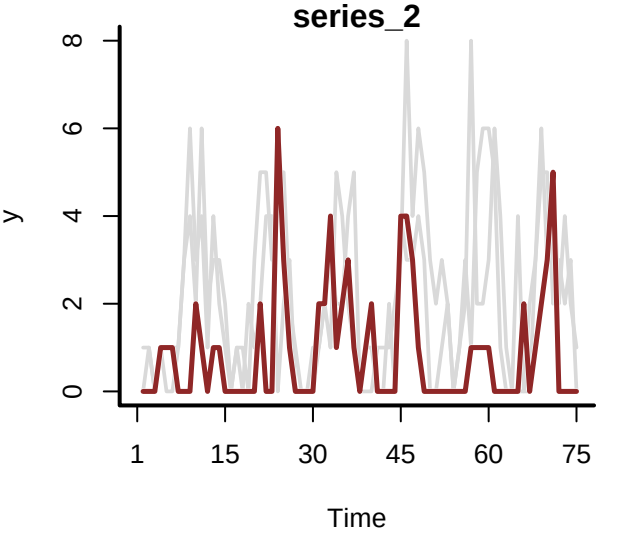

Time series
y
Time
0
2
4
6
8
1
20
40
60
80
100

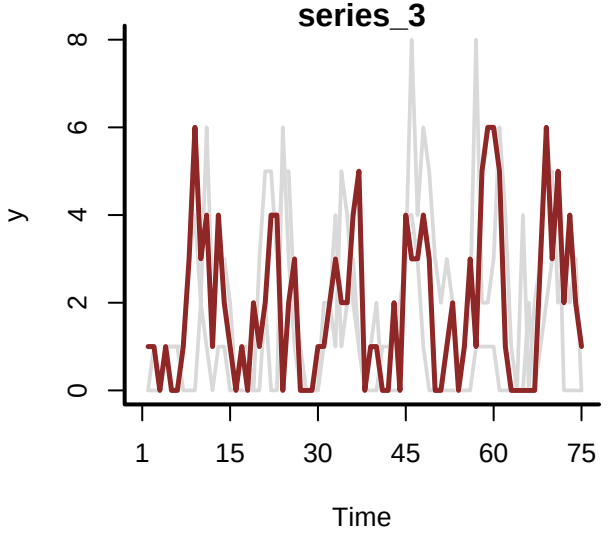

Histogram
Density
y
0.0
0.1
0.2
0.3
0.4
0
2
4
6
8

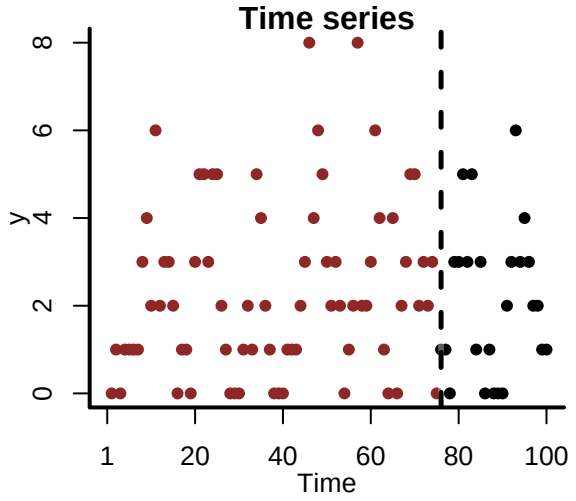

ACF
Autocorrelation
Lag
−0.5
