



Module 1

Corporate Financial Decision-Making for Value Creation

Alternatives to DCF Techniques (What else is there?)

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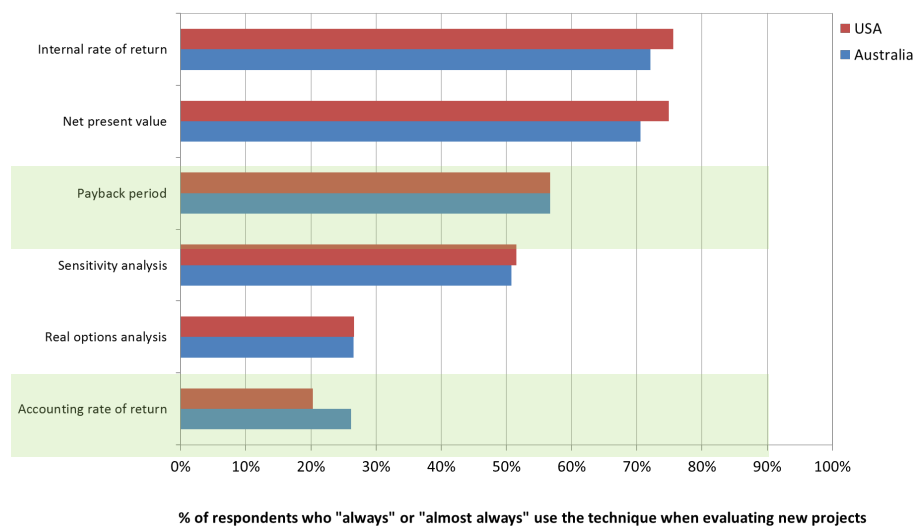


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Popularity of project evaluation techniques

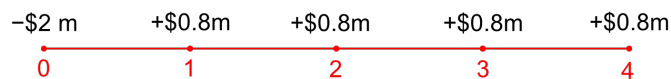




Payback Period - The technique

A project's payback period (PP) is simply the amount of time it takes to recoup the initial cost of a project from the project's after-tax net cash flows.

Consider an earlier example:



Assuming that the cash flows occur at year-end:

Payback period = 3 years.

Assuming cash flows occur evenly throughout year:

Payback period = 2.5 years.

Payback Period - The technique

There are three simple steps to the payback period approach:

1. Forecast expected cash flows.
 - Timing and amount.
2. Calculate how long it will take to recoup initial investment from net cash flows.
3. Apply the appropriate decision rule:

Independent projects:

Accept projects with $PP < \text{Maximum allowable period}$

Mutually exclusive projects:

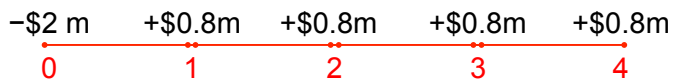
*Prefer project with shortest PP; provided
 $PP < \text{Maximum allowable period}$*



Payback Period – Demonstration

Use Payback Period to rank the following projects (assume maximum allowable payback period of 5 yrs):

Project 7

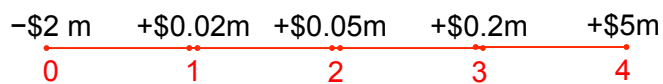


Payback Period = 3 years
(or 2.5 yrs if cash flows occur continuously over year)

$$2m - 1.6m = 0.4m$$

$$\frac{0.4m}{0.8m} = 0.5$$

Project 8



Payback Period = 4 years
(or 3.346 yrs if cash flows occur continuously over year)

$$2m - 270,000 = 1.73m$$

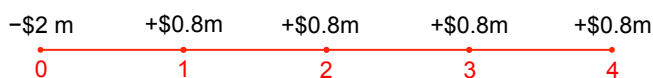
$$\frac{1.73m}{5m} = 0.346$$

Therefore prefer Project 7 over Project 8.

