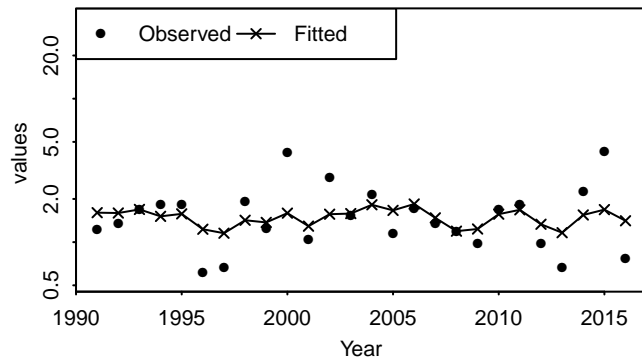
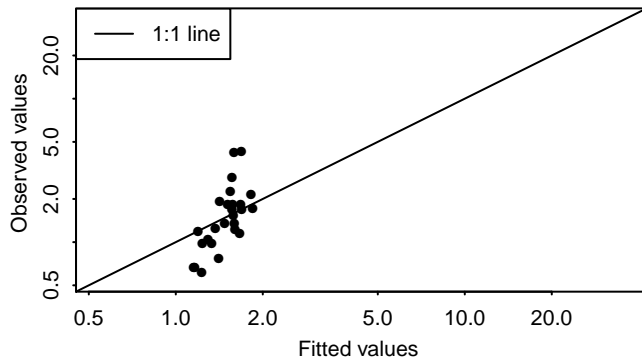


# Turbot in IV Diagnostics – BTS–ISIS, age 1

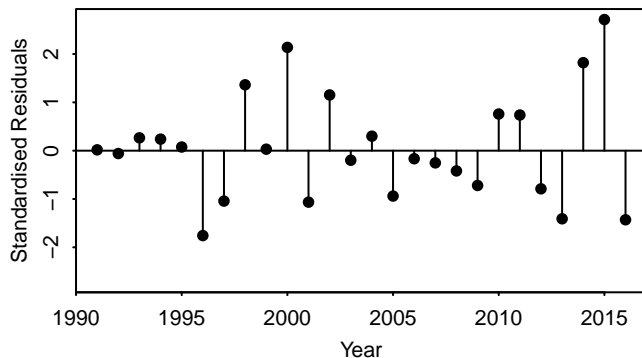
a) Observed and fitted values time series



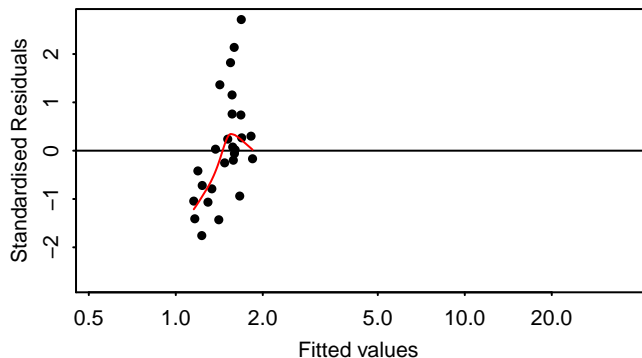
b) Observed vs fitted values



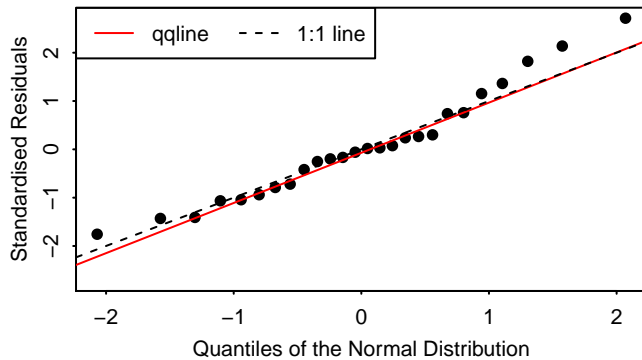
c) Standardised residuals over time



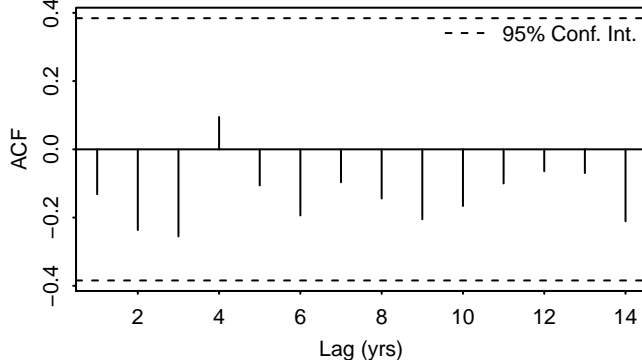
d) Tukey–Anscombe plot



e) Normal Q–Q plot

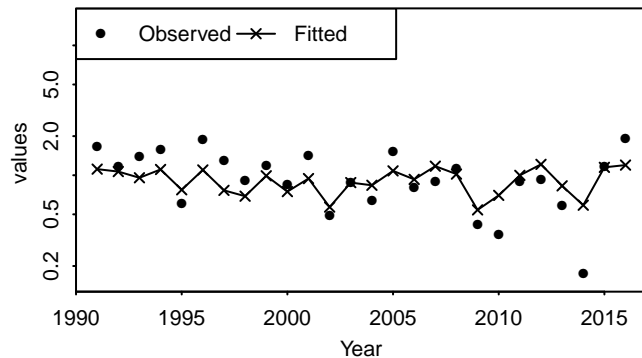


f) Autocorrelation of Residuals

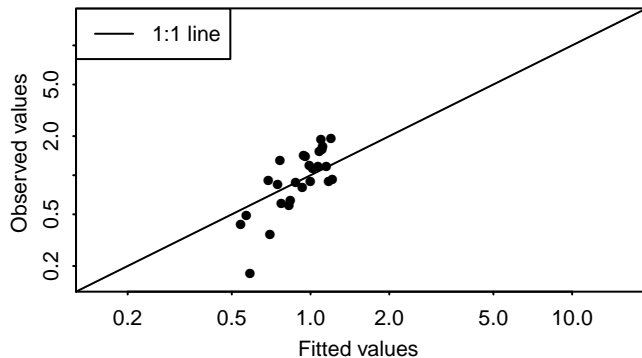


# Turbot in IV Diagnostics – BTS–ISIS, age 2

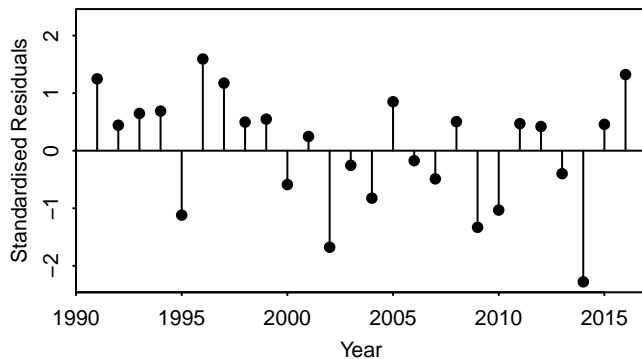
a) Observed and fitted values time series



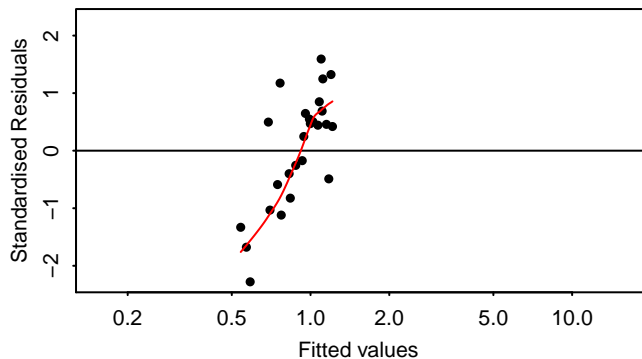
b) Observed vs fitted values



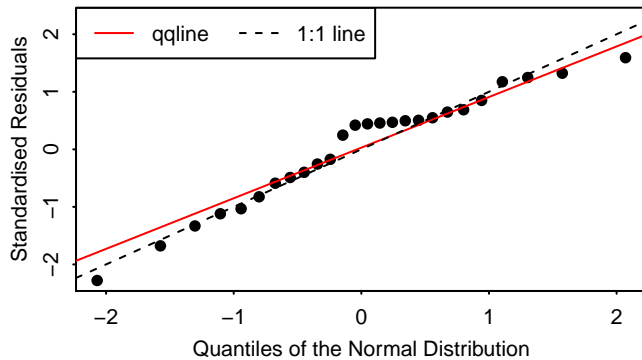
c) Standardised residuals over time



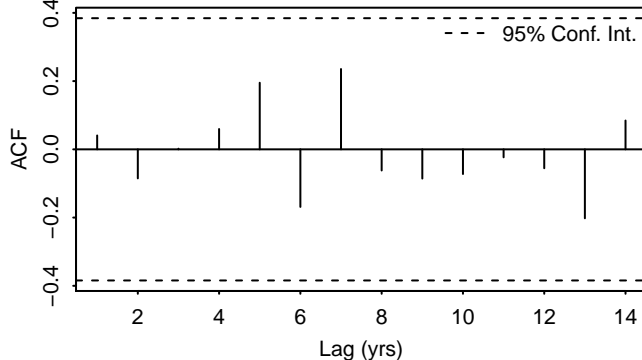
d) Tukey–Anscombe plot



e) Normal Q–Q plot

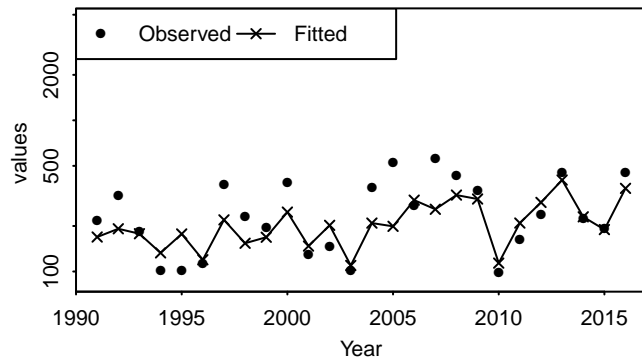


f) Autocorrelation of Residuals

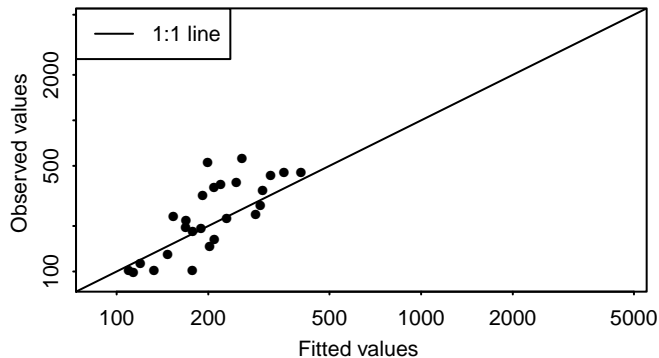


# Turbot in IV Diagnostics – BTS–ISIS, age 3

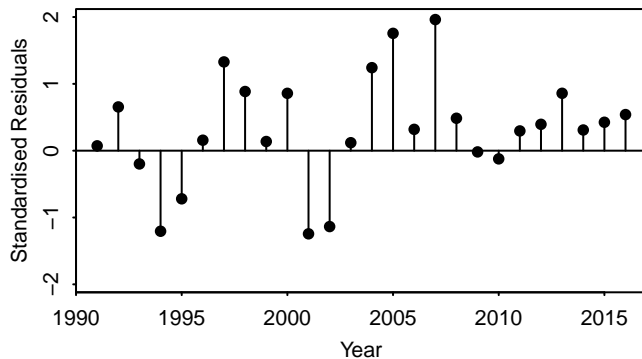
a) Observed and fitted values time series



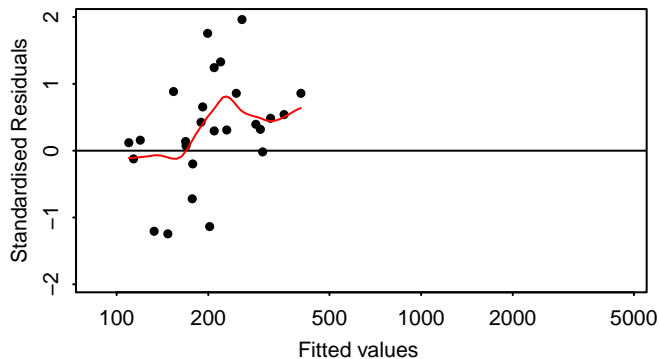
b) Observed vs fitted values



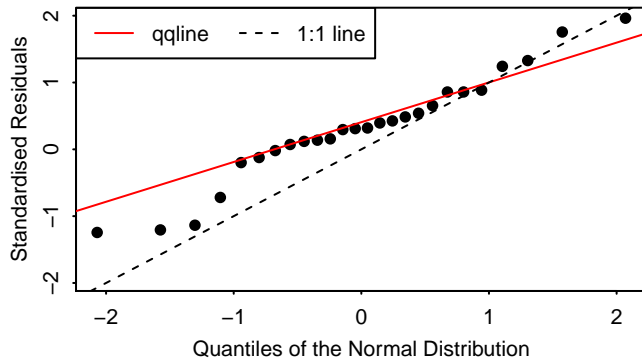
c) Standardised residuals over time



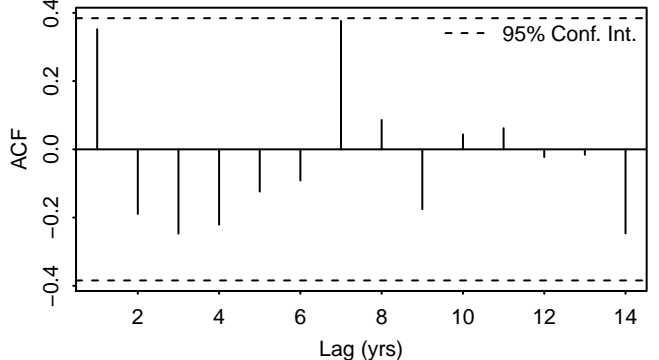
d) Tukey–Anscombe plot



e) Normal Q–Q plot

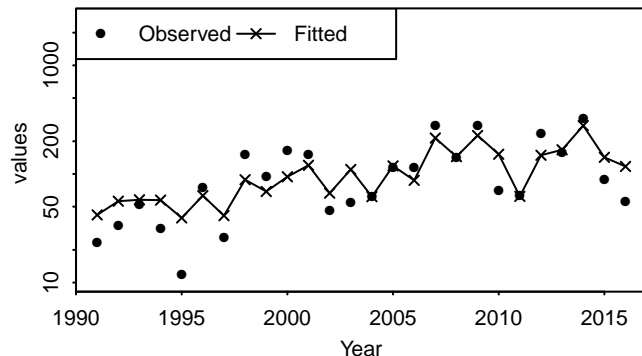


f) Autocorrelation of Residuals

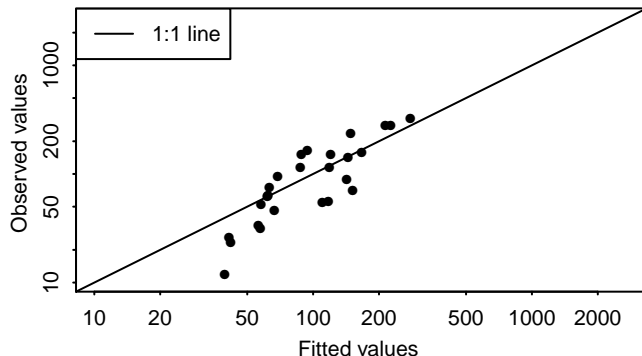


# Turbot in IV Diagnostics – BTS–ISIS, age 4

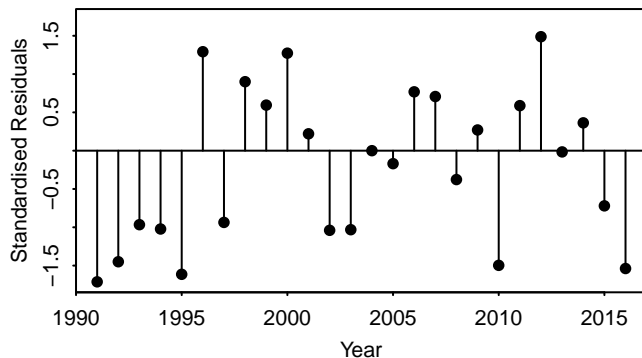
a) Observed and fitted values time series



