Modified Internal Rate of Return (MIRR) and IRR

Modified internal rate of return of a project's cash flows over up to six years with separate finance and reinvestment rates, compared with the ordinary IRR.

Method: Modified internal rate of return

Input parameters

Unit system: SI

Parameter	Value	Unit
Cash flow now (investment, negative)	-1,000,000	
Year 1	300,000	
Year 2	350,000	
Year 3	400,000	
Year 4	300,000	
Year 5	200,000	
Year 6	0	
Finance rate (for negative flows)	9.0000	%
Reinvestment rate (for positive flows)	10.000	%

Calculated results

Parameter	Value	Unit
Modified internal rate of return	13.925	%
Internal rate of return	17.595	%
Present value of the negative flows	1,000,000	
Future value of the positive flows	1,919,080	
Years counted (to the last non-zero flow)	5.0000	

Notes for this case

• MIRR discounts the negative flows to today at the finance rate and compounds the positive flows to the last year at the reinvestment rate, then finds the single rate linking them: MIRR = (FV⁺/PV⁻)^(1/n) − 1. Unlike the IRR it has one answer and does not assume that returns are reinvested at the IRR itself, so it is usually lower and more realistic for high-IRR projects.

Formula and method

$$MIRR = \left(\frac{\sum C_k^{+} (1 + r_r)^{n-k}}{\sum |C_k^{-}| (1 + r_f)^{-k}} \right)^{1/n} - 1$$

Variables

C_0	Cash flow now (investment, negative)	-
C_1	Year 1	-
C_2	Year 2	-
C_3	Year 3	-
C_4	Year 4	-
C_5	Year 5	-
C_6	Year 6	-
r_f	Finance rate (for negative flows)	-

r_r	Reinvestment rate (for positive flows)	-
$MIRR$	Modified internal rate of return	-
IRR	Internal rate of return	-
PV^-	Present value of the negative flows	-
FV^+	Future value of the positive flows	-
n	Years counted (to the last non-zero flow)	-

Method and standards

MIRR.

Assumptions and limits

- Year-end cash flows; up to six years.

References

Modified internal rate of return

Report details

Report reference	FCC-GJT6-SRE7 (the same inputs always give the same reference)
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Release checks	3 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/general/economics/modified-irr

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.