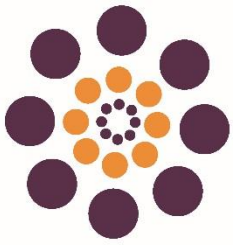
Financial Modelling in Excel (Intermediate)

Online Course Notes

Module 1 of 6

"About Financial Modelling"



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Specialists in Financial Modelling

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MODULE ONE: About Financial Modelling

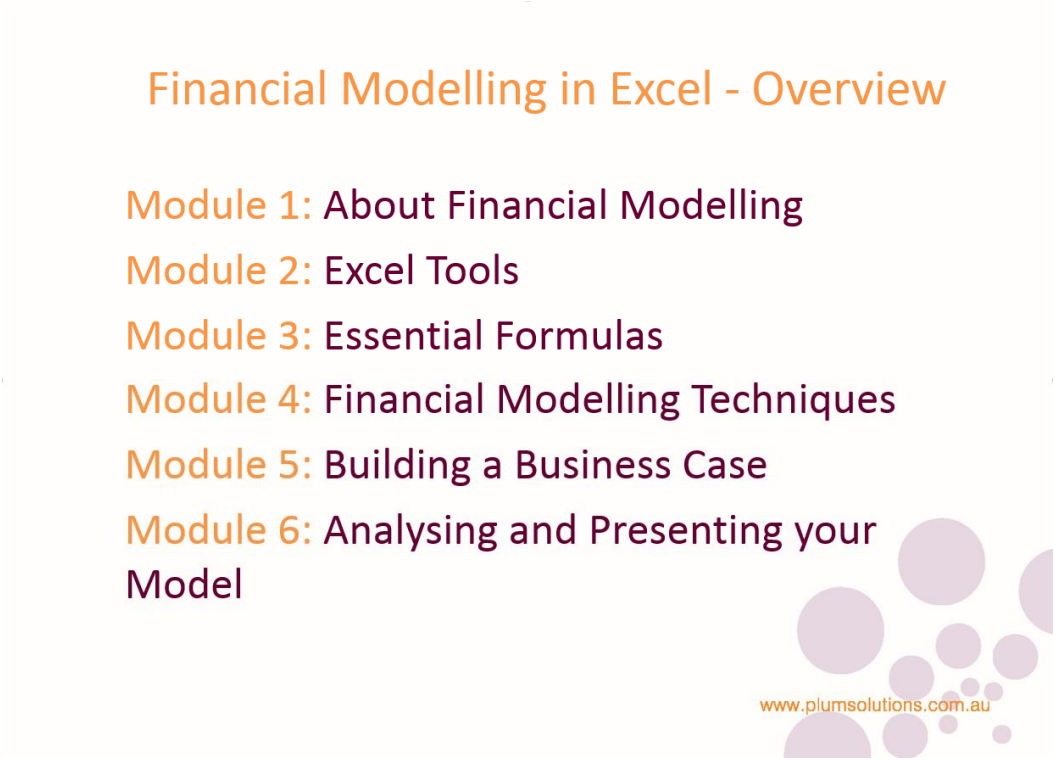
Log into your online course and download the Excel templates on each video page. Follow along with the video demonstration, and save your model. Note that the Excel models in Module One are not required uploads for this course, however, you are welcome to submit them if you'd like us to check that you're on the right track.

Overview of this Course

This course is about using and building financial models. The suggested pre-requisite knowledge is either an intermediate working knowledge of Excel or attendance at a standard Excel Introduction Course. It is therefore assumed that you have attended this course, or have a similar level of knowledge. Most of the functions, tools and techniques taught in this course have been covered in the Introduction course, and we will be focussing on how to use them in the modelling environment. There are a couple of tools, however, which are not covered until an Intermediate or Advanced standard Excel course which are important for Financial Modelling, and are therefore taught in this course.

