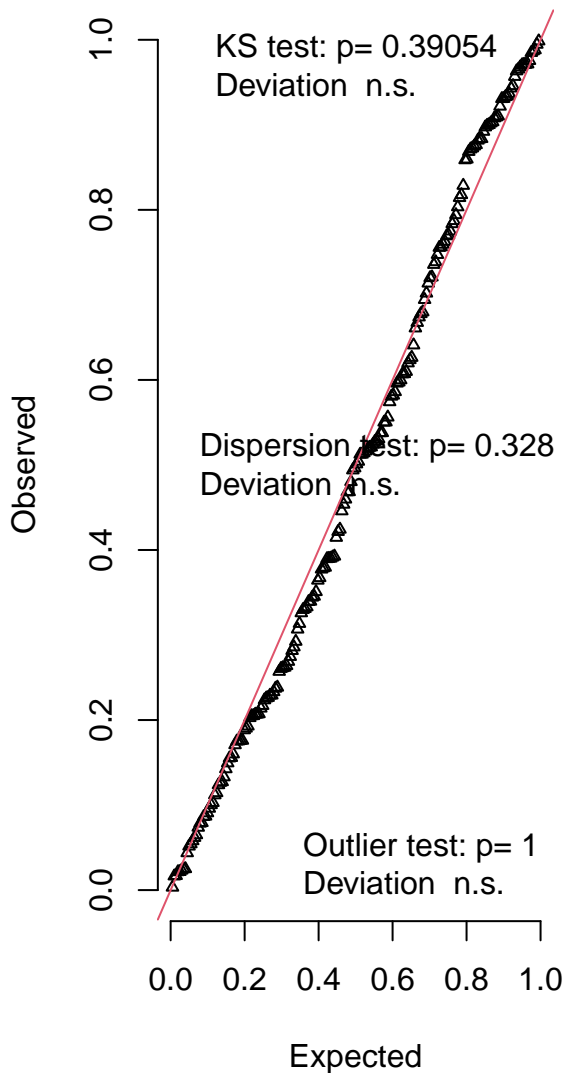
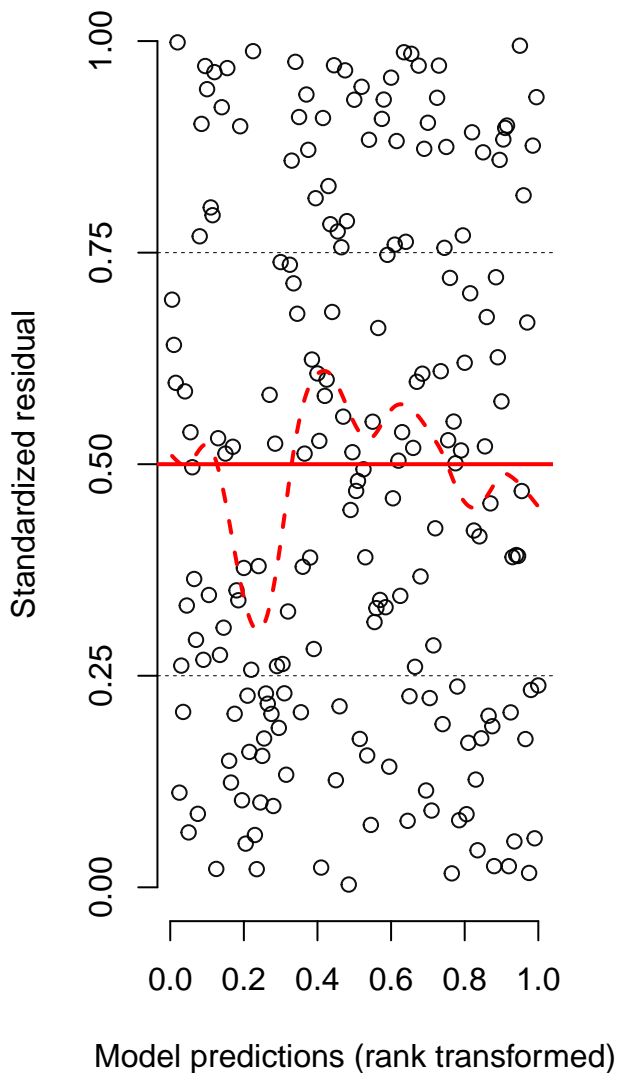