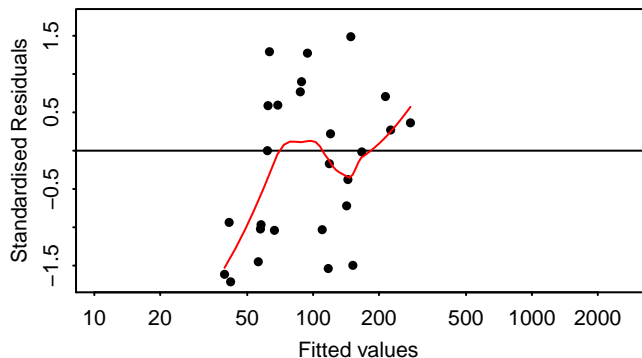
b) Observed vs fitted values



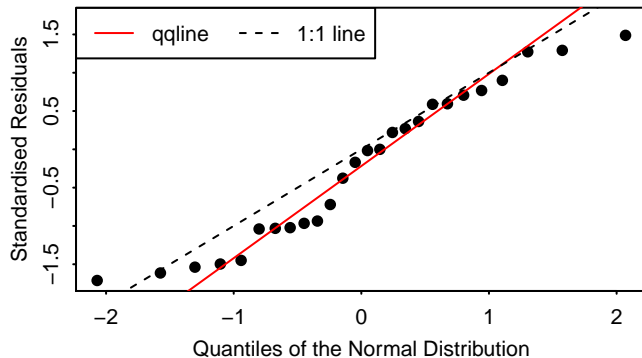
c) Standardised residuals over time



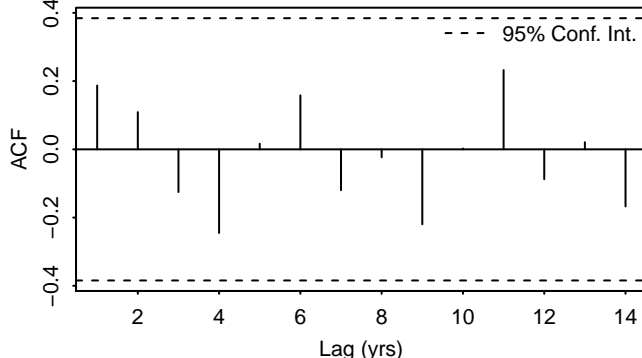
d) Tukey–Anscombe plot



e) Normal Q–Q plot

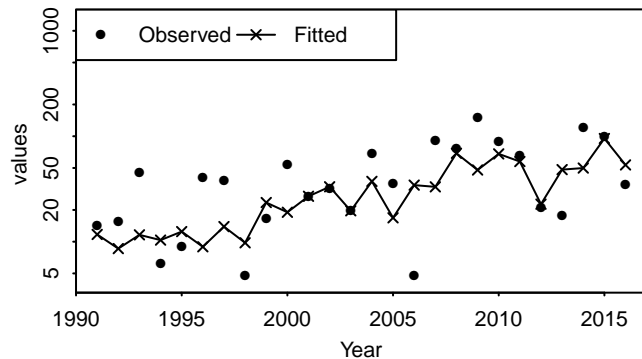


f) Autocorrelation of Residuals

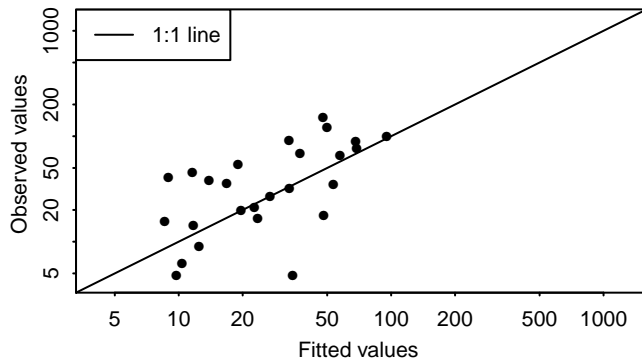


# Turbot in IV Diagnostics – BTS–ISIS, age 5

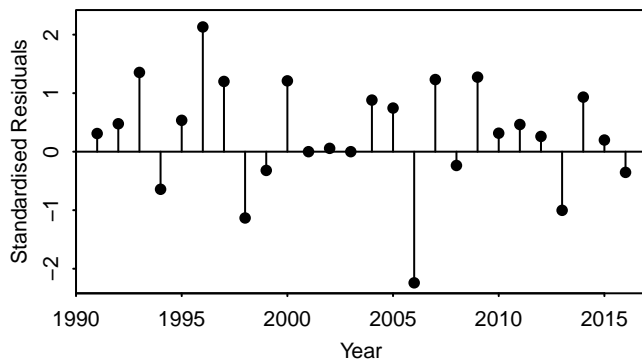
a) Observed and fitted values time series



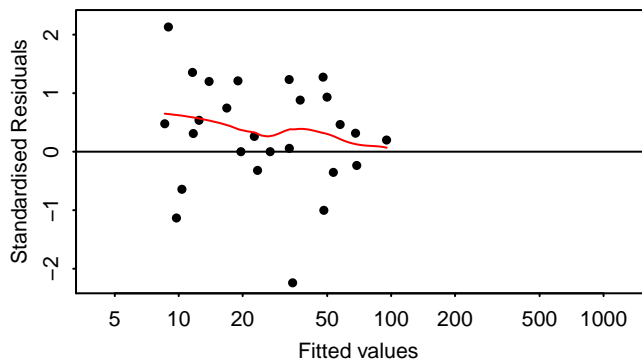
b) Observed vs fitted values



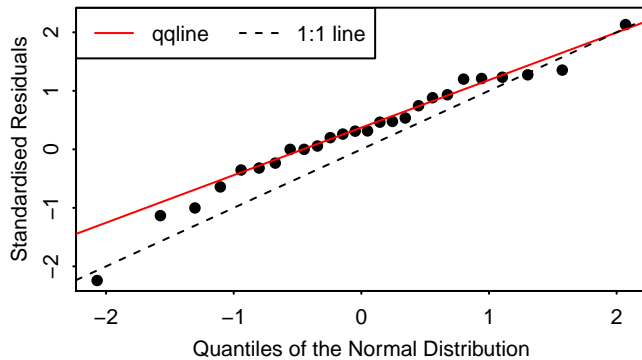
c) Standardised residuals over time



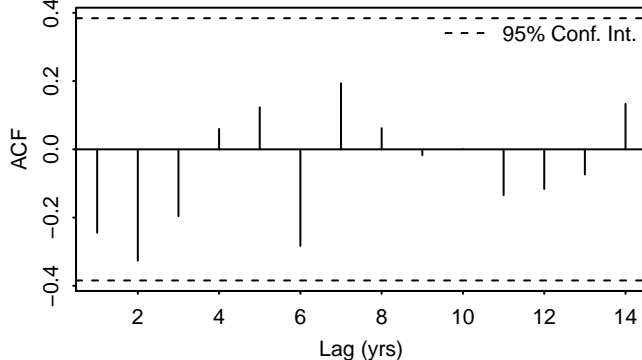
d) Tukey–Anscombe plot



e) Normal Q–Q plot

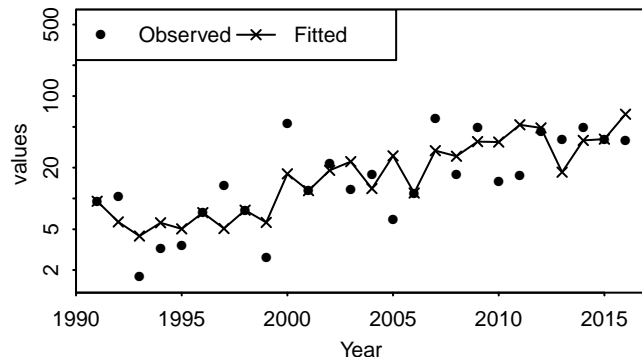


f) Autocorrelation of Residuals

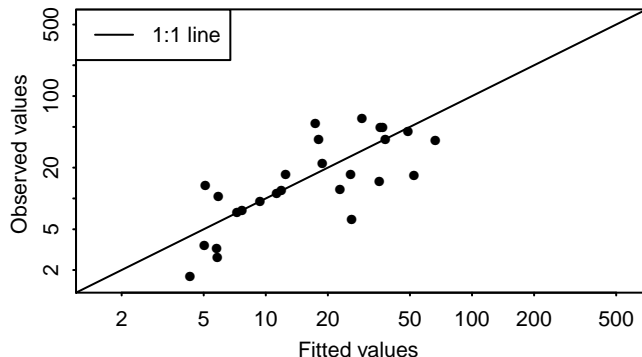


# Turbot in IV Diagnostics – BTS–ISIS, age 6

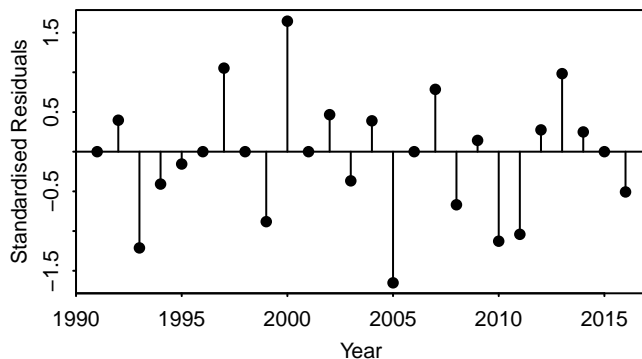
a) Observed and fitted values time series



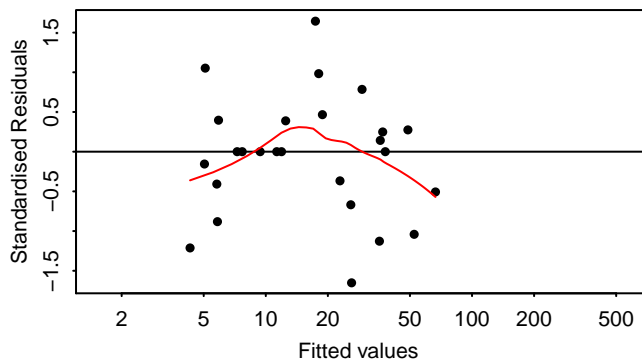
b) Observed vs fitted values



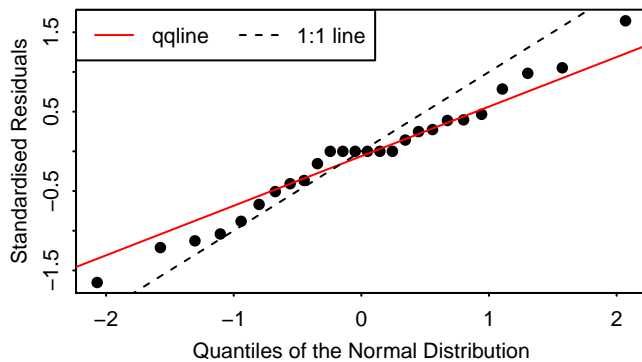
c) Standardised residuals over time



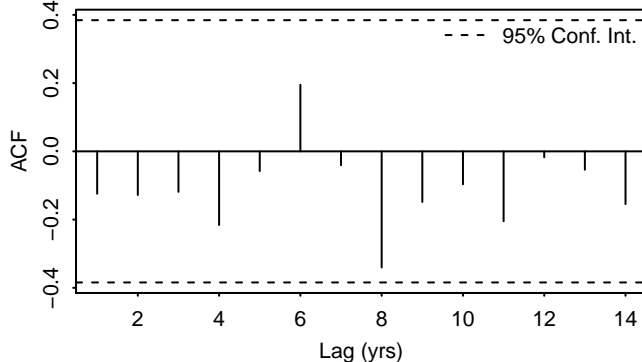
d) Tukey–Anscombe plot



e) Normal Q–Q plot

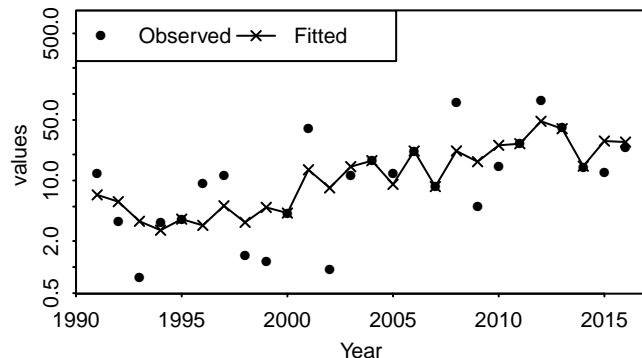


f) Autocorrelation of Residuals

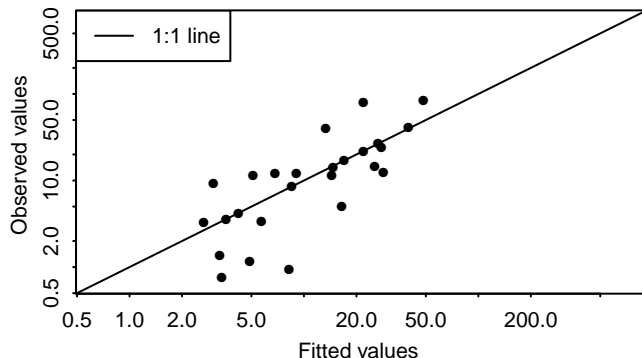


# Turbot in IV Diagnostics – BTS–ISIS, age 7

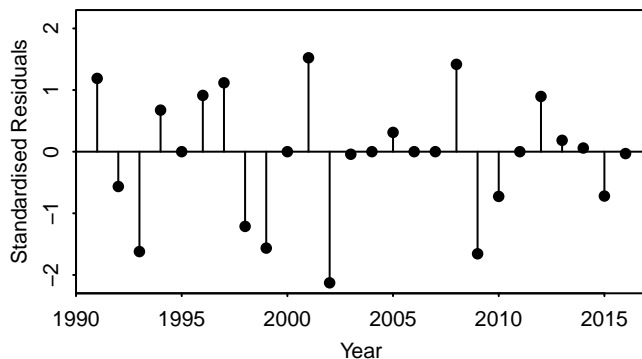
a) Observed and fitted values time series



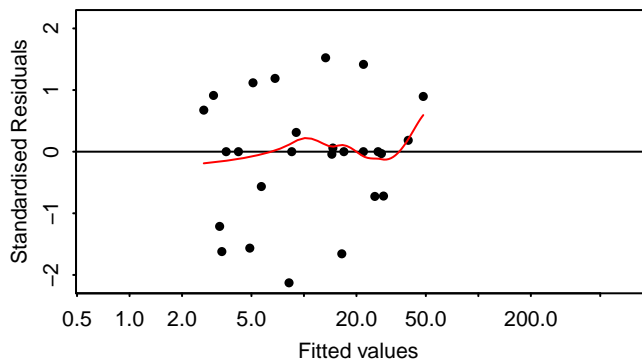
b) Observed vs fitted values



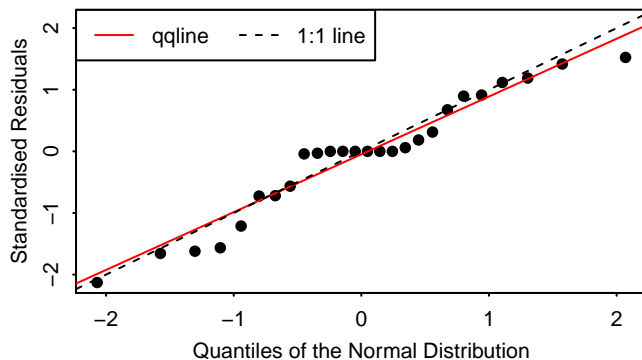
c) Standardised residuals over time



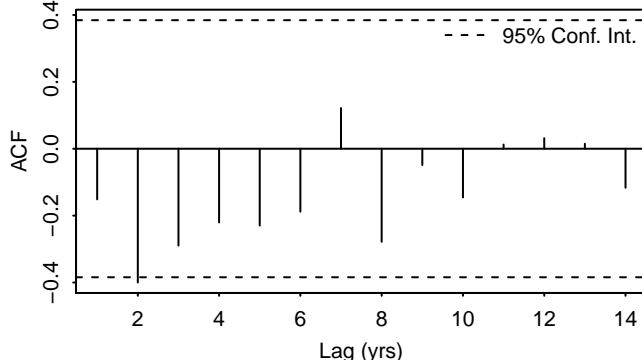
d) Tukey–Anscombe plot



e) Normal Q–Q plot

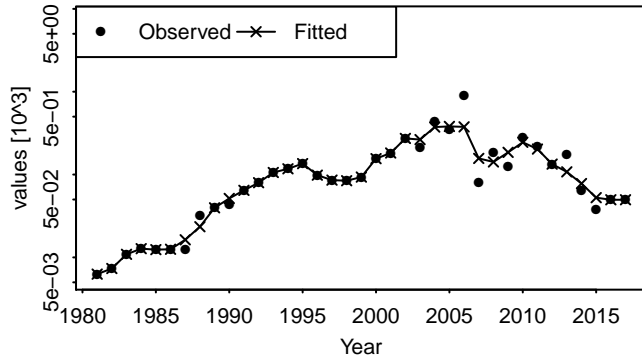


f) Autocorrelation of Residuals

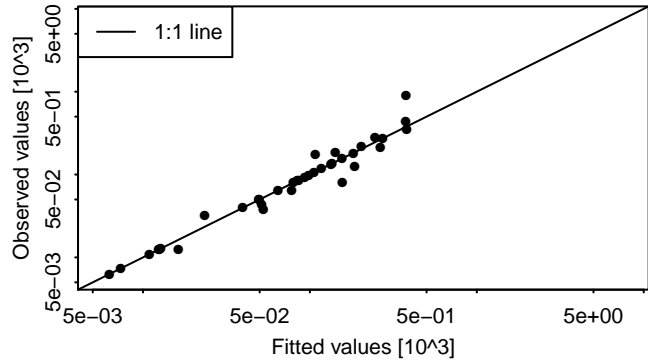


# Turbot in IV Diagnostics – catch, age 1

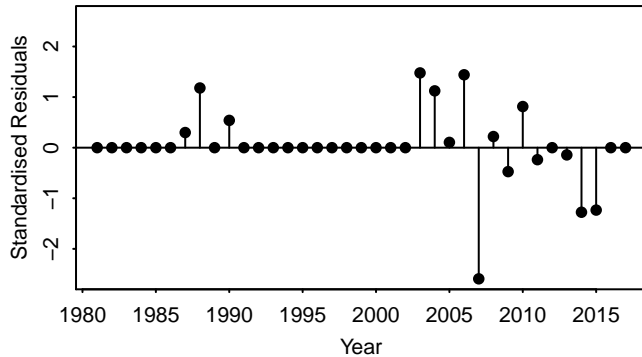
a) Observed and fitted values time series



