

It's audit season for many companies around the world. Accountants will be embroiled in lengthy discussions with their auditors to provide a true and fair view of their financials. But how many will consider whether they are providing senior management with a similar perception regarding their forecasts? Here at SumProduct we see time and time again poor decisions made by management based on mistakes held to be true in financial models. Companies are loathe to pay for specialists to come in and check their models, seemingly happier to pay a greater price through lost sales, higher costs and reduced market share instead. Therefore, this month, we turn our attention to the importance of good modelling and undertaking reviews.

Liam Bastick, Managing Director, SumProduct



Best Practice Modelling

Spreadsheets are often seen as a core skill for accountants, many of whom are reasonably conversant with Excel. However, many would-be modellers frequently forget that the key customers of a spreadsheet model (i.e. the decision makers) are not necessarily sophisticated Excel users and often only see the final output on a printed page, e.g. as an appendix to a Word document or as part of a set of PowerPoint slides.

With this borne in mind, it becomes easier to understand why there have been numerous high profile examples of material spreadsheet errors. I am not saying that well-structured models will ensure no mistakes, but in theory it should reduce both the number and the magnitude of these errors.

Modellers should strive to build "Best Practice" models. Here, we want to avoid the semantics of what constitutes "best" in "Best Practice". There is no set of rules that is applicable for each and every situation. A quick scan of the web will find you various rules such as *Best Practice Spreadsheet Modelling Standards*, *FAST*, *SMART* and *TransparencEY* amongst others. Each requires modellers to read a large set of rules to learn by heart. Who does this? When was the last time you read documentation or instructions? Instead, let's consider the term as a proper noun to reflect the idea that a good model has four key attributes:

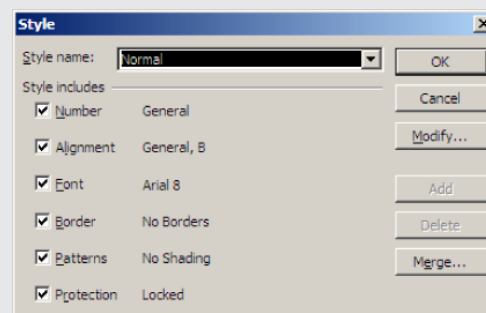
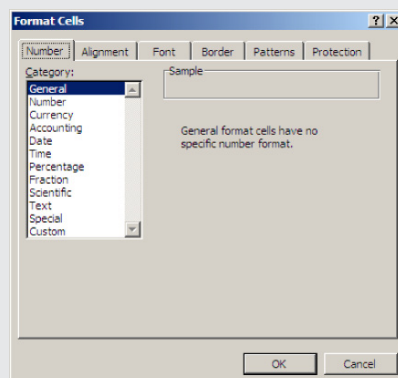
- **Consistency:** Formulae should be copied uniformly across ranges, to make it easy to add / remove periods or categories as necessary. Sheet titles and hyperlinks should be consistently positioned to aid navigation and provide details about the content and purpose of the particular worksheet. For forecast spreadsheets incorporating dates, the dates should be consistently positioned (i.e. first period should always be in one particular column), the number of periods should be consistent where possible and the periodicity should be uniform (the model should endeavour to show all sheets monthly or quarterly, etc.). If periodicities must change, they should be in clearly delineated sections of the model;
- **Robustness:** Models should be materially free from error, mathematically accurate and readily auditable. Key output sheets should ensure that error messages such as #DIV/0!, #VALUE!, #REF! etc. cannot occur (ideally, these error messages should not occur anywhere);
- **Flexibility:** When building a model, the user should consider what inputs should be variable and how they should be able to vary. This may force the model builder to consider how assumptions should be entered; and
- **Transparency:** Most Excel users are familiar with keeping inputs / assumptions away from calculations away from outputs. However, this concept can be extended: if most decisionmakers see models printed out or on slides, the spreadsheets should be understandable without sight of the formula bar.

i.e. "CRaFT". If your model adheres to these four standards, you are most likely in possession of a "Best Practice" model.

