Y1 + CI
Estimate
−1
0
1
2
3
4
5
10
15
20

X.Y1
Estimate
−1
0
1
2
3
4
5
10
15
20

Y1
Observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

Y1
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.Y1
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

Y1
Sample Quantiles
2
1
0
−1
−2
−1
0
1
2

X.Y1
Sample Quantiles
2
1
0
−1
−2
−1
0
1
2

Y1
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Y1 + CI
Estimate
−1
0
1
2
3
4
5
10
15
20

X.Y1
Estimate
−1
0
1
2
3
4
5
10
15
20

Y1
Observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

Y1
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.Y1
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

Y1
Sample Quantiles
2
1
0
−1
−2
−1
0
1
2

X.Y1
Sample Quantiles
2
1
0
−1
−2
−1
0
1
2

Y1
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

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Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Y1 + CI
Estimate
5
4
3
2
1
0
−1
5
10
15
20

X.Y1
Estimate
5
4
3
2
1
0
−1
5
10
15
20

Y1
Observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

Y1
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.Y1
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

Y1
Sample Quantiles
2
1
0
−1
−2
−1
0
1
2

X.Y1
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2
−1
0
1
2

Y1
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

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Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

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Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Y1 + CI
Estimate
5
4
3
2
1
0
−1
5
10
15
20

X.Y1
Estimate
5
4
3
2
1
0
−1
5
10
15
20

Y1
Observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

Y1
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.Y1
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

Y1
Sample Quantiles
2
1
0
−1
−2
−1
0
1
2

X.Y1
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2
−1
0
1
2

Y1
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

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Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

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Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.4
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20
X.SJI
Estimate
7.5
8.0
8.5
5
10
15
20
X.EBays
Estimate
7.2
7.3
7.4
7.5
7.6
7.7
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
2
1
0
−1
−2
−2
−1
0
1
2

SJI
Sample Quantiles
1.5
1.0
0.5
0.0
−1.0
−2.0
−2
−1
0
1
2

EBays
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2
−1
0
1
2

X.SJF
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2
X.SJI
Sample Quantiles
0.5
0.0
−0.5
−2
−1
0
1
2
X.EBays
Sample Quantiles
0.0
−0.5
−1.0
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

SJI
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Cholesky standardized model smoothation residuals

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation residuals

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.4
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20
X.SJI
Estimate
7.5
8.0
8.5
5
10
15
20
X.EBays
Estimate
7.2
7.3
7.4
7.5
7.6
7.7
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
2
1
0
−1
−2
−2
−1
0
1
2

SJI
Sample Quantiles
1.5
1.0
0.5
0.0
−1.0
−2.0
−2
−1
0
1
2

EBays
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2
−1
0
1
2

X.SJF
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2
X.SJI
Sample Quantiles
0.5
0.0
−0.5
−2
−1
0
1
2
X.EBays
Sample Quantiles
0.0
−0.5
−1.0
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

SJI
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

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Cholesky standardized model smoothation residuals

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation residuals

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

X.SJI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20

X.EBays
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
1.0
0.5
0.0
−0.5
−1.0
0.6
0.4
0.2
−0.2
−0.6
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
3
2
1
0
−1
−2
−3
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
1
0
−1
−2
−2
−1
0
1
2
SJI
Sample Quantiles
1
0
−1
−2
−2
−1
0
1
2
EBays
Sample Quantiles
0.5
0.0
−0.5
−1.0
−1.5
−2.0
−1
0
1

X.SJF
Sample Quantiles
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2
X.SJI
Sample Quantiles
−1.0
−0.5
0.0
−2
−1
0
1
2
X.EBays
Sample Quantiles
−1.0
−0.5
0.0
0.5
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

SJI
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
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Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

X.SJI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20

X.EBays
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
1.0
0.5
0.0
−0.5
−1.0
0.6
0.4
0.2
−0.2
−0.6
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
3
2
1
0
−1
−2
−3
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
1
0
−1
−2
−2
−1
0
1
2
SJI
Sample Quantiles
1
0
−1
−2
−2
−1
0
1
2
EBays
Sample Quantiles
0.5
0.0
−0.5
−1.0
−1.5
−2.0
−1
0
1

X.SJF
Sample Quantiles
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2
X.SJI
Sample Quantiles
−1.0
−0.5
0.0
−2
−1
0
1
2
X.EBays
Sample Quantiles
−1.0
−0.5
0.0
0.5
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

SJI
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

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Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
X.SJI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20
X.EBays
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
1.0
0.5
0.0
−0.5
−1.0
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
3
2
1
0
−1
−2
−3
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
1
0
−1
−2
−2
−1
0
1
2
SJI
Sample Quantiles
1
0
−1
−2
−2
−1
0
1
2
EBays
Sample Quantiles
0.5
0.0
−0.5
−1.0
−1.5
−2.0
−1
0
1

X.SJF
Sample Quantiles
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2
X.SJI
Sample Quantiles
−1.5
−1.0
−0.5
0.0
−2
−1
0
1
2
X.EBays
Sample Quantiles
−1.0
−0.5
0.0
0.5
−2
−1
0
1
2

SJF
SJI
EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

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SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
X.SJI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20
X.EBays
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
1.0
0.5
0.0
−0.5
−1.0
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
3
2
1
0
−1
−2
−3
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
1
0
−1
−2
−2
−1
0
1
2
SJI
Sample Quantiles
1
0
−1
−2
−2
−1
0
1
2
EBays
Sample Quantiles
0.5
0.0
−0.5
−1.0
−1.5
−2.0
−1
0
1

X.SJF
Sample Quantiles
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2
X.SJI
Sample Quantiles
−1.5
−1.0
−0.5
0.0
−2
−1
0
1
2
X.EBays
Sample Quantiles
−1.0
−0.5
0.0
0.5
−2
−1
0
1
2

SJF
SJI
EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

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Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.5
7.0
7.5
5
10
15
20

X.SJF
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

X.SJI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20

X.EBays
Estimate
6.5
7.0
7.5
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
1.0
0.5
0.0
−0.5
−1.0
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
1.5
1.0
0.5
0.0
−1.0
−2.0
−2
−1
0
1
2
SJI
Sample Quantiles
1
0
−1
−2
−2
−1
0
1
2
EBays
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−1.5
−1
0
1

X.SJF
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2
−1
0
1
2
X.SJI
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2
−1
0
1
2
X.EBays
Sample Quantiles
2.0
1.5
1.0
0.5
0.0
−0.5
−1.5
−2
−1
0
1
2

SJF
SJI
EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

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Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.5
7.0
7.5
5
10
15
20

X.SJF
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

X.SJI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20

X.EBays
Estimate
6.5
7.0
7.5
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
1.0
0.5
0.0
−0.5
−1.0
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
1.5
1.0
0.5
0.0
−1.0
−2.0
−2
−1
0
1
2
SJI
Sample Quantiles
1
0
−1
−2
−2
−1
0
1
2
EBays
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−1.5
−1
0
1

X.SJF
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2
−1
0
1
2
X.SJI
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2
−1
0
1
2
X.EBays
Sample Quantiles
2.0
1.5
1.0
0.5
0.0
−0.5
−1.5
−2
−1
0
1
2

SJF
SJI
EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

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Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
5
10
15
20

X.SJI
Estimate
7.4
7.6
7.8
8.0
8.2
8.4
8.6
5
10
15
20

X.EBays
Estimate
7.3
7.4
7.5
7.6
7.7
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.4
0.2
0.0
−0.2
−0.4
−0.6
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
1
0
−1
−2
−2
−1
0
1
2
SJI
Sample Quantiles
1.5
1.0
0.5
0.0
−1.0
−2.0
−2
−1
0
1
2
EBays
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.0
−1
0
1

X.SJF
Sample Quantiles
1.5
1.0
0.5
0.0
−1.0
−2.0
−2
−1
0
1
2
X.SJI
Sample Quantiles
0.8
0.6
0.4
0.2
0.0
−0.2
−2
−1
0
1
2
X.EBays
Sample Quantiles
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2

SJF
SJI
EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

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Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
5
10
15
20

