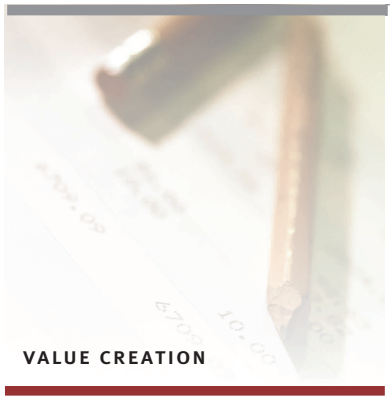


VALUE CREATION

SIMULATE THIS

How to use a simulation model to analyse expected returns in private equity portfolios – an outline.

INTRODUCTION

Standard EVCA valuation methods are useful historic reporting tools and recently have been improved but increasingly investors are seeking ways to understand and analyse expected returns. Therefore, portfolios of unrealised investments need to be analysed to assess expected returns and their sensitivity to variations in the financial performance of the investee companies and the valuation multiples that can be achieved on exit.

Traditional sensitivity analysis combines single point estimates of a model's variables to predict a single outcome. As a result, a hypothesis is typically 'tested' using low, base and high case scenarios which produce three sets of outputs. Thus users are led to the conclusion that the outcome will range between the low and high cases, with the base case being the more likely one to occur. Although the final outcome, i.e. the expected returns, will range between the low and high case scenarios, there is no indication of the likelihood of each of these happening, and no account is taken of the effects of portfolio diversification.

Simulation analysis utilises advanced statistical methods to overcome these limitations. A range of software packages are available. "@Risk" is a highly regarded Excel based programme which produces results based on Monte Carlo simulation techniques.

To set up a simulation, a range of values and a suitable probability distribution for each of the variables being tested are provided as inputs. @Risk uses this information, along with the underlying Excel model, and analyses the full range of possible outcomes on a probability basis, effectively by 'running' thousands of "what-if" scenarios all at once. The output of the model – an expected distribution of returns – identifies the range within which it is likely that the return will fall. In addition, it highlights the extremes of both downside and upside, and indicates the key variables in the model that have the most significant effect on the final result.

TRADITIONAL SENSITIVITY

As discussed, the traditional approach to valuation is to create separate scenarios: usually a base case, upside case and downside case and apply a range of valuation multiples for each. Figure 1 shows a simplified summary of this approach for one investment.

This shows some of the sensitivity, but does not allow for scenarios outside of these three nor does it suggest the relative probabilities of each scenario occurring.

SIMPLIFIED SIMULATION MODELS

Using the simple example shown below, the analysis in this section applies simulation modelling techniques to examine the effect that variations in the base case inputs would have on the expected gross returns to the investors.

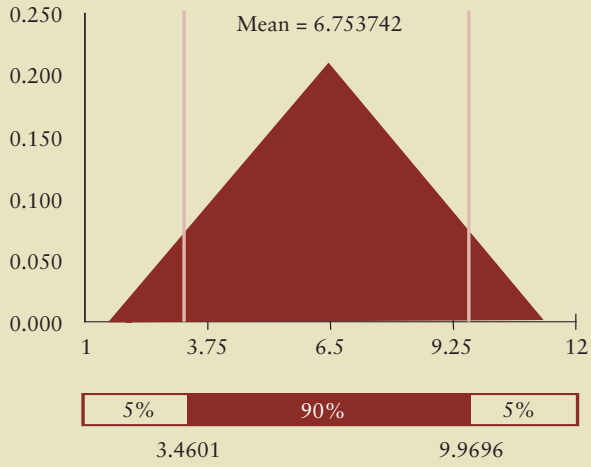
A set of assumptions can be made which follows a Triangular Distribution (approximating a Normal Distribution) with three points representing value at low percentile, most likely value and value at top percentile. To be conservative, the low and high case values are assumed to be, say, the 25th and 95th percentiles respectively in all cases for simplicity. Thus the model assumes a 25 percent probability that inputs could be lower than the low case value and a 5 percent probability that input values could exceed the high case.

