How to Use Excel Features and Create Pivot Tables

Introduction

BARS relies heavily on interoperability with Microsoft Excel to provide users with an alternative view of data *and* an alternative form of data entry. Users can export different grids within each of the BARS tabs to Excel and can use those exports to do massive data entry for eventual upload/import. Pivot tables bring the capabilities of Excel and BARS a step further, allowing users to dig deeper into what information is being provided by BARS to make better decisions in adjustments.

This training is not meant to cover all aspects of using Microsoft Excel or pivot tables, but will provide new users with several basic key instructions and features to get started. This training will work through an instructional scenario using the BARS system.

Step 1:

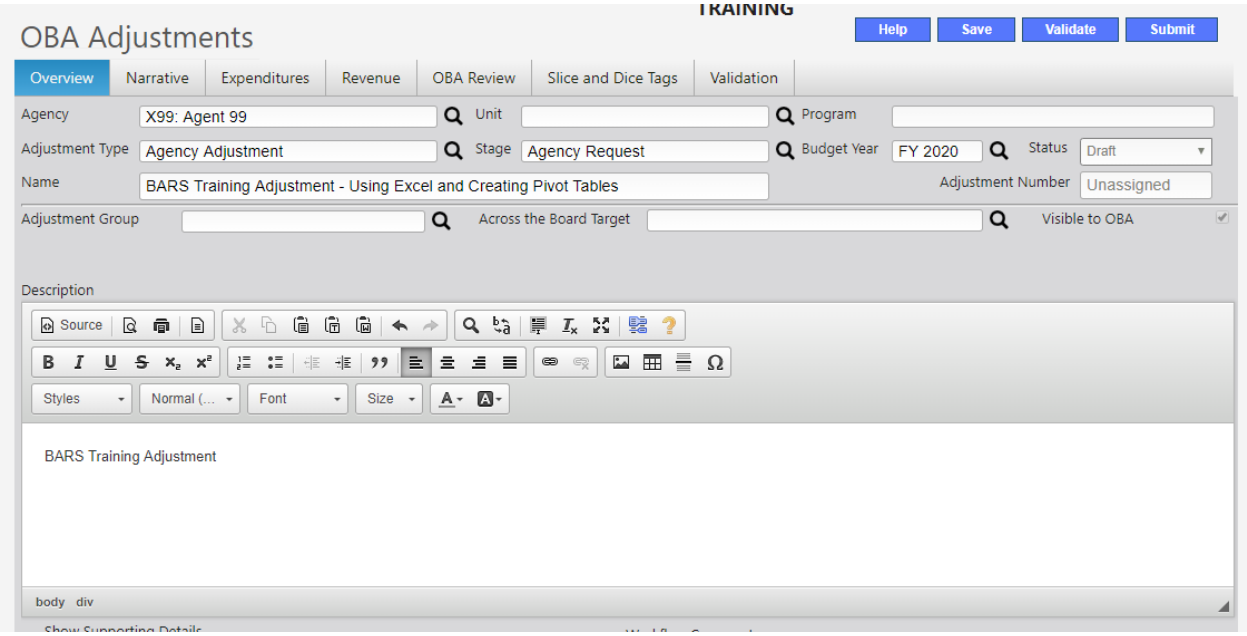
Log into BARS Production

Step 2:

From the **BARS** Homepage/Worktray, hover over **Operating Budget** at the top of the page and select **Adjustments** > **Agency / OBA Adjustments**.

Step 3:

Complete Overview Tab with all of the required information.

