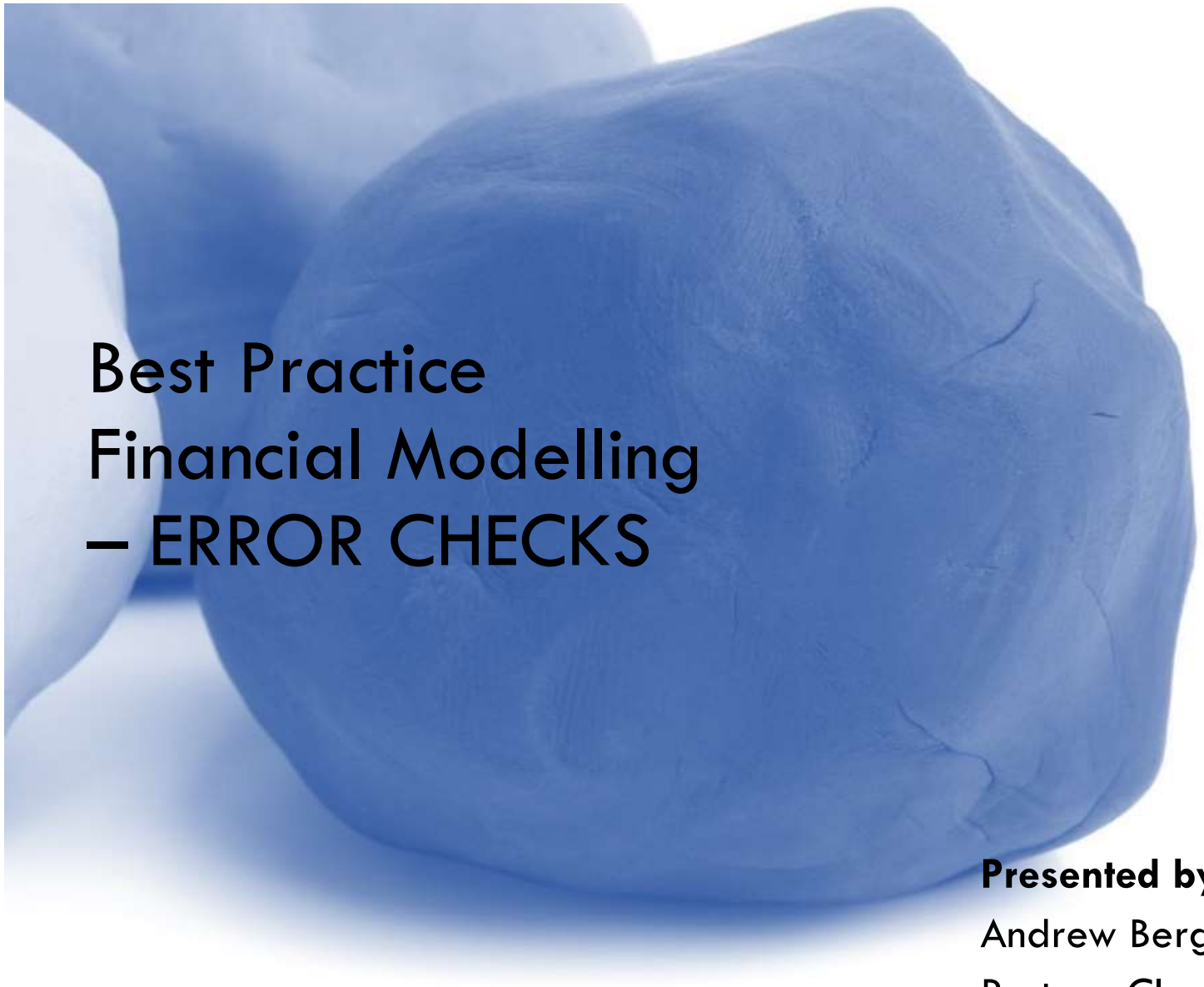

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Best Practice Financial Modelling – ERROR CHECKS

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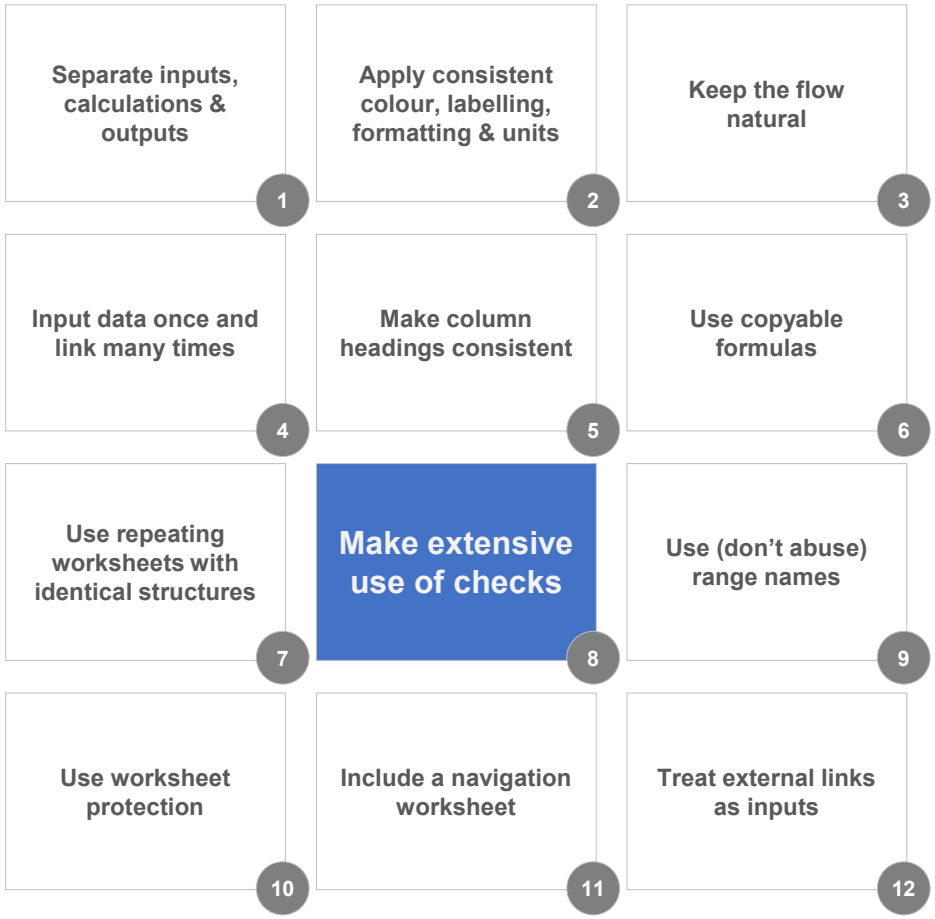
ClayMatter's Modelling Best Practices