FIGURE 1: ASSUMPTIONS

		Downside Case	Base Case	Upside Case
	EBIT in exit year	2,000	2,500	3,000
	Enterprise Value			
EBIT multiple	4.0x	8,000	10,000	12,000
EBIT multiple	5.0x	10,000	12,500	15,000
EBIT multiple	6.0x	12,000	15,000	18,000
	Equity Value			
EBIT multiple	4.0x	4,000	6,000	8,000
EBIT multiple	5.0x	6,000	8,500	11,000
EBIT multiple	6.0x	8,000	11,000	14,000
	IRR			
EBIT multiple	4.0x	12%	24%	34%
EBIT multiple	5.0x	24%	36%	45%
EBIT multiple	6.0x	34%	45%	54%

Source: Acanthus Advisers

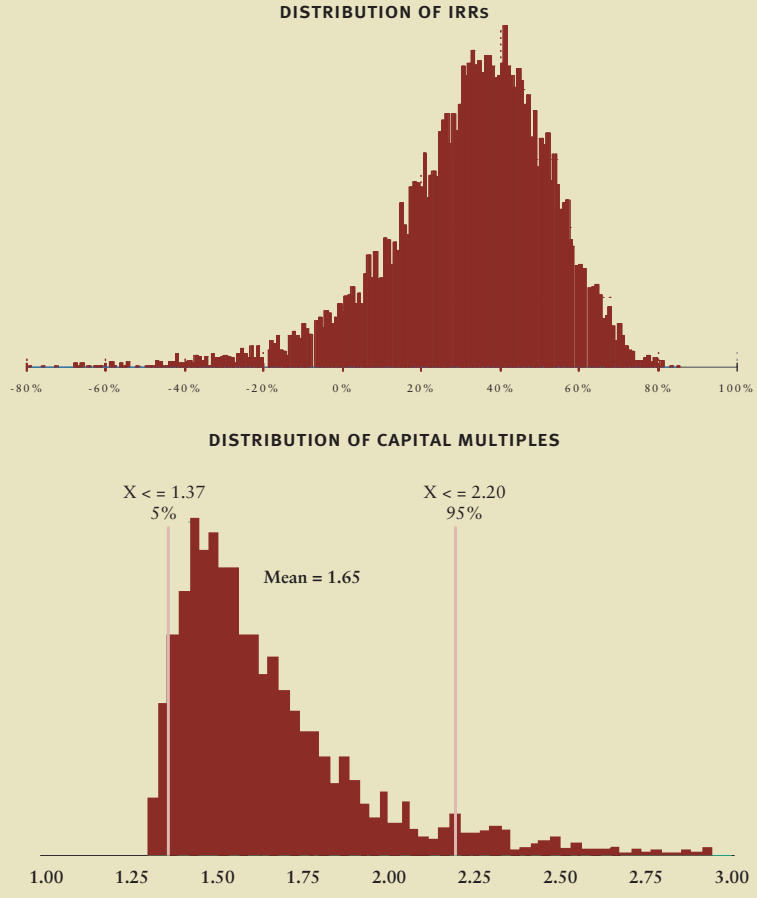
FIGURE 2: SAMPLE INPUT DISTRIBUTION



Note: The bottom axis of each chart shows the range of possible outcomes; the left-hand axis shows the relative likelihood of each possibility.

Source: Acanthus Advisers

FIGURE 3: OUTPUT OF THE SIMPLIFIED MODEL



Source: Acanthus Advisers

Taking individual inputs from these distributions, the model is run several thousand times and the returns noted for each iteration. The distribution of these returns is shown in figure 3. This shows that the majority of out-turns are in the 25-45 percent range, in common with the traditional scenario approach above, but also shows that returns are negative in a significant number of cases (approximately 8 percent in this example) and that there is a significant chance of returns exceeding 50 percent. A similar interpretation can be made for capital multiples.

ADDING COMPLEXITY

The simplified model above only focused on two variables and just one investment. The modelling for investments in a portfolio can incorporate considerably more complexity notably by increasing the number of inputs that are varied, linking the inputs and using multi-year models. In total, in Acanthus's models, typically some 50 inputs are varied for each company in the unrealised portfolio. The principal variables include:

- Revenue growth in each year
- EBITDA margins for each year
- EBIT margins for each year
- Cash flows relating to working capital and investment for each year
- Exit multiples
- Year of exit

Clearly, this approach can be usefulto LPs in evaluating risk and expected returns in their own portfolios. ■

This outline was written by Dermot Crean and Armando D'Amico at Acanthus Advisers, a London-based provider of private equity fund placement and corporate finance services.