Package ‘FinCal’

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Title  Time Value of Money, Time Series Analysis and Computational Finance

Description

Package for time value of money calculation, time series analysis and computational finance.

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Computing bank discount yield (BDY) for a T-bill

**Description**
Computing bank discount yield (BDY) for a T-bill

**Usage**
`bdy(d, f, t)`

**Arguments**
- `d`: the dollar discount, which is equal to the difference between the face value of the bill and the purchase price
- `f`: the face value (par value) of the bill
- `t`: number of days remaining until maturity

**See Also**
`bdy2mmy`

**Examples**
```r
bdy(d=1500, f=100000, t=120)
```

Computing money market yield (MMY) for a T-bill

**Description**
Computing money market yield (MMY) for a T-bill

**Usage**
`bdy2mmy(bdy, t)`

**Arguments**
- `bdy`: bank discount yield
- `t`: number of days remaining until maturity
Technical analysts - Candlestick chart: show prices for each period as a continuous line. The box is clear if the closing price is higher than the opening price, or filled red if the closing is lower than the opening price.

### Usage

```r
candlestickChart(ohlc, start = NULL, end = NULL, main = "", ...)```

### Arguments

- **ohlc**: output from `get.ohlc.yahoo` or `get.ohlc.google`
- **start**: start date to plot, if not specified, all date in `ohlc` will be included
- **end**: end date to plot
- **main**: an overall title for the plot
- **...**: Arguments to be passed to `ggplot`

### See Also

- `get.ohlc.yahoo`
- `get.ohlc.google`

### Examples

```r
# google <- get.ohlc.yahoo("GOOG", start="2013-07-01", end="2013-08-01"); candlestickChart(google)
# apple <- get.ohlc.google("AAPL", start="2013-07-01", end="2013-08-01"); candlestickChart(apple)
```
### cash.ratio

**Description**

Cash ratio – Liquidity ratios measure the firm’s ability to satisfy its short-term obligations as they come due.

**Usage**

```r
cash.ratio(cash, ms, cl)
```

**Arguments**

- `cash` - Cash
- `ms` - Marketable securities
- `cl` - Current liabilities

**See Also**

- `current.ratio`
- `quick.ratio`

**Examples**

```r
cash.ratio(cash=3000, ms=2000, cl=2000)
```

### coefficient.variation

**Description**

Computing Coefficient of variation

**Usage**

```r
coefficient.variation(sd, avg)
```

**Arguments**

- `sd` - Standard deviation
- `avg` - Average value
See Also

Sharpe.ratio

Examples

coefficient.variation(sd=0.15,avg=0.39)

cogs(units=cinv=price=method="FIFO")
cogs(units=cinv=price=method="LIFO")
cogs(units=cinv=price=method="WAC")

---

cogs  

Cost of goods sold and ending inventory under three methods  
(FIFO,LIFO,Weighted average)

Description

Cost of goods sold and ending inventory under three methods (FIFO,LIFO,Weighted average)

Usage

cogs(uinv, pinv, units, price, sinv, method = "FIFO")

Arguments

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>uinv</td>
<td>units of beginning inventory</td>
</tr>
<tr>
<td>pinv</td>
<td>price of beginning inventory</td>
</tr>
<tr>
<td>units</td>
<td>nx1 vector of inventory units. inventory purchased ordered by time (from first to last)</td>
</tr>
<tr>
<td>price</td>
<td>nx1 vector of inventory price. same order as units</td>
</tr>
<tr>
<td>sinv</td>
<td>units of sold inventory</td>
</tr>
<tr>
<td>method</td>
<td>inventory methods: FIFO (first in first out, permitted under both US and IFRS), LIFO (late in first out, US only), WAC (weighted average cost, US and IFRS)</td>
</tr>
</tbody>
</table>

Examples

cogs(uinv=2,pinv=2,units=c(3,5),price=c(3,5),sinv=7,method="FIFO")
cogs(uinv=2,pinv=2,units=c(3,5),price=c(3,5),sinv=7,method="LIFO")
cogs(uinv=2,pinv=2,units=c(3,5),price=c(3,5),sinv=7,method="WAC")
current.ratio

**current ratio**  – Liquidity ratios measure the firm’s ability to satisfy its short-term obligations as they come due.

**Description**

current ratio – Liquidity ratios measure the firm’s ability to satisfy its short-term obligations as they come due.

**Usage**

`current.ratio(ca, cl)`

**Arguments**

- `ca`  current assets
- `cl`  current liabilities

**See Also**

- `cash.ratio`
- `quick.ratio`

**Examples**

`current.ratio(ca=8000, cl=2000)`

**ddb**

**Depreciation Expense Recognition – double-declining balance (DDB), the most common declining balance method, which applies two times the straight-line rate to the declining balance.**

**Description**

Depreciation Expense Recognition – double-declining balance (DDB), the most common declining balance method, which applies two times the straight-line rate to the declining balance.

**Usage**

`ddb(cost, rv, t)`
Arguments

- **cost**: cost of long-lived assets
- **rv**: residual value of the long-lived assets at the end of its useful life. DDB does not explicitly use the asset’s residual value in the calculations, but depreciation ends once the estimated residual value has been reached. If the asset is expected to have no residual value, the DB method will never fully depreciate it, so the DB method is typically changed to straight-line at some point in the asset’s life.
- **t**: length of the useful life

See Also

- `slde`

Examples

