

Chapter 5 – Capital Expenditure Analysis

Capital Expenditures

Business expenditures can be categorized into two main types: *revenue expenditures* and *capital expenditures*. Revenue expenditures are defined as those whose benefits will be realized within a year—for example, payment for wages, supplies and insurance. Capital expenditures are defined as those whose benefits will be realized over a time greater than one year—for example, the purchase of land, buildings, kitchen equipment and computers. Capital expenditures are not made as often, but they are typically for larger dollar amounts and (by definition) involve a longer time horizon than revenue expenditures.

Capital Expenditure Analysis, or *capital budgeting* as it is sometimes called, involves determining the value potential of a project/investment. This is referred to as Net Present Value or NPV; an analysis of incoming and outgoing cash flows. In this chapter, we will explain some basic principles to help you correctly estimate and account for the relevant cash flows for a project. We will also identify where cash flow estimation errors often occur and show you how you can avoid these mistakes.

Cash Flows versus Accounting Income

NPV is based on the timing of the *actual cash flow*, which contrasts with the way most accounting flows are handled, based on *accruals*. Accrual accounting means recording revenue or expense when they are recognized and measurable, regardless of whether or not the cash has been received or disbursed. For example, if you sell craft supplies on credit, the accounting flows will show that sale as revenue on the day that the transaction occurred, even though money will not be received until after billing at the end of the accounting period.

What is important in capital expenditure analysis is to make sure that every cash flow that you attribute to a project is valued at the time it actually occurs.

The Incremental Cash Flow Principle (ICF)

The only cash flows which are relevant to the valuation of a project are the *incremental* cash flows resulting from the project's acceptance or undertaking. The incremental cash flows attributable to the project can be estimated by subtracting the cash flows the activity would generate without the project from the cash flows that the activity would generate if the project were accepted or undertaken.

The incremental cash flow principle may seem very basic, but it is a powerful idea that can help you clarify otherwise confusing situations. Incremental cash flow can have a significant impact on whether or not to approve funds for a project, it contributes to determining rate of return (ROR).

Allocated Costs

Allocated costs refer specifically to costs associated with the operation of the activity as a whole that are apportioned to the various operating areas of the activity, normally based on a formula of some type. For example, the costs of electricity or common-area maintenance may be

allocated among various activities.

Unit managers tend to dislike allocated costs over which they have little if any control. Care should be exercised when allocating costs to ensure that the allocations are fair and accurate.

From the ICF principle, we know that the only costs relevant to the project are the actual incremental costs that result from the project's acceptance. For example, if you plan to open a new snack bar in a military club, the new snack bar will use additional electricity ... but will not increase the cost for lawn and shrub maintenance outside the club.

Excess Capacity

When a project puts new demands on the resources or assets of an organization, the opportunity cost of using those resources must be borne by the project. This is true of *excess capacity*.

Suppose you are evaluating the project of expanding your restaurant dining room. You estimated that without the expansion, your current dish machine would have to be replaced in five years. If you expand, however, your dish machine will reach capacity in only three years and have to be replaced at that time.

If you expand the dining room, there will be an opportunity cost associated with purchasing the new dish machine two years earlier than you otherwise would have (remembering the time value of money). According to the ICF principle, the opportunity cost associated with using up the excess capacity of the dish machine would have to be charged to the dining room expansion project.

Notice that even a potentially confusing situation such as this can be handled easily and correctly if you carefully apply the ICF principle. Just remember that *all* incremental cash flows have to be accounted for, and *only* incremental cash flows are relevant.

Investment in Net Working Capital

Many projects, especially medium and larger-sized ones, will require an investment outflow not only for buildings and/or equipment, but also for net working capital (defined as current assets minus current liabilities). It is usually assumed that any investment in net working capital is recovered in full at the end of the project's life.

Consider the case of the dining room expansion again. Since the expansion will likely generate additional dining room sales, it is also likely that food and beverage inventory, the extension of credit (and thus accounts receivable), and the need for cash on hand will increase. Although there is also likely to be an increase in accounts payable (a current liability), it will usually not be enough to offset the increase in current assets necessary for the expansion. Thus, net working capital needs will increase.

This money must come from somewhere! And it must be considered part of the initial investment cash outflows. Depending on the nature of the project, investment in net working capital might be assumed to occur at the project's beginning in one lump sum, or it might be spread out over several years as sales due to the project gradually increase.