# DHARMA residual diagnostics

## QQ plot residuals

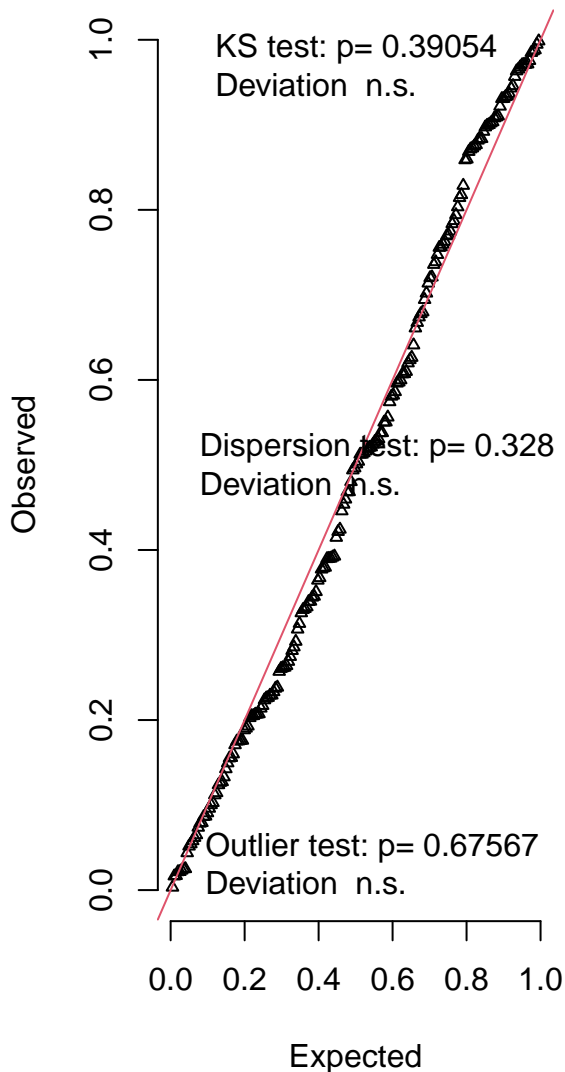


## Residual vs. predicted

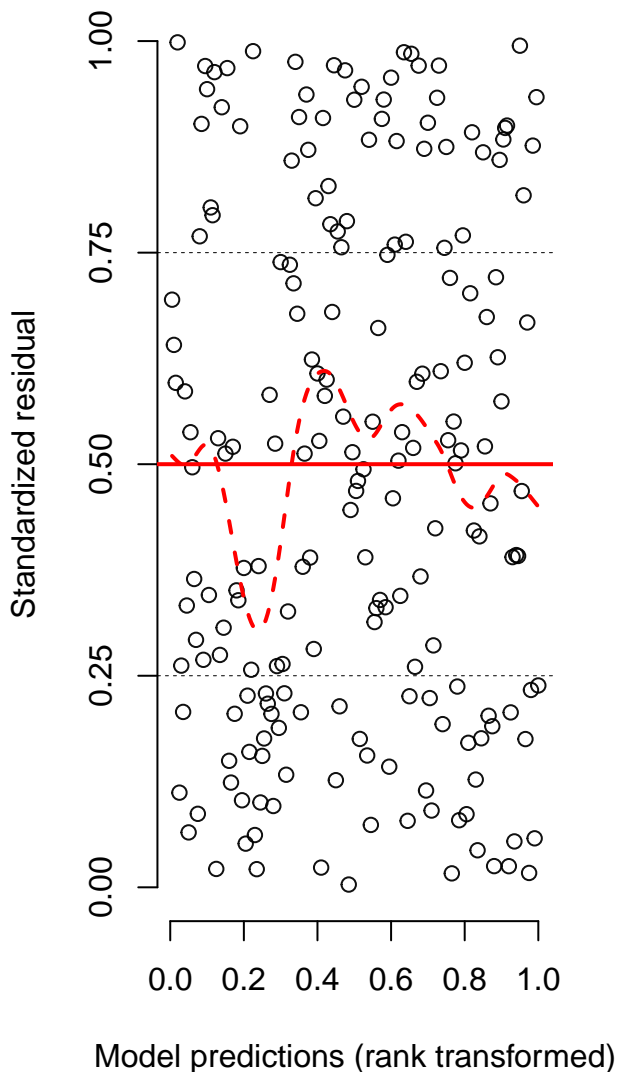


# DHARMA residual diagnostics

## QQ plot residuals

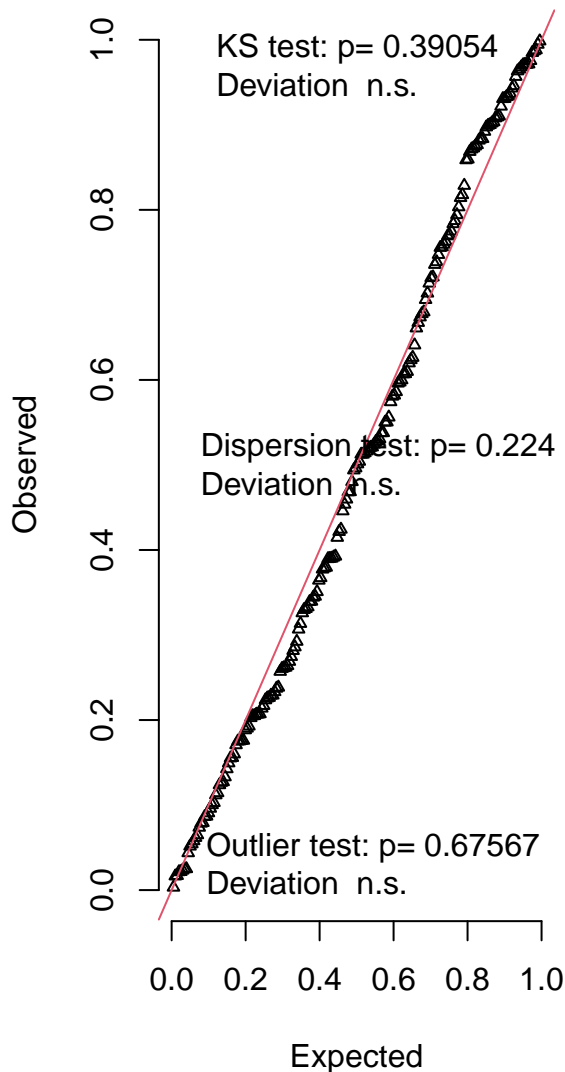


## Residual vs. predicted

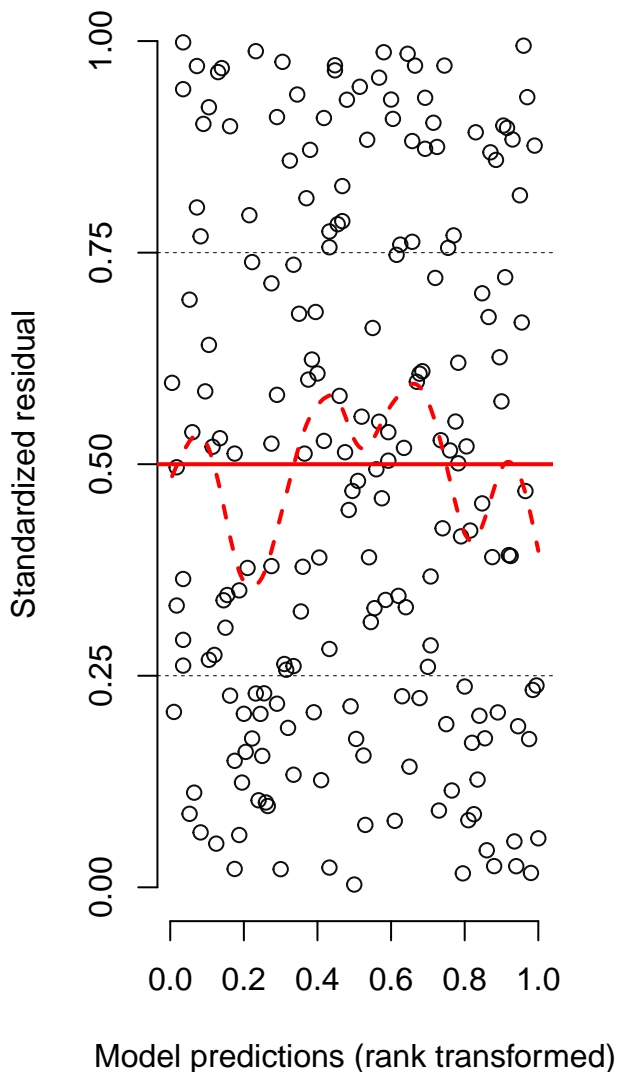


# DHARMA residual diagnostics

## QQ plot residuals

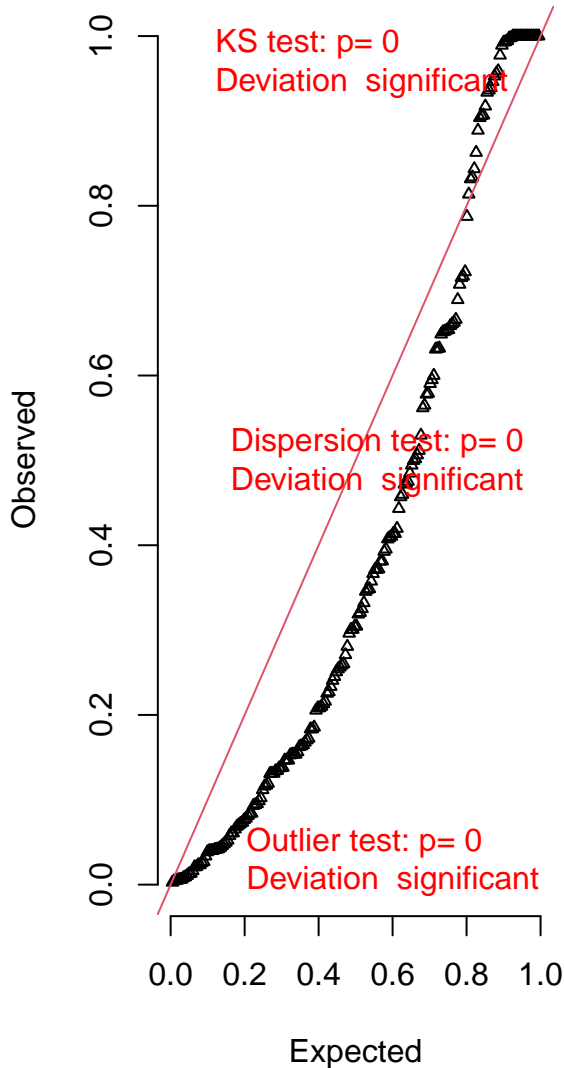


## Residual vs. predicted

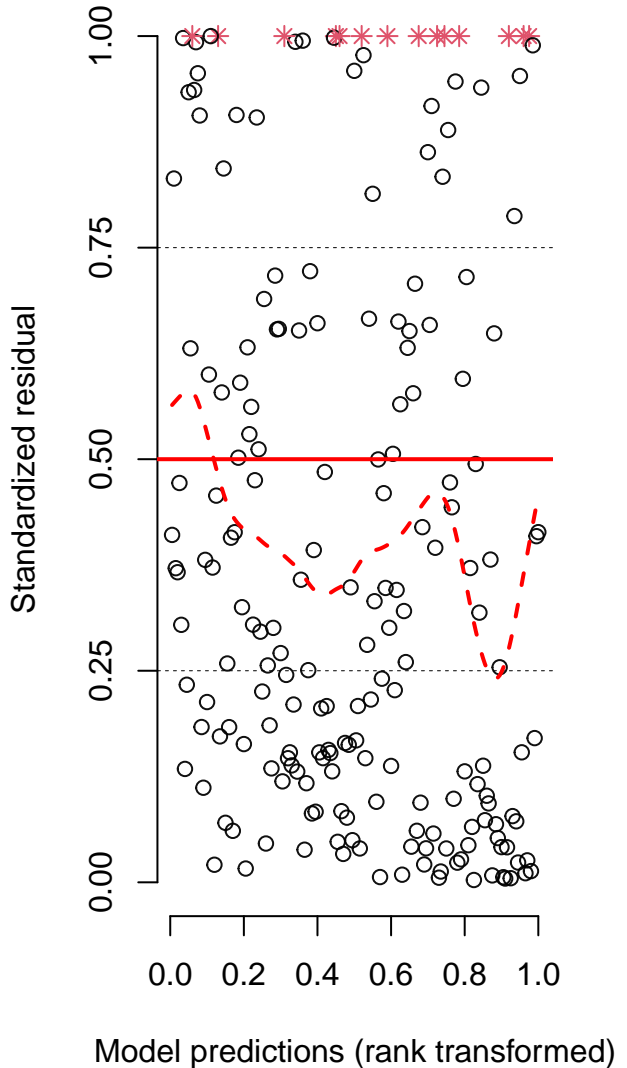


# DHARMA residual diagnostics

## QQ plot residuals

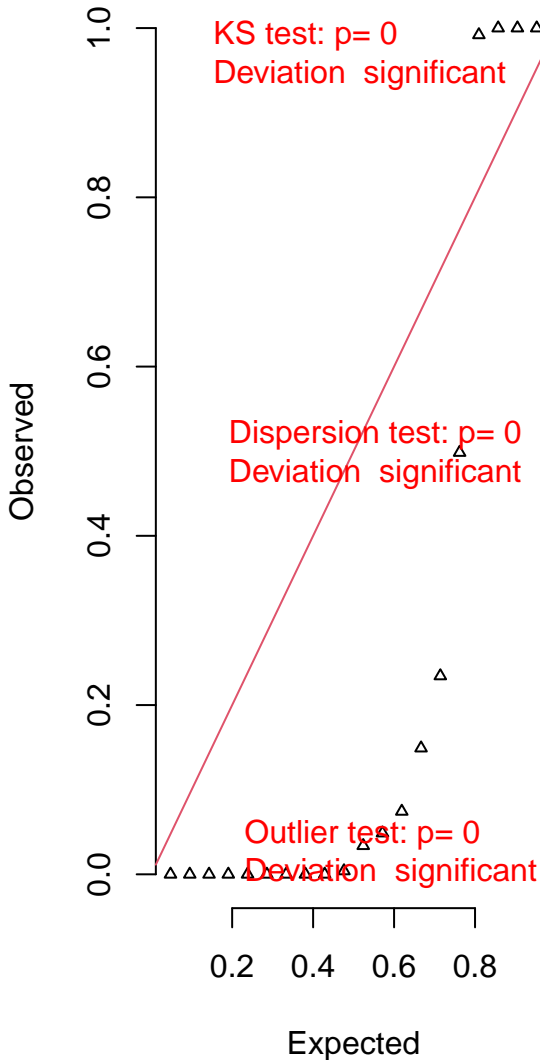


## Residual vs. predicted

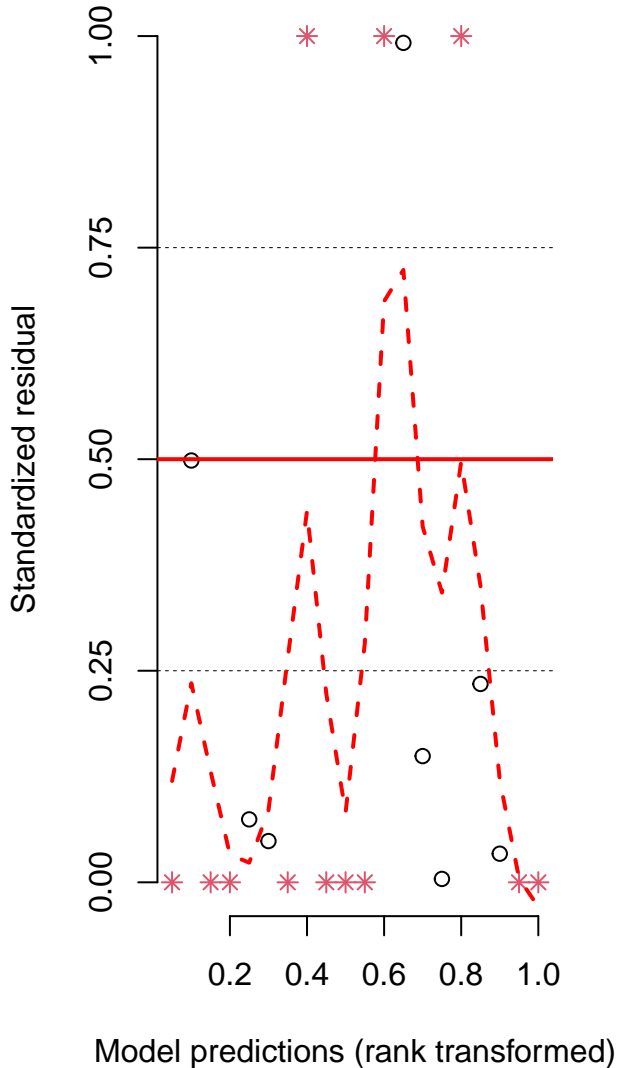


# DHARMA residual diagnostics

## QQ plot residuals

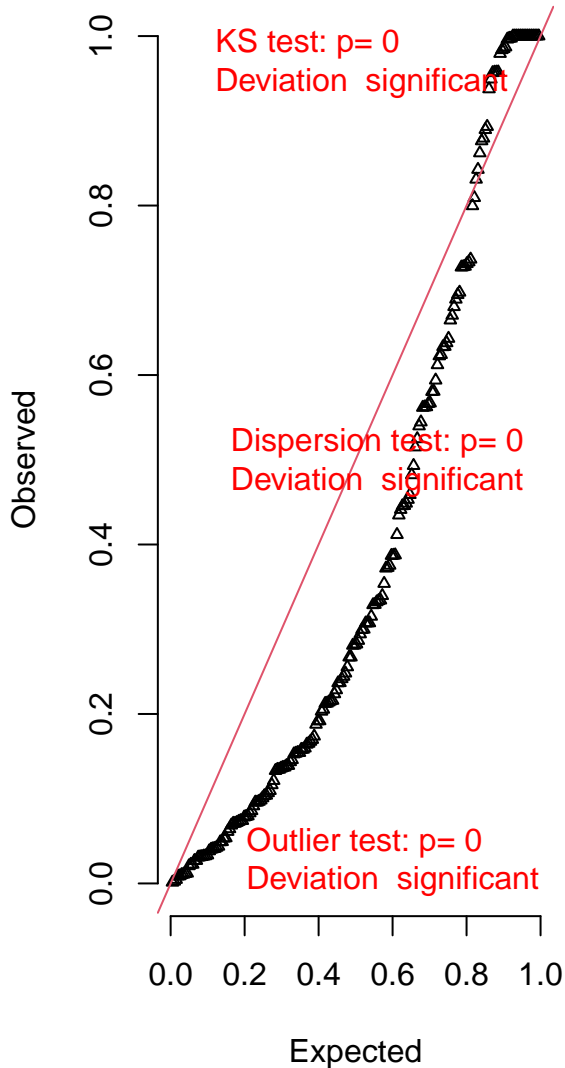


## Residual vs. predicted

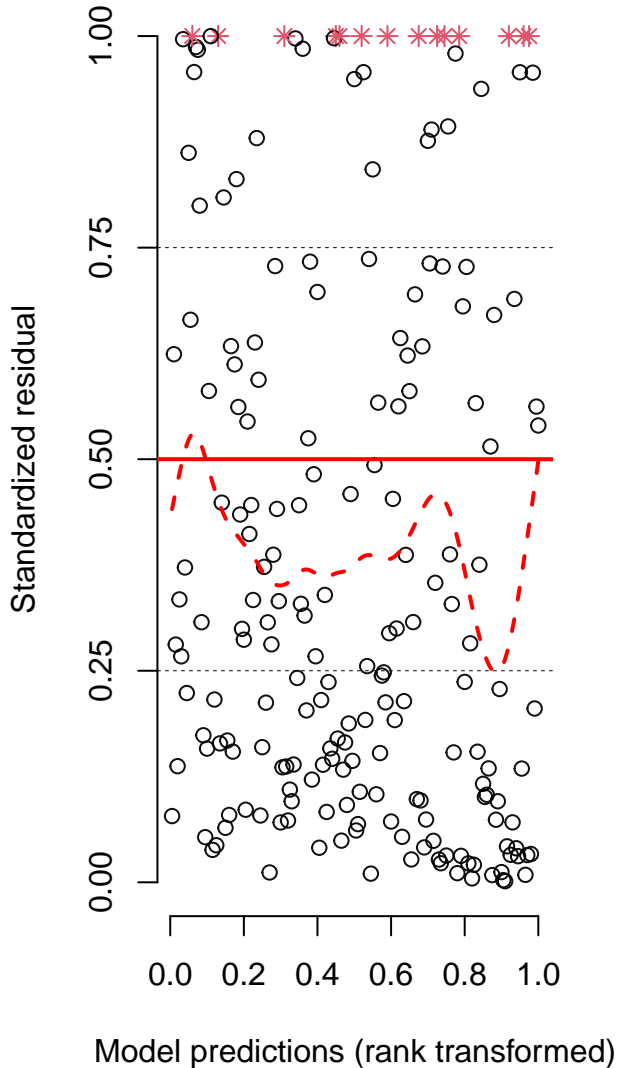


# DHARMA residual diagnostics

## QQ plot residuals

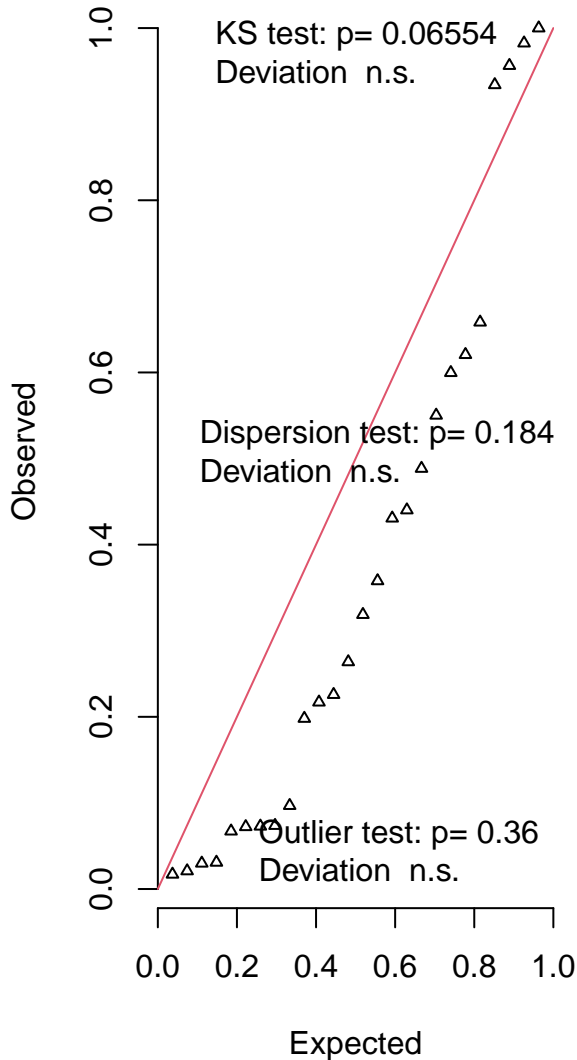


## Residual vs. predicted

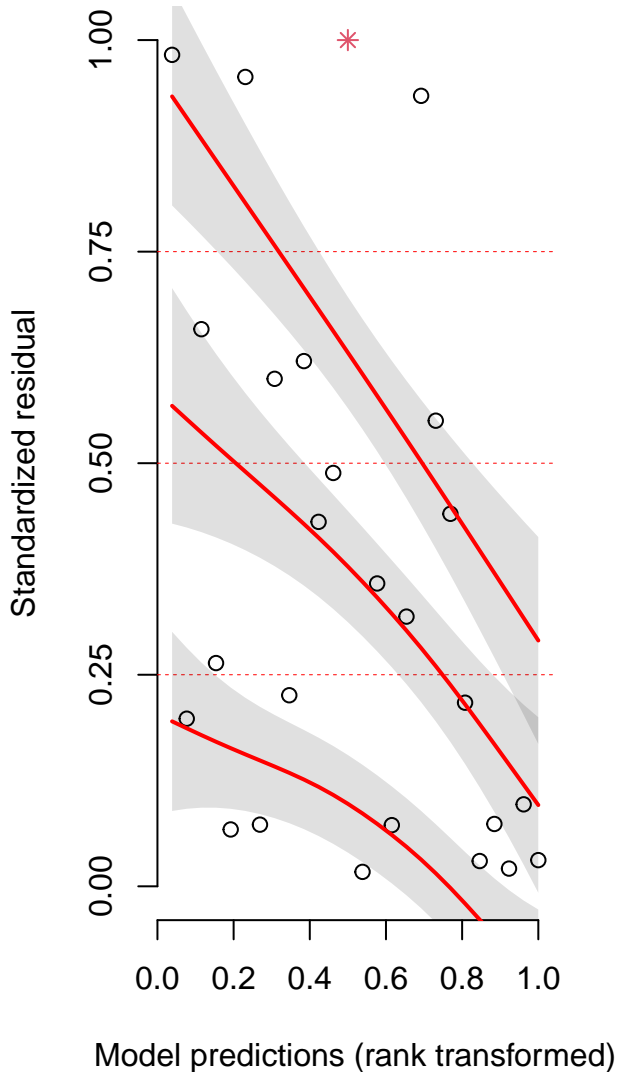


# DHARMA residual diagnostics

## QQ plot residuals

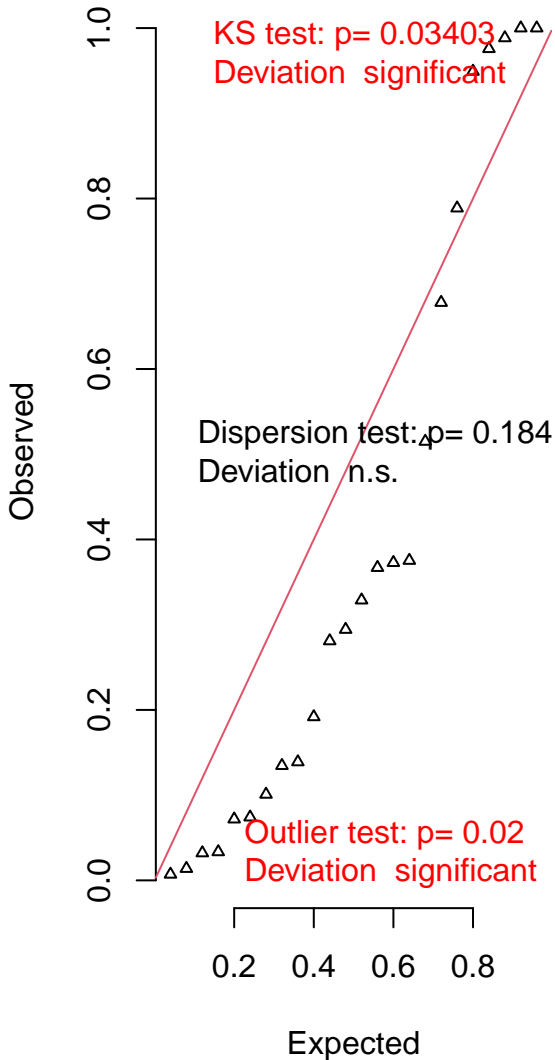


## Residual vs. predicted Quantile deviations detected (red curves) Combined adjusted quantile test significant

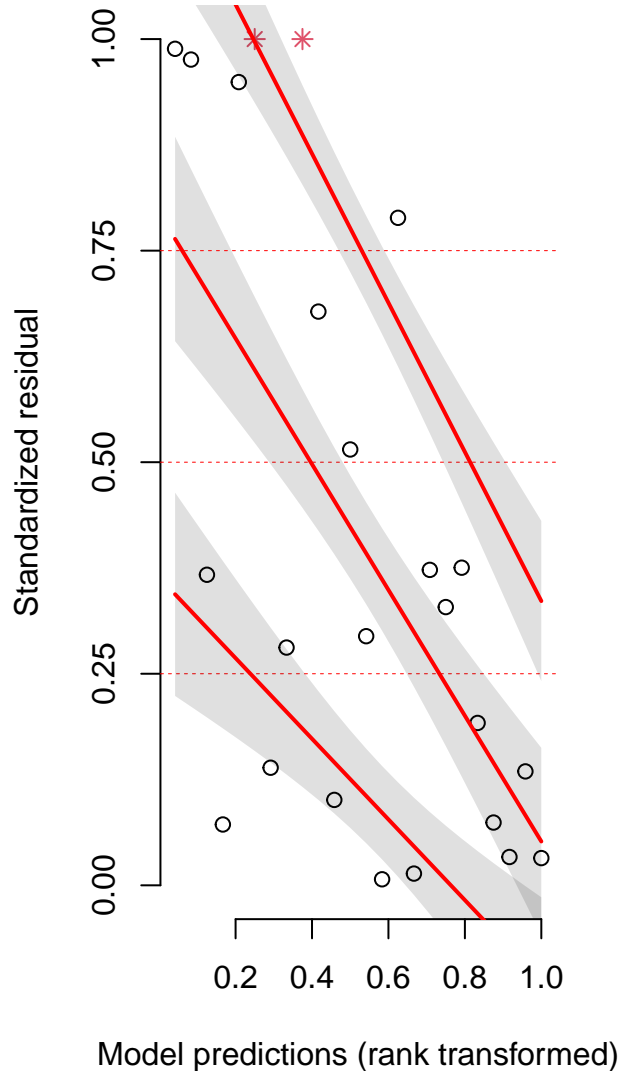


# DHARMA residual diagnostics

## QQ plot residuals

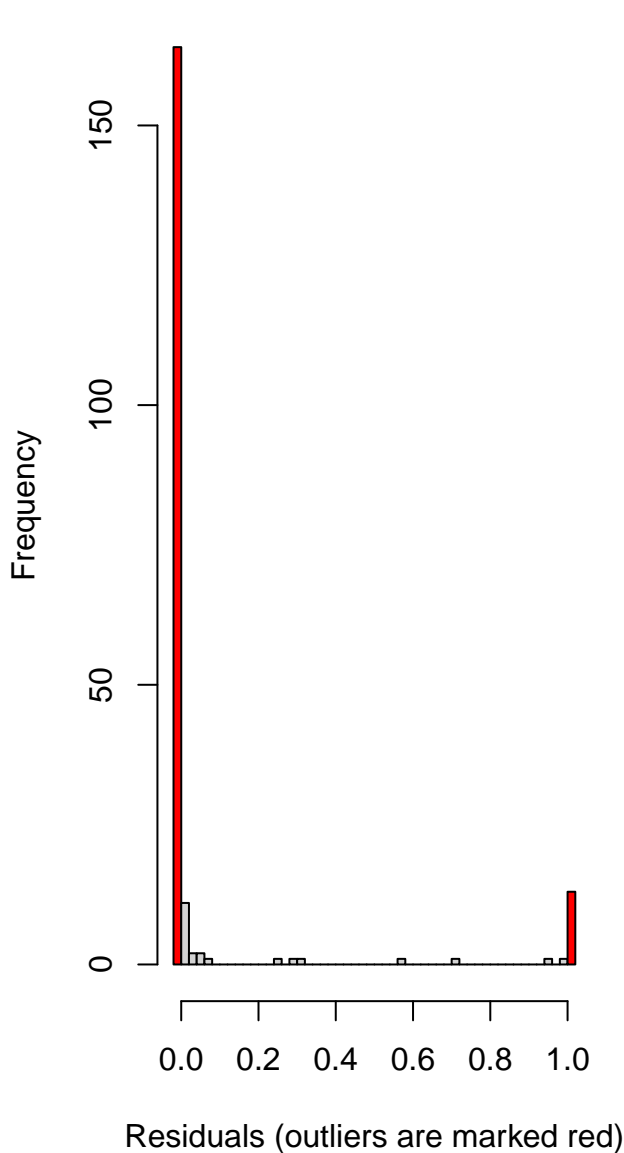


## Residual vs. predicted Quantile deviations detected (red curves) Combined adjusted quantile test significant

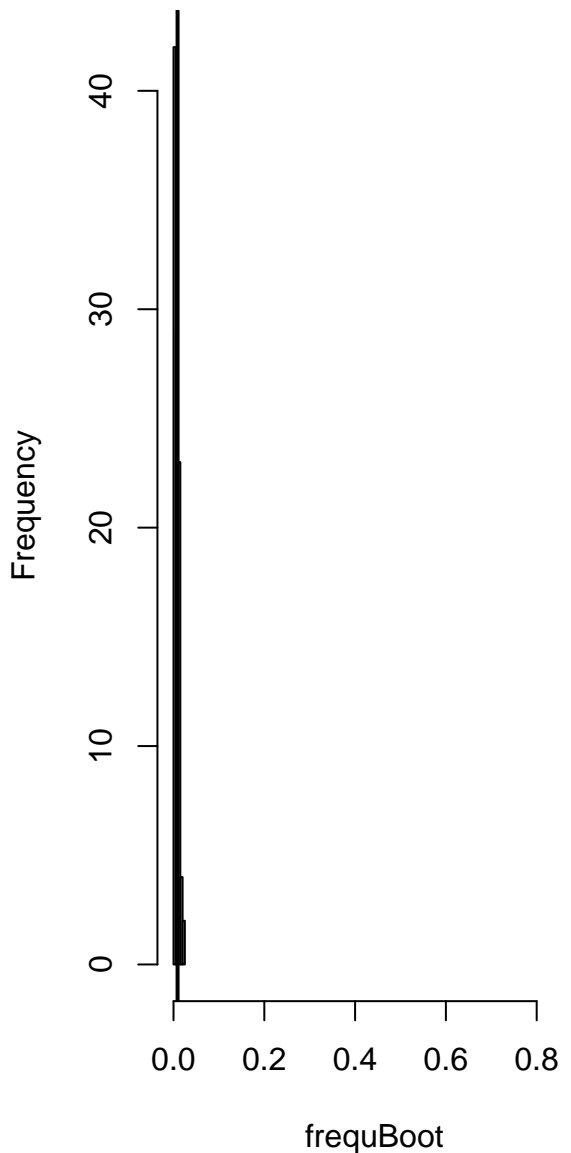




Outlier test significant

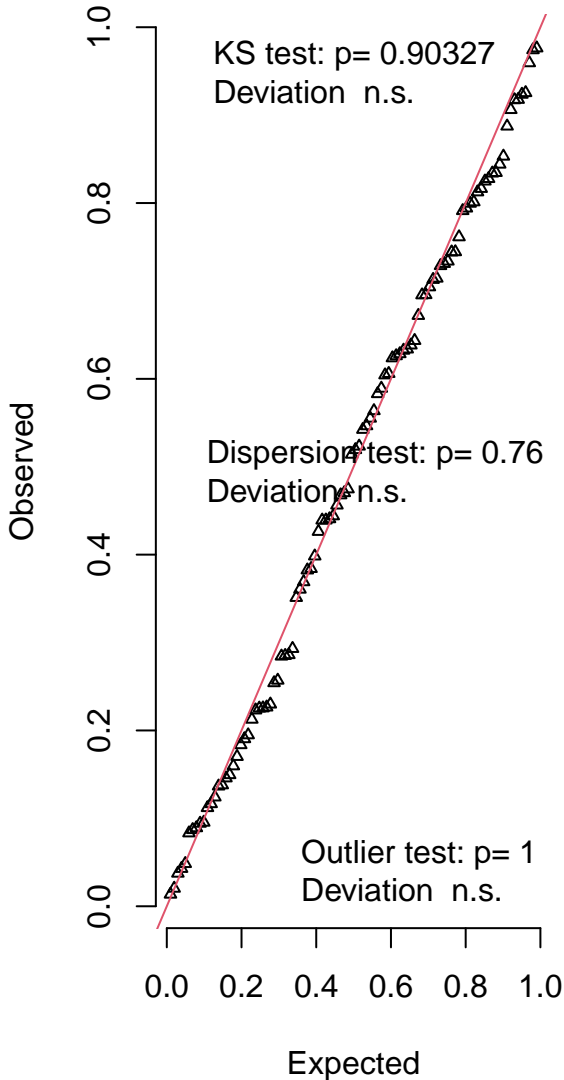


Histogram of frequBoot

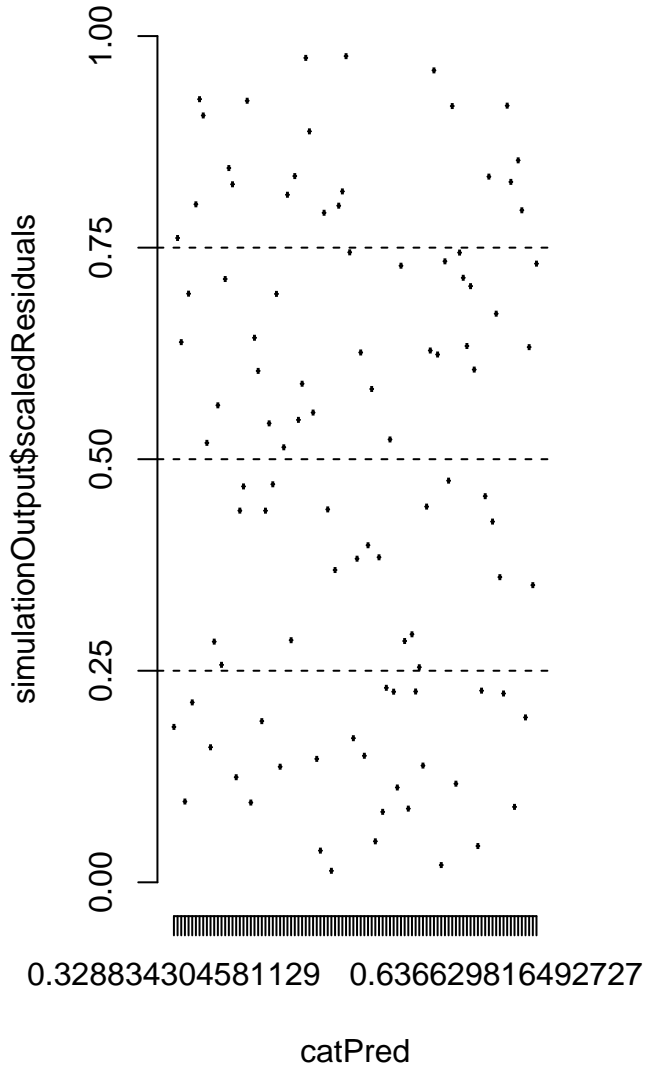


# DHARMA residual diagnostics

## QQ plot residuals

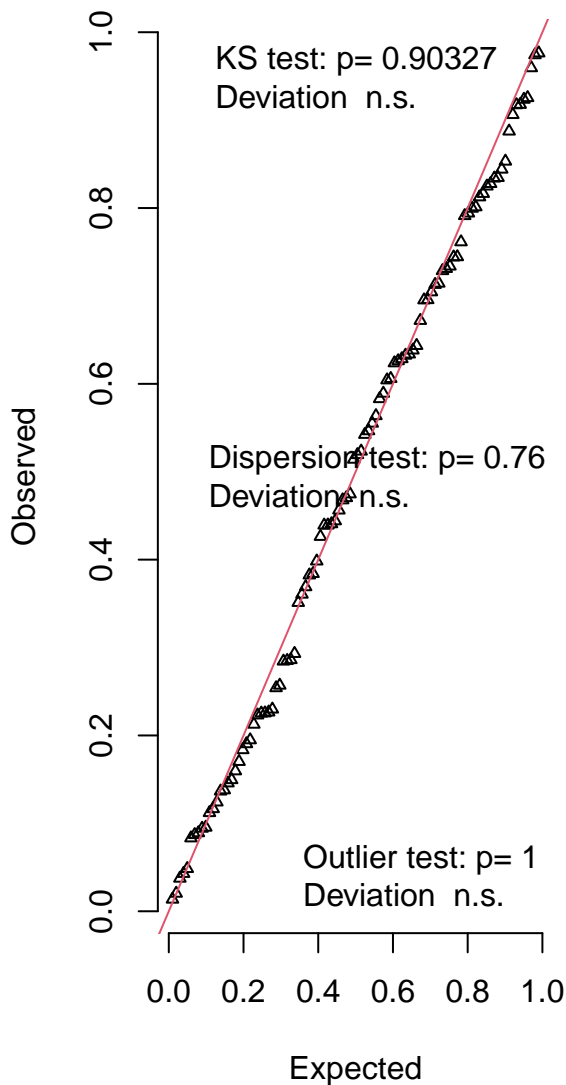


Within-group deviation from uniformity n.s.

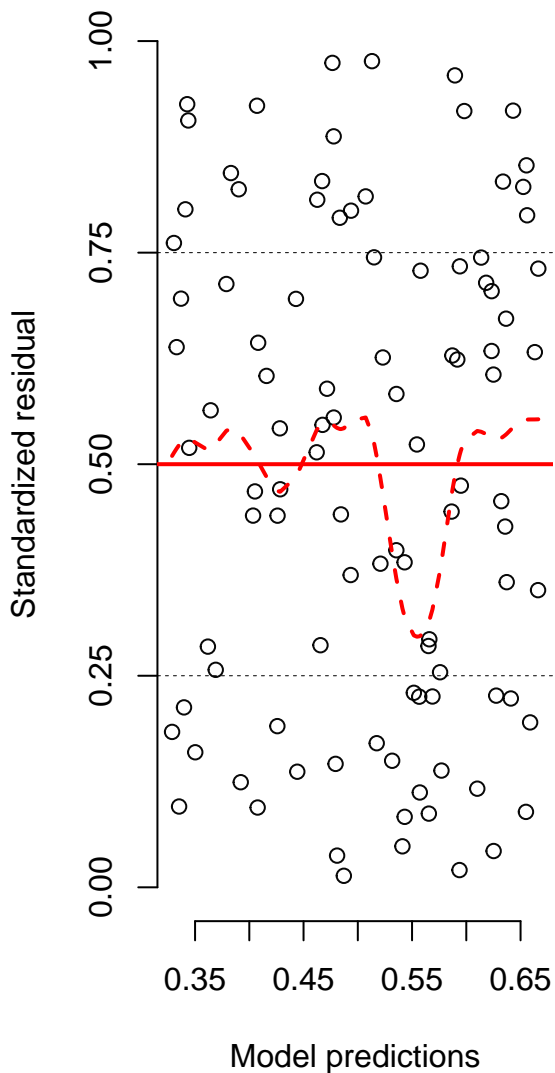


# DHARMA residual diagnostics

## QQ plot residuals

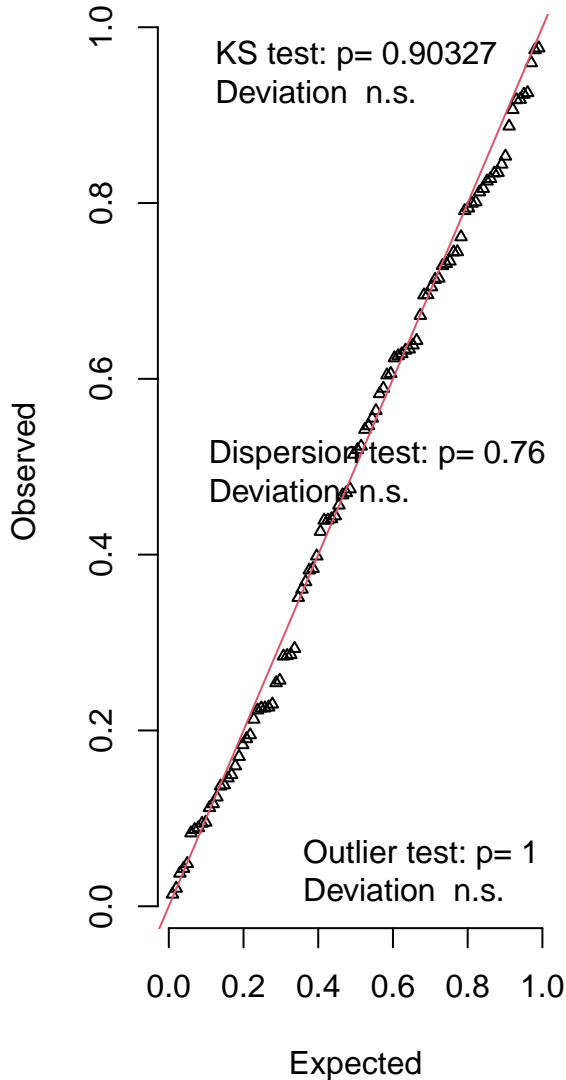


## Residual vs. predicted

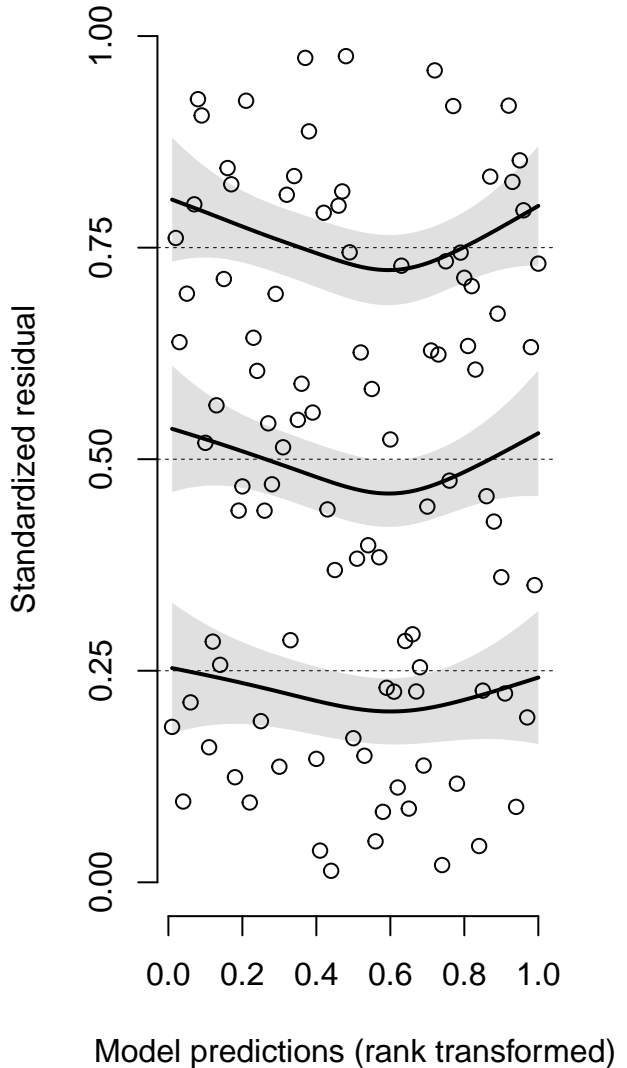


# DHARMA residual diagnostics

## QQ plot residuals

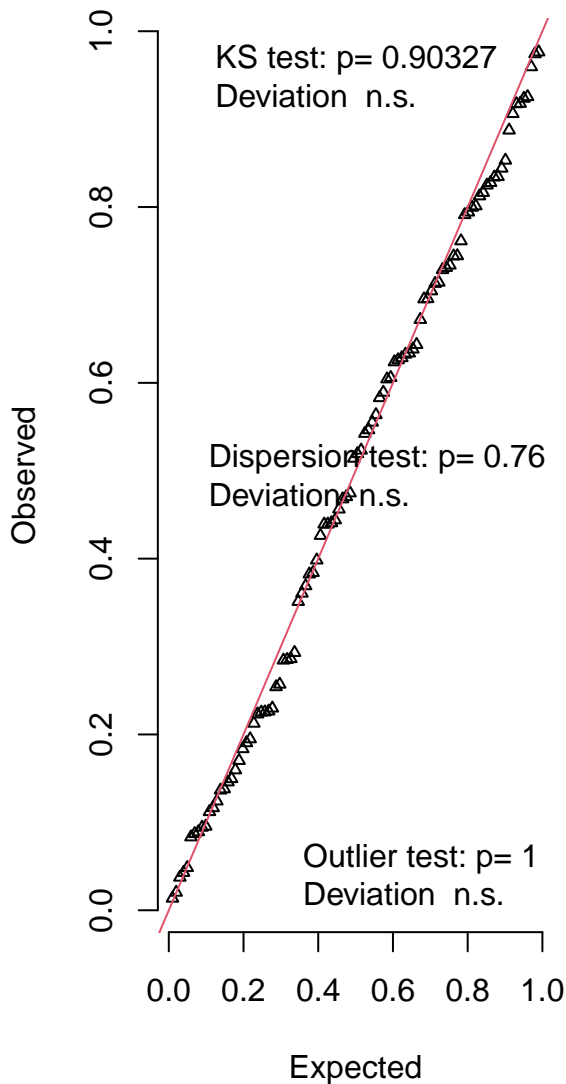


## Residual vs. predicted No significant problems detected

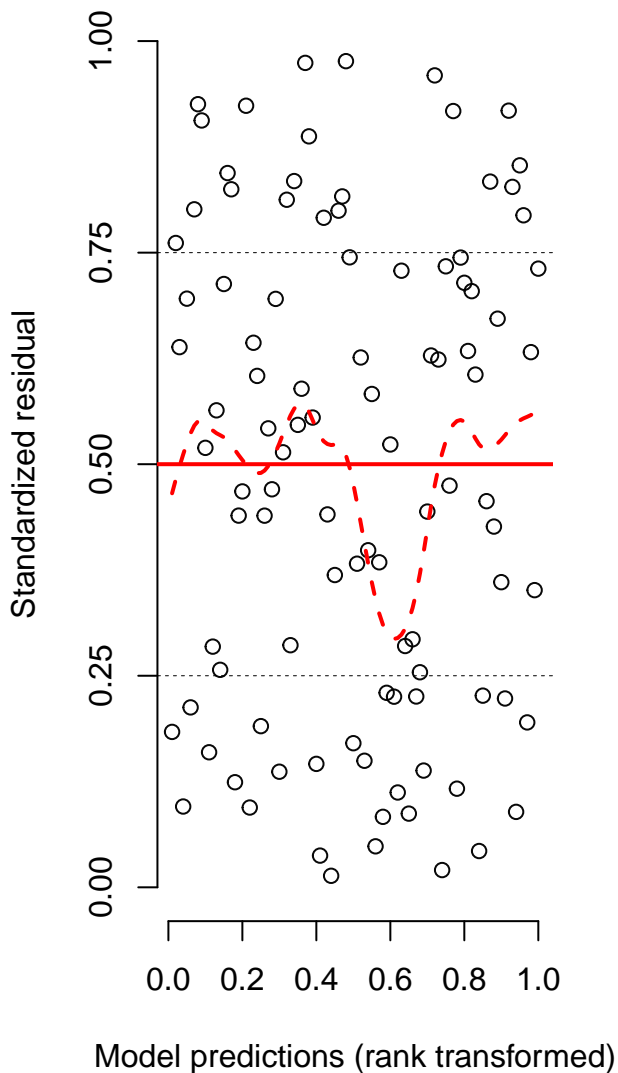


# DHARMA residual diagnostics

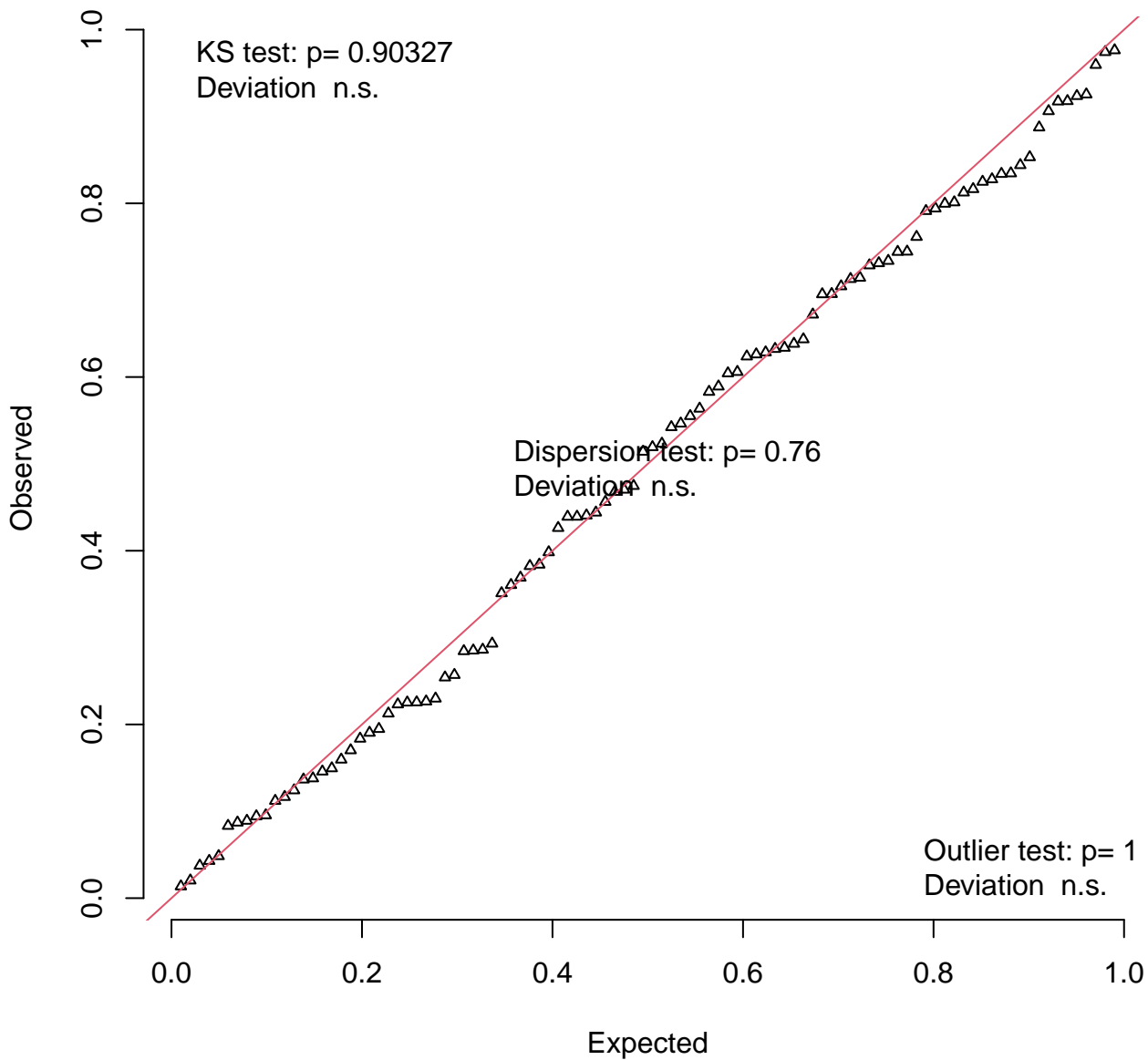
## QQ plot residuals



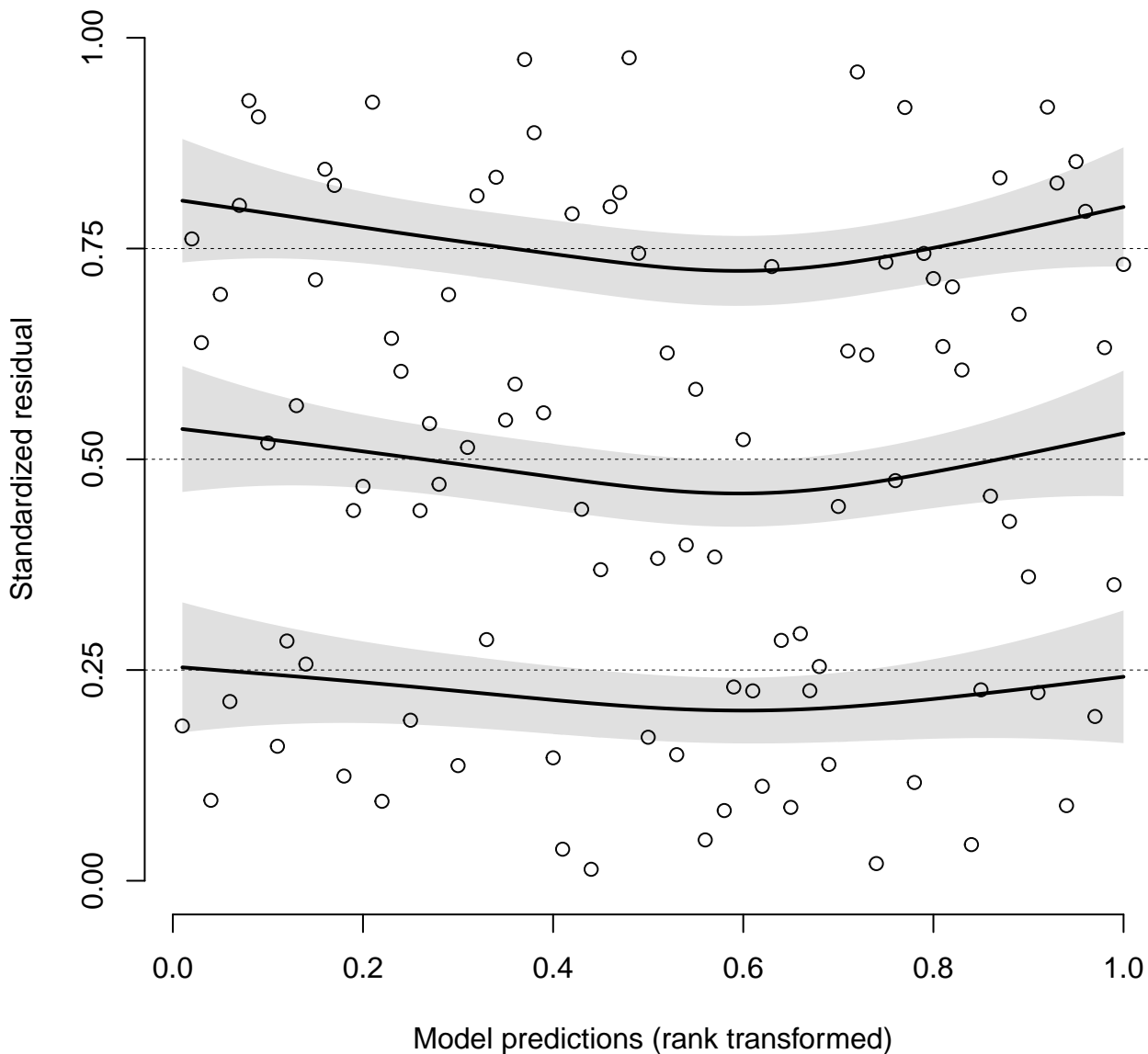
## Residual vs. predicted



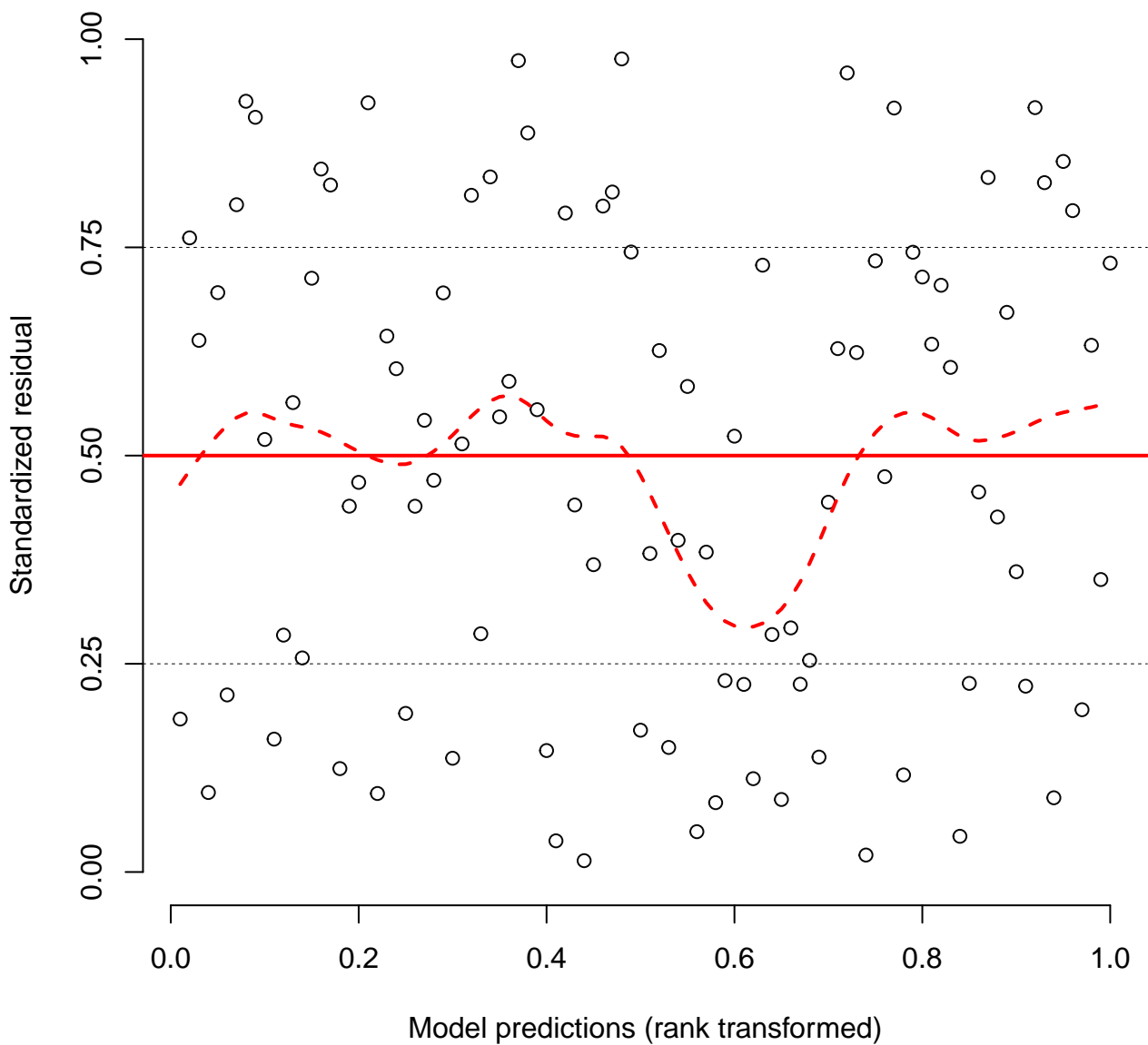
# QQ plot residuals



**Residual vs. predicted**  
**No significant problems detected**

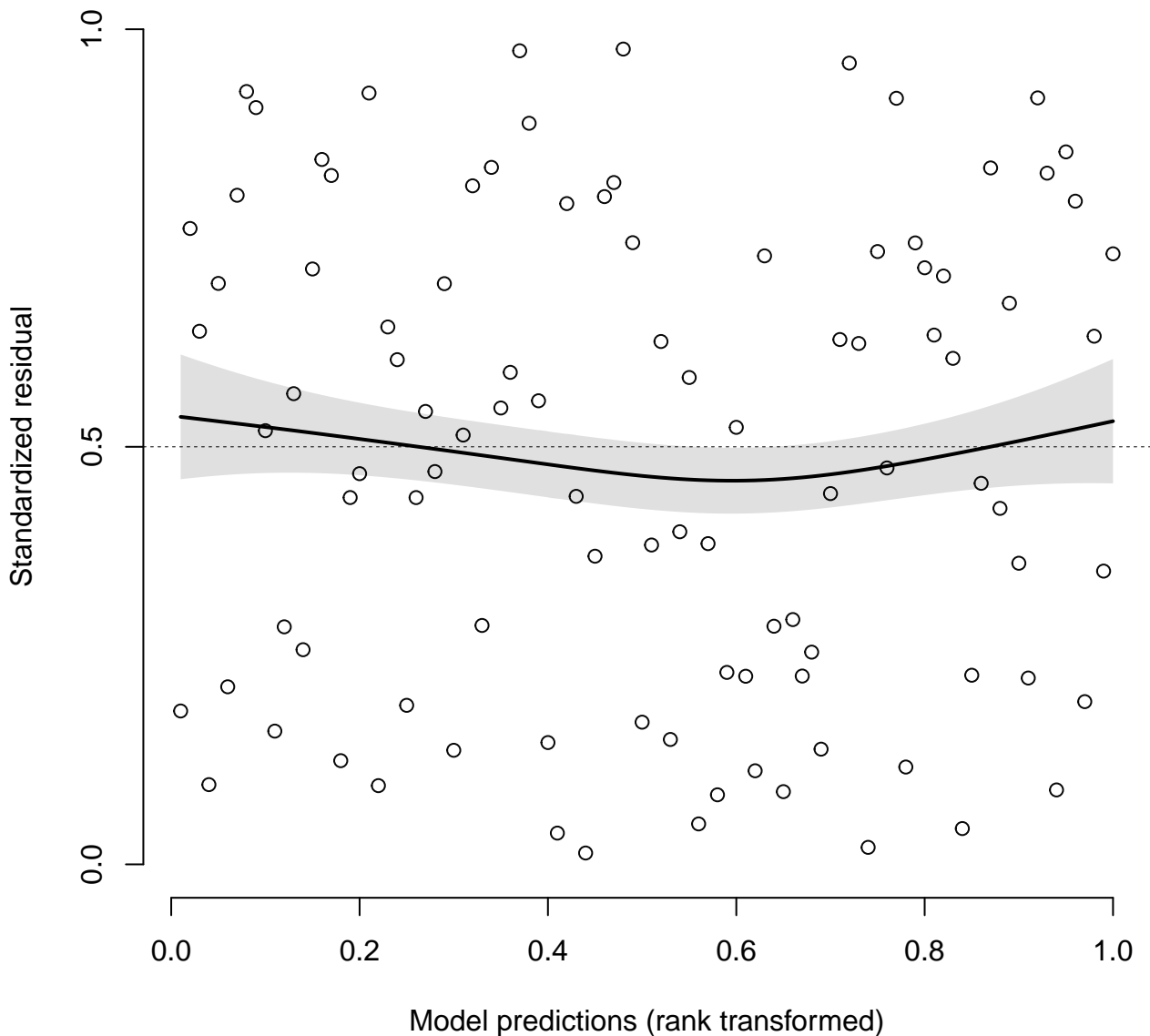


**Residual vs. predicted**

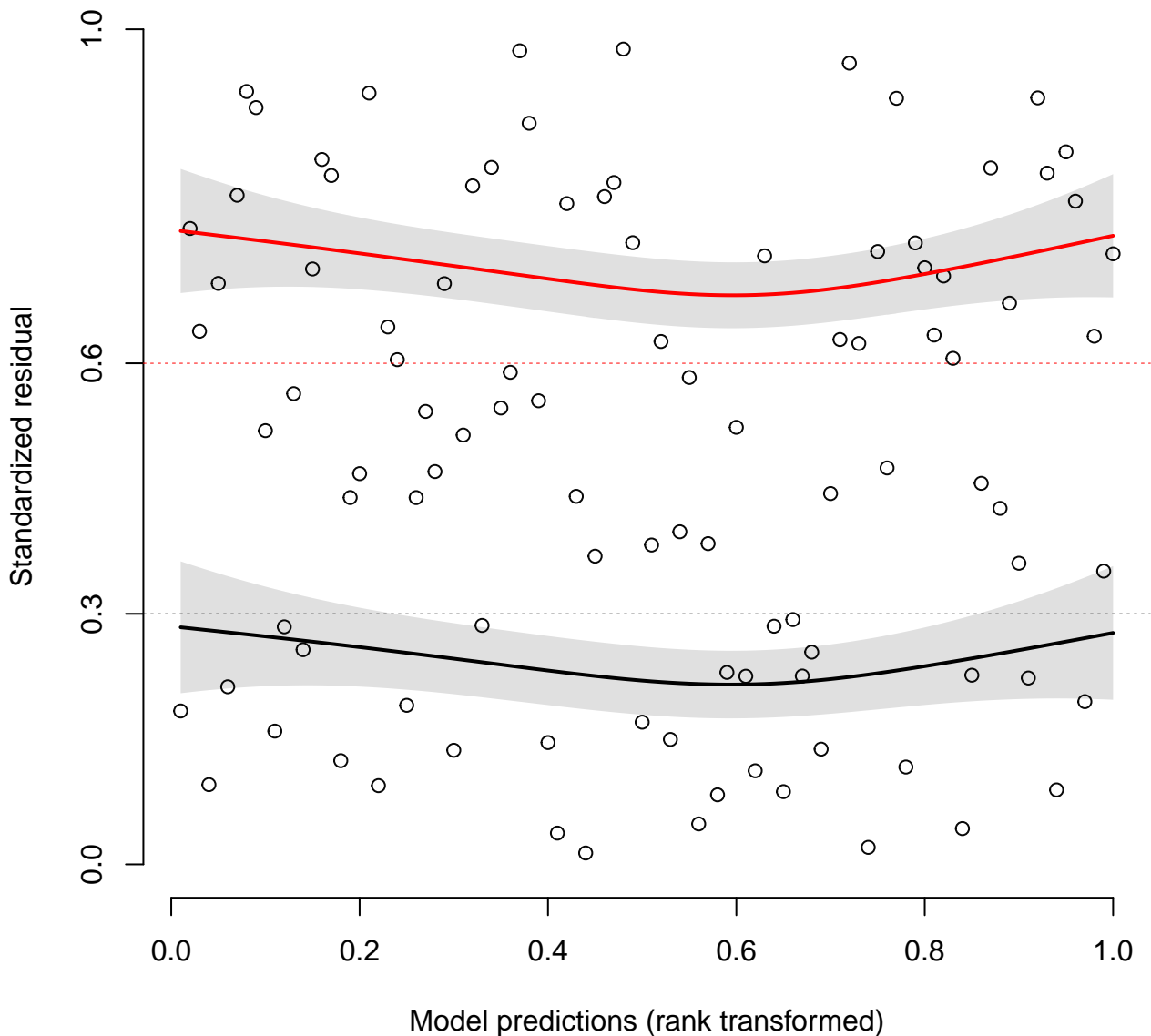




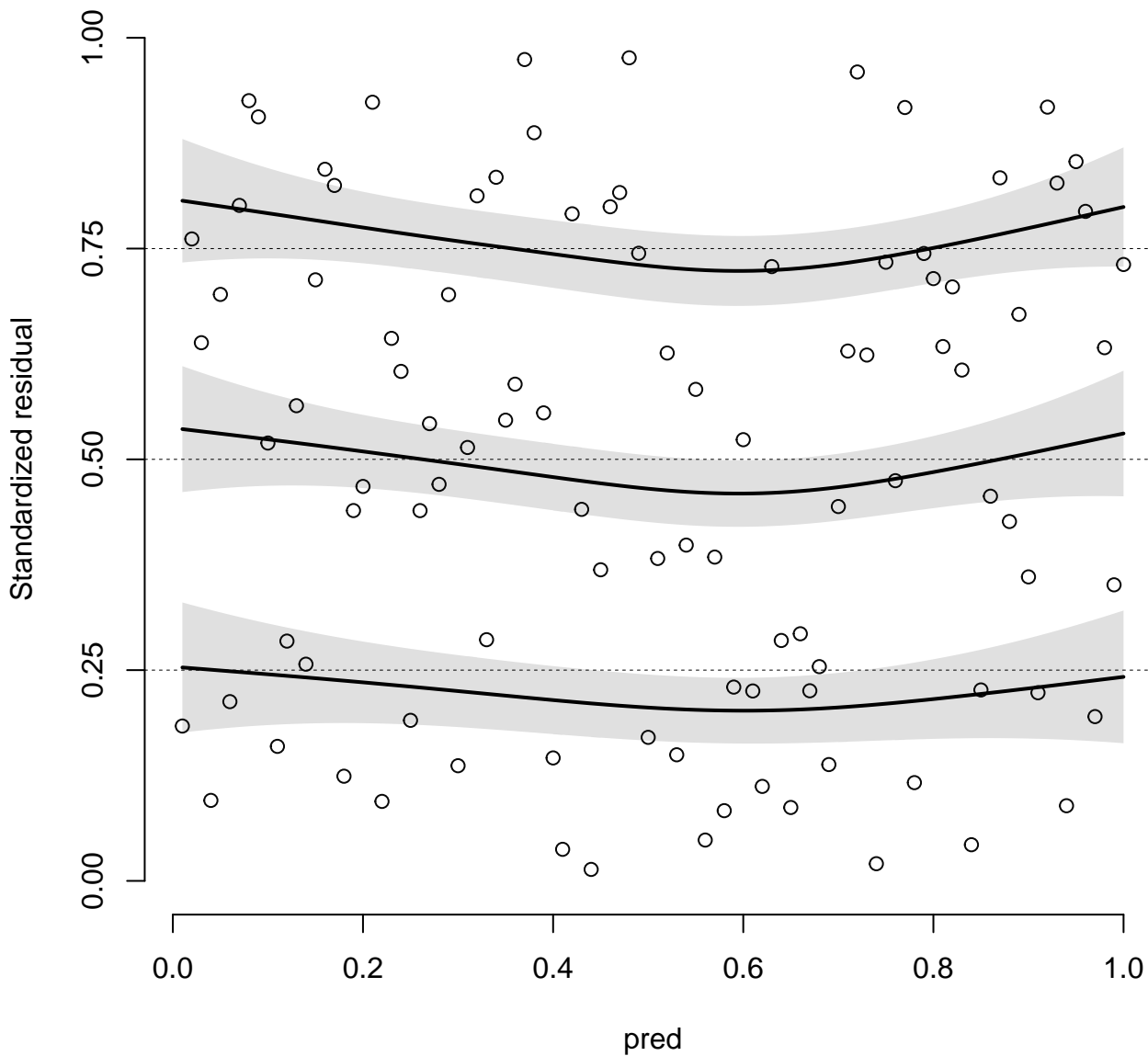
**Residual vs. predicted**  
**No significant problems detected**