```r
ddb(cost=1200, rv=200, t=5)
```

---

**Description**

debt ratio – Solvency ratios measure the firm’s ability to satisfy its long-term obligations.

**Usage**

debt.ratio(td, ta)

Arguments

- **td**: total debt
- **ta**: total assets

See Also

- `total.d2e`
- `lt.d2e`
- `financial.leverage`

Examples

```r
debt.ratio(td=6000, ta=20000)
```
diluted.EPS  

**diluted Earnings Per Share**

**Description**

diluted Earnings Per Share

**Usage**

```
diluted.EPS(ni, pd, cpd = 0, cdi = 0, tax = 0, w, cps = 0, cds = 0, iss = 0)
```

**Arguments**

- **ni**: net income
- **pd**: preferred dividends
- **cpd**: dividends on convertible preferred stock
- **cdi**: interest on convertible debt
- **tax**: tax rate
- **w**: weighted average number of common shares outstanding
- **cps**: shares from conversion of convertible preferred stock
- **cds**: shares from conversion of convertible debt
- **iss**: shares issuable from stock options

**See Also**

- EPS
- iss
- was

**Examples**

```
diluted.EPS(ni=115600, pd=10000, cpd=42000, tax=0.4, w=200000, cds=60000)
diluted.EPS(ni=115600, pd=10000, cpd=10000, w=200000, cps=40000)
diluted.EPS(ni=115600, pd=10000, w=200000, iss=2500)
diluted.EPS(ni=115600, pd=10000, cpd=10000, cdi=42000, tax=0.4, w=200000, cps=40000, cds=60000, iss=2500)
```
**discount.rate**  
*Computing the rate of return for each period*

**Description**

Computing the rate of return for each period

**Usage**

`discount.rate(n, pv, fv, pmt, type = 0)`

**Arguments**

- `n`: number of periods
- `pv`: present value
- `fv`: future value
- `pmt`: payment per period
- `type`: payments occur at the end of each period (type=0); payments occur at the beginning of each period (type=1)

**See Also**

- `fv.simple`
- `fv.annuity`
- `fv`
- `pv`
- `pmt`
- `n.period`

**Examples**

`discount.rate(n=5, pv=0, fv=600, pmt=-100, type=0)`
ear

Convert stated annual rate to the effective annual rate

Description
Convert stated annual rate to the effective annual rate

Usage
ear(r, m)

Arguments
r stated annual rate
m number of compounding periods per year

See Also
ear.continuous
hpr2ear
ear2bey
ear2hpr

Examples
ear(r=0.12, m=12)
ear(0.04, 365)

ear.continuous

Convert stated annual rate to the effective annual rate with continuous compounding

Description
Convert stated annual rate to the effective annual rate with continuous compounding

Usage
ear.continuous(r)

Arguments
r stated annual rate
See Also

- `ear`
- `r.norminal`

Examples

```r
ear.continuous(r=0.1)

ear.continuous(0.03)
```

---

### `ear2bey`

**bond-equivalent yield (BEY), 2 x the semiannual discount rate**

---

**Description**

bond-equivalent yield (BEY), 2 x the semiannual discount rate

**Usage**