For a more detailed discussion on the above, please see <http://www.sumproduct.com/thought/model-construction-tips>.

Formats and Styles

One way to make your spreadsheets appear more consistent is to employ styles in your models. The terms 'format' and 'style' are often used interchangeably but they are not the same thing. To see this, select any cell in Excel and apply the shortcut keystroke CTRL + 1. This shortcut brings up the Format Cells dialog box →

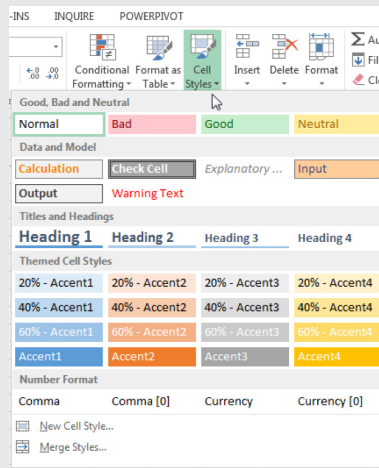


Excel has six format properties: Number, Alignment, Font, Border, Patterns and Protection. A style is simply a pre-defined set of these various formats. With a little forethought, these styles can be

set up and applied to a worksheet cell or range very easily.

In all versions of Excel, styles may be accessed via the keyboard shortcut ALT + O + S ↵

Depending upon your version of Excel, the dialog box may look slightly different to the image above. The dropdown box (highlighted above) can be edited so that new styles may be created. If you click the 'Modify button' (Excel 2003 and earlier) or the 'Format' button (Excel 2007 and later) the 'Format Cells' dialog box appear again and formats may be created in the usual way, clicking on 'OK' or 'Add' to complete the process. Now that this style has been added, in Excel 2007 and later you simply select the range and then click on the style in the Styles gallery on the Home tab →



Applying styles in Excel 2003 (and earlier) is just as simple using ALT + O + S again.

The difference between Formats and Styles becomes obvious when you realise you want to change (update) a style. Just select one of the cells that the style is attached to and call up the Style dialog box in the usual way, modifying the style as required. Click 'OK' when finished. Note that every cell in the open workbook that uses this style has automatically updated. Once you start using styles, you will never look back!

For more on styles, please see <http://www.sumproduct.com/thought/file-style>.

Inconsistent Formulae

	A	B	C	D	E	F	G	H	I	J	K	L
1	16	80	79	80	17	12	46	20	63	67	28	
2	64	58	72	39	63	90	73	15	29	36	45	
3	94	79	30	21	1	49	63	66	85	49	97	
4	87	73	36	88	44	27	59	0	1	21	19	
5	88	74	87	16	78	39	56	98	40	84	21	
6	96	98	15	63	59	89	70	36	99	25	50	
7	6	65	10	27	12	4	55	32	71	74	72	
8	64	0	51	1	14	34	18	81	46	62	94	
9	18	67	18	89	23	8	52	51	17	48	0	
10	7	47	57	31	24	38	30	5	90	75	37	
11	60	1	67	62	89	41	10	99	10	36	72	
12	12	53	3	0	53	58	29	95	28	7	65	
13	99	70	28	81	10	25	14	31	47	7	25	
14	42	82	51	46	18	79	33	63	9	53	20	
15	49	63	47	95	95	25	82	49	76	1	58	
16	55	88	77	95	73	60	25	37	20	87	48	
17	59	97	20	68	12	82	3	23	90	69	78	
18												

← Consider the following block of data

Let's assume this data is supposed to refer to a similar block of data elsewhere. How can we tell if the formula has been copied across and down correctly? Inspection by eye achieves nothing here. One option is to use the keyboard shortcut CTRL + ` (the character is the key to the left of the 1 on a standard QWERTY keyboard) →