0.0
0.5
1.0
0
5
10
15
20

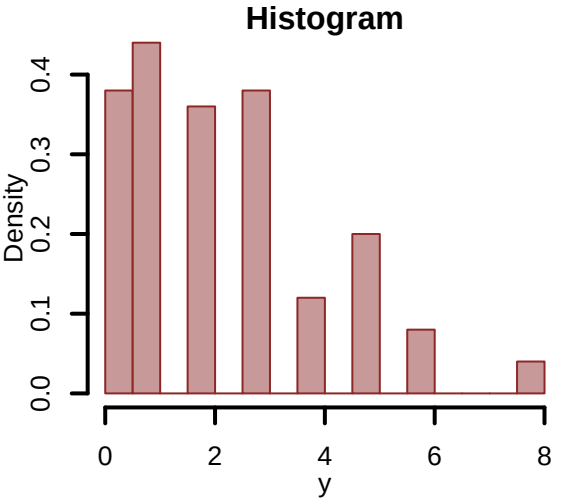

CDF
Empirical CDF
y
0.0
0.2
0.4
0.6
0.8
1.0
0
2
4
6
8

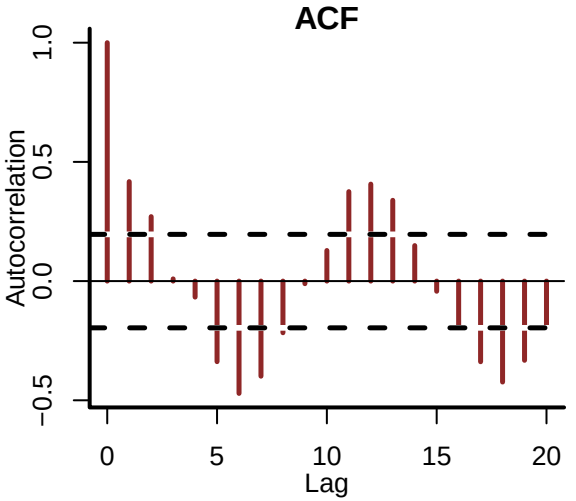

series_1
y
0
2
4
6
8
1
15
30
45
60
75
Time

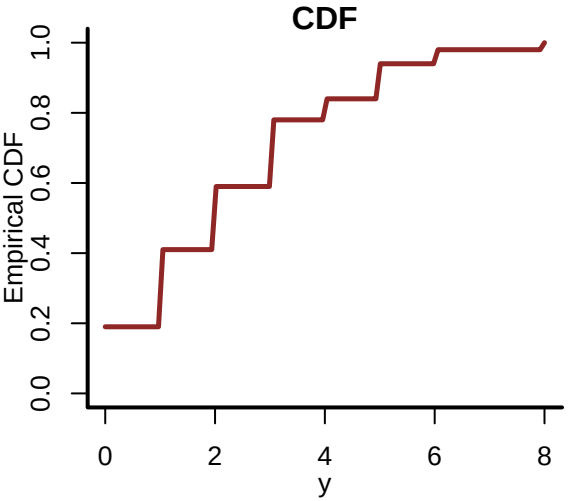