```r
ear2bey(ear)
```

**Arguments**

- `ear` effective annual rate

**See Also**

- `ear`

**Examples**

```r
ear2bey(ear=0.08)
```

---

### `ear2hpr`

**Computing HPR, the holding period return**

---

**Description**

Computing HPR, the holding period return

**Usage**

```r
ear2hpr(ear, t)
```
Arguments

    ear  effective annual rate
    t    number of days remaining until maturity

See Also

    hpr2ear
    ear
    hpr

Examples

    ear2hpr(ear=0.05039,t=150)

---

EIR

Equivalent/proportional Interest Rates

Description

An interest rate to be applied n times p.a. can be converted to an equivalent rate to be applied p times p.a.

Usage

    EIR(r, n = 1, p = 12, type = c("e","p"))

Arguments

    r  interest rate to be applied n times per year (r is annual rate!)
    n  times that the interest rate r were compounded per year
    p  times that the equivalent rate were compounded per year
    type  equivalent interest rates ('e', default) or proportional interest rates ('p')

Examples

    # monthly interest rate equivalent to 5% compounded per year
    EIR(r=0.05,n=1,p=12)

    # monthly interest rate equivalent to 5% compounded per half year
    EIR(r=0.05,n=2,p=12)

    # monthly interest rate equivalent to 5% compounded per quarter
    EIR(r=0.05,n=4,p=12)

    # annual interest rate equivalent to 5% compounded per month
    EIR(r=0.05,n=12,p=1)
# this is equivalent to
ear(r=0.05,m=12)

# quarter interest rate equivalent to 5% compounded per year
EIR(r=0.05,n=1,p=4)

# quarter interest rate equivalent to 5% compounded per month
EIR(r=0.05,n=12,p=4)

# monthly proportional interest rate which is equivalent to a simple annual interest
EIR(r=0.05,p=12,type='p')

---

**EPS**

*Basic Earnings Per Share*

**Description**

Basic Earnings Per Share

**Usage**

EPS(ni, pd, w)

**Arguments**

- **ni**: net income
- **pd**: preferred dividends
- **w**: weighted average number of common shares outstanding

**See Also**

- diluted.EPS
- was

**Examples**

EPS(ni=10000,pd=1000,w=11000)
**financial.leverage**

**Description**

financial leverage – Solvency ratios measure the firm’s ability to satisfy its long-term obligations.

**Usage**

financial.leverage(te, ta)

**Arguments**

- **te**: total equity
- **ta**: total assets

**See Also**

total.d2e
lt.d2e
debt.ratio

**Examples**

financial.leverage(te=16000, ta=20000)

---

**fv**

*Estimate future value (fv)*

**Description**

Estimate future value (fv)

**Usage**

fv(r, n, pv = 0, pmt = 0, type = 0)

**Arguments**

- **r**: discount rate, or the interest rate at which the amount will be compounded each period
- **n**: number of periods
- **pv**: present value
- **pmt**: payment per period
- **type**: payments occur at the end of each period (type=0); payments occur at the beginning of each period (type=1)
See Also

- `fv.simple`
- `fv.annuity`
- `pv`
- `pmt`
- `n.period`
- `discount.rate`

Examples

```r
fv(0.07, 10, 1000, 10)
```

---

**fv.annuity**  
*Estimate future value of an annuity*

Description

Estimate future value of an annuity

Usage

```r
fv.annuity(r, n, pmt, type = 0)
```

Arguments

- `r`: discount rate, or the interest rate at which the amount will be compounded each period
- `n`: number of periods
- `pmt`: payment per period
- `type`: payments occur at the end of each period (type=0); payments occur at the beginning of each period (type=1)

See Also

- `fv`

Examples

