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Figure 4.1 Typical cumulative cash flow curve for a project (Merna and Al-Thani, 2008)

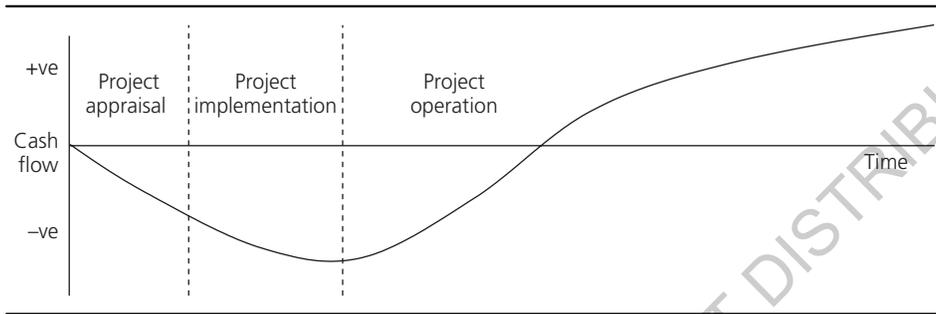
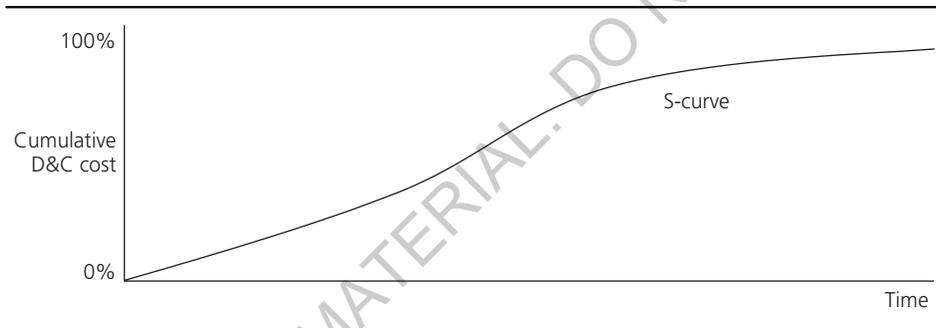


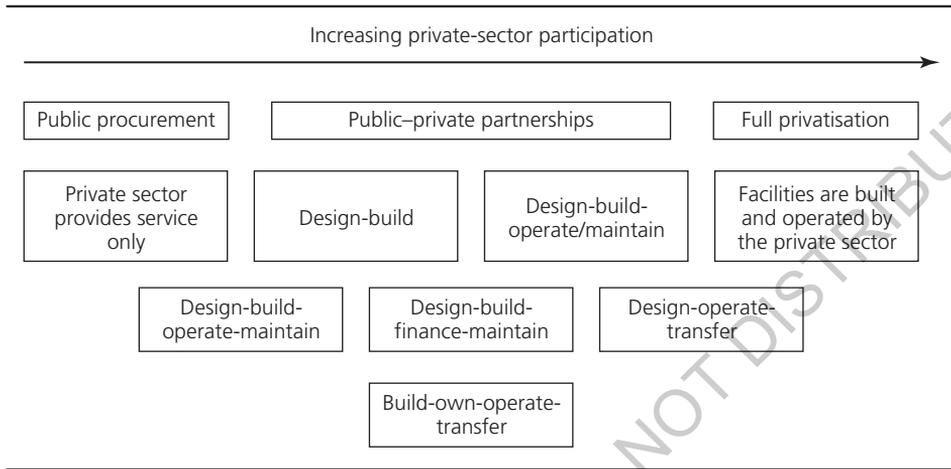
Figure 4.2 The S-curve for a project



surplus seen as equity returns. However, even after the break-even point, the project may require financing for short periods, to meet the mismatch between receipts and payments. Some projects include reserve accounts, such as debt service reserve accounts or life-cycle reserve accounts, to fund periods of potential cash flow shortfalls.

In project financing it is this future cash flow that becomes the basis for raising resources for investing in the project. It is the job of the financial advisor and lenders to the project to structure the debt and cash flows in such a way (robust) that it meets the needs of the project and at the same time is attractive to the potential agencies and individuals willing to provide resources to the project for investment. In order to achieve this objective effectively, a thorough knowledge of the financial instruments and the financial markets in which the investors trade is essential. In this chapter, various financial instruments available for project financing are discussed.

