

Important Risk Management Formulas PDF



Formulas Examples with Units

List of 20 Important Risk Management Formulas

1) Basis Risk Formula

Formula

$$BR = FPC - SPHA$$

Example

$$14755 = 22255 - 7500$$

Evaluate Formula 

2) Calmar Ratio Formula

Formula

$$CR = \left(\frac{ARR}{MDD} \right) \cdot -1$$

Example

$$0.24 = \left(\frac{12}{-50} \right) \cdot -1$$

Evaluate Formula 

3) Credit Spread Formula

Formula

$$CS_p = CBY - TBY$$

Example

$$0.54 = 2.5 - 1.96$$

Evaluate Formula 

4) Credit Value at Risk Formula

Formula

$$CR_v = WCL - ECL$$

Example

$$12500 = 33000 - 20500$$

Evaluate Formula 

5) Default Risk Premium Formula

Formula

$$DRP = R_i - R_f$$

Example

$$5.7 = 6 - 0.3$$

Evaluate Formula 

6) Economic Capital Formula

Formula

$$EC = \frac{EaR}{RR}$$

Example

$$7750 = \frac{620}{0.08}$$

Evaluate Formula 

7) Interest Rate Risk Formula

Formula

$$IR_{risk} = \frac{OP - NP}{NP}$$

Example

$$2.9823 = \frac{450 - 113}{113}$$

Evaluate Formula 



8) Loss Given Default Formula ↻

Formula

$$LGD = 1 - R_r$$

Example

$$0.6 = 1 - 0.4$$

Evaluate Formula ↻

9) Market Risk Premium Formula ↻

Formula

$$MRP = EEMR - R_f$$

Example

$$18.7 = 19 - 0.3$$

Evaluate Formula ↻

10) Maximum Drawdown Formula ↻

Formula

$$MDD = \left(\frac{V_{\text{trough}} - V_{\text{peak}}}{V_{\text{peak}}} \right) \cdot 100$$

Example

$$-50 = \left(\frac{25000 - 50000}{50000} \right) \cdot 100$$

Evaluate Formula ↻

11) Modigliani-Modigliani Measure Formula ↻

Formula

$$M_2 = R_{ap} - R_{mkt}$$

Example

$$20.1 = 25 - 4.9$$

Evaluate Formula ↻

12) Pain Ratio Formula ↻

Formula

$$PR = \frac{ER}{PI}$$

Example

$$7.3333 = \frac{110}{15}$$

Evaluate Formula ↻

13) Probability of Default Regression Model Formula ↻

Formula

$$PD = \frac{1}{1 + \exp(-z)}$$

Example

$$0.5075 = \frac{1}{1 + \exp(-0.03)}$$

Evaluate Formula ↻

14) Risk Adjusted Return on Capital Formula ↻

Formula

$$RAROC = \frac{R - e - el + ifc}{P_{\text{Capital}}}$$

Example

$$374.15 = \frac{780000 - 47000 - 6700 + 22000}{2000}$$

Evaluate Formula ↻

15) Risk Determination Formula ↻

Formula

$$\sigma_R = RI \cdot L$$

Example

$$84 = 21 \cdot 4$$

Evaluate Formula ↻



16) Risk Exposure Formula

Formula

$$RE = RI \cdot p$$

Example

$$10.5 = 21 \cdot 0.5$$

Evaluate Formula 

17) Risk Tolerance Formula

Formula

$$RT = \frac{PEE \cdot 0.35}{MGI}$$

Example

$$17.5 = \frac{500000 \cdot 0.35}{10000}$$

Evaluate Formula 

18) Sortino Ratio Formula

Formula

$$S = \frac{R_p - R_f}{\sigma_d}$$

Example

$$3.5667 = \frac{11 - 0.3}{3}$$

Evaluate Formula 

19) Sterling Ratio Formula

Formula

$$SR = \left(\frac{CAGR}{AMDD - 10} \right) \cdot -1$$

Example

$$10 = \left(\frac{150}{-5 - 10} \right) \cdot -1$$

Evaluate Formula 

20) Upside/Downside Ratio Formula

Formula

$$R_{up/down} = \frac{AI}{DI}$$

Example

$$3.0909 = \frac{17}{5.5}$$

Evaluate Formula 



Variables used in list of Risk Management Formulas above

- **AI** Advancing Issues
- **AMDD** Average Maximum Drawdown
- **ARR** Average Rate of Return
- **BR** Basis Risk
- **CAGR** Compound Annual Growth Rate
- **CBY** Corporate Bond Yield
- **CR** Calmar Ratio
- **CR_v** Credit Value at Risk
- **CS_p** Credit Spread
- **DI** Declining Issues
- **DRP** Default Risk Premium
- **e** Expenses
- **EaR** Earnings at Risk
- **EC** Economic Capital
- **ECL** Expected Credit Loss
- **EEMR** Expected Equity Market Rate
- **el** Expected Loss
- **ER** Effective Return
- **FPC** Future Price of Contract
- **ifc** Income From Capital
- **IR_{risk}** Interest Rate Risk
- **L** Likelihood
- **LGD** Loss Given Default
- **M₂** Modigliani-Modigliani measure
- **MDD** Maximum Drawdown
- **MGI** Monthly Gross Income
- **MRP** Market Risk Premium
- **NP** New Price
- **OP** Original Price
- **p** Probability
- **P_{Capital}** Capital Cost
- **PD** Probability of Default
- **PEE** Public Equity Exposure
- **PI** Pain Index
- **PR** Pain Ratio

Constants, Functions, Measurements used in list of Risk Management Formulas above

- **Functions:** **exp**, **exp(Number)**
n an exponential function, the value of the function changes by a constant factor for every unit change in the independent variable.



- **R** Revenue
- **R_{ap}** Return on Adjusted Portfolio
- **R_f** Risk Free Rate
- **R_i** Interest Rate
- **R_{mkt}** Return on Market Portfolio
- **R_p** Expected Portfolio Return
- **R_{up/down}** Upside/Downside Ratio
- **RAROC** Risk Adjusted Return on Capital
- **RE** Risk Exposure
- **RI** Risk Impact
- **Rr** Recovery Rate
- **RR** Required Rate of Return
- **RT** Risk Tolerance
- **S** Sortino Ratio
- **SPHA** Spot Price of Hedged Asset
- **SR** Sterling Ratio
- **TBY** Treasury Bond Yield
- **V_{peak}** Peak Value
- **V_{trough}** Trough Value
- **WCL** Worst Credit Loss
- **z** Linear Combination
- **σ_d** Standard Deviation of Downside
- **σ_R** Risk



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