series_2
y
0
2
4
6
8
1
15
30
45
60
75
Time

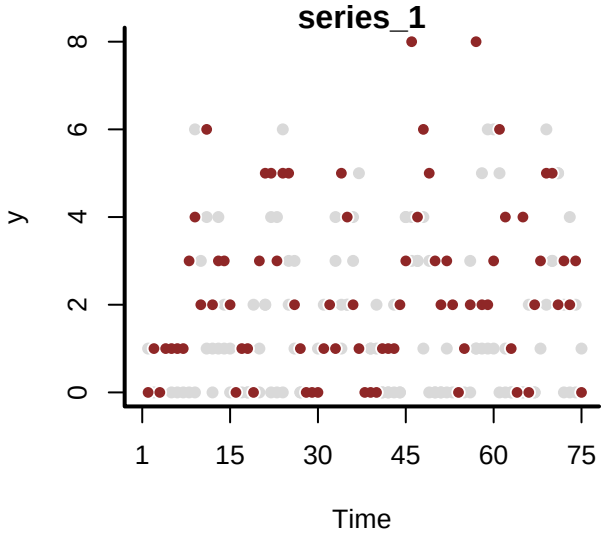

series_3
y
0
2
4
6
8
1
15
30
45
60
75
Time

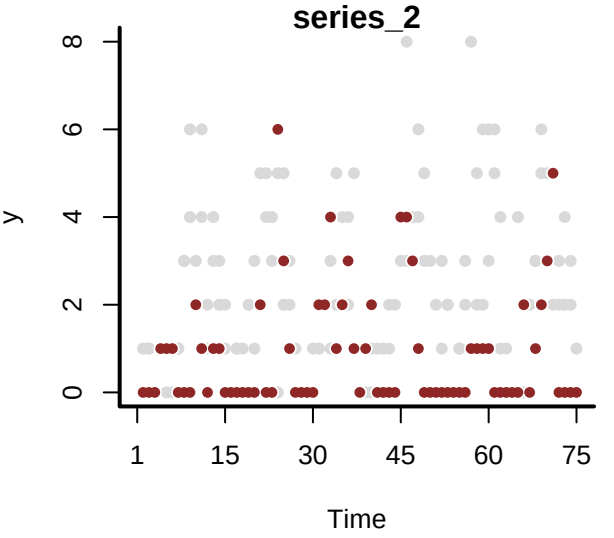

Time series
y
Time
0
2
4
6
8
1
20
40
60
80
100

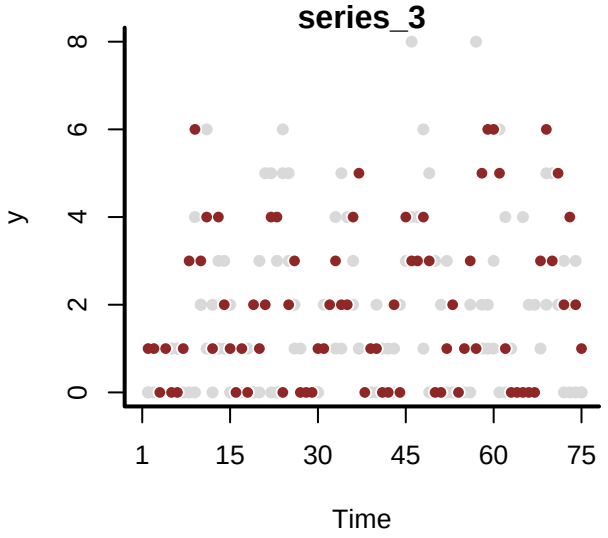