	A	B	C	D	E	F	G	H	I	J	K	L
1	=A33	=B33	=C33	=D33	=E33	=F33	=G33	=H33	=I33	=J33	=K33	=L33
2	=A34	=B34	=C34	=D34	=E34	=F34	=G34	=H34	=I34	=J34	=K34	=L34
3	=A35	=B35	=C35	=D35	=E35	=F35	=G35	=H35	=I35	=J35	=K35	=L35
4	=A36	=B36	=C36	=D36	=E36	=F36	=G36	=H36	=I36	=J36	=K36	=L36
5	=A37	=B37	=C37	=D37	=E37	=F37	=G37	=H37	=I37	=J37	=K37	=L37
6	=A38	=B38	=C38	=D38	=E38	=F38	=G38	=H38	=I38	=J38	=K38	=L38
7	=A39	=B39	=C39	=D39	=E39	=F39	=G39	=H39	=I39	=J39	=K39	=L39
8	=A30	=B30	=C30	=D30	=E30	=F30	=G30	=H30	=I30	=J30	=K30	=L30
9	=A31	=B31	=C31	=D31	=E31	=F31	=G31	=H31	=I31	=J31	=K31	=L31
10	=A32	=B32	=C32	=D32	=E32	=F32	=G32	=H32	=I32	=J32	=K32	=L32
11	=A33	=B33	=C33	=D33	=E33	=F33	=G33	=H33	=I33	=J33	=K33	=L33
12	=A34	=B34	=C34	=D34	=E34	=F34	=G34	=H34	=I34	=J34	=K34	=L34
13	=A35	=B35	=C35	=D35	=E35	=F35	=G35	=H35	=I35	=J35	=K35	=L35
14	=A36	=B36	=C36	=D36	=E36	=F36	=G36	=H36	=I36	=J36	=K36	=L36
15	=A37	=B37	=C37	=D37	=E37	=F37	=G37	=H37	=I37	=J37	=K37	=L37
16	=A38	=B38	=C38	=D38	=E38	=F38	=G38	=H38	=I38	=J38	=K38	=L38
17	=A39	=B39	=C39	=D39	=E39	=F39	=G39	=H39	=I39	=J39	=K39	=L39
18												

	A	B	C	D	E	F	G	H	I	J	K	L
1	16	80	79	80	17	12	46	20	63	67	28	
2	64	58	72	39	63	90	73	15	29	36	45	
3	94	79	30	21	1	49	63	66	85	49	97	
4	87	73	36	88	44	27	59	0	1	21	19	
5	88	74	87	16	78	39	56	98	40	84	21	
6	96	98	15	63	59	89	70	36	99	25	50	
7	6	65	10	27	12	4	55	32	71	74	72	
8	64	0	51	1	14	34	18	81	46	62	94	
9	18	67	18	89	23	8	52	51	17	48	0	
10	7	47	57	31	24	38	30	5	90	75	37	
11	60	1	67	62	89	41	10	99	10	36	72	
12	12	53	3	0	53	58	29	95	28	7	65	
13	99	70	28	81	10	25	14	31	47	7	25	
14	42	82	51	46	18	79	33	63	9	53	20	
15	49	63	47	95	95	25	82	49	76	1	58	
16	55	88	77	95	73	60	25	37	20	87	48	
17	59	97	20	68	12	82	3	23	90	69	78	
18												

This shortcut toggles cell values with their content (i.e. formulae). This will show formulae which have not been copied across properly, but this is still fraught with user error (can you spot the relevant cells?) and would be cumbersome with vast arrays of data.

Instead, there is a simpler, automatic approach. Select all of the data (click anywhere in the range and press CTRL + *). Then use the keyboard shortcut CTRL + \ viz.

This automatically selects all of the cells whose contents are different from the comparison cell in each row (for each row, the comparison cell is in the same column as the active cell).

CTRL + SHIFT + \ selects all cells whose contents are different from the comparison cell in each column (for each column, the comparison cell is in the same row as the active cell). In this example, where a formula is supposed to be copied across and down, there will be no difference.