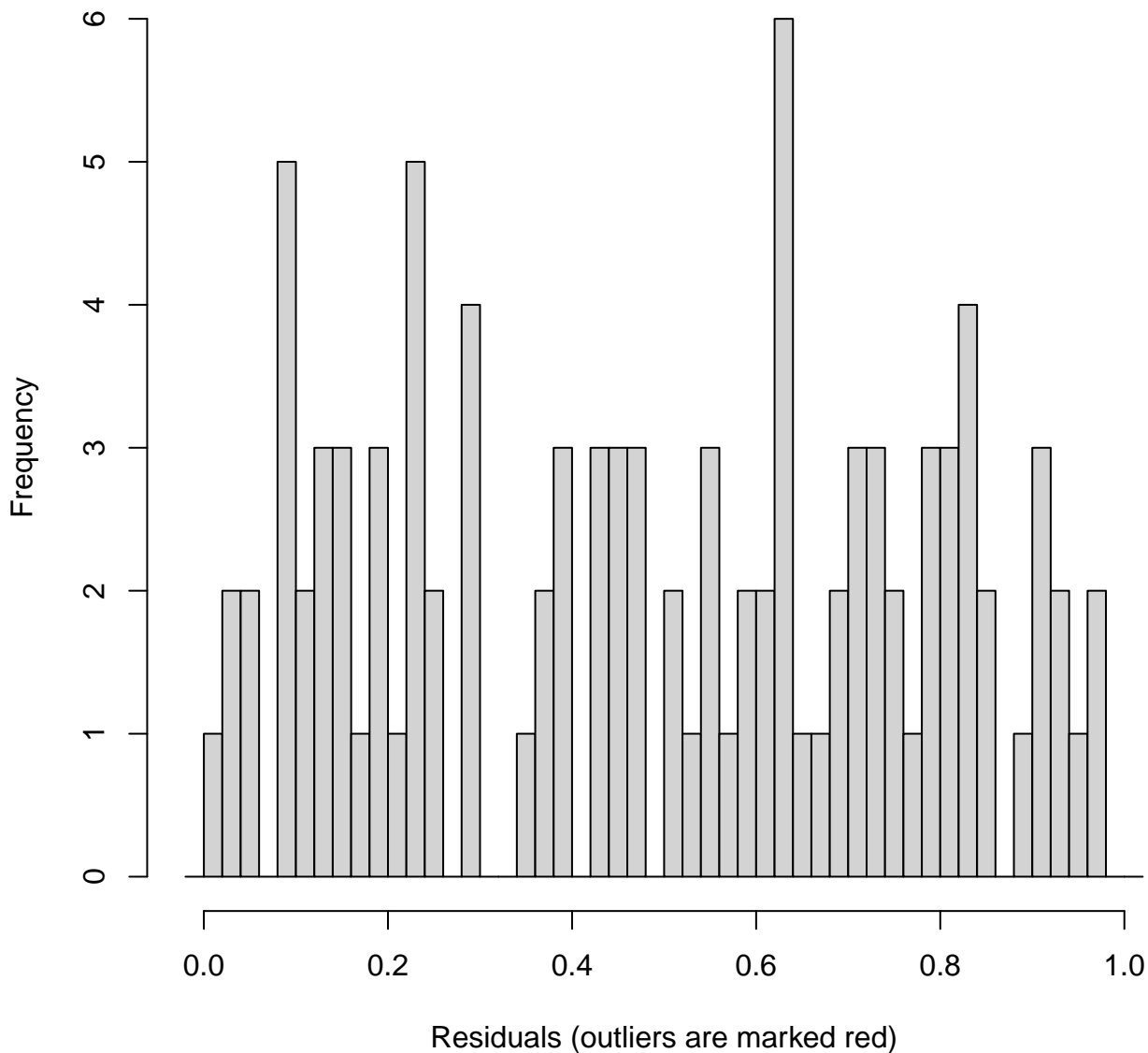
**Residual vs. predicted**  
**Quantile deviations detected (red curves)**  
**Combined adjusted quantile test significant**



**Residual vs. predicted**  
**No significant problems detected**

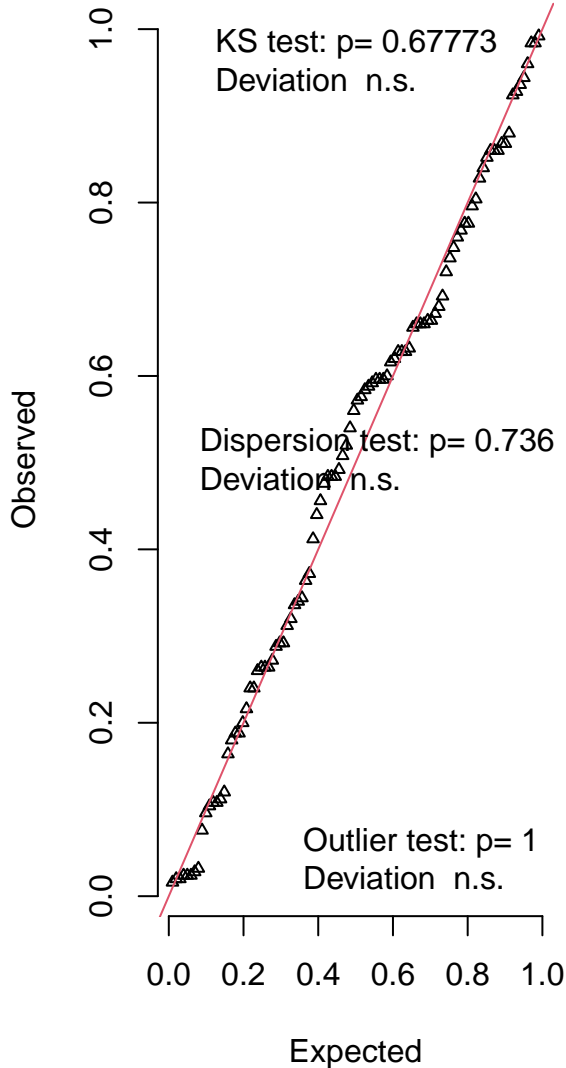


Hist of DHARMA residuals

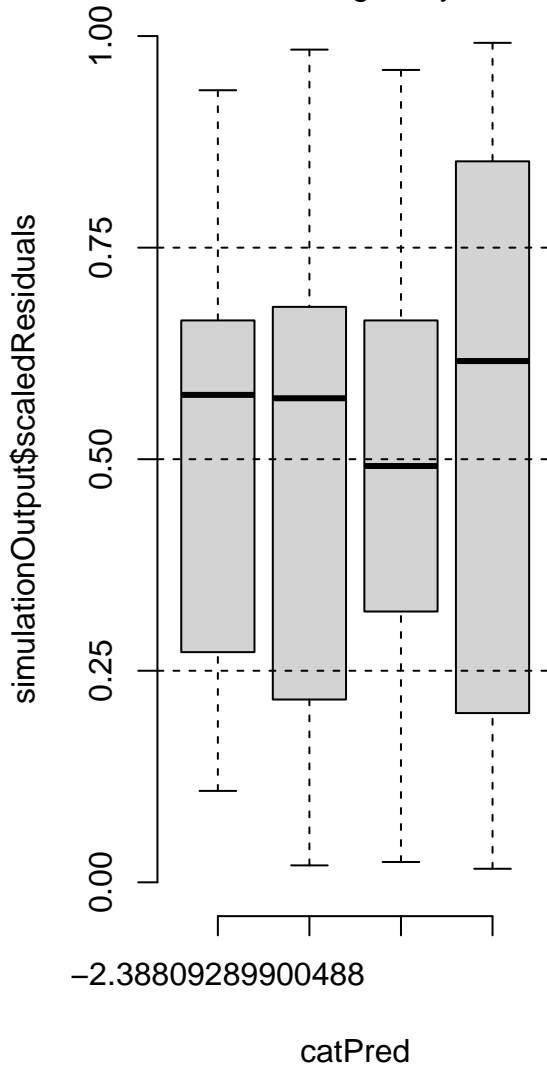


## DHARMA residual diagnostics

### QQ plot residuals

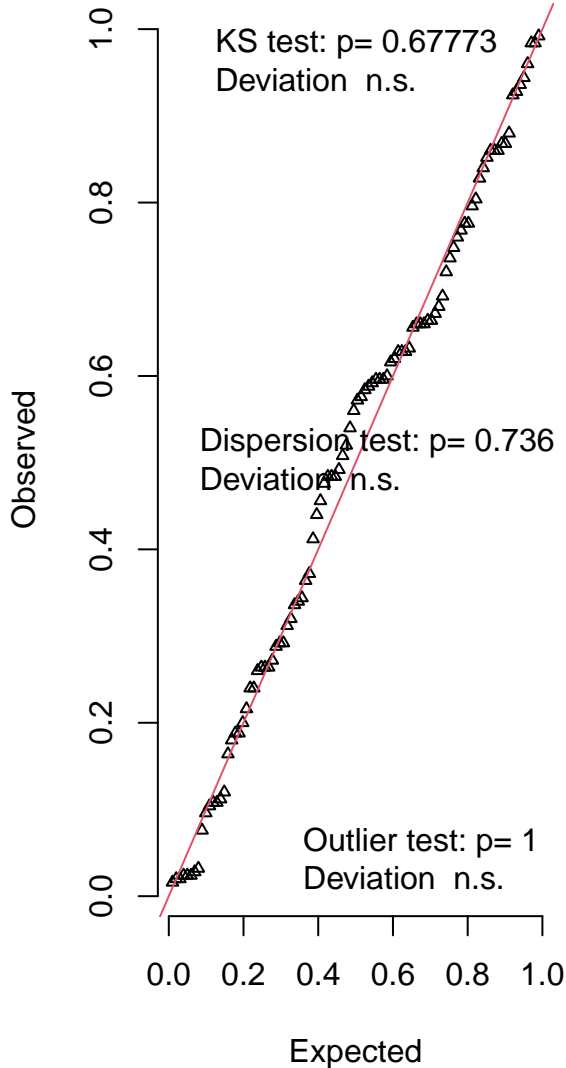


Within-group deviation from uniformity n.s.  
Levene Test for homogeneity of variance n.s.

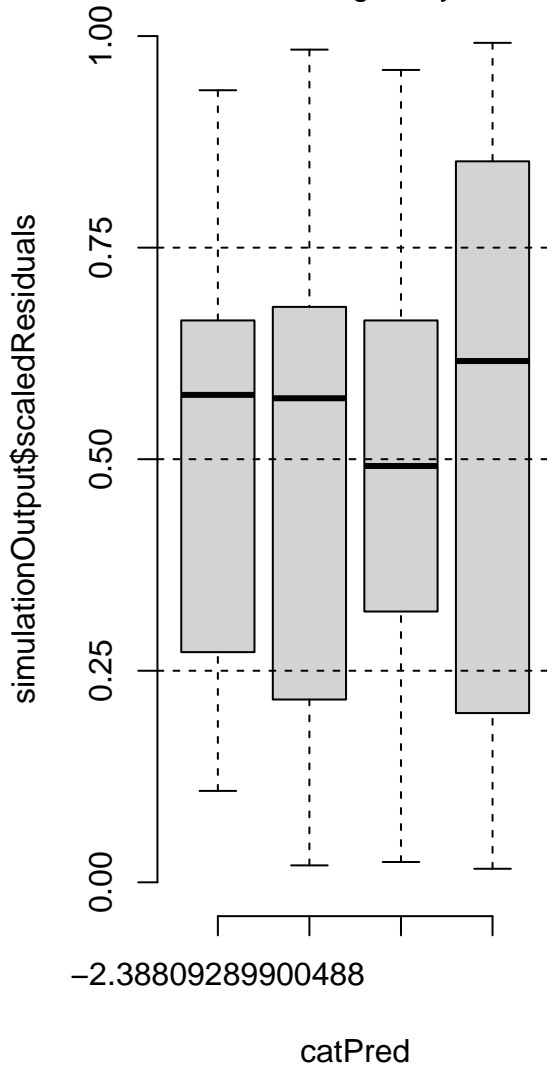


## DHARMA residual diagnostics

### QQ plot residuals

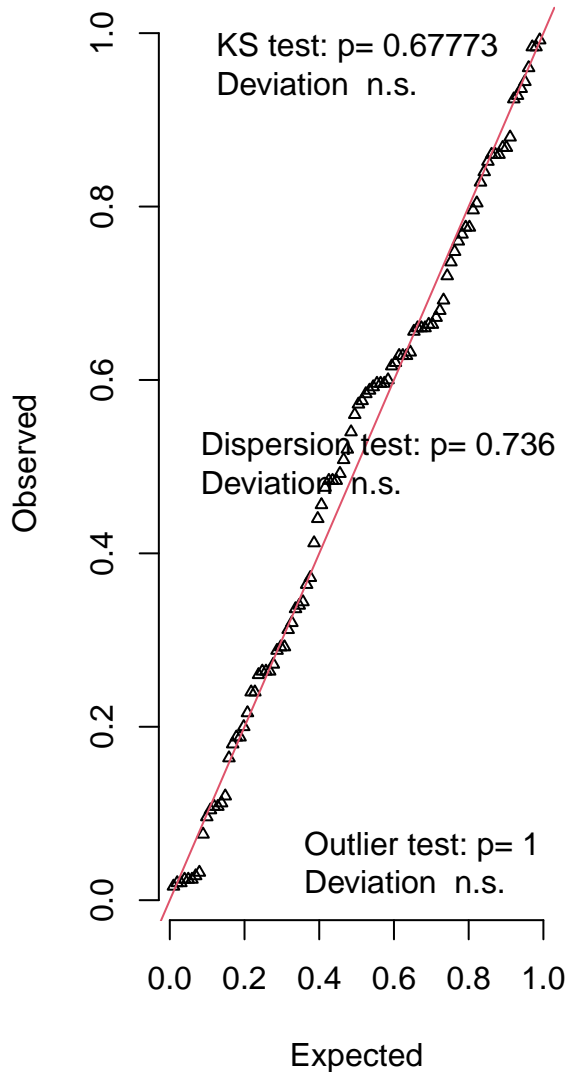


Within-group deviation from uniformity n.s.  
Levene Test for homogeneity of variance n.s.

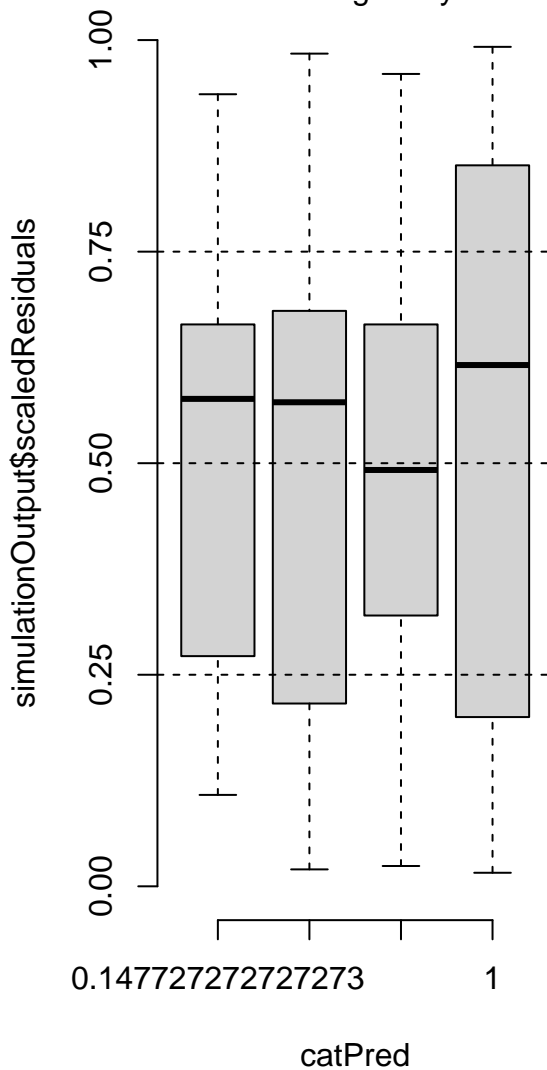


# DHARMA residual diagnostics

## QQ plot residuals

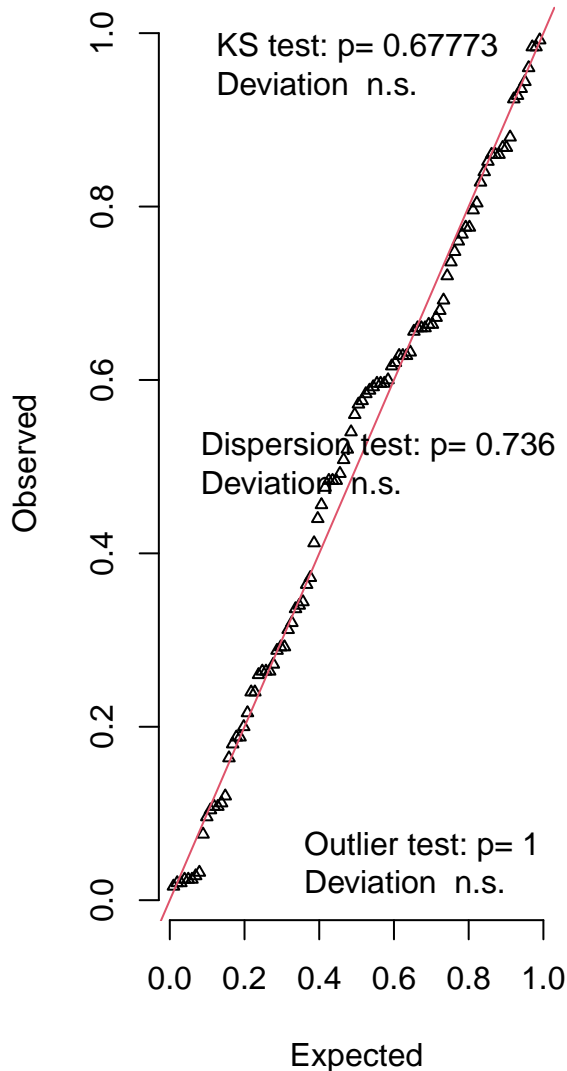


Within-group deviation from uniformity n.s.  
Levene Test for homogeneity of variance n.s.

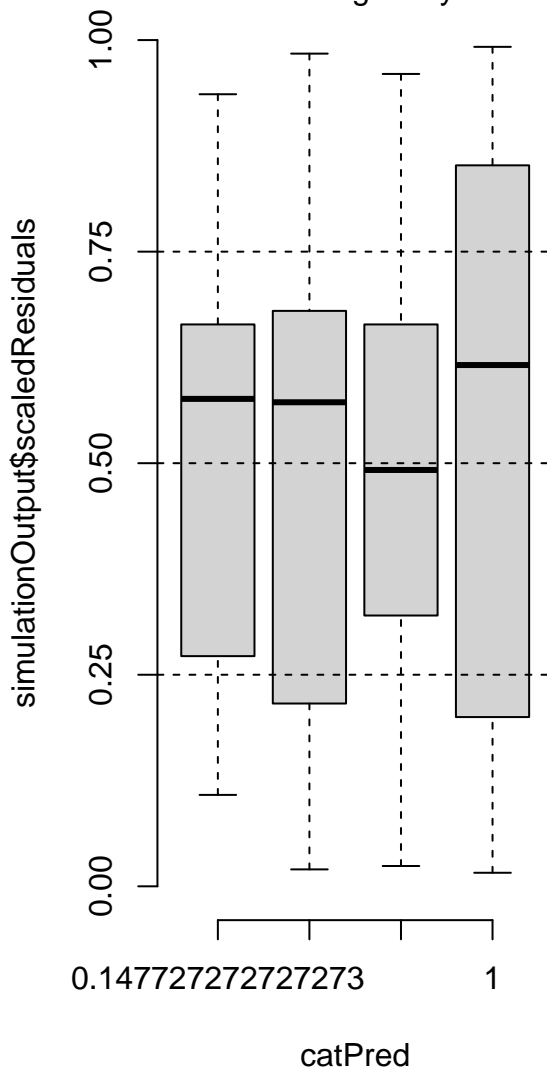


# DHARMA residual diagnostics

## QQ plot residuals

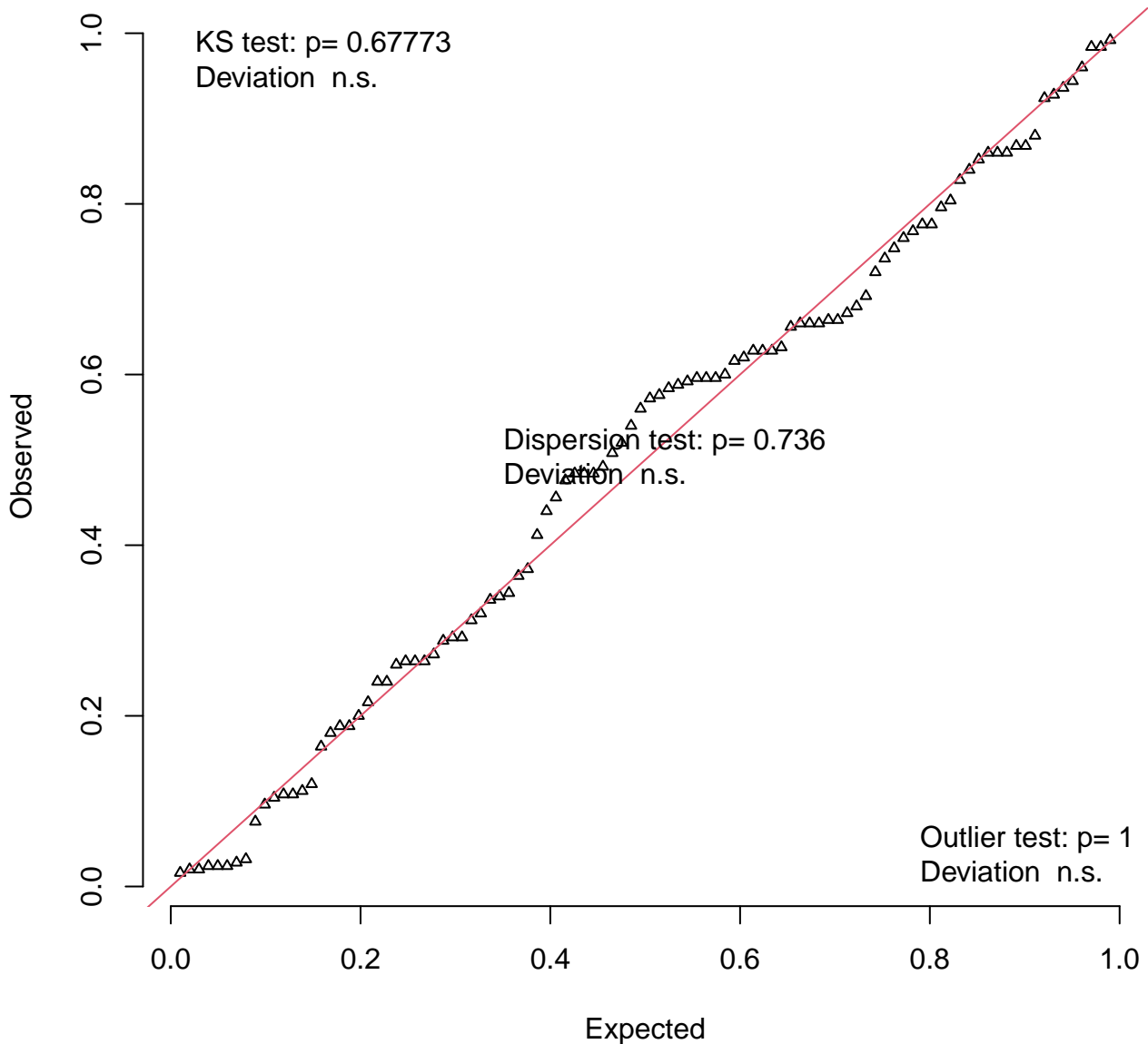


Within-group deviation from uniformity n.s.  
Levene Test for homogeneity of variance n.s.

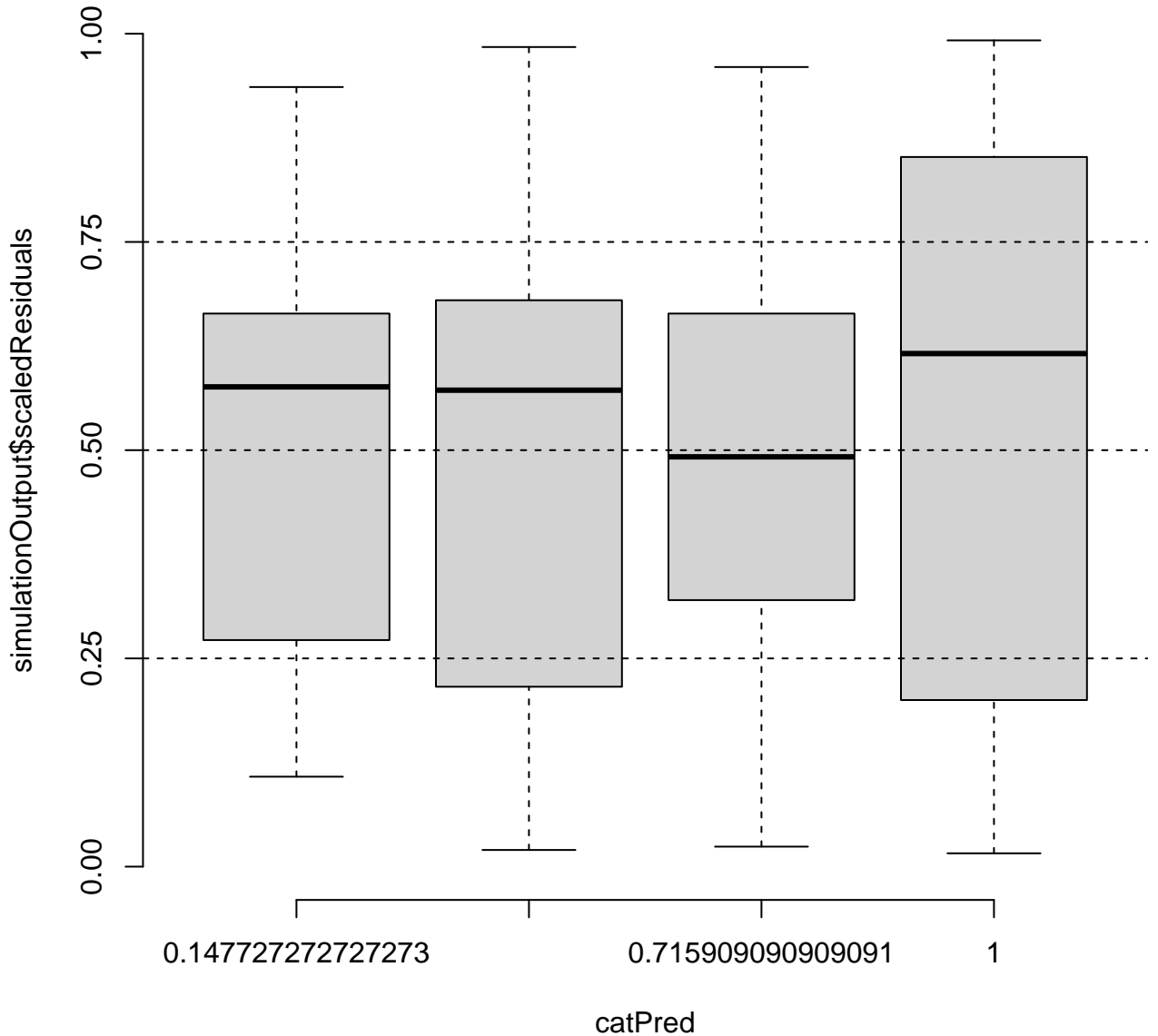




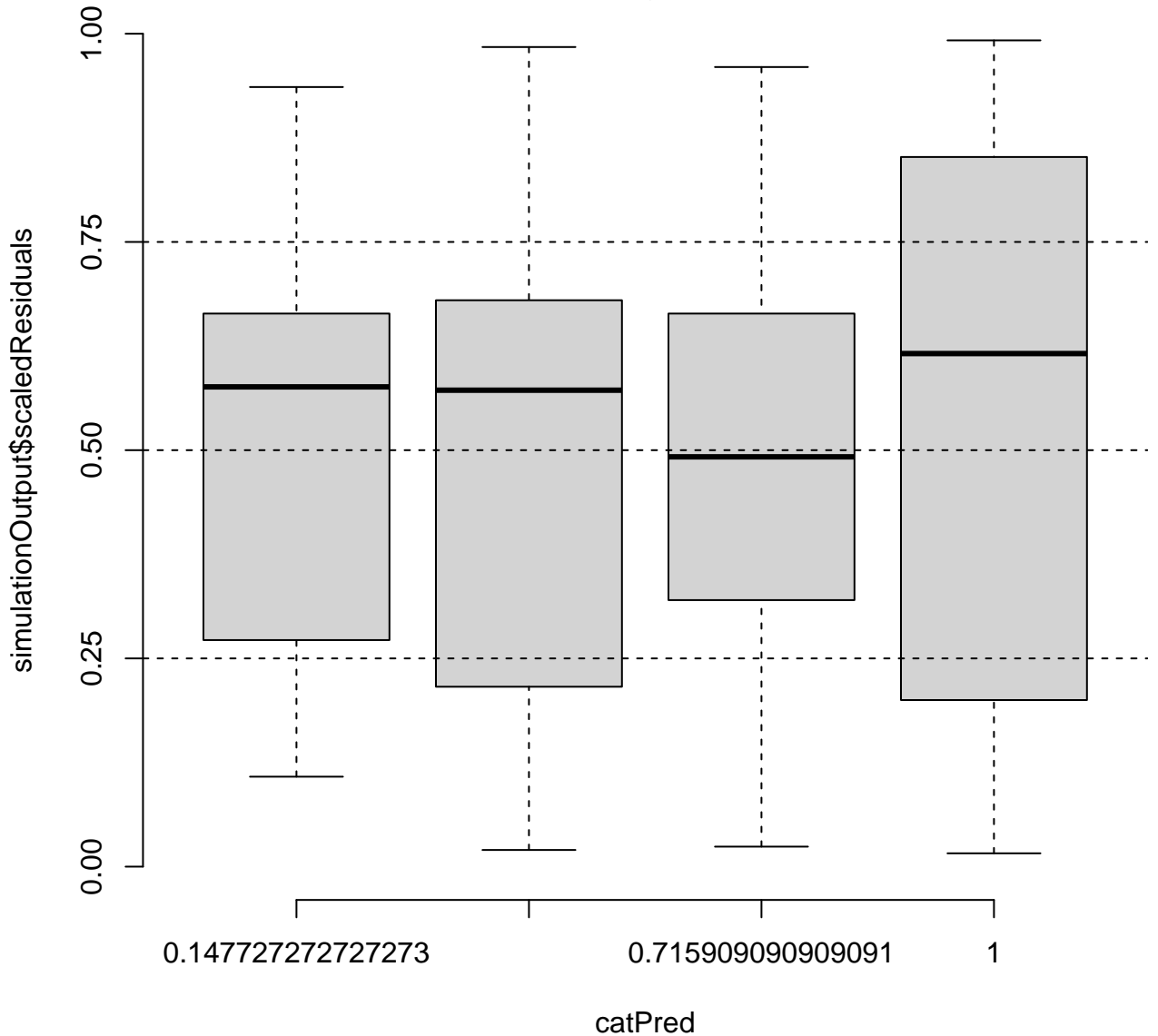
# QQ plot residuals



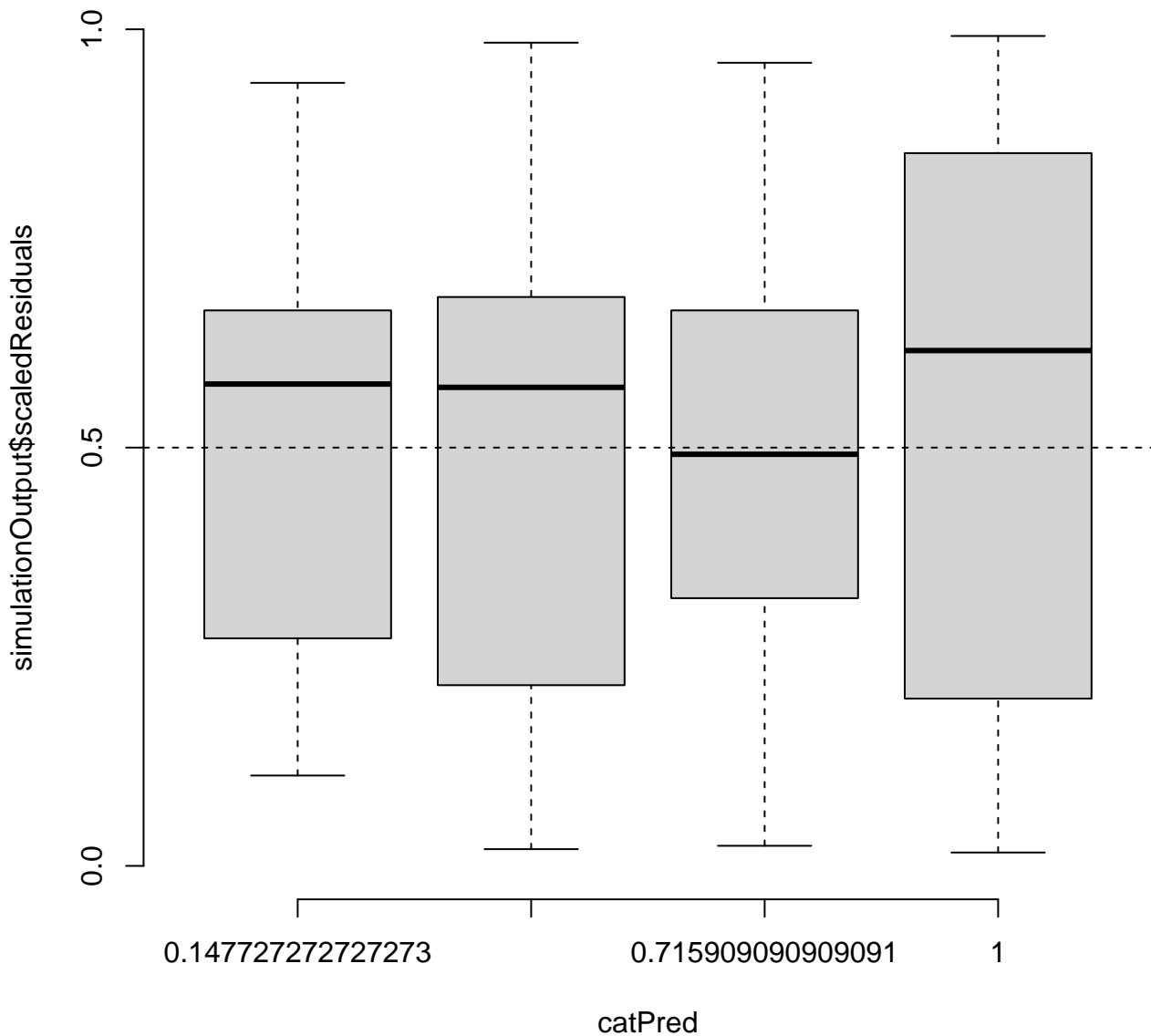
Within-group deviation from uniformity n.s.  
Levene Test for homogeneity of variance n.s.



