The New SAS[®] ODS Excel Destination: A User Review and Demonstration

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My thanks to Nancy Goodling, Wayne Hester, Chevell Parker, Scott Huntley, Dan O'Connor, and Amy Peters at SAS Institute for their essential help.

Any errors in the presentation content are mine.

LeRoy Bessler

Mequon, Wisconsin, USA June 2015

Purpose of Presentation

- Problem:
 - Too many (partial) old SAS tool choices
 - Users really want only ONE choice
- Solution Here:
 - Show you new ODS Excel destination
 - Demonstrate benefits/capabilities
 - Identify limitations

Comments

Graphs used here are for proof of concept, but are not meant as good graphic design.

- To Color-Code Spreadsheet Data:
- See Color-Coding Your Data
- in my other presentation/paper for today
- "Using Color to Communicate, Not to Decorate"

Test Environment

Most of the examples were created with SAS V9.4 TS1M2. For the examples that require TS1M3, I used an Early Adopter Release, which is distributed only via SAS University Edition, which runs on a Linux Virtual Machine, and is accessed by SAS Studio. The Linux Virtual Machine is provided as a download.

Viewing & Creation Environments

- Viewing the output from ODS Excel or PROC MSCHART requires Excel 2010 or higher,
- but creating the output does not require Excel to be on the SAS computer.
- You can create ODS Excel or PROC MSCHART output with SAS on MVS, UNIX, Linux, or
- Windows without Excel being installed.

Compare Pre-ODS-EXCEL Alternatives

Feature	TableEditor*	ExcelXP	MSOffice2K x	HTML	DDE**
					requires an
Pivot Table	Yes	No	No	No	Excel macro
AutoFit					
Columns	By Default*	No	By Default*	By Default	Yes
	Yes, but All		Yes, but All		
Filters	Columns only	Yes	Columns only	No	Yes
Freeze Panes	Row 1 only	Yes	Yes	No	Yes
Side-By-Side					
Elements in					
WorkSheet	Yes	No	Yes	No	Yes
Multi-Sheet					
WorkBook	Yes	Yes, Easy	Yes	No	Yes
Graphs	Yes	No	Yes	Yes	Yes
	Not with				
Titles	other features	Yes	Yes	Yes	Yes

*Headings of columns autofit by default can be overlaid by filter buttons *Javascript must be enabled **SAS must be running on Windows

ODS Excel Destination

- It is the current SAS technology direction for SAS to Excel.
- It is definitely better than ExcelXP!
- Current Limitations Cannot do:
- **Pivot Tables**
- Panels (horizontal arrays of tables and/or images)

- At this time, the TableEditor TagSet IS the <u>only</u> ODS solution to create Pivot Tables.
- Best resource on the topic is
- Short title: "The Armchair Quarterback"
- by Peter Eberhardt & Louanna Kona.
- See Reference 3 in my paper in the Procoodings for link to this resource
- Proceedings for link to this resource.

- At this time, the MSOffice2K_x TagSet IS the <u>only</u> ODS solution to create Panels in a worksheet.
- Panel:
- N tables side-by-side
- N graphs side-by-side
- N tables + max. one graph at right end

For code to create panels in an Excel worksheet with the MSOffice2K_x ODS TagSet, download the zip file "SAS to Excel - OLD ODS Methods & DDE Comparison - Slides, Code, Reference Doc" in the Conference **Proceedings & Tools Package** I myself would prefer an enhancement to ODS Excel to support this. For a panel of one graph + its table, consider the new PROC MSCHART.

Let's see what ODS Excel CAN do It is definitely better than ExcelXP!

Basic Syntax

ods excel file="YourPath\YourFileName.xlsx" options(name1=' value1' name2=' value2'...); < SAS code goes here > ods excel close; If doing a graph, use "ods excel gtitle gfootnote;" to imbed the text in the image.

Most examples in the demo steps simply consist of adding or changing ODS Excel options

Simple Example

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Provide a Custom Sheet Name

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Title2 as hyperlink to elsewhere

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(Link could be another WorkBook)

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Wisconsin Illinois SAS® Users *

For SAS Users from Wisconsin, Illinois, Northwest Indiana, East Iowa, Southwest Michigan, Southeast Minnesota, or anywhere else

Next Conference:

Milwaukee, WI - June 24, 2015 <u>Click Here for Conference Brochure</u>

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If you can't open the PDF, send email to one of us: Coordinator: <u>LeRoy Bessler</u> Registrar: <u>Craig Wildeman</u>

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ods excel close;
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sheet_interval='bygroup' (opens "Sex - F")



After Clicking "Sex - M" tab



WorkBook with color-coded WorkSheet tabs

At WorkBook Open & After, worksheet tabs have only a tinge of color at their bottom.