X.SJI
Estimate
7.4
7.6
7.8
8.0
8.2
8.4
8.6
5
10
15
20

X.EBays
Estimate
7.3
7.4
7.5
7.6
7.7
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.4
0.2
0.0
−0.2
−0.4
−0.6
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
1
0
−1
−2
−2
−1
0
1
2
SJI
Sample Quantiles
1.5
1.0
0.5
0.0
−1.0
−2.0
−2
−1
0
1
2
EBays
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.0
−1
0
1

X.SJF
Sample Quantiles
1.5
1.0
0.5
0.0
−1.0
−2.0
−2
−1
0
1
2
X.SJI
Sample Quantiles
0.8
0.6
0.4
0.2
0.0
−0.2
−2
−1
0
1
2
X.EBays
Sample Quantiles
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2

SJF
SJI
EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

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Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

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Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

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Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
5
10
15
20

X.SJI
Estimate
7.4
7.6
7.8
8.0
8.2
8.4
8.6
5
10
15
20

X.EBays
Estimate
7.3
7.4
7.5
7.6
7.7
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.4
0.2
0.0
−0.2
−0.4
−0.6
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
−3
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
1
0
−1
−2
−3
−2
−1
0
1
2
SJI
Sample Quantiles
0
−1
−2
−3
−2
−1
0
1
2
EBays
Sample Quantiles
0
−1
−2
−3
−2
−1
0
1
2

X.SJF
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2

X.SJI
Sample Quantiles
−0.2
−0.1
0.0
0.1
0.2
0.3
0.4
−2
−1
0
1
2

X.EBays
Sample Quantiles
−0.2
−0.1
0.0
0.1
0.2
−2
−1
0
1
2

SJF
SJI
EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

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Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

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Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

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Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
5
10
15
20

X.SJI
Estimate
7.4
7.6
7.8
8.0
8.2
8.4
8.6
5
10
15
20

X.EBays
Estimate
7.3
7.4
7.5
7.6
7.7
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.4
0.2
0.0
−0.2
−0.4
−0.6
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
−3
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
1
0
−1
−2
−3
−2
−1
0
1
2
SJI
Sample Quantiles
0
−1
−2
−3
−2
−1
0
1
2
EBays
Sample Quantiles
0
−1
−2
−3
−2
−1
0
1
2

X.SJF
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2

X.SJI
Sample Quantiles
−0.2
−0.1
0.0
0.1
0.2
0.3
0.4
−2
−1
0
1
2

X.EBays
Sample Quantiles
−0.2
−0.1
0.0
0.1
0.2
−2
−1
0
1
2

SJF
SJI
EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

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Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

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Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

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Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
5
10
15
20
X.SJI
Estimate
7.4
7.6
7.8
8.0
8.2
8.4
8.6
5
10
15
20
X.EBays
Estimate
7.3
7.4
7.5
7.6
7.7
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.4
0.2
0.0
−0.2
−0.4
−0.6
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
−3
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2

SJI
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2

EBays
Sample Quantiles
−1.0
−0.5
0.0
0.5
1.0
−2
−1
0
1
2

X.SJF
Sample Quantiles
−0.1
0.0
0.1
0.2
0.3
0.4
0.5
0.6
−2
−1
0
1
2
X.SJI
Sample Quantiles
−1.0
−0.5
0.0
0.5
1.0
−2
−1
0
1
2
X.EBays
Sample Quantiles
−0.4
−0.2
0.0
0.2
0.4
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

SJI
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

Fitted ytT + CI

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Cholesky standardized model smoothation residuals

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation residuals

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Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
5
10
15
20
X.SJI
Estimate
7.4
7.6
7.8
8.0
8.2
8.4
8.6
5
10
15
20
X.EBays
Estimate
7.3
7.4
7.5
7.6
7.7
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.4
0.2
0.0
−0.2
−0.4
−0.6
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
−3
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2

SJI
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2

EBays
Sample Quantiles
−1.0
−0.5
0.0
0.5
1.0
−2
−1
0
1
2

X.SJF
Sample Quantiles
−0.1
0.0
0.1
0.2
0.3
0.4
0.5
0.6
−2
−1
0
1
2
X.SJI
Sample Quantiles
−1.0
−0.5
0.0
0.5
1.0
−2
−1
0
1
2
X.EBays
Sample Quantiles
−0.4
−0.2
0.0
0.2
0.4
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

SJI
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

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Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
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Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

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Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

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Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.5
7.0
7.5
5
10
15
20

X.SJF
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

X.SJI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20

X.EBays
Estimate
6.5
7.0
7.5
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
1.0
0.5
0.0
−0.5
−1.0
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
1.5
1.0
0.5
0.0
−1.0
−2.0
−2
−1
0
1
2
SJI
Sample Quantiles
1
0
−1
−2
−2
−1
0
1
2
EBays
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2

X.SJF
Sample Quantiles
−1.5
−1.0
−0.5
0.0
0.5
1.0
−2
−1
0
1
2
X.SJI
Sample Quantiles
−1.5
−1.0
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2
X.EBays
Sample Quantiles
−1
0
1
2
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

SJI
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
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States xtT

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Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.5
7.0
7.5
5
10
15
20

X.SJF
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

X.SJI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20

X.EBays
Estimate
6.5
7.0
7.5
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
1.0
0.5
0.0
−0.5
−1.0
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
1.5
1.0
0.5
0.0
−1.0
−2.0
−2
−1
0
1
2
SJI
Sample Quantiles
1
0
−1
−2
−2
−1
0
1
2
EBays
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2

X.SJF
Sample Quantiles
−1.5
−1.0
−0.5
0.0
0.5
1.0
−2
−1
0
1
2
X.SJI
Sample Quantiles
−1.5
−1.0
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2
X.EBays
Sample Quantiles
−1
0
1
2
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

SJI
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

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States xtT

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Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

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Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20

EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
5
10
15
20

X.SJI
Estimate
7.4
7.6
7.8
8.0
8.2
8.4
8.6
5
10
15
20

X.EBays
Estimate
7.1
7.2
7.3
7.4
7.5
7.6
7.7
7.8
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
2
1
0
−1
−2
−2
−1
0
1
2
SJI
Sample Quantiles
1.5
1.0
0.5
0.0
−1.0
−2.0
−2
−1
0
1
2
EBays
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−1
0
1

X.SJF
Sample Quantiles
0.0
0.5
1.0
1.5
2.0
−2
−1
0
1
2
X.SJI
Sample Quantiles
−0.5
0.0
0.5
1.0
1.5
2.0
2.5
−2
−1
0
1
2
X.EBays
Sample Quantiles
−0.5
0.0
0.5
1.0
1.5
2.0
2.5
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

SJI
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

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Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20

EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
5
10
15
20

X.SJI
Estimate
7.4
7.6
7.8
8.0
8.2
8.4
8.6
5
10
15
20

X.EBays
Estimate
7.1
7.2
7.3
7.4
7.5
7.6
7.7
7.8
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
2
1
0
−1
−2
−2
−1
0
1
2
SJI
Sample Quantiles
1.5
1.0
0.5
0.0
−1.0
−2.0
−2
−1
0
1
2
EBays
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−1
0
1

X.SJF
Sample Quantiles
0.0
0.5
1.0
1.5
2.0
−2
−1
0
1
2
X.SJI
Sample Quantiles
−0.5
0.0
0.5
1.0
1.5
2.0
2.5
−2
−1
0
1
2
X.EBays
Sample Quantiles
−0.5
0.0
0.5
1.0
1.5
2.0
2.5
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

SJI
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.5
7.0
7.5
5
10
15
20

X.SJI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20

X.EBays
Estimate
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.5
0.0
−0.5
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
−3
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2
SJI
Sample Quantiles
−3
−2
−1
0
1
−2
−1
0
1
2
EBays
Sample Quantiles
−3
−2
−1
0
1
−2
−1
0
1
2

X.SJF
Sample Quantiles
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2
X.SJI
Sample Quantiles
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2
X.EBays
Sample Quantiles
−0.5
0.0
0.5
1.0
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

SJI
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Fitted ytT + CI

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Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

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Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.5
7.0
7.5
5
10
15
20

X.SJI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20

X.EBays
Estimate
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.5
0.0
−0.5
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
−3
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2
SJI
Sample Quantiles
−3
−2
−1
0
1
−2
−1
0
1
2
EBays
Sample Quantiles
−3
−2
−1
0
1
−2
−1
0
1
2

X.SJF
Sample Quantiles
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2
X.SJI
Sample Quantiles
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2
X.EBays
Sample Quantiles
−0.5
0.0
0.5
1.0
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

