# Economic Decision Analysis in Engineering
# Questions on Week 1 Topics





1

## Question

What are the main differences between "Capital Costs" and "Operating Costs"?





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## Answer

Capital costs are one-off, usually up-front (spent before we receive gross revenue from the project) and usually very large compared to periodic operating costs.

Operating costs are periodic, spent after capital costs in the years we receive revenue, and are often small each year compared to capital costs.





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## Question

What is the main difference between net cash flow and profit?





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## Answer

Net Cash Flow is actual money. It includes actual capital costs in the years they are actually incurred.

Net Cash Flow =

Gross Revenue - Capex - Opex - Decommissioning (or Abandonment expenditure ("Decomex" or "Abex")

Profit is not actual money. It includes depreciation of capital costs. Depreciation is specified in the tax regulations or accounting conventions. These vary from one situation to another.

Main Difference

Profit =

Gross Revenue - Depreciation - Opex - Decomex or Abex





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## Question

Why is it wrong to use profit as our bottom line in making investment decisions?





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## Answer

Profit is an artificial measure dependent on somewhat arbitrary depreciation and accounting rules.

Profit can be different in different situations.

Profit usually does not take into account the timing of actual expenditure.



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## Question

How does depreciation affect the economics of project development, particularly marginal project development?



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## Answer

Depreciation delays the deduction (= the benefit) of up-front capital expenditure in the tax calculation.

It harms investments (especially marginal projects) because it makes it more difficult for them to compete with alternative investments (for example, the bank).

In other words, depreciation might distort investment decisions.



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## Question

What would be a more economically efficient way of treating capital costs in the tax system instead of depreciation?

Why?



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## Answer

A more economically efficient system would be to allow deductions of capital without any depreciation.

It would be even more efficient if interest was allowed on any un-deducted capital costs.

Then the system would mirror what would happen if we deposited the money in an alternative investment (eg the bank).



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## Question

What is a marginal project development?



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## Answer

A marginal project is a project with low net cash flow.

It might be a large project with high costs, or a small project with low revenue.

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## Question

What is a tax loss carry forward?

How does it affect tax payments in net cash flow projections?

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## Answer

A tax loss carry forward is a negative taxable income.

It reduces or eliminates tax payable in those years when it applies.

It can re-phase, or delay, or eliminate tax payments.

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## Question

Why did New Zealand allow depreciation as cost are incurred (=starting in the year of expenditure)?

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## Answer

A Government would allow depreciation as costs are incurred to protect or encourage marginal project developments, even though that might delay Government revenue.

If many marginally economic projects are developed, rather than left stranded (not developed), then Government revenue is greater than otherwise would be the case.

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## Question

Why would a company prefer to pay tax later rather than sooner ?

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## Answer

A company would prefer to pay tax later because it can invest the money saved in another investment (for example, the bank, the stock market, or other projects).

Delaying tax payments has a quantifiable, objective effect. It is not a subjective effect.