LUMSA University
Department of Human Sciences
Communication, Education, Psychology

Business planning and Start up

MODELLING

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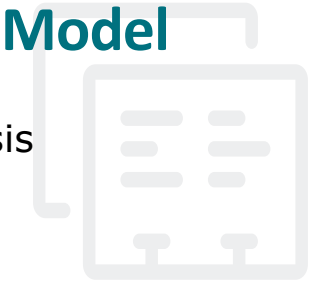
Agenda

01 What is a financial Model

Understanding and analysis



02 Publish and Present

Making examples

03 Summary & Wrap-up

Making examples and
starting with excel

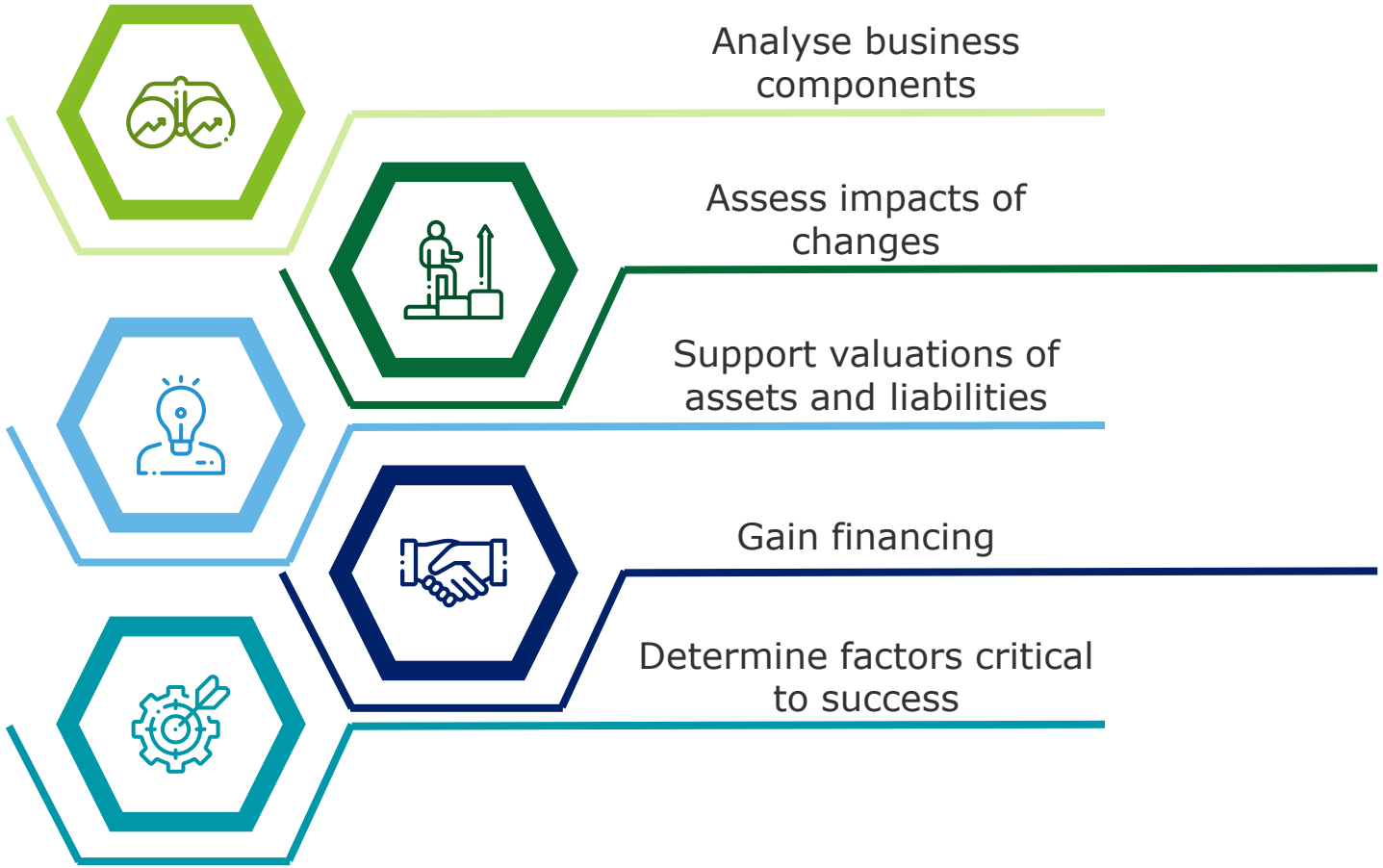
What is a financial Model

Financial Model

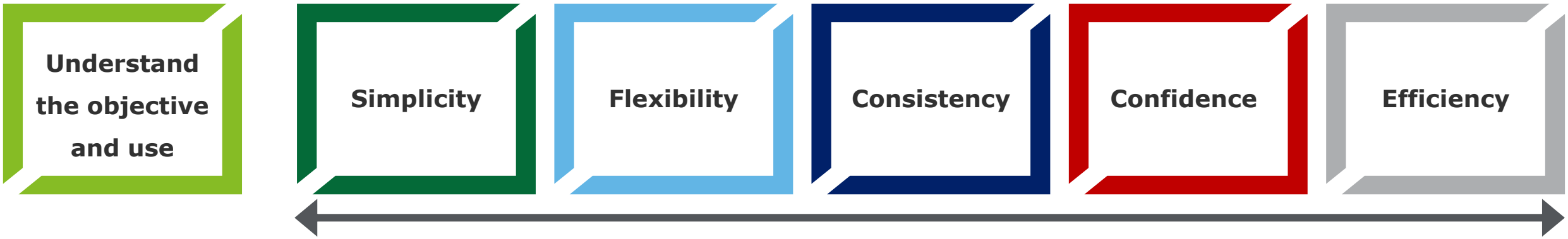
What is?