SJI
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

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Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
5
10
15
20
X.SJI
Estimate
7.2
7.4
7.6
7.8
8.0
8.2
8.4
5
10
15
20
X.EBays
Estimate
7.2
7.4
7.6
7.8
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
−3
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
2
1
0
−1
−2
−2
−1
0
1
2
SJI
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.5
−2
−1
0
1
2
EBays
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−1
0
1

X.SJF
Sample Quantiles
0.0
0.5
1.0
1.5
2.0
−2
−1
0
1
2
X.SJI
Sample Quantiles
−0.5
0.0
0.5
1.0
1.5
2.0
−2
−1
0
1
2
X.EBays
Sample Quantiles
−0.5
0.0
0.5
1.0
1.5
2.0
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12
SJI
ACF
1.0
0.5
0.0
−0.5
0
2
4
6
8
10
12
EBays
ACF
1.0
0.5
0.0
−0.5
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T. Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T. Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

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Cholesky standardized model smoothation residuals

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation residuals

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
5
10
15
20
X.SJI
Estimate
7.2
7.4
7.6
7.8
8.0
8.2
8.4
5
10
15
20
X.EBays
Estimate
7.2
7.4
7.6
7.8
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
−3
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
2
1
0
−1
−2
−2
−1
0
1
2
SJI
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.5
−2
−1
0
1
2
EBays
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−1
0
1

X.SJF
Sample Quantiles
0.0
0.5
1.0
1.5
2.0
−2
−1
0
1
2
X.SJI
Sample Quantiles
−0.5
0.0
0.5
1.0
1.5
2.0
−2
−1
0
1
2
X.EBays
Sample Quantiles
−0.5
0.0
0.5
1.0
1.5
2.0
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12
SJI
ACF
1.0
0.5
0.0
−0.5
0
2
4
6
8
10
12
EBays
ACF
1.0
0.5
0.0
−0.5
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T. Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T. Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

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Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

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Cholesky standardized model smoothation residuals

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation residuals

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

SJI + CI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20

EBays + CI
Estimate
6.5
7.0
7.5
5
10
15
20

X.SJF
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

X.SJI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20

X.EBays
Estimate
6.5
7.0
7.5
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
1.0
0.5
0.0
−0.5
−1.0
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
SJI
EBays
Sample Quantiles
Sample Quantiles
Sample Quantiles
−2
−1
0
1
2

X.SJF
Sample Quantiles
−1.5
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2
X.SJI
Sample Quantiles
−0.5
0.0
0.5
1.0
−2
−1
0
1
2
X.EBays
Sample Quantiles
−0.5
0.0
0.5
1.0
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

SJI
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

SJI + CI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20

EBays + CI
Estimate
6.5
7.0
7.5
5
10
15
20

X.SJF
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

X.SJI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20

X.EBays
Estimate
6.5
7.0
7.5
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
1.0
0.5
0.0
−0.5
−1.0
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
SJI
EBays
Sample Quantiles
Sample Quantiles
Sample Quantiles
−2
−1
0
1
2

X.SJF
Sample Quantiles
−1.5
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2
X.SJI
Sample Quantiles
−0.5
0.0
0.5
1.0
−2
−1
0
1
2
X.EBays
Sample Quantiles
−0.5
0.0
0.5
1.0
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

SJI
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20

EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
5
10
15
20
X.SJI
Estimate
7.4
7.6
7.8
8.0
8.2
8.4
5
10
15
20
X.EBays
Estimate
7.3
7.4
7.5
7.6
7.7
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.4
0.2
0.0
−0.2
−0.4
−0.6
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
SJI
EBays
Sample Quantiles
Sample Quantiles
Sample Quantiles
−2
−1
0
1
2

X.SJF
Sample Quantiles
0.00
0.05
0.10
0.15
−2
−1
0
1
2
X.SJI
Sample Quantiles
−0.5
0.0
0.5
1.0
−2
−1
0
1
2
X.EBays
Sample Quantiles
−0.6
−0.4
−0.2
0.0
0.2
0.4
0.6
−2
−1
0
1
2

SJF
SJI
EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

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Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20

EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
5
10
15
20
X.SJI
Estimate
7.4
7.6
7.8
8.0
8.2
8.4
5
10
15
20
X.EBays
Estimate
7.3
7.4
7.5
7.6
7.7
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.4
0.2
0.0
−0.2
−0.4
−0.6
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
SJI
EBays
Sample Quantiles
Sample Quantiles
Sample Quantiles
−2
−1
0
1
2

X.SJF
Sample Quantiles
0.00
0.05
0.10
0.15
−2
−1
0
1
2
X.SJI
Sample Quantiles
−0.5
0.0
0.5
1.0
−2
−1
0
1
2
X.EBays
Sample Quantiles
−0.6
−0.4
−0.2
0.0
0.2
0.4
0.6
−2
−1
0
1
2

SJF
SJI
EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20

EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
5
10
15
20

X.SJI
Estimate
7.4
7.6
7.8
8.0
8.2
8.4
8.6
5
10
15
20

X.EBays
Estimate
7.3
7.4
7.5
7.6
7.7
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.4
0.2
0.0
−0.2
−0.4
−0.6
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
−3
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
1
0
−1
−2
−2
−1
0
1
2
SJI
Sample Quantiles
1
0
−1
−2
−3
−2
−1
0
1
2
EBays
Sample Quantiles
1
0
−1
−2
−3
−2
−1
0
1
2

X.SJF
Sample Quantiles
−0.1
0.0
0.1
0.2
0.3
0.4
0.5
−2
−1
0
1
2
X.SJI
Sample Quantiles
−0.2
0.0
0.2
0.4
0.6
−2
−1
0
1
2
X.EBays
Sample Quantiles
−0.3
−0.1
0.0
0.1
0.2
0.3
−2
−1
0
1
2

SJF
SJI
EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Cholesky standardized model smoothation residuals

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation residuals

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20

EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
5
10
15
20

X.SJI
Estimate
7.4
7.6
7.8
8.0
8.2
8.4
8.6
5
10
15
20

X.EBays
Estimate
7.3
7.4
7.5
7.6
7.7
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.4
0.2
0.0
−0.2
−0.4
−0.6
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
−3
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
1
0
−1
−2
−2
−1
0
1
2
SJI
Sample Quantiles
1
0
−1
−2
−3
−2
−1
0
1
2
EBays
Sample Quantiles
1
0
−1
−2
−3
−2
−1
0
1
2

X.SJF
Sample Quantiles
−0.1
0.0
0.1
0.2
0.3
0.4
0.5
−2
−1
0
1
2
X.SJI
Sample Quantiles
−0.2
0.0
0.2
0.4
0.6
−2
−1
0
1
2
X.EBays
Sample Quantiles
−0.3
−0.1
0.0
0.1
0.2
0.3
−2
−1
0
1
2

SJF
SJI
EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

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Cholesky standardized model smoothation residuals

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Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

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Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
5
10
15
20
X.SJI
Estimate
7.4
7.6
7.8
8.0
8.2
8.4
5
10
15
20
X.EBays
Estimate
7.3
7.4
7.5
7.6
7.7
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.4
0.2
0.0
−0.2
−0.4
−0.6
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
−3
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2

SJI
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2

EBays
Sample Quantiles
−1.0
−0.5
0.0
0.5
1.0
−2
−1
0
1
2

X.SJF
Sample Quantiles
0.2
0.0
−0.2
−0.4
−0.6
−2
−1
0
1
2
X.SJI
Sample Quantiles
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
−2
−1
0
1
2
X.EBays
Sample Quantiles
0.4
0.3
0.2
0.1
0.0
−0.1
−0.2
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

SJI
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

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Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
5
10
15
20
X.SJI
Estimate
7.4
7.6
7.8
8.0
8.2
8.4
5
10
15
20
X.EBays
Estimate
7.3
7.4
7.5
7.6
7.7
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.4
0.2
0.0
−0.2
−0.4
−0.6
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
−3
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2

SJI
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2

EBays
Sample Quantiles
−1.0
−0.5
0.0
0.5
1.0
−2
−1
0
1
2

X.SJF
Sample Quantiles
0.2
0.0
−0.2
−0.4
−0.6
−2
−1
0
1
2
X.SJI
Sample Quantiles
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
−2
−1
0
1
2
X.EBays
Sample Quantiles
0.4
0.3
0.2
0.1
0.0
−0.1
−0.2
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

