

Performing Capital Budgeting Calculations

Posted on June 22, 2023

Briefly discuss the concepts of NPV, IRR, MIRR, and payback period. What is each one? How is it used? What are the advantages and disadvantages of each one? Then, complete problems 14.1 and 14.5 (The calculations should be completed in Excel and uploaded as a Word document). Discuss in the paper whether the projects are acceptable based on your analysis.

Introduction

Investment of capital to acquire assets is considered a vital decision for any business. For the healthcare sector, these investments include spending on hospital construction, technologies used in diagnosis and treatment, information technology infrastructure and platforms, and the training of its professionals (Butera et al., 2018). On one side, these investments increase the capacity of the business and lead to growth, but on the other side, they increase costs. For these financial decisions to be effective, capital budgeting decisions are taken. For the healthcare sector, this can be extremely challenging as healthcare technology keeps changing with updated methods of diagnosis and cure. Any hospital that does not undertake capital investment in the latest technology may become obsolete in the market. Thus, these substantial expenditures are essential for the hospital to stay in the business and provide the best available services.

Hospitals can invest in a range of projects. The mandatory investments are made to replace the existing worn-out, broken equipment. Detailed analysis is required when the investments are focused on the expansion of markets catered or capacity building within the existing service market. Strategic financial planning is required to make decisions about capital budgeting. Investment projects presented for capital budgeting describe the cash flow of the project, provide a risk analysis, and provide financial measures to determine the impact of the project. These financial measures include “payback period, internal rate of return (IRR), net present value (NPV), and modified internal rate of return (MIRR)”. (Reiter & Song, 2020).

Net Present Value (NPV)

The NPV evaluates a project's dollar profitability based on discounted cash flow, and therefore, it is also referred to as the DCF profitability measure. If a project is based on negative NPV, it is rejected as it depicts the project's inability to return the capital invested. When the NPV of a project is positive, it is financially accepted as it shows excess cash flow that can be reinvested (Reiter & Song, 2020).

Advantages and Disadvantages

Decisions based on this method use the future forecast of cash flows. One major benefit of the NPV method is its consideration of the time value of money; therefore, the discounted cash flow is used. The measure assumes that the project would yield positive cash flow; however, that may differ from reality, which could be a disadvantage (Ye & Tiong, 2000).

For the given problem 14.1, the project is considered financially acceptable as the NPV is positive. For problem 14.5, project X is considered financially acceptable; it has a positive NPV of \$966, but project Y is not financially accepted as it has a negative NPV of \$887.

Internal Rate of Return (IRR)

IRR helps to measure the probable rate of return or the percentage return of discounted cash flow. The assumption that the project will yield the expected rate of return relies on the fact that the forecasted cash flows will occur. A project will be considered financially acceptable if the IRR is more than the total **cost of capital** for the project. This implies that the project can not only regenerate the invested capital but also make a profit for the shareholders. When the IRR is negative, the capital investment shifts as a cost to the shareholders (Reiter & Song, 2020).

Advantages and Disadvantages

The main benefit of the IRR methodology includes the **time value of money** and can also provide a subjective comparison between projects for investment. The disadvantage of the method is that a project does not produce forecasted cashflows the IRR will change (Miletic & Latinac, n.d.).

For the given problem 14.1, the IRR is higher than the total capital cost. For problem 14.5, the IRR of Project X is higher than the total cost of capital and higher than that of Project Y.

Modified Internal Rate of Investment (MIRR)

MIRR is a capital budgeting method used to determine the feasibility of a project. This method is a modification of the IRR method and provides a more accurate representation of the rate of return.

Unlike the IRR method, MIRR does not reinvest positive cash flow at the same rate of return. The MIRR gives the discounted rate for the future value of the cash flow (Kierulff, 2008).

Advantages and Disadvantages

The method allows for determining the discounted rate of the investment and also the rate of reinvestment of the cash flow. Unlike both NPV and IRR, MIRR considers the cash flow between periods. It is also not affected by non-normal cash flows (Kierulff, 2008).

Payback Period

The payback period can be elaborated as the time (in years) a project will take to return the starting cost or investment. This means that the shorter the payback period, the more quickly the project generates liquidity and new reinvestment opportunities. The payback period is often equated with the breakeven point, which shows when a business's cost and revenue become equal. However, when considering capital budgeting, payback is more focused on the number of years in which the project will equalize the initial investment (Reiter & Song, 2020).

For the given problem 14.1, the payback period is reasonable as it is below five years. For problem 14.5, Project X is a better choice in all aspects as it has a shorter payback period than Project Y. The NPV and IRR values of Project X are also better than those of Project Y.

References

- Butera, J., Barry, H., & Wilbur, M. (2018). *Capital Investment in Health Systems: What is the latest thinking?* / HFG.
<https://www.hfgproject.org/capital-investment-in-health-systems-what-is-the-latest-thinking/>
- Kierulff, H. (2008). MIRR: A better measure. *Business Horizons*, 51(4), 321–329.
<https://doi.org/10.1016/j.bushor.2008.02.005>
- Miletic, M., & Latinac, D. (n.d.). *Internal rate of return method—A commonly used method with few advantages and many disadvantages?*
- Reiter, K. L., & Song, P. H. (2020). *Gapenski's Healthcare Finance: An Introduction to Accounting and Financial Management*. Health Administration Press.
- Ye, S., & Tiong, R. L. K. (2000). NPV-at-Risk Method in Infrastructure Project Investment Evaluation. *Journal of Construction Engineering and Management*, 126(3), 227–233.
[https://doi.org/10.1061/\(ASCE\)0733-9364\(2000\)126:3\(227\)](https://doi.org/10.1061/(ASCE)0733-9364(2000)126:3(227))