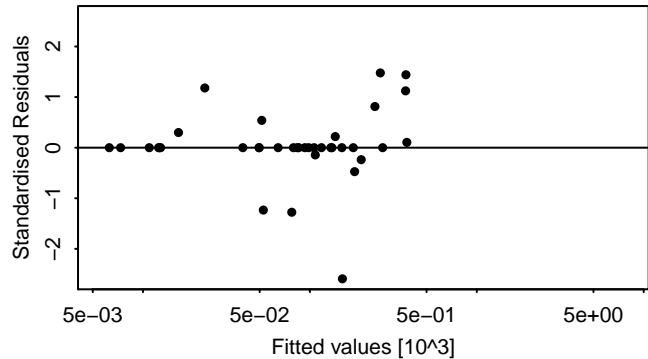
b) Observed vs fitted values



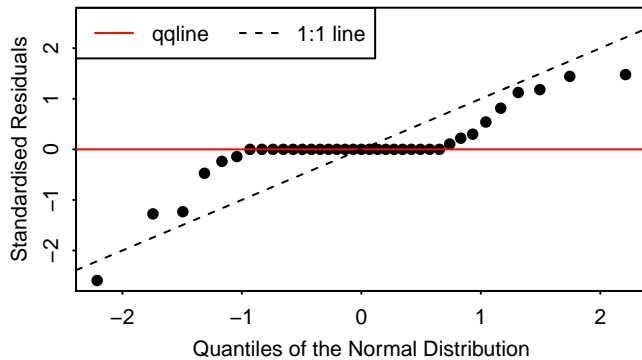
c) Standardised residuals over time



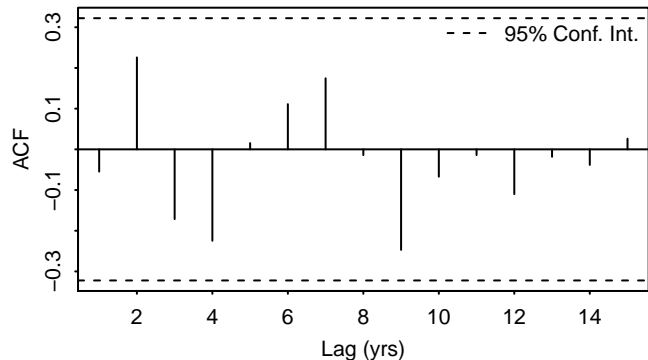
d) Tukey–Anscombe plot



e) Normal Q–Q plot



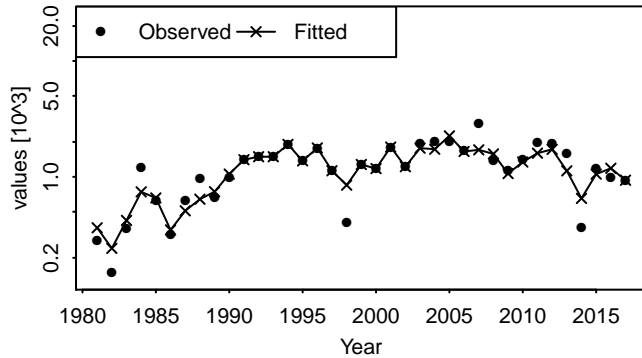
f) Autocorrelation of Residuals



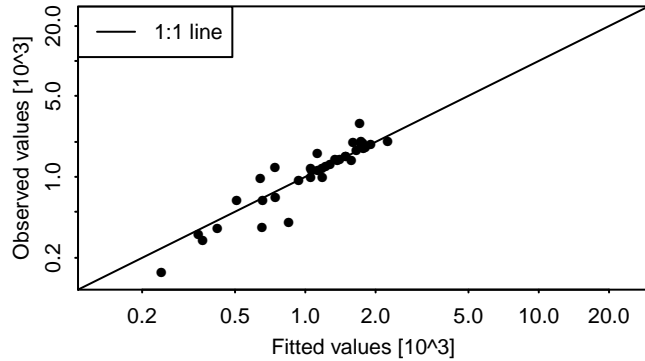


# Turbot in IV Diagnostics – catch, age 2

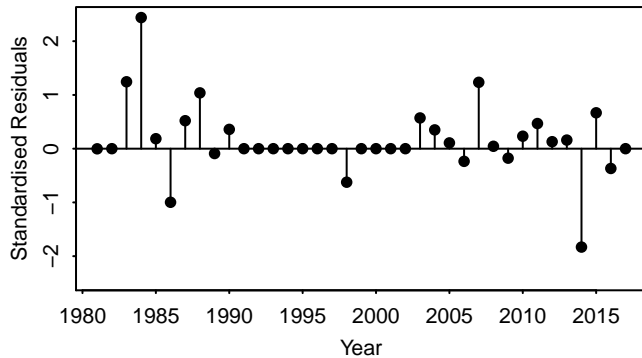
a) Observed and fitted values time series



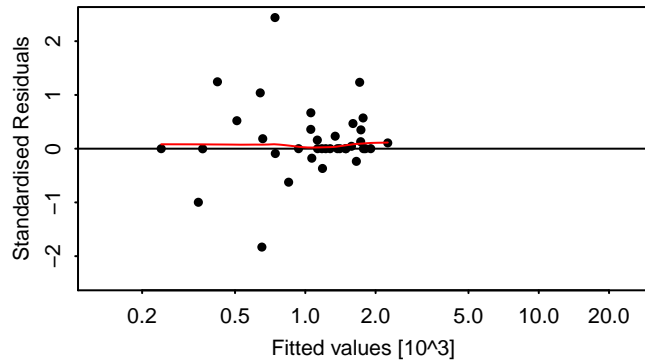
b) Observed vs fitted values



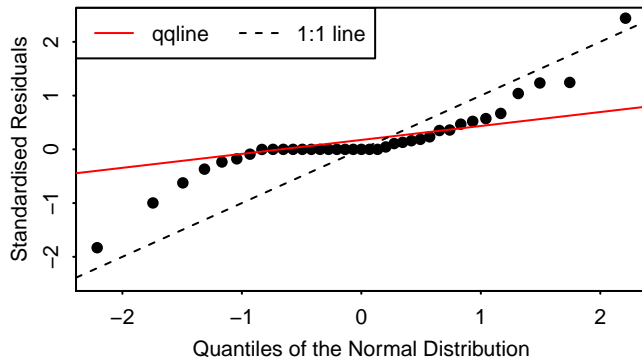
c) Standardised residuals over time



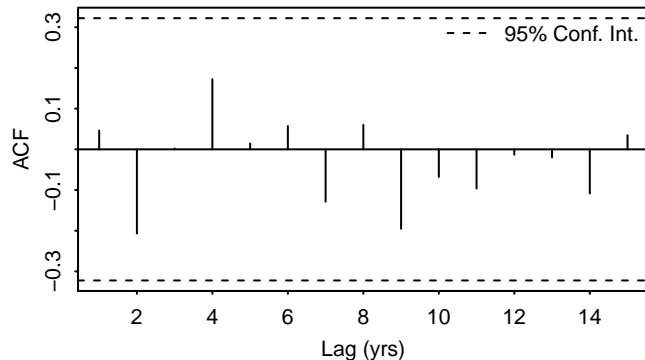
d) Tukey–Anscombe plot



e) Normal Q–Q plot

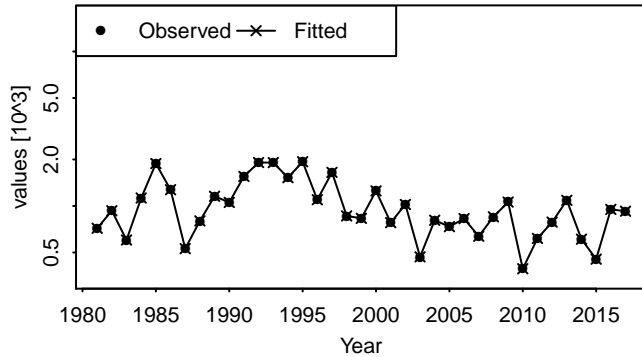


f) Autocorrelation of Residuals

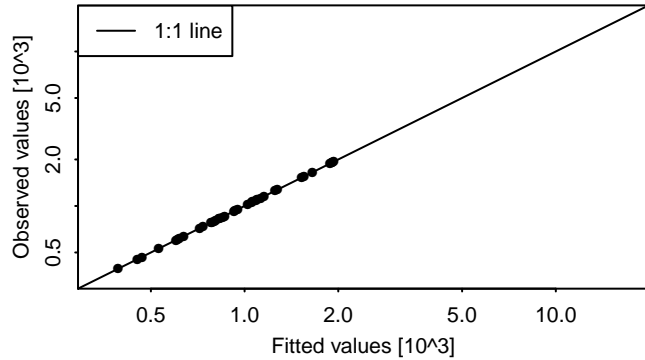


# Turbot in IV Diagnostics – catch, age 3

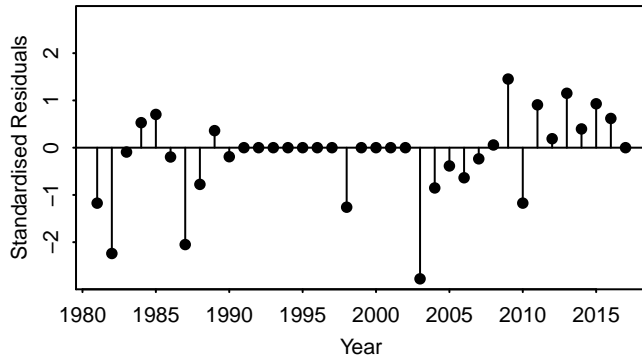
a) Observed and fitted values time series



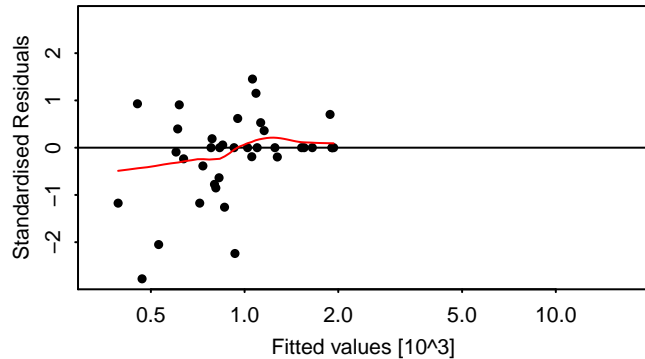
b) Observed vs fitted values



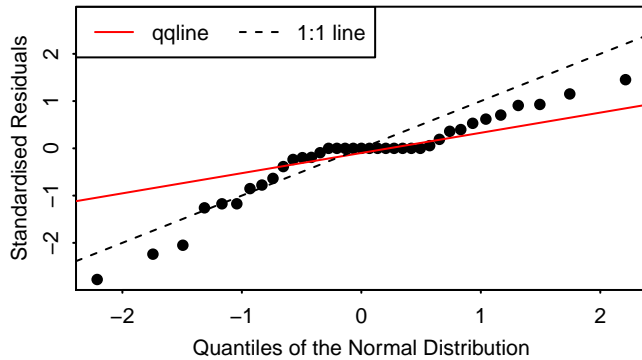
c) Standardised residuals over time



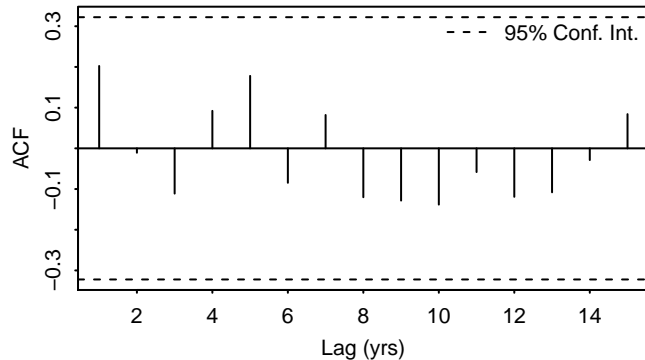
d) Tukey–Anscombe plot



e) Normal Q–Q plot

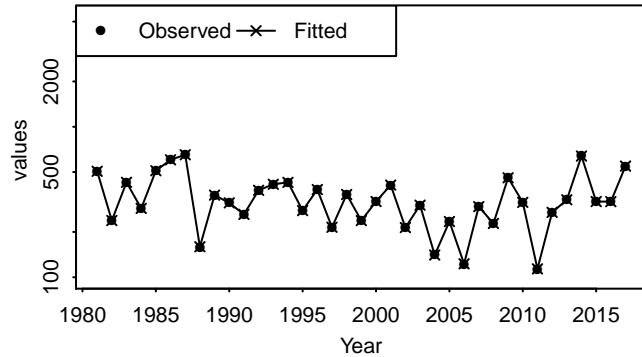


f) Autocorrelation of Residuals

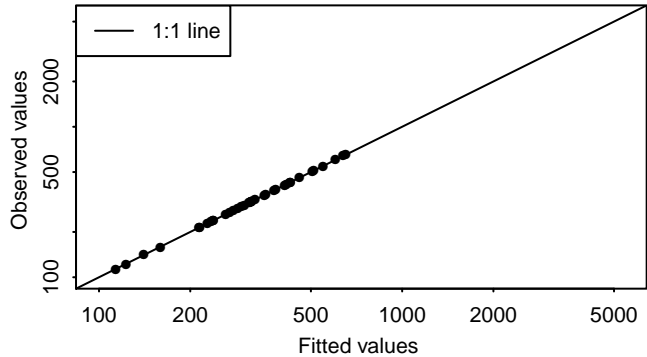


# Turbot in IV Diagnostics – catch, age 4

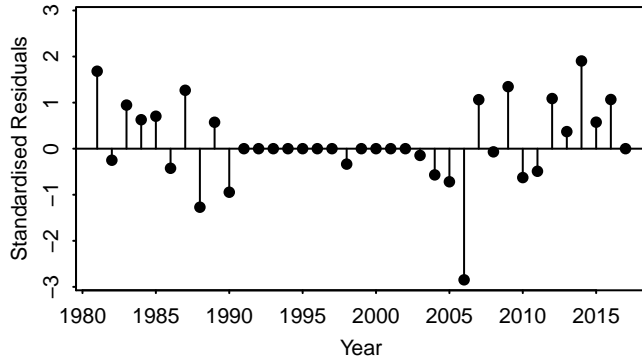
a) Observed and fitted values time series