- **Forecast** (future Cash flows) designed to inform a business decision with flexible parameters.
- Key outputs are usually: **Financial Statements** and **Investement appraisal measures**.

Why build a Financial Model?



Fundamental Principles



Objective and use

- The nature of the decision being contemplated.
- How the model supports the decision.

Users

- Who will be using the model, and to what end?

It is vital when modelling to:

- keep the model as **simple** as it can be;
- introduce appropriate **flexibility** (but too much may add unnecessary complexity);
- apply **consistent principles** to similar items and events;
- be **confident**: don't start building without planning and include meaningful checks;
- be **efficient**: it all saves time and money in the end.

Decisions are made using models!

Business situations **never stay constant** and a **variety** of different scenarios and **sensitivities** may be being considered.

In addition, models are not for the model builder, they are a **shared resource.**

Usual components of a Financial Model

OUTPUT SHEETS

- Integrated financial statements
- Investment appraisal

CALCULATION SHEETS

Lots, often…

INPUT SHEETS

Where users enter the data to be processed by the model.

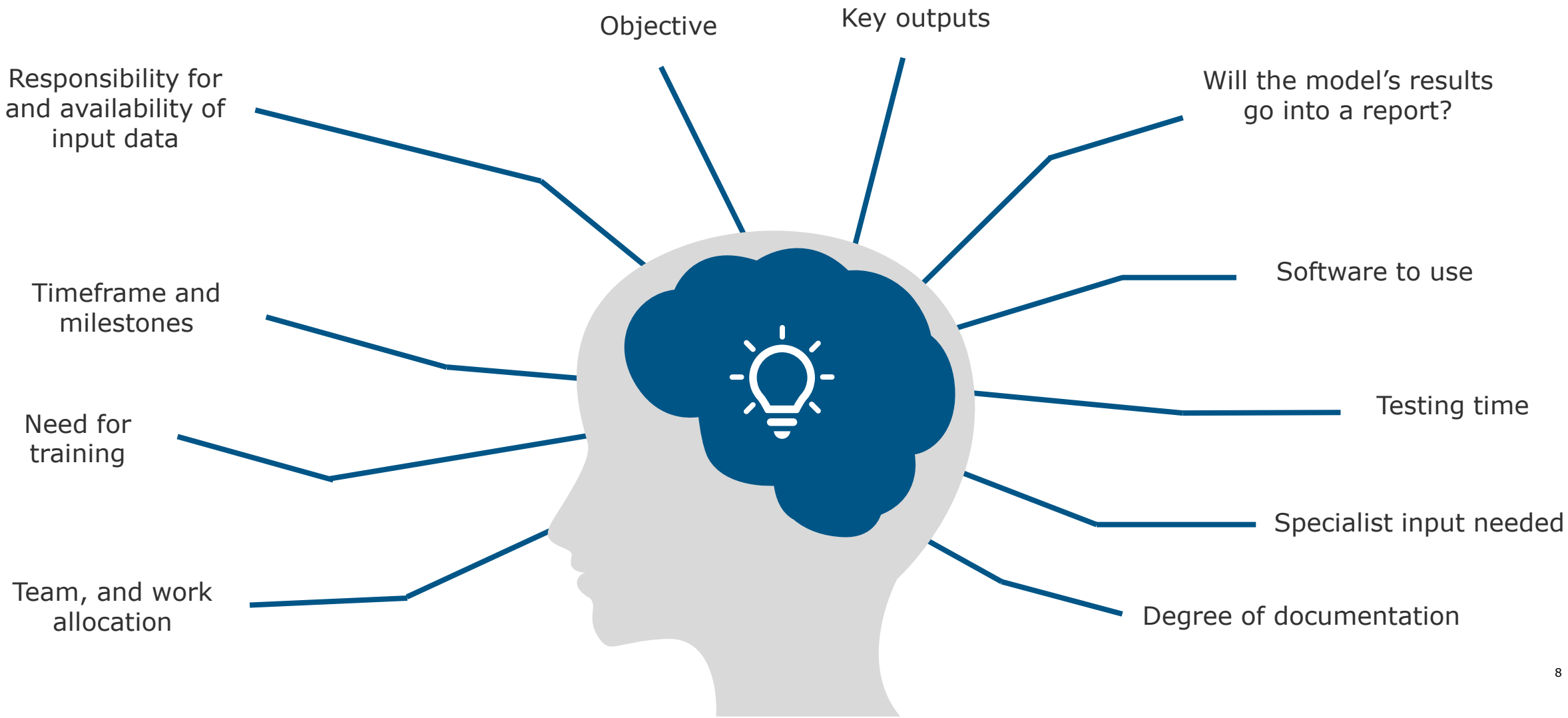
ADMINISTRATIVE SHEETS

- Checks
- Summaries
- Content pages
- …

The 3 Stage Model Development Process

There is usually a lot of **feedback between stages**. For example, a fast moving situation could mean the later redesign of a model component.

