Present Worth Factor with Inflation and Discount (PWF)

Present worth factor of a series of payments inflating each year, the present worth of the series and of one future payment, and the annual payment on a loan.

Input parameters

Unit system: SI

Parameter	Value	Unit
First-year payment (end of year 1)	1,000.0	
Inflation (escalation) rate per year	6.0000	%
Market discount rate per year	6.0000	%
Number of years	15.000	
Year of a single payment to value	10.000	
Loan principal	50,000	
Loan interest rate per year	0	%
Loan term, years	10.000	

Calculated results

Parameter	Value	Unit
Present worth factor	14.151	
Present worth of the series	14,151	
Present worth of the year-k payment	943.40	
Annual loan payment	5,000.0	

Notes for this case

- Payments are at the end of each year, the first one being A. Amounts are in any currency; the result is in the same unit.

Formula and method

$$PWF(N,i,d) = \frac{1}{d-i}\left[1-\left(\frac{1+i}{1+d}\right)^{N}\right] \ (i \neq d), \quad = \frac{N}{1+i} \ (i = d)$$

$$PW_k = \frac{A(1+i)^{k-1}}{(1+d)^{k}}, \quad \text{payment} = \frac{M}{PWF(N_L,0,m)}$$

Variables

A	First-year payment (end of year 1)	-
i	Inflation (escalation) rate per year	-
d	Market discount rate per year	-
N	Number of years	-
k	Year of a single payment to value	-
M	Loan principal	-
m	Loan interest rate per year	-
N_L	Loan term, years	-
$PWF(N,i,d)$	Present worth factor	-
PW	Present worth of the series	-
PW_k	Present worth of the year-k payment	-

payment	Annual loan payment	-

Method and standards

Present worth of a geometric series of payments.

Assumptions and limits

- Annual end-of-year payments; constant rates.

Report details

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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/present-worth-factor-inflation

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.