

Three Different Types of Interest Rates in the Application of Mathematical Programming to Capital Budgeting

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ABSTRACT

There are three important types of interest rates to be considered in capital budgeting area including the valuation of investment projects. These are what is called the internal rate of return, cost of capital and market interest rate. The objective of this paper is to present a capital budgeting model that these three different interest rates can be incorporated in the applications of mathematical programming to the capital budgeting problem.

First, we show a rationale for maximum net present value principle and its limitation in selecting the projects in two-period investments analysis. Second, when the marginal cost of capital is not constant as in real world, we show that the appropriate criterion should be maximum surplus principle, not the maximum NPV principle. To compute the value of surplus we used the market interest rate as a proper discount rate. Each surplus is determined by deducting the cost of investment from the corresponding return on investment. To obtain the cost of investment we first calculated the capital charge bases and then applied the cost of capital to them. The internal rate of return was employed in this paper as a measure that provides the capital charge bases.