Things to consider



Key specification points

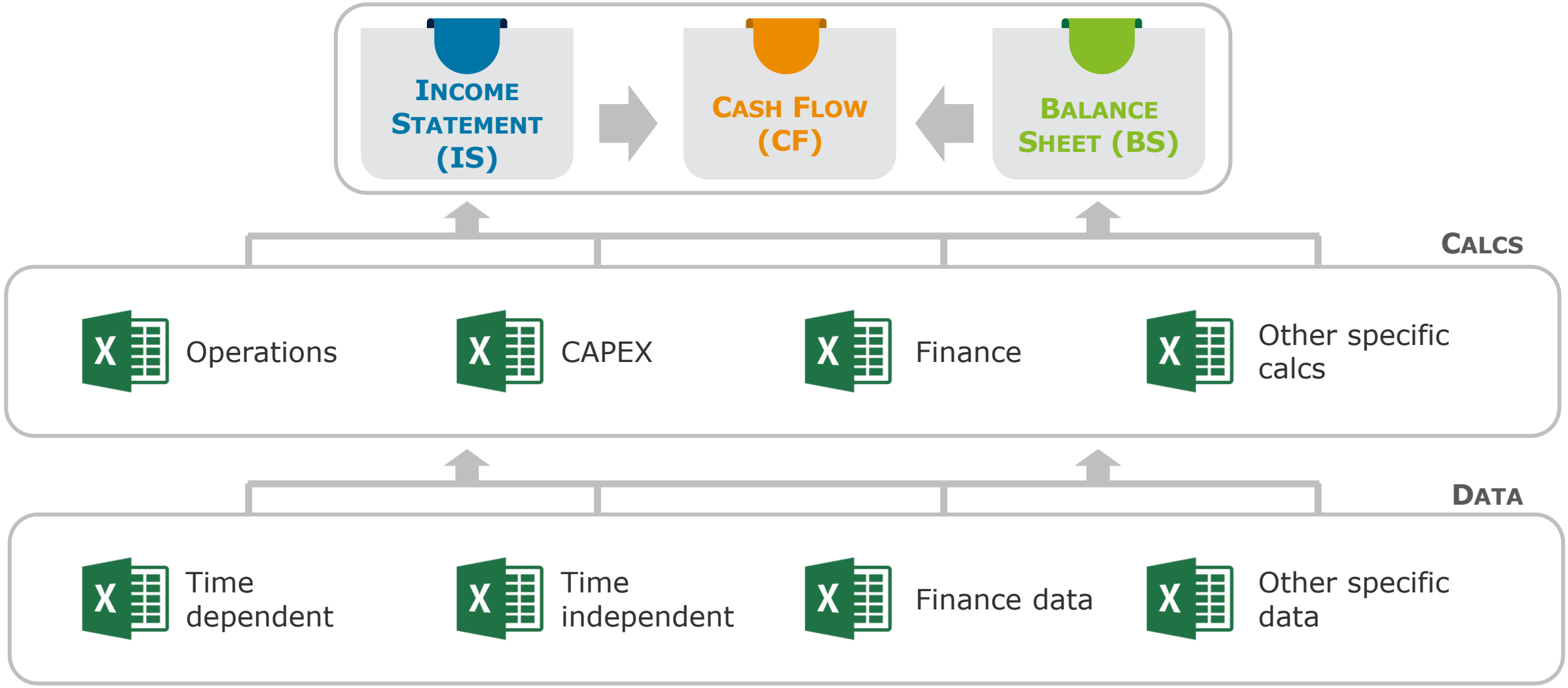
Consider produce a written **Specification** describing:

1. **Objective** of the model
2. Key **outputs** and **inputs**
3. What **sheets** the model will have
4. How major **calculations** will be performed
5. The (or at least the type of) **sensitivities**
6. Any known **unknowns**
7. List of **assumptions**

Benefits of **client agreement** over the specification!

Publish and Present

Spreadsheet structuring



IMPORTANT!

you must include the same time period in the same column on every sheet

Spreadsheet structuring *(cont.)*

Categorise & breakdown

- Separate data, logic, output and administration detail, ideally on separate sheets.
- Within these breakdowns, group similar elements together, eg all fixed asset data.

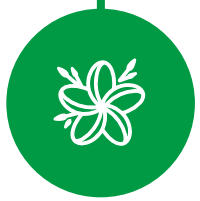
Recognise & exploit similarities

- Handle similar elements consistently, eg similar business units.

Promote ease of use

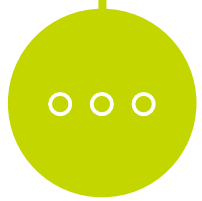
- Establish and maintain a consistent layout.
- Use styles and formats.
- Include explanatory notes and comments where necessary.
- Call up data from the data sections separately where appropriate.
- Think about how the user will navigate around the model.
- Protect the workbook where necessary.

Data design



Layout & presentation

- Classify data and group similar inputs together.
- Maintain a consistent sign convention.
- Format to ensure data cells are easily identifiable.
- Label all data inputs – description and units.
- Simple calculations are acceptable where useful, eg checks.