```r
fv.annuity(0.03, 12, -1000)
```

```r
fv.annuity(r=0.03, n=12, pmt=-1000, type=1)
```
fv.simple

Estimate future value (fv) of a single sum

Description

Estimate future value (fv) of a single sum

Usage

fv.simple(r, n, pv)

Arguments

- **r**: discount rate, or the interest rate at which the amount will be compounded each period
- **n**: number of periods
- **pv**: present value

See Also

fv

Examples

fv.simple(0.08,10,-300)
fv.simple(r=0.04,n=20,pv=-50000)

fv.uneven

Computing the future value of an uneven cash flow series

Description

Computing the future value of an uneven cash flow series

Usage

fv.uneven(r, cf)

Arguments

- **r**: stated annual rate
- **cf**: uneven cash flow
See Also

g.simple

Examples

g.uneven(r=0.1, cf=c(-1000, -500, 0, 4000, 3500, 2000))

---

geometric.mean Geometric mean return

Description

Geometric mean return

Usage

geometric.mean(r)

Arguments

r returns over multiple periods

Examples

g.uneven(r=c(-0.0934, 0.2345, 0.0892))

---

get.ohlc.google Download stock prices from Google Finance (open, high, low, close, volume)

Description

Download stock prices from Google Finance (open, high, low, close, volume)

Usage

g.ohlc.google(symbol, start = "2013-01-01", end = "today")

Arguments

symbol symbol of stock, e.g. AAPL, GOOG, SPX
start start date, e.g., 2013-07-31
end end date, e.g., 2013-08-06
**get.ohlc.yahoo**

**See Also**

* get.ohlc.yahoo
* get.ohlcs.google

**Examples**

```
# get.ohlc.google(symbol="AAPL")
# get.ohlc.google(symbol="AAPL", start="2013-08-01")
# get.ohlc.google(symbol="AAPL", start="2013-07-01", end="2013-08-01")
```

---

**get.ohlc.yahoo**  
*Download stock prices from Yahoo Finance (open, high, low, close, volume, adjusted)*

**Description**

Download stock prices from Yahoo Finance (open, high, low, close, volume, adjusted)

**Usage**

```
get.ohlc.yahoo(symbol, start = "firstDay", end = "today", freq = "d")
```

**Arguments**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>symbol</td>
<td>symbol of stock, e.g. AAPL, GOOG, SPX</td>
</tr>
<tr>
<td>start</td>
<td>start date, e.g., 2013-07-31</td>
</tr>
<tr>
<td>end</td>
<td>end date, e.g., 2013-08-06</td>
</tr>
<tr>
<td>freq</td>
<td>time interval, e.g., d:daily, w:weekly, m:monthly</td>
</tr>
</tbody>
</table>

**See Also**

* get.ohlcs.yahoo
* get.ohlc.google

**Examples**

```
# get.ohlc.yahoo(symbol="AAPL")
# get.ohlc.yahoo(symbol="AAPL", start="2013-08-01", freq="d")
# get.ohlc.yahoo(symbol="AAPL", start="2013-07-01", end="2013-08-01", freq="w")
```
get.ohlcs.google  
*Batch download stock prices from Google Finance (open, high, low, close, volume)*

**Description**

Batch download stock prices from Google Finance (open, high, low, close, volume)

**Usage**

```r
google.ohlcs(symbolsL start = "2013-01-01", end = "today")
```

**Arguments**

- **symbols**: symbols of stock, e.g. AAPL, GOOG, SPX
- **start**: start date, e.g., 2013-07-31
- **end**: end date, e.g., 2013-08-06

**See Also**

- `get.ohlcs.google`
- `get.ohlcs.yahoo`

**Examples**

```r
# get.ohlcs.google(symbols=c("AAPL","GOOG","SPY"))
# get.ohlcs.google(symbols=c("AAPL","GOOG","SPY"),start="2013-01-01")
# get.ohlcs.google(symbols=c("AAPL","GOOG","SPY"),start="2013-01-01",end="2013-07-31")
```

google.ohlcs.yahoo  
*Batch download stock prices from Yahoo Finance (open, high, low, close, volume, adjusted)*

**Description**

Batch download stock prices from Yahoo Finance (open, high, low, close, volume, adjusted)

**Usage**