This course is designed to suit business professionals who need to put their ideas into a financial model. Translating business ideas from vague concepts into a concrete set of numbers can be the hardest part of getting a new product idea or business off the ground.

Financial Modelling in Excel consists of six modules:



Module 1 consists of 6 videos:

1. Introduction to FME course
2. Anatomy of a Financial Model
3. Excel Versions
4. What's New in Excel 2016
5. Best Practice in FM
6. Overview of Scenario Analysis Methods

Video 1.1: Introduction to Financial Modelling in Excel Course

Welcome to the online course. If you have any questions or problems throughout the course, you can get help in the following ways:

- Log into the Plum Support Centre at http://www.plumsolutions.com.au/plum-support-centre (note you'll have access to the support centre until four weeks after your course access expires)
- Email us directly at info@plumsolutions.com.au
- Telephone +612 9818 7250 or 1300 852 215 from within Australia
- Log into the website, and click on the Live Support button on the bottom corner

Video 1.2: Anatomy of a Financial Model

Recommended Reading: See the section on "The Workbook Anatomy of a Model" in Chapter 2, Page 36 of Using Excel for Business Analysis. Below is an extract from this chapter:
Also read the following blog articles:
- The Workbook Anatomy of a Model
- Golden Rules for Model Design

Typically, modellers will work from back to front when building their model. The output, or the part they want the viewer or user to see, will be at the front, calculations will go in the middle, and source data and assumptions should go at the back. The figure below shows an example of what your tabs in a well-structured model might look like.

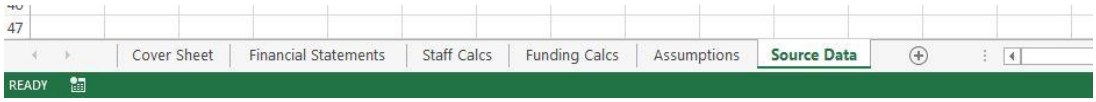
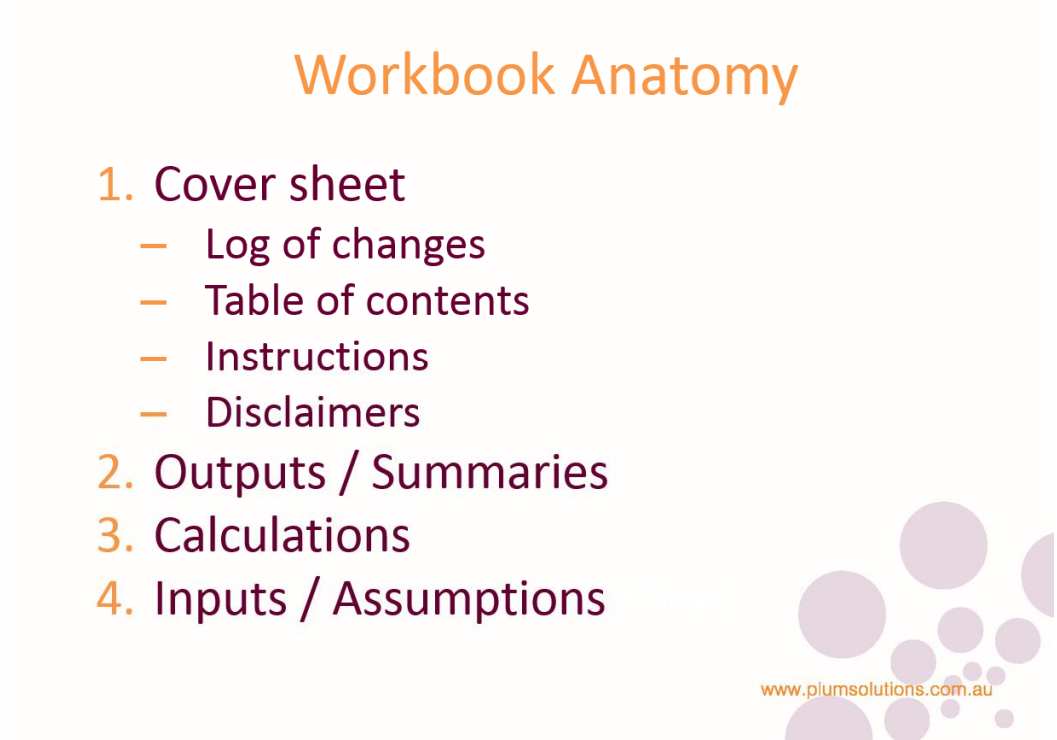