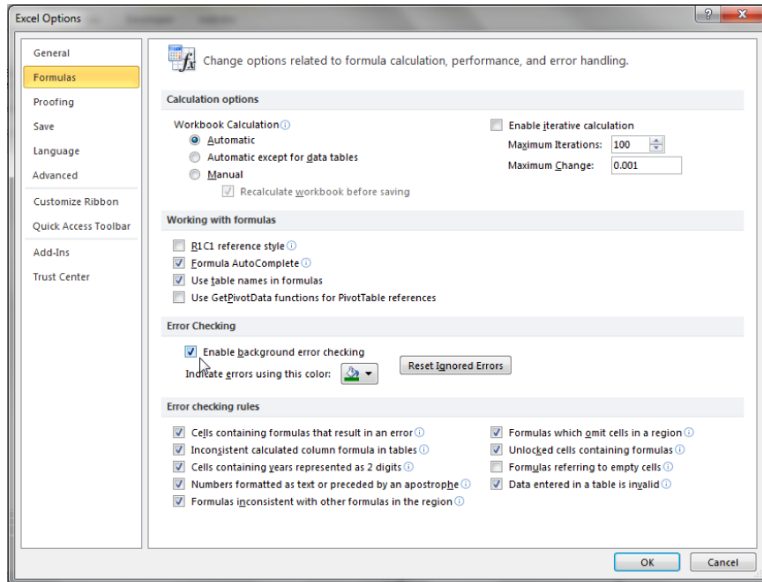
These cells can now be highlighted and reviewed at leisure.

Self-Review Checks: The Quick & Dirty Dozen

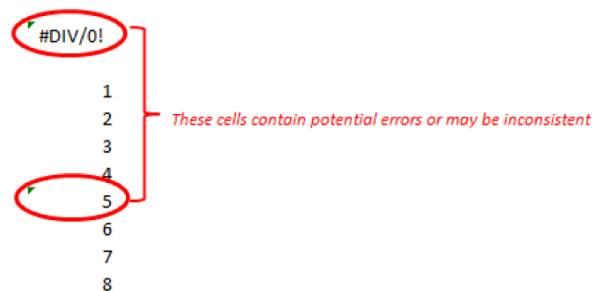
Whilst nothing replaces the peace of mind in obtaining a third party model audit, SumProduct often gets asked to provide an initial list of checks model builders can perform on their own models. Assuming modellers do not have access to specialist auditing software, this list is not intended to be exhaustive (we can't give away all of our secrets!), but it's a good starting point ↘

1. Use Excel's Background Error Checking – Strictly speaking, this should be instigated during the model development phase as it can assist the modeller throughout construction.

To enable this functionality, go to Excel's Options (ALT + T + O) and in the 'Formulas' section, ensure that the 'Enable background error checking' tick box is checked. Once activated, the user can select which error checking rules should be catered for by inspecting the 'Error checking rules' section directly beneath this check box. ↘

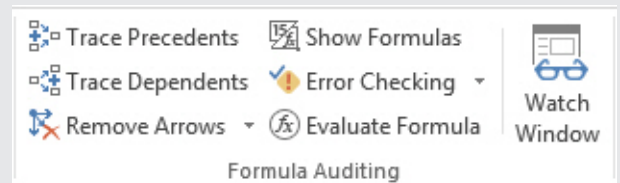


This functionality does not prevent errors from occurring, but potentially erroneous cells are highlighted by Excel in a fashion similar to cells that include comments, viz. ↘

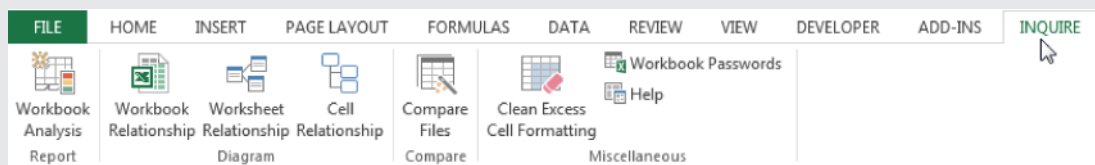


The problem with this approach is it is easy to miss this annotation, but it is better than nothing.

2. Use Excel's Formula Auditing tools – In the 'Formulas' tab of the Ribbon, use the tools in the 'Formula Auditing' section of the toolbar. In particular, 'Error Checking' is useful (although it may only be applied to one worksheet at a time) as it highlights a lot of issues Excel is programmed to consider as "dubious" (e.g. inconsistent formulae, #DIV/0! errors).