Extras

- Consider using data validation.
- Consider using conditional formatting.

Calculation design

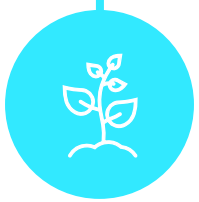
Key principles

- Minimise the number of unique formulae in the model:
  - ✓ no formula changes within rows;
  - ✓ maximise generic calculation blocks, eg fixed assets.
- No hard-coding within formulae.
- Breakdown complex formulae into manageable chunks.
- Try to avoid using custom functions.

What you **don't want** to see:

```
=IF($D$381=1,IF(I179>0,MIN((H261*$F$385+H263*$F$386)/4*$E$343+I
F(MAX($E$108:H108)>0,(H238*$F$385+H240*$F$386)/4*$E$343,0),SUM
PRODUCT($C$353:$C$355,INDEX($D$52:$N$54,0,MATCH(INT(I62),$D$3:$
N$3)))/4+IF(MAX($E$108:H108)>0,SUMPRODUCT($C$353:$C$355+1,INDE
X($D$52:$N$54,0,MATCH(INT(I62),$D$3:$N$3)))/4,0)-I180),0),0)
```

Output design



Key principles

- Calculating output before it is output.
- Establishing a clear layout (think about printouts too).

T I P S

Agree headings with the client first.

If output is financial statements, build up piecemeal.

Think about showing key output, e.g. IRR on all sheets.

Think about using a control panel sheet with all the key output.

Styles

In addition to ***enhancing the appearance of the model****, applying style properties to cells can be used to* ***advantage*** *in* *innumerable ways:*

Input

Input

1. Build the inputs sheets using logical headings – these will be similar to the sheet headings and those used in the model documentation.
2. Consider how you will incorporate sensitivities at the outset.
3. Ensure that each input can be entered only once.
4. The values of some inputs may need to be restricted and this should be clear.
5. Include time dependent and time independent inputs on different sheets.

Output

Output

1

Knowing the outputs required to the right level of detail is the key to successful modelling:

- these govern the rest of the model;
- they are derived from the objective.

2

The format of key outputs should be included in the Model Specification.

3

For financial models, key outputs are usually:

- integrated financial statements: Cash Flows, Profit & Loss account, Balance Sheet.

4

Be mindful of nature and quality of input data available.

Control

Minimise the risk of error in the model.

Trap any errors which do arise immediately.

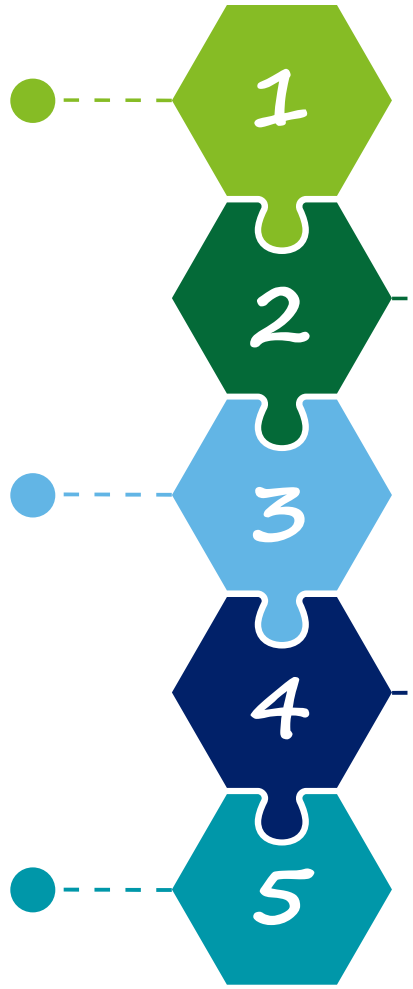
Not wait until your model is complete only to find out that it doesn't work but you've no idea why.

Confidence comes through Control.

Avoid sleepless nights!

Checks

The model should contain a separate **Checks sheet**.



Always include a balance sheet **balance check**.

Include other **meaningful checks** depending on the situation.

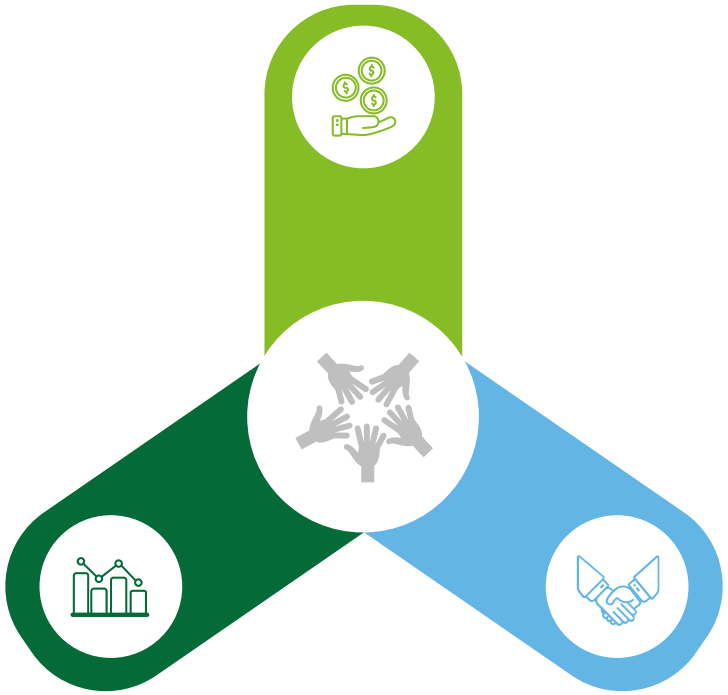
Set up a **master check** (a check of checks).