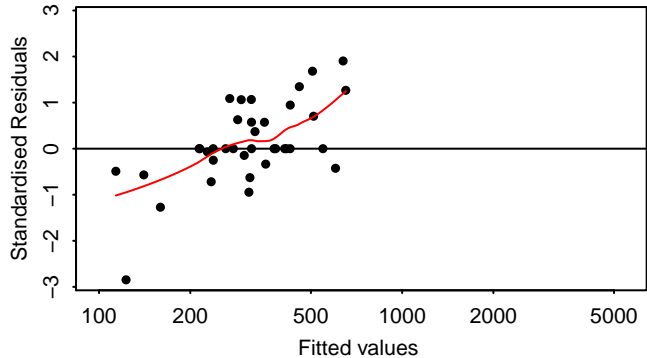
b) Observed vs fitted values



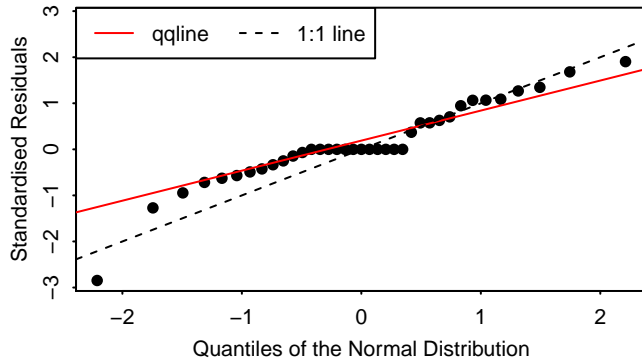
c) Standardised residuals over time



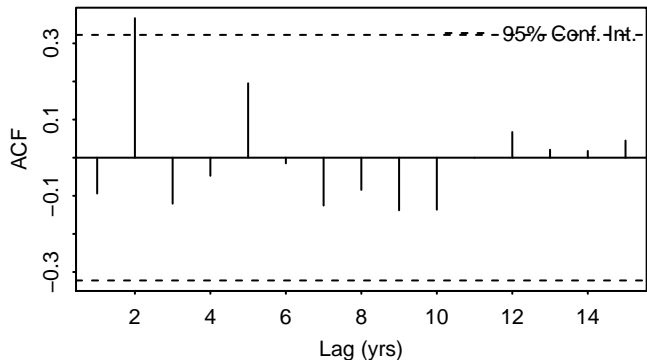
d) Tukey–Anscombe plot



e) Normal Q–Q plot

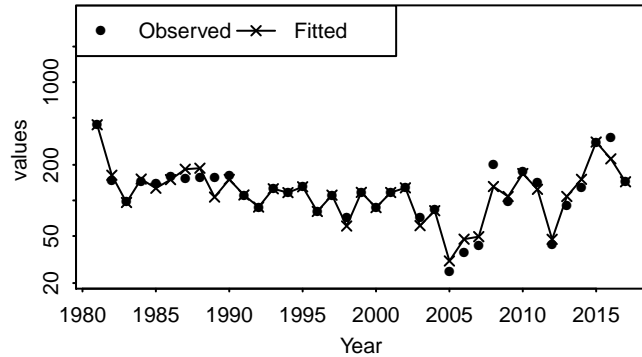


f) Autocorrelation of Residuals

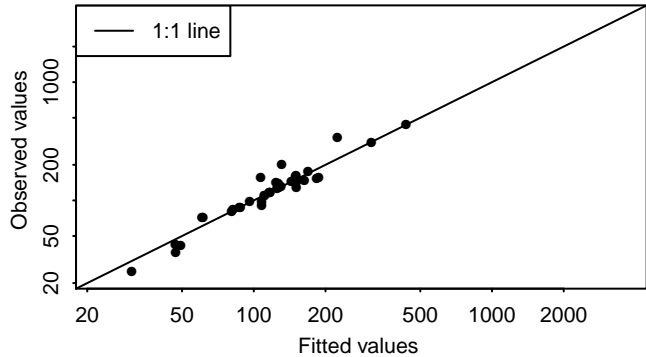


# Turbot in IV Diagnostics – catch, age 5

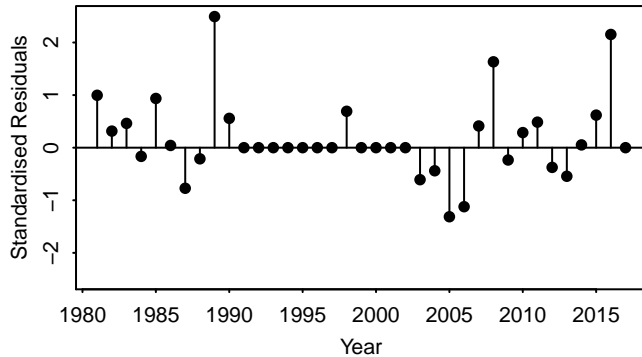
a) Observed and fitted values time series



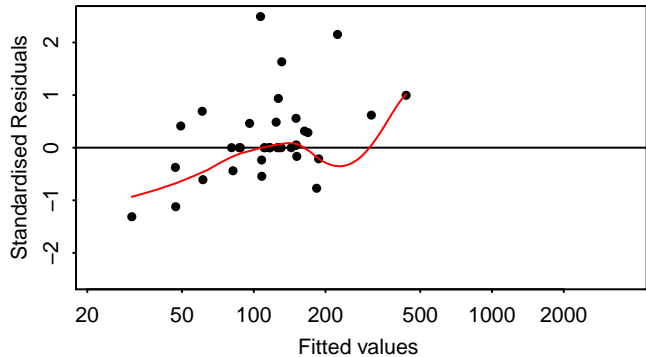
b) Observed vs fitted values



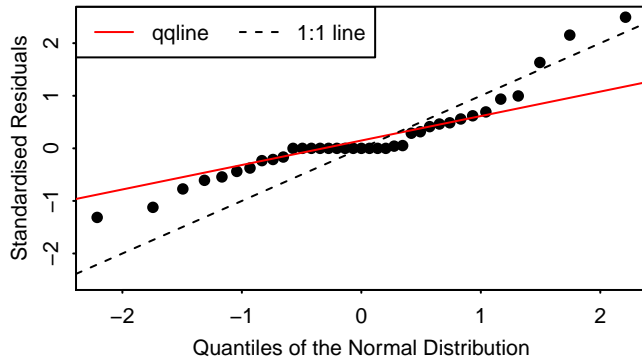
c) Standardised residuals over time



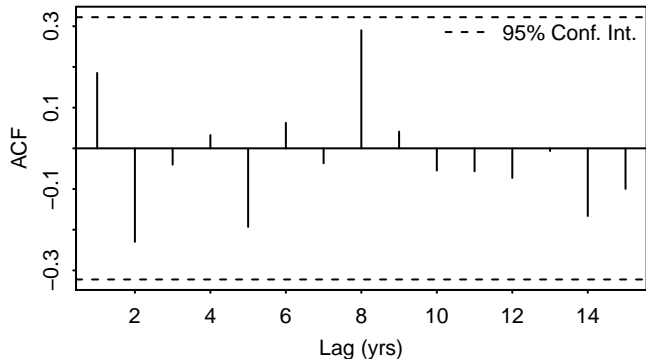
d) Tukey–Anscombe plot



e) Normal Q–Q plot

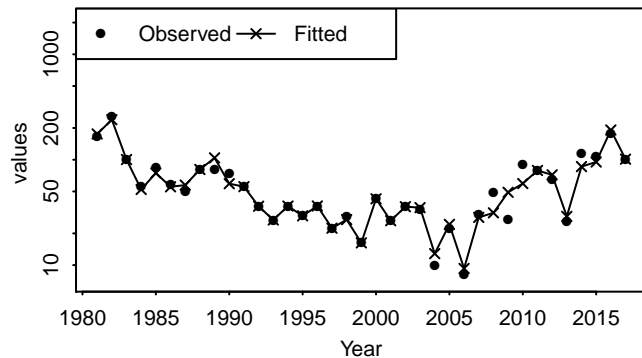


f) Autocorrelation of Residuals

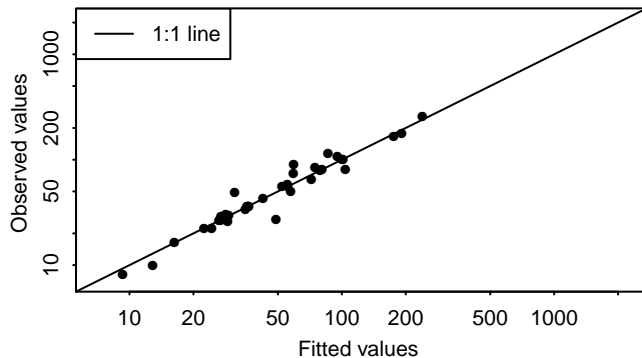


# Turbot in IV Diagnostics – catch, age 6

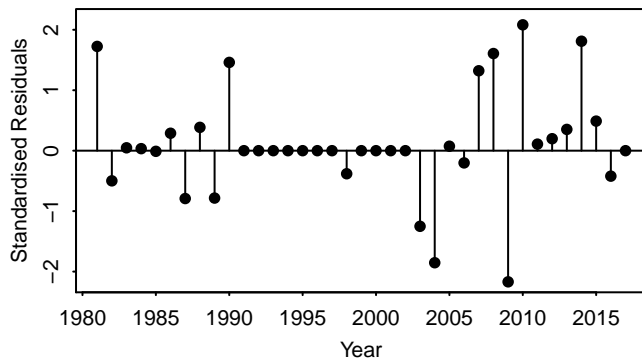
a) Observed and fitted values time series



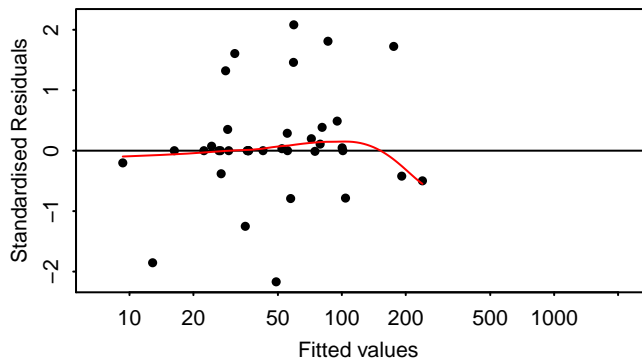
b) Observed vs fitted values



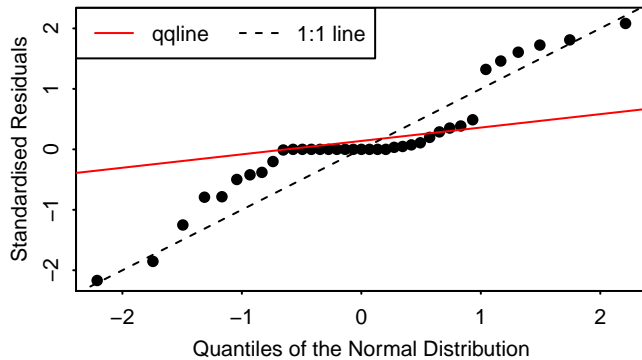
c) Standardised residuals over time



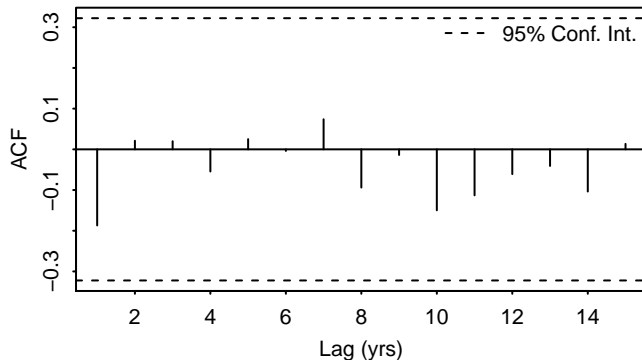
d) Tukey–Anscombe plot



e) Normal Q–Q plot

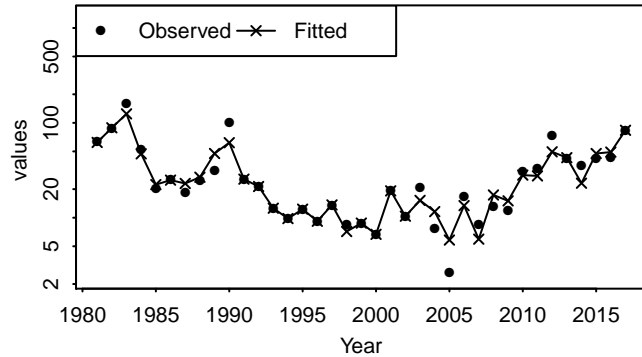


f) Autocorrelation of Residuals

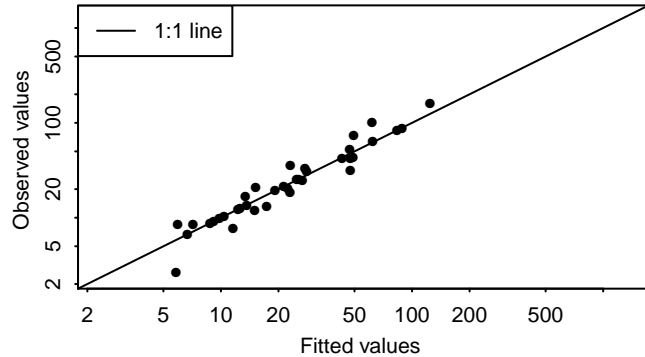


# Turbot in IV Diagnostics – catch, age 7

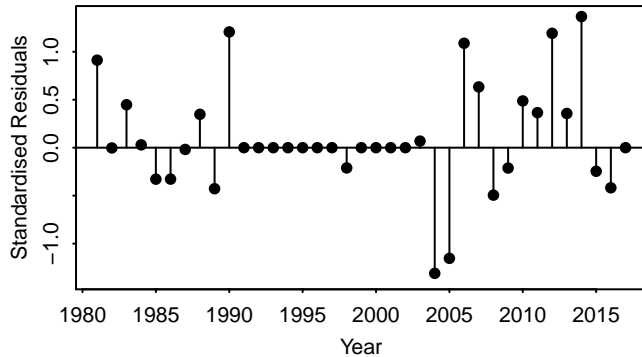
a) Observed and fitted values time series



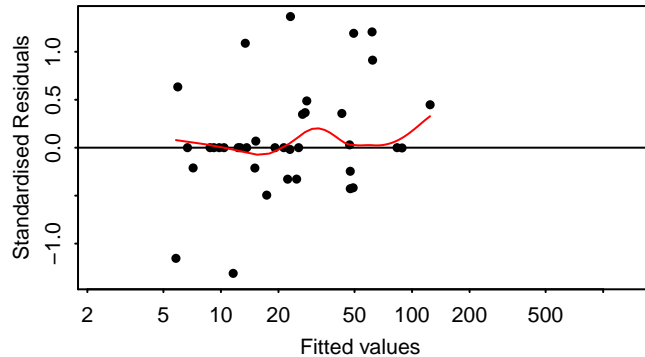
b) Observed vs fitted values



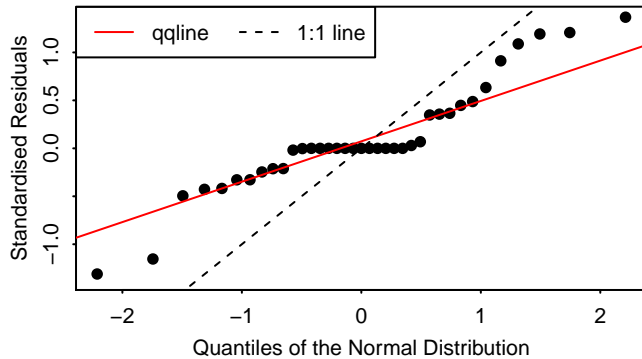
c) Standardised residuals over time



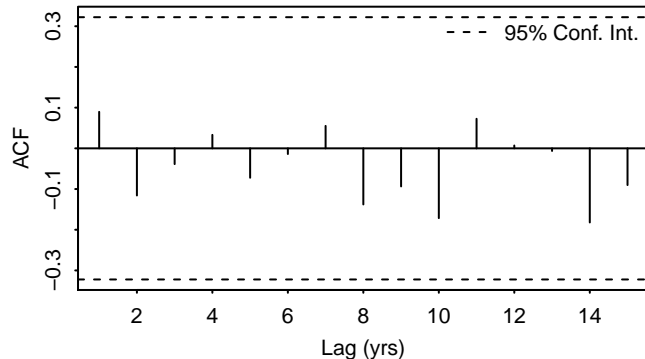
d) Tukey–Anscombe plot



e) Normal Q–Q plot

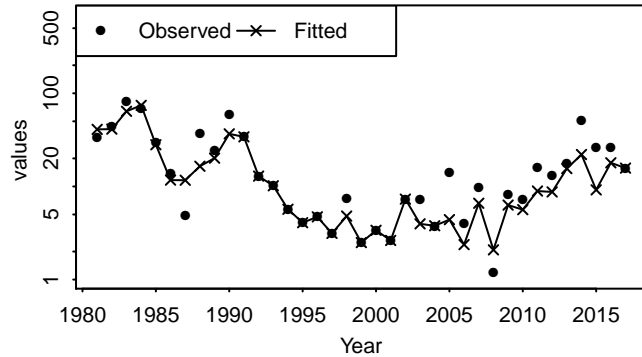


f) Autocorrelation of Residuals

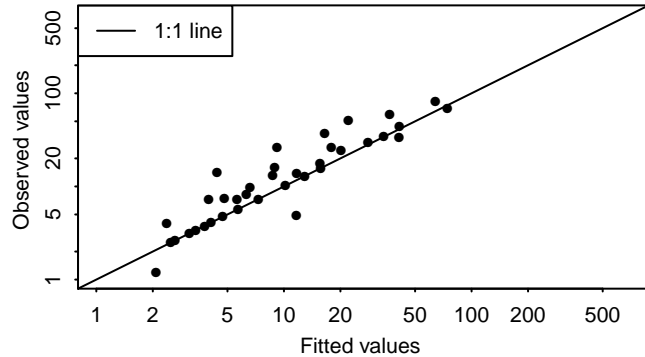


# Turbot in IV Diagnostics – catch, age 8

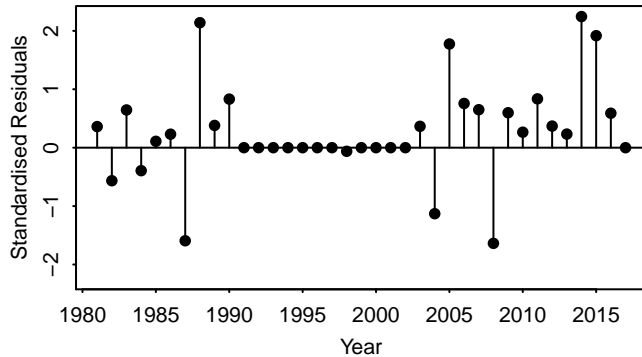
a) Observed and fitted values time series



