

## Three day financial modelling for project finance course for experienced modellers

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### Course Objectives

The course is intended to provide techniques, ideas, structures and methodologies to help delegates;

- ~ *produce models which can be developed seamlessly from feasibility stage through to financial close*
- ~ *produce models which can run all cases needed during deal development and for sensitivity analysis*
- ~ *produce models without circular code*
- ~ *minimise the risk of errors in the model or in the running process*
- ~ *produce models which are easy to check, change and use*

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### Course Structure

The three day course is a mixture of theory and practical work, looking in detail at the process of writing, developing and running a project finance spreadsheet model. The course content is based on more than twenty-six years experience in this field, and is designed to offer experienced modellers a package of methods which, taken as a whole, provide solutions to the common modelling problems, and form a reliable basis from which to address the more esoteric problems. For modellers working within a team, the course offers a basis to introduce consistency of layout and philosophy enabling better cross-support within the group, and supporting the evolution of a standard in-house style and quality. The intention is always to help make modellers lives easier and their models even better. The program covers optimal model layout and structure including detailed review of most sub-sections, the avoidance of circular code, the treatment of multiple currencies within the model, making timings flexible within the model, incorporating monthly or quarterly calculations neatly into a semi-annual model structure, methodologies for checking and debugging, and running the usual project finance sensitivities safely and easily. In addition, without assuming any pre-existing VBA knowledge, the course considers macros for controlling events, such as dividend lock-ins, driven by LLCR thresholds, or for generation of results tables across a range of input values, and how such macros can be copied from model to model.

The course agenda will be split over the three days on a flexible basis allowing the focus of the course to respond to the specific questions and interests of the delegate group.

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### Required Skills

Delegates for this course are expected to have excellent Excel skills and some direct project finance modelling experience, as well as an understanding of the basic drivers and constraints of project finance. Delegates without modelling experience may want

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to consider the equivalent course for novice modellers, details of which can be found at [www.projfinmod.co.uk](http://www.projfinmod.co.uk).

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## Agenda

### Day One

Introduction & review of project finance model objectives and requirements

*Why is project finance different?*  
*What does this mean for the model?*  
*Feasibility analysis*  
*Development of project structure*  
*Scenario analysis*  
*Sensitivity Analysis*  
*Flexibility*  
*Robustness*

#### Model Design

*Reflecting Objectives*  
*Anticipating Development*  
*Flexible control of timing and calculation options within the model*  
*One model runs all cases for the project*  
*Model calculates nominal figures*  
*Using 'Pinch points'*  
*Seeking simplest solution at each stage*

#### Building from the basics - Model Layout

*Model sections divided into three types, data, calculation and report*  
*Which sections are needed?*  
*In what order?*  
*Detailed page layout*  
*Timeline*

#### Data Input

*Where?*  
*What?*  
*Interface between data and calculations*  
*Controlling timings using flexible inputs*  
*Using 'switches'*  
*Controlling calculation options*  
*Expanding data choices*  
*Review of illustrative data input sheet*

#### Handling Inflation in the model

*Purpose of inflation in the model*

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*Value dates*  
*Calculation of inflation in the model*  
*Review of illustrative inflation calculations*

Construction Costs

*Inputs*  
*Timings*  
*Categories*  
*Review of illustrative construction cost sheet*

The Practical Modelling Process

*Customising the Excel environment*  
*Planning the model*  
*Setting up the model outline*  
*Populating the model*

*Practical Exercise 1*

Delegates provided with model skeleton including basic data and will work with course director to model construction cost calculations, controlling timings, applying inflation and using switches to control calculation options.

The Operations Section

*Calculating revenues*  
*Calculating fixed and variable operating costs*  
*Applying flexible timing inputs for start/build up of operations and end of analysis*  
*Calculating debtors and creditors*  
*Review of illustrative operations calculations*

Telling the Story with the Cash Flow Summary

*Start to finish, top to bottom, the story of the project*  
*Provides cross-check for model*

*Practical Exercise 2*

Using the model from *practical 1* delegates work with the course director to complete the operations sheet, using timing inputs to control timing and levels of operation, and demonstrating the flow of information from the data sheet through the model calculations. Calculated operating and capital cost values then used to begin populating the cash flow summary page.

Day Two

Circularity in the Model

*Are there circular calculations in project finance?*  
*How should we handle them?*  
*Why no sophisticated project finance model should include circular code*

*How can it be avoided?*

*Use of re-calc macro to deal with unavoidable circularity*

### *Practical Exercise 3*

Delegates will work with course director to develop a simple re-calc macro and observe its operation with a simple test calculation.