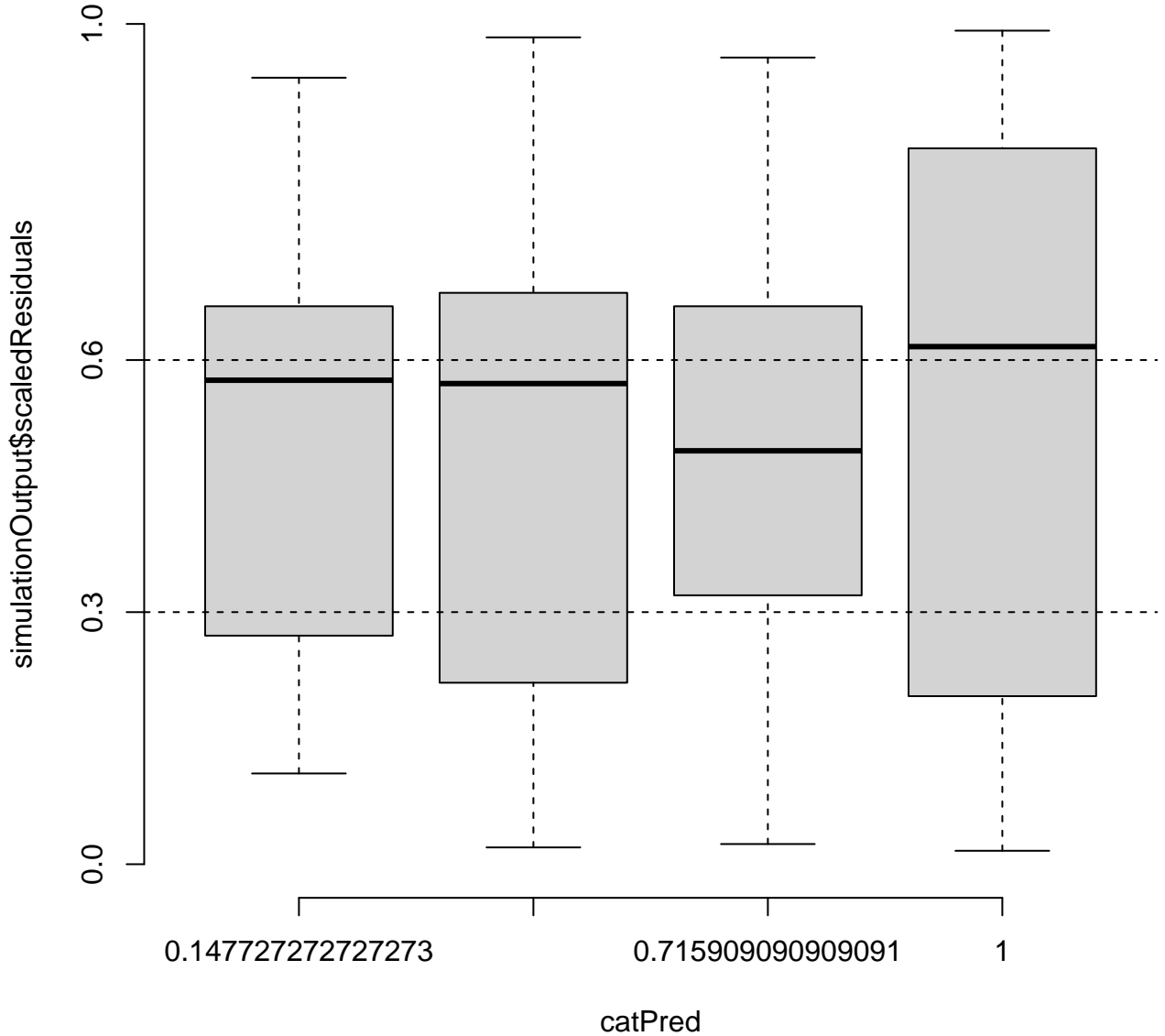
Within-group deviation from uniformity n.s.  
Levene Test for homogeneity of variance n.s.



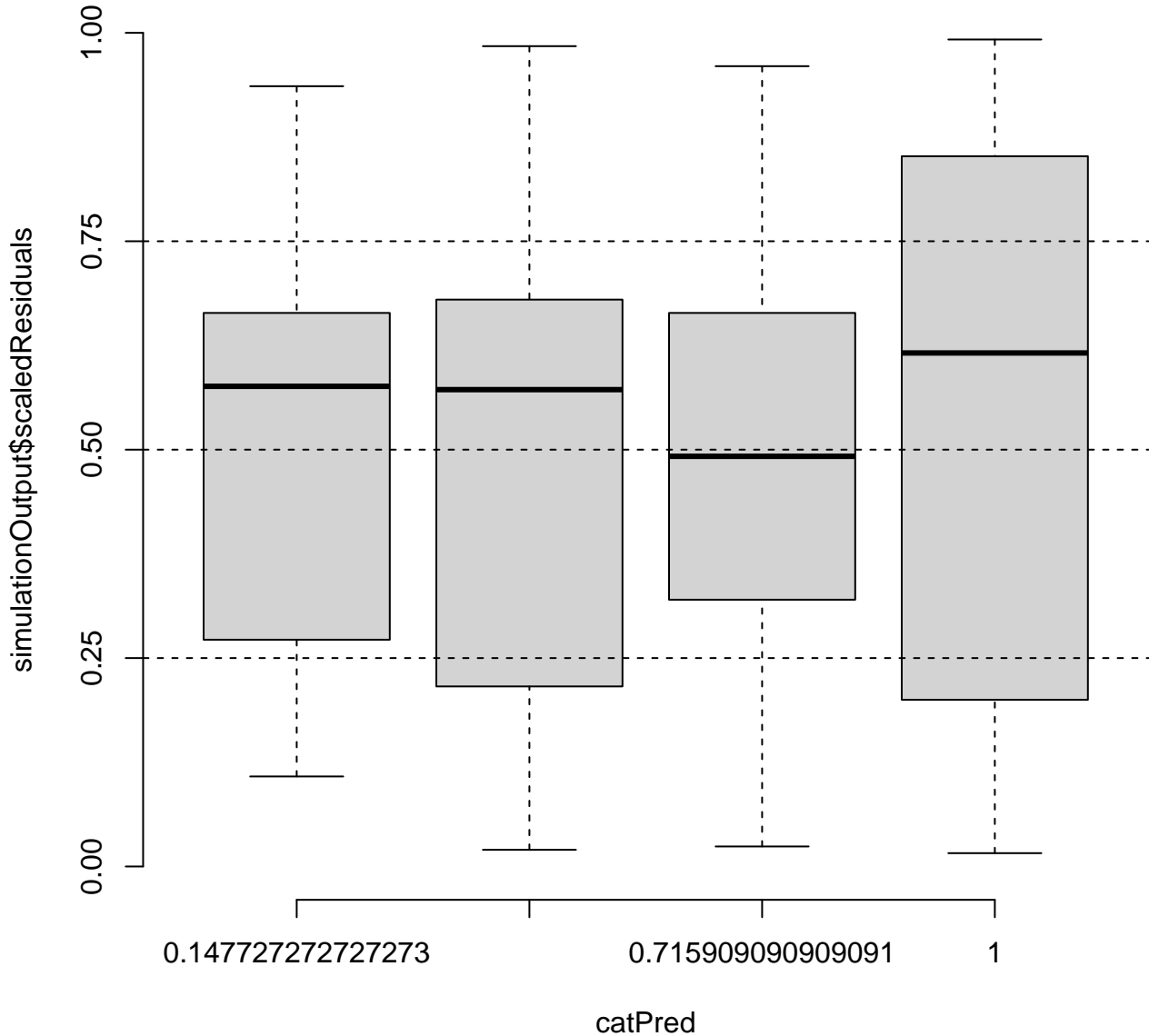
Within-group deviation from uniformity n.s.  
Levene Test for homogeneity of variance n.s.



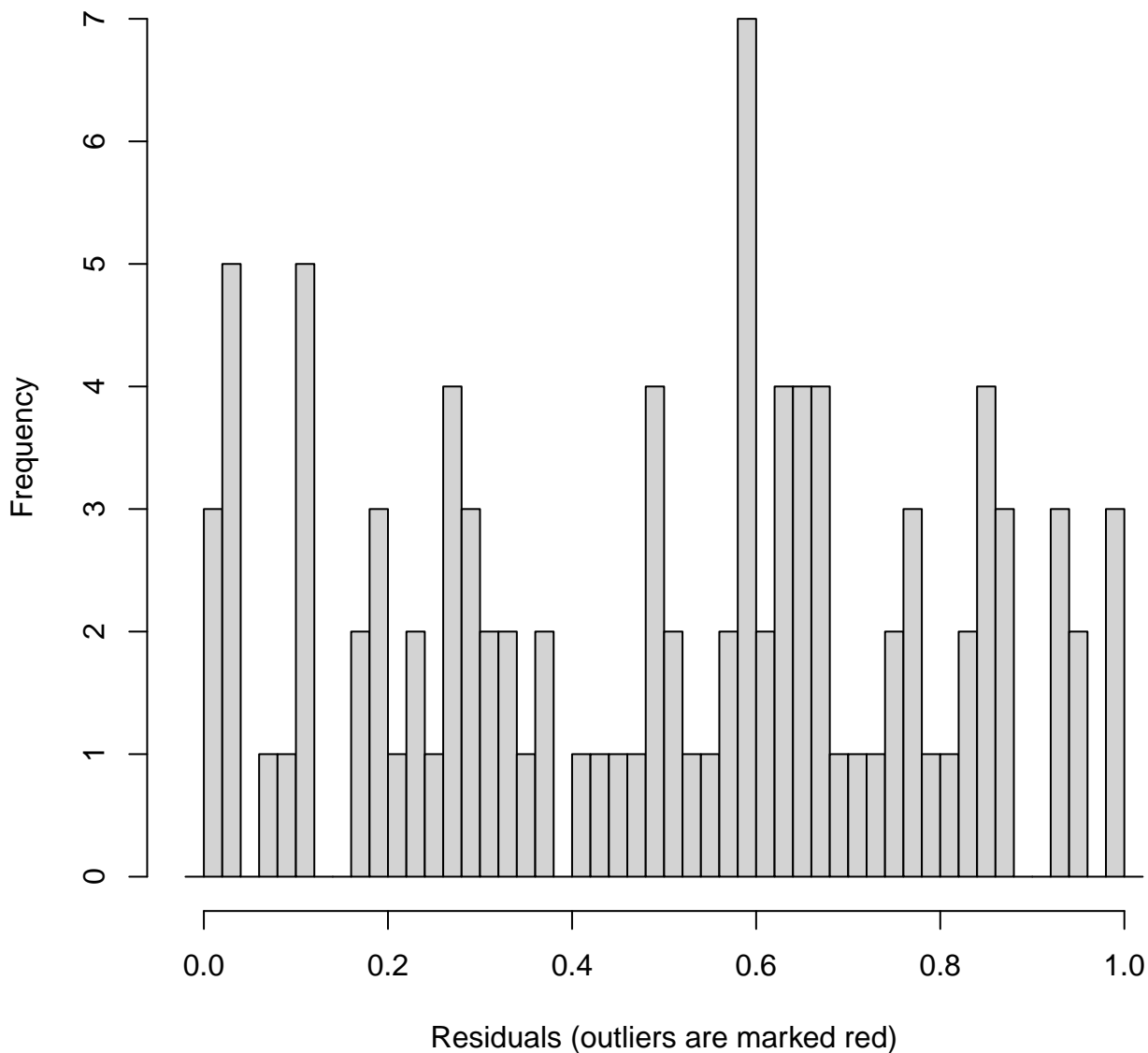
Within-group deviation from uniformity n.s.  
Levene Test for homogeneity of variance n.s.



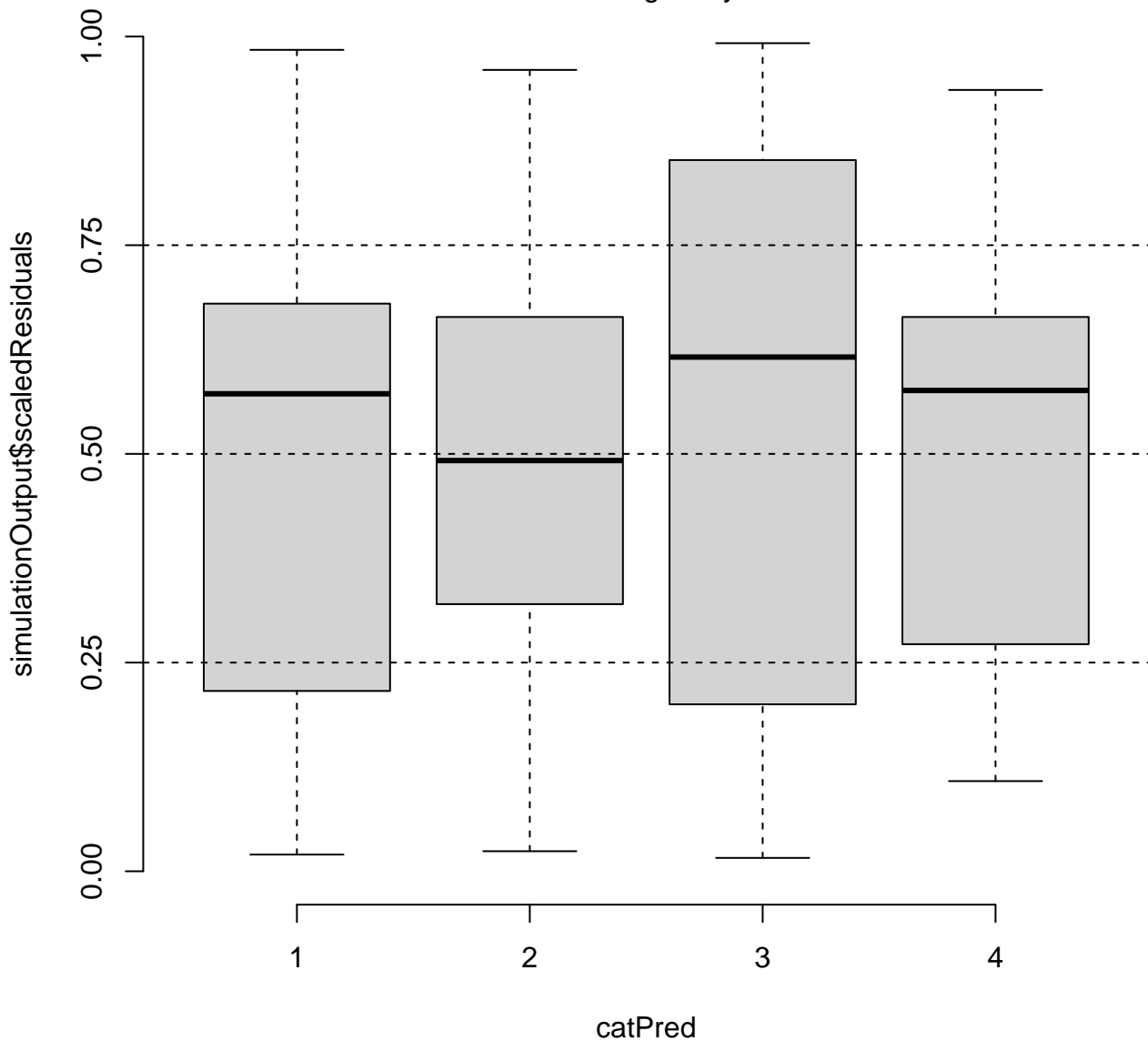
Within-group deviation from uniformity n.s.  
Levene Test for homogeneity of variance n.s.



Hist of DHARMA residuals

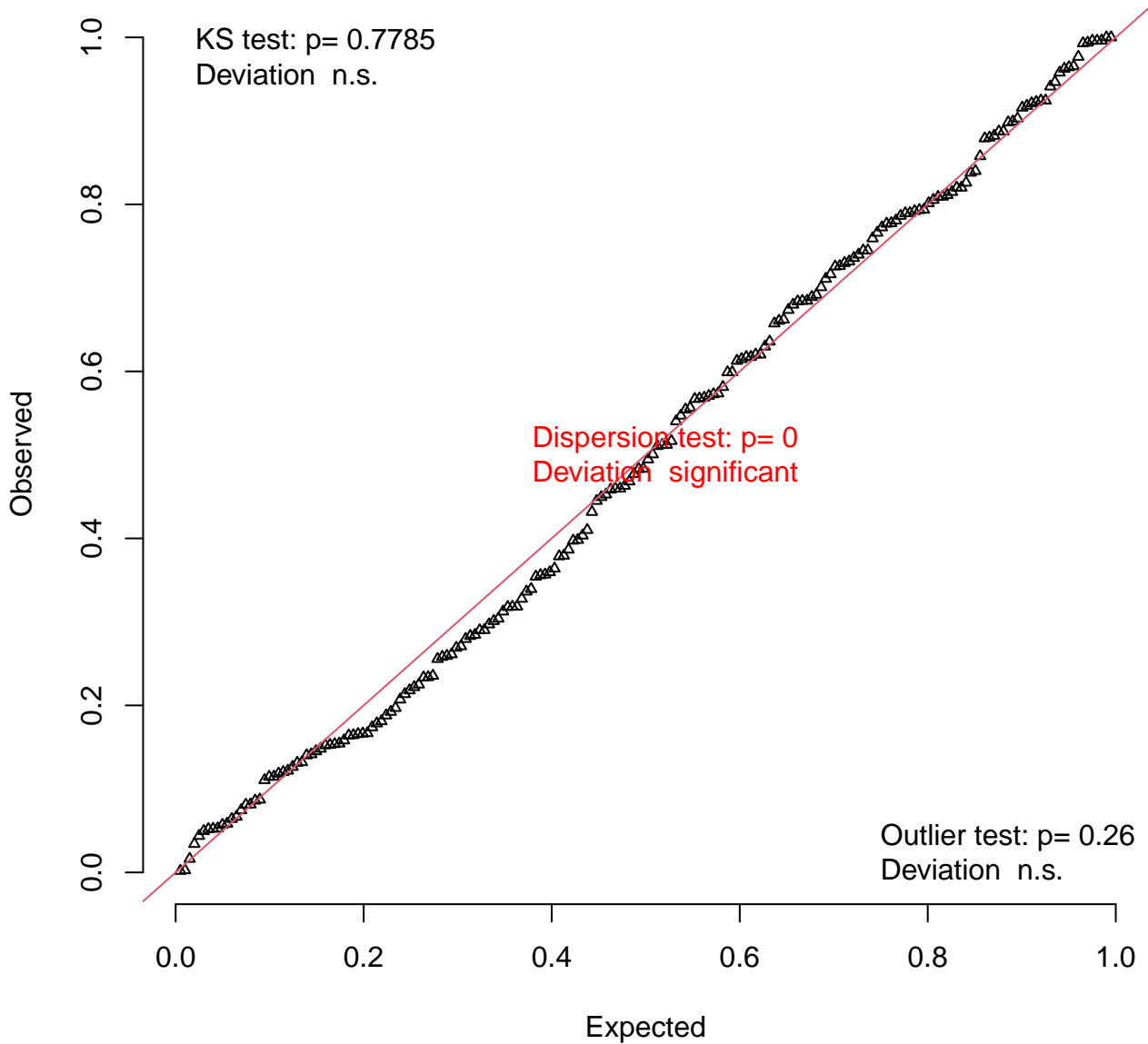


Within-group deviation from uniformity n.s.  
Levene Test for homogeneity of variance n.s.

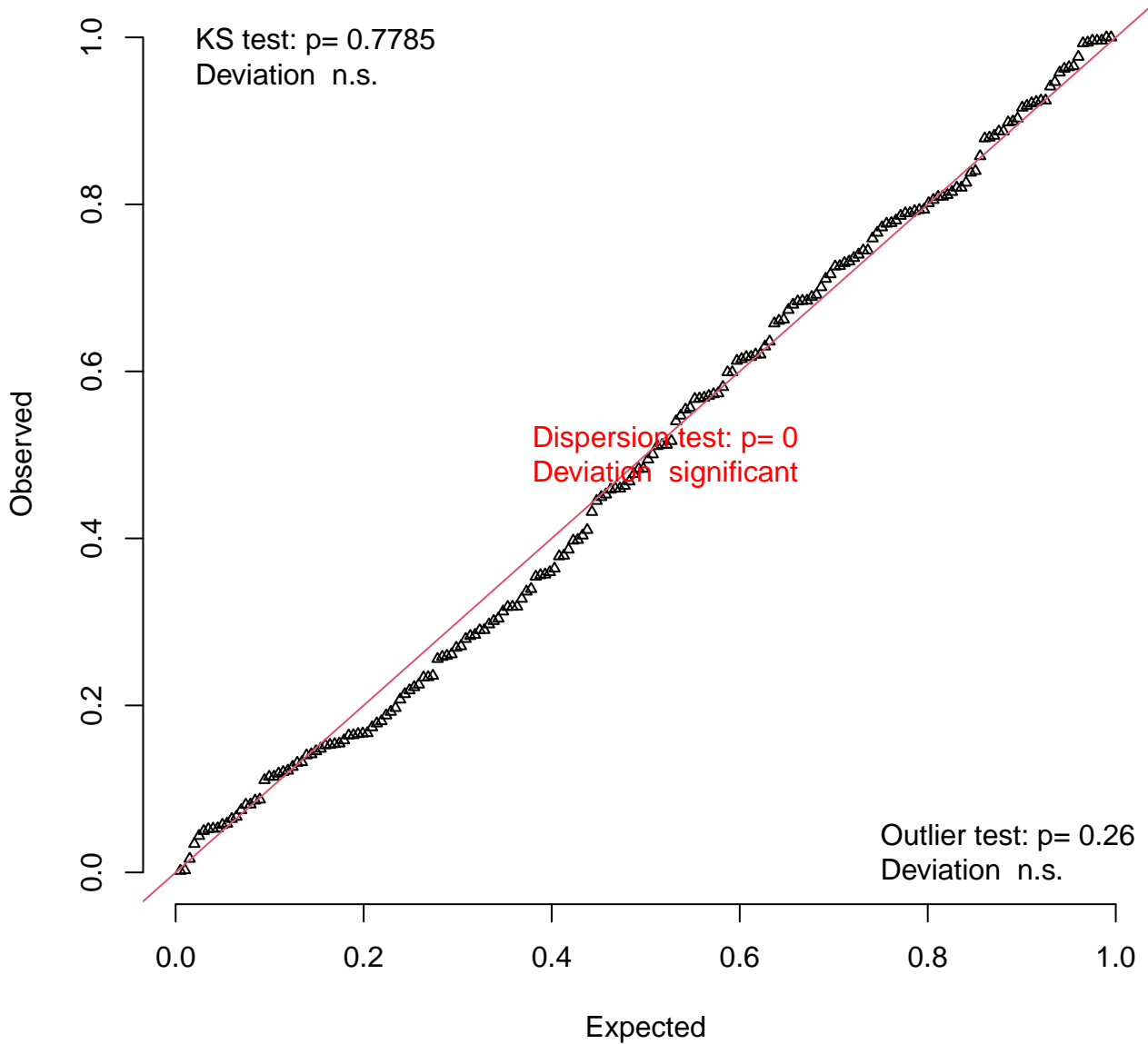




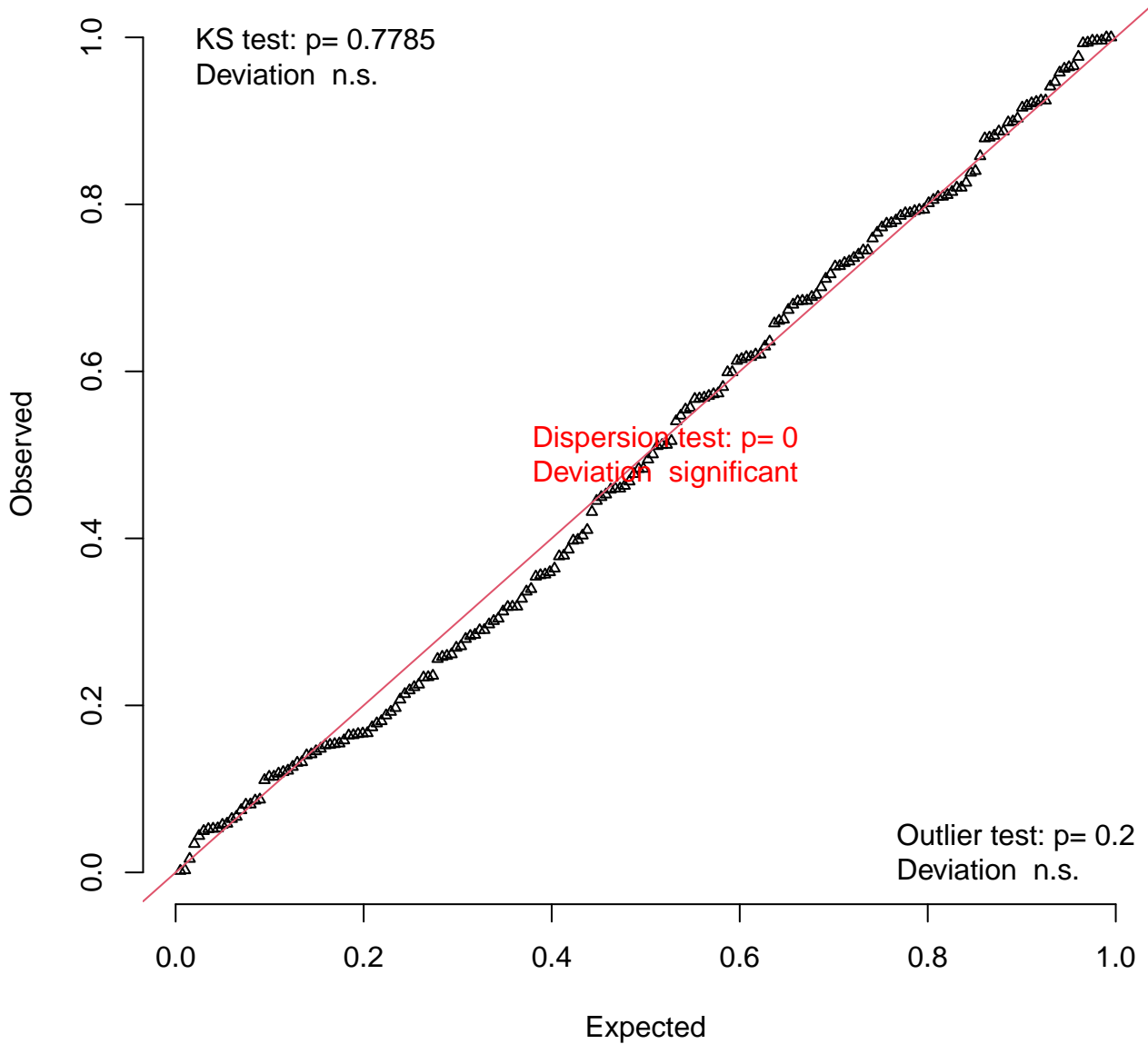
# QQ plot residuals



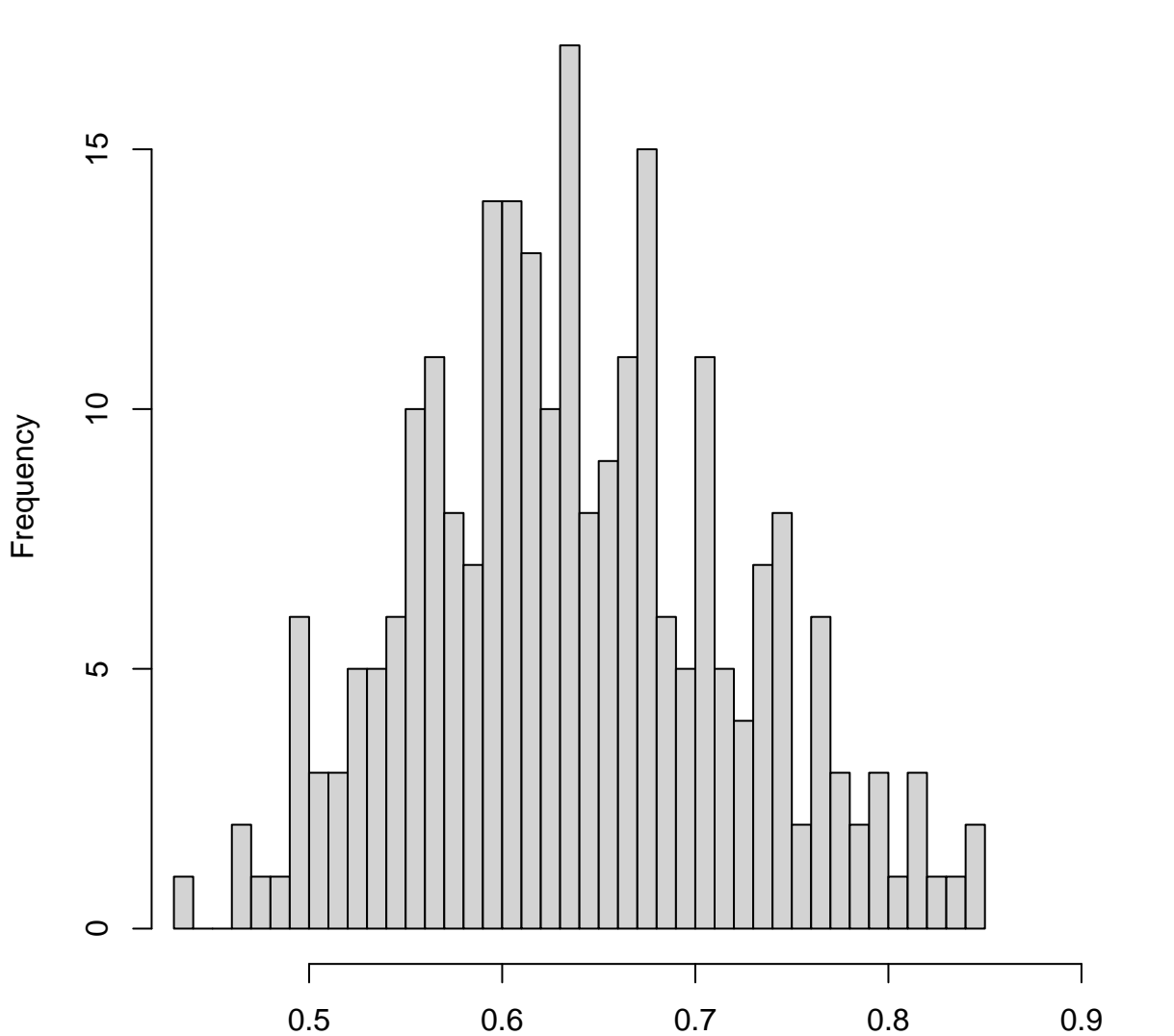
# QQ plot residuals



# QQ plot residuals

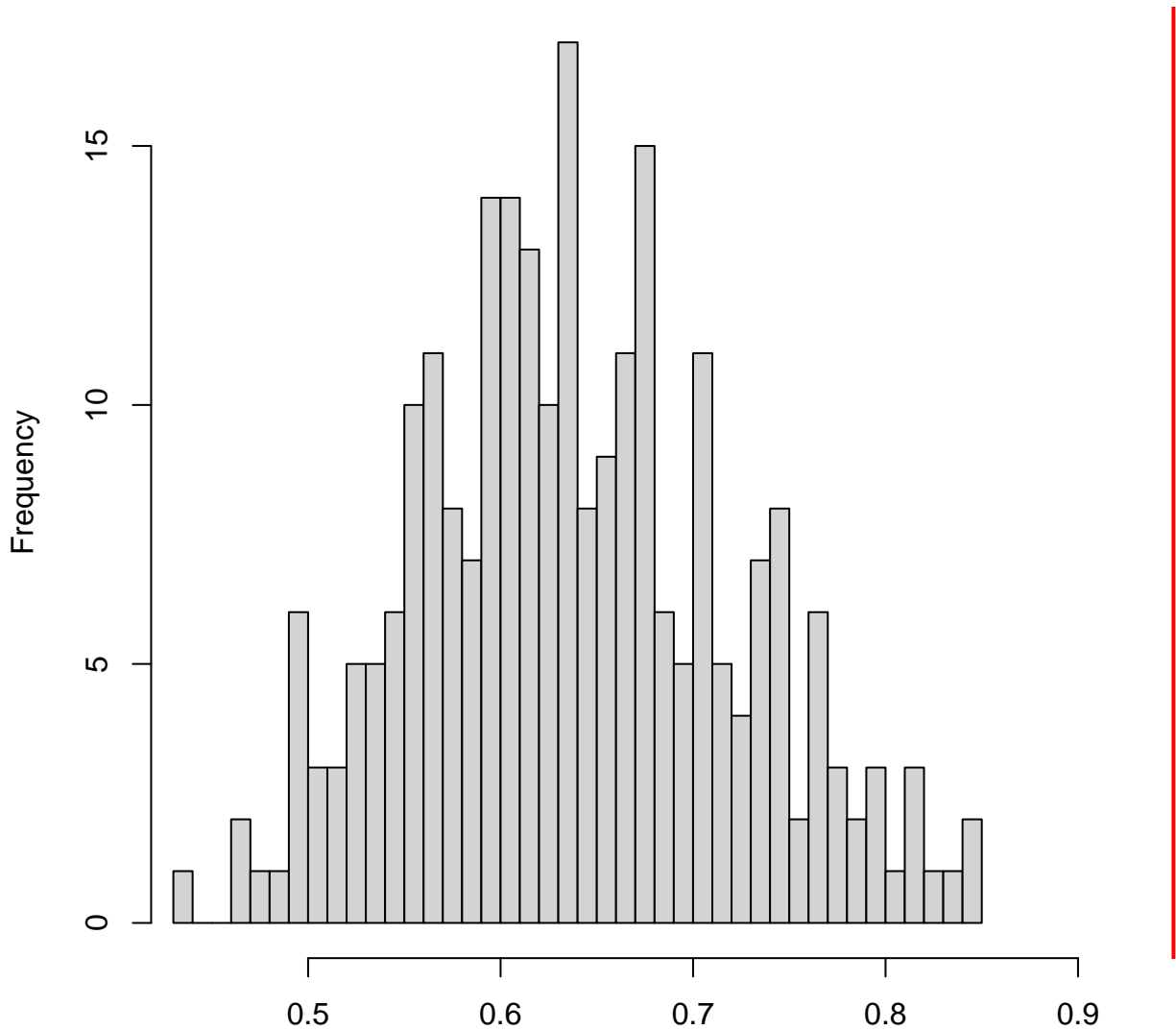


**DHARMA nonparametric dispersion test via sd of  
residuals fitted vs. simulated**



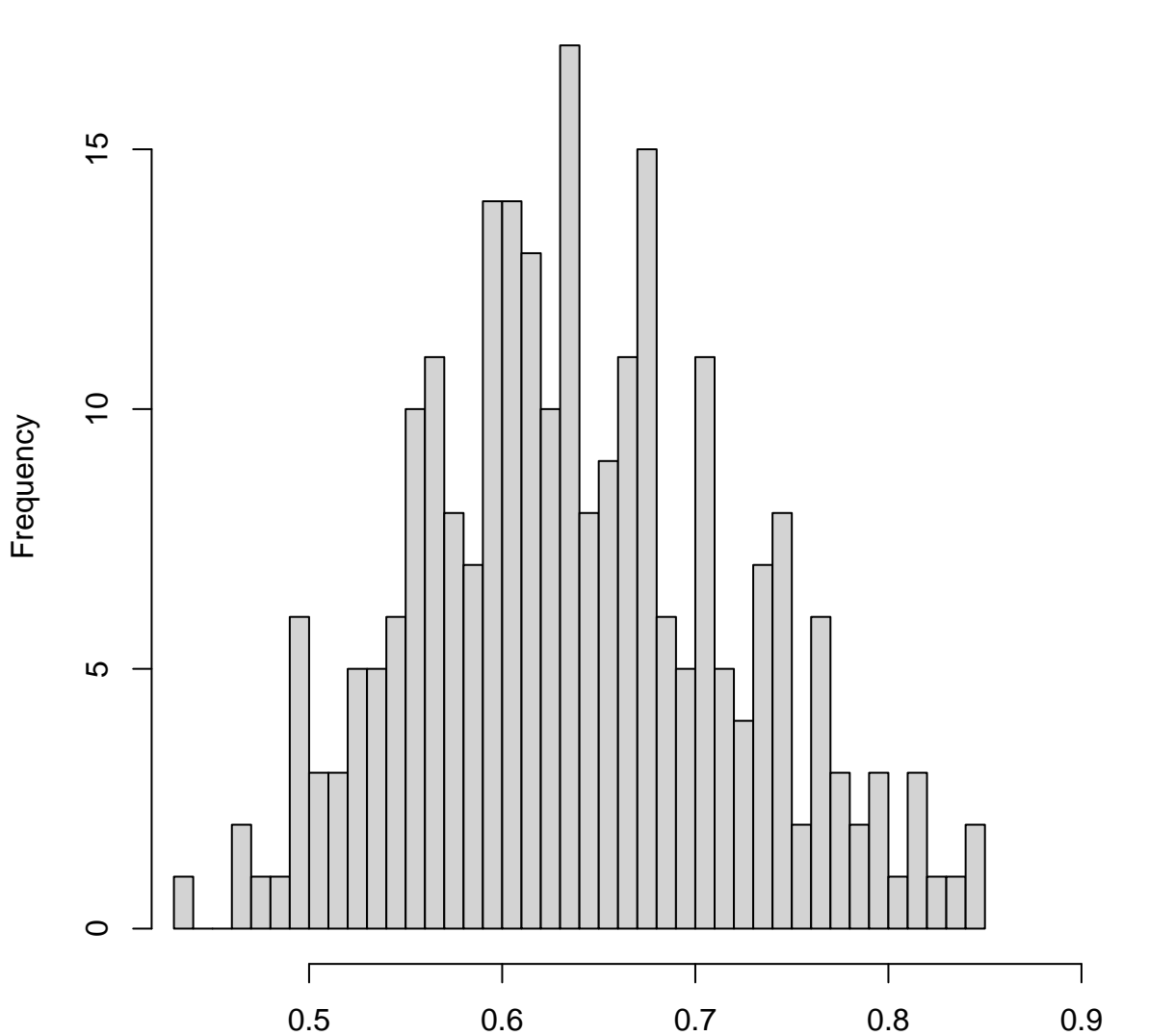
Simulated values, red line = fitted model. p-value (two.sided) = 0