Histogram
Density
y
0.0
0.1
0.2
0.3
0.4
0
2
4
6
8

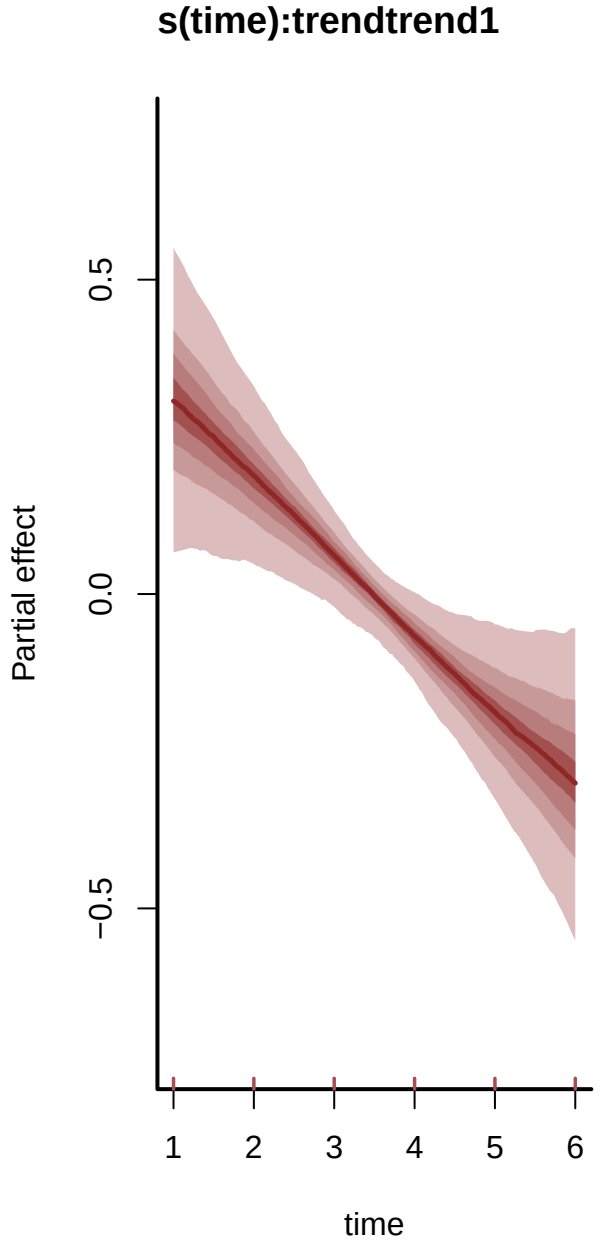

ACF
Autocorrelation
Lag
−0.5
0.0
0.5
1.0
0
5
10
15
20

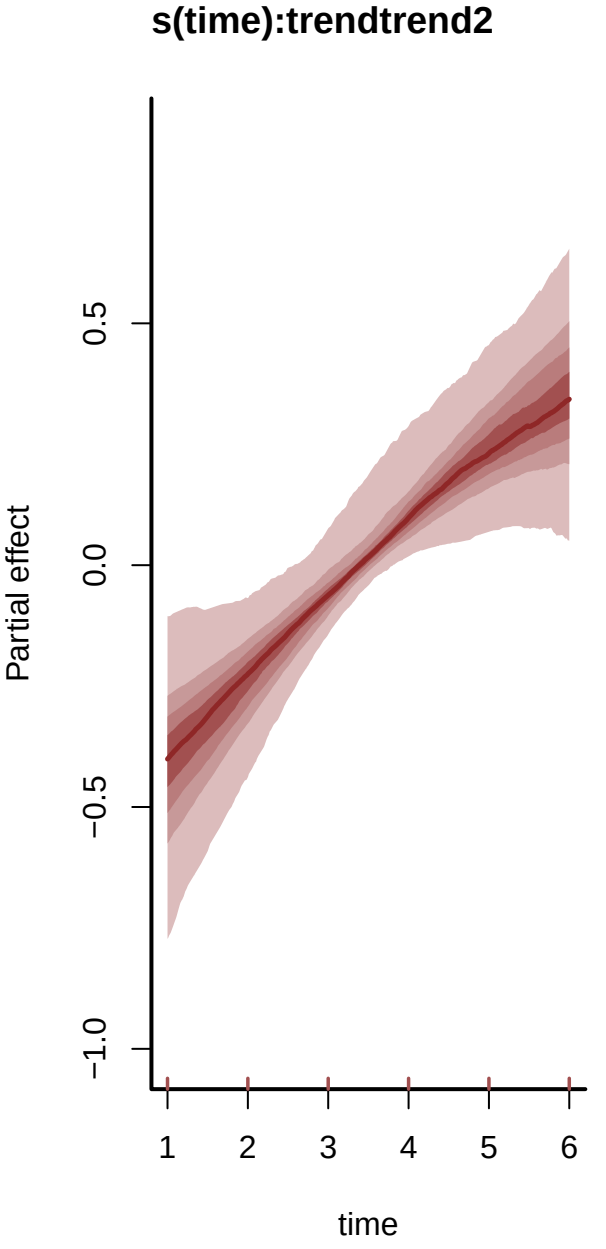

CDF
Empirical CDF
y
0.0
0.2
0.4
0.6
0.8
1.0
0
2
4
6
8