SJI
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

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Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

SJI + CI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20

EBays + CI
Estimate
6.5
7.0
7.5
5
10
15
20

X.SJF
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

X.SJI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20

X.EBays
Estimate
6.5
7.0
7.5
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
1.0
0.5
0.0
−0.5
−1.0
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2
SJI
Sample Quantiles
−3
−2
−1
0
1
−2
−1
0
1
2
EBays
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2

X.SJF
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.5
−2
−1
0
1
2
X.SJI
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2
X.EBays
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

SJI
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
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Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

SJI + CI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20

EBays + CI
Estimate
6.5
7.0
7.5
5
10
15
20

X.SJF
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

X.SJI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20

X.EBays
Estimate
6.5
7.0
7.5
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
1.0
0.5
0.0
−0.5
−1.0
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2
SJI
Sample Quantiles
−3
−2
−1
0
1
−2
−1
0
1
2
EBays
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2

X.SJF
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.5
−2
−1
0
1
2
X.SJI
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2
X.EBays
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

SJI
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

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Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.5
7.0
7.5
5
10
15
20

X.SJF
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

X.SJI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20

X.EBays
Estimate
6.5
7.0
7.5
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
1.0
0.5
0.0
−0.5
−1.0
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
−3
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
1
0
−1
−2
−2
−1
0
1
2
SJI
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2.0
−2
−1
0
1
2
EBays
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−1.5
−1
0
1

X.SJF
Sample Quantiles
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2
X.SJI
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2
X.EBays
Sample Quantiles
0.0
−0.5
−1.0
−1.5
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

SJI
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
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Cholesky standardized model smoothation residuals

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Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.5
7.0
7.5
5
10
15
20

X.SJF
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

X.SJI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20

X.EBays
Estimate
6.5
7.0
7.5
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
1.0
0.5
0.0
−0.5
−1.0
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
−3
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
1
0
−1
−2
−2
−1
0
1
2
SJI
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2.0
−2
−1
0
1
2
EBays
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−1.5
−1
0
1

X.SJF
Sample Quantiles
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2
X.SJI
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2
X.EBays
Sample Quantiles
0.0
−0.5
−1.0
−1.5
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

SJI
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

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Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.5
7.0
7.5
5
10
15
20

X.SJF
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
X.SJI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
X.EBays
Estimate
6.5
7.0
7.5
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.5
0.0
−0.5
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
−3
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2
SJI
Sample Quantiles
−1.5
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2
EBays
Sample Quantiles
−1.5
−1.0
−0.5
0.0
0.5
−2
−1
0
1
2

X.SJF
Sample Quantiles
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2
X.SJI
Sample Quantiles
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2
X.EBays
Sample Quantiles
−2.0
−1.5
−1.0
−0.5
0.0
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12
SJI
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12
EBays
ACF
1.0
0.5
0.0
−0.5
0
2
4
6
8
10
12

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Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.5
7.0
7.5
5
10
15
20

X.SJF
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
X.SJI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
X.EBays
Estimate
6.5
7.0
7.5
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.5
0.0
−0.5
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
−3
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2
SJI
Sample Quantiles
−1.5
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2
EBays
Sample Quantiles
−1.5
−1.0
−0.5
0.0
0.5
−2
−1
0
1
2

X.SJF
Sample Quantiles
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2
X.SJI
Sample Quantiles
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2
X.EBays
Sample Quantiles
−2.0
−1.5
−1.0
−0.5
0.0
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12
SJI
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12
EBays
ACF
1.0
0.5
0.0
−0.5
0
2
4
6
8
10
12

States xtT

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Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.5
7.0
7.5
5
10
15
20

X.SJF
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
X.SJI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20
X.EBays
Estimate
6.5
7.0
7.5
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
1.0
0.5
0.0
−0.5
−1.0
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
3
2
1
0
−1
−2
−3
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2
SJI
Sample Quantiles
−1.5
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2
EBays
Sample Quantiles
−1.5
−1.0
−0.5
0.0
0.5
−2
−1
0
1
2

X.SJF
Sample Quantiles
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2
X.SJI
Sample Quantiles
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2
X.EBays
Sample Quantiles
−2.0
−1.5
−1.0
−0.5
0.0
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

SJI
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

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Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.5
7.0
7.5
5
10
15
20

X.SJF
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
X.SJI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20
X.EBays
Estimate
6.5
7.0
7.5
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
1.0
0.5
0.0
−0.5
−1.0
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
3
2
1
0
−1
−2
−3
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2
SJI
Sample Quantiles
−1.5
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2
EBays
Sample Quantiles
−1.5
−1.0
−0.5
0.0
0.5
−2
−1
0
1
2

X.SJF
Sample Quantiles
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2
X.SJI
Sample Quantiles
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2
X.EBays
Sample Quantiles
−2.0
−1.5
−1.0
−0.5
0.0
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

SJI
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Fitted ytT + CI

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Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

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Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

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Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

SJI + CI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20

EBays + CI
Estimate
6.5
7.0
7.5
5
10
15
20

X.SJF
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

X.SJI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20

X.EBays
Estimate
6.5
7.0
7.5
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
1.0
0.5
0.0
−0.5
−1.0
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2
SJI
Sample Quantiles
−1.5
−0.5
0.0
0.5
1.0
1.5
2.0
−2
−1
0
1
2
EBays
Sample Quantiles
−1.0
−0.5
0.0
0.5
1.0
−1
0
1

X.SJF
Sample Quantiles
−1.5
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2
X.SJI
Sample Quantiles
−1.5
−0.5
0.0
0.5
1.0
1.5
2.0
−2
−1
0
1
2
X.EBays
Sample Quantiles
−1.0
−0.5
0.0
0.5
1.0
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

SJI
ACF
1.0
0.5
0.0
−0.5
0
2
4
6
8
10
12

EBays
ACF
1.0
0.5
0.0
−0.5
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Fitted ytT + CI

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Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

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Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

SJI + CI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20

EBays + CI
Estimate
6.5
7.0
7.5
5
10
15
20

X.SJF
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

X.SJI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20

X.EBays
Estimate
6.5
7.0
7.5
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
1.0
0.5
0.0
−0.5
−1.0
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2
SJI
Sample Quantiles
−1.5
−0.5
0.0
0.5
1.0
1.5
2.0
−2
−1
0
1
2
EBays
Sample Quantiles
−1.0
−0.5
0.0
0.5
1.0
−1
0
1

X.SJF
Sample Quantiles
−1.5
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2
X.SJI
Sample Quantiles
−1.5
−0.5
0.0
0.5
1.0
1.5
2.0
−2
−1
0
1
2
X.EBays
Sample Quantiles
−1.0
−0.5
0.0
0.5
1.0
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

SJI
ACF
1.0
0.5
0.0
−0.5
0
2
4
6
8
10
12

EBays
ACF
1.0
0.5
0.0
−0.5
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
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States xtT

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Fitted ytT + CI

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Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
5
10
15
20

X.SJI
Estimate
7.4
7.6
7.8
8.0
8.2
8.4
8.6
5
10
15
20

X.EBays
Estimate
7.3
7.4
7.5
7.6
7.7
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.4
0.2
0.0
−0.2
−0.4
−0.6
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2
SJI
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2
EBays
Sample Quantiles
−1
0
1
2
−1
0
1

X.SJF
Sample Quantiles
0.2
0.1
0.0
−0.1
−0.2
−2
−1
0
1
2
X.SJI
Sample Quantiles
0.5
0.0
−0.5
−2
−1
0
1
2
X.EBays
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2

SJF
SJI
EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

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Confidence intervals are for the expected value of X (conditioned on the data up to T).