**DHARMA nonparametric dispersion test via sd of  
residuals fitted vs. simulated**



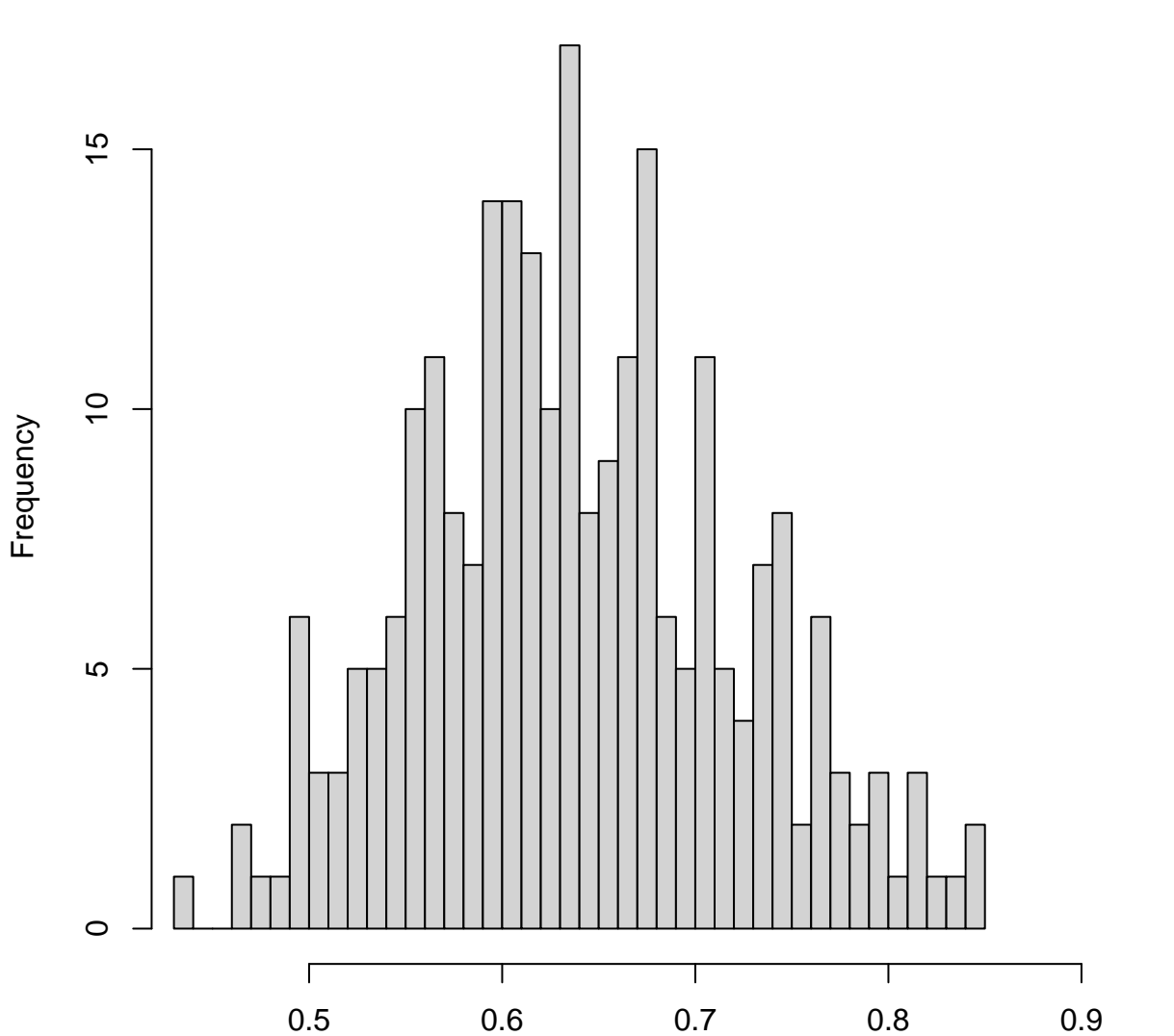
Simulated values, red line = fitted model. p-value (less) = 1

**DHARMA nonparametric dispersion test via sd of  
residuals fitted vs. simulated**



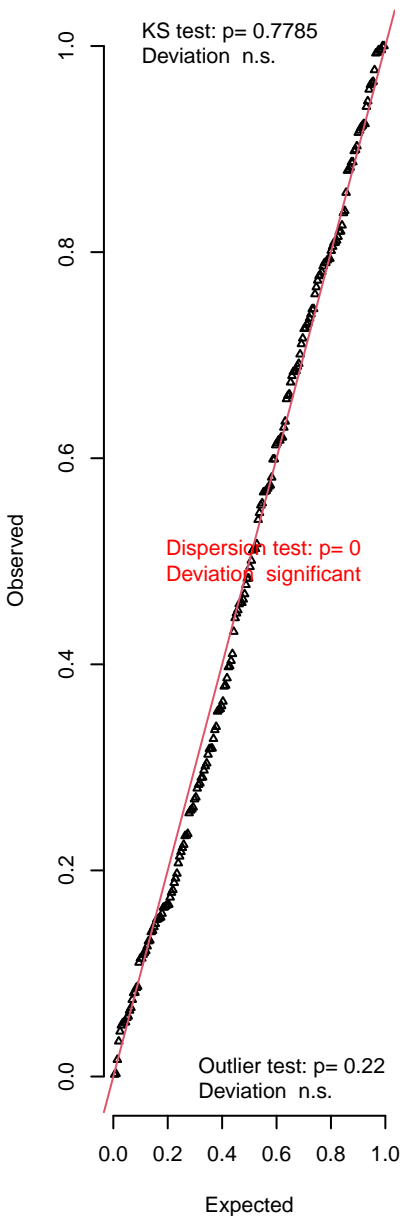
Simulated values, red line = fitted model. p-value (greater) = 0

**DHARMA nonparametric dispersion test via sd of  
residuals fitted vs. simulated**

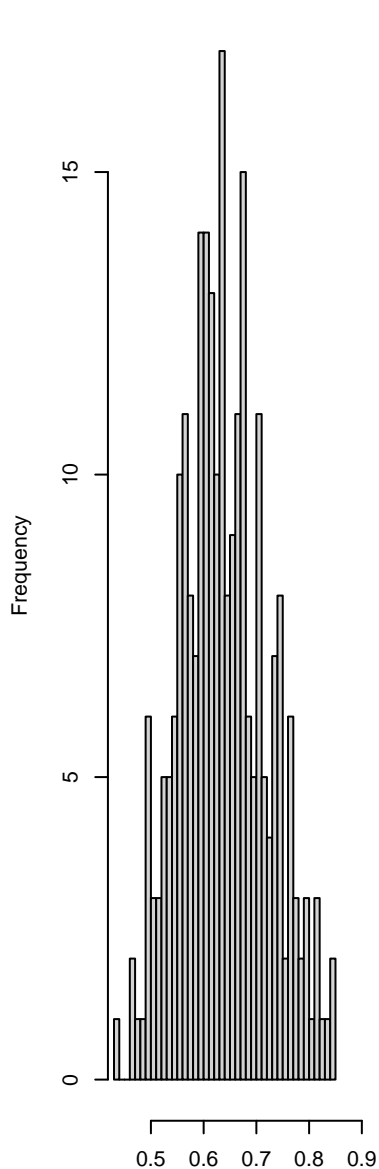


Simulated values, red line = fitted model. p-value (two.sided) = 0

QQ plot residuals



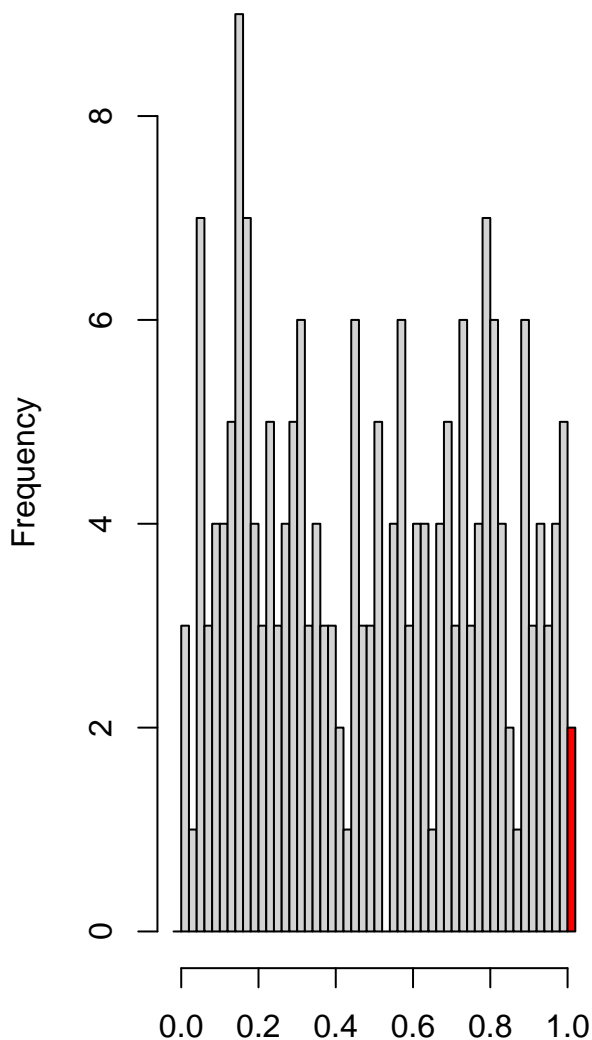
DHARMA nonparametric dispersion test via sd of  
residuals fitted vs. simulated



ated values, red line = fitted model.  $p$ -value (two

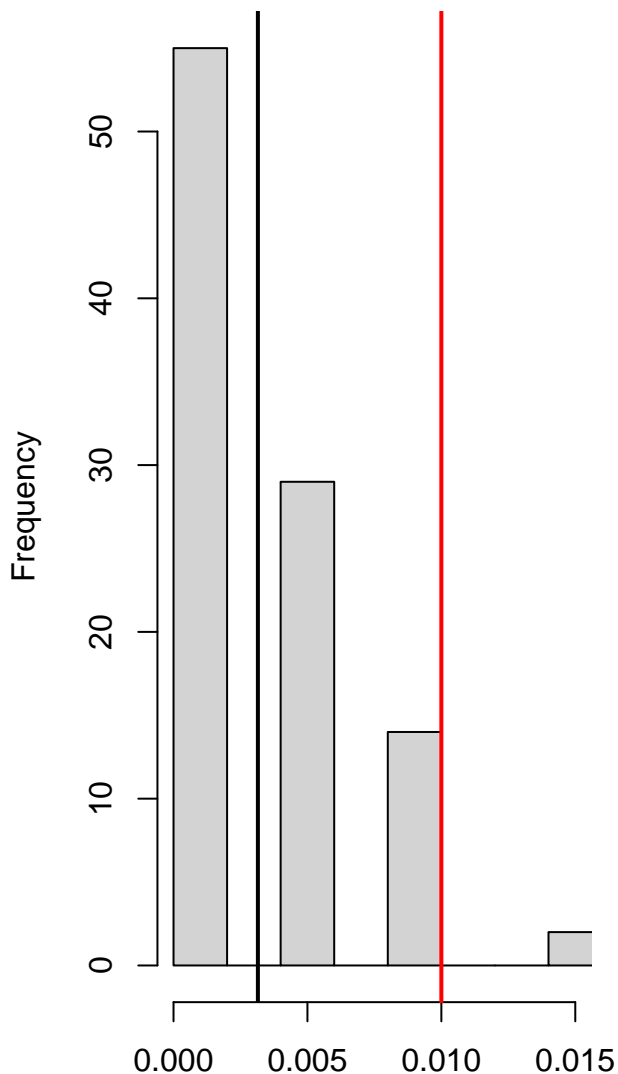


Outlier test n.s.



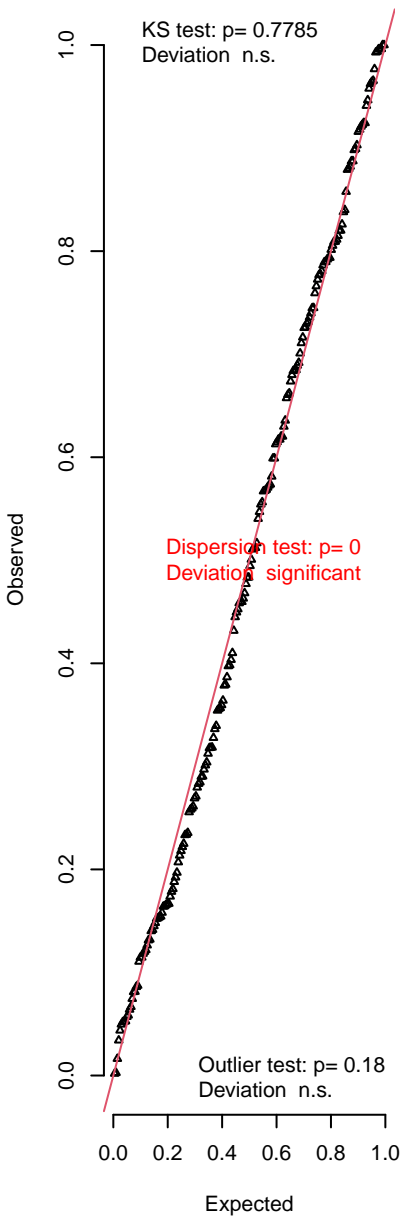
Residuals (outliers are marked red)

Histogram of frequBoot

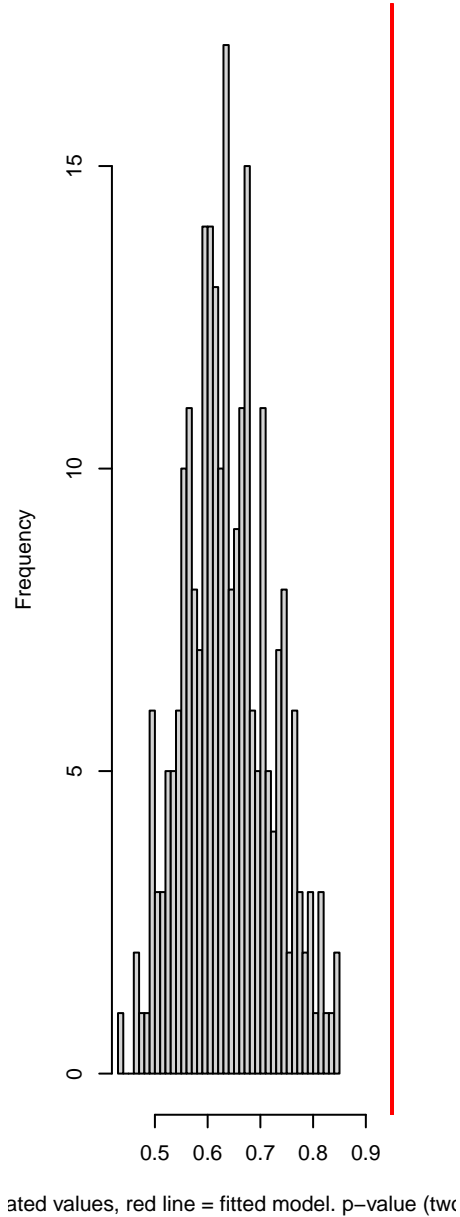


frequBoot

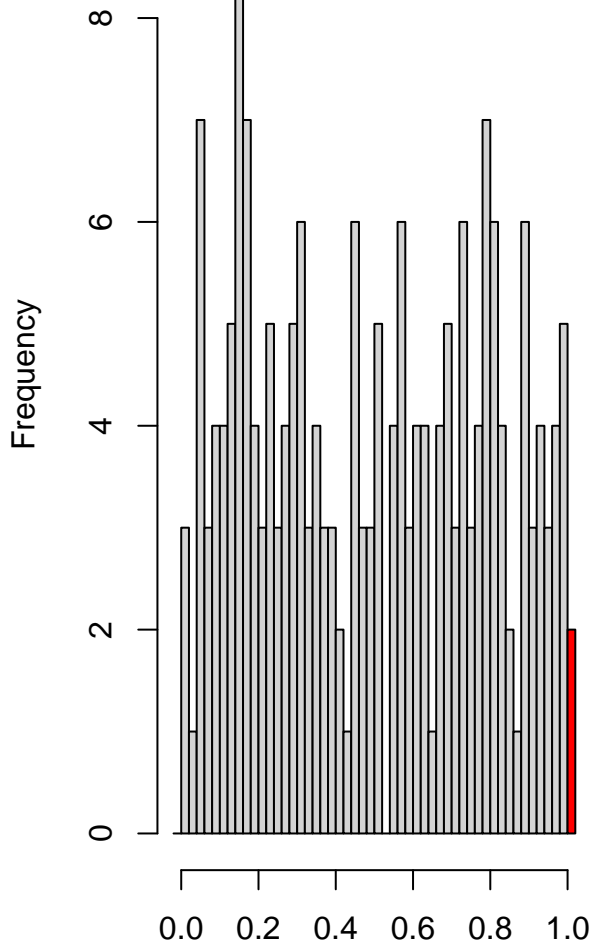
QQ plot residuals



DHARMA nonparametric dispersion test via sd of  
residuals fitted vs. simulated

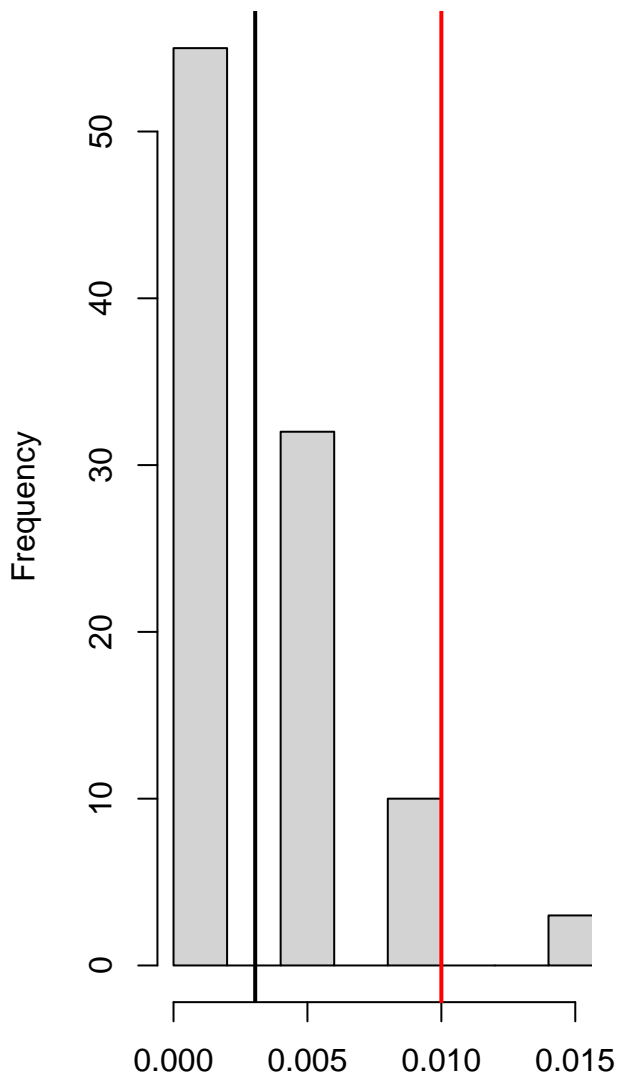


Outlier test n.s.



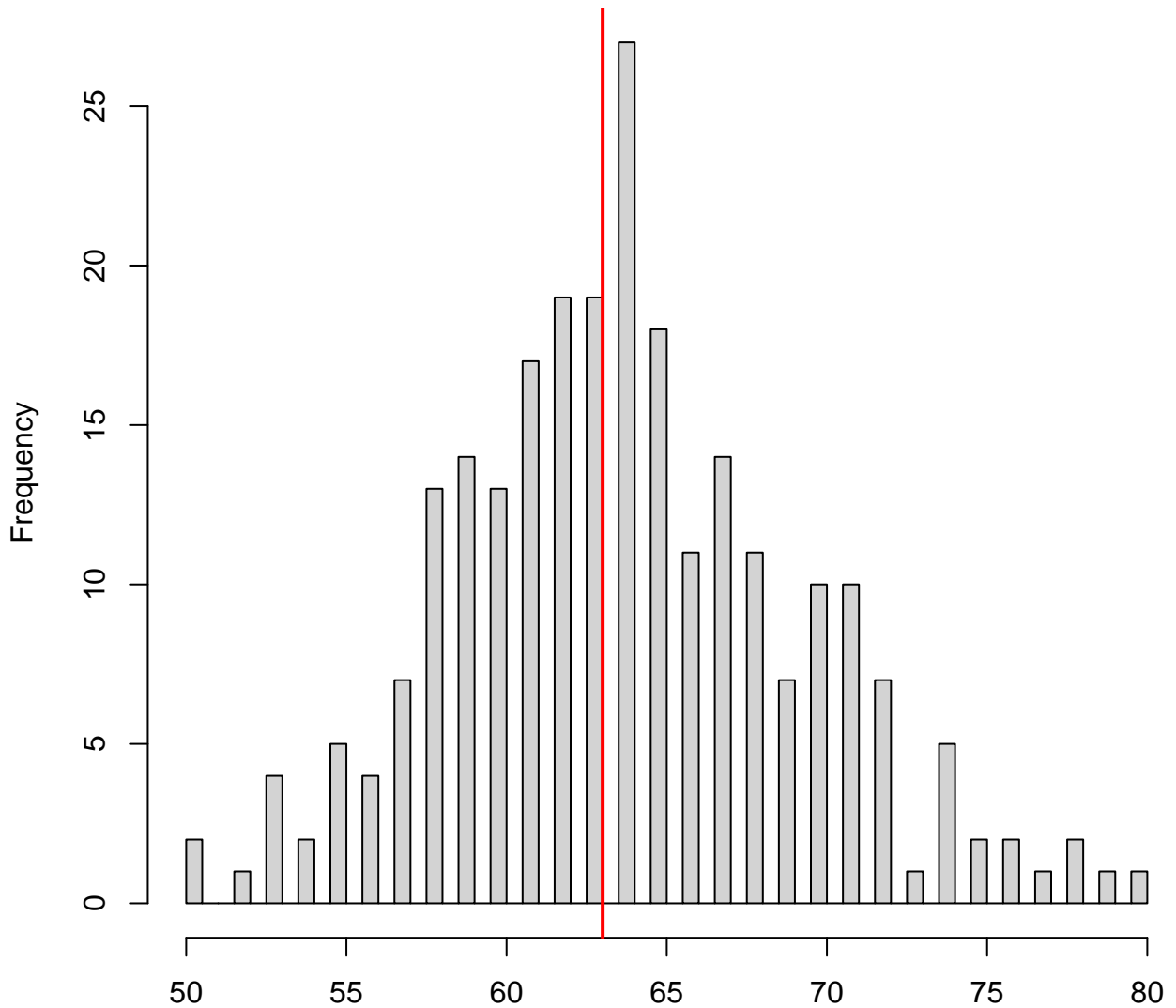
Residuals (outliers are marked red)

Histogram of frequBoot



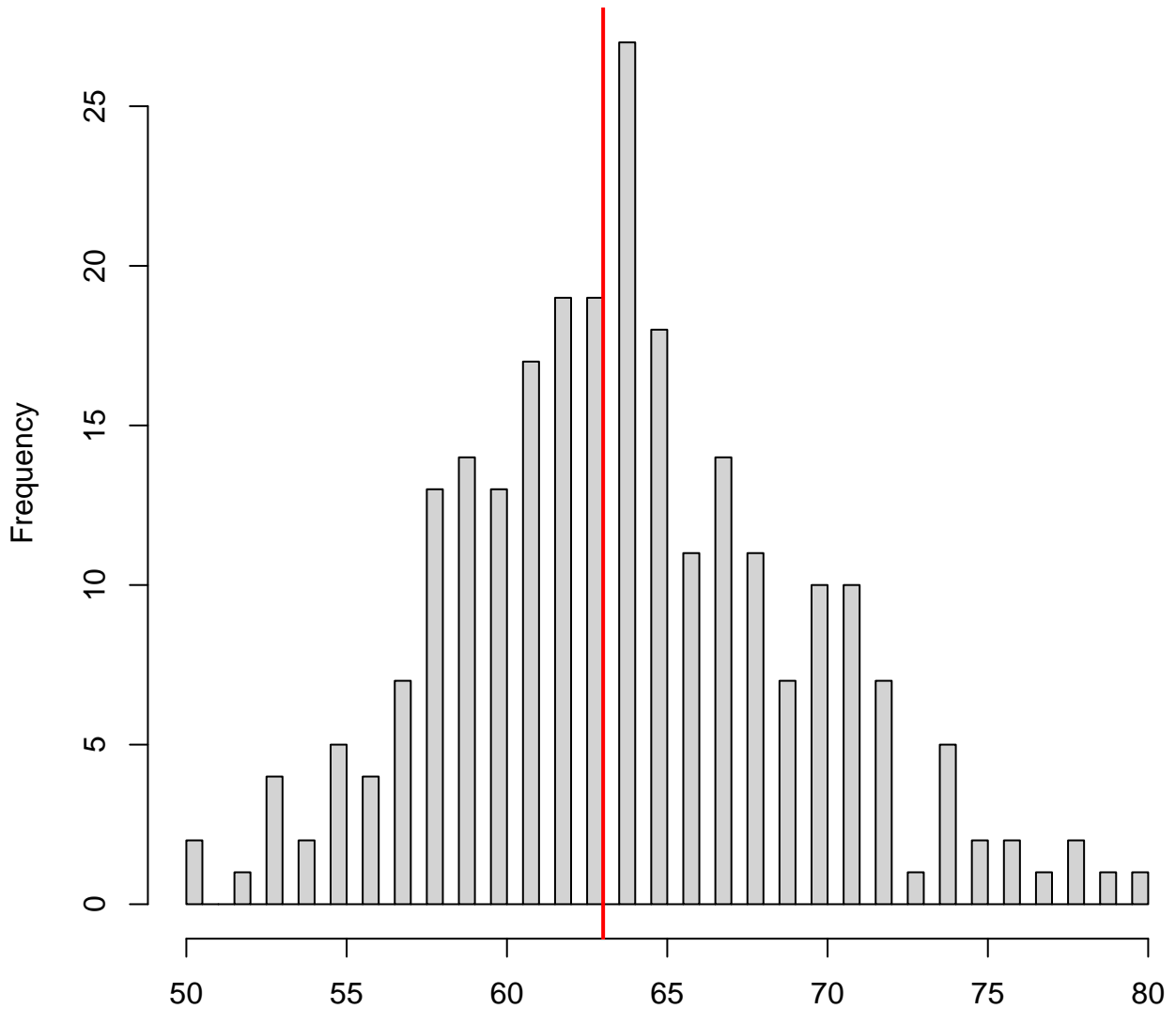
frequBoot

**DHARMA zero-inflation test via comparison to  
expected zeros with simulation under H0 = fitted  
model**



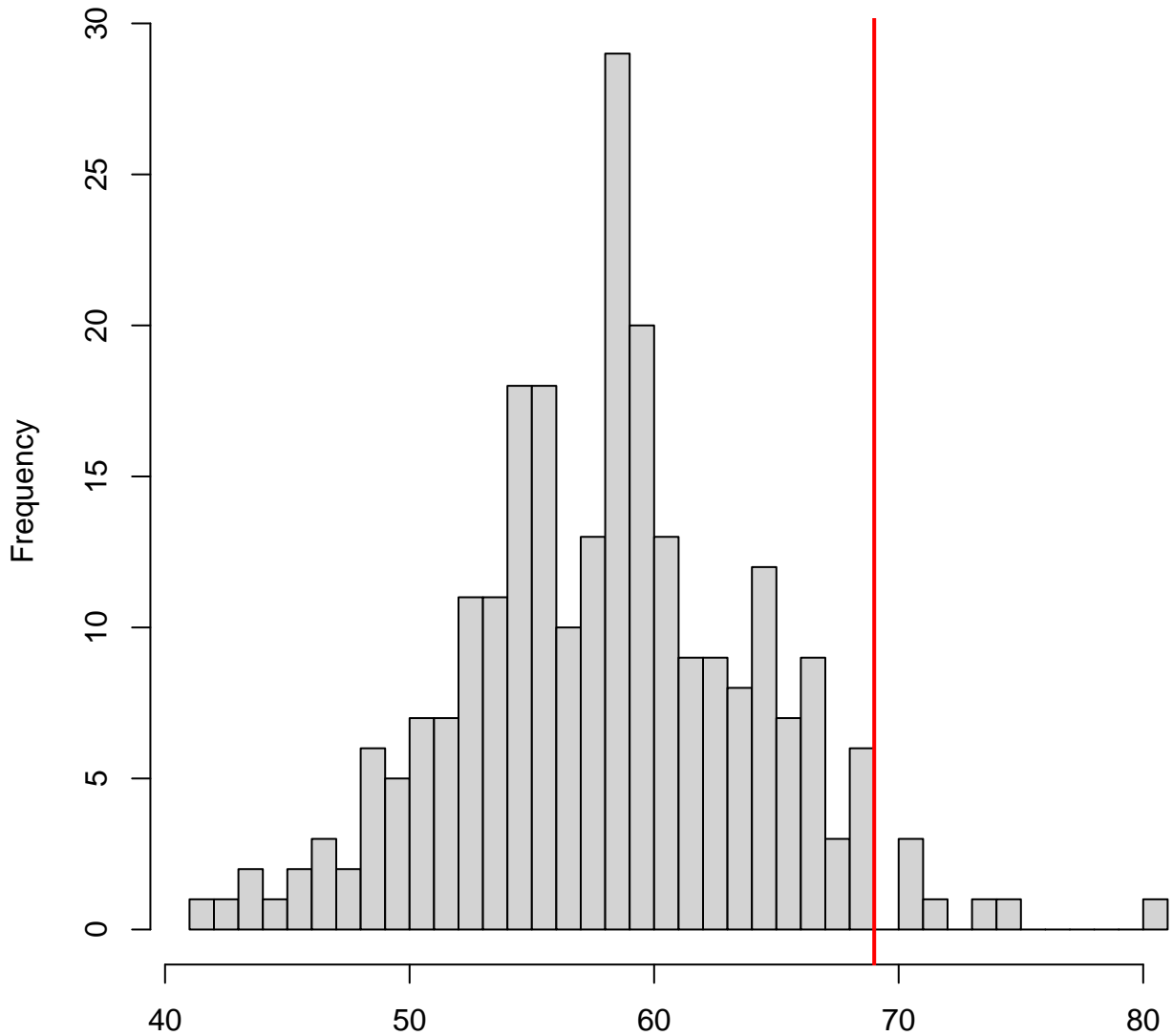
Simulated values, red line = fitted model. p-value (two.sided) = 0.96

**DHARMA zero-inflation test via comparison to  
expected zeros with simulation under  $H_0$  = fitted  
model**



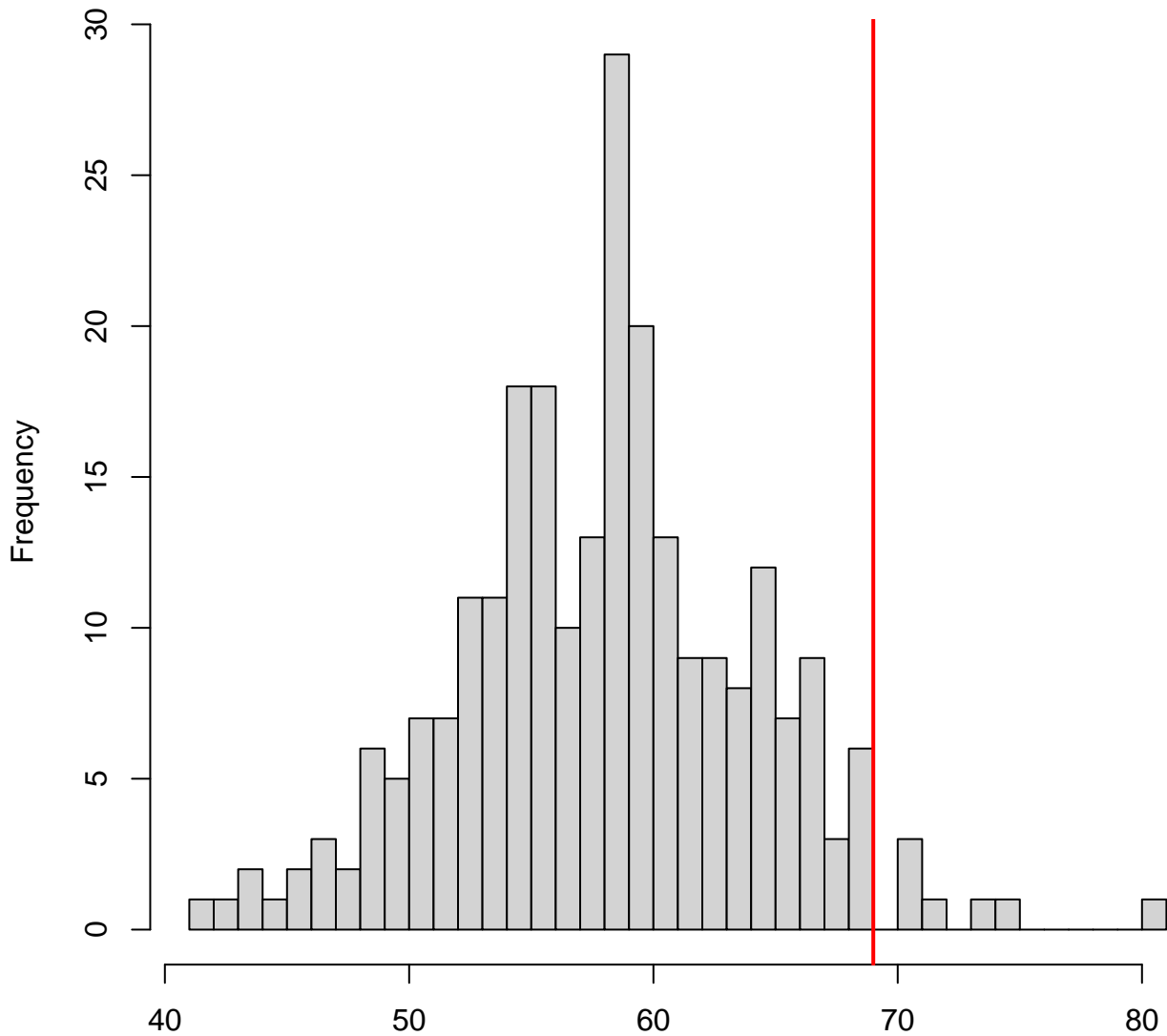
Simulated values, red line = fitted model. p-value (less) = 0.48