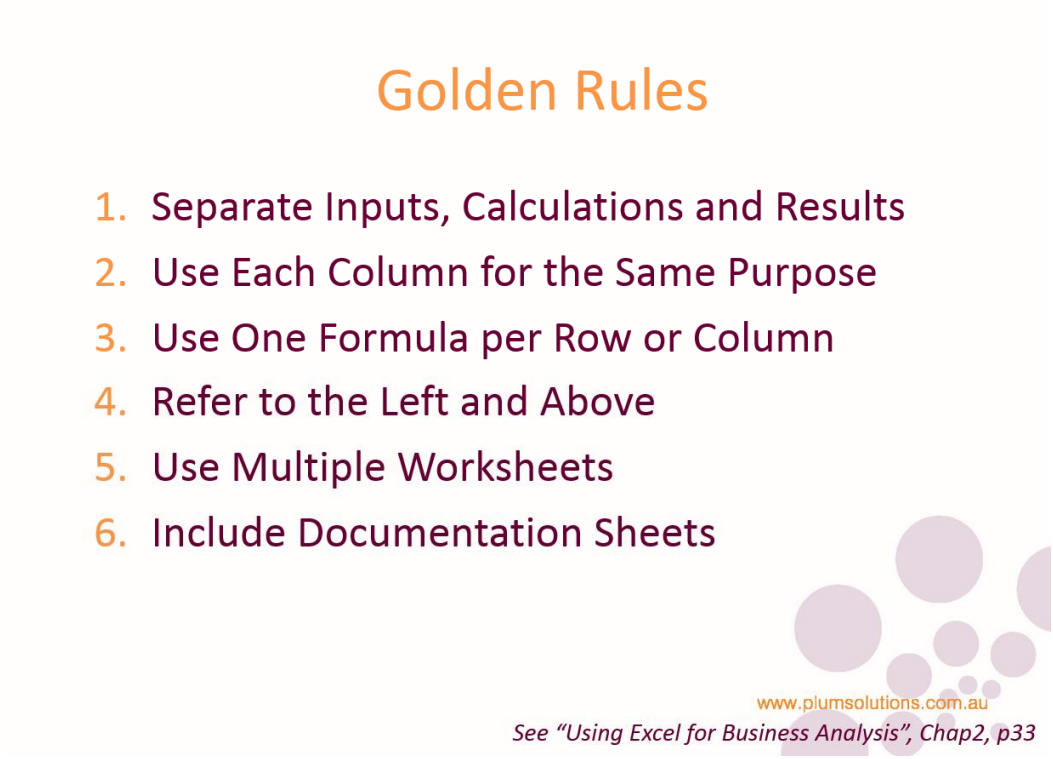
Figure: Model Structure

Like the executive summary, a board paper, or other report, the first few pages should contain what casual viewers need to see at a glance. If they need further information, they can dig deeper into the model.



