Package: wqc (via r-universe)

May 15, 2026

Title Wavelet Quantile Correlation Analysis

Version 0.1.2

Date 2025-06-12

Description Estimate and plot wavelet quantile correlations(Kumar and Padakandla,2022) between two time series. Wavelet quantile correlation is used to capture the dependency between two time series across quantiles and different frequencies. This method is useful in identifying potential hedges and safe-haven instruments for investment purposes. See Kumar and Padakandla(2022) <doi:10.1016/j.frl.2022.102707> for further details.

Depends R (>= 4.0)

Imports waveslim, QCSIS, stats, lattice, grid, viridisLite

License GPL-3

Encoding UTF-8

RoxygenNote 7.3.2

Suggests knitr, rmarkdown, testthat (>= 3.0.0)

VignetteBuilder knitr

Config/testthat/edition 3

NeedsCompilation no

Author Anoop S Kumar [aut, cre]

Maintainer Anoop S Kumar <akumar.sasikumar@gmail.com>

Repository https://anoopgift.r-universe.dev

Date/Publication 2025-06-18 08:40:02 UTC

RemoteUrl https://github.com/cran/wqc

RemoteRef HEAD

RemoteSha 2bde8cb7902762c111918e712bb4b1c50950dec2

Contents

`apply_quantile_correlation` *Apply Quantile Correlation Analysis*

Description

Apply Quantile Correlation Analysis

Usage

```
apply_quantile_correlation(data, quantiles, wf = "la8", J = 8, n_sim = 1000)
```

Arguments

`data`	Data frame containing the time series data. The first column is the reference series; subsequent columns are the target series.
`quantiles`	Numeric vector of quantiles.
`wf`	Wavelet family name.
`J`	Decomposition level.
`n_sim`	Number of simulations for confidence intervals.

Value

A combined data.frame of quantile correlation results, with one row per level-quantile-series combination.

Examples

```
data <- data.frame(x = rnorm(1000), y = rnorm(1000), z = rnorm(1000))
quantiles <- c(0.05, 0.5, 0.95)
res_df <- apply_quantile_correlation(data, quantiles,n_sim=10)
head(res_df)
```

`plot_quantile_heatmap` *Plot Wavelet Quantile Correlation Heatmap*

Description

Create a heatmap of estimated quantile-wavelet correlations with white borders for cells where the estimate lies outside its 95% confidence interval.

Usage

```
plot_quantile_heatmap(
  df,
  label_levels = TRUE,
  palette = viridisLite::viridis(100)
)
```

Arguments

`df`	Data frame with columns `Level`, `Quantile`, `Estimated_QC`, `CI_Lower`, and `CI_Upper`.
`label_levels`	Logical; if `TRUE`, label the y-axis with level numbers.
`palette`	Color palette vector for `col.regions`; default uses `viridisLite::viridis(100)`.

Value

A `lattice` `levelplot` object (invisibly).

Examples

```
df <- data.frame(
  Level        = rep(1:2, each = 3),
  Quantile     = rep(c(0.1, 0.5, 0.9), times = 2),
  Estimated_QC = runif(6, -1, 1),
  CI_Lower     = rep(-0.5, 6),
  CI_Upper     = rep(0.5, 6)
)
# Use :: for namespace clarity, avoid library() calls
plot_quantile_heatmap(df, label_levels = TRUE, palette = viridisLite::viridis(100))
```

quantile_correlation_analysis
Quantile Correlation Analysis

Description

Quantile Correlation Analysis

Usage

```
quantile_correlation_analysis(x, y, quantiles, wf = "la8", J = 8, n_sim = 1000)
```

Arguments

x	Numeric vector for the first time series.
y	Numeric vector for the second time series.
quantiles	Numeric vector of quantiles.
wf	Wavelet family name.
J	Decomposition level.
n_sim	Number of simulations for confidence intervals.

Value

Data frame with quantile correlation estimates and confidence intervals for one pair of series.

Examples

```
data <- data.frame(x = rnorm(1000), y = rnorm(1000))
quantiles <- c(0.05, 0.5, 0.95)
result <- quantile_correlation_analysis(data$x, data$y, quantiles,n_sim=10)
head(result)
```

Index