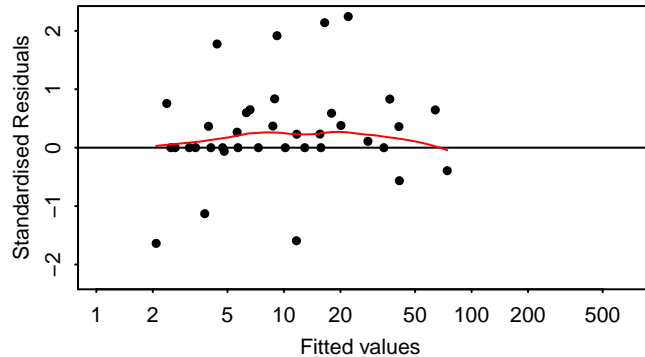
b) Observed vs fitted values



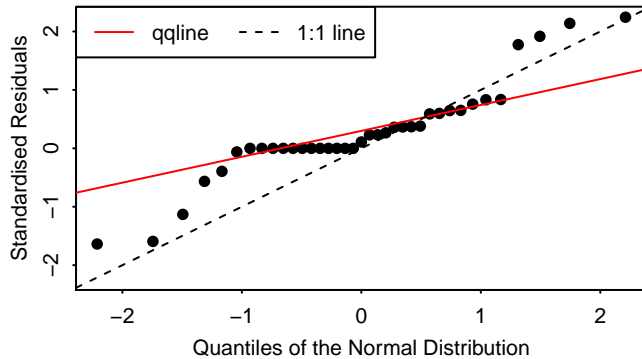
c) Standardised residuals over time



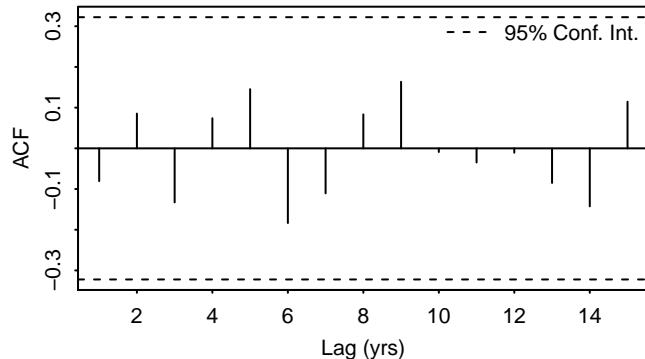
d) Tukey–Anscombe plot



e) Normal Q–Q plot

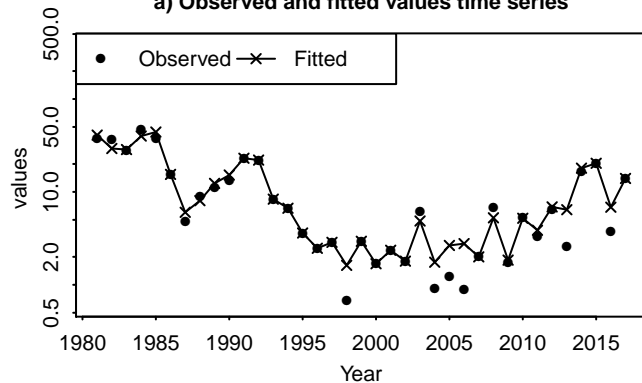


f) Autocorrelation of Residuals

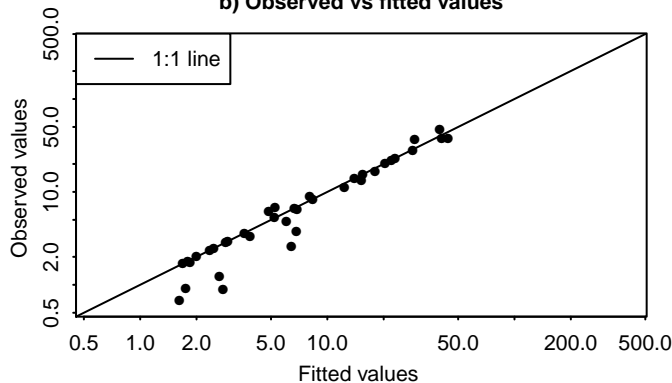


# Turbot in IV Diagnostics – catch, age 9

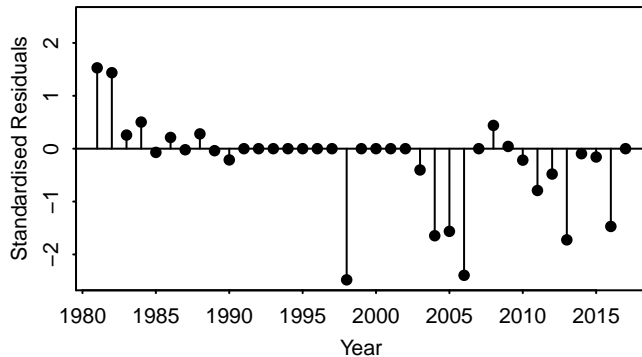
a) Observed and fitted values time series



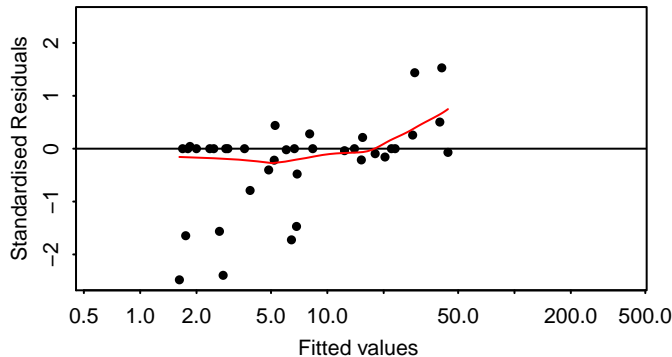
b) Observed vs fitted values



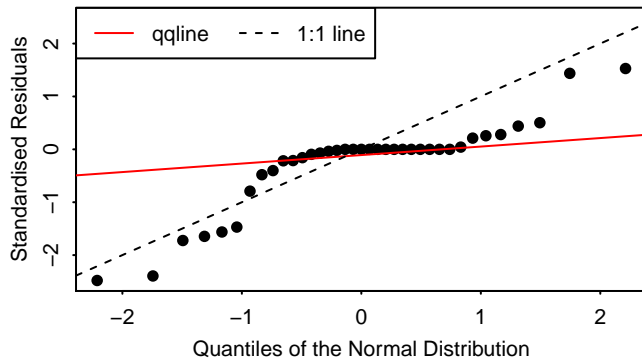
c) Standardised residuals over time



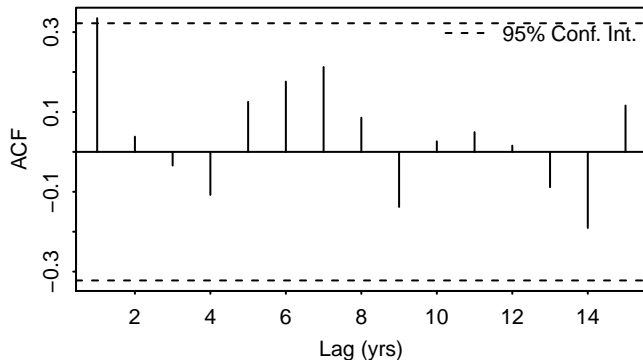
d) Tukey–Anscombe plot



e) Normal Q–Q plot



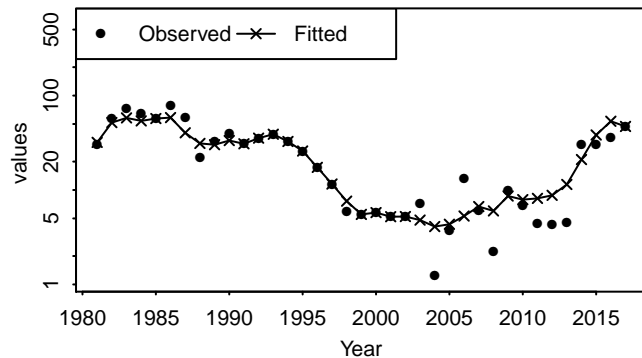
f) Autocorrelation of Residuals



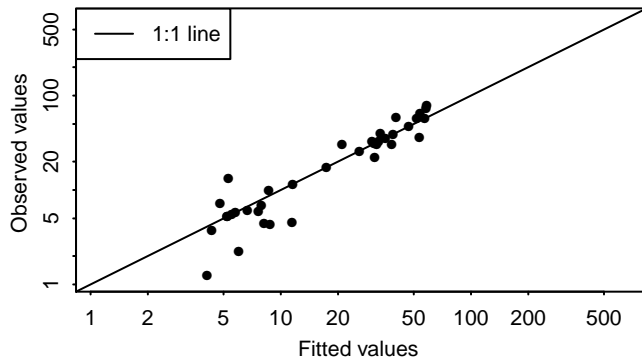


# Turbot in IV Diagnostics – catch, age 10

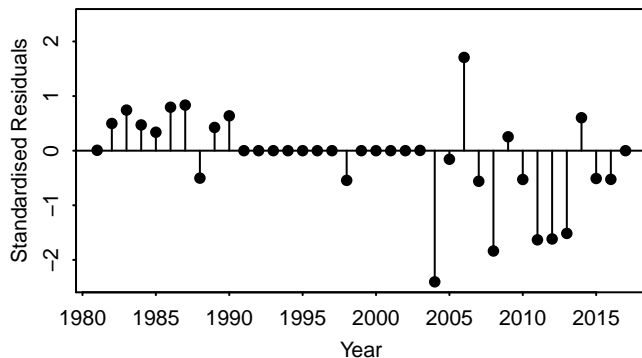
a) Observed and fitted values time series



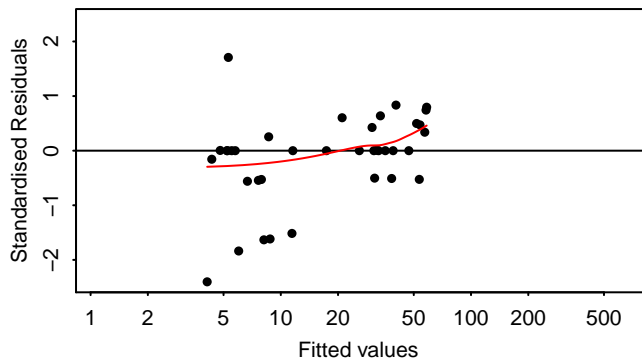
b) Observed vs fitted values



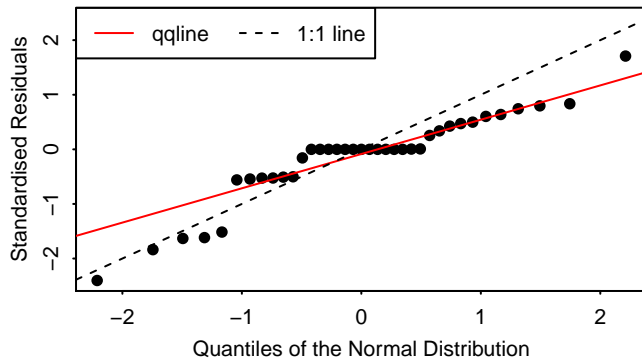
c) Standardised residuals over time



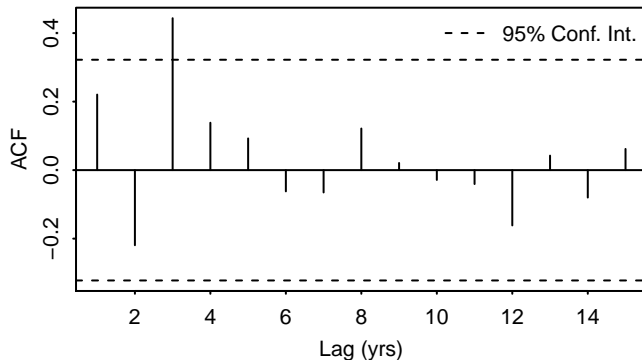
d) Tukey–Anscombe plot



e) Normal Q–Q plot

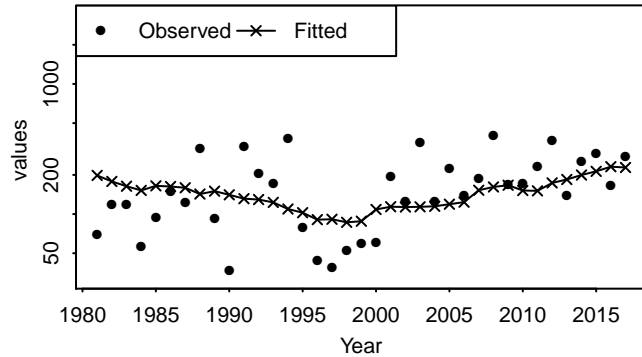


f) Autocorrelation of Residuals

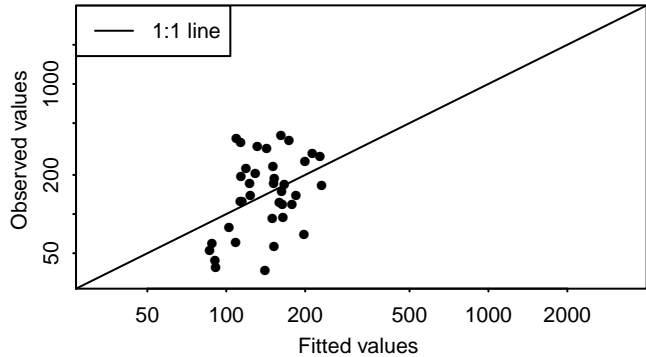


# Turbot in IV Diagnostics – IBTS\_Q1, age –1

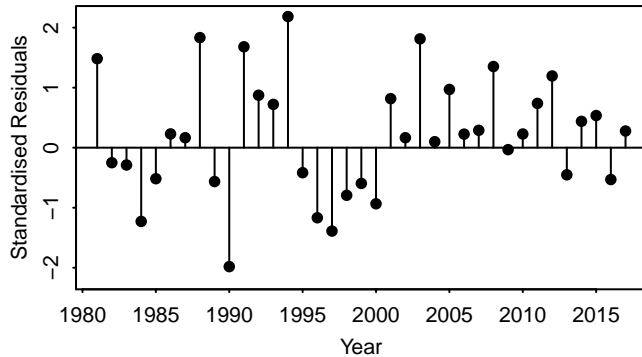
a) Observed and fitted values time series



