MODULE 6:
CAPITAL BUDGETING

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OUTLINE

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1. Introduction

As you are seeing throughout your study of finance, financial managers make decisions regarding the benefits and costs associated with an investment. An important part of decision making within a business enterprise is that which involves long-lived projects. The purpose of this module is to introduce you to the decision-making process for long-lived projects, which we refer to as capital projects. Without capital projects, which include replacement projects, new products, expansions, and acquisitions, a business enterprise will not continue to grow.

The capital budgeting process requires estimating cash flows and then applying techniques that help the financial manager evaluate the benefits and costs of the investment project. In general, a company should invest in projects that enhance owners’ wealth. Therefore, the financial manager must use those techniques that will help in identifying the projects that will add value.

The challenges that we face in capital budgeting are many: estimating incremental cash flows from a project, incorporating risk, and selecting among the many projects that are available. In this module, we focus on the method of estimating cash flows, techniques that we can apply to these cash flows, and how risk may be incorporated into the decision process.

2. Learning outcomes

LO6.1 Explain the objective of capital budgeting and relate this to the objective of the firm.
LO6.2 Differentiate between mutually exclusive projects and independent projects.
LO6.3 Explain the basic process of capital budgeting decision-making.
LO6.4 Calculate investment cash flows relevant for a capital project.
LO6.5 Calculate operating cash flows for each year of a capital project.
LO6.6 List the different capital budgeting techniques that are used to evaluate projects.
LO6.7 Calculate the payback period and discounted payback period for a project.
LO6.8 Calculate the net present value of a capital project.
LO6.9 Calculate the profitability index of a capital project.
LO6.10 Draw an investment profile for a capital project.
LO6.11 Calculate the IRR for a project.
LO6.12 Calculate the MIRR for a project.
LO6.13 Identify the problems associated with the IRR and the MIRR.
LO6.14 List the advantages and disadvantages of the different capital budgeting techniques.
LO6.15 Identify the capital budgeting techniques that are appropriate for a capital budgeting situation.
LO5.16 Identify how risk affects the capital budgeting decision and may be incorporated in decision-making.
LO5.17 Recognize the relevant risk for capital budgeting.
LO5.18 Understand how sensitivity analysis and simulation may be used to assess risk of a capital budgeting project.
LO5.19 Estimate an asset's beta.

3. Module tasks

A. Readings
   i. Required reading
      (a) Capital budgeting & cash flows
      (b) Capital budgeting techniques
      (c) Capital budgeting and risk
   ii. Other resources
      (a) William 5 & 10 Capital budgeting example
      (b) Capital budgeting formulas
      (c) Advantages and disadvantages of the different capital budgeting techniques
      (d) Capital Budgeting, Study Finance.com, The University of Arizona
   iii. Optional reading
      (a) Fabozzi and Peterson text, Chapters 12, 13 and 14 (Long-term Investment Decisions). Available through the Florida Atlantic University Libraries’ NetLibrary® access.
      (b) Investment Decisions -- Capital budgeting, prepared by the United Nations.

B. Problem sets
   These problems sets are non-graded tasks. It is recommended that you complete these problem sets prior to attempting the graded online quiz.
   - Capital budgeting practice problems and solutions
   - Capital Budgeting Cash Flow Practice Problems
   - Goofy Gadget Gooferizer Project, with solutions
4. Module overview and discussion

A. Capital budgeting and cash flows

Determining whether an investment project produces benefits that outweigh the costs requires first estimating the cash flows that a project will produce. This requires estimating how a business’s cash flows change when an investment is made; in other words, what are the incremental cash flows?

Estimating these incremental cash flows requires estimating the cash flows from the investment itself – acquiring and disposing of the investment’s assets – and the cash flows from operating the investment – those affected by the revenues, expenditures, depreciation, and taxes. The bottom line is a set of net cash flows for each period associated with the investment decision.

B. Capital budgeting techniques

Once we estimate the net cash flows that arise from an investment opportunity, we apply techniques to these cash flows to assess the attractiveness of the opportunity. These techniques produce a result in terms of the length of time to pay back the investment (the payback period and the discounted payback period), the value added (the net present value), the benefit-cost ratio (the profitability index) or the return (the internal rate of return and the modified internal rate of return).

In most general circumstances, the internal rate of return, net present value, and profitability index will produce similar recommendations regarding accepting an investment project. However, if there is a limit on the capital budget or if projects are mutually exclusive, we must be careful in selecting the technique to use in our investment selection process.

C. Capital budgeting and risk

The cash flows that we evaluate using the capital budgeting techniques are merely estimates. The future is not know with certainty and neither are future cash flows. Therefore, we must factor the degree of uncertainty into our decision making. We generally do this by adjusting the discount rate associated with the project by the amount of risk. Specifically, we should adjust the discount rate for the amount of systematic risk associated with the project. And while that sounds appropriate in theory, it is difficult to do in practice.

D. What’s next?

In the next module, we focus on the capital structure of the business. The capital structure that a company selects affects the financial risk of the business and, hence, the company’s cost of capital.