After either Sheet tab has been pressed, the InActive sheet tab is fully colored.

Possible Rationale: Maximize readability of text on the Active tab. If dark enough colors are unwisely chosen, text on the Active tab would be hard to read.

Color-Coded WorkSheet Tabs ods excel ... options(... sheet_interval='proc'); ods excel options(sheet name='Girls' tab color='LightRed'); title4 ... proc print data=sashelp.class noobs; where sex eq 'F'; id name; run; ods excel options(sheet_name='Boys' tab color='LightBlue'); title4 ... proc print data=sashelp.class noobs; where sex eq 'M'; id name; run; ods excel close;

tab_color - At Initial Open of WorkBook

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3	After eit	her S	Sheet	tab has l	been pre	essed, the	e InActi	ve sl	neet ta	b is fu	lly col	ored			
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6	Name	Sex	Age	Height	Weight										
7	Alice	F	13	56.5	84.0										
8	Barbara	F	13	65.3	98.0										
9	Carol	F	14	62.8	102.5										
10	Jane	F	12	59.8	84.5										
11	Janet	F	15	62.5	112.5										
12	Joyce	F	11	51.3	50.5										
13	Judy	F	14	64.3	90.0										
14	Louise	F	12	56.3	77.0										
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20															
14 4 F	M Girle Boys										14				
Tab Colors at Initial Open Only a tinge of color at bottom of tabs



tab_color – After Clicking on Boys Tab

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Ready

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Tab Colors after Clicking on the Boys Tab



tab_color - After Clicking Back to Girls Tab

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9	Carol	F _	14	62.8	102.5									
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Tab Colors after Clicking back to Girls Tab



Provide an Index for the WorkBook

ods excel . . .

options(sheet_interval='proc' index='yes' ...);
title1 ...;

ods excel options(sheet_name='Girls');

title2 justify=left bold "Female Students ... ";

proc print data=sashelp.class noobs;

where sex eq 'F'; id name; run;

ods excel options(sheet_name='Boys');

title2 justify=left bold "Male Students ... ";
proc print data=sashelp.class noobs;

where sex eq 'M'; id name; run;

ods excel close;

index='yes' - efficient and informative

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After Clicking on "Girls" in the Index

Table of Contents – same code except contents='yes' – <u>TWO</u> uninformative links per tab

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Table & Plot on Separate Sheets

ods excel . . . options(. . .
sheet_interval='proc');

ods excel options(sheet_name='Class Listing') ;
title1 . . . ;

proc print data=sashelp.class noobs; id name; run;

ods excel options(sheet_name='Plot Wgt vs Hgt')
 gtitle gfootnote ; /* imbed text in image */
goptions . . ; title1 . . . ;
proc gplot data=sashelp.class;
plot weight*height; run; quit;
ods excel close;

Table and Graph on Separate WorkSheets

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14

After Clicking the Plot Weight vs Height Tab

Ready

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sheet_interval='none' Table + Graph

PROC with Multiple Outputs sheet_interval option

sheet_interval='output' - UNIVARIATE Output 1

UNIVARIATE Output 2 on Separate WorkSheet

UNIVARIATE Output 3 on Separate WorkSheet

UNIVARIATE Output 4 on Separate WorkSheet

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UNIVARIATE Output 5 on Separate WorkSheet

Ready

PROC UNIVARIATE - sheet_interval='none'

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Ready

PROC MSChart – TS1M3

proc sort out=work.stocks data=sashelp.stocks

(where=((stock="IBM") and ('01Jan00'd LE date LE '31dec00'd))); by date; run;

ods excel file="C:\MicrosoftChart.xlsx"

options(zoom="143" sheet_name='Microsoft Chart');

title "... position='topleft' hides input table";

proc mschart data=work.stocks category=date

width=8in height=4in position="topleft";

< chart control statements here >

run; ods excel close;

/* If you reduce chart height enough, the bottom of the table peeks out. */

/* If you don't sort the input by date,
 the chart is amazingly drawn backward. */

PROC MSChart – TS1M3

```
/* chart control statements: */
chartattrs nowall
  borderattrs =(type=solid solid_color=black)
 backfillattrs=(type=solid solid_color=yellow);
vcolumn volume / secondary;
line close;
categoryaxis type=date;
primaryaxis title;
secondaryaxis title;
format date monyy5.;
label close = 'Close';
label volume = 'Volume(millions)';
```

chart supports "data tips"

position="topright" reveals input data table

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Ready

14

The Table from PROC MSChart

- With position="topleft",
 IF the table is short enough, you can hide it,
 IF you regard it as unwanted.
- I like the companion table, except if a standalone graph is mandatory.
- I have long said:
 Image + Precise Numbers = quick, easy inference + reliable inference
- The developer reported that a future release of PROC MSCHART will allow the table to be retained or suppressed.

