

# Business

Lecture 4

# Management

**Financial Management**

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# **Financial Feasibility**

The next task, after determining the technical and market feasibility of the project, is to determine the profitability from both the financial and economic standpoint.

Profitability is defined as the ability to earn return over and above the cost of capital with consideration of the risks involved.

# **Financial Feasibility**

**The following are the profitability indicators:**

- Net present value (NPV)
- Benefit-cost ratio (B/C)
- Internal rate of return (IRR)
- Cash Payback period
- Accounting rates of return

**Any or a combination of these indicators determine the profitability of the project.**

# Financial Feasibility

Money **now** is more valuable than money **later on**.

$$PV = FV / (1+r)^n$$



So \$1,000 now is the **same** as \$1,100 next year (at 10% interest).

# Financial Feasibility

$$PV = FV / (1+r)^n$$

Example: try to get PV for \$900 in three years, using an interest rate of 6%

The interest rate (r) is now 6%, which is **0.06** as a decimal:

$$\rightarrow PV = FV / (1+r)^n$$

$$\rightarrow PV = \$900 / (1 + 0.06)^3$$

$$\rightarrow PV = \$900 / 1.06^3$$

$$\rightarrow PV = \$755.66 \text{ (to nearest cent)}$$

# **Financial Feasibility**

The first three profitability indicators take into account the relative timing of cost and benefit (revenue) flow through the process of discounting.

The NPV, IRR, and B/C ratio will involve discounting. Discounting is defined as a process of translating future value into their present value worth by applying a discount factor that reflects the diminishing value of the same amount of money as one moves further into the future.

# Net present value

The net present value is defined as the difference between the present value project benefit (B) and the value of the present value of the project cost (C).

# Net present value

$$NPV = \frac{B_{n_i} - C_{n_i}}{(1 + r)^n}$$

Where

- B = benefits derived from the project
- C = investment, operating and other associated cost incurred by the project.
- r = discount rate
- $n_i$  = number of years



# Net present value

The decision rule for the NPV criterion is that accept project where NPV is equal to or greater than 0 and reject otherwise. Derivation of NPV of a project requires the following:

1. benefit and cost stream
2. a decision on the period over which calculations are to be made, generally the life of the project in question
3. the discount rate

The benefits(B) are derived from the market and financial studies while cost stream would include the investment outlay and the operating expenses, extracted from the technical and financial studies.

# Benefit cost ratio

The benefit-cost ratio  $B/C$  is the ratio of the present value of gross benefit to the present value of gross cost.

$$B / C = \sum \left[ \frac{B_{n_i}}{(1 + r)^n} / \frac{C_{n_i}}{(1 + r)^n} \right]$$

The decision rule is: accept projects with  $B/C$  greater or equal to 1; otherwise reject.

# Internal rate of return (IRR)

The internal rate of return of a project is that discount rate which equates the present value of the benefit and cost. The new present value of benefit is zero and  $B/C = 1$ .

## **Procedure for estimating IRR:**

IRR could be estimated by a trial and error method or by interpolation using positive NPV and negative NPV as upper and lower limits in which  $NPV = 0$ .

# Internal rate of return (IRR)

$$IRR = R_1 + \frac{NPV_1(R_2 - R_1)}{NPV_1 + |NPV_2|}$$

The decision rule is to accept the project if IRR is greater than or equal to the relevant discount rate; otherwise reject.

PRESENT VALUE OF 1							PRESENT VALUE OF 1						
YEAR	0.1%	0.2%	0.3%	0.4%	0.5%	0.6%	YEAR	0.7%	0.8%	0.9%	1.0%	1.1%	1.2%
0	1.000	1.000	1.000	1.000	1.000	1.000	0	1.000	1.000	1.000	1.000	1.000	1.000
1	.999	.998	.997	.996	.995	.994	1	.993	.992	.991	.990	.989	.988
2	.998	.996	.994	.992	.990	.988	2	.986	.984	.982	.980	.978	.976
3	.997	.994	.991	.988	.985	.982	3	.979	.976	.973	.971	.968	.965
4	.996	.992	.988	.984	.980	.976	4	.972	.969	.965	.961	.957	.953
5	.995	.990	.985	.980	.975	.971	5	.966	.961	.956	.951	.947	.942
6	.994	.988	.982	.976	.971	.965	6	.959	.953	.948	.942	.936	.931
7	.993	.986	.979	.972	.966	.959	7	.952	.946	.939	.933	.926	.920
8	.992	.984	.976	.969	.961	.953	8	.946	.938	.931	.923	.916	.909
9	.991	.982	.973	.965	.956	.948	9	.939	.931	.923	.914	.906	.898
10	.990	.980	.970	.961	.951	.942	10	.933	.923	.914	.905	.896	.888
11	.989	.978	.968	.957	.947	.936	11	.926	.916	.906	.896	.887	.877
12	.988	.976	.965	.953	.942	.931	12	.920	.909	.898	.887	.877	.867
13	.987	.974	.962	.949	.937	.925	13	.913	.902	.890	.879	.867	.856
14	.986	.972	.959	.946	.933	.920	14	.907	.894	.882	.870	.858	.846
15	.985	.970	.956	.942	.928	.914	15	.901	.887	.874	.861	.849	.836
16	.984	.969	.953	.938	.923	.909	16	.894	.880	.866	.853	.839	.826
17	.983	.967	.950	.934	.919	.903	17	.888	.873	.859	.844	.830	.816
18	.982	.965	.948	.931	.914	.898	18	.882	.866	.851	.836	.821	.807
19	.981	.963	.945	.927	.910	.893	19	.876	.860	.843	.828	.812	.797
20	.980	.961	.942	.923	.905	.887	20	.870	.853	.836	.820	.803	.788
21	.979	.959	.939	.920	.901	.882	21	.864	.846	.828	.811	.795	.778
22	.978	.957	.936	.916	.896	.877	22	.858	.839	.821	.803	.786	.769
23	.977	.955	.933	.912	.892	.871	23	.852	.833	.814	.795	.778	.760