Fitted ytT + CI

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Fitted ytT + CI

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Cholesky standardized model smoothation residuals

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation residuals

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Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

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Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
5
10
15
20

X.SJI
Estimate
7.4
7.6
7.8
8.0
8.2
8.4
8.6
5
10
15
20

X.EBays
Estimate
7.3
7.4
7.5
7.6
7.7
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.4
0.2
0.0
−0.2
−0.4
−0.6
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2
SJI
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2
EBays
Sample Quantiles
−1
0
1
2
−1
0
1

X.SJF
Sample Quantiles
0.2
0.1
0.0
−0.1
−0.2
−2
−1
0
1
2
X.SJI
Sample Quantiles
0.5
0.0
−0.5
−2
−1
0
1
2
X.EBays
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2

SJF
SJI
EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
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Fitted ytT + CI

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Fitted ytT + CI

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Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

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Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20

EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
5
10
15
20

X.SJI
Estimate
7.4
7.6
7.8
8.0
8.2
8.4
8.6
5
10
15
20

X.EBays
Estimate
7.3
7.4
7.5
7.6
7.7
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.4
0.2
0.0
−0.2
−0.4
−0.6
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
−3
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2

SJI
Sample Quantiles
−3
−2
−1
0
1
−2
−1
0
1
2

EBays
Sample Quantiles
−3
−2
−1
0
1
−2
−1
0
1
2

X.SJF
Sample Quantiles
0.5
0.0
−0.5
−1.0
−1.5
−2.0
−2
−1
0
1
2
X.SJI
Sample Quantiles
0.5
0.0
−0.5
−1.0
−1.5
−2.0
−2
−1
0
1
2
X.EBays
Sample Quantiles
0.0
−0.5
−1.0
−1.5
−2
−1
0
1
2

SJF
SJI
EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

Fitted ytT + CI

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Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

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Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

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Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20

EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
5
10
15
20

X.SJI
Estimate
7.4
7.6
7.8
8.0
8.2
8.4
8.6
5
10
15
20

X.EBays
Estimate
7.3
7.4
7.5
7.6
7.7
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.4
0.2
0.0
−0.2
−0.4
−0.6
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
−3
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2

SJI
Sample Quantiles
−3
−2
−1
0
1
−2
−1
0
1
2

EBays
Sample Quantiles
−3
−2
−1
0
1
−2
−1
0
1
2

X.SJF
Sample Quantiles
0.5
0.0
−0.5
−1.0
−1.5
−2.0
−2
−1
0
1
2
X.SJI
Sample Quantiles
0.5
0.0
−0.5
−1.0
−1.5
−2.0
−2
−1
0
1
2
X.EBays
Sample Quantiles
0.0
−0.5
−1.0
−1.5
−2
−1
0
1
2

SJF
SJI
EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

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Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

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Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
5
10
15
20
X.SJI
Estimate
7.4
7.6
7.8
8.0
8.2
8.4
8.6
5
10
15
20
X.EBays
Estimate
7.3
7.4
7.5
7.6
7.7
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.4
0.2
0.0
−0.2
−0.4
−0.6
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
−3
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2
SJI
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2
EBays
Sample Quantiles
−1.0
−0.5
0.0
0.5
1.0
−2
−1
0
1
2

X.SJF
Sample Quantiles
0.5
0.4
0.3
0.2
0.1
0.0
−0.2
−2
−1
0
1
2
X.SJI
Sample Quantiles
1.0
0.5
0.0
−0.5
−2
−1
0
1
2
X.EBays
Sample Quantiles
0.4
0.2
0.0
−0.2
−2
−1
0
1
2

SJF
SJI
EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
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Fitted ytT + CI

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Cholesky standardized model smoothation residuals

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation residuals

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Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

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Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

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Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
5
10
15
20
X.SJI
Estimate
7.4
7.6
7.8
8.0
8.2
8.4
8.6
5
10
15
20
X.EBays
Estimate
7.3
7.4
7.5
7.6
7.7
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.4
0.2
0.0
−0.2
−0.4
−0.6
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
−3
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2
SJI
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2
EBays
Sample Quantiles
−1.0
−0.5
0.0
0.5
1.0
−2
−1
0
1
2

X.SJF
Sample Quantiles
0.5
0.4
0.3
0.2
0.1
0.0
−0.2
−2
−1
0
1
2
X.SJI
Sample Quantiles
1.0
0.5
0.0
−0.5
−2
−1
0
1
2
X.EBays
Sample Quantiles
0.4
0.2
0.0
−0.2
−2
−1
0
1
2

SJF
SJI
EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
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Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

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Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

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Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

SJI + CI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20

EBays + CI
Estimate
6.5
7.0
7.5
5
10
15
20

X.SJF
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

X.SJI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20

X.EBays
Estimate
6.5
7.0
7.5
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
1.0
0.5
0.0
−0.5
−1.0
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
1
0
−1
−2
−2
−1
0
1
2
SJI
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.5
−2
−1
0
1
2
EBays
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−1
0
1

X.SJF
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.5
−2
−1
0
1
2
X.SJI
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.5
−2
−1
0
1
2
X.EBays
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12
SJI
ACF
1.0
0.5
0.0
−0.5
0
2
4
6
8
10
12
EBays
ACF
1.0
0.5
0.0
−0.5
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

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Fitted ytT + CI

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Fitted ytT + CI

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Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

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Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

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Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

SJI + CI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20

EBays + CI
Estimate
6.5
7.0
7.5
5
10
15
20

X.SJF
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

X.SJI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20

X.EBays
Estimate
6.5
7.0
7.5
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
1.0
0.5
0.0
−0.5
−1.0
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
1
0
−1
−2
−2
−1
0
1
2
SJI
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.5
−2
−1
0
1
2
EBays
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−1
0
1

X.SJF
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.5
−2
−1
0
1
2
X.SJI
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.5
−2
−1
0
1
2
X.EBays
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12
SJI
ACF
1.0
0.5
0.0
−0.5
0
2
4
6
8
10
12
EBays
ACF
1.0
0.5
0.0
−0.5
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
4
5
6
7
8
9
5
10
15
20

X.SJI
Estimate
5
6
7
8
9
10
5
10
15
20

X.EBays
Estimate
5
6
7
8
9
10
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
1.0
0.5
0.0
−0.5
−1.0
1.5
−1.5
0.6
0.4
0.2
−0.2
−0.4
−0.6
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
−3
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−2
−1
0
1
2
SJI
Sample Quantiles
1
0
−1
−2
−2
−1
0
1
2
EBays
Sample Quantiles
0
−1
−2
−3
−2
−1
0
1
2

X.SJF
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2

X.SJI
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2

X.EBays
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2

SJF
SJI
EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation residuals

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation residuals

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
4
5
6
7
8
9
5
10
15
20

X.SJI
Estimate
5
6
7
8
9
10
5
10
15
20

X.EBays
Estimate
5
6
7
8
9
10
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
1.0
0.5
0.0
−0.5
−1.0
1.5
−1.5
0.6
0.4
0.2
−0.2
−0.4
−0.6
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
−3
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−2
−1
0
1
2
SJI
Sample Quantiles
1
0
−1
−2
−2
−1
0
1
2
EBays
Sample Quantiles
0
−1
−2
−3
−2
−1
0
1
2

X.SJF
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2

X.SJI
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2

X.EBays
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2

SJF
SJI
EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation residuals

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation residuals

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
4
5
6
7
8
9
5
10
15
20

X.SJI
Estimate
5
6
7
8
9
10
5
10
15
20

X.EBays
Estimate
5
6
7
8
9
10
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
1.0
0.5
0.0
−0.5
−1.0
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
SJI
EBays
Sample Quantiles
Sample Quantiles
Sample Quantiles
−1.0
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2

X.SJF
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2

X.SJI
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2

X.EBays
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2

SJF
SJI
EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation residuals

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation residuals

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
4
5
6
7
8
9
5
10
15
20

X.SJI
Estimate
5
6
7
8
9
10
5
10
15
20

X.EBays
Estimate
5
6
7
8
9
10
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
1.0
0.5
0.0
−0.5
−1.0
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
SJI
EBays
Sample Quantiles
Sample Quantiles
Sample Quantiles
−1.0
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2

X.SJF
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2

X.SJI
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2

X.EBays
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2

SJF
SJI
EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation residuals

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation residuals

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
4
5
6
7
8
9
5
10
15
20

X.SJI
Estimate
5
6
7
8
9
10
5
10
15
20

X.EBays
Estimate
5
6
7
8
9
10
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
1.0
0.5
0.0
−0.5
−1.0
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2
SJI
Sample Quantiles
1.0
0.5
0.0
−0.5
−2
−1
0
1
2
EBays
Sample Quantiles
−0.5
−1.0
−1.5
−2
−1
0
1
2