For those lucky enough to have the Professional Plus version of Excel 2013, Spreadsheet Inquire adds to Excel's in-built functionalities to allow users to analyse the links between workbooks, worksheets and / or individual cells ↘



3. Find Prima Facie Errors – There are glitches in Excel and occasionally, a prima facie error may slip through. These obvious errors are particularly embarrassing to miss, as these are usually identified by end users picoseconds after a model has been handed over.

There is a simple sure-fire check: CTRL + F (Excel's 'Find' functionality).

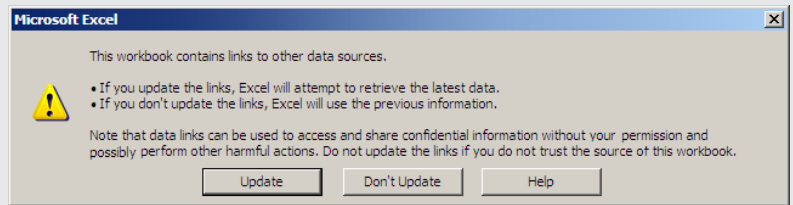
Simply type '#' in 'Find what' (the obvious errors all begin with '#'), but then click on the 'Options' button to display the options and change the 'Within' setting to 'Workbook' and then look at 'Formulas', 'Values' and 'Comments' in turn using the 'Find All' button to correct any issues identified.

4. Review inconsistencies in formulae – as discussed earlier in this newsletter.

5. Look for errors in unintentional links in range names – The Name Manager in Excel (CTRL + F3) can be used to both identify links and range names containing errors. For more information, see <http://www.sumproduct.com/thought/names>.

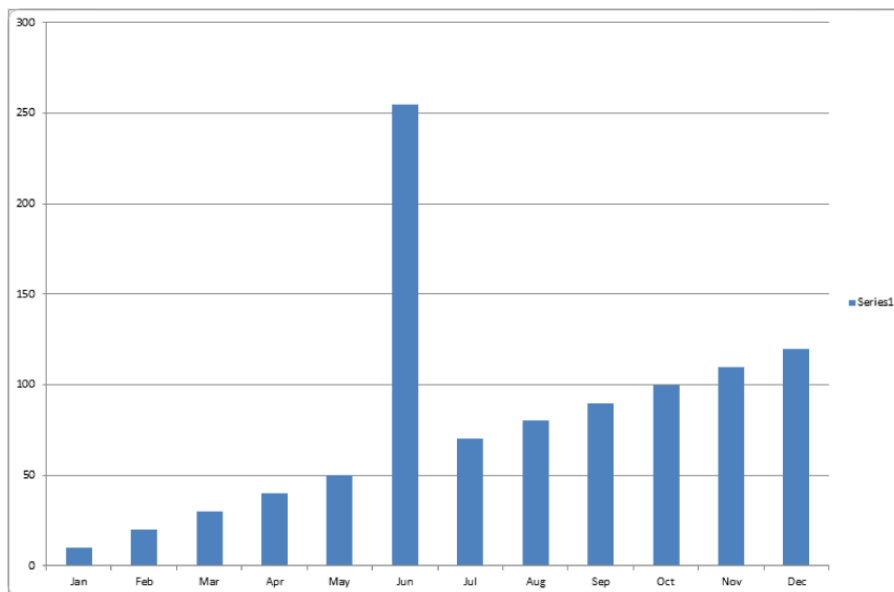
6. Locate unintentional links – How often does the following dialog box send shivers down your spine?

So-called “phantom links” (i.e. links that seem to appear that cannot be found) have been the bane of many a spreadsheet developer. SumProduct provides tips in locating these vermin on our web site: <http://www.sumproduct.com/thought/locating-links>.



8. Create “quick” charts – For key outputs, you can graph the data momentarily. Simply highlight the data and press the ‘F11’ function key, viz.