Moving the upper left corner

options(start_at='3,2'

sheet_name='Start Content at Col3Row2'
embedded_titles='yes'
embedded_footnotes='yes'
title_footnote_width='8'
absolute_row_height='14'
zoom="&ZoomPct"
frozen_headers='4'
frozen_rowheaders='3'
autofilter='1-4');

TS1M2 start_at='3,2' like TS1M3 fails

- Numerous ERRORs appear in SAS log.
- The output workbook is unusable.

TS1M2 start_at='C2' succeeds

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8			Africa	Addis Aba	aba	Men's Di	ress			7	\$76,793	\$136,273	\$2
9			Africa	Addis Aba	aba	Sandal				10	\$62,819	\$204,284	\$1
10			Africa	Addis Aba	aba	Slipper				14	\$68.641	\$279,795	\$1
11	-		Africa	Addis Aba	aba	Sport Sh	oe			4	\$1,690	\$16,634	
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TS1M3 start_at='C2' (like TS1M2) Fails

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Moving the upper left corner

TS1M2: use Start_At=(C2) for Column C Row 2 TS1M3: use Start_At=(3,2) for Column 3 Row 2

The Limits of Start_At

/* It can be used only once in a spreadsheet with any effect. The code below delivers the second table below the first table, not to its right, as clearly desired by the start_at value. */ ods excel . . . options(embedded_titles='yes' sheet_interval='none'); ods excel options(start_at='A1'); title1 justify=left bold "Student Heights"; proc print data=sashelp.class noobs; var name height; run;; ods excel options(start_at='D1'); title1 justify=left bold "Student Weights"; proc print data=sashelp.class noobs; var name weight; run; ods excel close;

Alternative to an Index

- With an index, when you are in a sheet at the far right, the index tab, IF you have created an index, can be accessed with full scroll left arrow at the bottom left of the workbook
- I like a workbook with all tabs viewable without scrolling (and with meaningful sheet labels)
- I had a project where one summary spreadsheet had dozens or hundreds of related detail spreadsheets
- Following is the Bessler UNindex solution
- See the paper for the code

The Bessler UNindex Solution

- In a summary workbook, the summarization key values can be made into hyperlinks to corresponding workooks of their detail
- NOTE: at least one ODS tagset does not support hyperlinks from table cells
- However, ODS Excel does support hyperlinks in table cells
- Here is how the solution works . . .

Summary WorkBook

After Clicking United States cell in the Summary Note the link back to the Summary WorkBook

Index Solution for the Same Data

- Much of the coding for the UNindex solution is adaptable the ODS Excel Index solution, with omissions of no longer needed code, and with a few rearrangements and minor option changes
- See the paper for the code
- Here is how the solution works . . .

Index WorkSheet

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After Returning to Index and Clicking Entry Or Clicking Directly on United States Sheet tab

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After Clicking UnitedStates Entry in the Index



Dynamic TagAttr with Formula

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- id country;
- var predict actual / style=

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{tagattr='format:$#,##0_);[Red]\($#,##0\)'};
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var Difference / style=

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formula:RC[-1]-RC[-2]'};
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run;

- For Microsoft Numeric Format Alternatives Other Than
 'format:\$#,##0_);[Red]\(\$#,##0\)'
- See https://support.office.com/en-nz/article/Create-acustom-number-format-78f2a361-936b-4c03-8772-09fab54be7f4?ui=en-US&rs=en-NZ&ad=NZ

Dynamic TagAttr with Formula

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After Changing Germany Actual to \$200,000

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Ready

Conclusion

ODS Excel is the current SAS technology direction for SAS to Excel.

It is definitely better than ExcelXP! Current Limitations – Cannot Do: Pivot Tables

Panels (horizontal arrays of tables and/or images) However, Start_At might be upgraded to do multiple placements on the same worksheet per my discussion with SAS. My thanks to Nancy Goodling, Wayne Hester, Chevell Parker, Scott Huntley, Dan O'Connor, and Amy Peters at SAS Institute for their essential help.

Any errors in the presentation content are mine.

LeRoy Bessler

Mequon, Wisconsin, USA June 2015 For Your Suggestions, Comments, Questions, Alternate Solutions, etc.

> LeRoy Bessler PhD Mequon, Wisconsin, USA Le_Roy_Bessler@wi.rr.com