Figure 9.1 Public–private partnership continuum (adapted from Merna and Njiru, 2002; Rall *et al.*, 2010)



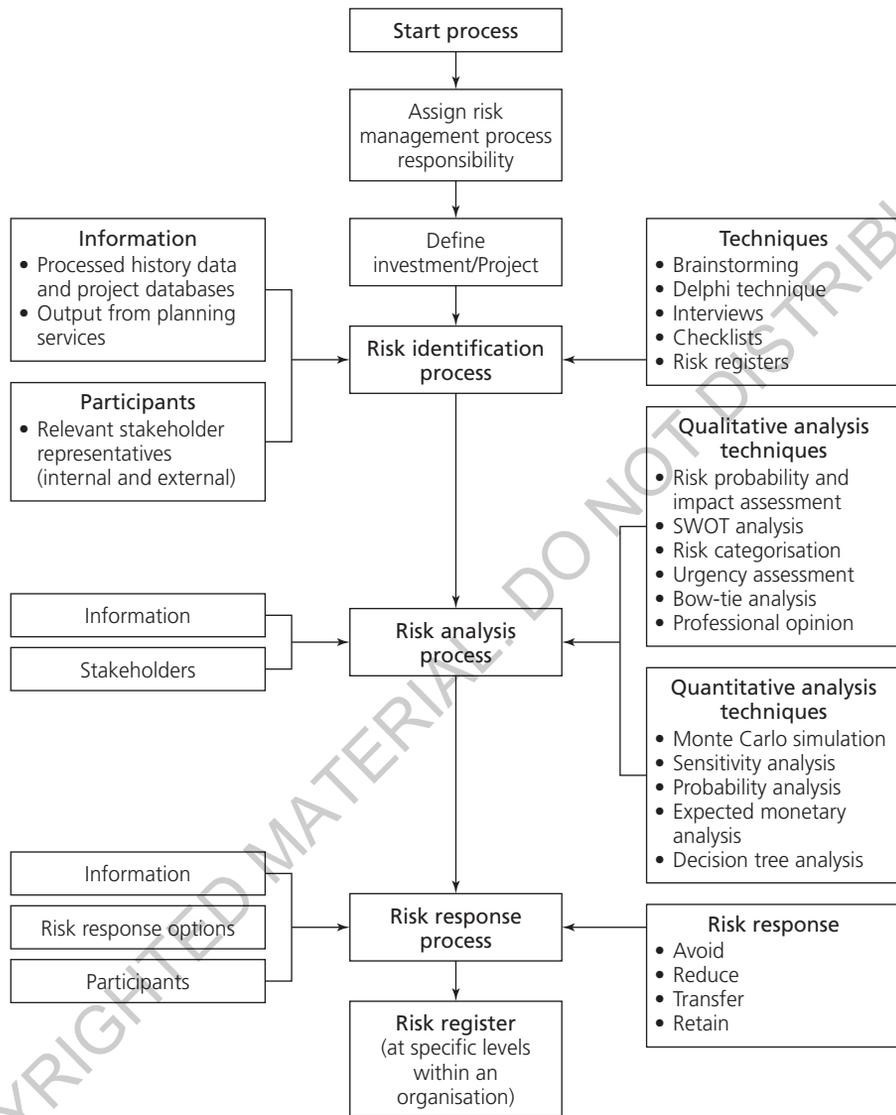
- Public procurement – where the government retains ownership and self-operates the assets; however, some activities are contracted out to the private sector where the government only has to pay for the services provided.
- PPPs – where the private sector provides infrastructure assets and operates them over a set concession period. Following the concession period, the private sector transfers ownership back to the public sector. Some common types of PPP projects are summarised in Table 9.1.
- Full privatisation – where the private sector owns and operates the assets and the government pays for the availability of services provided by the private sector to the public sector.

There is often confusion between the terms PPP and privatisation. There is, however, a clear difference between these two forms of private-sector engagement. Privatisation involves the permanent transfer to the private sector of a previously publicly owned asset, along with the responsibility for delivering a service to the end user, whereas a PPP involves a continuing role for the public sector as a ‘partner’ in an ongoing contractual relationship with the private sector.

9.4. Advantages and disadvantages of the PPP model

Since the global financial crisis of 2008 there has been renewed interest in PPPs in both developed and developing countries. With governments facing constraints on public resources, while at the same time recognising the importance of investment in infrastructure to support growth in their economies, they have turned to the private sector to fund the infrastructure gap. Table 9.2 summarises the advantages and disadvantages of the PPP model.

Figure 12.2 Risk assessment process (adapted from Merna and Al-Thani, 2008)



- identify the causes of each risk
- assess how risks are interrelated and how risks should be classified and grouped for analysis and evaluation.

