

# *Discounted Cash Flow Analysis*



# Evaluating the Financial Viability of a Project

*Consider the following two projects:*

	Investment (Today)	End of Year 1	End of Year 2	End of Year 3	End of Year 4	End of Year 5
<b>Project 1</b>	\$1,000	\$5,000				
<b>Project 2</b>	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000

*If you're the CEO, which would you prefer? Why?*

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*If you're the CEO, which would you prefer? Why?*

Project 2 has “less value” than Project 1 because of the increasing uncertainties of the cash flows, lost investment opportunities (“opportunity costs”), and other factors such as inflation.

*How much more valuable is Project 1 compared to Project 2?*

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*What are the benefits relative to the costs?*

the future cash flows

the initial investment

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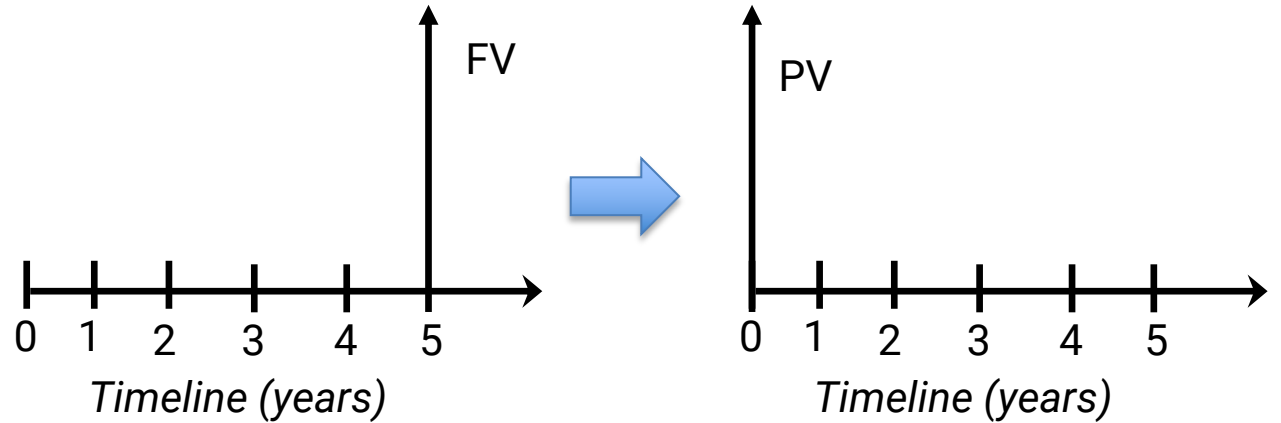
To compare the two projects quantitatively, we first need to “discount” the the future cash flows (profits in this case) back to today (time = 0).

*Discounted Cash Flow Analysis: DCF*

# Discounted Cash Flows: All about TVM!

## *A Single Future Cash Flow*

$$PV = \frac{FV}{(1 + i)^N}$$



Where:

*PV* = the present value of the future cash flows

*FV* = the actual value of the future cash flow

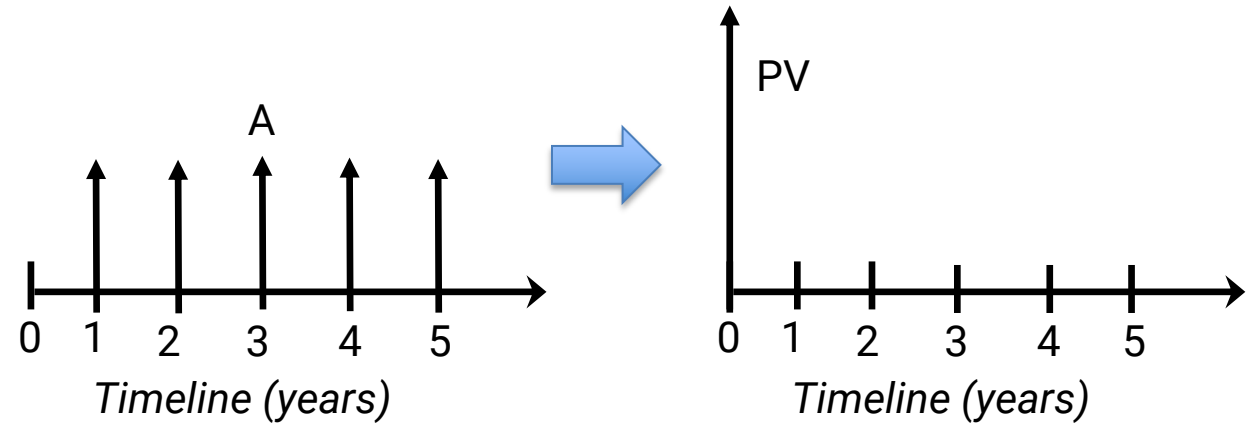
*N* = the number of time periods considered (usually years)

