

The financial Package

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Title Solving financial problems in R

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Depends R (>= 2.0)

Description Time value of money, cash flows and other financial functions.

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URL <http://www.r-project.org>, <http://www.komsta.net/>

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*cf**Cash Flow model*

Description

Calculates a Cash Flow model from a vector of flows.

Usage

```
cf(x, i = NULL, safe = NULL, rein = safe)
```

Arguments

<code>x</code>	a vector of cash flows.
<code>i</code>	a vector of periodic rates used in calculating NPV, NFV and NUS table.
<code>safe</code>	a vector of safe periodic rates using in calculating MIRR.
<code>rein</code>	a vector of reinvestment periodic rates using in calculating MIRR.

Details

The negative values are money paid out, the positive values are money received in.

IRR (Internal rate of return) is calculated by solving polynomial, using `polyroot` function. If IRR equation have several real solutions, all are found.

NPV extremes are found in the same method, after obtaining first-order derivative of IRR equation.

MIRR table and NPV table are created only if `i`, `safe` and `rein` are given (are not null).

Value

An object of class "cf", being a list of the following compounds:

<code>cf</code>	a vector of cash flows.
<code>mirr</code>	a matrix containing for each safe and reinvestment rate pair - modified internal rate of return values. If not calculated, has NULL value.
<code>tab</code>	a matrix containing for each periodic rate (<code>i</code>) - NPV, NFV and NUS value. If not calculated, set to NULL.
<code>irr</code>	a vector of IRR values - real rates giving NPV equal to zero. The number of values are dependent of sign changes in cash flow series (one or more real roots of polynomial).
<code>ext</code>	a vector of rate values giving extremes in NPV - maxima or minima. May have no values, if they are no sign changes in cash flows.

Author(s)

Lukasz Komsta

See Also[summary.cf](#)**Examples**

```
y = cf(c(-2500, 6250, -3800), 1:10, 2:11, 4:13)
y
summary(y)
plot(y)
plot(y, type="n")
```

`ireff`*Effective and nominal financial rates*

Description

Calculates effective and nominal rates for periodic and continuous compounding.

Usage

```
ireff(nom, p)
irnom(eff, p)
```

Arguments

<code>nom</code>	a vector of nominal rates.
<code>eff</code>	a vector of effective rates.
<code>p</code>	a vector of times of compounding, may be Inf for continuous compounding.

Value

A vector of nominal (`irnom`) or effective (`ireff`) rates.

Author(s)

Lukasz Komsta

See Also[irnom](#)**Examples**

```
ireff(20, c(1:20, Inf))
irnom(20, c(1:20, Inf))
```

`plot.cf`*Plot of cash flow model*

Description

Plots bar plot of the cash flows or NPV versus periodic rate.

Usage

```
plot.cf(x, type = c("bar", "npv"), ...)
```

Arguments

<code>x</code>	an object of class "cf", obtained using <code>cf</code> .
<code>type</code>	type of the plot.
<code>...</code>	additional arguments passed to <code>barplot</code> internally.

Details

The "bar" plot displays all cash flows as bars, their cumulative sum as a line-plot and NPV as horizontal lines.

The "npv" plot displays dependence between rate and NPV in range 0 - 100 percent. The roots (IRR values) and extremes are indicated by vertical lines.

Author(s)

Lukasz Komsta

See Also

[cf](#)

Examples

```
y = cf(c(-2500, 6250, -3800), 1:10, 2:11, 4:13)
plot(y)
plot(y, type="npv")
```

`plot.tvm`*Plot TVM models*

Description

Makes bar plots of TVM models.

Usage

```
plot.tvm(x, row = 1, ...)
```

Arguments

<code>x</code>	an object of class "tvm" containing time value of money model.
<code>row</code>	a row number in the model to plot.
<code>...</code>	additional arguments passed to <code>barplot</code> internally.

Details

The present value, payments and future value are plotted as bars. Cumulative sum of these are indicated by a line.

Author(s)

Lukasz Komsta

See Also

[tvm](#)

Examples

```
y=tvm(pv=10000, i=10, n=10, pmt=NA)
plot(y)
```

`sppv`*Single Payment or Uniform Series Present and Future Values*

Description

Calculate SPPV, SPFV, USPV and USFV factors from given rates and numbers of periods.

Usage

```
sppv(i, n)
spfv(i, n)
uspv(i, n)
usfv(i, n)
```

Arguments

`i` a vector of rates (in percents).
`n` a vector of periods.

Value

A vector of SPPV, SPFV, USPV or USFV values.

Author(s)

Lukasz Komsta

Examples

```
spfv(10, 1:100)
sppv(10, 1:100)
uspv(10, 1:100)
usfv(10, 1:100)
```

summary.cf

Summarizing cash flow models

Description

This function gives summary for each step in cash flow model.

