Package 'epo'

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Type Package

Title Enhanced Portfolio Optimization (EPO)

Version 0.1.0

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Description Implements the Enhanced Portfolio Optimization (EPO) method as described in Pedersen, Babu and Levine (2021) <doi:10.2139/ssrn.3530390>.

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URL https://github.com/Reckziegel/epo, https://reckziegel.github.io/epo/

BugReports https://github.com/Reckziegel/epo/issues

Encoding UTF-8

RoxygenNote 7.2.3

Imports assertthat (>= 0.2.1), dplyr (>= 1.1.2), rlang (>= 1.1.1), xts (>= 0.13.1)

Suggests testthat (>= 3.0.0)

Config/testthat/edition 3

NeedsCompilation no

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Contents

epo *Enhanced Portfolio Optimization (EPO)*

Description

Computes the optimal portfolio allocation using the EPO method.

Usage

```
epo(
  x,
  signal,
  lambda,
  method = c("simple", "anchored"),
  w,
  anchor = NULL,
  normalize = TRUE,
  endogenous = TRUE
)

## Default S3 method:
epo(
  x,
  signal,
  lambda,
  method = c("simple", "anchored"),
  w,
  anchor = NULL,
  normalize = TRUE,
  endogenous = TRUE
)

## S3 method for class 'tbl'
epo(
  x,
  signal,
  lambda,
  method = c("simple", "anchored"),
  w,
  anchor = NULL,
  normalize = TRUE,
  endogenous = TRUE
)

## S3 method for class 'xts'
epo(
  x,
```

```
  signal,
  lambda,
  method = c("simple", "anchored"),
  w,
  anchor = NULL,
  normalize = TRUE,
  endogenous = TRUE
)

## S3 method for class 'matrix'
epo(
  x,
  signal,
  lambda,
  method = c("simple", "anchored"),
  w,
  anchor = NULL,
  normalize = TRUE,
  endogenous = TRUE
)
```

Arguments

x	A data-set with asset returns. It should be a `tibble`, a `xts` or a `matrix`.
signal	A `double` vector with the investor's belief's (signals, forecasts).
lambda	A `double` with the investor's risk-aversion preference.
method	A `character`. One of: `"simple"` or `"anchored"`.
w	A `double` between `0` and `1`. The shrinkage level increases from 0 to 1.
anchor	A `double` vector with the anchor (benchmark) in which the allocation should not deviate too much from. Only used when `method = "anchored"`.
normalize	A `boolean` indicating whether the allocation should be normalized to sum `1` (full-investment constraint). The default is `normalize = TRUE`.
endogenous	A `boolean` indicating whether the risk-aversion parameter should be considered endogenous (only used when `method = "anchored"`). The default is `endogenous = TRUE`.

Value

The optimal allocation vector.

Examples

```
x <- diff(log(EuStockMarkets)) # stock returns
s <- colMeans(x) # it could be any signal

##################
### Simple EPO ###
##################
```

```
# Traditional Mean-Variance Analysis
epo(x = x, signal = s, lambda = 10, method = "simple", w = 0)

# 100% Shrinkage
epo(x = x, signal = s, lambda = 10, method = "simple", w = 1)

# 50% Classical MVO and 50% Shrinkage
epo(x = x, signal = s, lambda = 10, method = "simple", w = 0.5)

####################
### Anchored EPO ###
####################

benchmark <- rep(0.25, 4) # 1/N Portfolio

# Traditional Mean-Variance Analysis
epo(x = x, signal = s, lambda = 10, method = "anchored", w = 0.0, anchor = benchmark)

# 100% on the Anchor portfolio
epo(x = x, signal = s, lambda = 10, method = "anchored", w = 1.0, anchor = benchmark)

# Somewhere between the two worlds
epo(x = x, signal = s, lambda = 10, method = "anchored", w = 0.5, anchor = benchmark)
```

Index