

Best Practices in Financial Modelling

A brief overview of building financial models for valuations professionals



This course is about modelling!

We are going to make our numbers look good

Amongst the slides that follow, we will discuss:

- What a model is and what it is used for
- The key components of a financial model
- Steps in building a model
- Best practices in model design and development



What is a Model?

- A set of calculations that turns certain inputs into an (or a set of) output(s)
- Allows the user to evaluate possible outcomes without having to actually implement (or even worse, wait for!) a certain course of action
- In our world typically performed in Microsoft Excel
- Usually the desired outputs can be clearly defined (e.g. forecast revenues / EBITDA / cash flows, net present value, share price, etc.)

Types of models we see in practice



The use of financial models is widespread in modern day finance – here are some of the more common use cases for financial models:

- Investment analysis and business valuation
- Project finance – calculation of cash flows from a capital project and impact on returns, payback, level of debt that can be carried, etc.
- Budgeting and forecasting
- Sales and operations planning
- Calculation of financial statement line items for reporting purposes (e.g. impairment analysis)
- Tax and estate planning



Key components of a financial model

All models have a collection of worksheets or sections that fall in to one of the following buckets:

Admn

Sheets such as table of contents, user guide, change logs, that serve an administrative purpose in the model

Inputs

Source data, key inputs and assumptions that drive the outputs of the model; sometimes may be linked to other files

Calculations

The main engine of the model where the inputs are combined with a prescribed algorithm to calculate model outputs

Outputs

Charts, tables, financial statements, dashboards, etc. that summarize and clearly and succinctly communicate the outputs generated by the model



How to start the modelling process

Model with the end in mind – here are some things to consider before you start building your model:

- Why is the model required, what is the ultimate output of the model that you need to solve for?
- Who is the intended audience, how sophisticated are they and what level of detail do they require?
- Do you need to prepare your model in accordance with any formal guidelines (i.e. IFRS, tax regulations, bid submission in response to an RFP, compliance with debt covenants, etc.)
- Is the required input data available and accessible? Where will it come from and how will it be entered?
- Do you have the requisite knowledge to perform the calculations?
- What is the desired level of granularity (detail by region, business unit, product, etc.) and periodicity (monthly, quarterly, annual)?
- Will you need to track different instances of the outputs (e.g. budget vs actual) or run certain predefined scenarios (base case, best case, worst case, etc.)?
- Will you require any complex calculations that may require macros or intended circular references?

Make sure you have a good understanding of the specifications of your model before you start coding in Excel – it is very painful and time consuming to start making changes once you're half way through building a model, and greatly increases the risk of error



Steps in building a model

1. Set up your file and sheets (i.e. the structure of the model)
2. Build your timelines keeping columns consistent across different sheets
3. Set up your outputs templates (e.g. DCF, financial statements) – these are the values you want to solve for in the model
4. Build your calculations for each item on your outputs page, taking care to keep calculations simple and recording any inputs or assumptions in a separate part of the model from where they can easily be updated
5. Link your model through from the inputs to the calculations to the outputs
6. Build error checks throughout your model to identify any potential mistakes
7. If appropriate, build a dashboard that summarizes the key outputs of the model using charts and graphs and layer on sensitivity analysis (e.g. data tables) to add a greater level of depth to your model
8. Complete a user guide / information sheet providing the model user sufficient information to operate the model in the future; you may want to summarize key assumptions here as well as data sources



Best practices in model design and development

1. Build from left to right and top to bottom
2. Keep columns consistent – the column for Year 1 on one sheet should be the same throughout all the sheets in the model
3. Separate your inputs from calculations and outputs – do not include any embedded assumptions in the model
4. Break down complex or large formulas in to smaller calculations - clearly lay out arithmetic instead of forcing it to fit entirely in one cell
5. One way to simplify formulas is to model using flags
6. Try to limit each row to one unique formula – changing formulas in the middle of the row can increase the risk of error in the model
7. Do not hide rows and columns – it is better to group them if required, otherwise best to leave visible as hidden rows and columns lead to many inadvertent errors
8. Use error checks and conditional formatting
9. Avoid excessive use of different fonts, highlighted cells, etc. as it makes the model busy and harder to follow – format your numbers in a clean manner and present numbers in thousands / millions for clarity
10. Use headers / section breaks to organize model calculations

The importance of review and quality control

- Given their ubiquitous use in industry, the dynamic nature of spreadsheets, and the vast amounts of data being generated, spreadsheet and model errors are a big source of risk for finance professionals
- Although very difficult to eliminate entirely, this risk can be managed through a well designed, built, and documented financial model
- There are also third party modelling tools and independent review or audit service providers who check and advise on financial models



Excel: Why using Microsoft's tool caused Covid-19 results to be lost

By Leo Kelion
Technology desk editor

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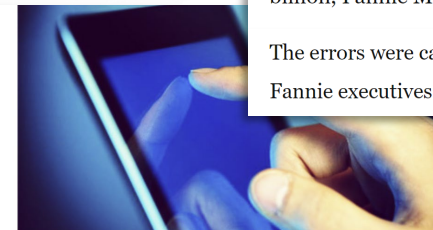


Finding Errors a Plus, Fannie Says

By David S. Hilzenrath
October 31, 2003

The day after announcing that its last quarterly earnings release contained errors totaling more than \$1 billion, Fannie Mae said yesterday that it remains "proud of our accounting processes and controls."

The errors were caused by a company accountant entering the wrong formula into an Excel spreadsheet, Fannie executives said. The spreadsheet was used to compute changes in the value of commitments the



Excel error leaves Barclays with unwanted Lehman assets

15 October 2008



Barclays Capital has been forced to file a legal relief motion relating to its acquisition of Lehman Brothers' US assets after a reformatting error with an Excel spreadsheet resulted in 179 contracts being mistakenly included in the purchase agreement.

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Spreadsheet blunders costing business billions

Katrina Bishop | @KatrinaBishop

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“All models are wrong ... but some are useful.”

— George Box

Thank you