Usage

```
summary.cf(object, flows = 2:length(object$cf), ...)
```

Arguments

`object` an object of "cf" class, created using `cf`.
`flows` a vector of first flow numbers to summarize, default is from first two flows to all flows.
`...` additional arguments, currently ignored.

Details

Summarizing is done by printing all information for first "flows" flows. By default, the summary of first 2, 3, 4 ... n flows are printed.

Author(s)

Lukasz Komsta

See Also[cf](#)**Examples**

```
y = cf(c(-10, 5, 5, 5, 5, 5))
summary(y)
```

`summary.tvm`*Summarizing TVM model by printing its amortization table*

Description

Prints amortization table of TVM model.

Usage

```
summary.tvm(object, row = 1, ...)
```

Arguments

<code>object</code>	an object of class "tvm", created by tvm
<code>row</code>	a row number to make summary, default first row.
<code>...</code>	additional arguments, currently ignored.

Details

A table containing balance, interest, principal and payment for each step is produced and printed.

Author(s)

Lukasz Komsta

See Also[tvm](#)**Examples**

```
y=tvm(pv=10000, i=10, n=10, pmt=NA)
summary(y)
```

tvm

*Fitting time value of money models***Description**

This function fits generalized time value of money models.

Usage

```
tvm(i = 0, n = 1, pv = 0, fv = 0, pmt = 0, days = 360/pyr, adv = 0, pyr = 12, cyr =
```

Arguments

<code>i</code>	a vector of nominal rates, as percentages.
<code>n</code>	a vector of period numbers.
<code>pv</code>	a vector of present values.
<code>fv</code>	a vector of future values.
<code>pmt</code>	a vector of payments.
<code>days</code>	a vector of days from begin of period to make payment. Default value is equivalent to END mode, 0 means BEGIN mode.
<code>adv</code>	a vector of numbers of payments made in advance.
<code>pyr</code>	a vector of numbers of payments per year.
<code>cyr</code>	a vector of numbers of compounding periods per year.

Details

In each variant (row) of arguments, one and EXACTLY one value must be set to NA, and this value is calculated from the others to "fit the model". For example, `pv` can be set to `c(10000, NA)` and `pmt` to `c(NA, -100)`. In first row `pmt` will be calculated, in the second - present value.

Value

A matrix of class "tvm" containing all the arguments (one row for each argument vector element).

Author(s)

Lukasz Komsta

Examples

```
y=tvm(pv=10000, i=1:10, n=10, pmt=NA)
y
update(y, pmt=-1000, pv=NA)
update(y, pmt=-1000, n=NA)
```

`update.cf`*Update a cash flow model*

Description

This function changes some data in cash flow model and recalculates it.

Usage

```
update.cf(object, flows = NULL, i = NULL, safe = NULL, rein = NULL, ...)
```

Arguments

<code>object</code>	an object of "cf" class, created by <code>cf</code> function.
<code>flows</code>	new updated flows.
<code>i</code>	a vector of new updated periodic rates.
<code>safe</code>	a vector of new updated safe MIRR rates.
<code>rein</code>	a vector of new updated reinvestment MIRR rates.
<code>...</code>	additional arguments, currently ignored.

Details

The function takes its first arguments, changing its given parameters, and returns recalculated model.

Value

An object of class "cf", see `link{cf}`.

Author(s)

Lukasz Komsta

See Also

[cf](#)

Examples

```
y = cf(c(-2500, 6250, -3800), 1:10, 2:11, 4:13)
y
update(y, i=11:20)
```

 update.tvm

Update time value of money model

Description

Changes something declared in TVM model and recalculates NA values.

Usage

```
update.tvm(object, i = NULL, n = NULL, pv = NULL, fv = NULL, pmt = NULL, days = NULL)
```

Arguments

object	an object of "tvm" class used to update.
i	a vector of nominal rates, as percentages.
n	a vector of period numbers.
pv	a vector of present values.
fv	a vector of future values.
pmt	a vector of payments.
days	a vector of days from begin of period to make payment. Default value is equivalent to END mode, 0 means BEGIN mode.
adv	a vector of numbers of payments made in advance.
pyr	a vector of numbers of payments per year.
cyr	a vector of numbers of compounding periods per year.
...	additional arguments, currently ignored.

Details

NA values must be REDECLARED in updating process, because TVM object cannot remember what parameters were NA!

Value

An updated object of "tvm" class, see [tvm](#)

Author(s)

Lukasz Komsta

See Also

[tvm](#)

Examples

```
y=tvm(pv=10000, i=1:10, n=10, pmt=NA)
update(y, pmt=-1000, n=NA)
```

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