Unless a model is very small, there should be a dedicated tab worksheet for each major component of the model. Whilst by no means a prescriptive list, below is an example of what might be included on each tab:

1. **Cover Sheet:** The cover sheet contains many details about the model. Whether or not a cover sheet is necessary is an issue for debate, but one can include (but is not limited to) details such as:
    - A log of changes and updates to the model with date, author, change details, and their impact to the output of the model. This is important for version control.
    - Flow chart of the model structure.
    - Table of contents.
    - Instructions on how to use the model.
    - The purpose of the model for which it should be used.
    - Disclaimers as to the limitations of the model, legal liability, and caveats.
    - Global or key assumptions integral to the use of the model.
2. **Input Sheet:** This is the only place where hard-coded data is permissible. There may be one or more input sheets if there are copious amounts of data, but the input data should be laid out in logical blocks, for example: consumption data, WACC data, assets and depreciation data, inflation and indices, pricing and tariffs, assumptions and constants (such as tax rate, discount rates, concession rates).
3. **Output, Summary, and Scenario Sheets:** These present the final outcomes. They may also contain scenario drop-down boxes, spin buttons, or tick boxes that allow the users of the model to generate their own outputs. Tables and charts summarising the outputs should be set up in such a way that they can be easily printed or used to generate reports. Ensure that these can be easily printed directly from the model, or copied or linked to other programs such as Word or PowerPoint.
4. **Calculation or Workings Sheets:** Split the calculation sheets logically and then, within each sheet, set them up consistently. If calculation sheets are split, ensure that the layout and formatting are as consistent as possible across all sheets.
5. **Error Check Sheet:** This sheet contains links to all error checks in the model. Error checks should be performed in the calculation section, but a summary of all error checks in one location means that once the model is in use, the modellers can quickly check to see if any of the error checks have been triggered.


Golden Rules
1. Separate Inputs, Calculations and Results
2. Use Each Column for the Same Purpose
3. Use One Formula per Row or Column
4. Refer to the Left and Above
5. Use Multiple Worksheets
6. Include Documentation Sheets
www.plumsolutions.com.au
See "Using Excel for Business Analysis", Chap2, p33

Video 1.3: Excel Versions

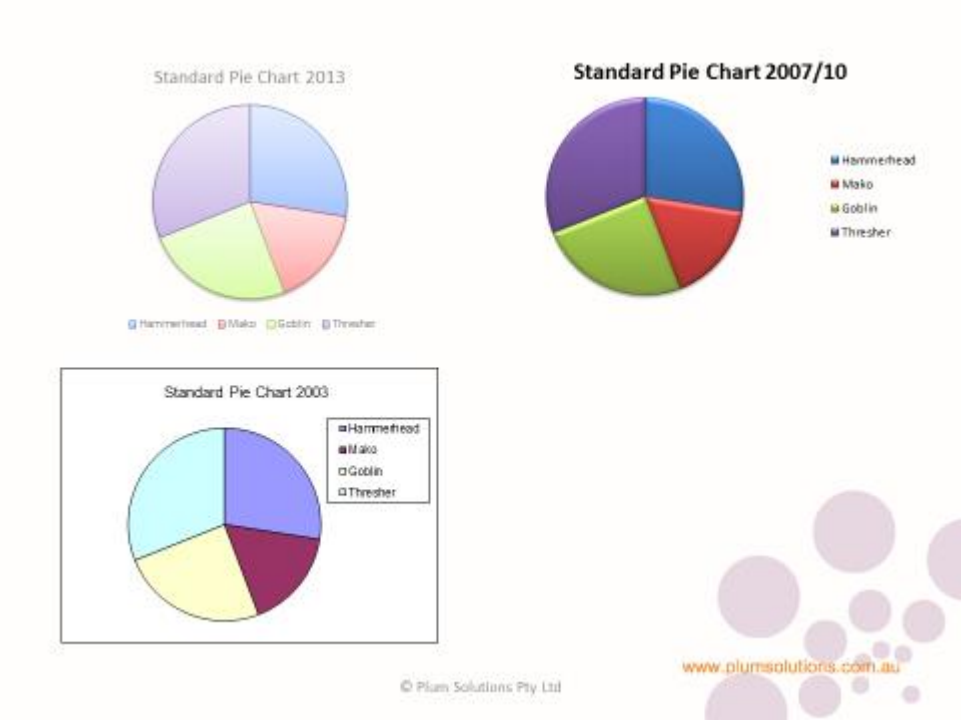
Recommended Reading:
1. See the section on "Excel Versions" in Chapter 5, page 101 of Using Excel for Business Analysis
2. Read the article What's New in Excel 2013
3. Download the PDF document entitled "Excel Versions" which describes the recent history of Excel, as depicted below.