# DHARMa generic simulation test



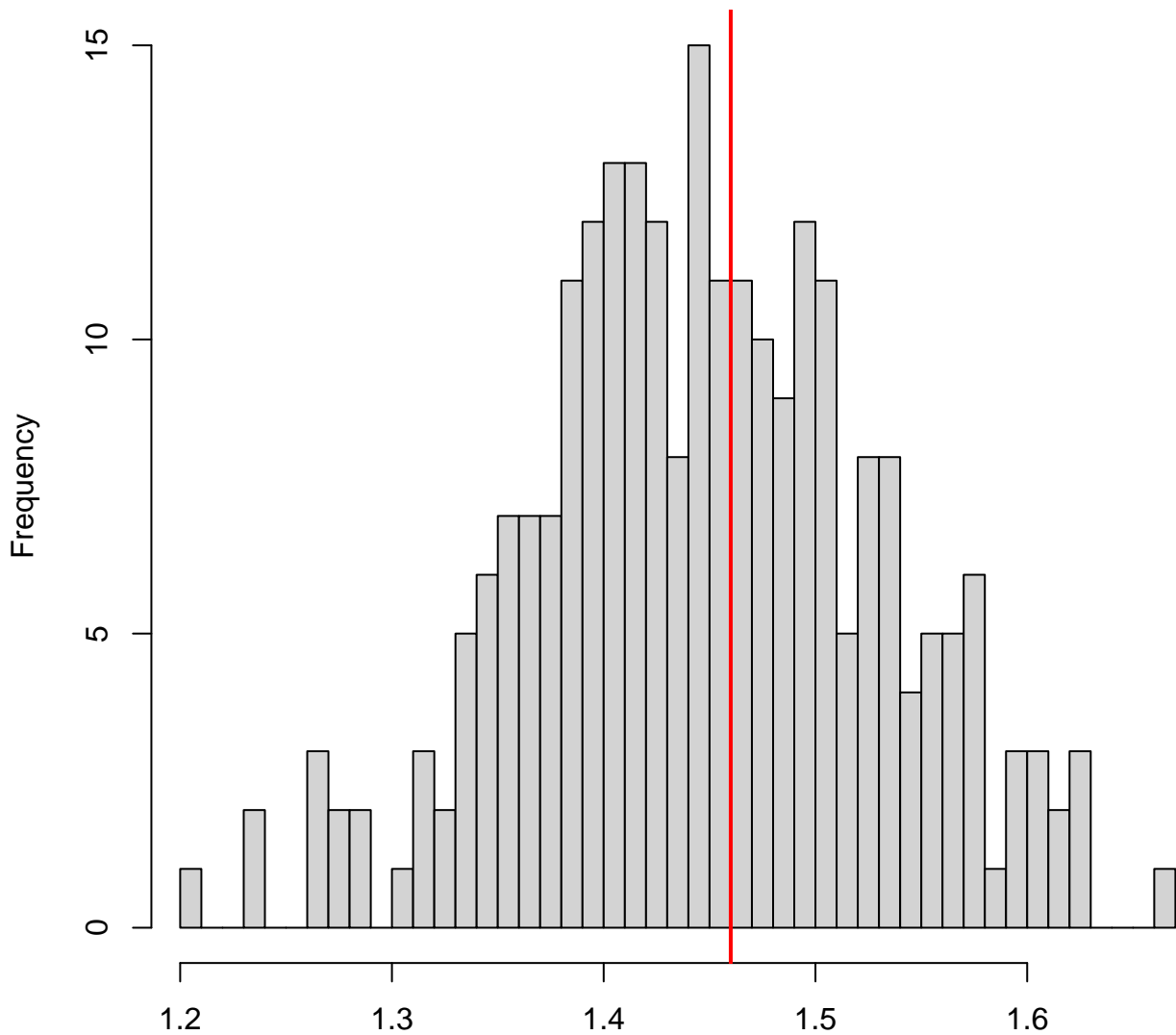
Simulated values, red line = fitted model. p-value (two.sided) = 0.104

# DHARMa generic simulation test



Simulated values, red line = fitted model. p-value (less) = 0.972

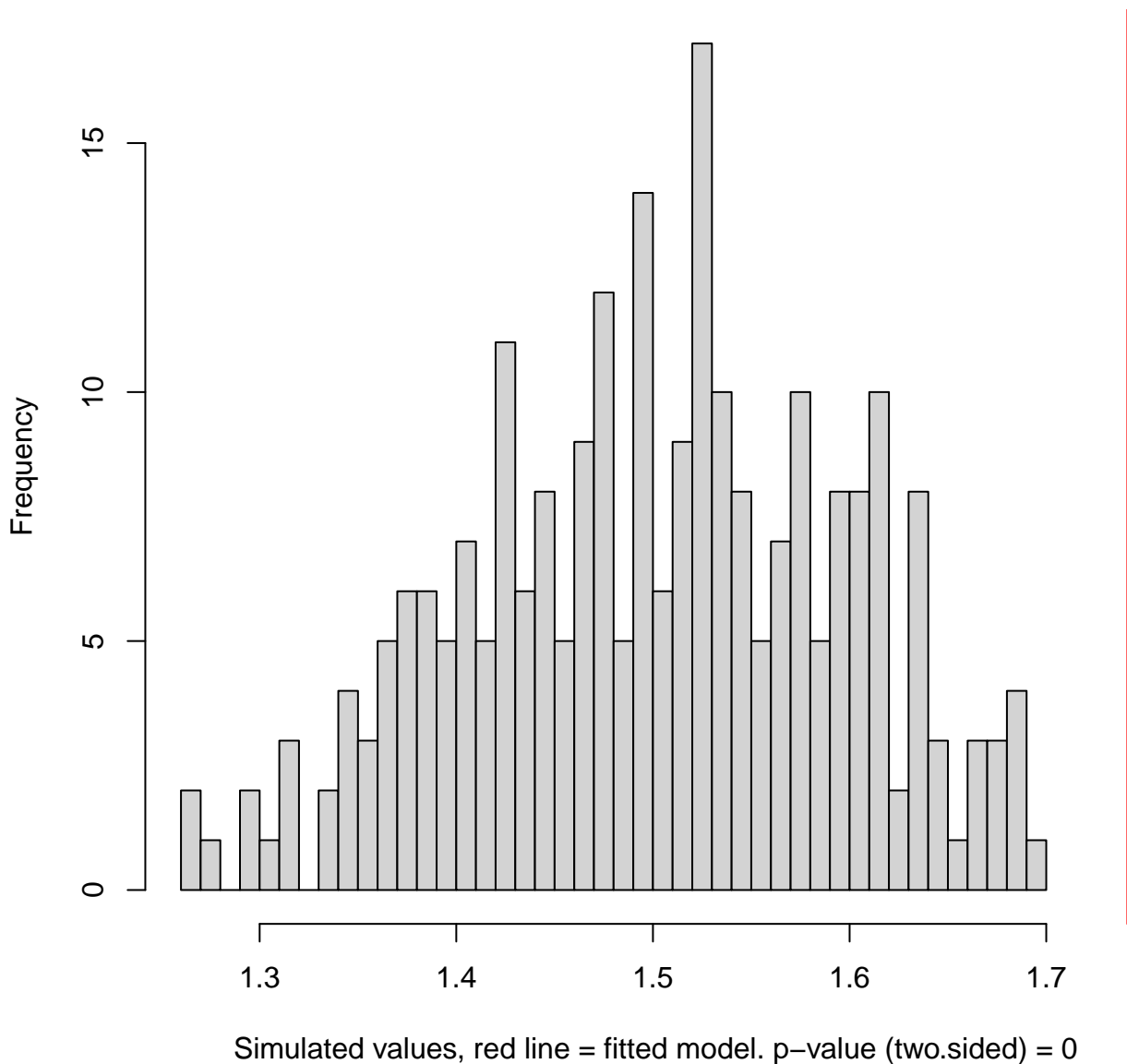
# DHARMa generic simulation test



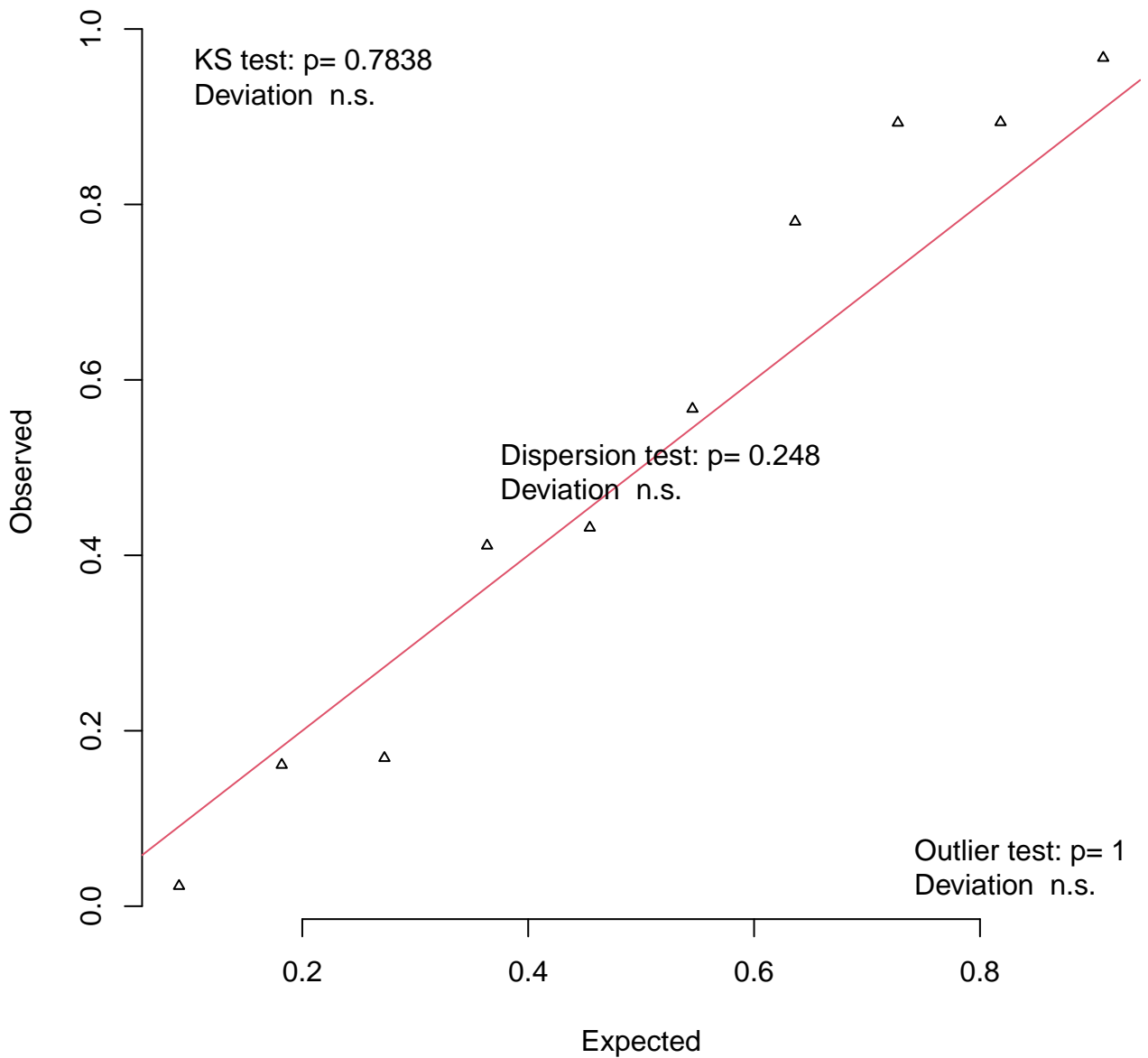
Simulated values, red line = fitted model. p-value (two.sided) = 0.92



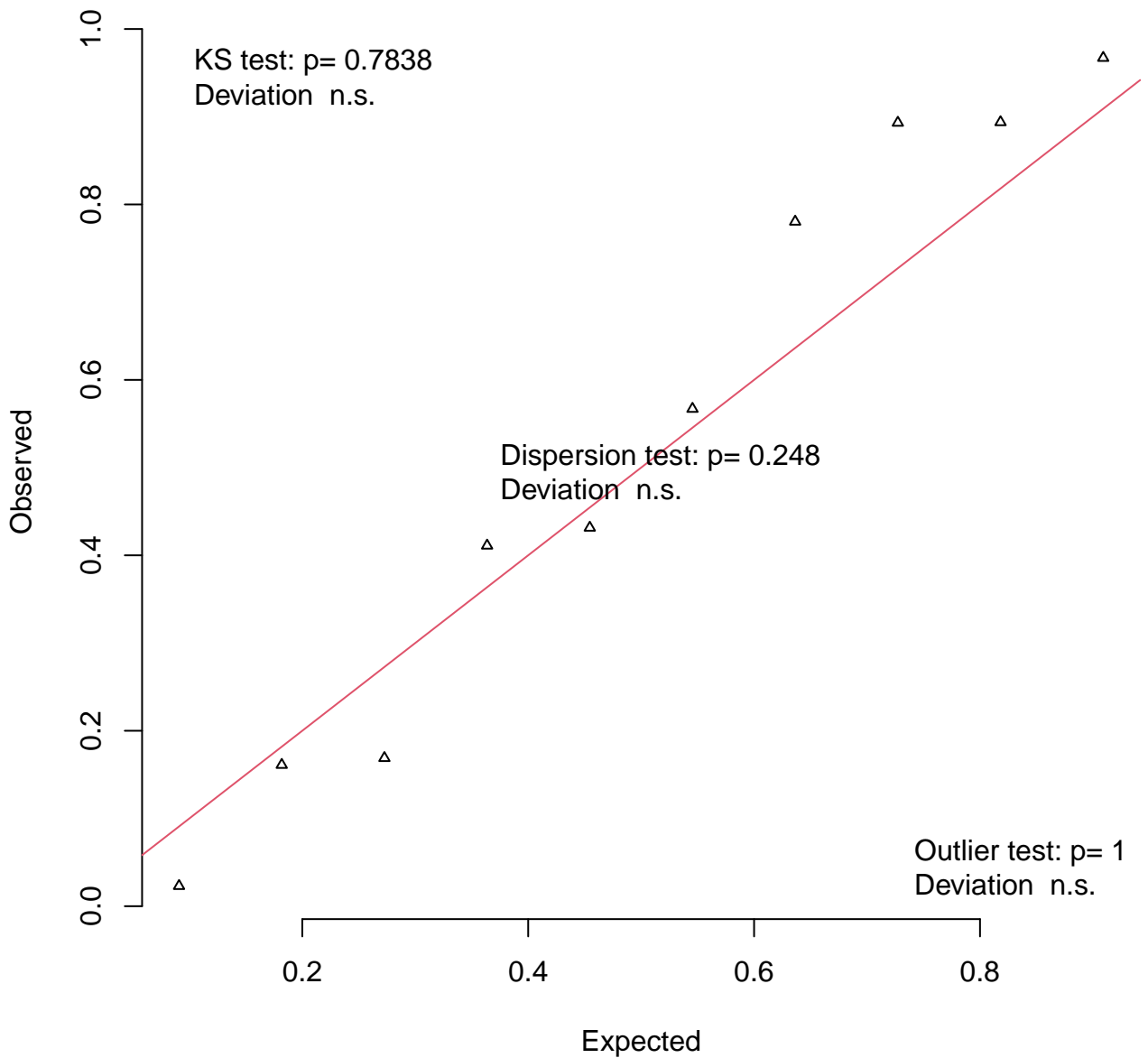
# DHARMa generic simulation test



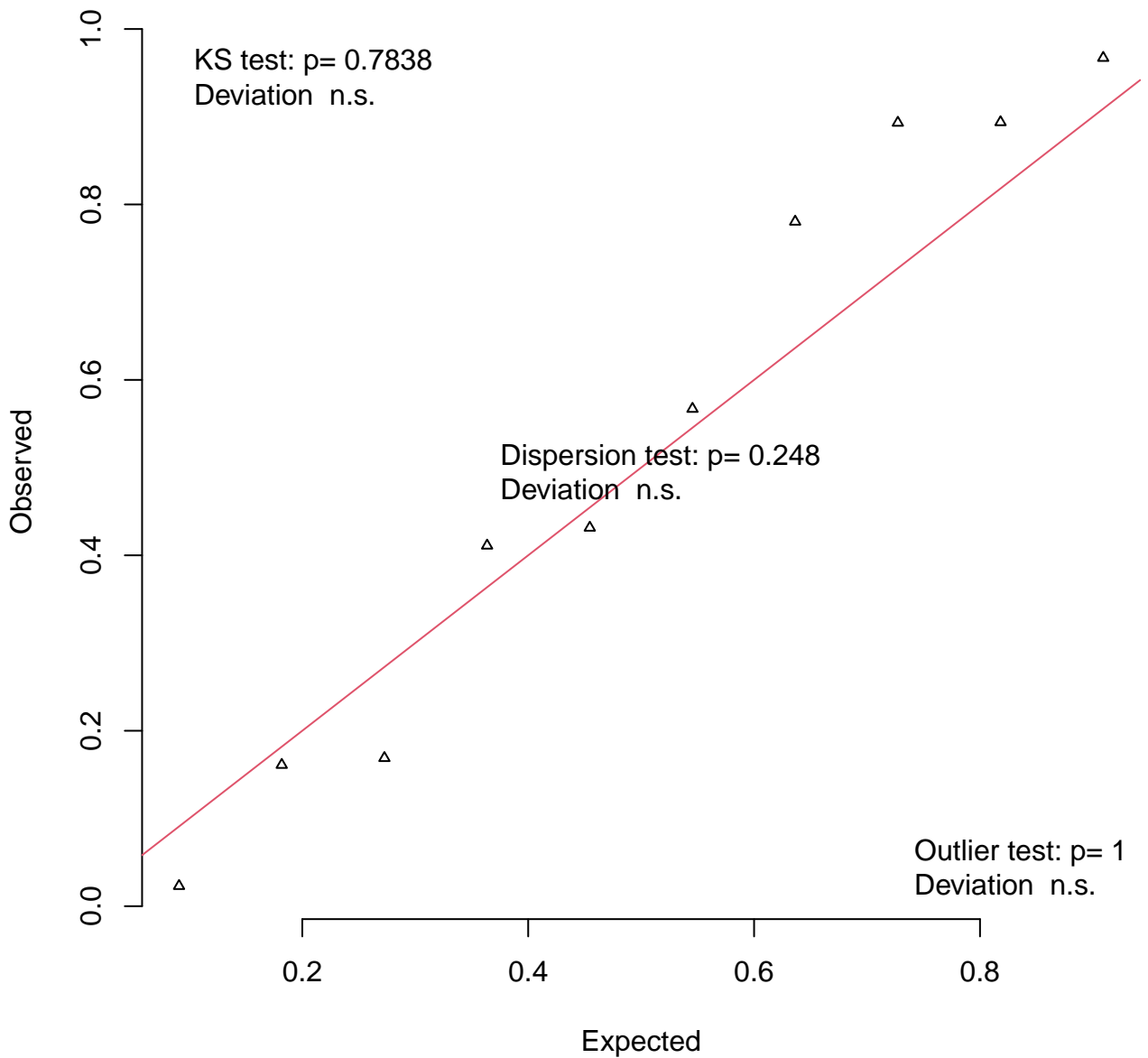
# QQ plot residuals



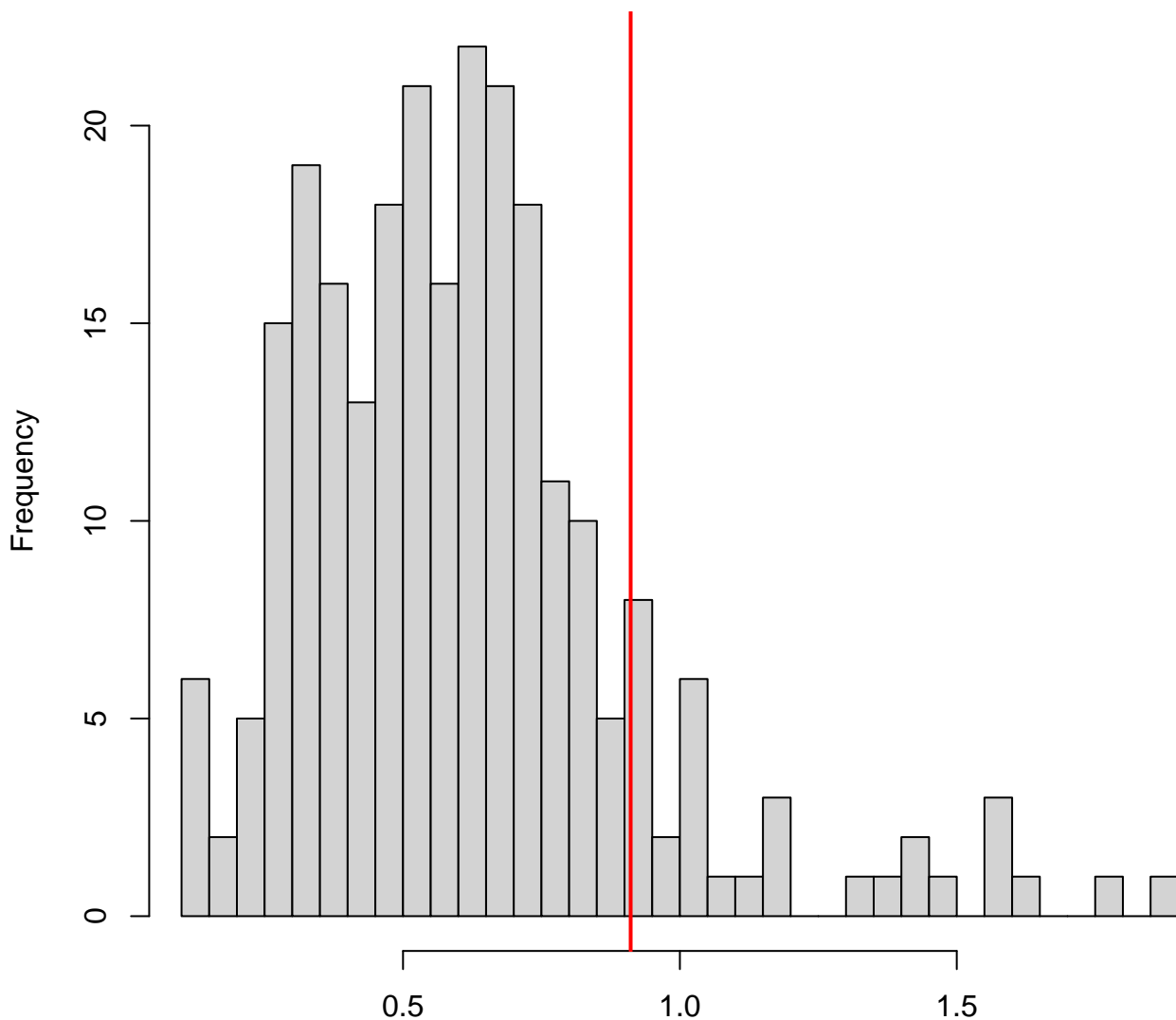
# QQ plot residuals



# QQ plot residuals

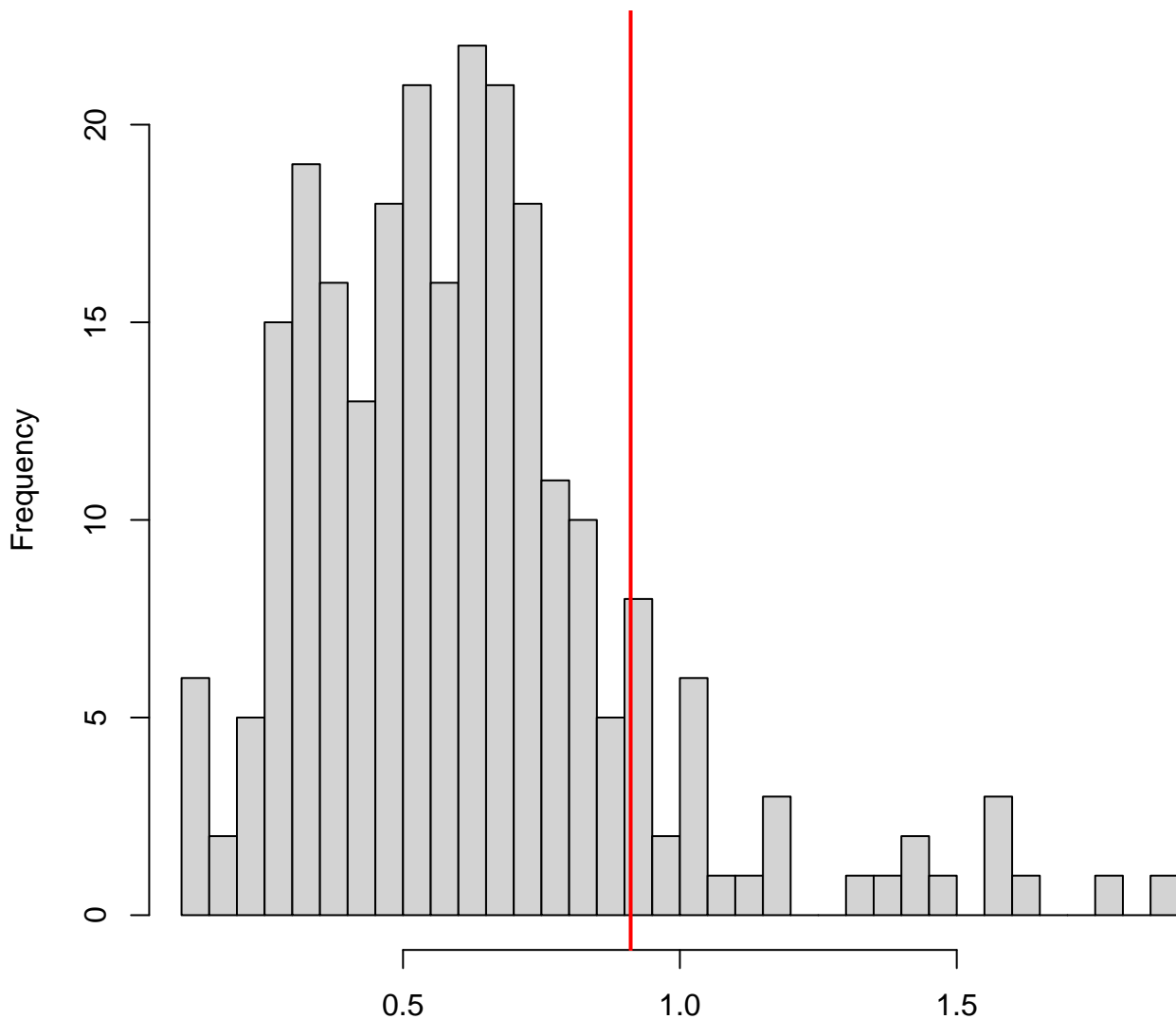


**DHARMA nonparametric dispersion test via sd of  
residuals fitted vs. simulated**



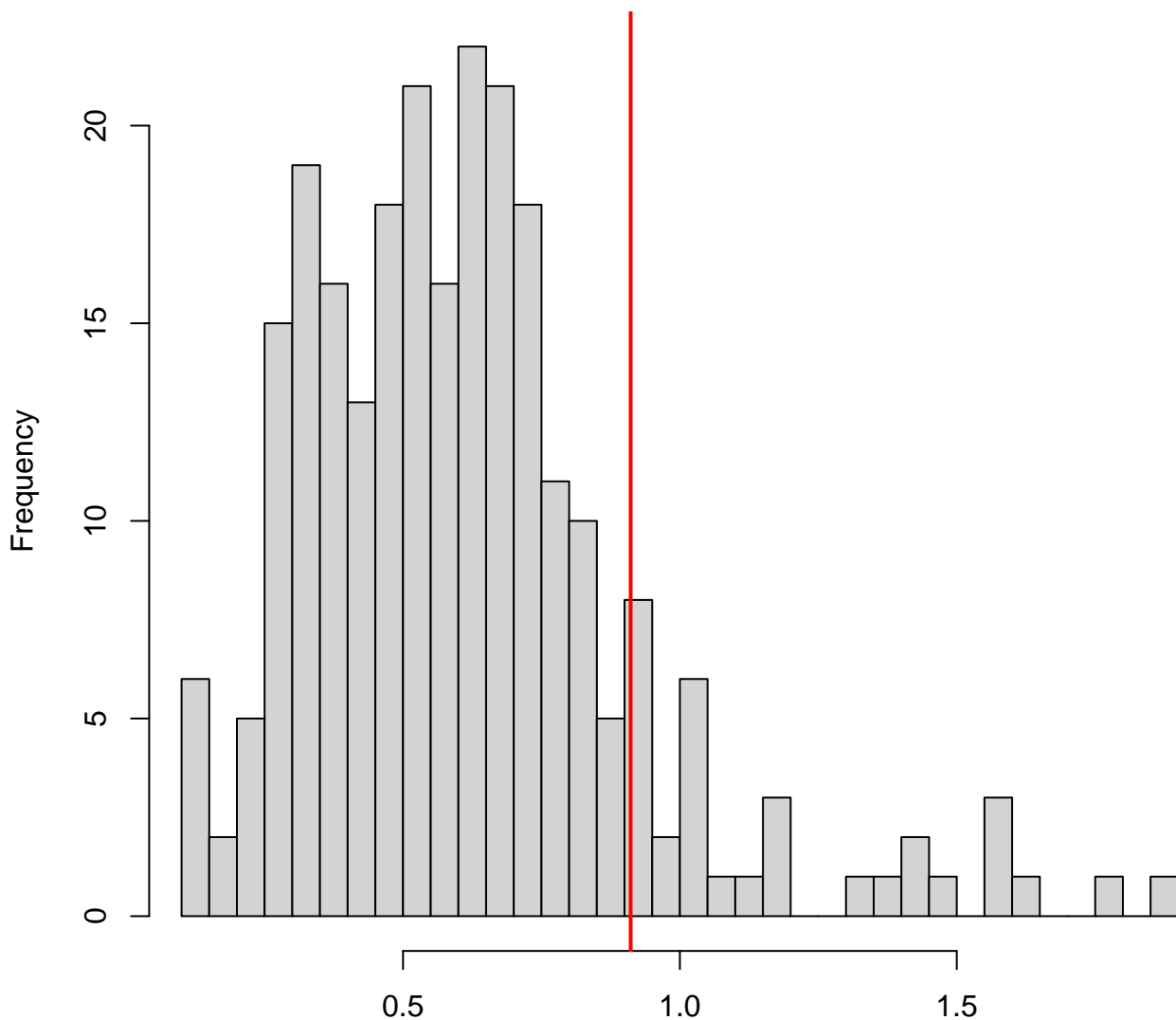
Simulated values, red line = fitted model. p-value (two.sided) = 0.248

**DHARMA nonparametric dispersion test via sd of  
residuals fitted vs. simulated**



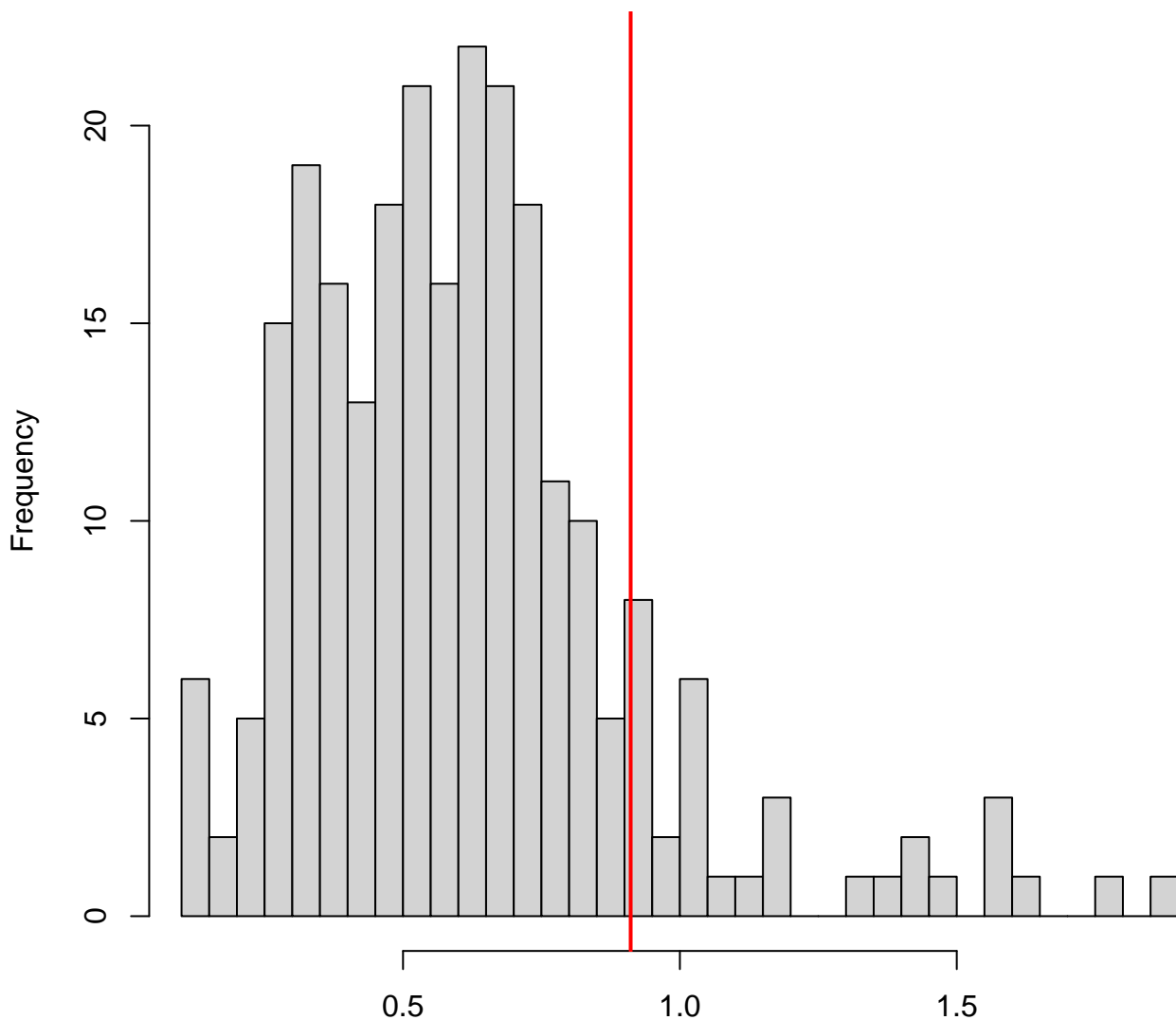
Simulated values, red line = fitted model. p-value (less) = 0.876

