Package 'makicoint'

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Type Package

Title Maki Cointegration Test with Structural Breaks

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Description Implements the Maki (2012) <doi:10.1016/j.econmod.2012.05.006> cointegration test that allows for an unknown number of structural breaks. The test detects cointegration relationships in the presence of up to five structural breaks in the intercept and/or slope coefficients. Four different model specifications are supported: level shifts, level shifts with trend, regime shifts, and trend with regime shifts. The method is described in Maki (2012) ``Tests for cointegration allowing for an unknown number of breaks'' <doi:10.1016/j.econmod.2012.05.006>.

License GPL-3

Encoding UTF-8

Depends R (>= 3.5.0)

Suggests testthat (>= 3.0.0), knitr, rmarkdown

VignetteBuilder knitr

RoxygenNote 7.3.3

URL https://github.com/merwanroudane/makicoint

BugReports https://github.com/merwanroudane/makicoint/issues

NeedsCompilation no

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Contents

coint_maki 2
cv_coint_maki 3
print.maki_test 4

Index **5**

`coint_maki` *Maki Cointegration Test with Structural Breaks*

Description

Performs the Maki (2012) cointegration test that allows for an unknown number of structural breaks. The test detects cointegration relationships in the presence of up to five structural breaks.

Usage

```
coint_maki(y, m = 1, model = 0, trimm = 0.15, lagoption = 1)
```

Arguments

`y`	Matrix or data frame with dependent variable in first column and independent variable(s) in remaining columns.
`m`	Maximum number of breaks to test (0-3). Values 4-5 require extended implementation.
`model`	Model specification (0-3): • 0: Level shift • 1: Level shift with trend • 2: Regime shift (changes in intercept and slope) • 3: Trend and regime shift
`trimm`	Trimming parameter (default 0.15). Determines the minimum distance between breaks as a fraction of sample size.
`lagoption`	Lag selection (0=no lags, 1=optimal lags using t-sig criterion).

Value

A list with class "maki_test" containing:

`statistic`	The test statistic (minimum tau)
`breakpoints`	Vector of detected break point locations
`critical_values`	Critical values at 1%, 5%, and 10% levels
`reject_1`	Logical; reject null at 1% level?
`reject_5`	Logical; reject null at 5% level?
`reject_10`	Logical; reject null at 10% level?
`conclusion`	Text conclusion of the test
`m`	Number of breaks tested
`model`	Model specification used
`n`	Sample size

References

Maki, D. (2012). Tests for cointegration allowing for an unknown number of breaks. *Economic Modelling*, 29(5), 2011-2015.

Examples

```
# Generate cointegrated series with one break
set.seed(123)
n <- 100
e1 <- rnorm(n)
e2 <- rnorm(n)
x <- cumsum(e1)
y <- 0.5 * x + cumsum(e2)
y[51:100] <- y[51:100] + 2  # Add structural break

# Run Maki test
data <- cbind(y, x)
result <- coint_maki(data, m=1, model=0)
print(result)
```

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cv_coint_maki *Get Critical Values for Maki Cointegration Test*

Description

Returns critical values for the Maki cointegration test based on Maki (2012) Table 1.

Usage

```
cv_coint_maki(n, m, model)
```

Arguments

n	Sample size (currently not used as values are asymptotic).
m	Number of breaks (0-5).
model	Model specification (0-3): • 0: Level shift • 1: Level shift with trend • 2: Regime shift • 3: Trend and regime shift

Value

Numeric vector of critical values at 1%, 5%, and 10% significance levels.

Examples

```
# Get critical values for m=1, model=0
cv_coint_maki(100, m=1, model=0)
```

`print.maki_test` *Print Method for Maki Test Results*

Description

Prints a formatted summary of the Maki cointegration test results, including test statistic, break points, critical values, and conclusions.

Usage

```
## S3 method for class 'maki_test'
print(x, ...)
```

Arguments

`x`	An object of class "maki_test" returned by `coint_maki`
`...`	Additional arguments (currently unused)

Value

Returns the input object `x` invisibly. This function is called primarily for its side effect of printing formatted test results to the console.

Index

coint_maki, 2, *4*
cv_coint_maki, 3

print.maki_test, 4