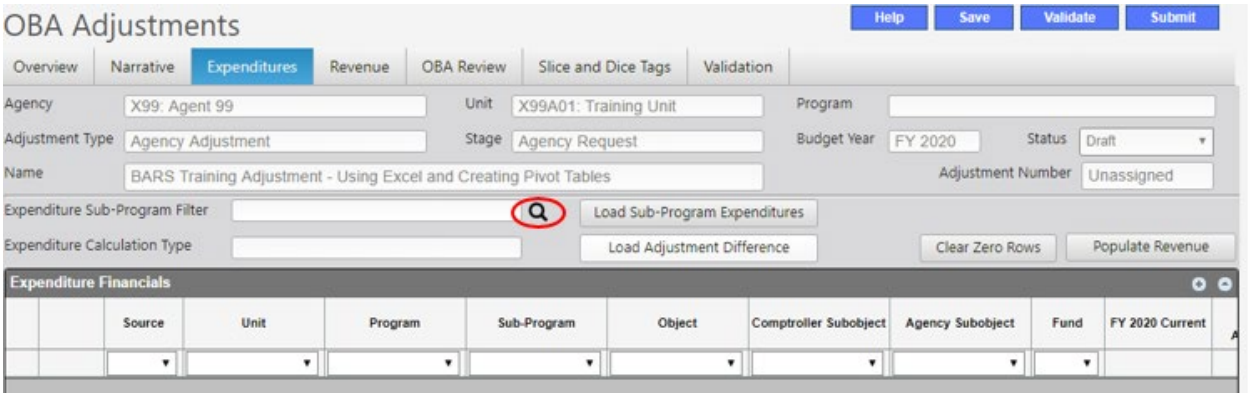


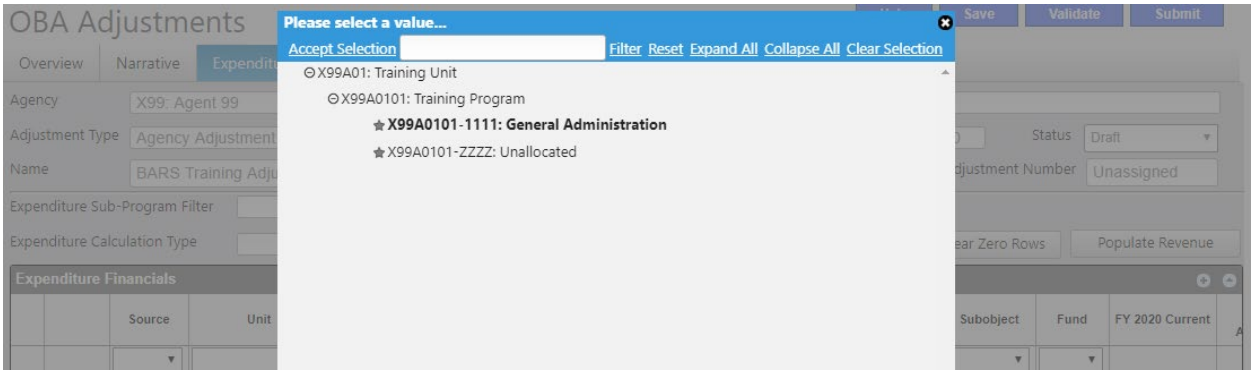
Once the Overview Tab is complete, move to the Expenditures Tab.

Step 4:

In the Expenditures Tab—

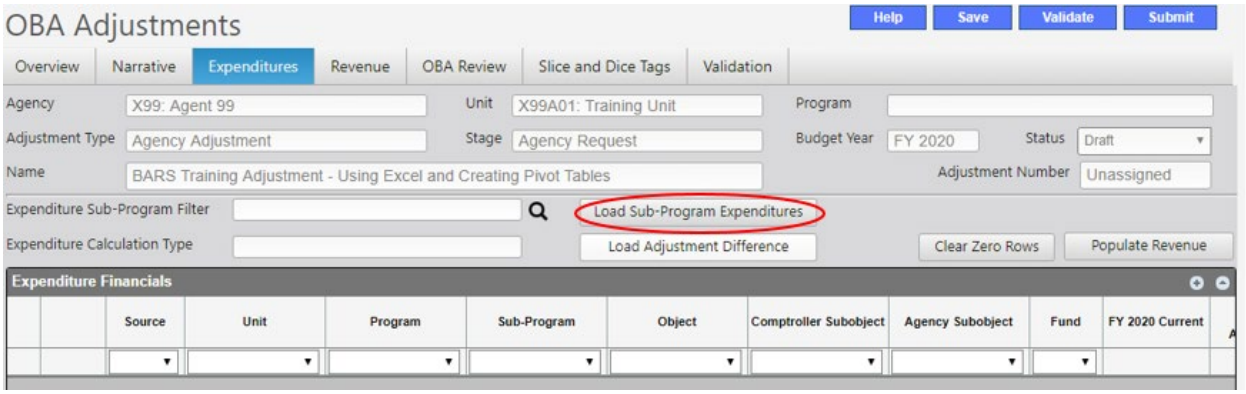
Confirm the information brought over from the Overview Tab is correct in the top section, and select the magnifying glass next to the **Expenditure Sub-Program Filter** to bring up a window to select a specific unit, program, or subprogram of the selected agency.





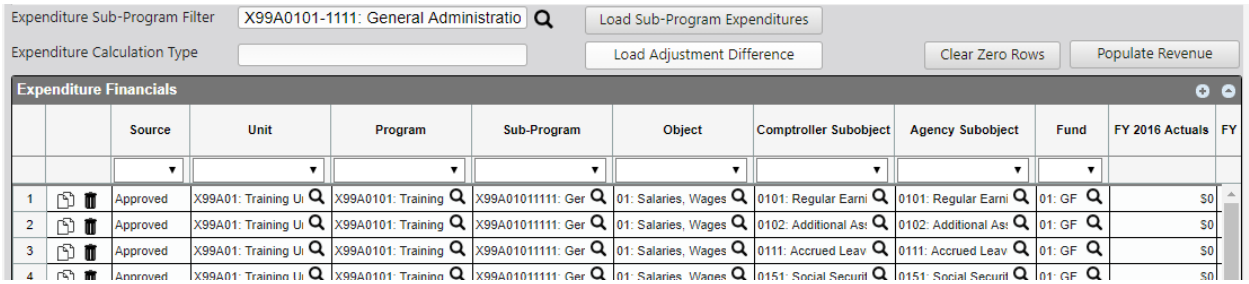
Click on that program or subprogram to highlight that portion of the budget. Once you have highlighted all of the desired units, programs, and subprograms, select **Accept** Selection to ready those sections of the budget to be loaded.