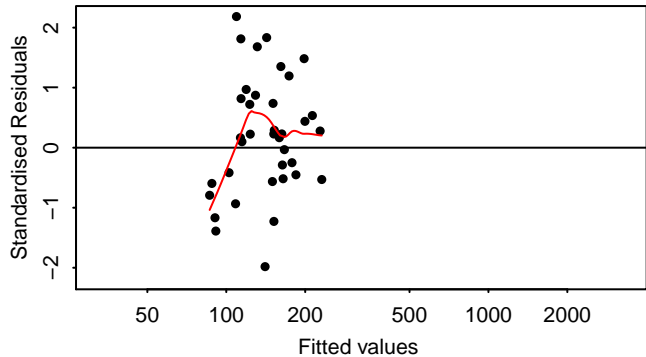
b) Observed vs fitted values



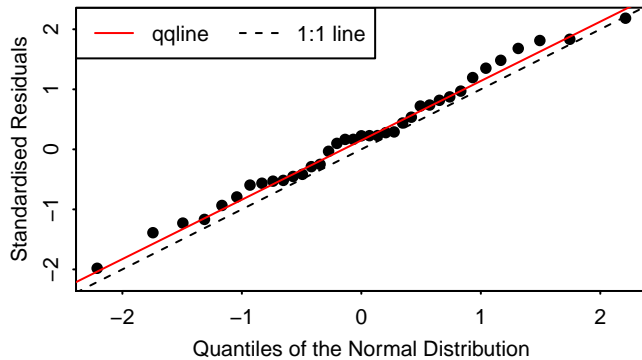
c) Standardised residuals over time



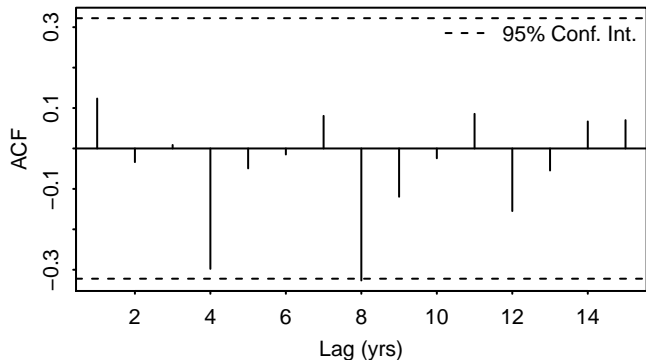
d) Tukey–Anscombe plot



e) Normal Q–Q plot

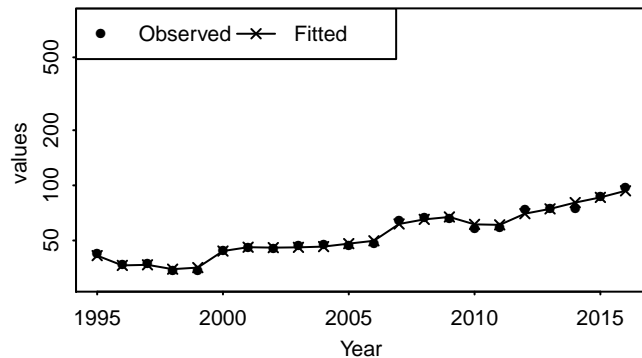


f) Autocorrelation of Residuals

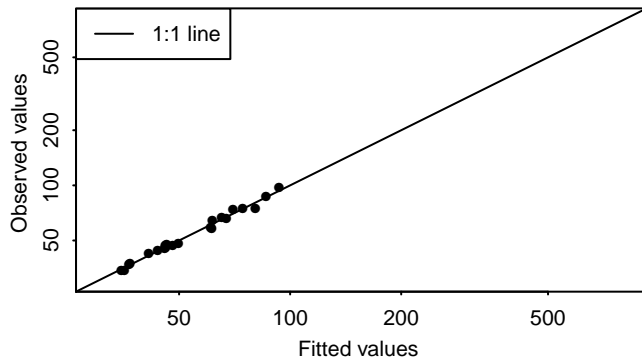


# Turbot in IV Diagnostics – NL\_LPUE, age –1

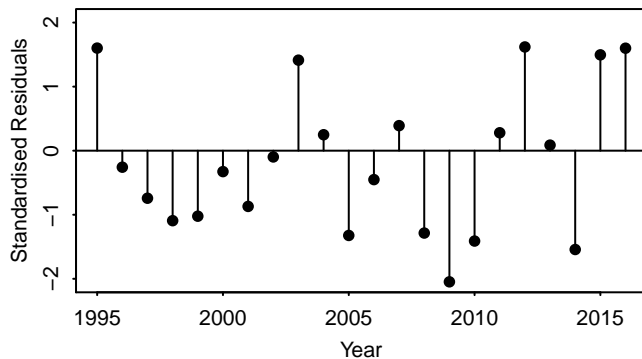
a) Observed and fitted values time series