X.SJF
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2

X.SJI
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2

X.EBays
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

SJI
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation residuals

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation residuals

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
4
5
6
7
8
9
5
10
15
20

X.SJI
Estimate
5
6
7
8
9
10
5
10
15
20

X.EBays
Estimate
5
6
7
8
9
10
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
1.0
0.5
0.0
−0.5
−1.0
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2
SJI
Sample Quantiles
1.0
0.5
0.0
−0.5
−2
−1
0
1
2
EBays
Sample Quantiles
−0.5
−1.0
−1.5
−2
−1
0
1
2

X.SJF
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2

X.SJI
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2

X.EBays
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

SJI
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation residuals

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation residuals

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
X.SJI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
X.EBays
Estimate
6.8
7.0
7.2
7.4
7.6
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.3
0.2
0.1
0.0
−0.1
−0.2
−0.3
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2
−1
0
1
2

SJI
Sample Quantiles
2
1
0
−1
−2
−2
−1
0
1
2

EBays
Sample Quantiles
2
1
0
−1
−2
−1
0
1
2

X.SJF
Sample Quantiles
2
1
0
−1
−2
−1
0
1
2
X.SJI
Sample Quantiles
0.10
0.05
0.00
−0.10
−0.20
−2
−1
0
1
2
X.EBays
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12
SJI
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12
EBays
ACF
1.0
0.5
0.0
−0.5
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

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Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
X.SJI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
X.EBays
Estimate
6.8
7.0
7.2
7.4
7.6
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.3
0.2
0.1
0.0
−0.1
−0.2
−0.3
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2
−1
0
1
2

SJI
Sample Quantiles
2
1
0
−1
−2
−2
−1
0
1
2

EBays
Sample Quantiles
2
1
0
−1
−2
−1
0
1
2

X.SJF
Sample Quantiles
2
1
0
−1
−2
−1
0
1
2
X.SJI
Sample Quantiles
0.10
0.05
0.00
−0.10
−0.20
−2
−1
0
1
2
X.EBays
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2

SJF
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12
SJI
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12
EBays
ACF
1.0
0.5
0.0
−0.5
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

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Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.5
7.0
7.5
5
10
15
20
X.SJI
Estimate
5
6
7
8
9
10
11
5
10
15
20
X.EBays
Estimate
7.0
7.2
7.4
7.6
7.8
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.5
0.0
−0.5
−1.0
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
−3
−4
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2
SJI
Sample Quantiles
2
1
0
−1
−2
−3
−4
−2
−1
0
1
2
EBays
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2
−1
0
1
2

X.SJF
Sample Quantiles
0.0
0.5
1.0
1.5
−2
−1
0
1
2
X.SJI
Sample Quantiles
−1.0
−0.5
0.0
0.5
1.0
−2
−1
0
1
2
X.EBays
Sample Quantiles
−0.5
0.0
0.5
1.0
−2
−1
0
1
2

SJF
SJI
EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

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Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.6
6.8
7.0
7.2
7.4
7.6
7.8
5
10
15
20

X.SJF
Estimate
6.5
7.0
7.5
5
10
15
20
X.SJI
Estimate
5
6
7
8
9
10
11
5
10
15
20
X.EBays
Estimate
7.0
7.2
7.4
7.6
7.8
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
0.5
0.0
−0.5
−1.0
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
−3
−4
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2
SJI
Sample Quantiles
2
1
0
−1
−2
−3
−4
−2
−1
0
1
2
EBays
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2
−1
0
1
2

X.SJF
Sample Quantiles
0.0
0.5
1.0
1.5
−2
−1
0
1
2
X.SJI
Sample Quantiles
−1.0
−0.5
0.0
0.5
1.0
−2
−1
0
1
2
X.EBays
Sample Quantiles
−0.5
0.0
0.5
1.0
−2
−1
0
1
2

SJF
SJI
EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.5
7.0
7.5
8.0
5
10
15
20

X.SJF
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

X.SJI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20

X.EBays
Estimate
6.5
7.0
7.5
8.0
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
1.0
0.5
0.0
−0.5
−1.0
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2
SJI
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2
EBays
Sample Quantiles
1.0
0.5
0.0
−0.5
−2
−1
0
1
2

X.SJF
Sample Quantiles
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2
X.SJI
Sample Quantiles
−1.0
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2
X.EBays
Sample Quantiles
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2

SJF
SJI
EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

SJF + CI
Estimate
6.0
6.5
7.0
7.5
5
10
15
20
SJI + CI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20
EBays + CI
Estimate
6.5
7.0
7.5
8.0
5
10
15
20

X.SJF
Estimate
6.0
6.5
7.0
7.5
5
10
15
20

X.SJI
Estimate
6.5
7.0
7.5
8.0
8.5
5
10
15
20

X.EBays
Estimate
6.5
7.0
7.5
8.0
5
10
15
20

SJF
SJI
EBays
Observation residuals, y − E[y]
1.0
0.5
0.0
−0.5
−1.0
5
10
15
20

SJF
SJI
EBays
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.SJF
X.SJI
X.EBays
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

SJF
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2
SJI
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.0
−2
−1
0
1
2
EBays
Sample Quantiles
1.0
0.5
0.0
−0.5
−2
−1
0
1
2

X.SJF
Sample Quantiles
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2
X.SJI
Sample Quantiles
−1.0
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2
X.EBays
Sample Quantiles
−0.5
0.0
0.5
1.0
1.5
−2
−1
0
1
2

SJF
SJI
EBays
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

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Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Y1 + CI
Estimate
4
2
0
−2
−4
−6
−8
0
200
400
600
800

Y2 + CI
Estimate
5
0
−5
−15
−25
0
200
400
600
800

X1
X2
X3
X4
X5
X6
X7
X8
X9
Estimate
0
200
400
600
800
100
0
−100
−200
−300
−400
50
−50
−150
−250
20
10
−10
−20

X10
X11
X12
Estimate
Estimate
Estimate
20
10
0
−10
−20
10
5
0
−5
−10
−15
5
0
−5
−10
−15
0
200
400
600
800
0
200
400
600
800
0
200
400
600
800

Y1
Y2
Observation residuals, y − E[y]
2
0
−2
−4
−6
5
0
−5
−10
−15
−20
−25
0
200
400
600
800

Y1
Y2
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
0
200
400
600
800

X1
X2
X3
X4
X5
X6
X7
X8
X9
Standardized state residuals, xtT − E[x]

X10
X11
X12
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
10
0
−10
−20
0
200
400
600
800

Y1
Sample Quantiles
5
0
−5
−10
−3
−2
−1
0
1
2
3

Y2
Sample Quantiles
5
0
−5
−10
−15
−20
−3
−2
−1
0
1
2
3

X1
X2
X3
X4
X5
X6
X7
X8
X9
Sample Quantiles

X10
X11
X12
Sample Quantiles
Sample Quantiles
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
10
0
−10
−20
−3 −2 −1 0 1 2 3

Y1
ACF
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

Y2
ACF
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

States xtT

This is the estimate of X conditioned on the data from t=1 to T. Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T. Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

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Cholesky standardized model smoothation residuals

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation residuals

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

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Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Y1 + CI
Estimate
5
0
−5
−10
0
200
400
600
800

Y2 + CI
Estimate
5
0
−5
−15
−25
0
200
400
600
800

X1
X2
X3
X4
X5
X6
X7
X8
X9
Estimate
0
200
400
600
800

X10
X11
X12
Estimate
Estimate
Estimate
4
2
0
−2
−4
10
5
0
−5
−10
−15
5
0
−5
−10
−15
0
200
400
600
800
0
200
400
600
800
0
200
400
600
800

Y1
Y2
Observation residuals, y − E[y]
2
0
−2
−4
−6
5
0
−5
−10
−15
−20
−25
0
200
400
600
800

Y1
Y2
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
0
200
400
600
800

X1
X2
X3
X4
X5
X6
X7
X8
X9
Standardized state residuals, xtT − E[x]

X10
X11
X12
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
10
0
−10
−20
0
200
400
600
800

Y1
Sample Quantiles
4
2
0
−2
−4
−6
−10
−3
−2
−1
0
1
2
3

Y2
Sample Quantiles
5
0
−5
−10
−15
−20
−3
−2
−1
0
1
2
3

X1
X2
X3
X4
X5
X6
X7
X8
X9
Sample Quantiles

X10
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−3
−2
−1
0
1
2
3

X11
Sample Quantiles
10
0
−10
−20
−3
−2
−1
0
1
2
3

X12
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
−3
−2
−1
0
1
2
3

Y1
ACF
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

Y2
ACF
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

This is the estimate of X conditioned on the data from t=1 to T. Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the estimate of X conditioned on the data from t=1 to T. Confidence intervals are for the expected value of X (conditioned on the data up to T).

