Package: portn (via r-universe)

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Type Package

Title Portfolio Analysis for Nature

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Description The functions are designed to find the efficient
mean-variance frontier or portfolio weights for static
portfolio (called Markowitz portfolio) analysis in resource
economics or nature conservation. Using the nonlinear
programming solver ('Rsolnp'), this package deals with the
quadratic minimization of the variance-covariances without
shorting (i.e., non-negative portfolio weights) studied in Ando
and Mallory (2012) <doi:10.1073/pnas.1114653109>. See the
examples, testing versions, and more details from:
<https://github.com/ysd2004/portn>.

Depends R (>= 4.0.0), Rsolnp

License GPL (>= 2)

URL https://github.com/ysd2004/portn

Encoding UTF-8

LazyData true

RoxygenNote 7.2.3

Repository https://ysd2004.r-universe.dev

RemoteUrl https://github.com/ysd2004/portn

RemoteRef HEAD

RemoteSha 83cf7bc899895ce56936fc1f3d1aeee4994829e9

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plotef	*Plot the efficient frontier line*

Description

Plotting the efficient frontier line from Markowitz (static) portfolio analysis

Usage

```
plotef(mptres)
```

Arguments

mptres   a list from `staticmpt` function

Details

This function provides the efficient frontier (blue line) using the result from `staticmpt` function. An array of inefficient weights are presented with red line. The observed returns and standard deviations are black dots.

Value

A plot of the efficient frontier

References

Ando, A. W. and M. L. Mallory. (2012) Optimal Portfolio Design to Reduce Climate-related Conservation Uncertainty in the Prairie Pothole Region. Proceedings of the National Academy of Sciences (PNAS). 109 (17) pp. 6484-6489.

See Also

[staticmpt](#)

Examples

```
## No change likely scenario of CCI in Figure 2, Ando and Mallory (2012)
rs <- c(0.265,0.671,0.372)
vmat <- matrix(c(0.003,0.005,-0.006,0.005,0.013,-0.010,-0.006,-0.010,0.012),ncol=3)
mus <- seq(min(rs),max(rs),length.out=100)
cci <- staticmpt(mus,rs,vmat)
plotef(cci)
```

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staticmpt	*Static Portfolio Optimization*

Description

The function generates portfolio weights for nature or conservation

Usage

```
staticmpt(mus, rbar, vmat)
```

Arguments

mus	An array of the expected values
rbar	An array of the observed mean returns
vmat	A variance and covariance matrix

Details

This function solves the series of the standard Markowitz portfolio analysis for nature or conservation, i.e., the quadratic problem without shorting.

min w' vmat w
s.t. w rbar = mu
w' 1 = 1 where w >= 0

where `w` is an array of non-negative portfolio weights, `rbar` is an array of the observed mean returns, `vmat` a matrix of variance-covariance matrix, and `mu` is an expected value.

Value

A list including the following component:

rbar An array of the observed mean returns

vmat A variance and covariance matrix

efdata A data.frame including:
- `sd` standard deviation
- `er` expected return in mus
- `conv` convergence status in optimization (0 = successful, otherwise: not an interior solution)
- `w1, w2, ...` portfolio weights
- `ef` 1 = on the efficient frontier and 0 = not on the efficient frontier

References

Ando, A. W. and M. L. Mallory. (2012) Optimal Portfolio Design to Reduce Climate-related Conservation Uncertainty in the Prairie Pothole Region. Proceedings of the National Academy of Sciences (PNAS). 109 (17) pp. 6484-6489.

See Also

plotef

Examples

```
## No change likely scenario of CCI in Figure 2, Ando and Mallory (2012)
rs <- c(0.265,0.671,0.372)
vmat <- matrix(c(0.003,0.005,-0.006,0.005,0.013,-0.010,-0.006,-0.010,0.012),ncol=3)
mus <- seq(min(rs),max(rs),length.out=100)
cci <- staticmpt(mus,rs,vmat)
```

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