An important point to note is the difference between file types:

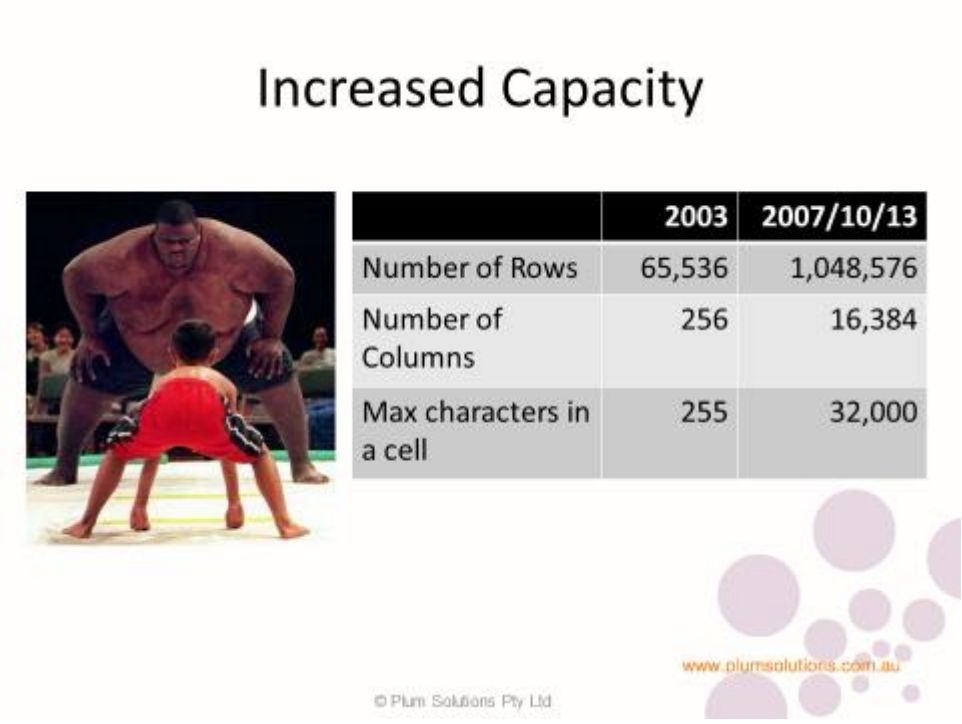
1. **.xls file format** related to Excel 2003 (a long time ago!) and is a much less secure, less compact file types.
2. **.xlsx file format** is the newer version and allows full functionality of the new features of the later versions.
3. **.xlsm file format** is used when the file contains macros.

Update: Excel for Mac 2016 was released in July 2015.

We can see that the humble pie chart has evolved significantly in the last few versions:



The upgrade from Excel 2003 had the largest effect in terms of size and capacity:



Although at first glance Excel 2010 did not seem to be very different from its predecessor, it did contain three new features which are game-changers to Excel users. Although not used extensively

in financial modelling, the Sparklines, Slicer and Power Pivot features are covered in other training courses offered by Plum Solutions, such as Data Analysis and Dashboard Reporting in Excel.

Excel 2013 offers a number of new functions and chart types. One useful feature is flash fill, which will automatically fill a range based on the pattern of values entered.