On the checks sheet, have one column which contains the results of each check but nothing else. **The master check then add up the column containing the results of all the individual checks**.

Never hardcode a difference as acceptable. Instead, allow a flexible **tolerance level**.

Integrated Financial Statements

The Balance Sheet should take cash from the bottom of the Cash flow statement.



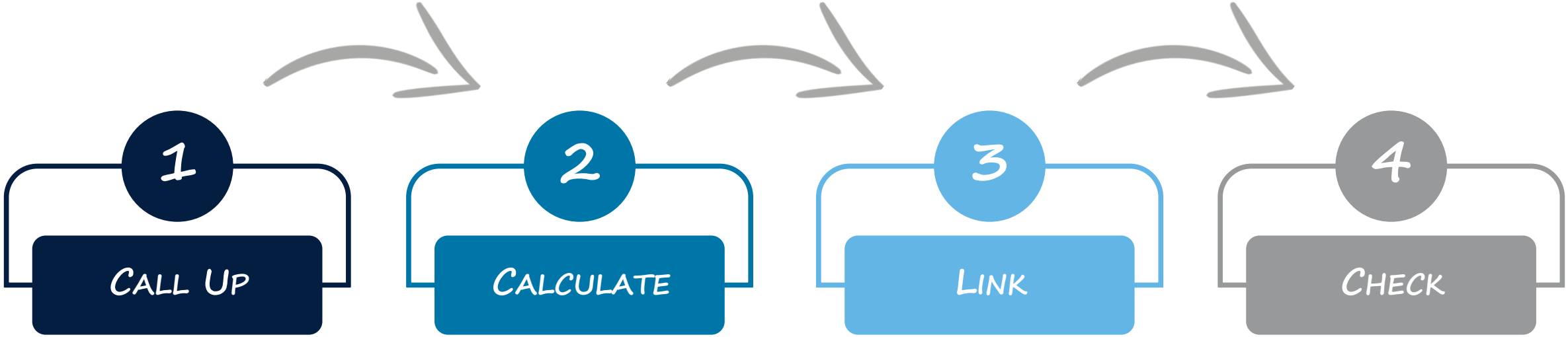
The Balance Sheet should take profit from the bottom of the P&L account.

Never use balancing figures.

By integrating first (and making sure the statements add up), we can then reliably post entries into them.

The Approach to Building

For each section of the model:



The data you need.

To get the results.

From control accounts to the integrated financial statements.

To minimise error.

Dealing with timelines

When deciding what **timing resolution** to adopt (monthly quarterly, annual), consider:

1. Trade off between **flexibility** & **accuracy** and **simplicity** of calculations & output.
2. Any **date dependent** operations, eg movability of construction start dates.
3. Will there be a **noticeable effect** on model size and operation (eg calculation time).
4. What **data** is actually **available**.

Example:

period label

	Jan-21	Feb-21	Mar-21	Apr-21	May-21
granularity	Monthly	Monthly	Monthly	Monthly	Monthly
section label	Operational	Operational	Operational	Operational	Operational
start date	01-Jan-21	01-Feb-21	01-Mar-21	01-Apr-21	01-May-21
end date	31-Jan-21	28-Feb-21	31-Mar-21	30-Apr-21	31-May-21
year no.	1	1	1	1	1
relative period no.	1	2	3	4	5
period no.	1	2	3	4	5

Dealing with timelines *(cont.)*

Consider the use of period counters and indexes.

Create the timeline(s) once on a separate sheet and call them up on other sheets as required.

Always start the timeline in the same column.

Use date flags where possible to increase transparency:

- the period in which the event is happening is flagged with a 1, all other periods being flagged with a 0;
- these flags are applied to the calculation (by multiplication) to trigger some other event.

Working Capital

In business, there is usally a **time lag** between making a sale and receiving the cash for that sale; the same is true for expenses.

Debtor and Creditor cycles

Businesses often describe their debtors and creditors as being a **number of days worth** of Sales and Purchases.

Many business also have substantial **stock**.

2 cash flow approaches

Use **revenues and costs from the profit and loss account** and make a single working capital adjustment representing the **net effect** of all the timing lags to get net operating cashflow.

Include operating cash received and paid explicitly on the cash flow statement

In high-resolution models where the business is **seasonal**, calculating the right debtor and creditor balances can be quite **complex**.

Fixed Assets

Fixed Assets generally take time to build and so have **two distinct phases**:

01 *Construction*

- Major capital expenditure (CapEx).
- No depreciation.

02 *Operation*

- Some capital expenditure (probably).
- Depreciation in charged.

TRANSACTIONS:

Depreciation

- Fixed assets should be written off to residual value over their useful economic life.
- No depreciation until an asset is in economic use.

1

Additions

- Usually significant.
- Impact on cash and balance sheet (and subsequently P&L through depreciation).

2

Disposals

- Sometimes these are significant, for example in a merger where surplus assets are to be sold.
- Impact on all three financial statements.