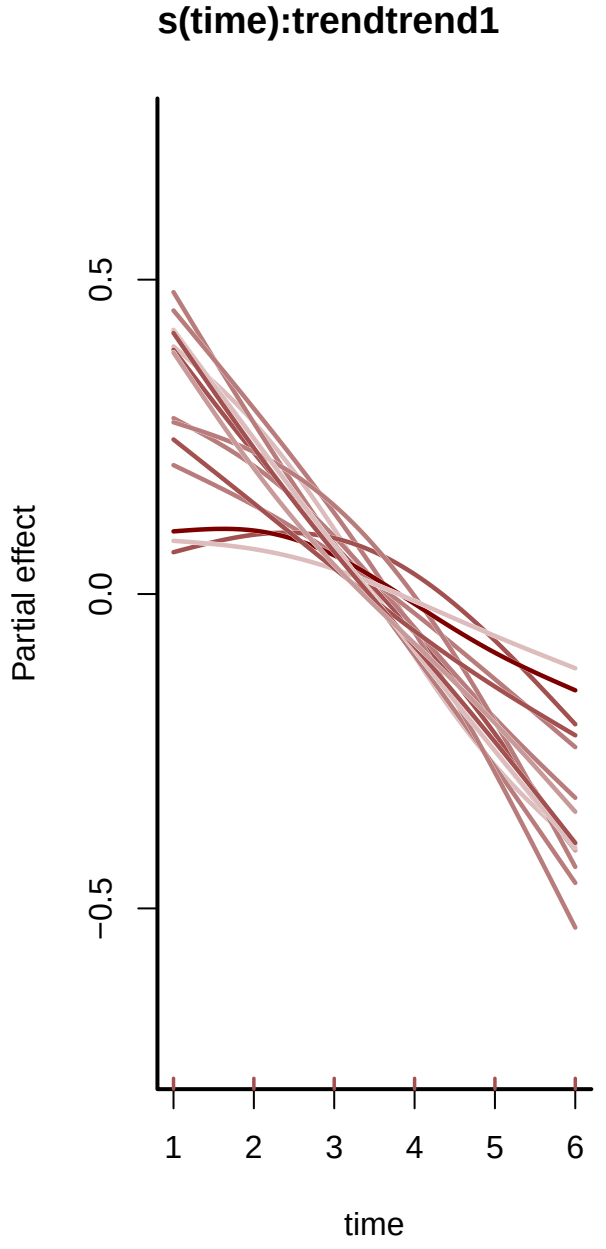

series_1
y
0
2
4
6
8
1
15
30
45
60
75
Time

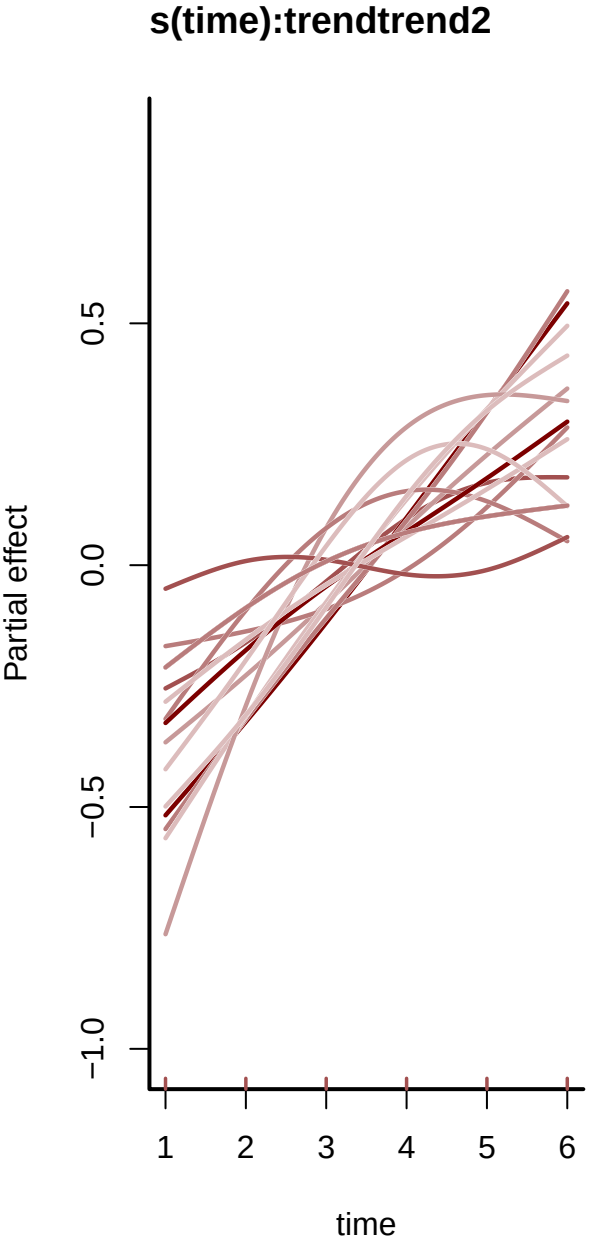

series_2
y
0
2
4
6
8
1
15
30
45
60
75
Time

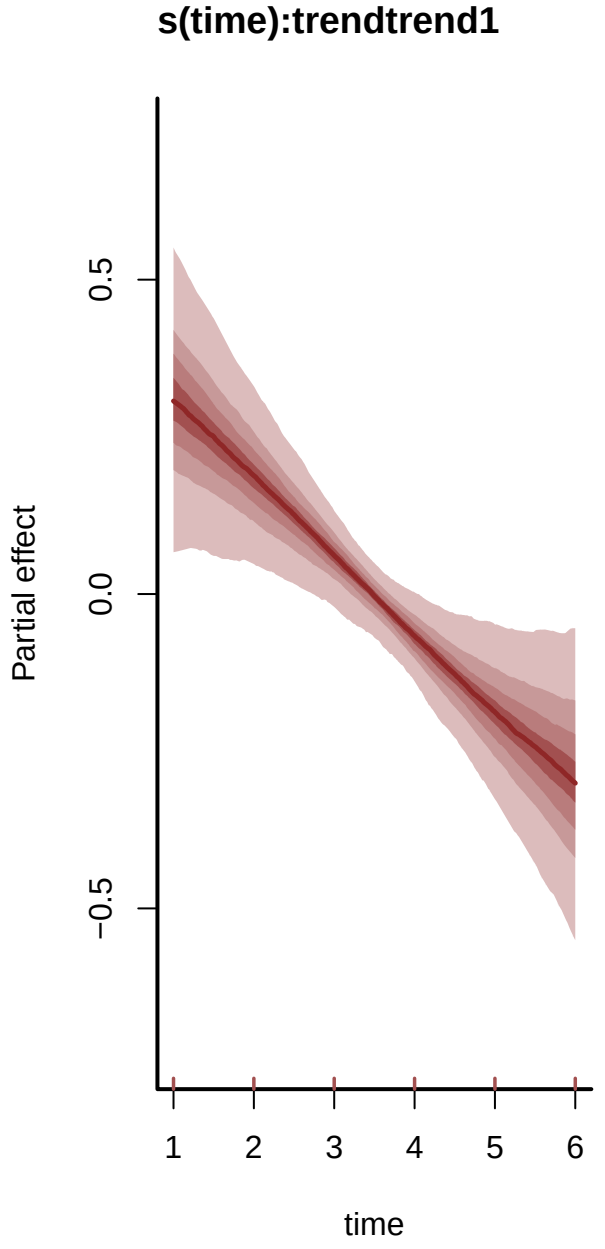

series_3
y
0
2
4
6
8
1
15
30
45
60
75
Time