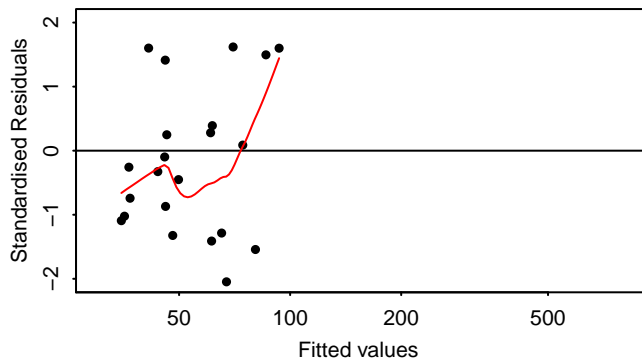
b) Observed vs fitted values



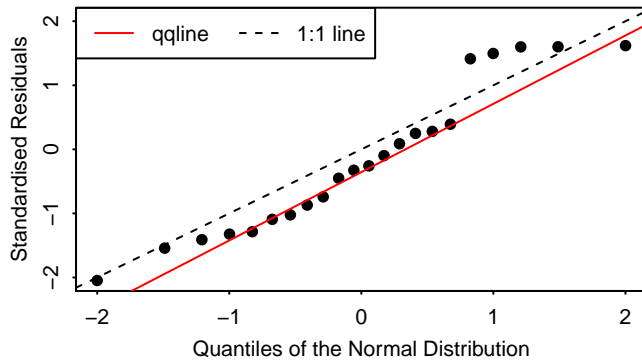
c) Standardised residuals over time



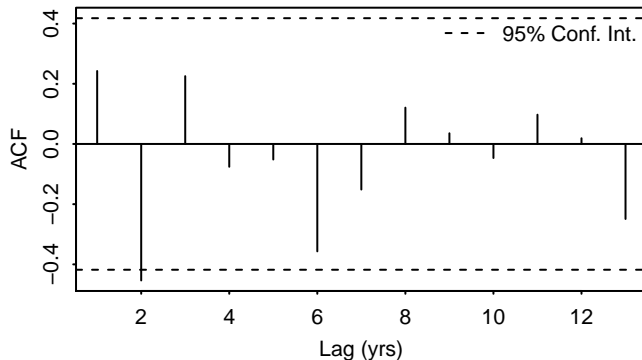
d) Tukey–Anscombe plot



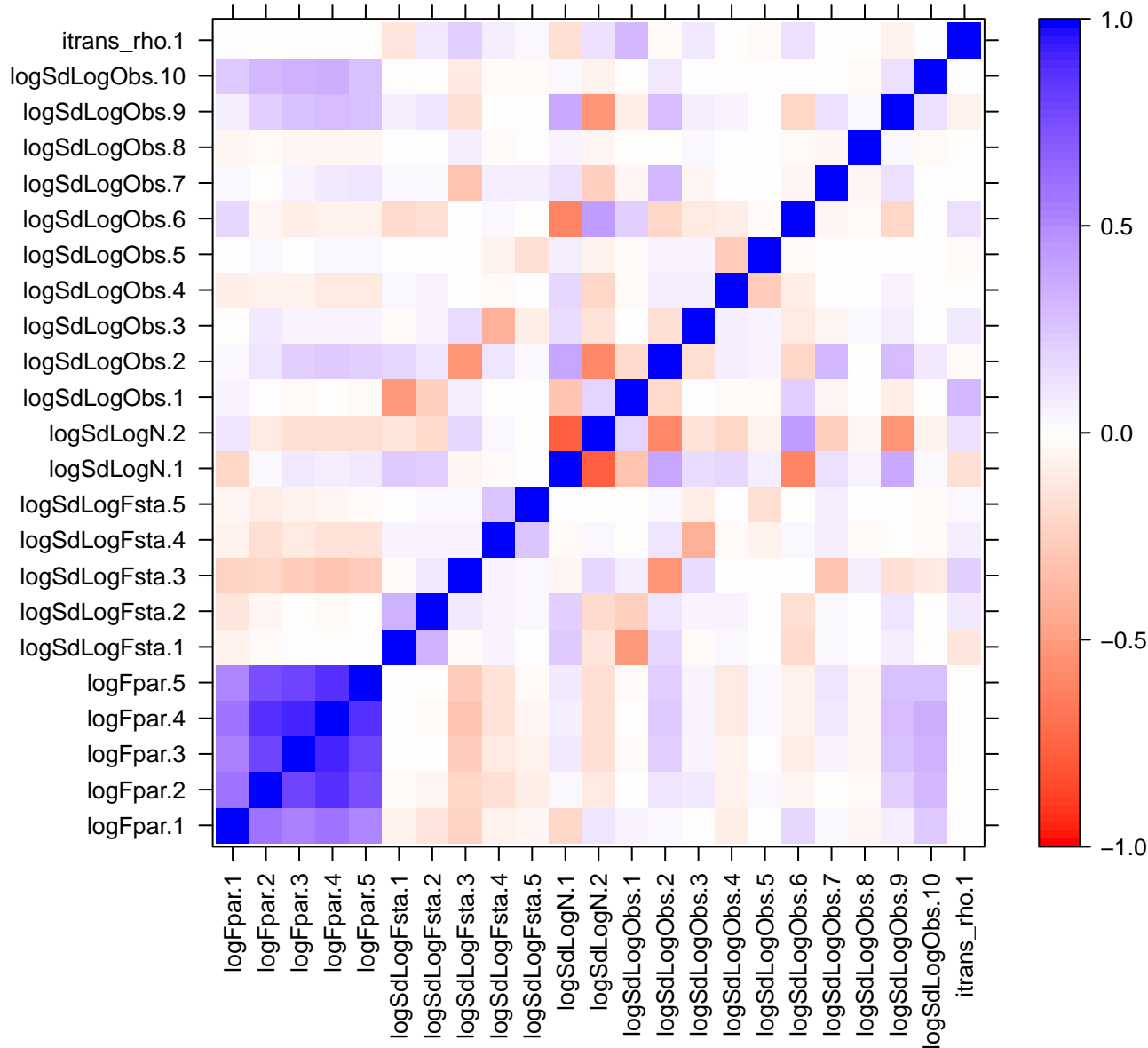
e) Normal Q–Q plot



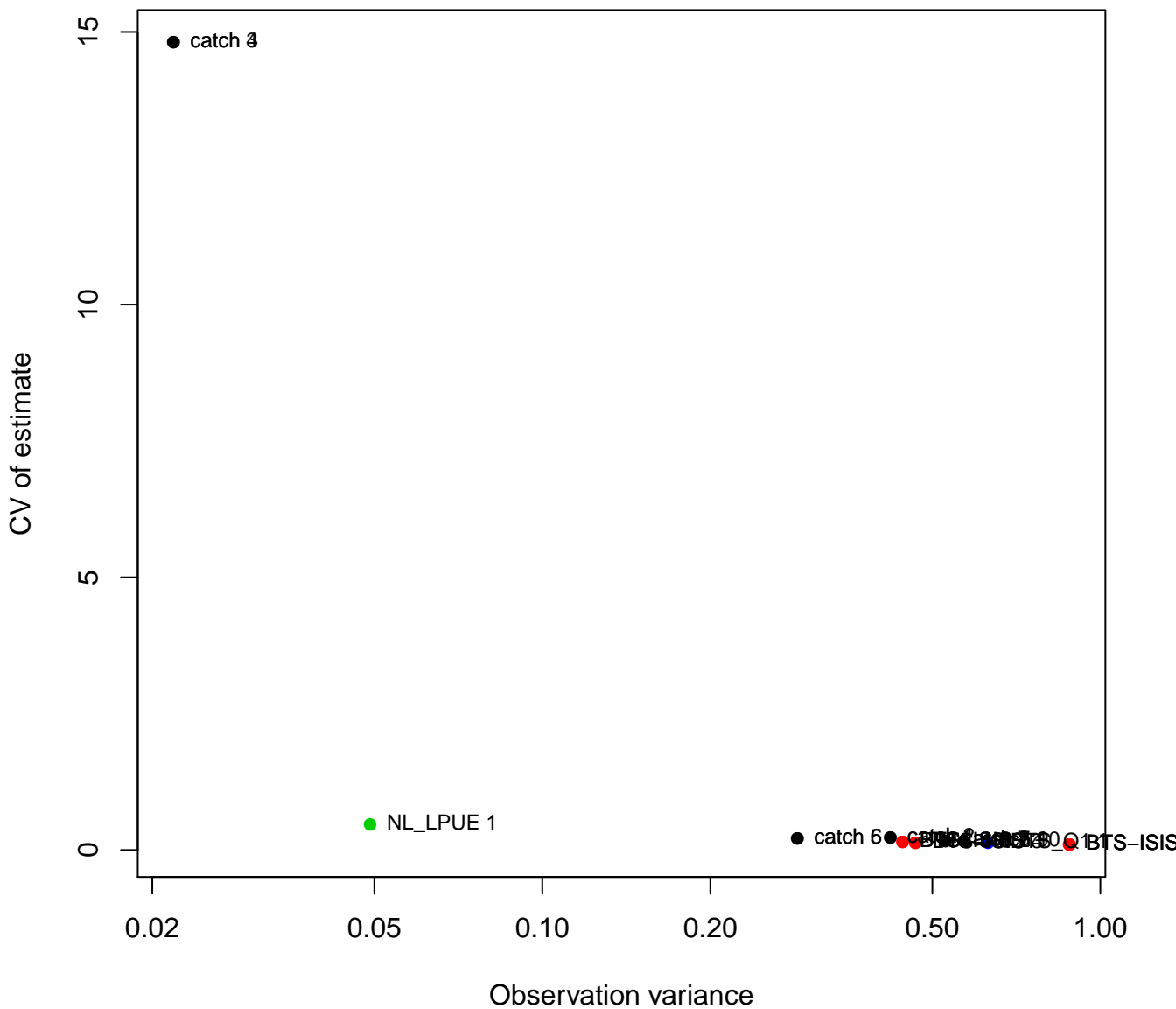
f) Autocorrelation of Residuals



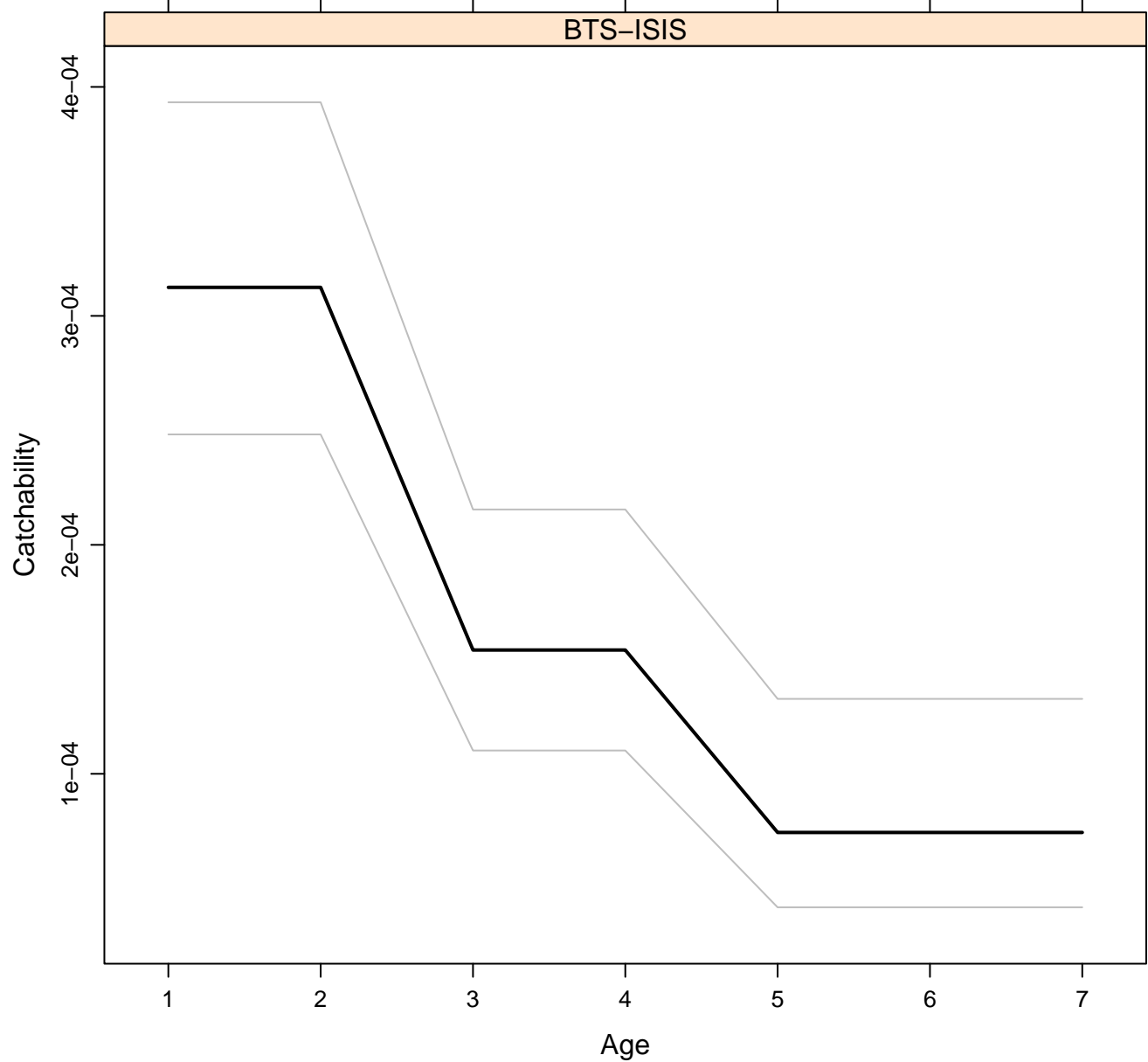
# Turbot in IV



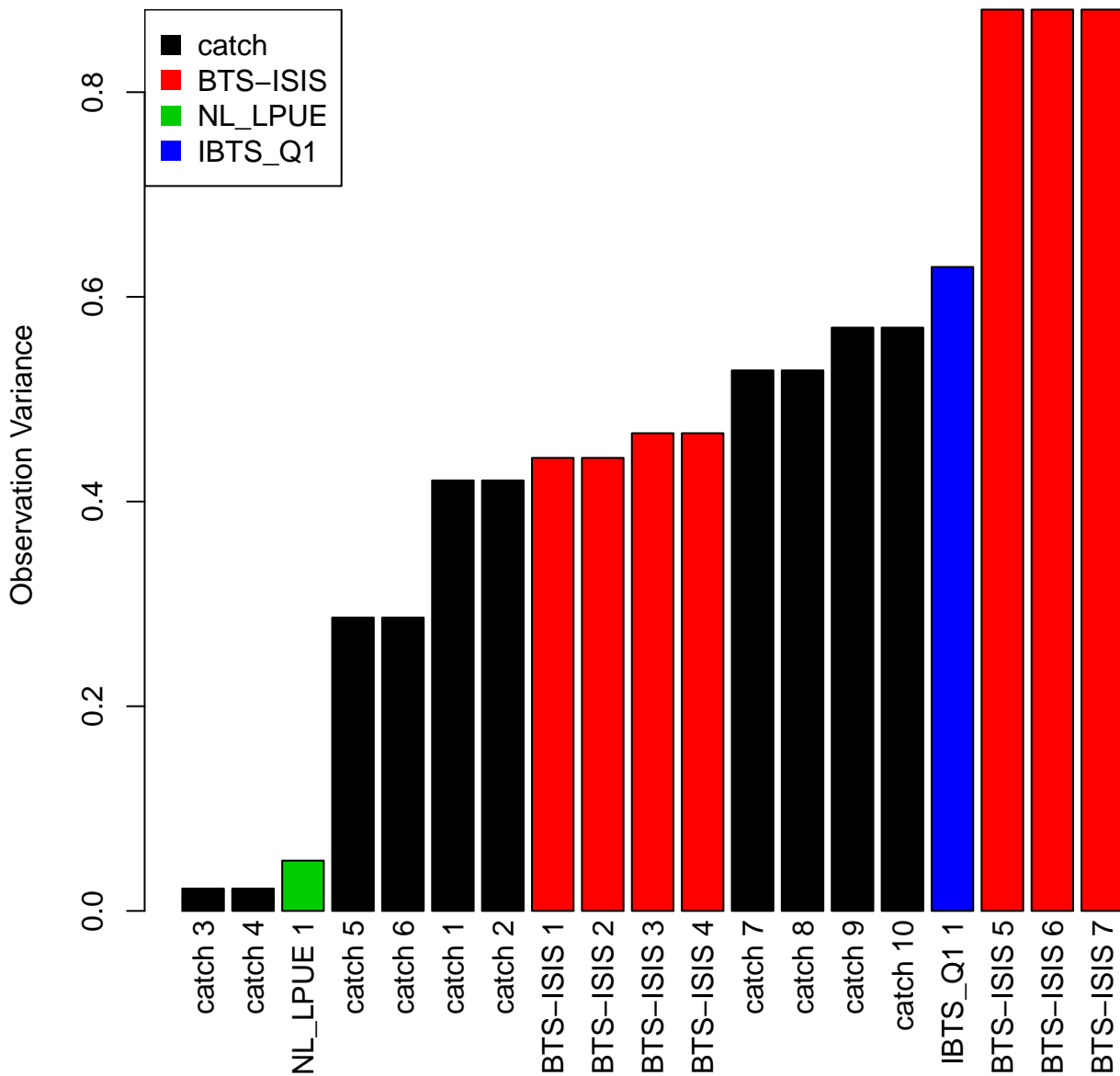
## Observation variance vs uncertainty



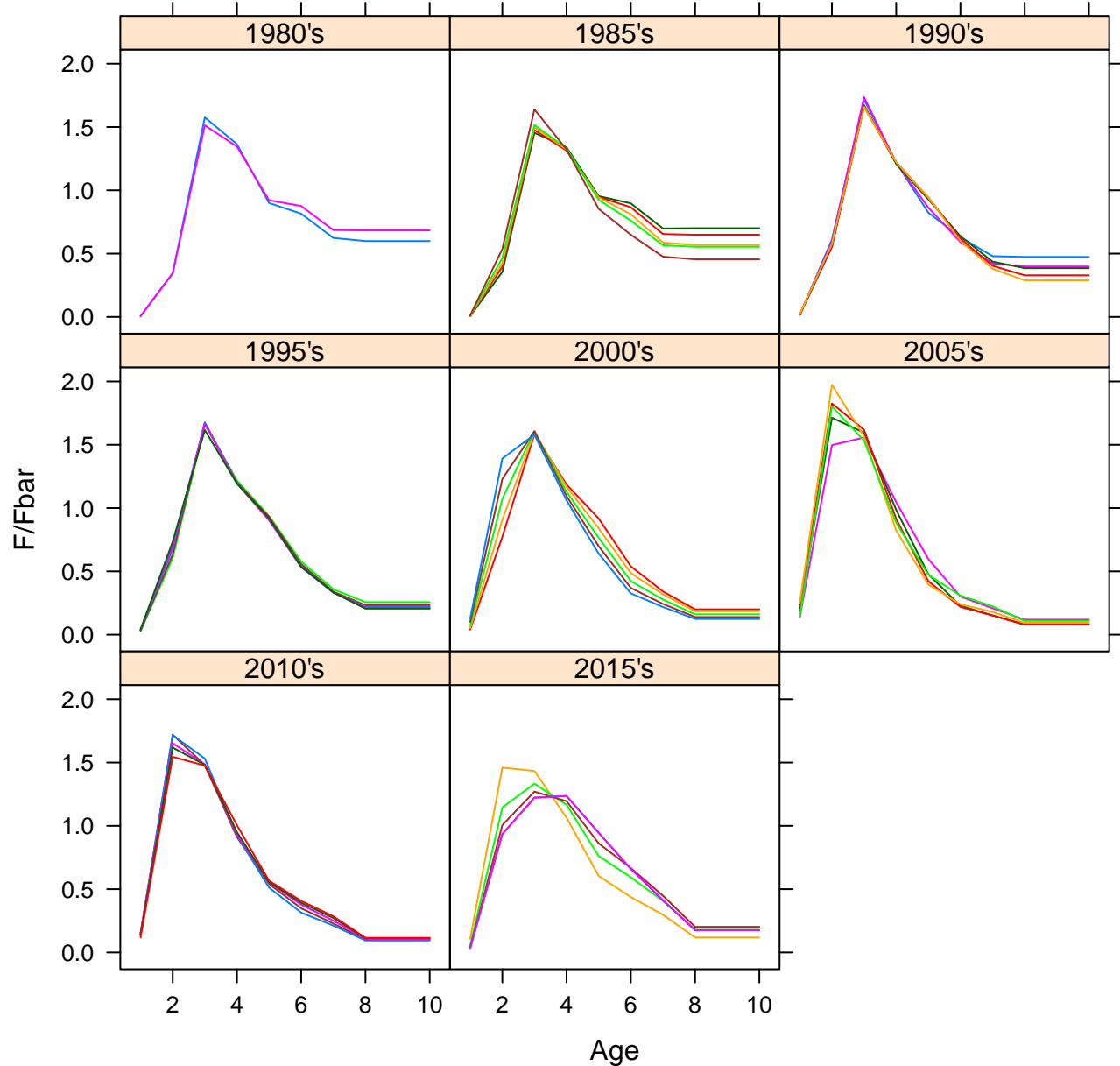
# Survey catchability parameters



Observation variances by data source



# Selectivity of the Fishery by Pentad





# Turbot in IV

Spawning stock biomass

SSB

30000  
25000  
20000  
15000  
10000  
5000  
0

Fishing mortality

Fbar

1.2  
1.0  
0.8  
0.6  
0.4  
0.2  
0.0

Recruitment

Rec

12000  
10000  
8000  
6000  