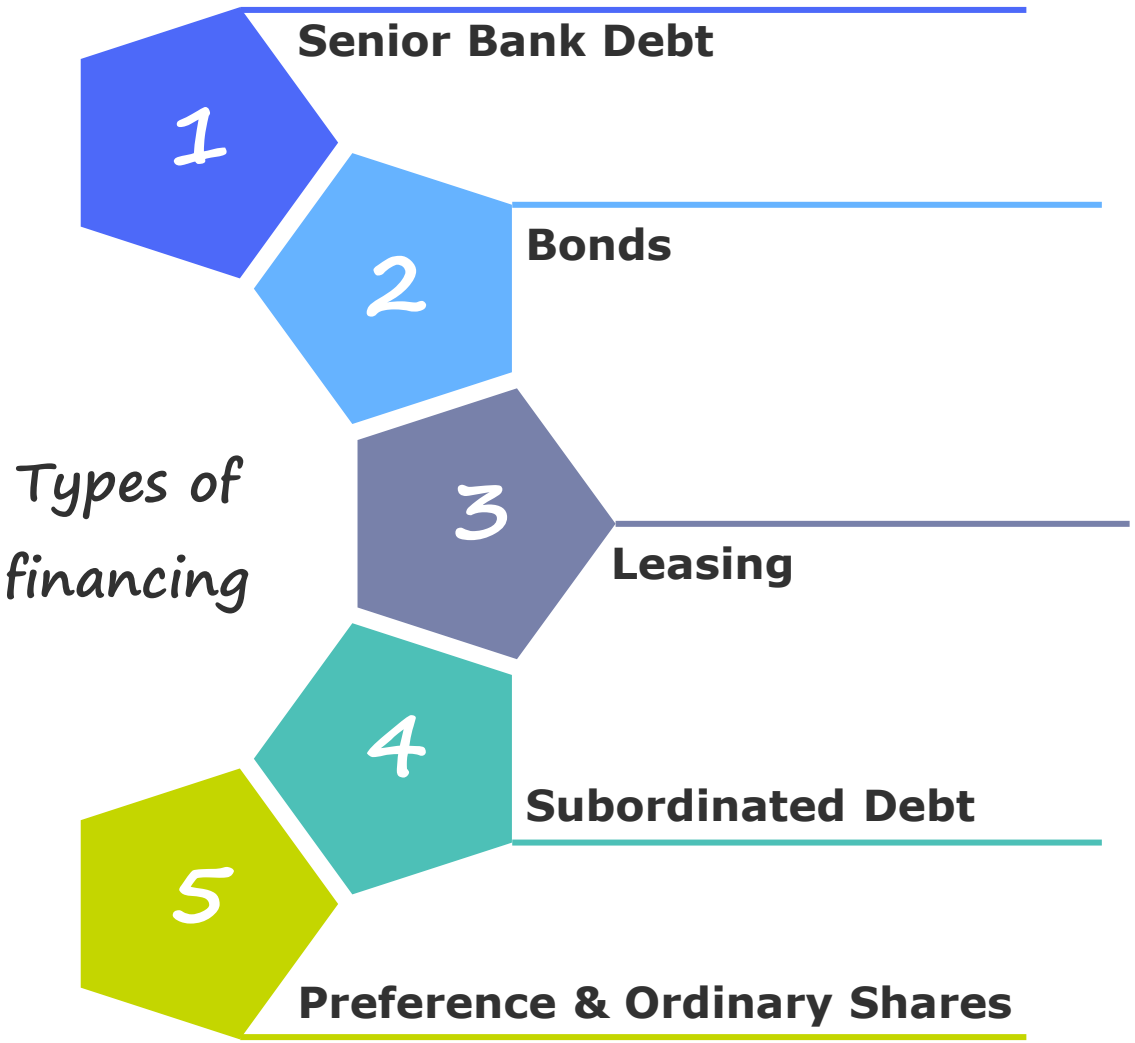
3

Revaluations

- Initial impact on balance sheet presentation.
- P&L subsequently affected through depreciation charge.
- Unusual to include in a model.