```r
google.ohlcs.yahoo(symbols, start = "firstDay", end = "today", freq = "d")
```
Arguments

symbols symbols of stock, e.g. AAPL, GOOG, SPX
start start date, e.g., 2013-07-31
end end date, e.g., 2013-08-06
freq time interval, e.g., d:daily, w:weekly, m:monthly

See Also

get.ohlc.yahoo
get.ohlc.yahoo

Examples

# get.ohlc.yahoo(symbols=c("AAPL","GOOG","SPY"),freq="d")
# get.ohlc.yahoo(symbols=c("AAPL","GOOG","SPY"),start="2013-01-01",freq="m")

gpm gp

gpm gp

gpm gp

gpm gp

gpm gp

gpm gp

gpm gp

Description

gross profit margin – Evaluate a company’s financial performance

Usage

gpm(gp, rv)

Arguments

gp gross profit, equal to revenue minus cost of goods sold (cogs)
rv revenue (sales)

See Also

npm

Examples

gpm(gp=1000,rv=20000)
harmonic.mean | harmonic mean, average price

**Description**
harmonic mean, average price

**Usage**
harmonic.mean(p)

**Arguments**
p | price over multiple periods

**Examples**
harmonic.mean(p=c(8,9,10))

---

hpr | Computing HPR, the holding period return

**Description**
Computing HPR, the holding period return

**Usage**
hpr(ev, bv, cfr = 0)

**Arguments**
ev | ending value
bv | beginning value
cfr | cash flow received

**See Also**
twrr
hpr2ear
hpr2mmy

**Examples**
hpr(ev=33,bv=30,cfr=0.5)
**hpr2bey**

*bond-equivalent yield (BEY), 2 x the semiannual discount rate*

**Description**

bond-equivalent yield (BEY), 2 x the semiannual discount rate

**Usage**

hpr2bey(hpr, t)

**Arguments**

- **hpr**: holding period return
- **t**: number of month remaining until maturity

**See Also**

hpr

**Examples**

hpr2bey(hpr=0.02, t=3)

---

**hpr2ear**

*Convert holding period return to the effective annual rate*

**Description**

Convert holding period return to the effective annual rate

**Usage**

hpr2ear(hpr, t)

**Arguments**

- **hpr**: holding period return
- **t**: number of days remaining until maturity

**See Also**

ear
hpr
ear2hpr
hpr2mmy: Computing money market yield (MMY) for a T-bill

**Description**

Computing money market yield (MMY) for a T-bill

**Usage**

```r
hpr2mmy(hpr, t)
```

**Arguments**

- `hpr`: holding period return
- `t`: number of days remaining until maturity

**See Also**

- `hpr`
- `mmy2hpr`

**Examples**

```r
hpr2mmy(hpr=0.015228, t=120)
```

---

irr: Computing IRR, the internal rate of return

**Description**

Computing IRR, the internal rate of return

**Usage**

```r
irr(cf)
```

**Arguments**

- `cf`: cash flow, the first cash flow is the initial outlay
irr2

See Also

pv.uneven
npv

Examples

# irr(cf=c(-5, 1.6, 2.4, 2.8))

irr2  Computing IRR, the internal rate of return

Description

This function is the same as irr but can calculate negative value. This function may take a very long time. You can use larger cutoff and larger step to get a less precision irr first. Then based on the result, change from and to, to narrow down the interval, and use a smaller step to get a more precision irr.

Usage

irr2(cf, cutoff = 0.1, from = -1, to = 10, step = 1e-06)

Arguments

cf  cash flow, the first cash flow is the initial outlay
cutoff  threshold to take npv as zero
from  smallest irr to try
to  largest irr to try
step  increment of the irr

See Also

irr

Examples

# irr2(cf=c(-5, 1.6, 2.4, 2.8))
# irr2(cf=c(-200, 50, 60, -70, 30, 20))
iss  \hspace{1cm} \textit{calculate the net increase in common shares from the potential exercise of stock options or warrants}

\textbf{Description}
\textmd{calculate the net increase in common shares from the potential exercise of stock options or warrants}

\textbf{Usage}
iss(amp, ep, n)

\textbf{Arguments}
\begin{itemize}
  \item \texttt{amp} \hspace{1cm} \textmd{average market price over the year}
  \item \texttt{ep} \hspace{1cm} \textmd{exercise price of the options or warrants}
  \item \texttt{n} \hspace{1cm} \textmd{number of common shares that the options and warrants can be convened into}
\end{itemize}

\textbf{See Also}
diluted.EPS

\textbf{Examples}
iss(amp=20, ep=15, n=10000)

\textbf{lineChart} \hspace{1cm} \textit{Technical analysts - Line charts: show prices for each period as a continuous line}

\textbf{Description}
\textmd{Technical analysts - Line charts: show prices for each period as a continuous line}

\textbf{Usage}
lineChart(ohlc, y = "close", main = "", ...)

\textbf{Arguments}
\begin{itemize}
  \item \texttt{ohlc} \hspace{1cm} \textmd{output from get.ohlc.yahoo or get.ohlc.google}
  \item \texttt{y} \hspace{1cm} \textmd{y coordinates: close, open, high, low or adjusted (yahoo data only)}
  \item \texttt{main} \hspace{1cm} \textmd{an overall title for the plot}
  \item \texttt{...} \hspace{1cm} \textmd{Arguments to be passed to ggplot}
Technical analysts - Line charts: show prices for each period as a continuous line for multiple stocks

Usage