**DHARMA nonparametric dispersion test via sd of  
residuals fitted vs. simulated**



Simulated values, red line = fitted model. p-value (greater) = 0.124

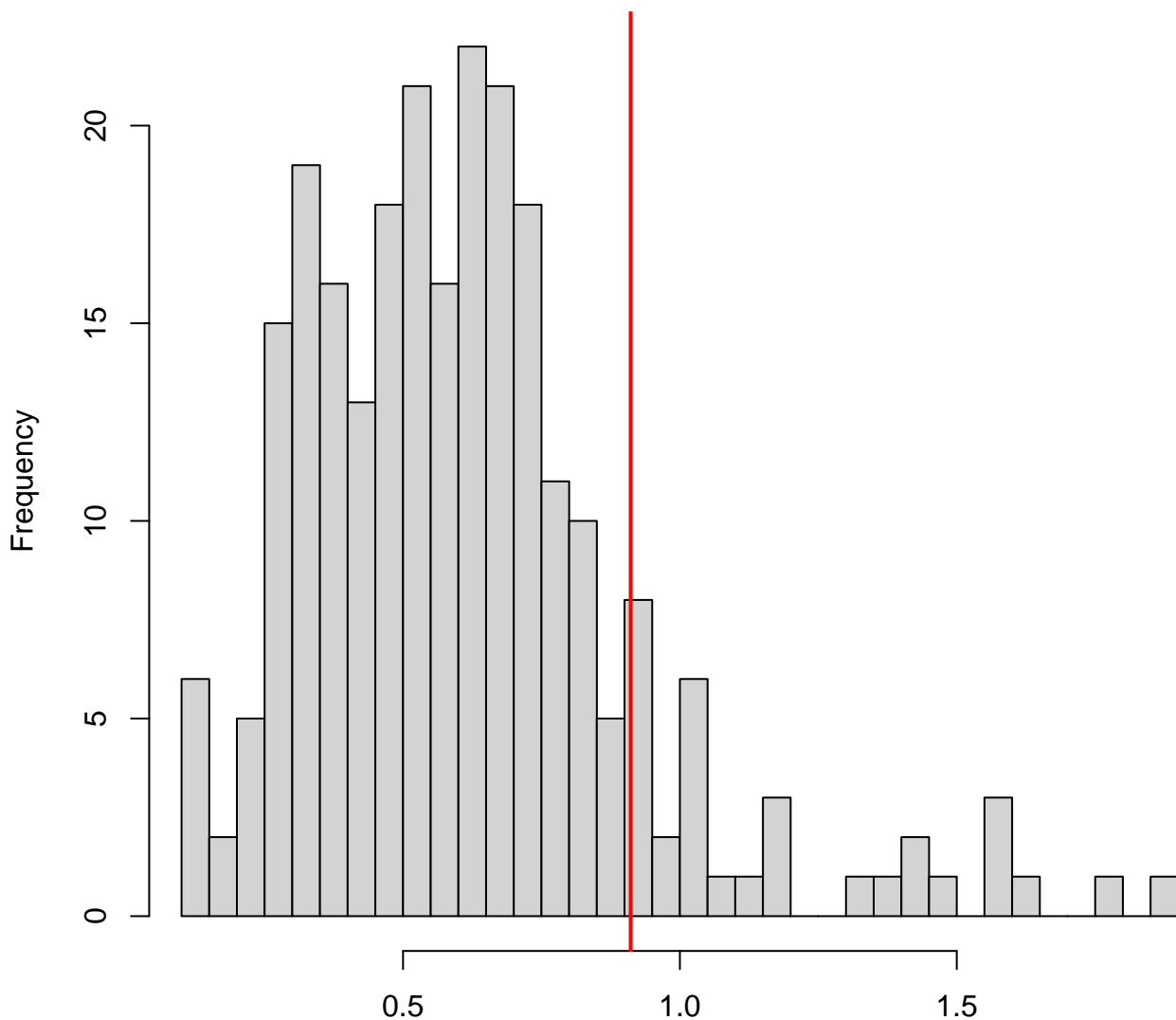
**DHARMA nonparametric dispersion test via sd of  
residuals fitted vs. simulated**



Simulated values, red line = fitted model. p-value (two.sided) = 0.248

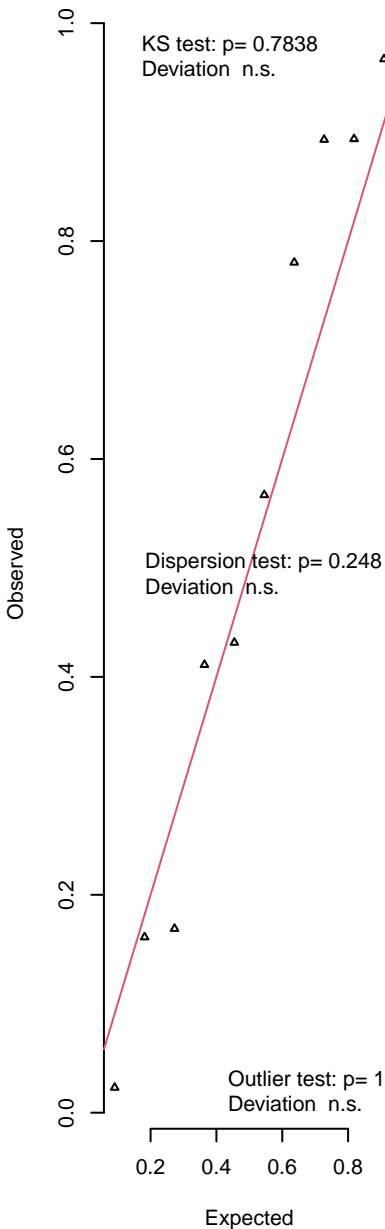


**DHARMA nonparametric dispersion test via sd of  
residuals fitted vs. simulated**

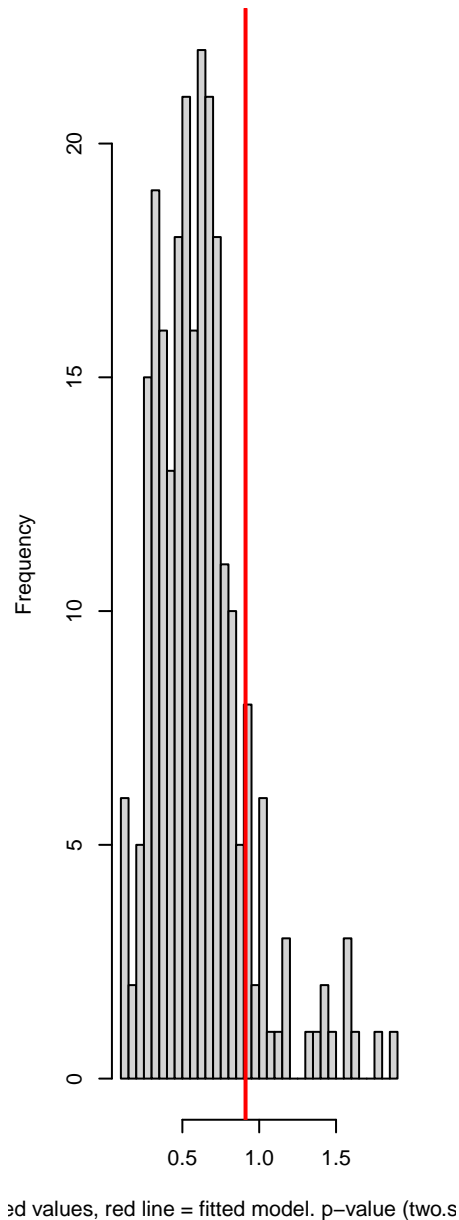


Simulated values, red line = fitted model. p-value (two.sided) = 0.248

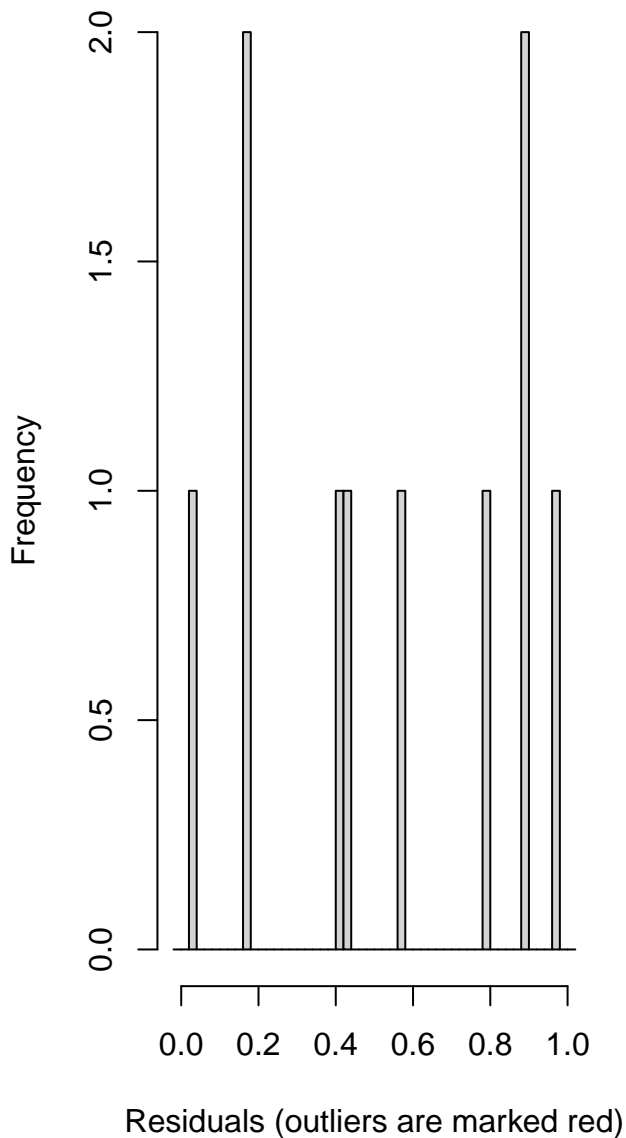
QQ plot residuals



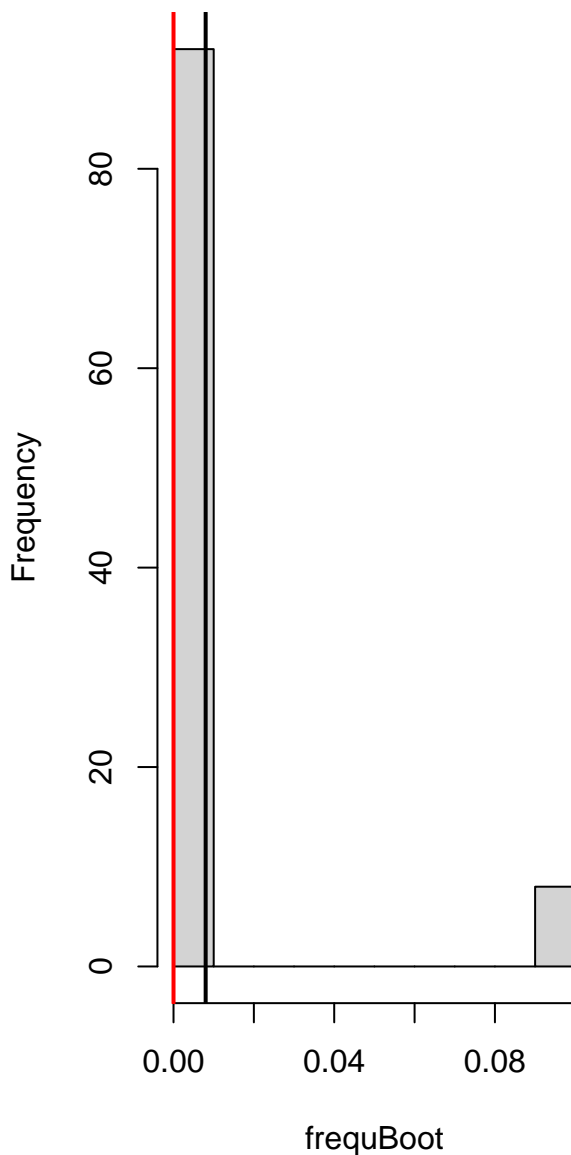
DHARMA nonparametric dispersion test via sd of residuals fitted vs. simulated



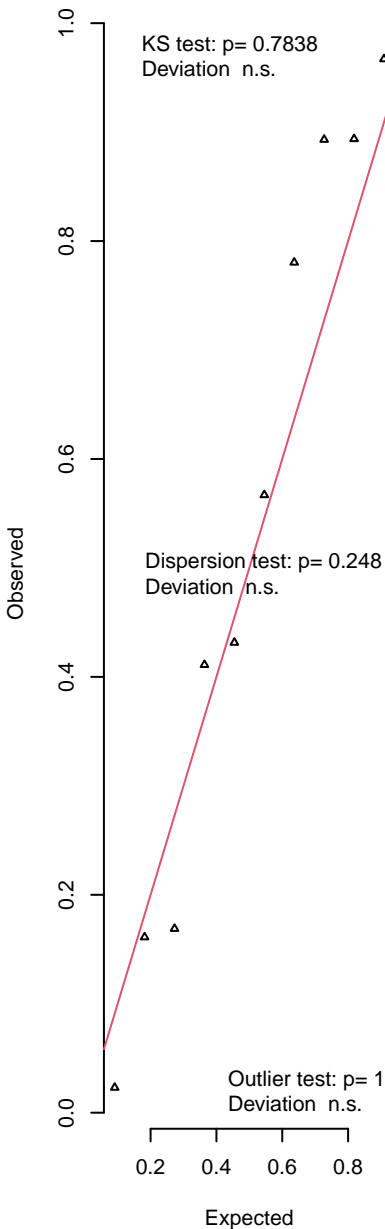
Outlier test n.s.



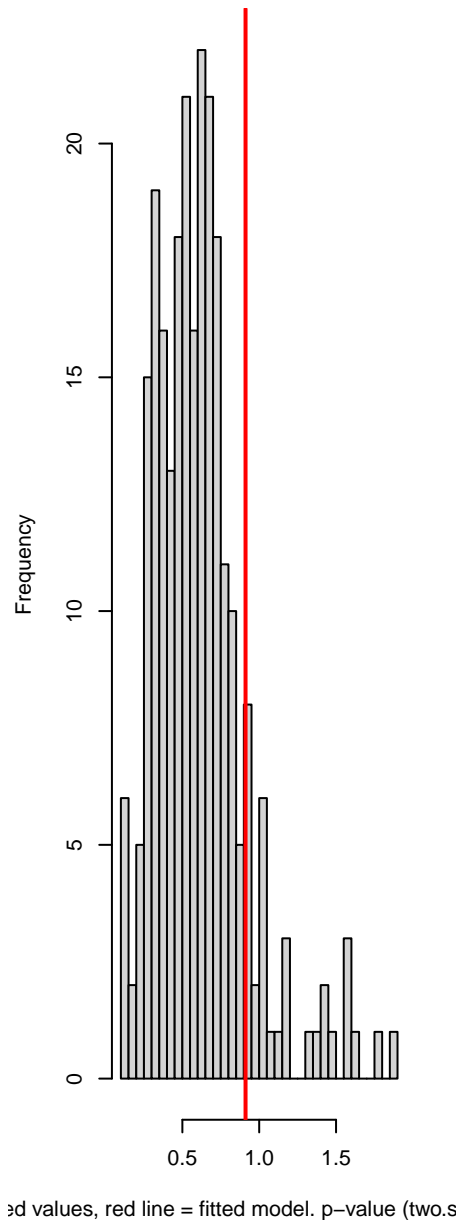
Histogram of frequBoot



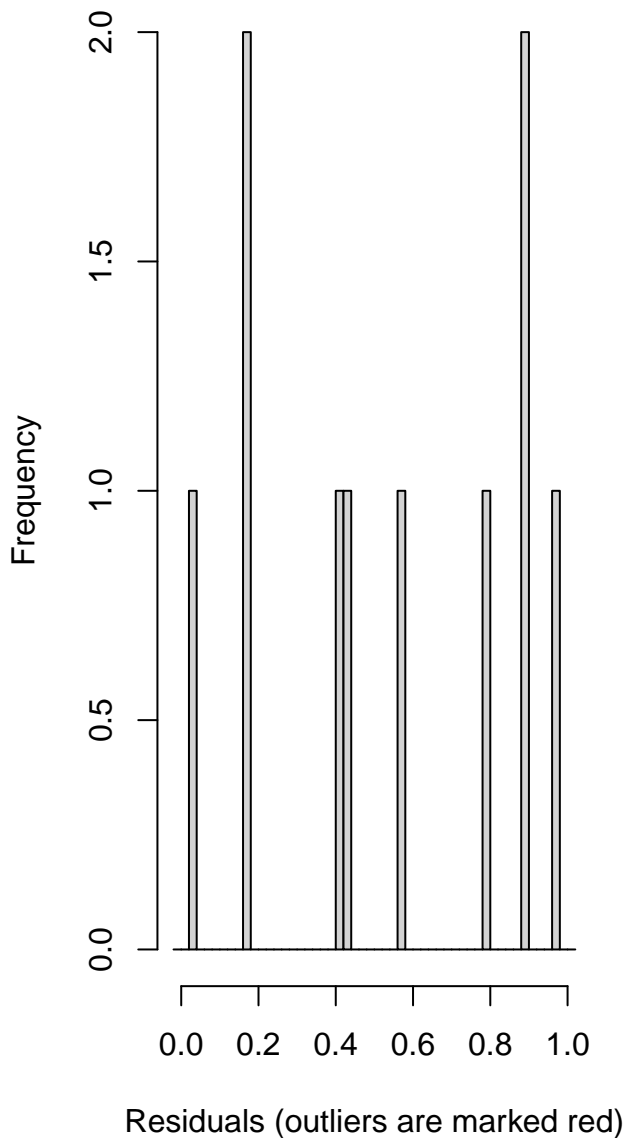
QQ plot residuals



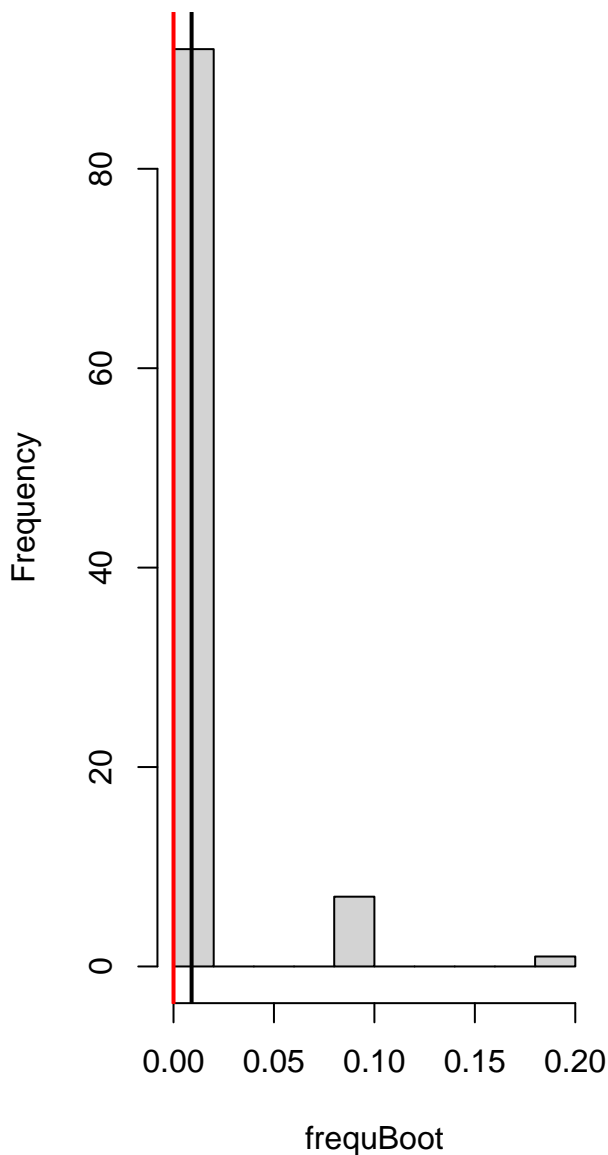
DHARMA nonparametric dispersion test via sd of residuals fitted vs. simulated



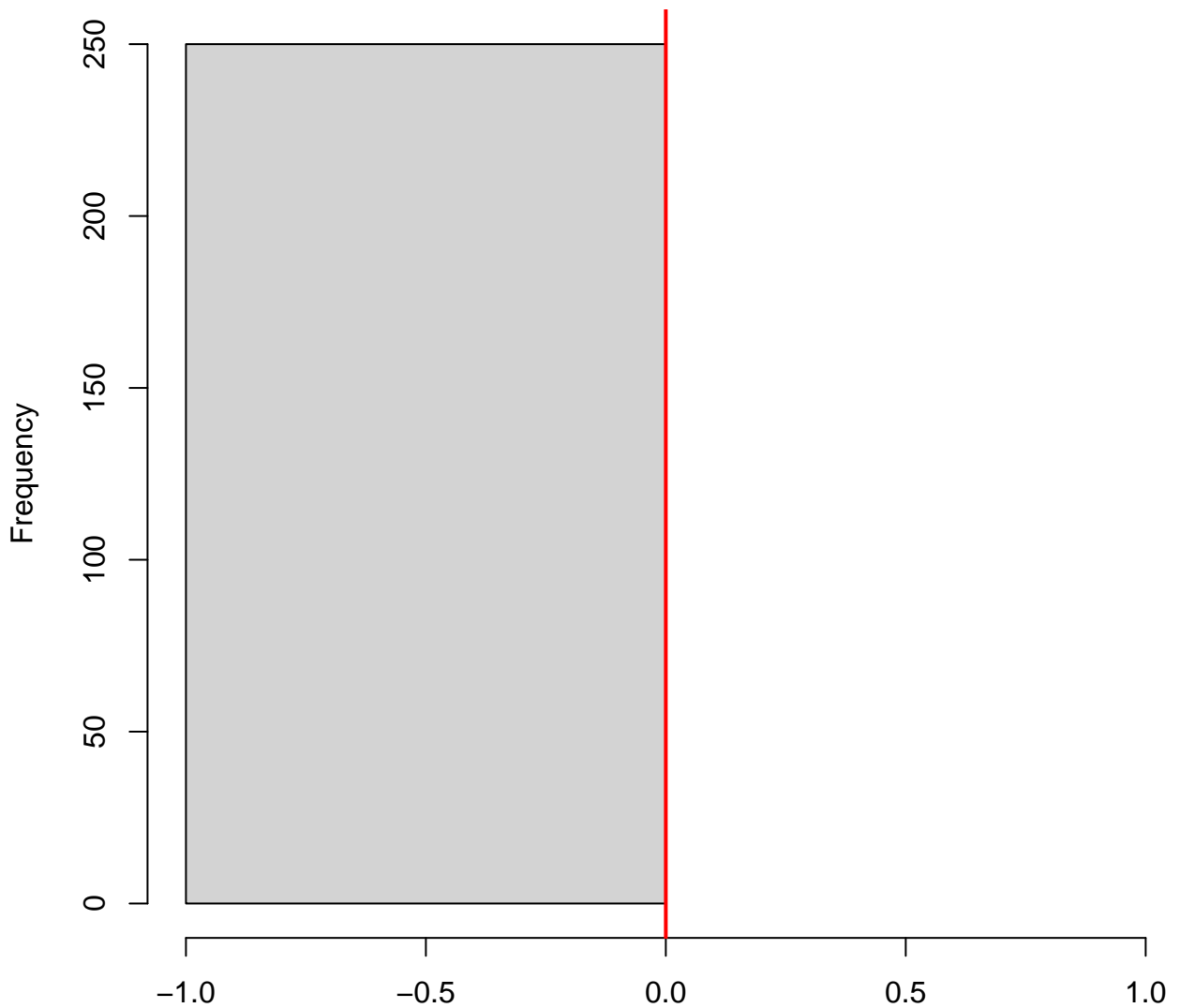
Outlier test n.s.



Histogram of frequBoot

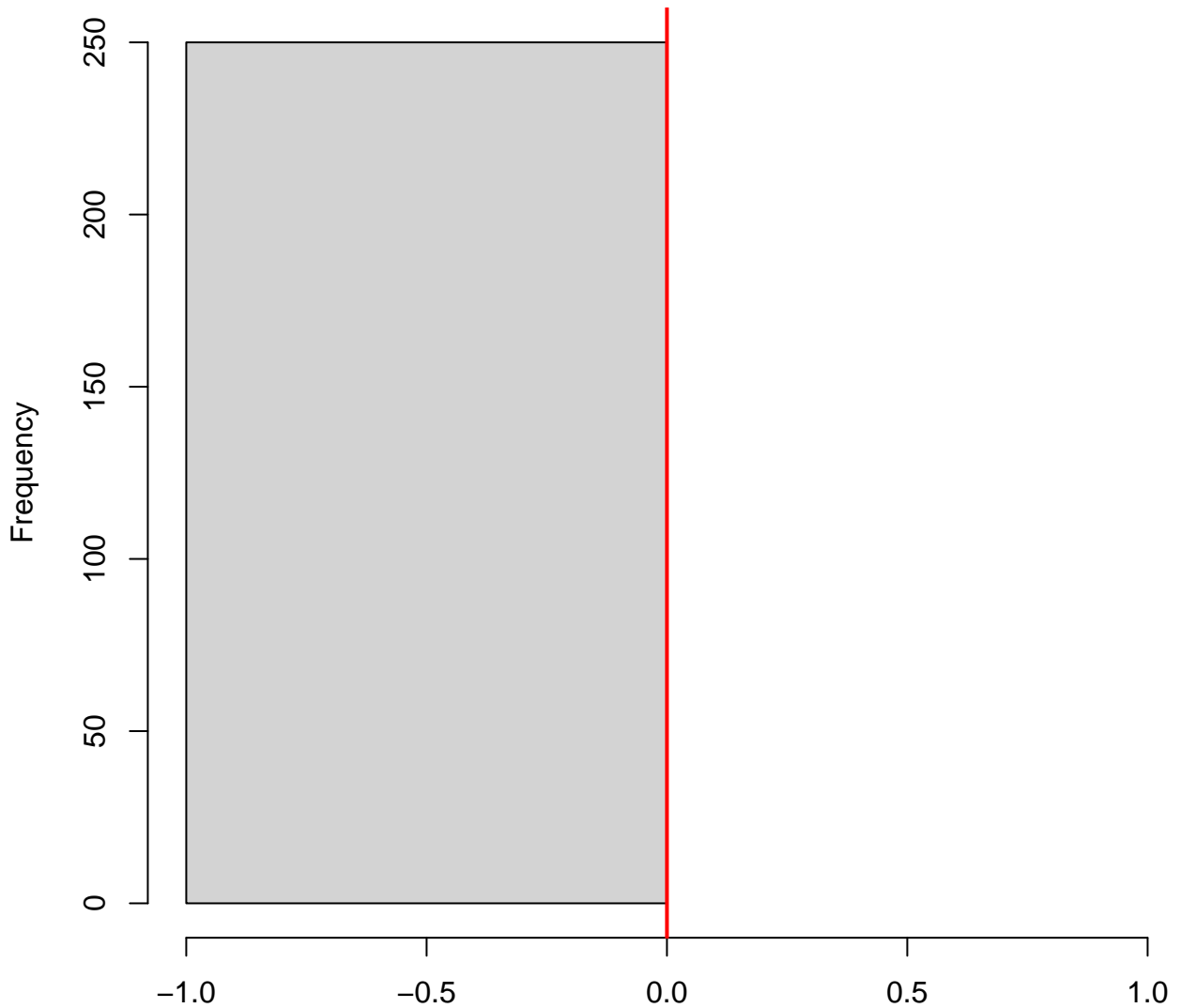


**DHARMa zero-inflation test via comparison to  
expected zeros with simulation under  $H_0$  = fitted  
model**



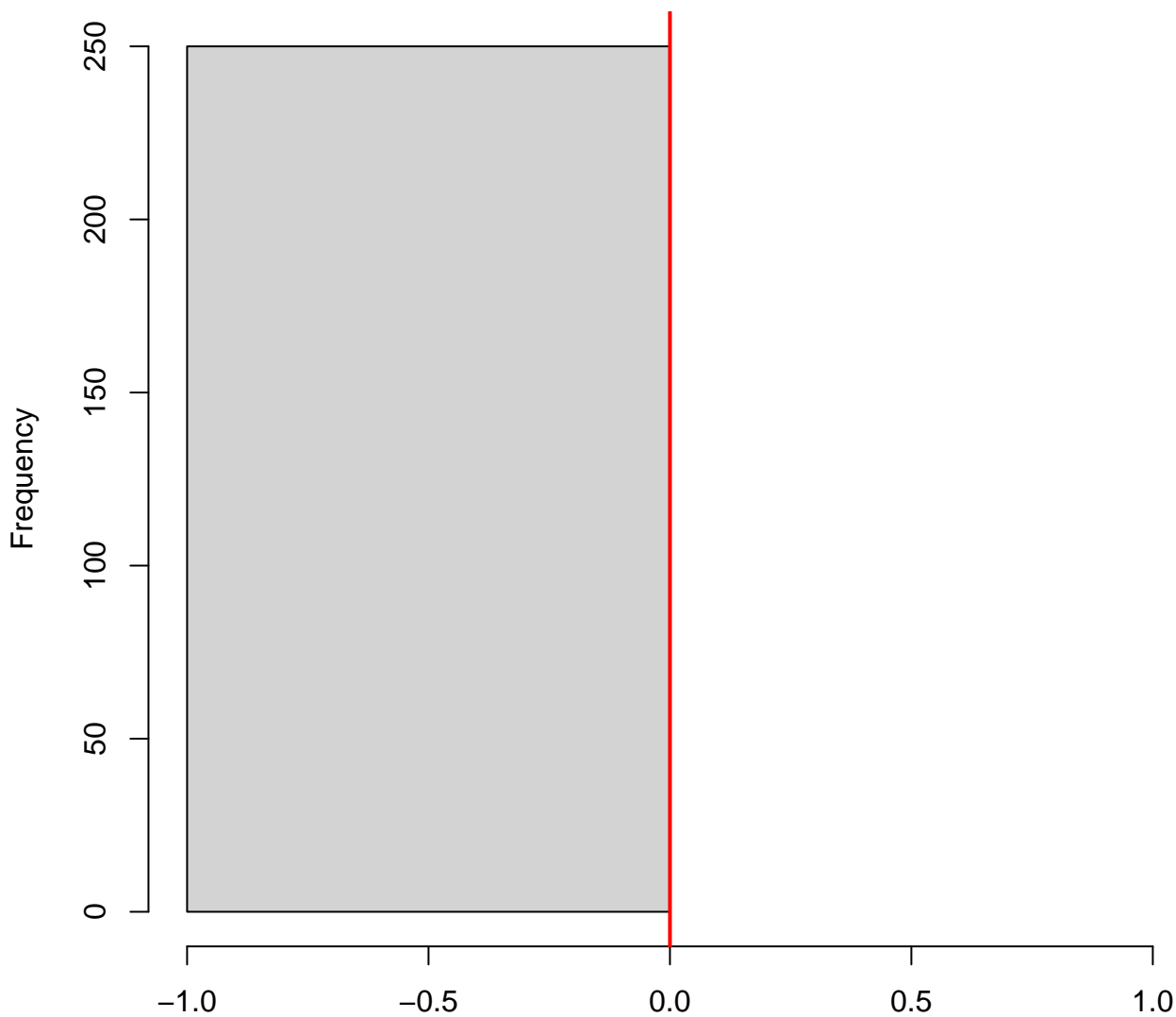
Simulated values, red line = fitted model. p-value (two.sided) = 1

**DHARMa zero-inflation test via comparison to  
expected zeros with simulation under  $H_0$  = fitted  
model**



Simulated values, red line = fitted model. p-value (less) = 1

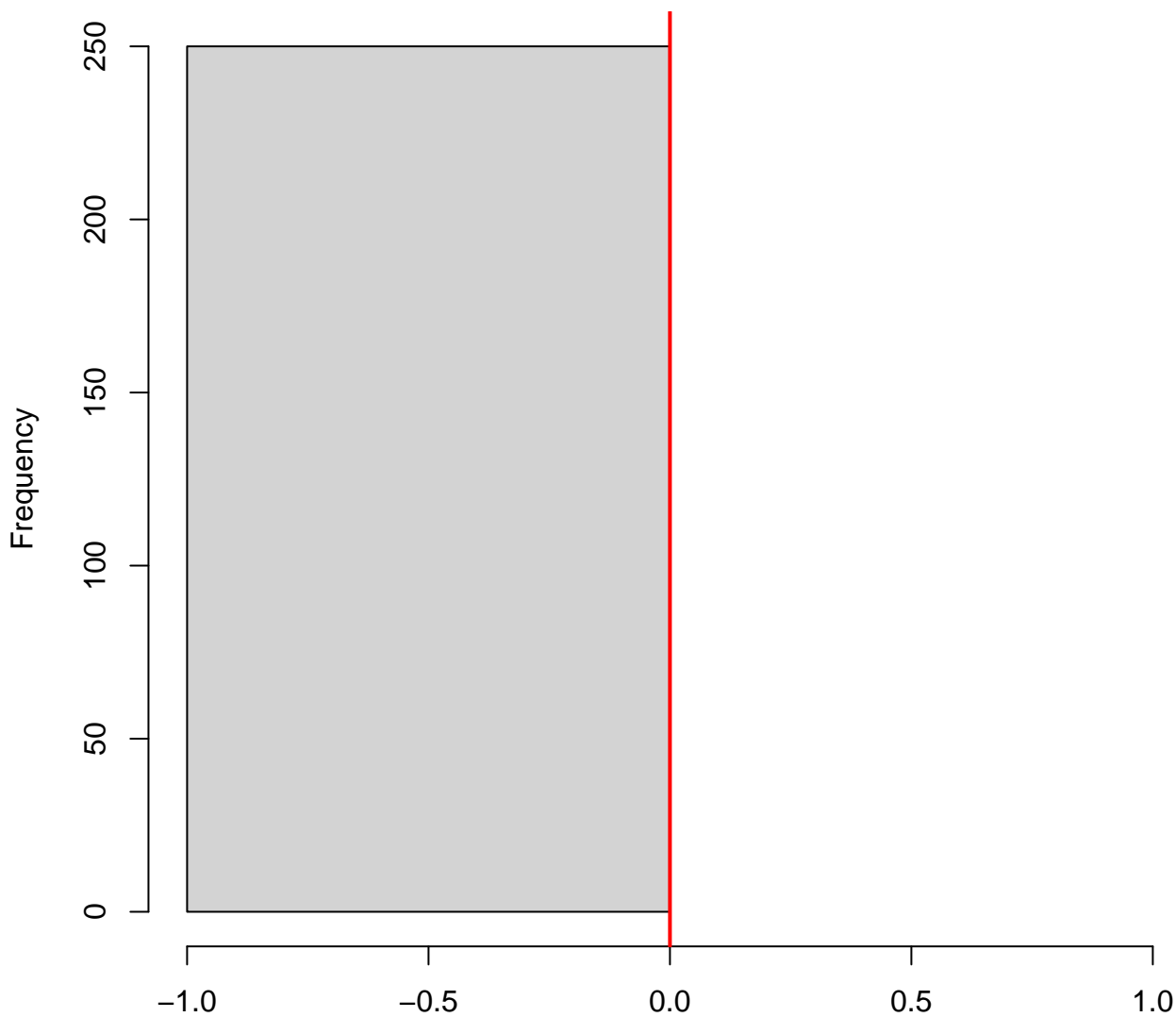
# DHARMa generic simulation test



Simulated values, red line = fitted model. p-value (two.sided) = 1

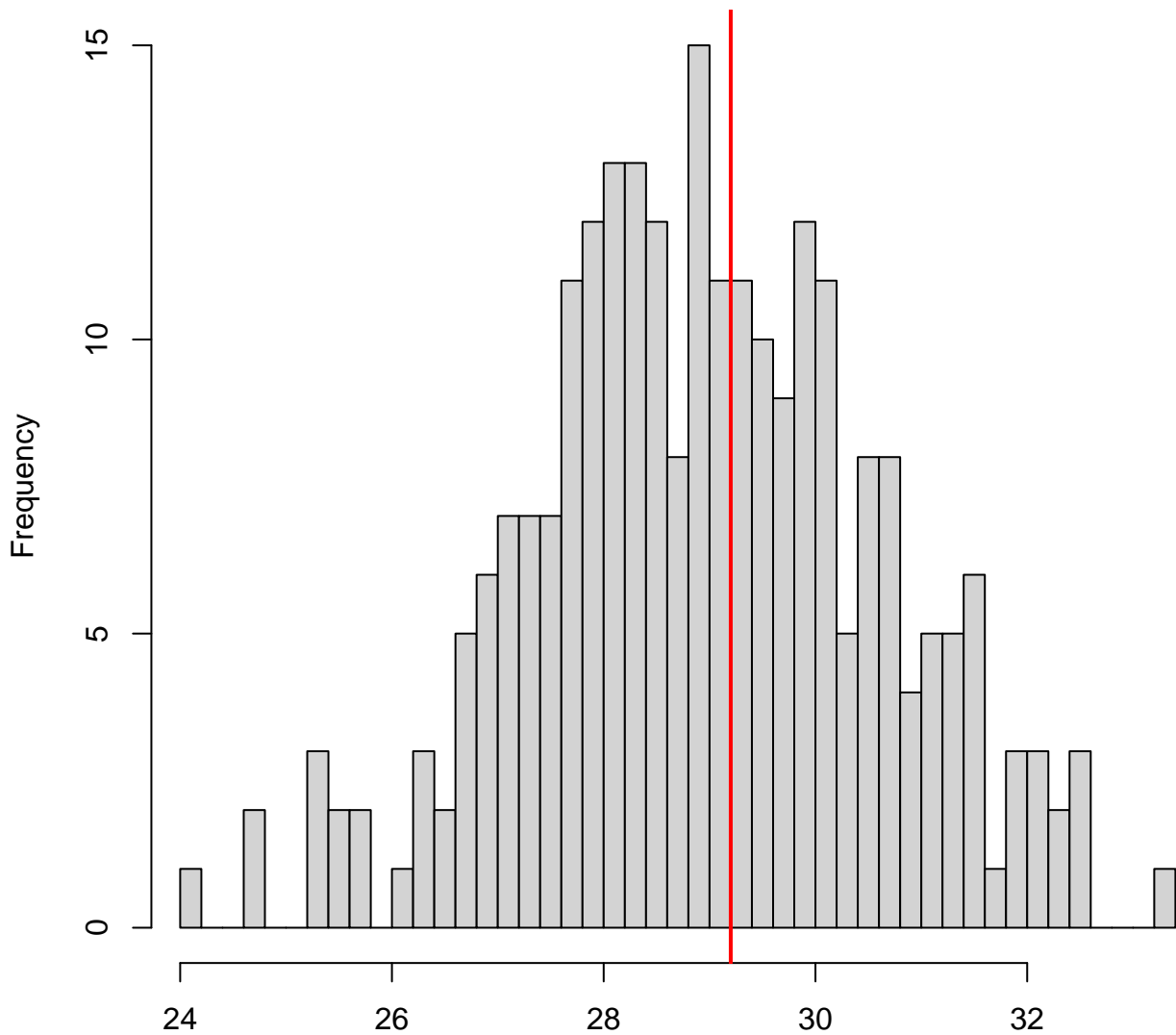


# DHARMa generic simulation test



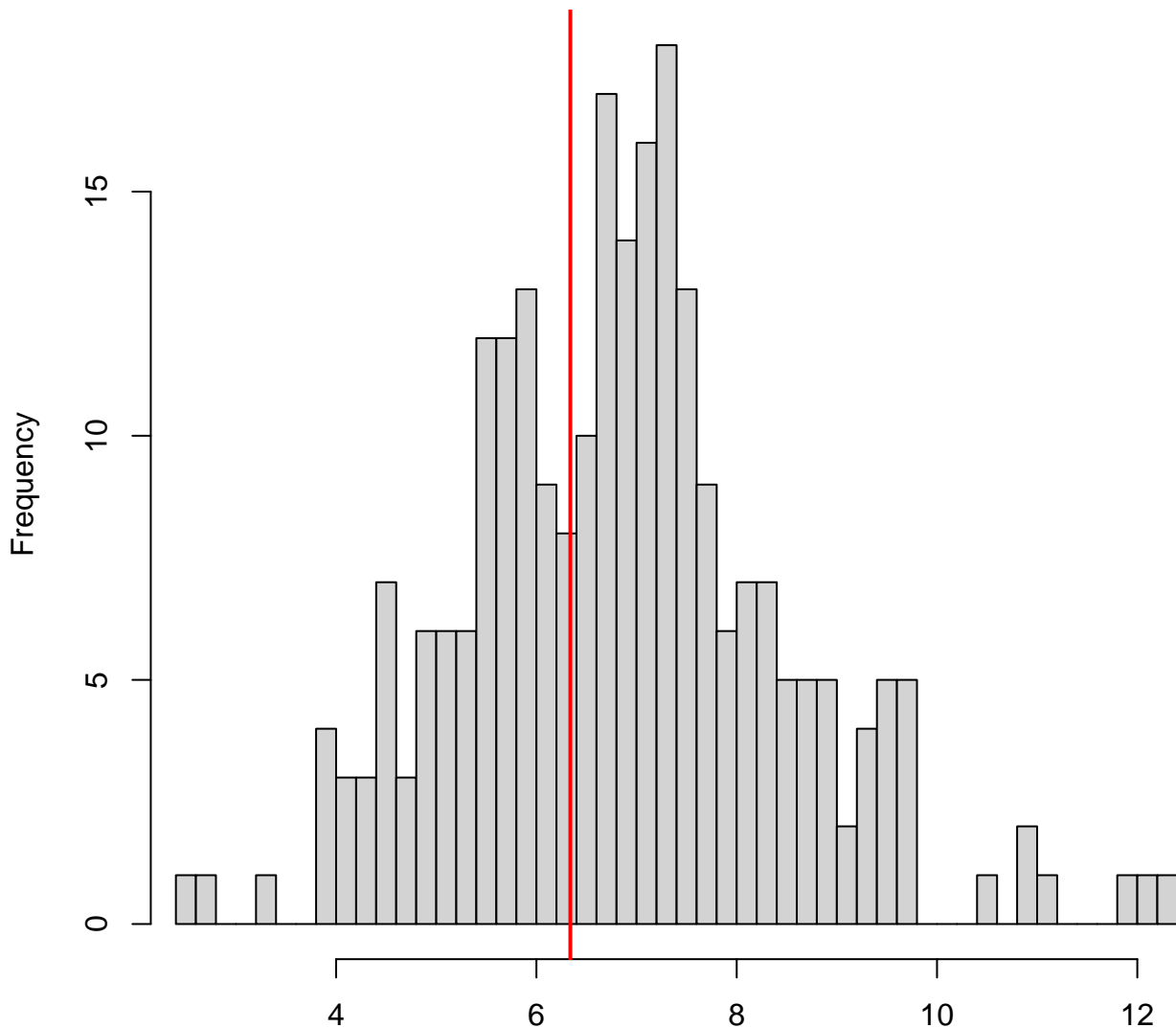
Simulated values, red line = fitted model. p-value (less) = 1