*i* = the "discount rate", related to a rate of return

# Discounted Cash Flows: All about TVM!

## *Multiple, Uniform Future Cash Flows*

$$PV = A \left[ \frac{(1 + i)^N - 1}{i (1 + i)^N} \right]$$



Where:

$PV$  = the present value of the future cash flows

$A$  = the value of the annual cash flows

$N$  = the number of time periods considered (usually years)

$i$  = the “discount rate”, related to a rate of return

# The Discount Rate

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*PV is determined using the company's "Discount Rate"*

Discount Rate: often the Minimum Aceptable Rate of Return for a project (sometimes called the MARR)

Within the financial community, the discount rate is also referred to as the "Hurdle Rate, or the "Cost of Capital"

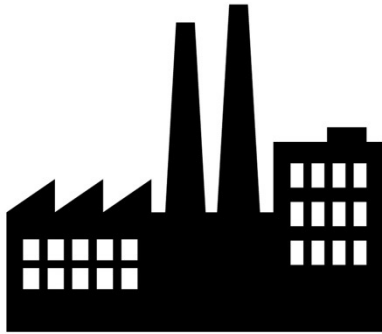
The Cost of Capital is related to cost of debt, stock price, and other metrics.

*Projects need to generate a high enough rate of return to keep the investors happy!*



# The Discount Rate: Another Perspective

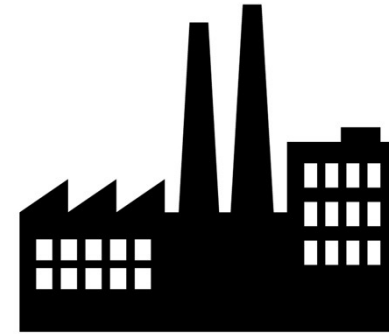
ACME Company



Hurdle Rate = 20%

Management has determined that any project requires a minimum rate of return of 20%

A1 Company



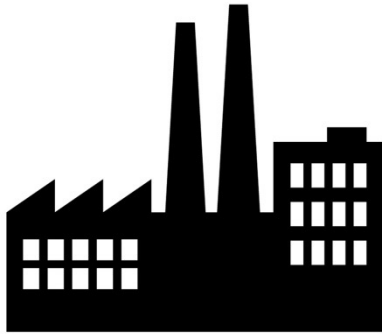
Hurdle Rate = 15%

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All projects are evaluated relative to each company's hurdle rate, their minimum acceptable rate of return.

# The Discount Rate: Another Perspective

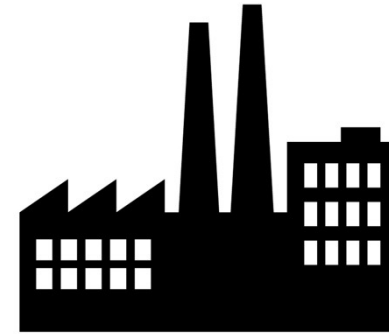
ACME Company



Hurdle Rate = 20%

Is the project worthwhile at a Hurdle Rate = 20%

A1 Company



Hurdle Rate = 15%

Is the project worthwhile at a Hurdle Rate = 15%

Each company can evaluate the same exact same project and come up with a different answer (yes or no) all depending upon its rate of return requirements.