```r
lineChartMult(ohlcs, y = "close", main = "", ...) # Arguments
```

Arguments

- `ohlcs`: output from `get.ohlc.yahoo.mult` or `get.ohlc.google.mult`
- `y`: y coordinates: close, open, high, low or adjusted (yahoo data only)
- `main`: an overall title for the plot
- `...`: Arguments to be passed to `ggplot`

See Also

- `get.ohlc.yahoo`
- `get.ohlc.google`
- `lineChart`

Examples

```r
# google <- get.ohlc.yahoo("GOOG"); lineChart(google)
# apple <- get.ohlc.google("AAPL"); lineChart(apple)
```
**lt.d2e**

*long-term debt-to-equity – Solvency ratios measure the firm’s ability to satisfy its long-term obligations.*

**Description**

long-term debt-to-equity – Solvency ratios measure the firm’s ability to satisfy its long-term obligations.

**Usage**

`lt.d2e(ltd, te)`

**Arguments**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ltd</td>
<td>long-term debt</td>
</tr>
<tr>
<td>te</td>
<td>total equity</td>
</tr>
</tbody>
</table>

**See Also**

- `total.d2e`
- `debt.ratio`
- `financial.leverage`

**Examples**

`lt.d2e(ltd=8000, te=20000)`

---

**mmy2hpr**

*Computing HPR, the holding period return*

**Description**

Computing HPR, the holding period return

**Usage**

`mmy2hpr(mmy, t)`

**Arguments**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>mmy</td>
<td>money market yield</td>
</tr>
<tr>
<td>t</td>
<td>number of days remaining until maturity</td>
</tr>
</tbody>
</table>
n.period

See Also

bdy2mmy
hpr2mmy
hpr

Examples

mmy2hpr(mmy=0.04898,t=150)

---

<table>
<thead>
<tr>
<th>n.period</th>
<th>Estimate the number of periods</th>
</tr>
</thead>
</table>

Description

Estimate the number of periods

Usage

n.period(r, pv, fv, pmt, type = 0)

Arguments

- `r`: discount rate, or the interest rate at which the amount will be compounded each period
- `pv`: present value
- `fv`: future value
- `pmt`: payment per period
- `type`: payments occur at the end of each period (type=0); payments occur at the beginning of each period (type=1)

See Also

pv
fv
pmt
discount.rate

discount.rate

Examples

n.period(0.1,-10000,60000000,-50000,0)
n.period(r=0.1,pv=-10000,fv=60000000,pmt=-50000,type=1)
net profit margin – Evaluate a company’s financial performance

**Description**

net profit margin – Evaluate a company’s financial performance

**Usage**

\[
\text{npm}(ni, rv)
\]

**Arguments**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ni</td>
<td>net income</td>
</tr>
<tr>
<td>rv</td>
<td>revenue (sales)</td>
</tr>
</tbody>
</table>

**See Also**

`gpm`

**Examples**

\[
\text{npm}(ni=8000, rv=20000)
\]

Computing NPV, the PV of the cash flows less the initial (time = 0) outlay

**Description**

Computing NPV, the PV of the cash flows less the initial (time = 0) outlay

**Usage**

\[
\text{npv}(r, cf)
\]

**Arguments**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>r</td>
<td>discount rate, or the interest rate at which the amount will be compounded each period</td>
</tr>
<tr>
<td>cf</td>
<td>cash flow, the first cash flow is the initial outlay</td>
</tr>
</tbody>
</table>
pmt

See Also

pv.simple
pv.uneven
irr

Examples

npv(r=0.12, cf=c(-5, 1.6, 2.4, 2.8))

---

pmt Estimate period payment

Description

Estimate period payment

Usage

pmt(r, n, pv, fv, type = 0)

Arguments

r discount rate, or the interest rate at which the amount will be compounded each period
n number of periods
pv present value
fv future value
type payments occur at the end of each period (type=0); payments occur at the beginning of each period (type=1)

See Also

pv
fv
n.period

Examples

pmt(0.08,10,-1000,10)
pmt(r=0.08,n=10,pv=-1000,fv=0)
pmt(0.08,10,-1000,10,1)
Describe the present value (pv)

Usage

\[ pv(r, n, f_v = 0, pmt = 0, type = 0) \]

Arguments

- \( r \): discount rate, or the interest rate at which the amount will be compounded each period
- \( n \): number of periods
- \( f_v \): future value
- \( pmt \): payment per period
- \( type \): payments occur at the end of each period (type=0); payments occur at the beginning of each period (type=1)

See Also

- \( pv \).
- \( pv \).
- \( fv \).
- \( pmt \).
- \( n \).
- \( discount \).

Examples

\[ pv(0.07, 10, 1000, 10) \]

\[ pv(r=0.05, n=20, f_v=1000, pmt=10, type=1) \]
**Description**

Estimate present value (pv) of an annuity

**Usage**