Accelerated versus Straight-Line Depreciation

Depreciation is the way accounting measures the loss in value of an asset. One definition is, “a non-cash expense that reduces the value of an asset as a result of wear and tear, age, or obsolescence” (adapted from investorwords.com).

The most common way of accounting for depreciation is called straight-line depreciation. The definition: “a method of calculating the depreciation of an asset which assumes the asset will lose an equal amount of value each year” (investorwords.com).

To compute straight-line depreciation, you simply divide the initial cost of the asset by its useful life. For example, if you bought a delivery truck for \$40,000 and estimated that it would have a useful life of ten years, the annual depreciation would be \$4,000.

$$\$40,000/10 \text{ years} = \$4,000$$

It's a simple mathematical calculation, but its validity rests on the accuracy of the two numbers. The initial cost should be fairly straightforward; just remember to include taxes, delivery charges, installation costs, or anything else that is part of the initial cost. But the estimate of useful life requires a leap of faith. The truck might break down after only five years, or it might still be hauling stuff after 15 years.

Accelerated depreciation is: “a depreciation method which allows faster write-offs than the straight line method” (investorwords.com). An advantage of accelerated depreciation is that it allows you to write off an asset more quickly, meaning that the net (taxable) income in the early years will be less.

Regardless of whether an organization uses straight-line or accelerated depreciation, the total amount of depreciation will be the same.

Accounting for the Effects of Inflation

In an inflationary economy, prices go steadily up. That means that \$1,000 will buy more today than it will in the future. In a recession, with prices going down, the opposite is true. Accounting correctly for the effects of inflation is therefore critical to the effectiveness of any project valuation. The guiding principle is simply to be consistent in incorporating the effects of inflation into your project analysis.

Analyzing Other Types of Projects

Not all projects involve a new facility or piece of equipment. For example, sometimes we want to determine if replacing a piece of equipment is worthwhile. Replacement project analyses are not difficult, but you must rigorously apply the ICF principle to make sure you determine only the incremental cash flows associated with the replacement decision.

Public-Private Venture (PPV) Agreement

A Public-Private Venture (PPV) is an agreement between an MWR/Services NAFL and a non-Federal entity whereby the non-Federal entity provides goods, services, or facilities to authorized MWR/Services and exchange patrons. The non-Federal entity may, through the PPV, provide a portion or all of the financing, design, construction, equipment, staffing and

operation of a program for goods, services, or facilities. PPV agreements may be used to provide only the services and activities that are the mission of the MWR, Category C lodging, and Armed Forces Exchange programs, and the agreements must conform to patron restrictions. Personal services contracts are *not* permitted. Examples of PPVs include many of the commercially-branded fast food restaurants on military installations, such as Pizza Hut and Burger King.

DoD NAF projects over \$1M in Cat C activities must have a PPV Analysis IAW DODI 1015.13.

Mutually Exclusive Project Alternatives

Sometimes there is more than one option for a particular project—for example; available land might have room for building a new Child Development Center or a new Fitness Center...but not both. When choosing one option automatically excludes accepting any of the remaining, we call the options *mutually exclusive project alternatives*.

When we have mutually exclusive project alternatives, we must determine the NPV of each alternative. From a capital budgeting perspective, it is a simple matter to then select the alternative that creates the most value (has the highest NPV).

In MWR/Services, however, the highest NPV may not be the deciding factor. For example, the decision on Child Development Center versus Fitness Center has implications for readiness as well as benefits to the military family. Still, with scarce resources, it is valuable to compute and consider the value proposition.

Furthermore, military installations may have more projects on the list than can be implemented in the immediate future. In this situation, higher headquarters may limit capital expenditures by selecting the *combination* of projects that maximizes total NPV. This process is called *capital rationing*.

Summary Chapter 5

When you look at business expenditures they can be categorized as either *revenue expenditures* or *capital expenditures*. Revenue expenditures are defined as those whose benefits will be realized within a year—for example, payment for wages, supplies and insurance. Capital expenditures are defined as those whose benefits will be realized over a time greater than one year—for example, the purchase of land, buildings, kitchen equipment and computers. Capital expenditure analysis is the means by which we determine the value-creation potential of a project. Correctly determining this potential is critical to the successful operation and expansion of MWR/Services activities on an installation. When it comes to cash flows the only cash flows which are relevant to the valuation of a project are the incremental cash flows (ICF) resulting from the project's acceptance or undertaking. Services may also create PPVs, in which certain MWR/Services activities are operated by an agreement with a private sector company.