Do the charts make sense? Are there unseemly ‘blips’ or inconsistent trends? Can dramatic changes be readily explained? These rough and ready charts can highlight calculation mistakes in an instant on occasion. ↘



9. Close and re-open – Do you get unexpected error messages upon opening? This is a frequent oversight made by modellers. Are calculations set to ‘Automatic’? Are there any unexpected links, circular arguments or other error messages (e.g. “Not enough memory to display”)? It is better that you discover these issues before your customers do.

10. Spell check – Nothing looks less professional than opening a Dashboard Summary to look at the “Selas Turnover” or items labelled incorrectly. There is really no excuse for not spell checking a model (‘Review’ tab of the Ribbon has a spelling check or simply hit ‘F7’).

11. Printing and viewing – Not strictly speaking an error, how many times have you decided to print out a model sent to you only to find it print over several reams of paper that even Tolstoy would have been proud of? It is worth taking time to set up print margins and included headers and footers. Also, each page should be reset (CTRL + HOME) and saved on the front page so that models are not opened with the end user finding themselves in cell GG494 of a sheet called “ID_Rev_MR”. Been there, done that, bought the consequences.

12. Protection – If as a modeller you have invested sleepless nights in getting a model to work, you do not really want an end user typing “17” over a sophisticated formula that has taken hours to get precisely right. These unowned hard codes often come back to haunt the modeller – unfairly – and cast doubt over the credibility of an otherwise robust model. Take the time to protect cells, worksheets and the workbook as required to avoid these issues.

Key Strokes

Each newsletter, we’d like to introduce you to several useful keystrokes you may or may not be aware of. Whether shackled to the keyboard or juggling with the mouse, these can make your life easier. This month’s selection summarises some of the tips mentioned elsewhere:

There are over 540 keyboard shortcuts in Excel. For a comprehensive list, please download our Excel file at <http://www.sumproduct.com/thought/keyboard-shortcuts>.

Keystroke	What it does
F7	Check spelling
CTRL + `	Toggle Excel display to show formulae within cells
CTRL + \	Selects all cells whose contents are different from the comparison cell in each row / column



Excel, Phone Home

Microsoft has announced its Office suite for iOS devices, with the release of the iPhone app Office Mobile for Office 365 subscribers.

For more information, check out <http://www.sumproduct.com/news/wake-up-call-for-excel>.

Since this article was originally published, Microsoft has gone on record stating that Office Mobile for iPhone will be available in 29 languages covering 135 markets and that the international rollout will occur over approximately four to five days.

Upcoming SumProduct training courses

Brisbane:

Financial Modelling Fundamentals: 9th – 10th Jul
Power of PowerPivot: 30th – 31st Oct

Hong Kong:

Structuring Mining Project Finance Models: 23rd – 27th Sep

Kuala Lumpur:

Financial Modelling for Mergers & Acquisitions: 1st – 3rd Jul
Advanced Valuation: 17th – 18th Jul

Melbourne:

Power of PowerPivot: 10th – 11th Oct

Perth:

Financial Modelling Fundamentals: 22nd – 23rd Jul
Financial Modelling for Mergers & Acquisitions: 2nd – 5th Sep
Introduction to PowerPivot: 6th Sep

South Africa:

Structuring Mining Project Finance Models: 21st – 25th Oct

Sydney:

Power of PowerPivot: 28th – 29th Oct

SumProduct can help

At the end of the day, getting an independent, objective review of the model trumps all of our suggestions above. This may seem like blatant self-promotion, but there are many war stories out there of the perils of foregoing a model audit. Many balk at this option due to cost, but what is the cost for a business that makes decision based on flawed forecasts? For any queries or a quote, please contact us at contact@sumproduct.com

Please forward

We have undertaken a vast array of assignments over the years, including:

- Business planning
- Building three-way integrated financial statement projections
- Independent expert reviews
- Key driver analysis
- Model reviews / audits for internal and external purposes
- M&A work
- Model scoping
- Project finance
- Real options analysis
- Refinancing / restructuring
- Strategic modelling
- Valuations
- Working capital management

If you require modelling assistance of any kind, please do not hesitate to contact us at contact@sumproduct.com

Please forward

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