```
pv.annuity(r, n, pmt, type = 0)
```

**Arguments**

- `r` discount rate, or the interest rate at which the amount will be compounded each period
- `n` number of periods
- `pmt` payment per period
- `type` payments occur at the end of each period (type=0); payments occur at the beginning of each period (type=1)

**See Also**

`pv`

**Examples**

```
pv.annuity(0.03,12,1000)
pv.annuity(r=0.0425,n=3,pmt=30000)
```

---

**Description**

Estimate present value of a perpetuity

**Usage**

```
pv.perpetuity(r, pmt, g = 0, type = 0)
```
Estimate present value (pv) of a single sum

**Description**

Estimate present value (pv) of a single sum

**Usage**

```
 pv.simple(r, n, fv)
```

**Arguments**

- **r**: discount rate, or the interest rate at which the amount will be compounded each period
- **n**: number of periods
- **fv**: future value

**See Also**

`pv`

**Examples**

```
 pv.simple(0.07,10,100)
 pv.simple(r=0.03,n=3,fv=1000)
```
**pv.uneven**

Computing the present value of an uneven cash flow series

**Description**
Computing the present value of an uneven cash flow series

**Usage**

```r
pv.uneven(r, cf)
```

**Arguments**

- `r` discount rate, or the interest rate at which the amount will be compounded each period
- `cf` uneven cash flow

**See Also**

- `pv.simple`
- `npv`

**Examples**

```r
pv.uneven(r=0.1, cf=c(-1000, -500, 0, 4000, 3500, 2000))
```

---

**quick.ratio**

quick ratio – Liquidity ratios measure the firm’s ability to satisfy its short-term obligations as they come due.

**Description**
quick ratio – Liquidity ratios measure the firm’s ability to satisfy its short-term obligations as they come due.

**Usage**