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

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Cholesky standardized model smoothation residuals

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation residuals

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Y1 + CI
Estimate
6
4
2
0
−2
−4
0
200
400
600
800

Y2 + CI
Estimate
0.05
0.00
−0.05
−0.10
0
200
400
600
800

X1
X2
X3
X4
X5
X6
X7
X8
X9
Estimate
0
200
400
600
800

X10
X11
X12
Estimate
Estimate
Estimate
4
2
0
−2
−4
0.05
0.00
−0.05
−0.10
0.00
−0.05
−0.10
0
200
400
600
800

Y1
Y2
Observation residuals, y − E[y]
2
1
0
−1
−2
0
200
400
600
800

Y1
Y2
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
0
200
400
600
800

X1
X2
X3
X4
X5
X6
X7
X8
X9
Standardized state residuals, xtT − E[x]
0
200
400
600
800
5
0
−5
−10
−15
2
1
0
−1
−2
4
2
0
−2
−4

X10
X11
X12
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
10
5
0
−5
−10
−20
0
200
400
600
800

Y1
Sample Quantiles
4
2
0
−2
−4
−6
−8
−3
−2
−1
0
1
2
3

Y2
Sample Quantiles
5
0
−5
−10
−15
−20
−3
−2
−1
0
1
2
3

X1
X2
X3
X4
X5
X6
X7
X8
X9
Sample Quantiles

X10
X11
X12
Sample Quantiles
Sample Quantiles
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
10
5
0
−5
−10
−20
−3
−2
−1
0
1
2
3

Y1
ACF
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

Y2
ACF
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

This is the estimate of X conditioned on the data from t=1 to T. Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the estimate of X conditioned on the data from t=1 to T. Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

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Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation residuals

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Y1 + CI
Estimate
5
0
−5
0
200
400
600
800

Y2 + CI
Estimate
0.2
0.0
−0.2
−0.4
−0.6
0
200
400
600
800

X1
X2
X3
X4
X5
X6
X7
X8
X9
Estimate
0
200
400
600
800

X10
Estimate
4
2
0
−2
−4
0
200
400
600
800

X11
Estimate
0.2
0.0
−0.2
−0.4
−0.6
0
200
400
600
800

X12
Estimate
2
0
−2
−4
0
200
400
600
800

Y1
5
0
−5
0
200
400
600
800
Y2
0.6
0.4
0.2
−0.2
−0.6
0
200
400
600
800
Observation residuals, y − E[y]

Y1
Y2
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
0
200
400
600
800

X1
X2
X3
X4
X5
X6
X7
X8
X9
Standardized state residuals, xtT − E[X]

X10
X11
X12
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
0
−5
−10
−15
0
200
400
600
800

Y1
Sample Quantiles
4
2
0
−2
−4
−6
−3
−2
−1
0
1
2
3

Y2
Sample Quantiles
5
0
−5
−10
−20
−3
−2
−1
0
1
2
3

X1
X2
X3
X4
X5
X6
X7
X8
X9
Sample Quantiles

X10
X11
X12
Sample Quantiles
Sample Quantiles
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
5
0
−5
−10
−15
−3
−2
−1
0
1
2
3

Y1
ACF
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

Y2
ACF
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

This is the estimate of X conditioned on the data from t=1 to T. Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the estimate of X conditioned on the data from t=1 to T. Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Cholesky standardized model smoothation residuals

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation residuals

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Y1 + CI
Estimate
4
2
0
−2
−4
−6
0
200
400
600
800
Y2 + CI
Estimate
0.6
0.4
0.2
0.0
−0.2
−0.4
0
200
400
600
800
Y3 + CI
Estimate
0.15
0.05
−0.05
−0.15
0
200
400
600
800

X1
X2
X3
X4
X5
X6
X7
X8
X9
Estimate
0
200
400
600
800

X10
X11
X12
X13
X14
Estimate
0
200
400
600
800
4
2
0
−2
−4
0.4
0.2
0.0
−0.2
−0.4
0.2
0.1
0.0
−0.1
−0.2

Y1
Y2
Y3
Observation residuals, y − E[y]
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
3
2
1
0
−1
−2
−3
0
200
400
600
800

Y1
Y2
Y3
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
0
200
400
600
800

X1
X2
X3
X4
X5
X6
X7
X8
X9
Standardized state residuals, xtT − E[X]

X10
X11
X12
X13
X14
Standardized state residuals, xtT − E[x]
0
200
400
600
800
2
1
0
−1
−2
−5
−10
−15
−20
10
5

Y1
Y2
Y3
Sample Quantiles
Sample Quantiles
Sample Quantiles
−3 −2 −1 0 1 2 3
−3 −2 −1 0 1 2 3
−3 −2 −1 0 1 2 3
2 0 −2 −4 −6 −8
5 0 −5 −10 −15 −20
6 4 2 0 −2 −4

X1
X2
X3
X4
X5
X6
X7
X8
X9
Sample Quantiles

X10
X11
X12
X13
X14
Sample Quantiles
Sample Quantiles
Sample Quantiles
Sample Quantiles
Sample Quantiles
1.0
0.5
0.0
−0.5
−1.0
0
−5
−10
−15
−20
10
5
−3 −2 −1 0 1 2 3

Y1
Y2
Y3
ACF
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

This is the estimate of X conditioned on the data from t=1 to T. Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the estimate of X conditioned on the data from t=1 to T. Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Y1 + CI
Y2 + CI
Y3 + CI
Y4 + CI
Estimate
0
200
400
600
800
6
4
2
−2
−4
−6
0.2
0.1
0.0
−0.1
0.4
−0.2

X1
X2
X3
X4
X5
X6
X7
X8
X9
Estimate
0
200
400
600
800

X10
X11
X12
X13
X14
X15
X16
Estimate
0
200
400
600
800

Y1
Y2
Y3
Y4
Observation residuals, y − E[y]
4
2
0
−2
−4
1
−1
1.0
0.5
−0.5
−1.0
0.10
0.05
0.00
−0.05
0
200
400
600
800

Y1
Y2
Y3
Y4
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
0
200
400
600
800

X1
X2
X3
X4
X5
X6
X7
X8
X9
Standardized state residuals, xtT − E[x]

X10
X11
X12
X13
X14
X15
X16
Standardized state residuals, xtT − E[x]
0
200
400
600
800

Y1
Y2
Y3
Y4
Sample Quantiles
Sample Quantiles
Sample Quantiles
Sample Quantiles
−3 −2 −1 0 1 2 3
−3 −2 −1 0 1 2 3
−3 −2 −1 0 1 2 3
−3 −2 −1 0 1 2 3
4 2 0 −2 −4 −6 −8
5 0 −5 −10 −15 −20
6 4 2 0 −2 −4
6 4 2 0 −2 −4 −6 −8

X1
X2
X3
X4
X5
X6
X7
X8
X9
Sample Quantiles

X10
X11
X12
X13
X14
X15
X16
Sample Quantiles

Y1
Y2
Y3
Y4
ACF
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
15
20
25
30

This is the estimate of X conditioned on the data from t=1 to T. Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the estimate of X conditioned on the data from t=1 to T. Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Y1 + CI
Estimate
0.0
0.5
1.0
1.5
5
10
15
20

X.Y1
Estimate
0.0
0.5
1.0
1.5
5
10
15
20

Y1
Observation residuals, y − E[y]
50
0
−50
5
10
15
20

Y1
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.Y1
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

Y1
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2.0
−2
−1
0
1
2

X.Y1
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2

Y1
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Cholesky standardized model smoothation residuals

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation residuals

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation residuals

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation residuals

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Y1 + CI
Estimate
0.0
0.5
1.0
1.5
5
10
15
20

X.Y1
Estimate
0.0
0.5
1.0
1.5
5
10
15
20

Y1
Observation residuals, y − E[y]
50
0
−50
5
10
15
20

Y1
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.Y1
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