Some Other uses for the re-calc macro

*Use of re-calc macro to automate target seeking*

Treatment of Currencies within the model

*Calculate figures in actual currency or in a consistent presentation currency?*

*Modelling real and nominal exchange rate movements.*

*Flexibly assigning currencies to costs, funding sources or deposits in the model.*

*Pitfalls*

*Review of illustrative currency calculations*

Funding Calculations

*Layout of funding section to make funding calculations easy to write and check*

*Calculating funding to match funding needs*

*Modelling multiple sources of funding*

*Modelling alternative funding structures*

*Modelling Equity*

*Modelling Loans*

- *drawdowns*
  - *interest*
  - *interest roll up*
  - *average balance*
  - *repayments*
- equal*  
*annuity*  
*sculpted*  
*dedicated cash flow or 'cash sweep'*

*Pro-rata funding drawdown*

*Cash constraints on drawdown and repayment*

*Funding sub totals*

*Review of illustrative funding calculations*

### *Practical Exercise 4*

Delegates will work with course director on the addition of a simple finance section to the models developed in practical 1.

Project Finance Cover Factors

*The cover factors answer questions*

*To model them we need to know what the questions are and what the answers mean*

*Key Project Finance Cover Factors*

*Loan Life NPV cover factor*

*Project Life NPV cover factor*

*Debt Service cover factors*

*What is "available cash"?*

*Can we include deposits in cover factor calculations?*

*Modelling pitfalls*

*Review of illustrative cover factor calculations*

*Cover factor constraints on cash distribution*

- *ADSCR*
- *LLCR review of specialised macro to trigger lock-ins based on LLCR values*

*Tax and Profit & Loss Calculations in the model*

*Basic elements of tax calculations*

*Basic elements of P&L calculations*

*Modelling tax to avoid circularity*

*Grouping semi annual figures for annual calculations*

*Calculating capital allowances and depreciation*

- *Written down balance*
- *Straight line*

*Input data specifying depreciation for different capital costs*

*Calculation of interest and fees capitalised for tax*

*Modelling accounting reserves*

*Dividends*

*Balance sheet*

*What's the point?*

*Making it balance*

*Equity Returns*

*Definition of IRR*

*Calculation of real and nominal IRR*

*Treatment of Equity Loans and sub debt*

## Day Three

*Developing the model*

*Adding monthly or quarterly data and calculations within a semi-annual timeline, without losing flexibility*

*Review of illustrative monthly and quarterly calculations*

*Practical Exercise 5*

Delegates will be provided with data and will incorporate quarterly capital cost data and calculations into their models

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## Cash Balance Calculations

*Basic elements of cash balance calculation*  
*Specific issues for construction period escrow account*  
*Specific issues for debt service reserve account*  
*Specific issues for Maintenance reserve fund*  
*Specific issues for surplus cash account*  
*Review of illustrative deposit calculations*

## Summary Sheets

*One page summary sheet*  
*Total sources and uses for the investment period*  
*Use of 'strings' to give a textual description of the case being printed*  
*Production of results in annual format from semi annual calculations*  
*Review of illustrative summary sheets*

## Scenario and Sensitivity analysis with the model

*Evaluating alternative base cases*  
*Purpose of sensitivity analysis*  
*Which sensitivities?*  
*Handling the common sensitivities in the model*  
*Managing the risk of error when running sensitivities*  
*Using case selection /sensitivity tables*

- *Defines set of scenario and sensitivity cases*
- *Cases easily re-run*
- *Case headings automatically identify case run and selected values*

*Review of illustrative sensitivity table*

## Practical Exercise 6

The delegates will add a sensitivity table to their models

## Generating results tables for a range of input values

*Using copy-paste macro to count through a series of values for one or more specific inputs*  
*Populating tables with a series of results using simple counters and copy-paste macro*  
*Reviewing illustrative table and macro*

## Practical Exercise 7

Delegates will work with the course director to copy the macro and accompanying spreadsheet elements into their models, and integrate its operation with the sensitivity table

## Checking the model

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*During development*

*Output check before releasing base case*

*Cross check sensitivity results*

*Identifying the model assumptions*

*Documentation of the model code as a checking tool*

*Seeking perfection, modelling approaches for minimising error risk*

Working with other people's models

*Finding your way around*

*Finding and presenting the key information*

*Checking the results*

*Running your own cases*

*Taking over the model for onward development (and when to start again)*

Storing Results and recording changes

*Keeping track of data changes*

*Storing results and tracking model changes*

*Practical Exercise 8*

The delegates will add a 'stored results' library sheet to their models and work with the course director to record a simple macro to operate it.

Summary & Discussion