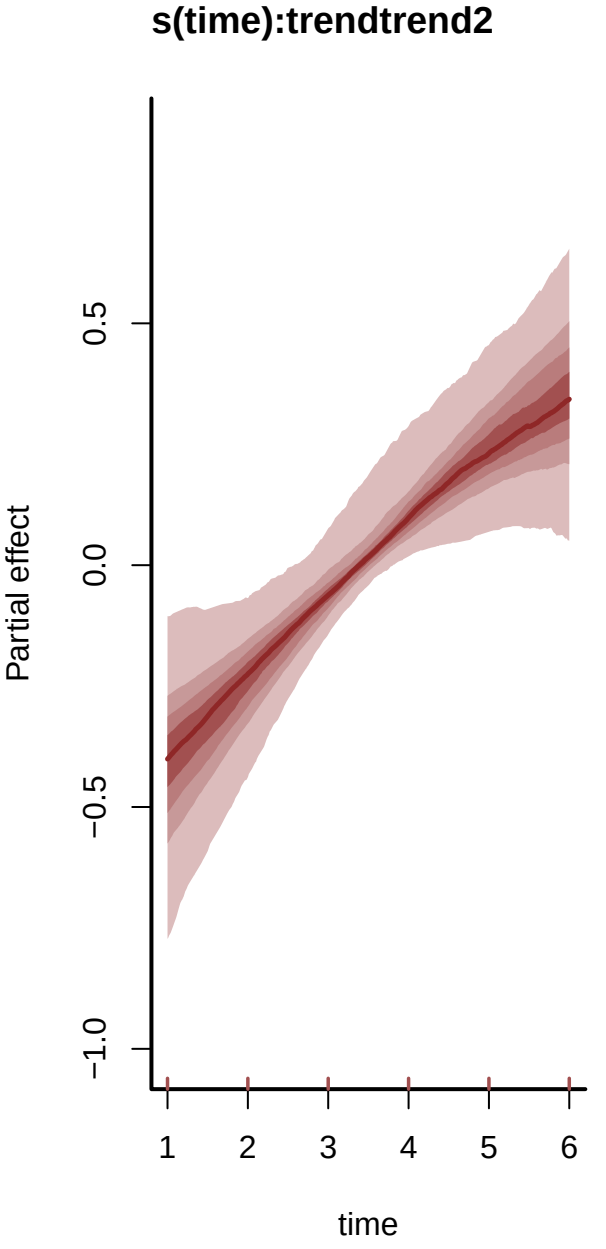

s(time):trendtrend1
Partial effect
0.5
0.0
−0.5
1
2
3
4
5
6
time

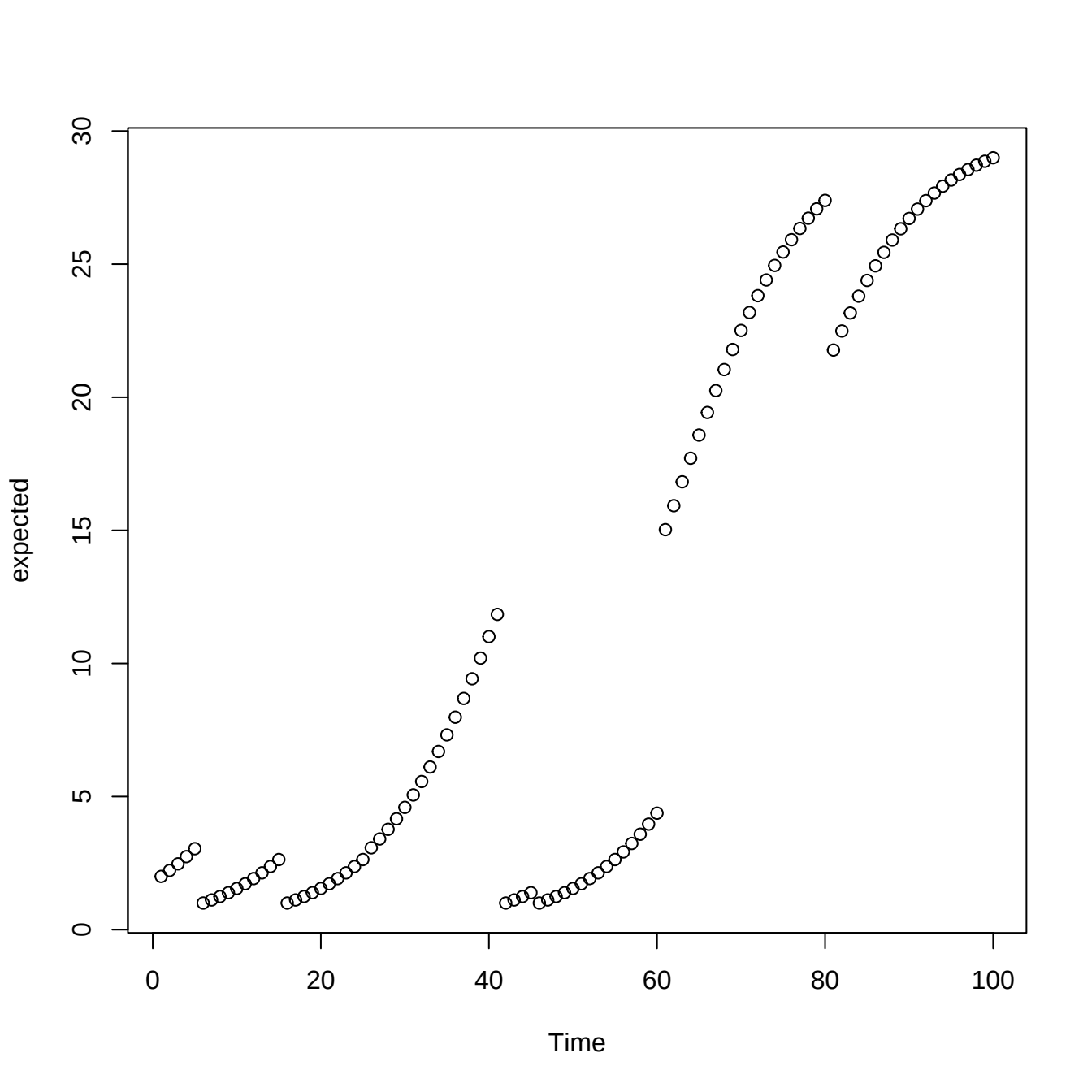

s(time):trendtrend2
Partial effect
0.5
0.0
−0.5
−1.0
1
2
3
4
5
6
time

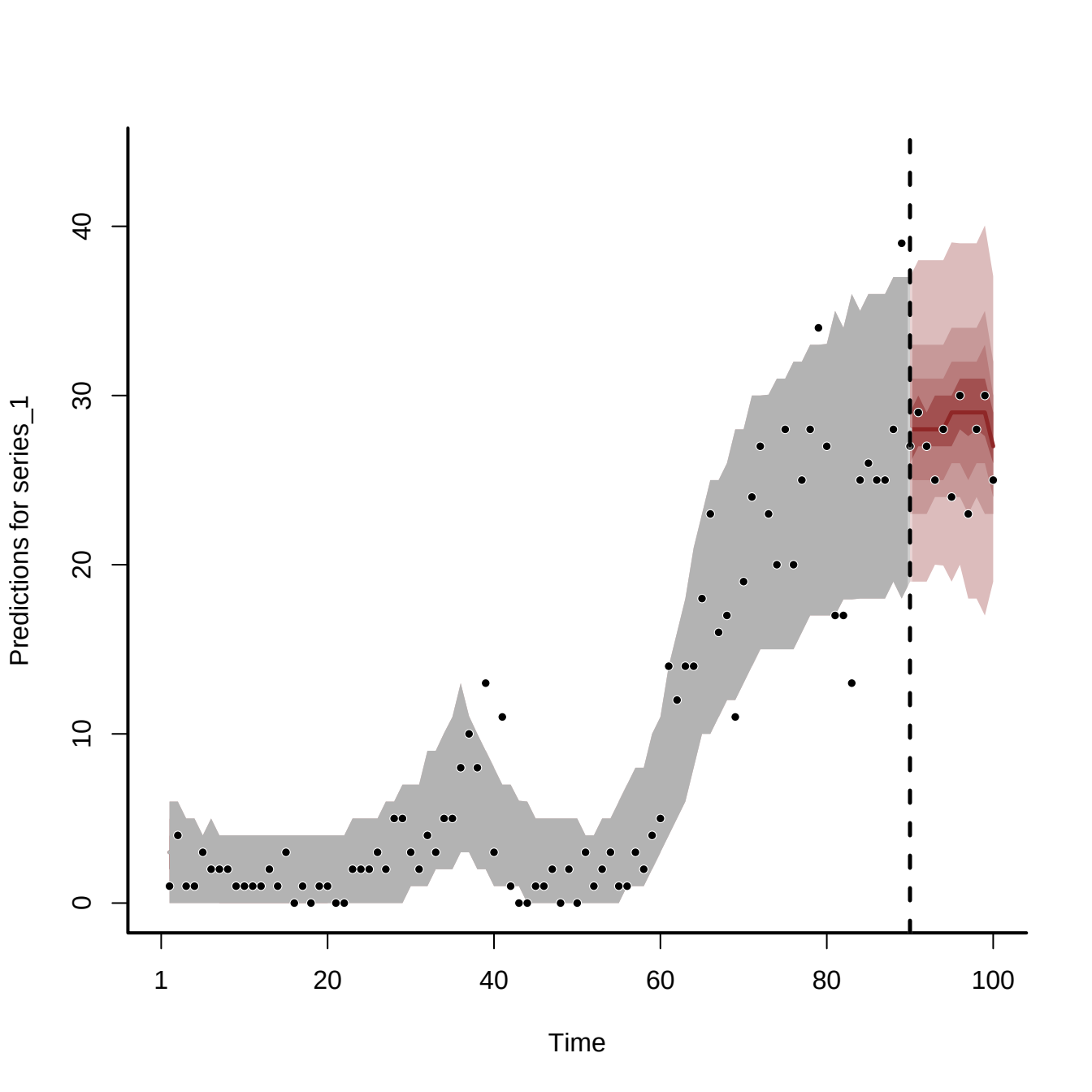