Y1
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2.0
−2
−1
0
1
2

X.Y1
Sample Quantiles
−2
−1
0
1
−2
−1
0
1
2

Y1
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Cholesky standardized model smoothation residuals

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation residuals

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation residuals

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation residuals

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Y1 + CI
Estimate
0.0
0.5
1.0
1.5
5
10
15
20

X.Y1
Estimate
0.0
0.5
1.0
1.5
5
10
15
20

Y1
Observation residuals, y − E[y]
50
0
−50
5
10
15
20

Y1
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.Y1
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

Y1
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2.0
−2
−1
0
1
2

X.Y1
Sample Quantiles
1
0
−1
−2
−2
−1
0
1
2

Y1
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation residuals

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation residuals

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Y1 + CI
Estimate
0.0
0.5
1.0
1.5
5
10
15
20

X.Y1
Estimate
0.0
0.5
1.0
1.5
5
10
15
20

Y1
Observation residuals, y − E[y]
50
0
−50
5
10
15
20

Y1
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
5
10
15
20

X.Y1
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
5
10
15
20

Y1
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2.0
−2
−1
0
1
2

X.Y1
Sample Quantiles
1
0
−1
−2
−2
−1
0
1
2

Y1
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
2
4
6
8
10
12

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T.
Confidence intervals are for the expected value of X (conditioned on the data up to T).

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Fitted ytT + CI

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation residuals

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation residuals

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Nile + CI
Estimate
1400
1200
1000
800
600
0
20
40
60
80
100

X.Nile
Estimate
1200
1100
1000
900
800
700
0
20
40
60
80
100

Nile
Observation residuals, y − E[y]
400
200
0
−200
−400
0
20
40
60
80
100

Nile
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
−3
0
20
40
60
80
100

X.Nile
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
−3
0
20
40
60
80
100

Nile
Sample Quantiles
2
1
0
−1
−2
−3
−2
−1
0
1
2

X.Nile
Sample Quantiles
1
0
−1
−2
−3
−2
−1
0
1
2

Nile
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
0
5
10
15
20

This is the estimate of X conditioned on the data from t=1 to T. Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the estimate of X conditioned on the data from t=1 to T. Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation residuals

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation residuals

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Nile + CI
Estimate
1400
1200
1000
800
600
0
20
40
60
80
100

X.Nile
Estimate
1200
1100
1000
900
800
700
0
20
40
60
80
100

Nile
Observation residuals, y − E[y]
400
200
0
−200
−400
0
20
40
60
80
100

Nile
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
−3
0
20
40
60
80
100

X.Nile
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
−3
0
20
40
60
80
100

Nile
Sample Quantiles
2
1
0
−1
−2
−3
−2
−1
0
1
2

X.Nile
Sample Quantiles
1
0
−1
−2
−3
−2
−1
0
1
2

Nile
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
0
5
10
15
20

This is the estimate of X conditioned on the data from t=1 to T. Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the estimate of X conditioned on the data from t=1 to T. Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation residuals

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation residuals

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation residuals acf

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Y1 + CI
Estimate
1400
1200
1000
800
600
0
20
40
60
80
100

X.Y1
Estimate
700
800
900
1000
1100
0
20
40
60
80
100

Y1
Observation residuals, y − E[y]
200
0
−200
−400
0
20
40
60
80
100

Y1
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
−3
0
20
40
60
80
100

X.Y1
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
0
20
40
60
80
100

Y1
Sample Quantiles
2
1
0
−1
−2
−2
−1
0
1
2

X.Y1
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2.0
−2
−1
0
1
2

Y1
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
0
5
10
15
20

States xtT

This is the estimate of X conditioned on the data from t=1 to T. Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T. Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation residuals

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation residuals

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Residuals normality test

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Residuals normality test

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Y1 + CI
Estimate
1400
1200
1000
800
600
0
20
40
60
80
100

X.Y1
Estimate
700
800
900
1000
1100
0
20
40
60
80
100

Y1
Observation residuals, y − E[y]
200
0
−200
−400
0
20
40
60
80
100

Y1
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
−3
0
20
40
60
80
100

X.Y1
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
0
20
40
60
80
100

Y1
Sample Quantiles
2
1
0
−1
−2
−2
−1
0
1
2

X.Y1
Sample Quantiles
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2.0
−2
−1
0
1
2

Y1
ACF
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
0
5
10
15
20

States xtT

This is the estimate of X conditioned on the data from t=1 to T. Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T. Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation residuals

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation residuals

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Residuals normality test

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Residuals normality test

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

HL + CI
Estimate
0.4
0.2
0.0
−0.2
−0.6
0
20
40
60
80
100

Folland + CI
Estimate
0.2
0.0
−0.2
−0.4
0
20
40
60
80
100

X1
Estimate
0.2
0.0
−0.2
−0.4
0
20
40
60
80
100

HL
Folland
Observation residuals, y − E[y]
0.4
0.2
0.0
−0.2
−0.4
0.2
0.1
0.0
−0.1
−0.2
0
20
40
60
80
100

HL
Folland
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
−3
0
20
40
60
80
100

X1
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
0
20
40
60
80
100

HL
Sample Quantiles
−3
−2
−1
0
1
2
−2
−1
0
1
2

Folland
Sample Quantiles
−2
−1
0
1
2
−2
−1
0
1
2

X1
Sample Quantiles
2
1
0
−1
−2
−2
−1
0
1
2

HL
ACF
1.0
0.8
0.6
0.4
0.2
−0.2
0
5
10
15
20

Folland
ACF
1.0
0.8
0.6
0.4
0.2
−0.2
0
5
10
15
20

States xtT

This is the estimate of X conditioned on the data from t=1 to T. Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T. Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

HL + CI
Estimate
0.4
0.2
0.0
−0.2
−0.6
0
20
40
60
80
100

Folland + CI
Estimate
0.2
0.0
−0.2
−0.4
0
20
40
60
80
100

X1
Estimate
0.2
0.0
−0.2
−0.4
0
20
40
60
80
100

HL
Folland
Observation residuals, y − E[y]
0.4
0.2
0.0
−0.2
−0.4
0.2
0.1
0.0
−0.1
−0.2
0
20
40
60
80
100

HL
Folland
Standardized observation residuals, y − E[y]
2
1
0
−1
−2
−3
0
20
40
60
80
100

X1
Standardized state residuals, xtT − E[x]
2
1
0
−1
−2
0
20
40
60
80
100

HL
Sample Quantiles
−3
−2
−1
0
1
2
−2
−1
0
1
2

Folland
Sample Quantiles
−2
−1
0
1
2
−2
−1
0
1
2

X1
Sample Quantiles
2
1
0
−1
−2
−2
−1
0
1
2

HL
ACF
1.0
0.8
0.6
0.4
0.2
−0.2
0
5
10
15
20

Folland
ACF
1.0
0.8
0.6
0.4
0.2
−0.2
0
5
10
15
20

States xtT

This is the estimate of X conditioned on the data from t=1 to T. Confidence intervals are for the expected value of X (conditioned on the data up to T).

States xtT

This is the estimate of X conditioned on the data from t=1 to T. Confidence intervals are for the expected value of X (conditioned on the data up to T).

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

This is the model fitted value of Y conditioned on the data from t=1 to T. Use fitted.ytt1 if you want the one−step−ahead predictions instead. The CI is for the expected value of Y and the data points will not fall within the CI. Use prediction intervals to compare the data to intervals.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Innovations (one−step ahead) residuals.These residuals should not have a temporal trend and 95% of residuals should fall within the CIs. A violation of this indicates that the model cannot fit the data.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized model smoothation (ytT) residuals. These residuals should not have a temporal trend. Residuals outside the +/− 2 limits are potential outliers.

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized state smoothation (xtT) residuals. Residuals outside the +/− 2 limits are potential outliers of x(t) to x(t+1).

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized model innovation (ytt1) residuals. The residuals should be Gaussian

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized state smoothation (xtT) residuals. The residuals should be Gaussian. Note if the data have many missing values, the state residuals will not be Gaussian. In that case, manually remove the states residuals associated with missing data and redo the qq plot.

Cholesky standardized model innovation (ytt1) residuals. These residuals should be temporally uncorrelated.

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