Today we will focus on #8!



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Error Checks

Why do we need error checks?

You simply aren't that good

Enhance trust

Stop errors sneaking in

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Error Checks

When should we build error checks?

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Don’t use these forms of error checks

1

=IF(A-B=0,“OK”,“Error”)

2

=IF(A=B,“OK”,A-B)

3

=IF(A=B,1,0)

4

=IF(A=B,TRUE,FALSE)

5

All/Some/mix of the above.
It depends on the model

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You can’t test for equality (or the difference is zero) due to how Excel does maths!

Excel can’t count?!??!

	A	B	C
1	Formula	Excel's Answer	Math's Answer
2	=1/6000	0.000166666666666670000000000000000	0.00016666666666666667
3	=1+B2	1.000166666666670000000000000000000	1.00016666666666667
4	=B3-1	0.000166666666666480000000000000000	0.00016666666666666667
5	=B2-B4	0.000000000000000018350121769317200	0
6	=(B4=B2)	FALSE	TRUE

If you test for equality will get false errors

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Form of the Error Checks

Excel can't count?!??!

	A	B	C
1	Formula	Excel's Answer	Math's Answer
2	=1/6000	0.000166666666666667000000000000000	0.00016666666666666667
3	=1+B2	1.000166666666670000000000000000000	1.00016666666666666667
4	=B3-1	0.000166666666666648000000000000000	0.00016666666666666667
5	=B2-B4	0.000000000000000018350121769317200	0
6	=(B4=B2)	FALSE	TRUE

The solution: ABSolute Tolerance

=ABS(A-B)<Tolerance

Always use ABS to:
1) Avoid summing offsetting errors 2) Missing negatives

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TRUE/FALSE vs 1/0

- The ultimate nerd fight!
- My preference is TRUE/FALSE
  - Keeps numbers for use as numbers
  - Count of errors is meaningless, less errors does not make it “better” – only no errors is OK!
  - Less typing
  - More intuitive: Does the Balance Sheet balance?
- But please don’t format the result to appear as OK or ERR etc, keep the result “pure”
  - **However, it is more important that you include error checks than worry about using the “1/0” or “TRUE/FALSE” so go with what you feel most comfortable with!**

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Some ideas for error checks

- The fundamental Balance sheet check!
- If you can calculate a number two ways – then probably a good idea to have an error check
  - Eg: Profit from sum of profits, or recalculated from Revenue less Expenses when summarising (eg Month to annual, or from region to country)
- If there is a fundamental relationship
  - Opening cash equals prior month closing cash for historical periods
  - Assets not over-depreciated, i.e. Closing balance never negative
- Assets fully depreciated (if that is the intention)
  - Total Depreciation = Opening + CAPEX
- No duplicates
  - Check a max of a COUNTIF is 1
- Maximum / only one non-zero value in a series of calculations for exclusive conditions
  - Eg the type of discount assigned, or the applicable tax rate
- Actuals match in Actuals periods when you have taken values through the model

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Bringing it all together

- Set aside a column for error checks
- Individual checks summarise to a row check
- Row checks summarise to a sheet check
- Sheet checks summarise to a Model check
- Throw in some conditional formatting for visuals and easy identification of errors (and giving a warm and fuzzy feeling when everything goes green!)

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ISERROR IS BAD (as are IFERROR and ISERR)

Some of the common errors you may encounter

- **# NAME?** - This error occurs when Excel does not recognize the text of the formula introduced in the cell, either because it is not well written the formula or does not exist.
- **# VALUE!** - This type of error occurs when it detects that Excel is calculating with different data types together, as for example numeric data, text, or date and time.
- **# NUM!** - This error occurs when Excel detects when a formula or function requires a numeric data and has introduced a non-numeric data as a letter or a date. It may also be the result of the calculation is as big or small that Excel can not display it.
- **# DIV/0!** - This error occurs when Excel detects that it has made a calculation of one number divided by 0 or a cell that contains no value.
- **# REF!** - This error occurs when Excel detects the use of a function or a calculation with invalid cell references.
- **# NULL!** - This error occurs when we want connect through some calculation or function data ranges or cells that do not intersect.
- **# N/A** - This error is generated in the Excel spreadsheet when using search functions or data matching which does not exist in the specified search range.
- **#SPILL! –** When are reference an array but have not left enough blank cells for Excel to display all elements of the array
- It is best to test for the exact error you are worries about rather than using ISERROR/ISERR/IFERROR as this can mask other errors you should be aware of
- For instance, use Excel's logical tests such as ISNUM, ISNA or test for the denominator to be non-zero

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