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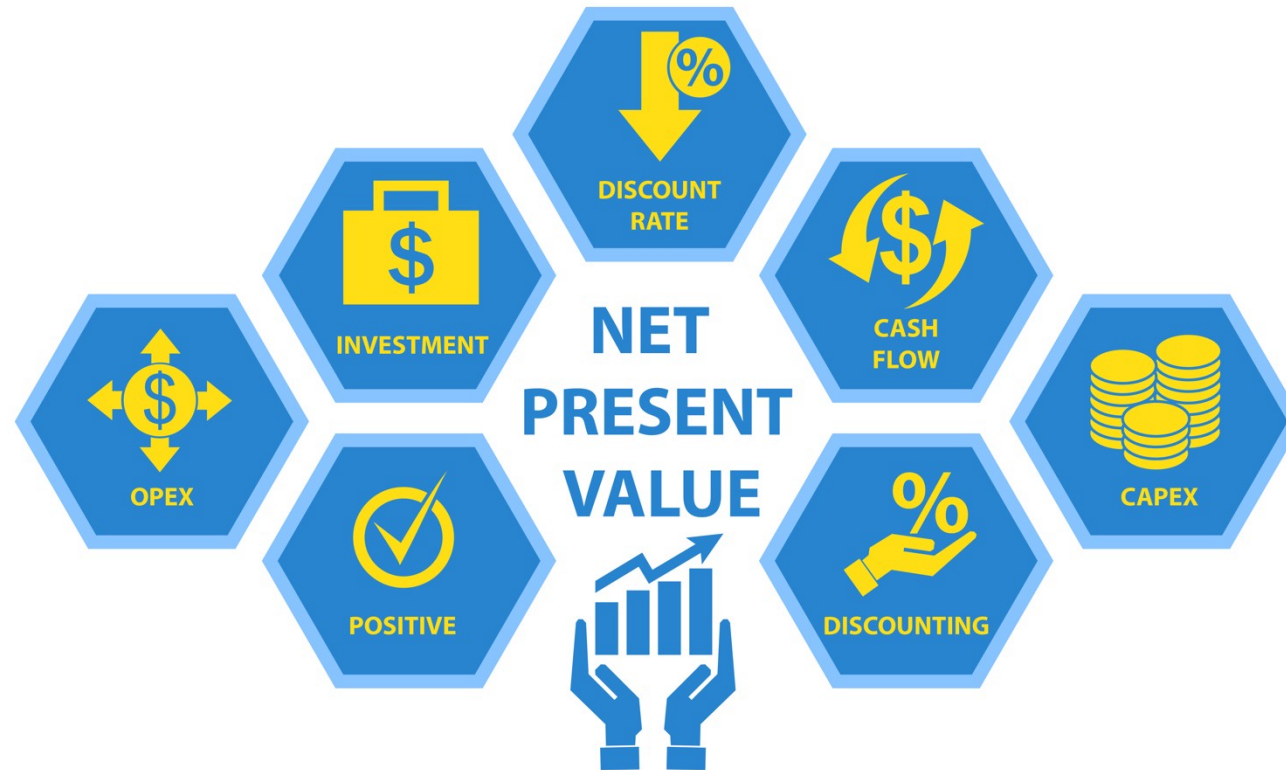
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*How much more valuable is Project 1 compared to Project 2?*

*Discounted Cash Flow Analysis: DCF*

# Next Time...

## *The Net Present Value*



# Credits & References

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Slide 1: DCF Discounted Cash Flow by momius, Adobe Stock (161123720.jpeg).

Slide 9-10: Black factory icons on white background by Anthonyycz, Adobe Stock (93389062.jpeg).

Slide 12: Concept of NPV - Net Present Value by Elnur, Adobe Stock (402998660.jpeg).