s(time):trendtrend1
Partial effect
0.5
0.0
−0.5
1
2
3
4
5
6
time

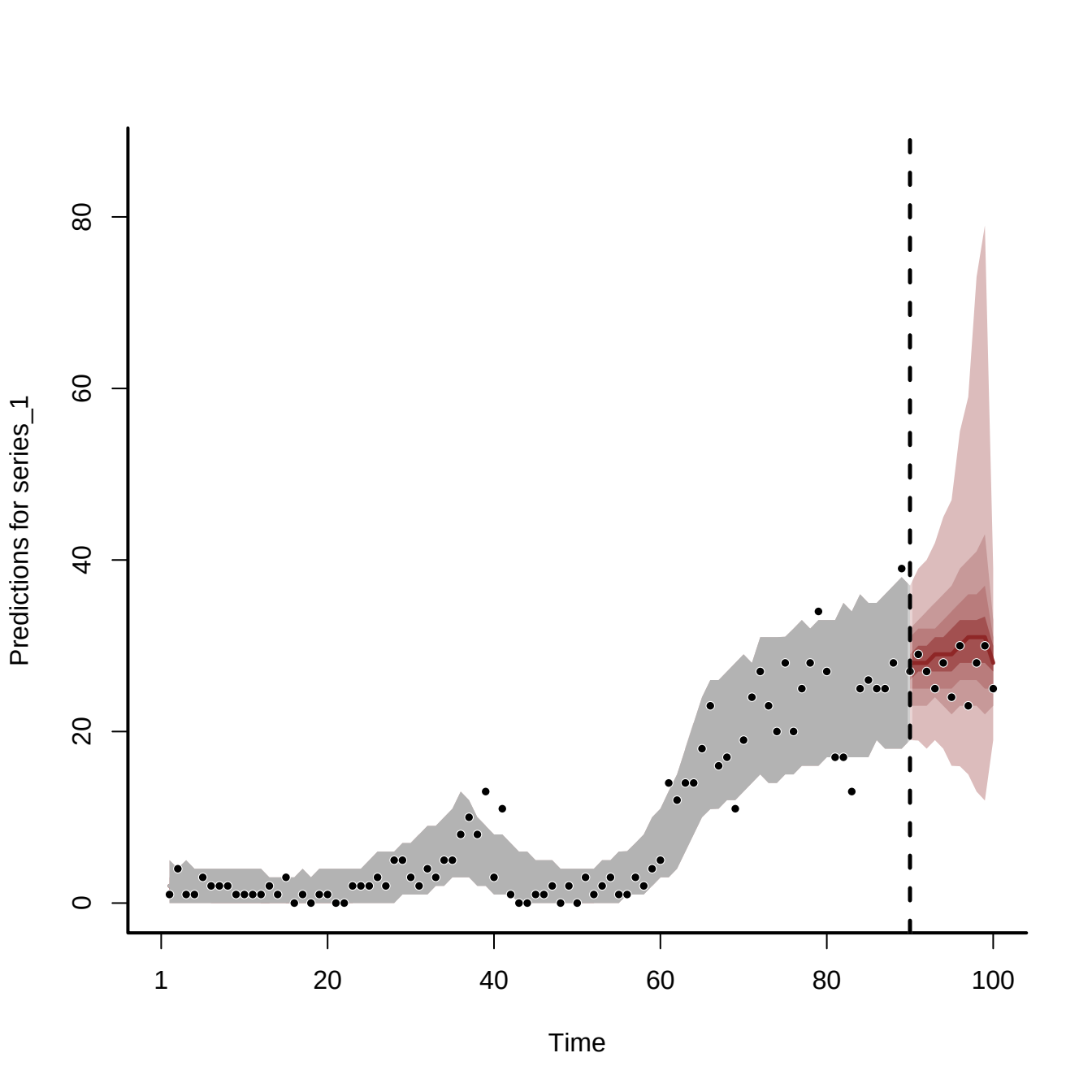

s(time):trendtrend2
Partial effect
0.5
0.0
−0.5
−1.0
1
2
3
4
5
6
time


s(time):trendtrend1
Partial effect
0.5
0.0
−0.5
1
2
3
4
5
6
time


s(time):trendtrend2
Partial effect
0.5
0.0
−0.5
−1.0
1
2
3
4
5
6
time


expected
Time
0
5
10
15
20
25
30
0
20
40
60
80
100


Predictions for series_1
0
10
20
30
40
1
20
40
60
80
100
Time


Predictions for series_1
0
20
40
60
80
1
20
40
60
80
100
Time