# DHARMa generic simulation test



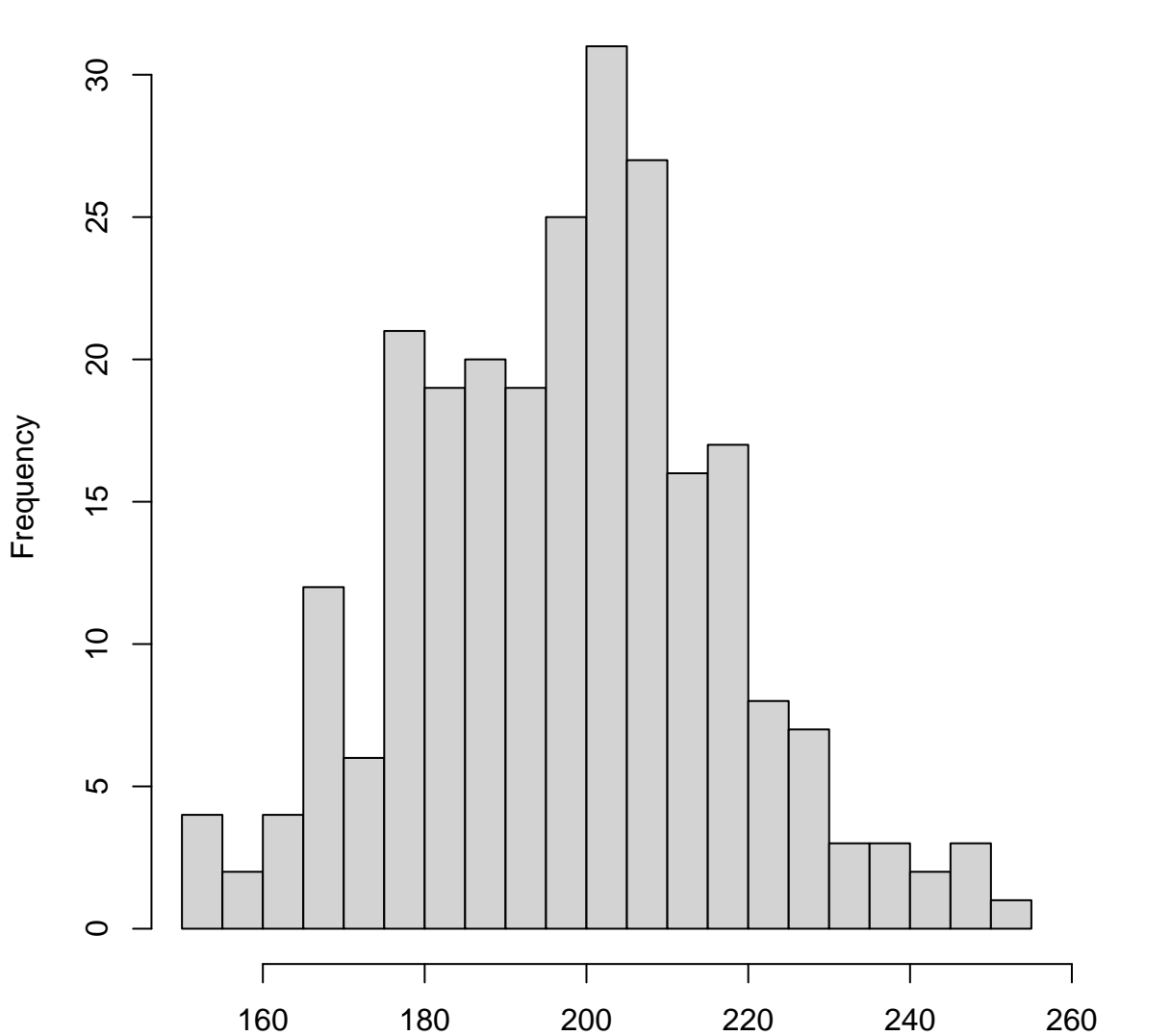
Simulated values, red line = fitted model. p-value (two.sided) = 0.92

# DHARMa generic simulation test



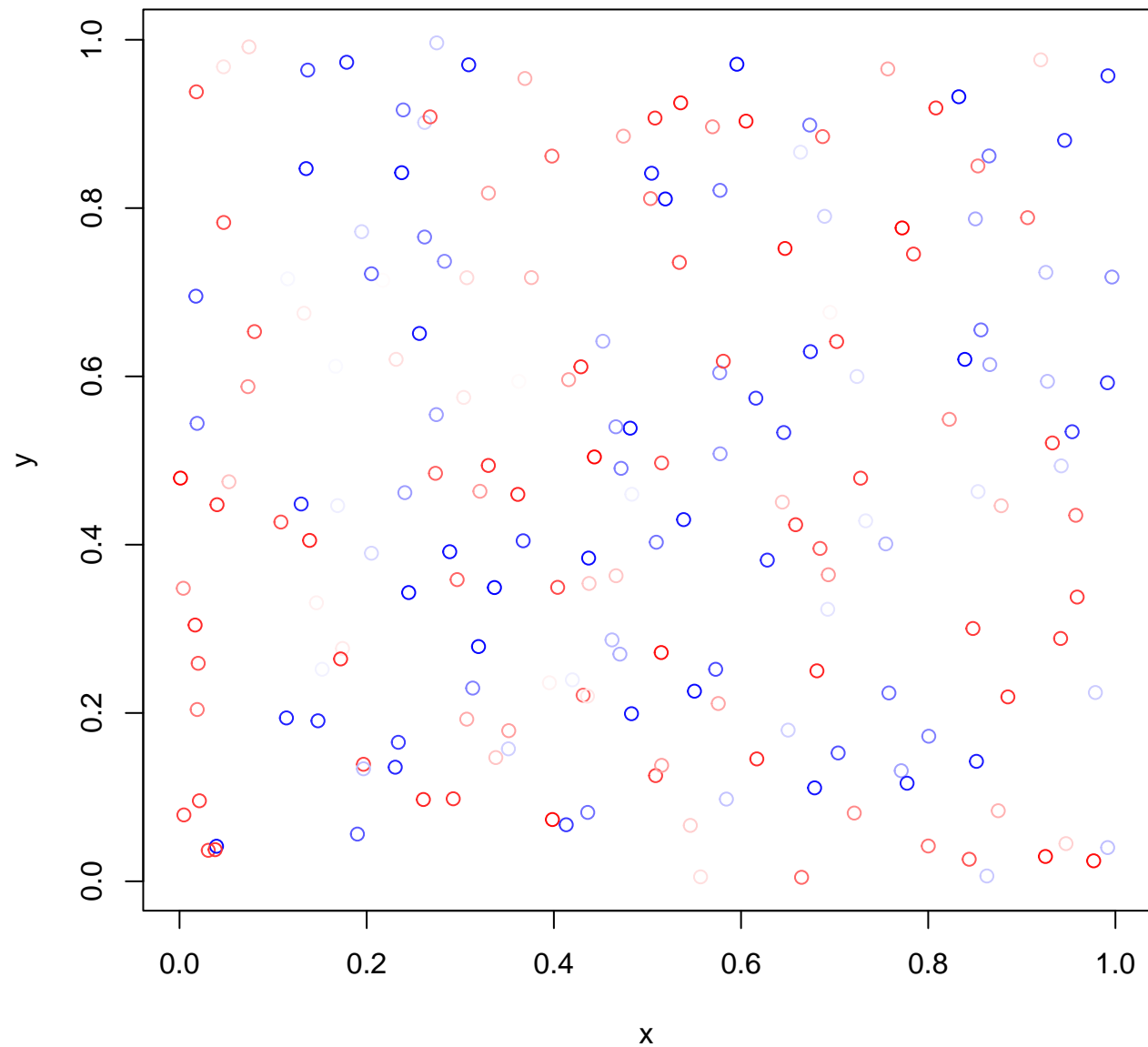
Simulated values, red line = fitted model. p-value (two.sided) = 0.752

**Dispersion test significant**

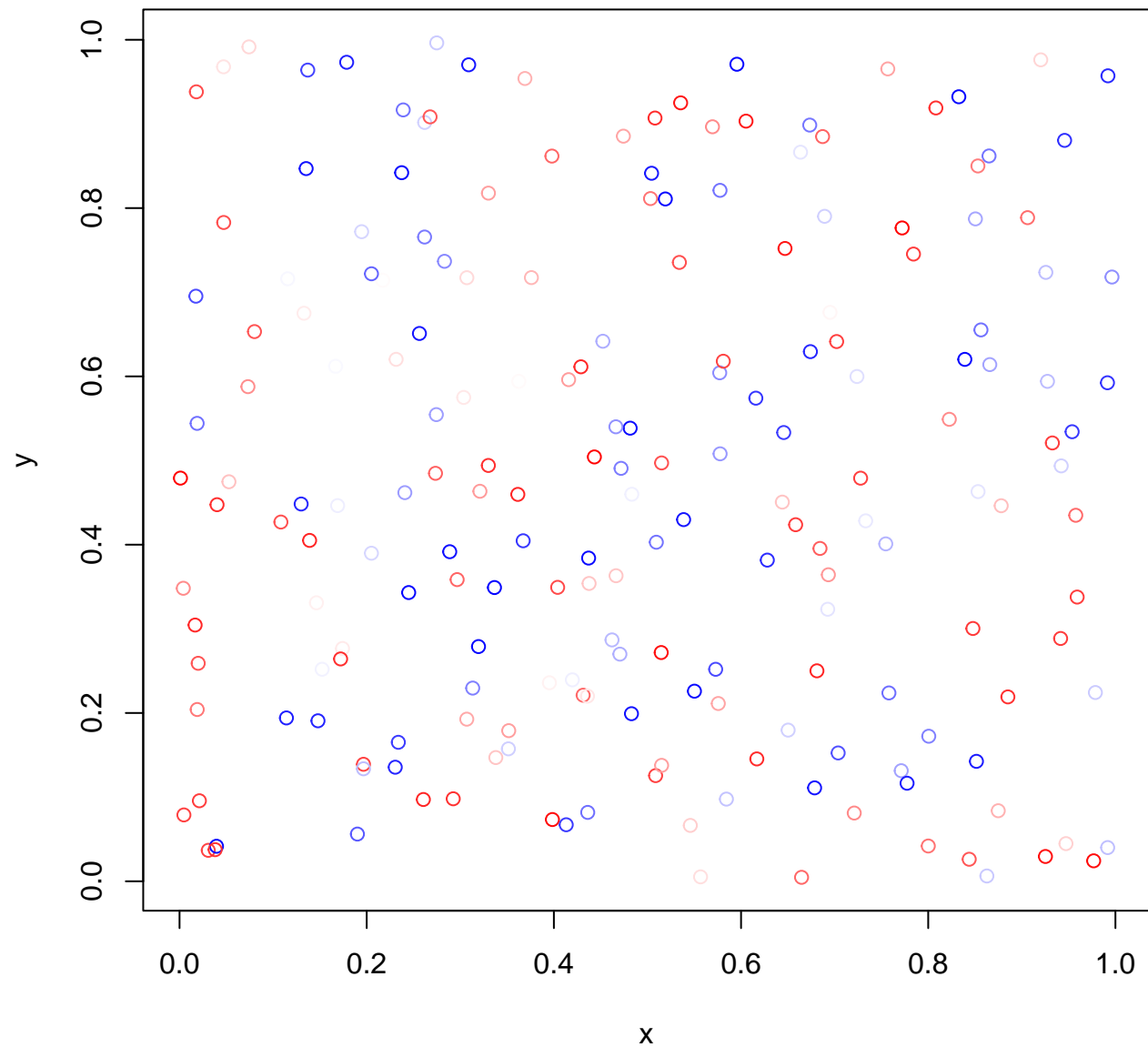


Simulated values, red line = fitted model. p-value (two.sided) = 0

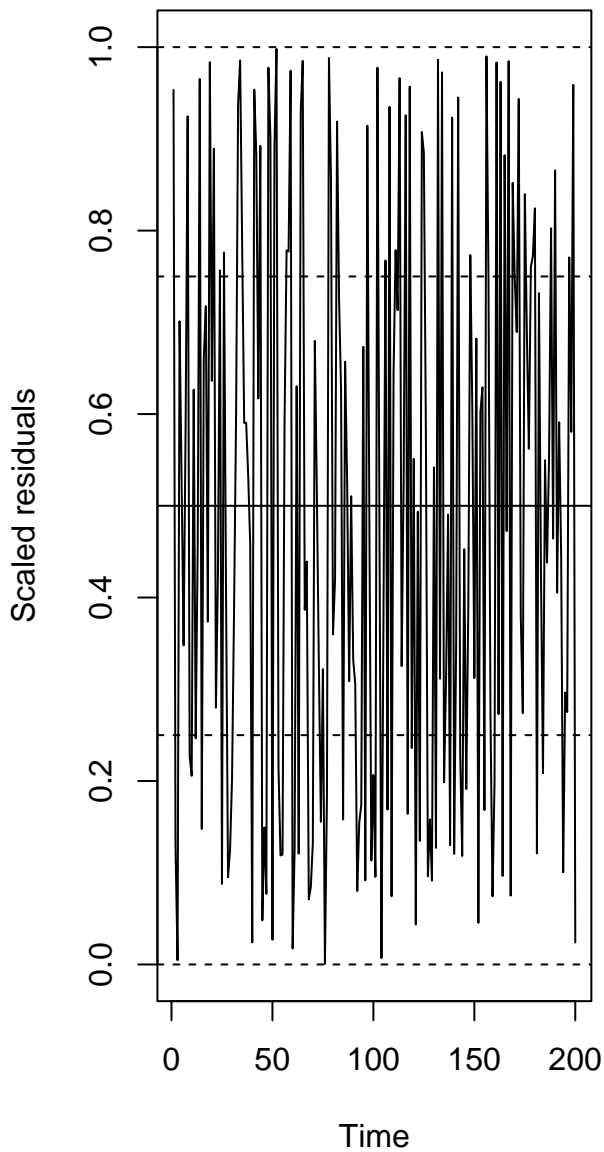
# DHARMa Moran's I test for distance-based autocorrelation



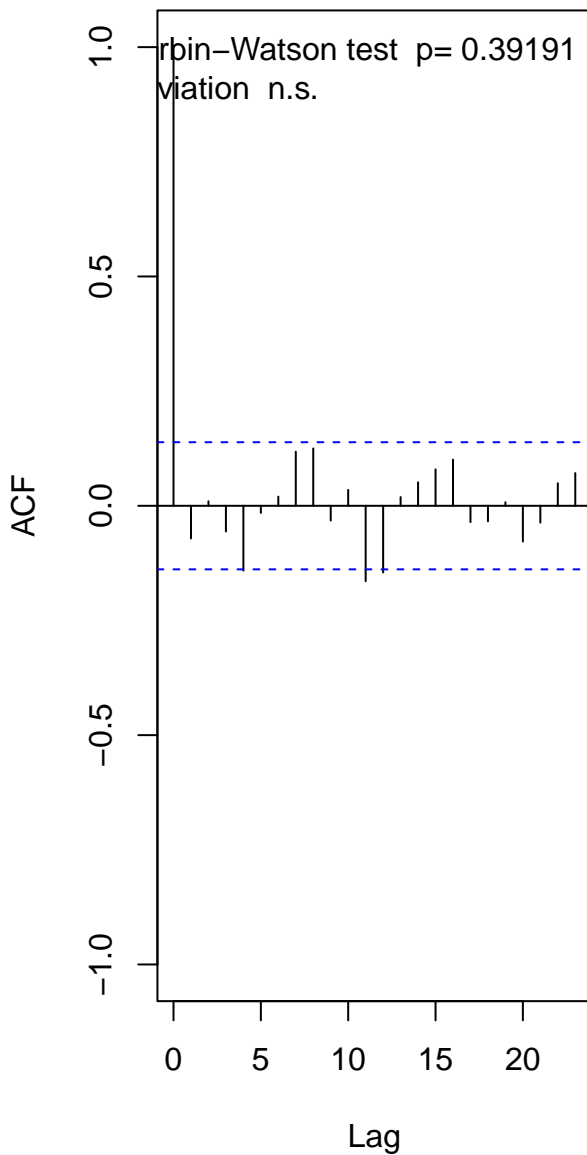
# DHARMa Moran's I test for distance-based autocorrelation



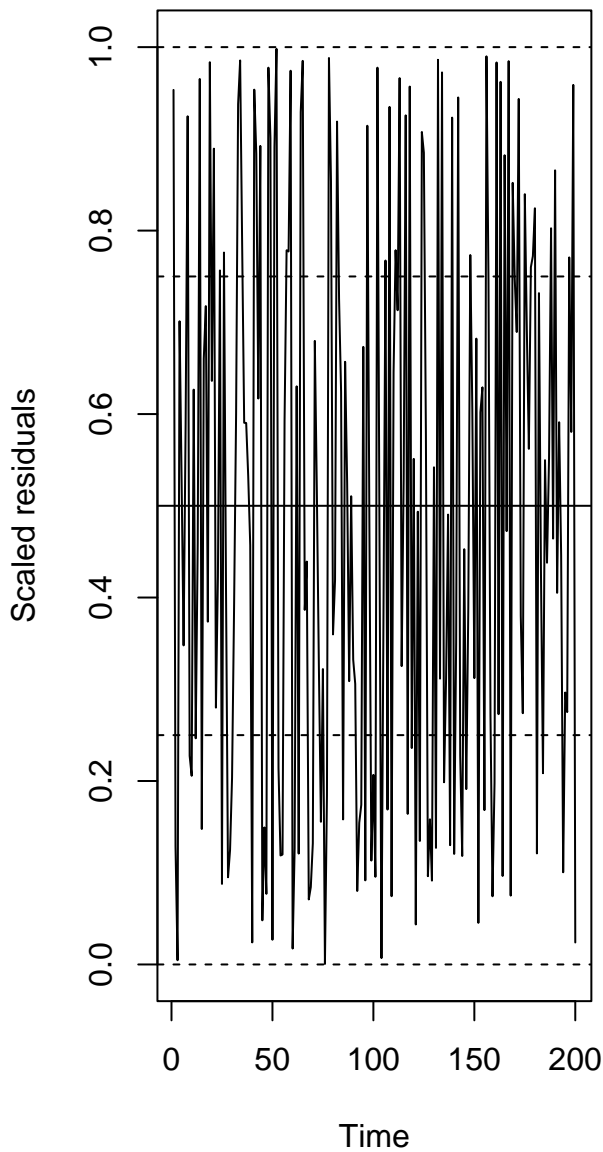
### Residuals vs. time



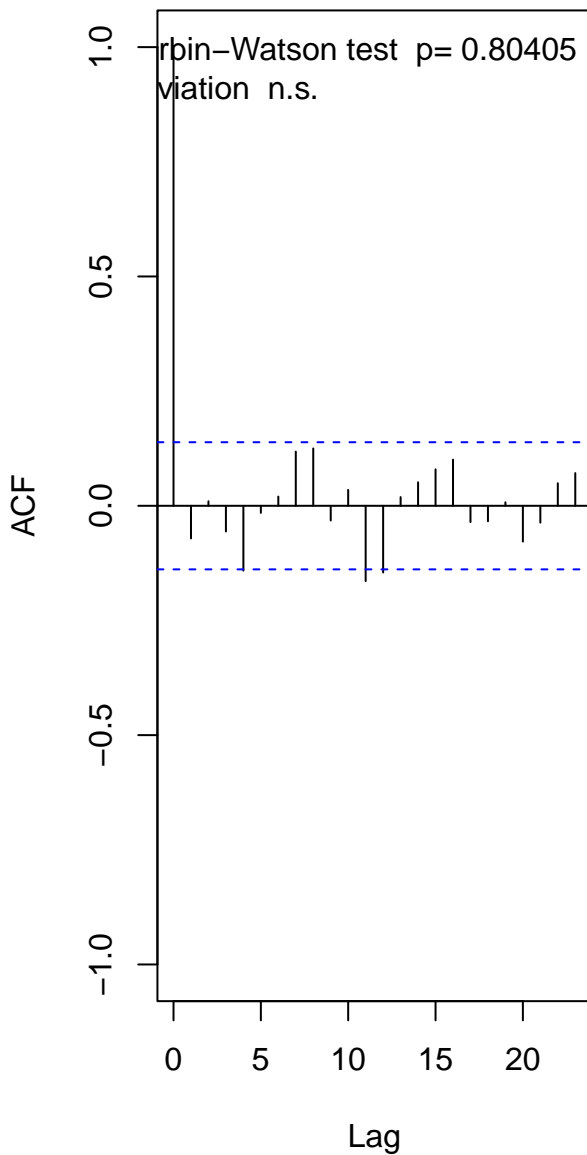
### Autocorrelation



# Residuals vs. time

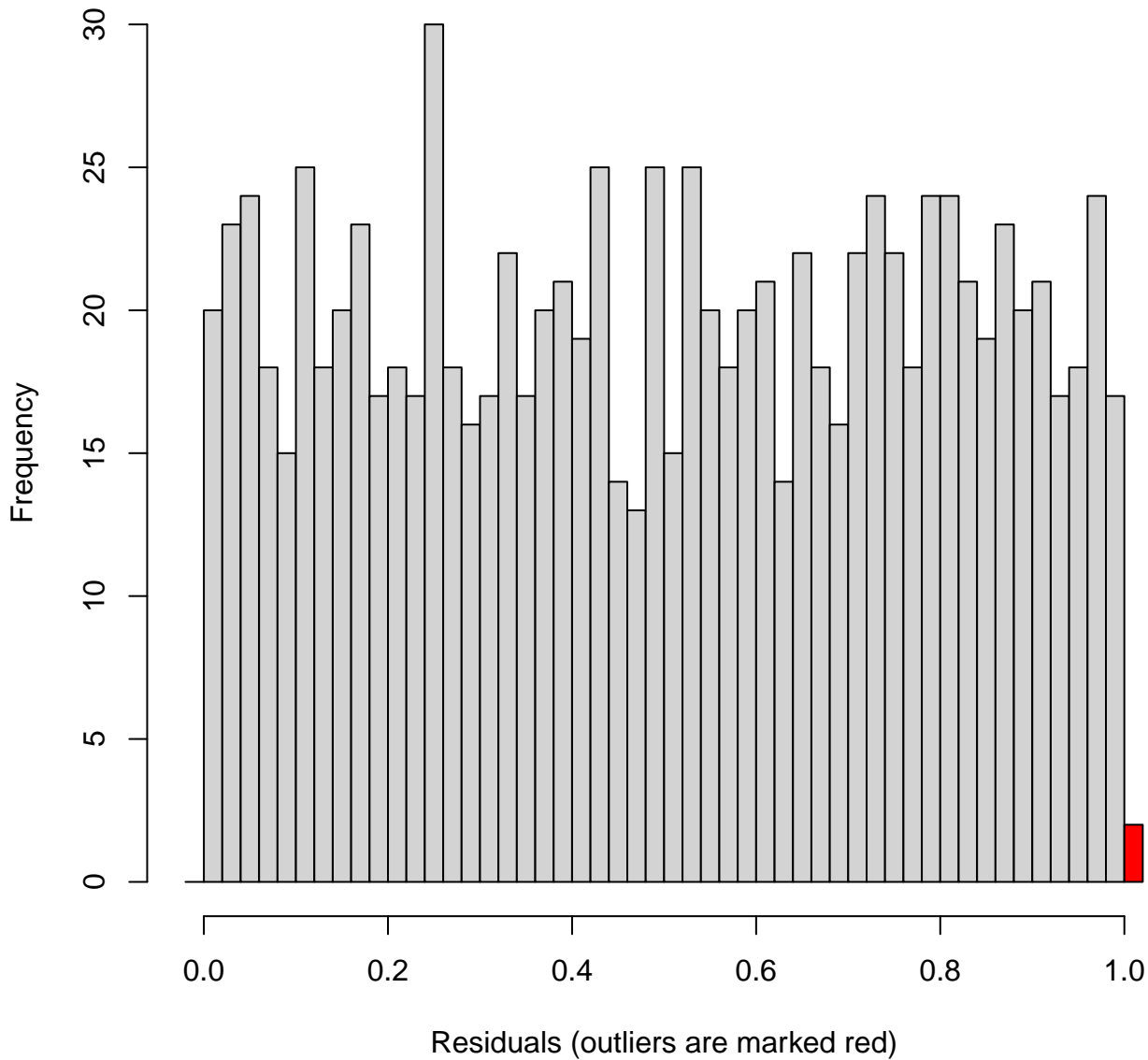


# Autocorrelation

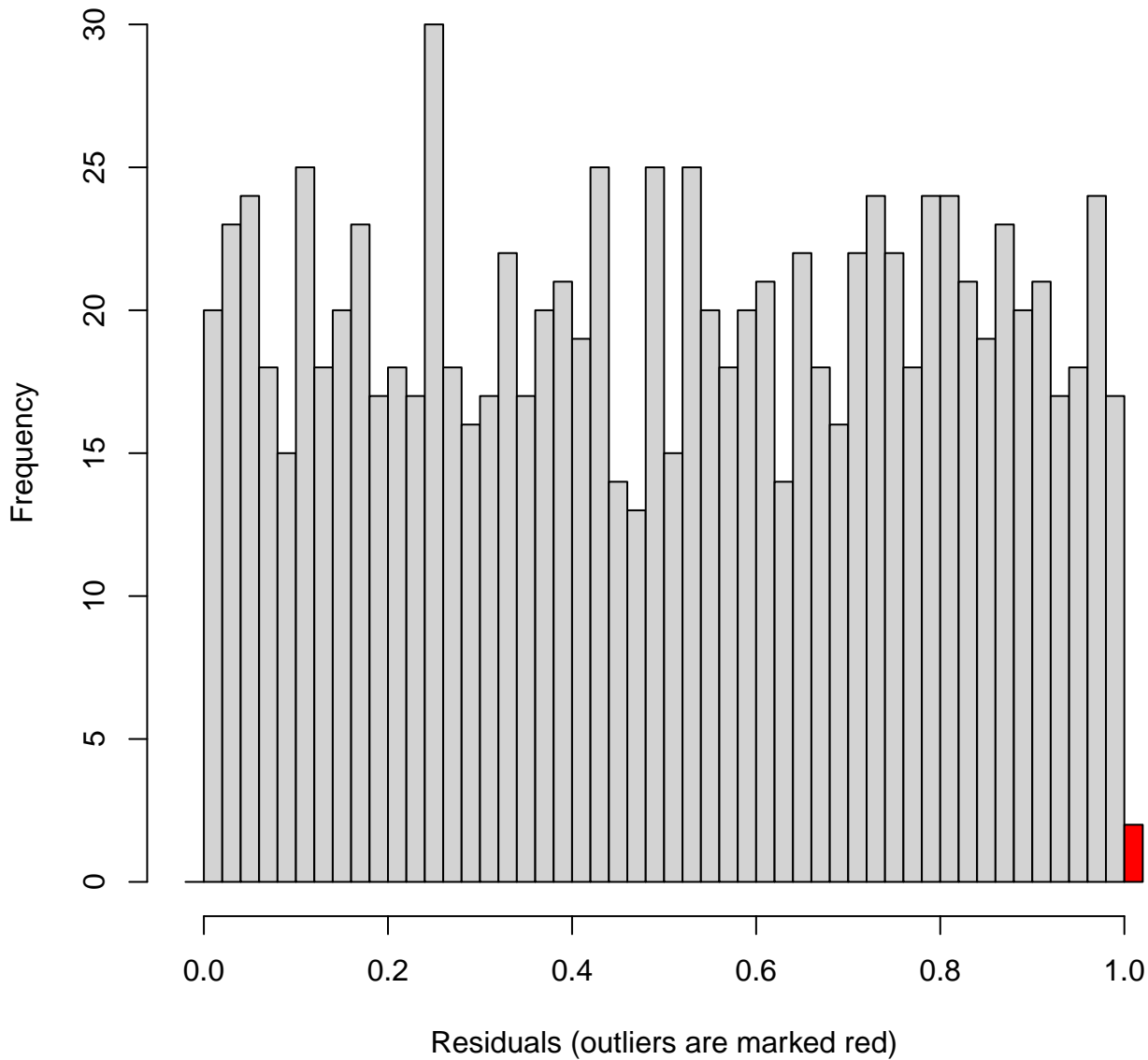




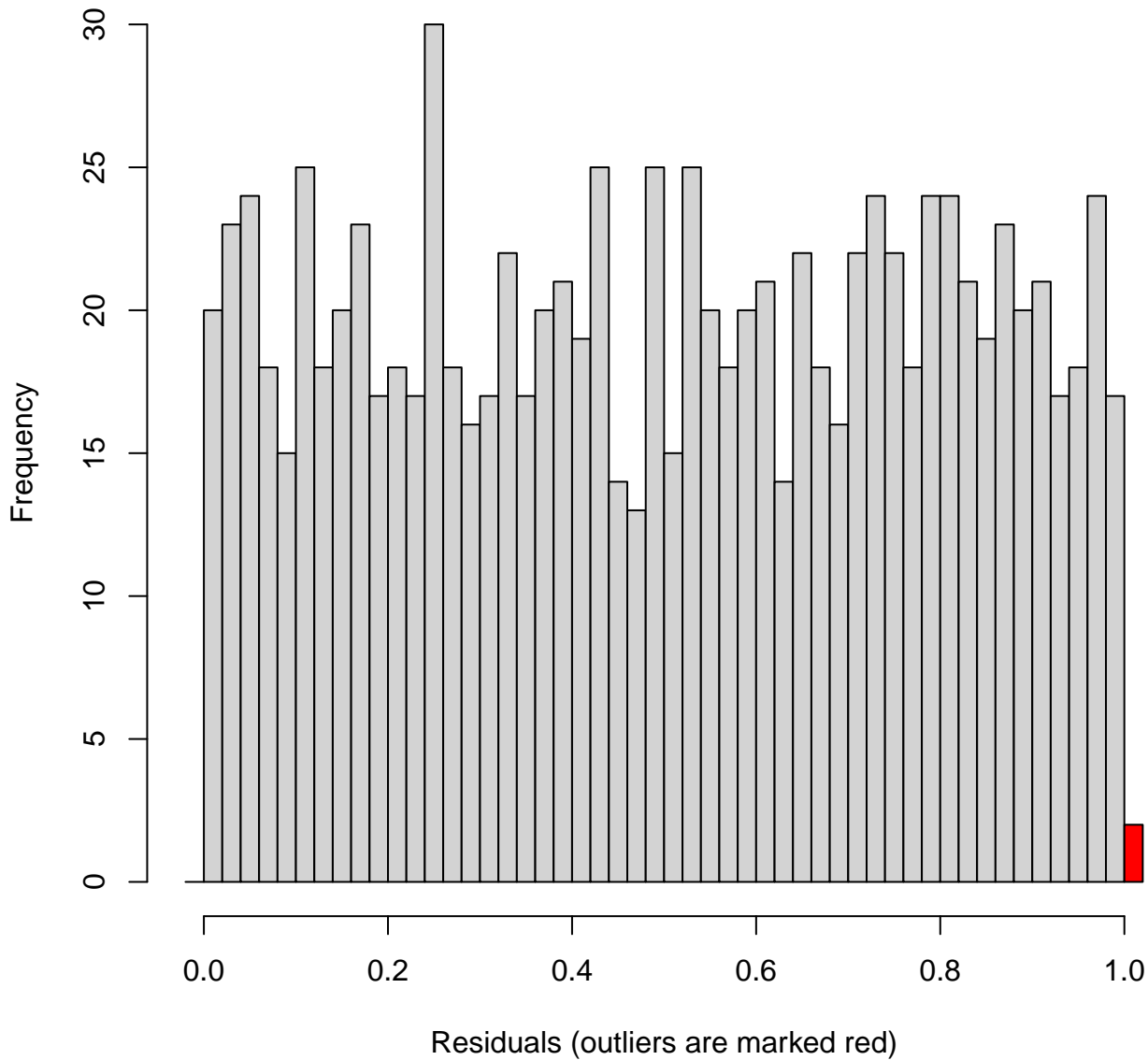
Outlier test n.s.



Outlier test n.s.



Outlier test n.s.



Outlier test n.s.

