

## Chapter 12

## Investment appraisal

## Introduction

This chapter is designed to give a comprehensive introduction to investment appraisal. Investment is an activity pursued by all firms and organisations when they acquire, at a cost, the long-run capability to create products and services. Investment entails the commitment of cash resources in the acquisition of buildings, physical 'plant' and human resources in order to earn cash return in the future. The fact that such returns can arise far into the future introduces the problem of time and how cash flows arising at different points can be brought to a common base for comparison purposes. In this chapter we explore both the financial and managerial issues in investment appraisal. We consider the problems of projecting cash flows for appraisal purposes drawing upon the insights in Chapters 13 and 14. We then review ways of correcting the cash flows for differences in the time when they arise. Because future flows are intrinsically uncertain we will examine how the risk inherent in investment can be accommodated within our analysis and finally we address some of the more managerial issues in this area of finance.

## Learning objectives

In this chapter our learning objectives are as follows:

*Matching cash flows over time*

- Be able to match cash revenues and expenditures to capital decisions and calculate the net present value of those cash flows.
- Understand the concept of the time value of money and its application to personal and company decision-making.
- Be able to identify the stages of corporate investment decision-making and the principles that need to be applied in practice.

*The net present value model*

- Be able to identify the relevant cash flows for NPV analysis.

- Be able to determine the net present value, to understand its significance and the limitations of its use.
- Be able to modify the application of the net present value model under conditions of capital rationing, tax, inflation and risk.

### *Other methods of investment appraisal*

- Understand the scope and limitations of other methods of investment appraisal.
- Be able to calculate the internal rate of return, payback and accounting rate of return.

## Matching cash flows over time

Investment appraisal relies upon the concept of matching. In investment appraisal we use decision matching in two ways:

1. by matching cash revenues and cash expenditures to the decision involved, and
2. by correcting future cash flows to a common time base (usually the point in time the decision is being made) so that they can be compared.

In this section we will deal with the underlying mechanics for doing this cash flow matching over time.

## Compounding

If an individual has a cash sum he or she may wish to know how much it will be worth to them to invest that cash rather than spend it immediately. To make this judgement they must choose a 'rate of return' or interest rate that will compensate them for the delay in spending and enjoying their cash. They will then 'roll up' the balance to the end of the bond as follows:

### Financial realities

An individual is offered a rate of 5 per cent per annum on a three year savings bond. They have £1000 to invest and interest accrues annually and will be reinvested each year to form part of the accumulating total upon which the subsequent year's interest will be calculated.

At the end of year 1 the balance will have accumulated to the original investment plus the interest on that original investment. Putting the sequence of interest payments and the accumulating balances on a spreadsheet we get the following:

**Exhibit 12.1**

Year	1	2	3
Opening year balance	£1000.00	£1050.00	£1102.50
Add interest at 5 per cent	£50.00	£52.50	£55.13
Closing year balance	£1050.00	£1102.50	£1157.63