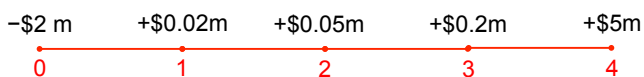
Payback Period - Problems

1. Ignores cash flows after investment is recouped
Consider again projects 7 and 8 (and their NPV assuming $r = 10\%$ p.a.):

Project 7



Project 8



Project	PP (Year-end)	PP (Continuous)	NPV
7	3	2.5	\$535,892
8	4	3.35	\$1,624,834

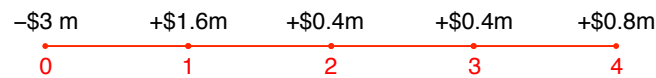


Payback Period - Problems

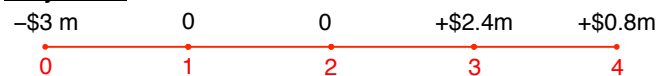
2. Doesn't allow for time value of money

The following two projects have equivalent PPs:

Project 9



Project 10



These problems lead to a natural bias against projects with longer developmental lives.

Accounting Rate of Return - The technique

A project's accounting rate of return (ARR) is simply the average rate of earnings expected from a project per dollar of capital invested:

$$ARR = \frac{\text{Average Net Income p.a.}}{(\text{Average}) \text{ Capital Investment in Project}}$$

where the *Capital Investment in Project* could be measured as *Historical Cost* or *Average Book Value*.



Accounting Rate of Return - The technique

There are three simple steps to the ARR approach:

1. Forecast expected earnings (*and* book value of asset over project's life if using *average investment*)
2. Calculate the average earnings over the life of project and express as a percentage of cost (or *average book value*)
3. Apply the appropriate decision rule

Independent projects:

Accept all projects with $ARR > \text{Benchmark rate}$

Mutually exclusive projects:

*Prefer project with highest ARR; provided
 $ARR > \text{Benchmark rate}$*

Accounting Rate of Return - Demonstration

Consider the following project that requires \$1m initial investment, has a life of four years and will have a book value at the end of that four years of only \$200,000 (assuming straight-line depreciation):

Time	Net Income	Book Value
0		\$1,000,000
1	\$150,000	\$800,000
2	\$140,000	\$600,000
3	\$120,000	\$400,000
4	\$90,000	\$200,000
Average	$\frac{(150k + 140k + 120k + 90k)}{4}$ $= \frac{500,000}{4} = \$125,000$	$\frac{(1,000,000 + 200,000)}{2}$ $= \$600,000$

$$ARR_{\text{Initial}} = \frac{\$125,000}{\$1,000,000} = 12.5\% \quad \quad \quad ARR_{\text{Average Book Value}} = \frac{\$125,000}{\$600,000} = 20.83\%$$



Accounting Rate of Return - Problems

1. Based on earnings – not cash flows
 - Earnings numbers can be highly subjective
 - Inventory valuation methods
 - Depreciation methods
 - I can't buy a can of soda with \$1m of earnings I need \$1 of cash
2. ARR ignores time value of money
 - Both of the following projects will have equal ARR!

Time	Project 11 Net Income	Project 12 Net Income
0		
1	\$100,000	\$0
2	\$90,000	\$0
3	\$80,000	\$0
4	\$70,000	\$340,000

Summary

Payback Period measures the time it takes to recoup the investment in a project:

- Popular because it gives feedback on the liquidity position of the firm
- Problematic in that it doesn't account (explicitly) for time value of money and ignores cash flows after investment is paid back.



Summary

Accounting Rate of Return measures the profitability of a project using Net Income and BV of Asset figures:

- Popular because of ready availability of accounting data
- Problematic as it relies on subjective earnings numbers and doesn't account for time value of money.

Source list

Slide 2:

Data sourced from Graham, J. R., & Harvey, C. R. (2001). The theory and practice of corporate finance: Evidence from the field. *Journal of Financial Economics*, 60(2), pp. 187-243;
Coleman, L., Maheswaran, K., & Pinder, S. (2010). Narratives in managers' corporate finance decisions. *Accounting & Finance*, 50(3), pp. 605-633.