4

Financing

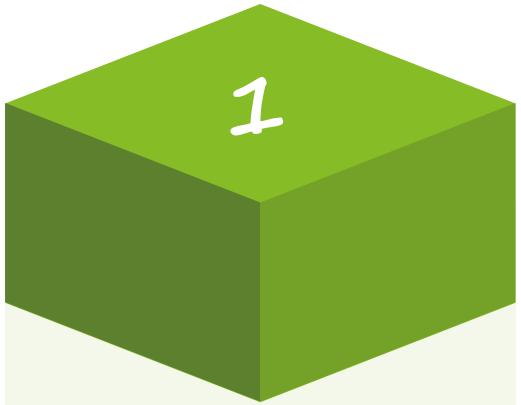


1. Mortgage (annuity)
2. Straight line
3. Bullet
4. Tailored (customised profile)

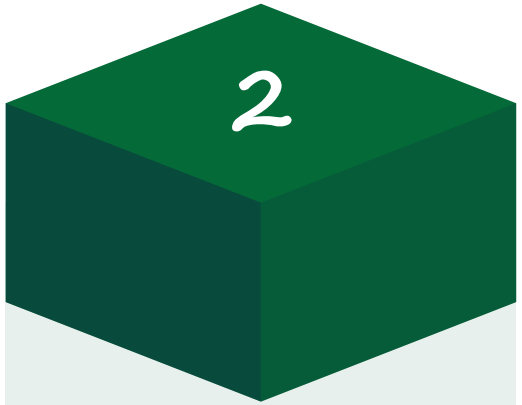
Loans repayment types

Financing *(cont.)*

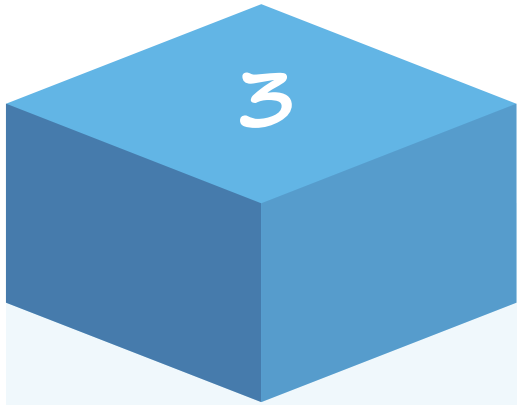
Modelling Financing



A regimented approach is required.

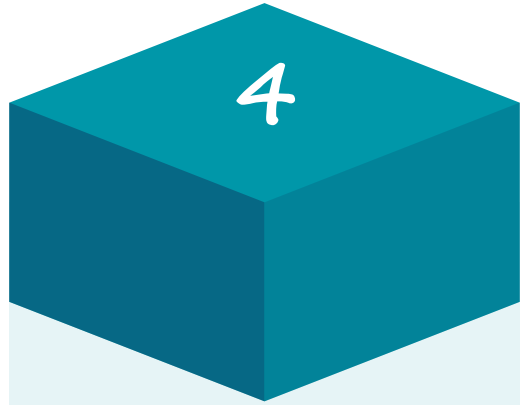


Have a control account for the **principal** component of every class of finance.



Priority mechanism (cash waterfall):

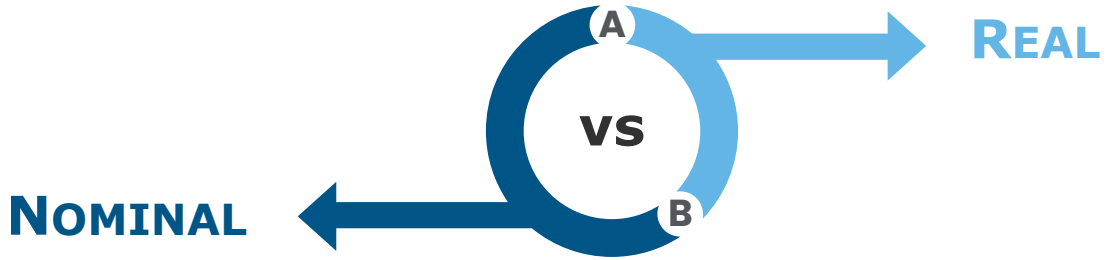
- these usually list the priority of all payments;
- those lower down the list only get anything once those above have all they are entitled to.



You may need a separate control account for each **interest** component too.

Incorporating inflaction

*Revenues and costs usually **increase over time** whilst input assumptions are likely to be as at a particular date.*



Generally **operational inputs** will be in **real terms**, **financing inputs** and **output** in **nominal terms**.

Inflation rates will be input (or not) and used to inflate the real term inputs.

Key principles

1. Be consistent in any application of inflation, remembering to use an appropriate discount rate.
2. Consider what inflation rate is most appropriate – eg RPI for all, or line specific.
3. Consider whether stepped or continuous inflation is most appropriate.

Quality Control

1. Analytical review
2. Flex testing
3. Limited parallel build
4. Benchmarking
5. Spreadsheet software
6. The “usual suspects”

Quality Control *(cont.)*

1. **Analytical review**
2. Flex testing
3. Limited parallel build
4. Benchmarking
5. Spreadsheet software
6. The "usual suspects"

- A senior role.
- Form an expectation of what the outputs should be.
- Compare this to what is actually seen.
- May include analysis of trends and relationships (including graphs and ratios).
- May also extend to understanding relationships between inputs:
  - ✓ whether variables are independent or interdependent;
  - ✓ depending on who is responsible for this.
- Should including overall commercial sense check (documentation will help).
- What is missing from the model that is usually seen?

Quality Control *(cont.)*

1. Analytical review
2. **Flex testing**
3. Limited parallel build
4. Benchmarking
5. Spreadsheet software
6. The "usual suspects"

- Changing variables, determining what you expect to happen, and seeing what does happen.
- Including zeroing, and including data to test specific functionality.
- Note that testing is very different from reviewing.

Quality Control *(cont.)*

1. Analytical review
2. Flex testing
3. **Limited parallel build**
4. Benchmarking
5. Spreadsheet software
6. The "usual suspects"

- Recompute risky / complex areas:
  - ✓ for example, the financial calculations.
- Simplified parallel building:
  - ✓ to obtain an approximate "sense check".

Quality Control *(cont.)*

1. Analytical review
2. Flex testing
3. Limited parallel build
4. **Benchmarking**
5. Spreadsheet software
6. The "usual suspects"

- Is there anything available publicly for comparison?
  - ✓ For example, option pricing.
- Have you other models which you can run the data through?
  - ✓ Are results approximately equal?

