Package ‘ivx’

May 4, 2019

Type Package

Title Robust Econometric Inference

Version 1.0.0

Description Drawing statistical inference on the coefficients of a short- or long-horizon predictive regression with persistent regressors by using the IVX method of Magdalinos and Phillips (2009) and <doi:10.1017/S0266466608090154> Kostakis, Magdalinos and Stamatogiannis (2015) <doi:10.1093/rfs/hhu139>.

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URL https://github.com/kvasilopoulos/ivx

BugReports https://github.com/kvasilopoulos/ivx/issues

Depends R (>= 3.1)

Imports magrittr (>= 1.5), Rcpp (>= 0.12.18), tibble (>= 2.1.1)

Suggests covr (>= 3.2.1), spelling (>= 2.1), testthat (>= 2.1.1)

LinkingTo Rcpp (>= 1.0.1), RcppArmadillo (>= 0.9.300.2.0)

Encoding UTF-8

Language en-US

LazyData true

RoxygenNote 6.1.1

NeedsCompilation yes

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Repository CRAN

Date/Publication 2019-05-04 07:20:03 UTC

R topics documented:

delta *Calculate the delta coefficient*

Description

Computes the long-run correlation coefficient between the residuals of the predictive regression and the autoregressive model for the regressor.

Usage

```
delta(object)
```

Arguments

`object`	on object of class "ivx"

Value

A vector of the estimated correlation coefficients. This should have row and column names corresponding to the parameter names given by the coef method.

Examples

```
mod <- ivx(Ret ~ LTY, data = monthly)

delta(mod)
```

ivx *Fitting IVX Models*

Description

ivx fits predictive regression models. The method allows standard chi-square testing for regressors with different degrees of persistence, from stationary to mildly explosive, and can be used for both short- and long-horizon predictive regressions.

Usage

```
ivx(formula, data, horizon, na.action, contrasts = NULL, offset, ...)

## S3 method for class 'ivx'
print(x, digits = max(3L, getOption("digits") - 3L), ...)
```

Arguments

`formula` an object of class "`formula`" (or one that can be coerced to that class): a symbolic description of the model to be fitted. The details of model specification are given under 'Details'.

`data` an optional data frame, list or environment (or object coercible by `as.data.frame` to a data frame) containing the variables in the model. If not found in `data`, the variables are taken from `environment(formula)`, typically the environment from which `lm` is called.

`horizon` is the horizon (default horizon = 1 corresponds to a short-horizon regression)

`na.action` a function which indicates what should happen when the data contain `NA`s. The default is set by the `na.action` setting of `options`, and is `na.fail` if that is unset. The 'factory-fresh' default is `na.omit`. Another possible value is `NULL`, no action. Value `na.exclude` can be useful.

`contrasts` an optional list. See the `contrasts.arg` of `model.matrix.default`.

`offset` this can be used to specify an *a priori* known component to be included in the linear predictor during fitting. This should be `NULL` or a numeric vector or matrix of extents matching those of the response. One or more `offset` terms can be included in the formula instead or as well, and if more than one are specified their sum is used. See `model.offset`.

`...` additional arguments to be passed to the low level regression fitting functions (see below).

`x` logicals. If `TRUE` the corresponding components of the fit (the model frame, the model matrix, the response, the QR decomposition) are returned.

`digits` the number of significant digits to use when printing.

Value

an object of class "ivx".

References

Magdalinos, T., & Phillips, P. (2009). Limit Theory for Cointegrated Systems with Moderately Integrated and Moderately Explosive Regressors. Econometric Theory, 25(2), 482-526.

Kostakis, A., Magdalinos, T., & Stamatogiannis, M. P. (2014). Robust econometric inference for stock return predictability. The Review of Financial Studies, 28(5), 1506-1553.

Examples

```
# Univariate
ivx(Ret ~ LTY, data = monthly)

# Multivariate
ivx(Ret ~ LTY + TBL , data = monthly)

# Longer horizon
ivx(Ret ~ LTY + TBL, data = monthly, horizon = 4)
```

`ivx_fit` *Fitter Functions for ivx Models*

Description

Basic function called by ‘ivx‘ to fit predictive models. These should only be used directly by experienced users.

Usage

```
ivx_fit(y, x, horizon = 1, offset = NULL, ...)
```

Arguments

`y`	vector of observations of length `n`, or a matrix with `n` rows.
`x`	design matrix of dimension `n * p`.
`horizon`	is the horizon (default horizon = 1 corresponds to a short-horizon regression)
`offset`	(numeric of length `n`). This can be used to specify an *a priori* known component to be included in the linear predictor during fitting.
`...`	currently disregarded.

Examples

```
ivx_fit(monthly$Ret, as.matrix(monthly$LTY))
```

`monthly` *Monthly data*

Description

- Date: year-month-date (monthly frequency)
- DE: dividend payout ratio
- LTY: long-term yield
- DY: dividend yield
- DP: dividend-price ratio
- TBL: T-bill rate
- EP: earnings-price ratio
- BM: book-to-market value ratio
- INF: inflation rate
- DFY: default yield spread
- NTIS: net equity expansion
- TMS: term spread
- Ret: S&P 500 value-weighted log excess returns

Usage

```
monthly
```

Format

A data.frame with 13 variables and 1,033 observations.

Source

https://drive.google.com/open?id=1FdT2STHO2Lnlweom4AwICVf-rpVMfgV4

`quarterly` *Quarterly data*

Description

- Date: year-month-date
- DE: dividend payout ratio
- LTY: long-term yield
- DY: dividend yield
- DP: dividend-price ratio
- TBL: T-bill rate
- EP: earnings-price ratio
- BM: book-to-market value ratio
- INF: inflation rate
- DFY: default yield spread
- NTIS: net equity expansion
- TMS: term spread
- Ret: S&P 500 value-weighted log excess returns

Usage

```
quarterly
```

Format

A data.frame with 13 variables and 345 observations.

Source

`https://drive.google.com/open?id=1FdT2STHO2Lnlweom4AwICVf-rpVMfgV4`

`summary.ivx` *Summarizing IVX Model Fits*

Description

summary method for class "ivx".

Usage

```
## S3 method for class 'ivx'
summary(object, ...)

## S3 method for class 'summary.ivx'
print(x, digits = max(3L, getOption("digits") -
  3L), signif.stars = getOption("show.signif.stars"), ...)
```

Arguments

`object`	object of class "ivx", usually, a result of a call to ivx.
`...`	further arguments passed to or from other methods.
`x`	an object of class `"summary.lm"`, usually, a result of a call to `summary.lm`.
`digits`	the number of significant digits to use when printing.
`signif.stars`	logical. If `TRUE`, ‘significance stars’ are printed for each coefficient.

Examples

```
mod <- ivx(Ret ~ LTY, data = monthly)

summary(mod)
```

`vcov.ivx` *Calculate Variance-Covariance Matrix for a Fitted Model Object*

Description

Calculate Variance-Covariance Matrix for a Fitted Model Object

Usage

```
## S3 method for class 'ivx'
vcov(object, complete = TRUE, ...)

## S3 method for class 'summary.ivx'
vcov(object, complete = TRUE, ...)
```

Arguments

`object`	a fitted ivx and summary.ivx object.
`complete`	logical indicating if the full variance-covariance matrix should be returned. When complete = TRUE, vcov() is compatible with coef().
`...`	additional arguments for method functions.

Value

A matrix of the estimated covariances between the parameter estimates of the model. This should have row and column names corresponding to the parameter names given by the coef method.

Examples

```
mod <- ivx(Ret ~ LTY, data = monthly)

vcov(mod)
```

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