Risk identification is assisted by numerous methods. Merna and Njiru (2002) have identified five key risk identification methods, namely, brainstorming, the Delphi technique, interviews, checklists and risk registers. The outputs of risk identification are those listed below (Merna and Al-Thani, 2008):

Figure 14.1 ProjectCo X structure chart

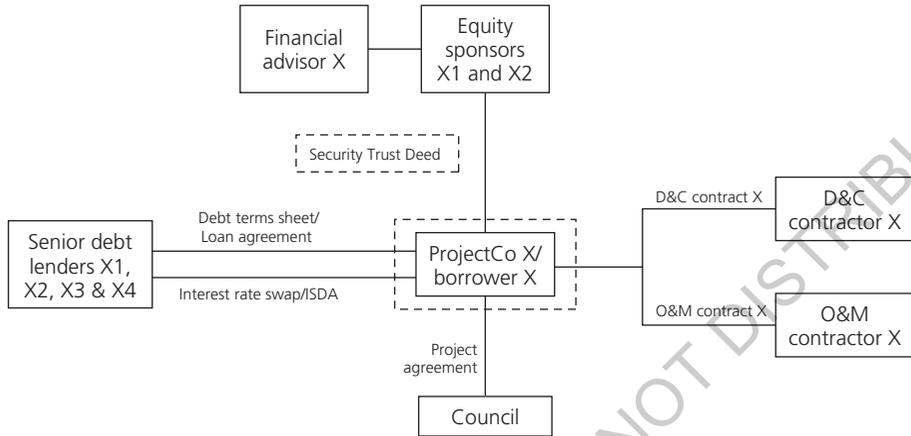


Figure 14.2 Indicative 3D plan/design of a school



14.4.1 Design and construction programme and cost

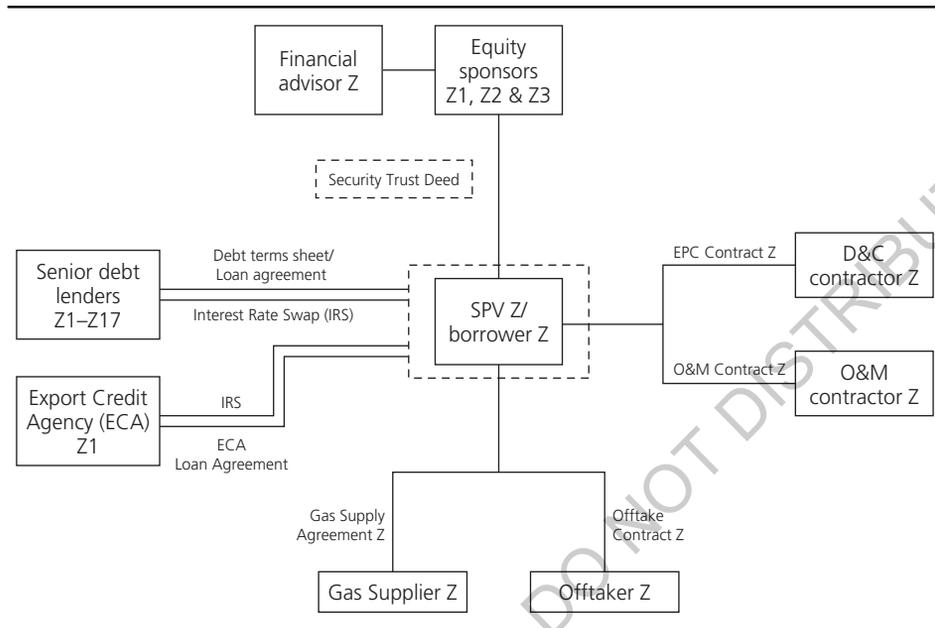
The overall high-level milestone durations proposed for the Project by D&C Contractor X are shown in Table 14.3.

The Project's overall fixed D&C Contract price is GBP 278 million.

14.5. ProjectCo X – operation and maintenance

During the Operation Phase, O&M Contractor X will be responsible for the O&M obligations under the Project Agreement for the 20 years Concession Period. The O&M obligations under the Project Agreement are summarised in Table 14.4.

Figure 15.2 Project structure chart



15.4. Design and construction

EPC Contractor Z will undertake the construction of the Project through a Fixed-Price, Date-Certain Turnkey EPC Contract. As such, EPC Contractor Z bears the risk of any time or cost overruns. The EPC Contractor has extensive experience in LNG and petrochemical projects with similar operating conditions in the plant, construction practices and cost management approach.

The EPC Contract includes:

- detailed design and engineering of the facility
- supply of permanent plant equipment
- yard management
- engineering of local infrastructure
- mobilisation, site establishment and site preparation
- mechanical completion and testing
- commissioning, training and rectification of defects.

In addition to the LNG liquefaction facility, the storage tanks and utility systems including a water treatment plant, EPC Contractor Z will be responsible for the construction of loading, logistics and transport-related facilities at the marine jetty, control room and administration buildings.

Table 15.2 highlights the main EPC Contract scope of works of the proposed LNG facilities.