```r
quick.ratio(cash, ms, rc, cl)
```

**Arguments**

- `cash` cash
- `ms` marketable securities
- `rc` receivables
- `cl` current liabilities
See Also

current.ratio
cash.ratio

Examples

quick.ratio(cash=3000, ms=2000, rc=1000, cl=2000)

r.continuous

Convert a given nominal rate to a continuous compounded rate

Description

Convert a given nominal rate to a continuous compounded rate

Usage

r.continuous(r, m)

Arguments

r norminal rate
m number of times compounded each year

See Also

r.norminal

Examples

r.continuous(0.03,4)

r.norminal

Convert a given continuous compounded rate to a nominal rate

Description

Convert a given continuous compounded rate to a nominal rate

Usage

r.norminal(rc, m)
\textit{r.perpetuity} \hfill 37

\textbf{Arguments}

\begin{itemize}
  \item[r_c] continuous compounded rate
  \item[m] number of desired times compounded each year
\end{itemize}

\textbf{See Also}

\texttt{r.continuous}
\texttt{ear.continuous}

\textbf{Examples}

\begin{verbatim}
  r.norminal(0.03,1)
  r.norminal(0.03,4)
\end{verbatim}

\begin{verbatim}
  r.perpetuity
  \textit{Rate of return for a perpetuity}
\end{verbatim}

\textbf{Description}

Rate of return for a perpetuity

\textbf{Usage}

\begin{verbatim}
r.perpetuity(pmt, pv)
\end{verbatim}

\textbf{Arguments}

\begin{itemize}
  \item[pmt] payment per period
  \item[pv] present value
\end{itemize}

\textbf{See Also}

\texttt{pv.perpetuity}

\textbf{Examples}

\begin{verbatim}
  r.perpetuity(pmt=4.5, pv=-75)
\end{verbatim}
sfratio

Computing Roy's safety-first ratio

Description
Computing Roy’s safety-first ratio

Usage
SFRatio(rp, rl, sd)

Arguments
rp portfolio return
rl threshold level return
sd standard deviation of portfolio returns

See Also
Sharpe.ratio

Examples
SFRatio(rp=0.09,rl=0.03,sd=0.12)
Sharpe.ratio (Computing Sharpe Ratio)

Description
Computing Sharpe Ratio

Usage
Sharpe.ratio(rp, rf, sd)

Arguments
- \( rp \): portfolio return
- \( rf \): risk-free return
- \( sd \): standard deviation of portfolio returns

See Also
- coefficient.variation
- SFRatio

Examples
Sharpe.ratio(rp=0.038, rf=0.015, sd=0.07)

slde

Depreciation Expense Recognition – Straight-line depreciation (SL) allocates an equal amount of depreciation each year over the asset’s useful life

Description
Depreciation Expense Recognition – Straight-line depreciation (SL) allocates an equal amount of depreciation each year over the asset’s useful life

Usage
slde(cost, rv, t)

Arguments
- \( cost \): cost of long-lived assets
- \( rv \): residual value of the long-lived assets at the end of its useful life
- \( t \): length of the useful life
**See Also**

ddb

**Examples**

slde(cost=1200, rv=200, t=5)

total.d2e
total debt-to-equity – Solvency ratios measure the firm’s ability to satisfy its long-term obligations.

**Description**

total debt-to-equity – Solvency ratios measure the firm’s ability to satisfy its long-term obligations.

**Usage**

total.d2e(td, te)

**Arguments**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>td</td>
<td>total debt</td>
</tr>
<tr>
<td>te</td>
<td>total equity</td>
</tr>
</tbody>
</table>

**See Also**

total.d2e
debt.ratio
financial.leverage

**Examples**

total.d2e(td=6000, te=20000)
**twrr**

*Computing TWRR, the time-weighted rate of return*

**Description**

Computing TWRR, the time-weighted rate of return

**Usage**

```
twrr(ev, bv, cfr)
```

**Arguments**

- `ev`: ordered ending value list
- `bv`: ordered beginning value list
- `cfr`: ordered cash flow received list

**See Also**

`hpr`

**Examples**

```
twrr(ev=c(120,260),bv=c(100,240),cfr=c(2,4))
```

---

**volumeChart**

*Technical analysts - Volume charts: show each period’s volume as a vertical line*

**Description**

Technical analysts - Volume charts: show each period’s volume as a vertical line

**Usage**

```
volumeChart(ohlc, main = "", ...)
```

**Arguments**

- `ohlc`: output from get.ohlc.yahoo or get.ohlc.google
- `main`: an overall title for the plot
- `...`: Arguments to be passed to ggplot
See Also

get.ohlc.yahoo
get.ohlc.google

Examples

# google <- get.ohlc.yahoo("GOOG");
# volumeChart(google)
# apple <- get.ohlc.google("AAPL");
# volumeChart(apple)

was ns nm

**calculate weighted average shares – weighted average number of common shares**

Description

calculate weighted average shares – weighted average number of common shares

Usage

was(ns, nm)

Arguments

ns n x 1 vector vector of number of shares
nm n x 1 vector vector of number of months relate to ns

See Also

EPS
diluted.EPS

Examples

s=c(10000,2000);m=c(12,6);was(ns=s,nm=m)

s=c(11000,4400,-3000);m=c(12,9,4);was(ns=s,nm=m)
**wpr**

*Weighted mean as a portfolio return*

**Description**

Weighted mean as a portfolio return

**Usage**

`wpr(r, w)`

**Arguments**

- `r`: returns of the individual assets in the portfolio
- `w`: corresponding weights associated with each of the individual assets

**Examples**

`wpr(r=c(0.12, 0.07, 0.03), w=c(0.5, 0.4, 0.1))`
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