4000  
2000  
0

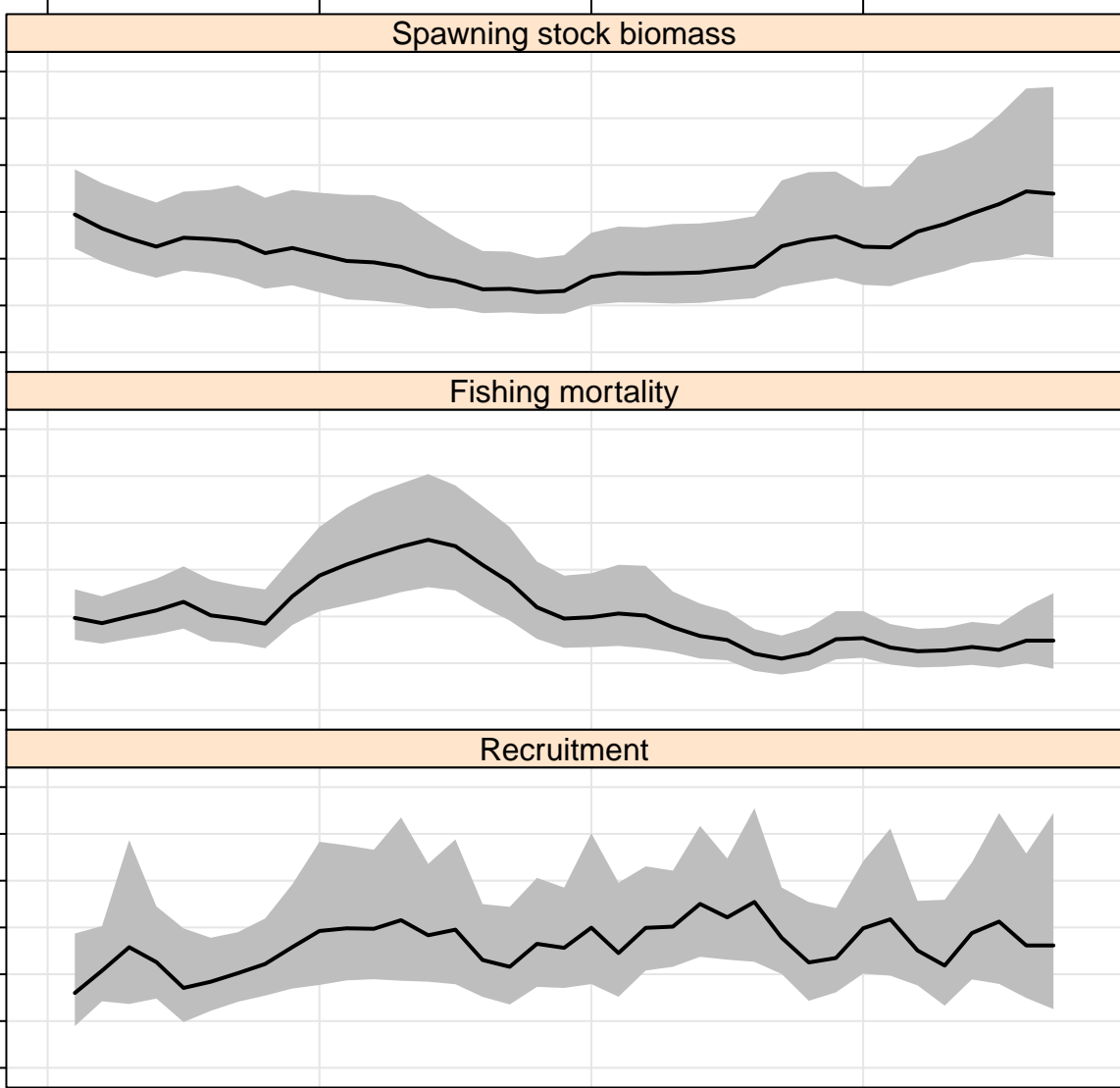
1980

1990

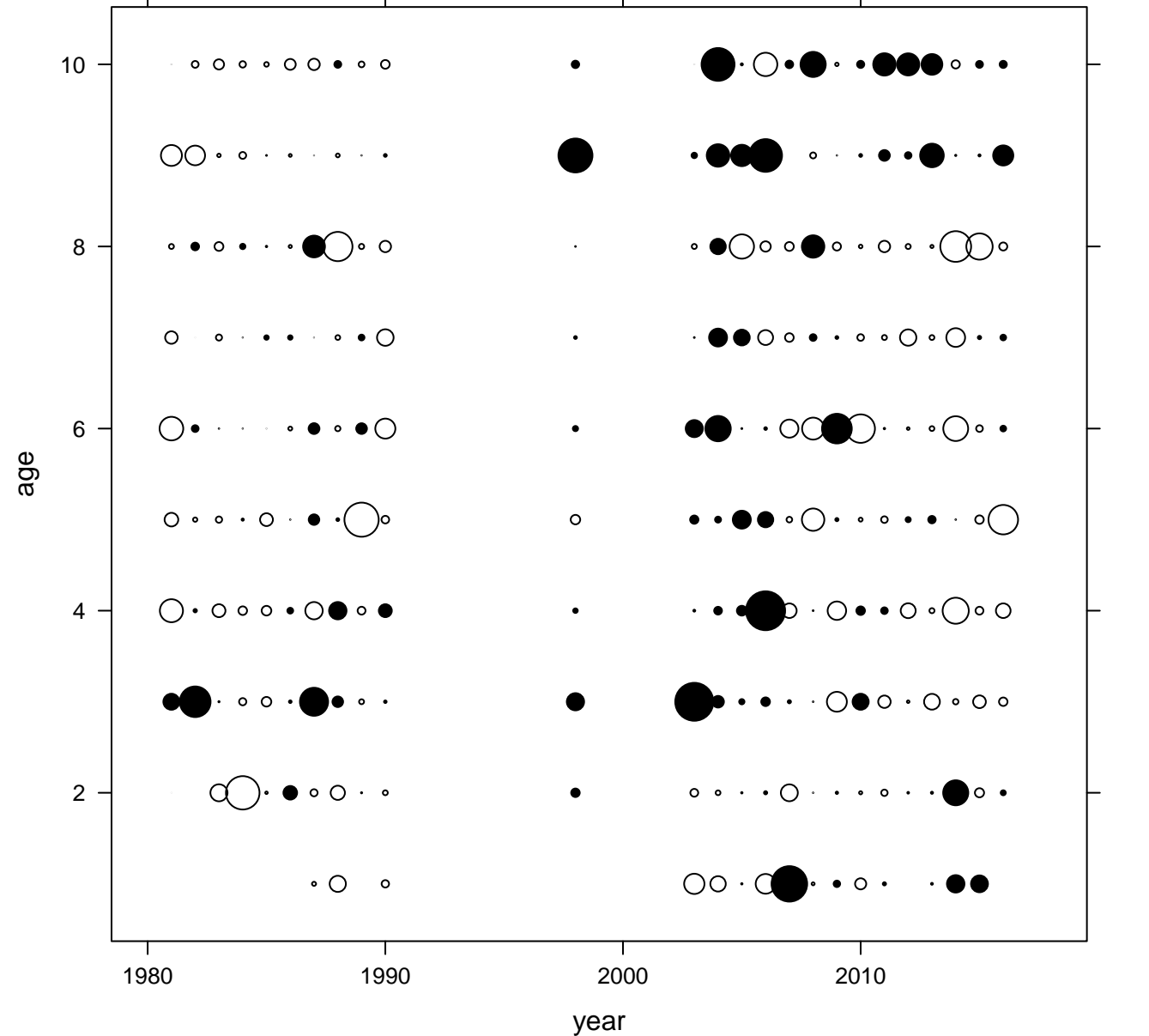
2000

2010

Year

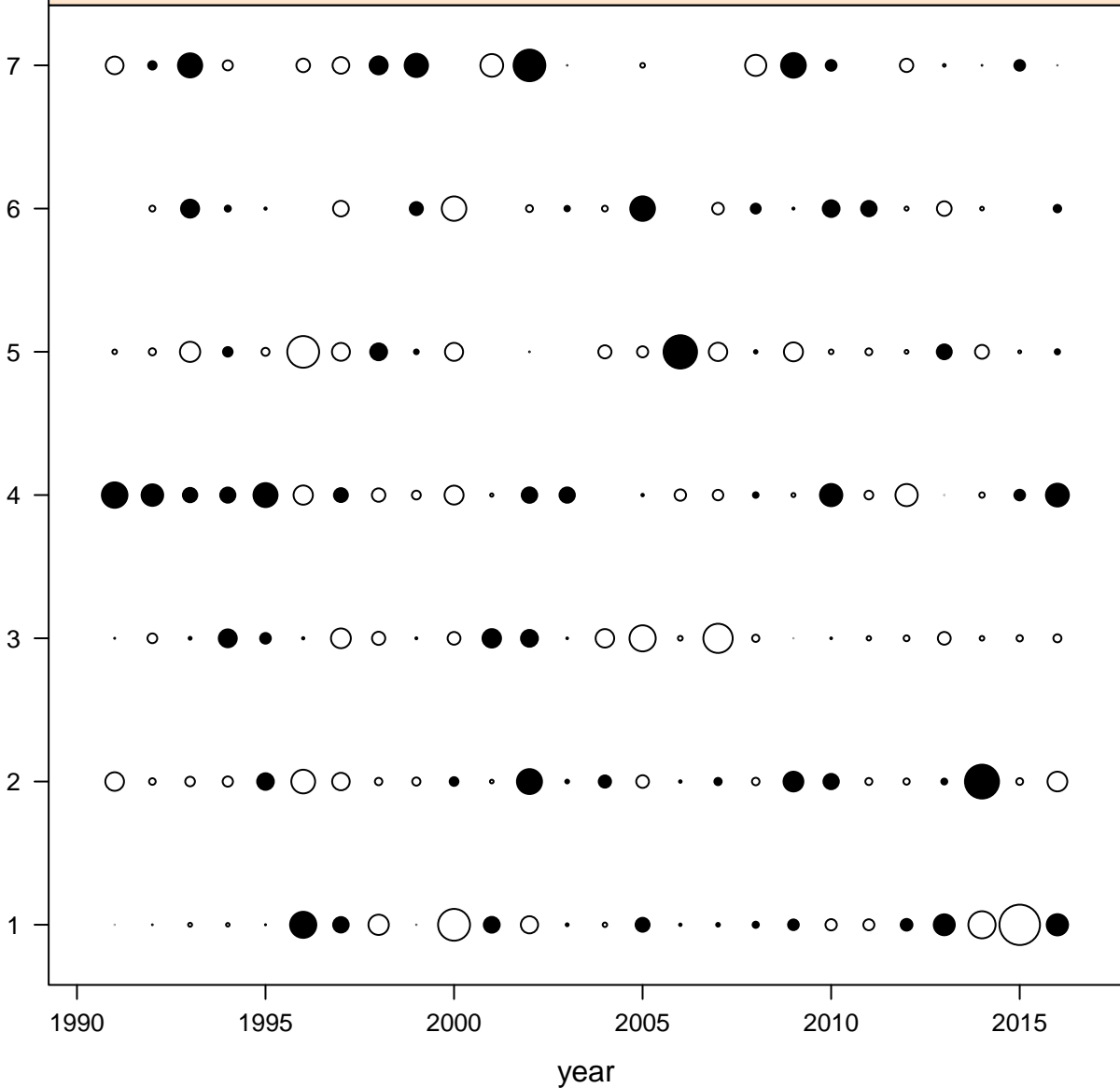


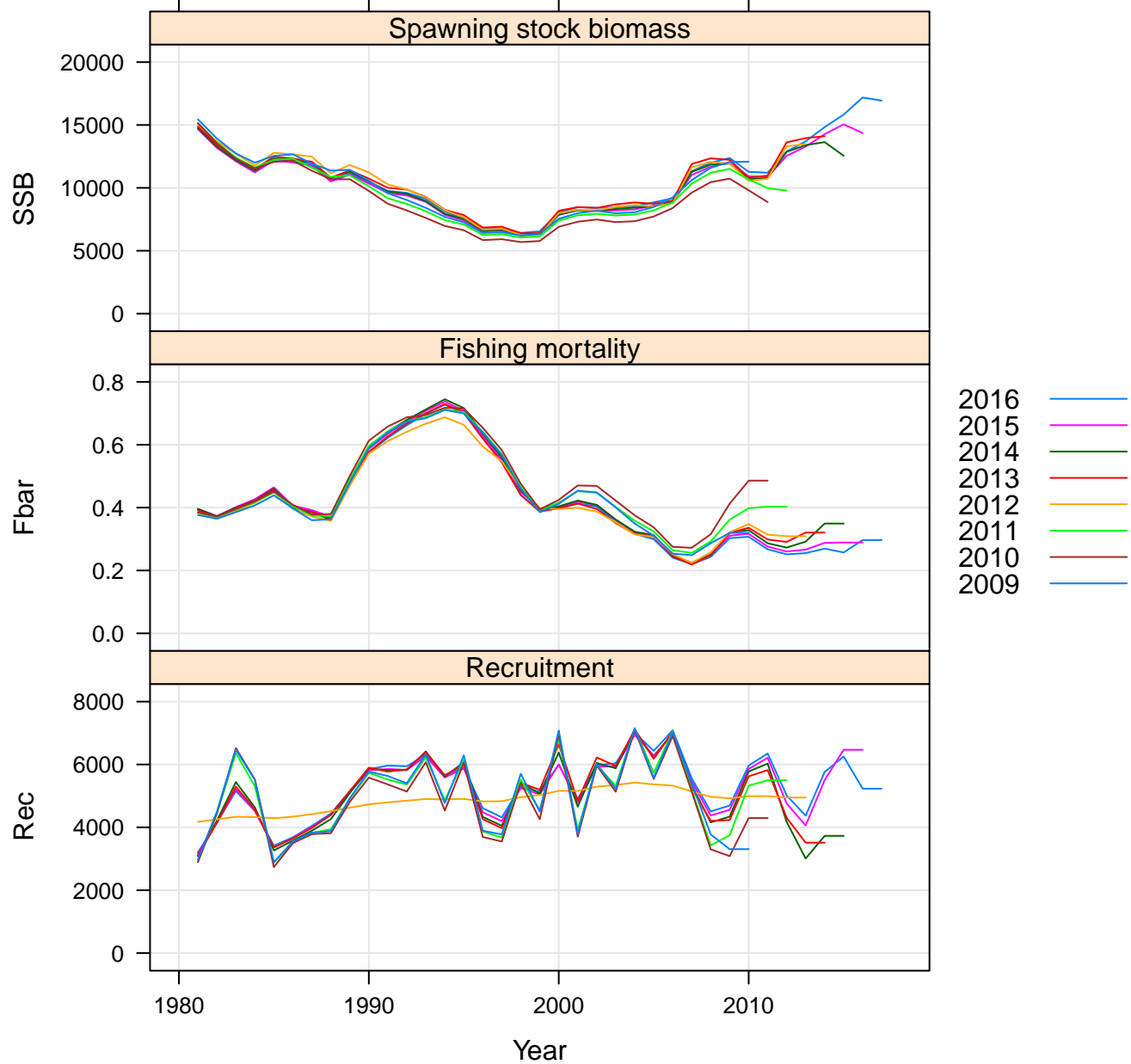
# Residuals by year Catch



# Residuals by survey

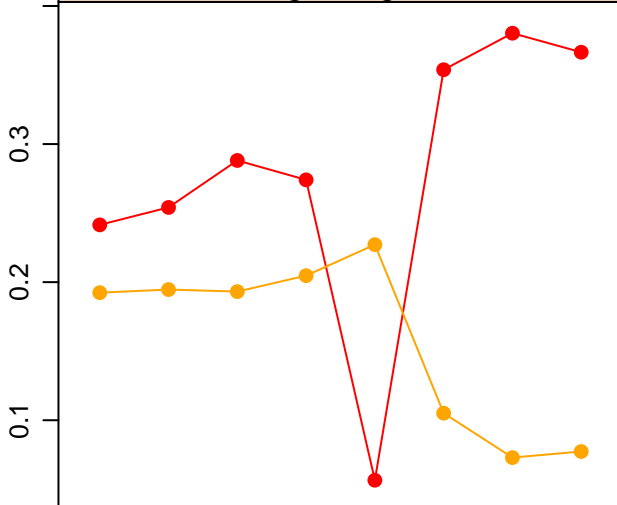
BTS-ISIS



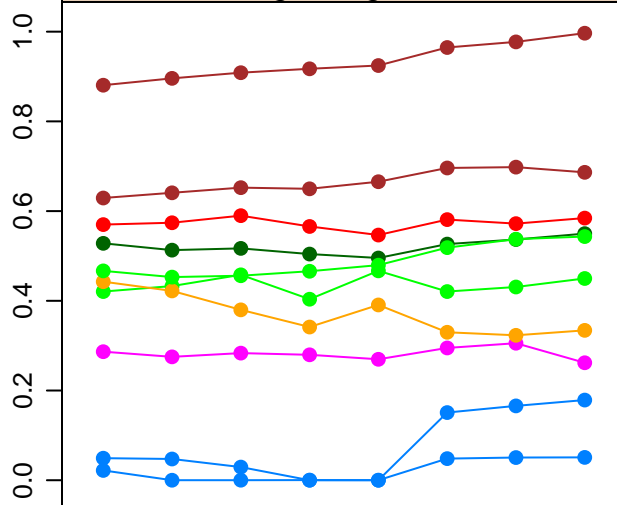


2016 2015 2014 2013 2012 2011 2010 2009

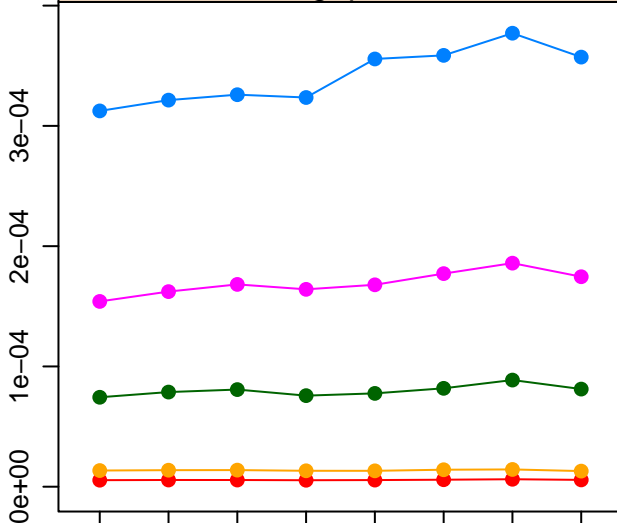
logSdLogN



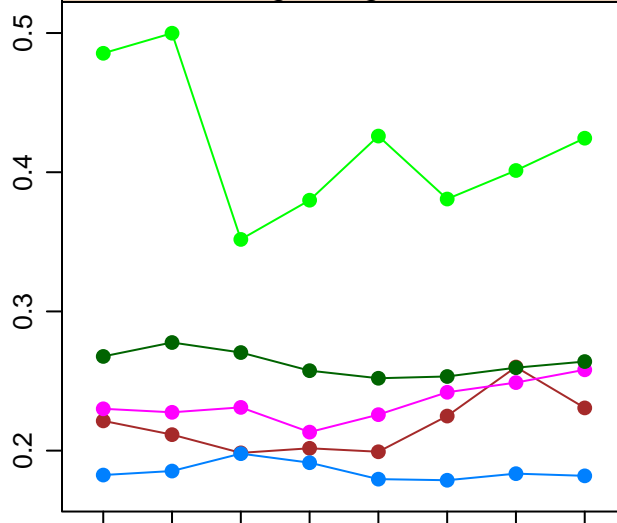
logSdLogObs



logFpar



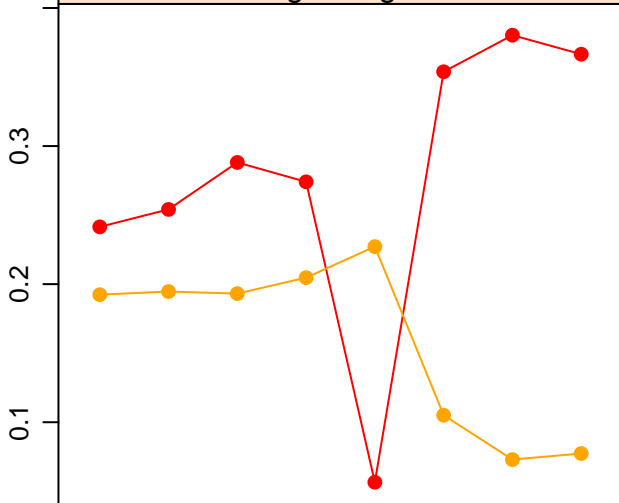
logSdLogFsta



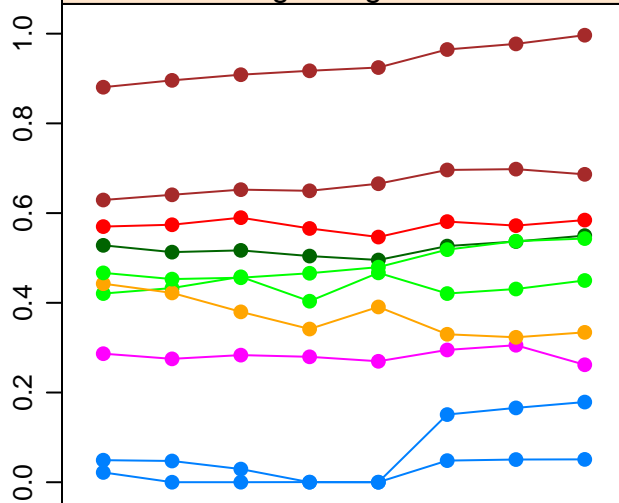
Assessment year

2016 2015 2014 2013 2012 2011 2010 2009

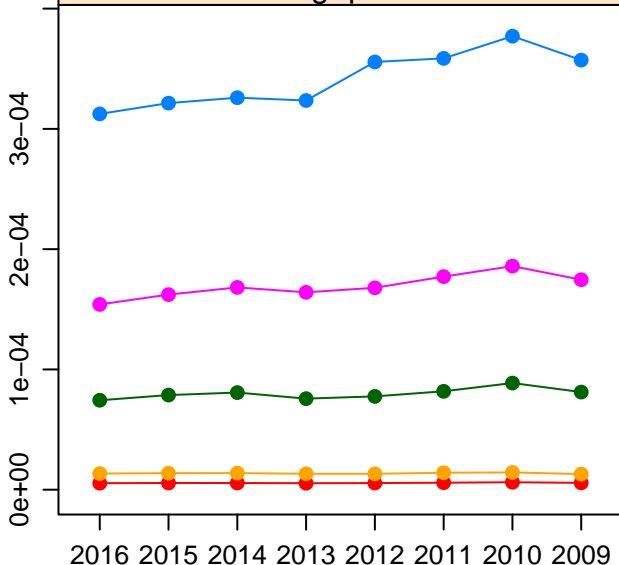
logSdLogN



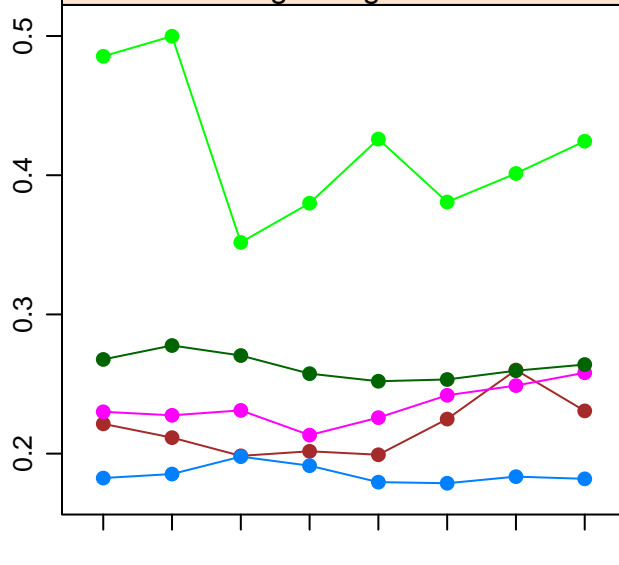
logSdLogObs



logFpar



logSdLogFsta



Assessment year

# Retrospective pattern in F at age