Quality Control *(cont.)*

1. Analytical review
2. Flex testing
3. Limited parallel build
4. Benchmarking
5. **Spreadsheet software**
6. The "usual suspects"

- **Mapping Tool**:
  - ✓ a representation of the nature of the contents in each cell;
  - ✓ useful for finding formulae which are not direct copies of others, and instances of hardcoding;
  - ✓ what they tell you, and what they don't.
- **Comparison Tool**:
  - ✓ compare common sheets within different workbooks (or the same);
  - ✓ highlights what has changed between versions.
- **Information Flow Diagram**:
  - ✓ shows number of links between sheets;
  - ✓ indicator of model structure.

Quality Control *(cont.)*

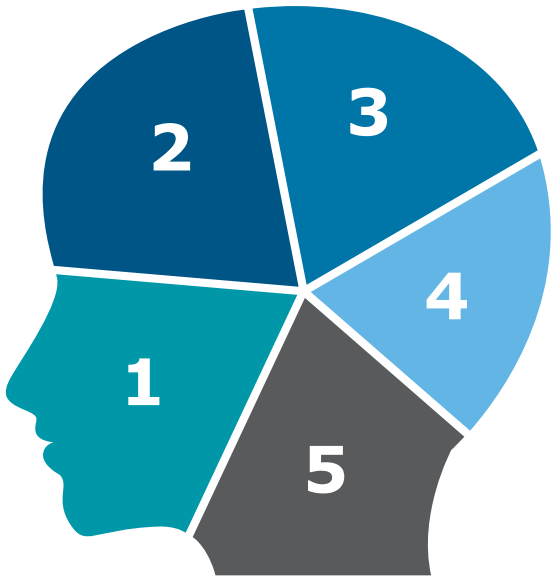
1. Analytical review
2. Flex testing
3. Limited parallel build
4. Benchmarking
5. Spreadsheet software
6. **The "usual suspects"**

- An aide memoire of usual suspects is provided.
- It is not a substitute for common sense.
- Note especially integrated financial statements, circular logic, and terminal values.

The Business Plan

*The Business Plan is the **input** to the Financial Planning Process.*

- The structure of the Business Plan defines the structure of the entire Economic and Financial Plan.
- The choice of the structure of the business plan must be consistent with the aims of the business plan.
- This structure may vary in relation to:



- Time frame
- Configuration of intermediate margins
- Time detail (month, quarter, year)
- Breakdown by product/market/sector
- Degree of detail/grouping

The Business Plan *(cont.)*

1. The Business Plan should be completed up to **EBITDA**.
2. The Business Plan **must reflect all the assumptions** made in the Marketing Plan and set out in the section of the Business Plan dedicated to assumptions.
3. In quantifying production costs special attention must be paid to identifying and separating **fixed costs variable costs**.
4. Remember that **revenues** (and consequently **operating costs**) accrue only when the activity is **operational** (important in start-up and project finance).
5. **Avoid** making assumptions in economic forecasts.

Summary & Wrap-up

Fundamental Principles

Understand the objective and use

- What the model is supposed to achieve.
- Who the users of the model are.
- What they're going to use it for.

Simplicity

- If in dobut, break it out!
- Use simple formulae.
- Call up inputs prior to use.
- Use timing flags.
- Use color coding.

Flexibility

- Avoid harcoding, except within input cells.
- Make sure each input can only be entered in one place.
- Define styles globally, so you can chang them easily.
- Plan how to manage sensitivities at the start.

Consistency

- Use the same column for the same thing on every sheet (TIME!)
- Setup a template sheet in advance
- Keep to one formula per row
- Use the same coding for similar business units
- Do not mix annual and monthly results

Confidence

- Don't start building without planning.
- Integrate financial statements first
- Include meaningful checks.
- Only post to financial statements from control accounts.
- Produce appropriate documentation.
- Apply version control and include date and time and filename on all printouts.

Efficiency

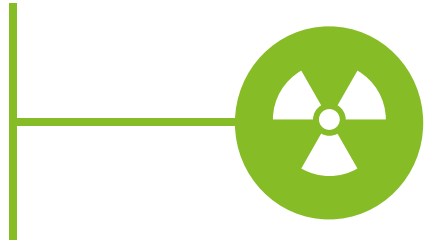
- It all saves time and money in the end.
- Practice makes perfect!

Fundamental Principles *(cont.)*

A

Quality Control

- Perform the work with due skill and care.
- As a result, perform appropriate Quality Control procedures over all models.



B

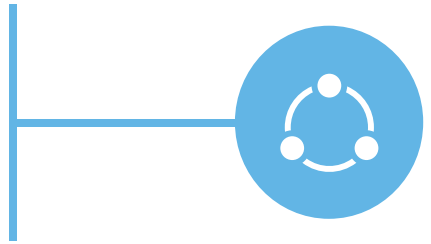
Documentation

- Produce a specification / book of assumptions.
- Keep this up to date.

C

Circular logic

- Avoid it if you can.
- Manage if you really can't avoid.
- Logic can still be circular even if there is no circular reference.



Suggestion


The best way to learn is through **experience**...and by asking for **advice**.
In addition, remember that **every situation is different** – common sense usually helps!