Video 1.4: What's New in Excel 2016

Recommended Reading: Read the following blog articles:
- Excel Top 10 Tricks (includes a Microsoft video of new features)
- Waterfalls and Other New Charts in Excel 2016
- Are Excel Improvements a Game Changer for Modelling? (You may need to join the LinkedIn Group to view the discussion)

Some of the more notable new features in Excel 2016 are:

- **Forecast Sheet**. The ordinary FORECAST or TREND functions are very useful for forecasting along a linear trend in previous versions of Excel. But if you want to create a forecast based on seasonality, then it's quite a detailed process (which I cover in my Budgeting & Forecasting in Excel course). The new Forecast Sheet feature makes it very easy to forecast based on historicals, including seasonality and you can even apply confidence intervals to your forecast.
- **Better Analysis in Pivot Tables & Pivot Charts.** Pivot tables handle dates and times even better than they did before with automatic grouping and you can drill down directly into pivot charts with new plus & minus buttons.
- **New Charts.** There are some fantastic new charts in Excel 2016 and definitely worth the upgrade for these alone. These include a Waterfall chart (no more fiddling around with the calculations!), a Tree Map and Sunburst. See the article on Waterfalls and Other New Charts in Excel 2016 for more detail on these.

Of course there are many more new features that are available in 2016; these are just a couple. It's good to keep up with all these new features that can save time and add extra bells and whistles to your model, but the principles of best practice still remain. For the purpose of building a pure, well-built and functional financial model, it really doesn't matter what version you are using. The functions, the formulas and all of the things that you loved about Excel are still there and still available but they just keep adding some new tools and features which can be useful in financial modelling.

Video 1.5: Best Practice in Financial Modelling

Recommended Reading:
- See the section on "Best Practice in Financial Modelling" in Chapter 3, page 55 of Using Excel for Business Analysis.
- Read the blog article Best Practice in Financial Modelling-

The principles of best practice outlined here are for the purpose of reducing errors, making a model easier to read, audit, update and use for its intended purpose. This list is by no means exhaustive, but outlines the most important principles in Financial Modelling. By following these key principles, your model is more likely to be robust, accurate, reliable and error-free.

Document your assumptions

- Your model is only as good as its assumptions
- Document source data and unique calculations **as you go**. (don't leave it all to the end)

Linking, not hard-coding

- Link as much as possible so that when the inputs change, the outputs also change (pretty much the whole **point** of Financial Modelling!)
- Use Named Ranges when linking to external files
- Never use a value within a formula
- You may notice that many modellers put input variables in blue font

Only enter data once

- Never enter the same value twice; enter it in once as a source and always reference to that one cell

Bad Habits

- Hit "enter" or the green tick after editing a formula; don't just click elsewhere. It's a bad habit many people have, and one that can cause unintentional errors
- Highlight the range only, not the entire row or column – using the entire row or column is tempting but uses too much memory

Consistent Formulas

- In a table or block of data, the same formula exists **all the way** across and down the entire block. This saves time, and avoids error
- Use Absolute / Mixed Referencing to achieve this

Formatting & Labelling

- Format cells appropriately. Use symbols for currency $€£¥, percentages % etc and commas for thousands – this makes your model easier to read and avoid mistakes and misinterpretations
- It sounds simple, but mixing units (e.g. mixing apples and oranges) is a common source of error in financial modelling.
- Label your data clearly

Video 1.6: Overview of Scenario Analysis Methods

Recommended Reading: See the section on "Overview of Scenario Tools" in Chapter 11, page 340 of Using Excel for Business Analysis

Many people will create a financial model, and save it as the base case. They then change all the numbers, and save it as a worst case. Then they change all the numbers again and save it as a best case. Whilst this method will work, it's not a very efficient way of performing scenario analysis. If a subsequent change needs to be made to the model, it will need to be made several times, and there is a high possibility that an error will be made between the different versions.

Let's take a look at the technical methods available in Excel for creating scenarios and sensitivities, which will provide a much better way of building models. In the **Introduction** and **Intermediate** Financial Modelling courses we cover the Data Validation drop-down method which is by far the simplest and most commonly-used method of scenario analysis. In the **Advanced Financial Modelling** course, we cover the other two methods, the most useful of which are the Data Tables.

Essentially, there are three technical methods of scenario analysis in Excel:

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