To then load the *Expenditure Financials* grid below, click **Load Sub-Program Expenditures**.



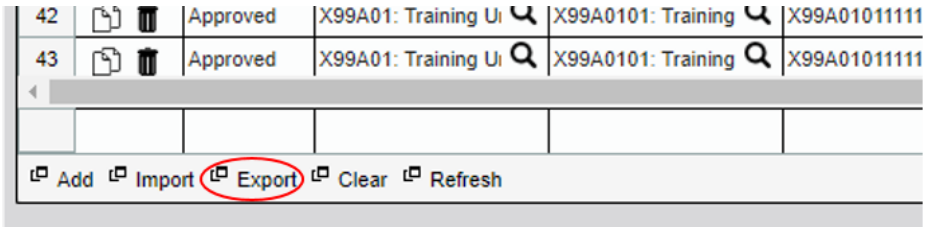
Step 5:

Once the *Expenditure Financials* grid has been populated, scroll down to view the grid.

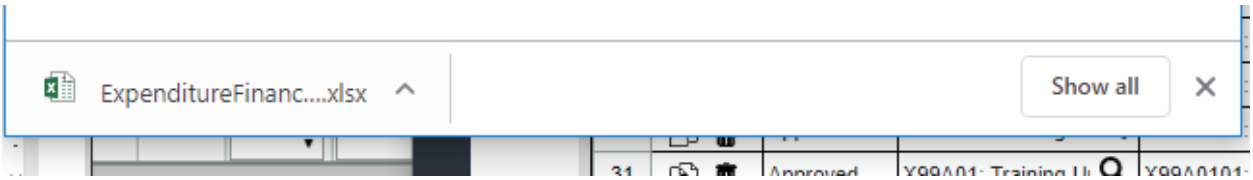


As shown below, the Expenditure grid has been populated with the data that is already in BARS through uploads and prior year adjustments. As mentioned in the "Creating an Adjustment" guide, adjustments may be made in the system in the "FY 20XX Adjustment" column *or* the "Export" and "Import" functions.

Scroll to the bottom left of the grid and select the **Export** button.



This will bring up a separate window that that saves the document (depending on the user's download settings) and requires the user to open the file.

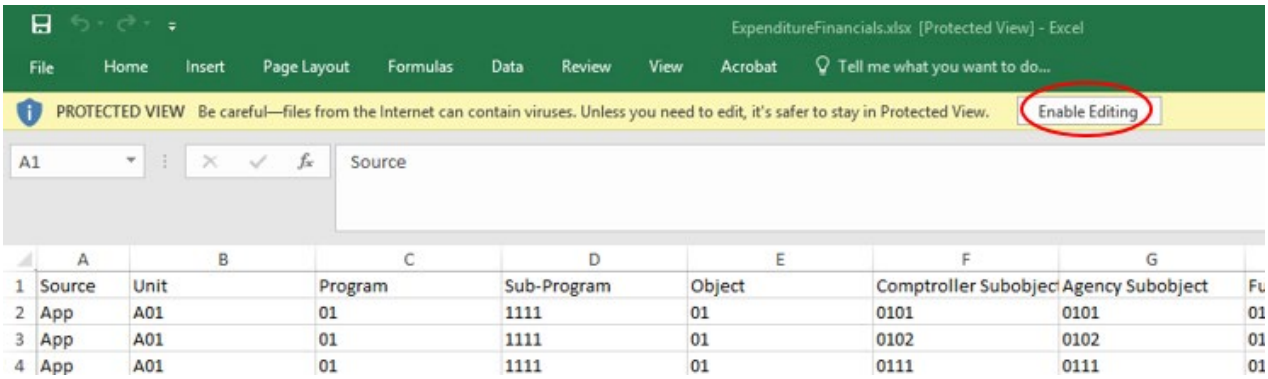


Open that file.

Step 6:

In the Excel Spreadsheet—

Confirm that the information exported by the system is the data for the selected agency, unit, program, and subprograms as selected in Step #4. If the warning message appears, the user must click **Enable Editing** before proceeding with the instructions below.



	A	B	C	D	E	F	G	
1	Source	Unit	Program	Sub-Program	Object	Comptroller Subobject	Agency Subobject	Fu
2	App	A01	01	1111	01	0101	0101	01
3	App	A01	01	1111	01	0102	0102	01
4	App	A01	01	1111	01	0111	0111	01

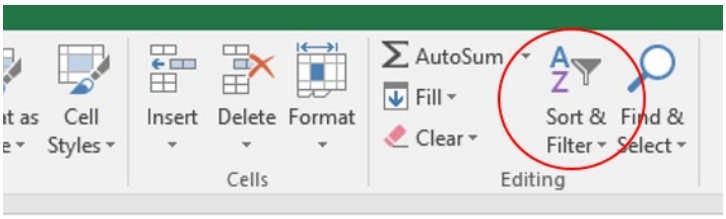
Step 7:

Once the spreadsheet is unlocked for editing, begin by using the "Filter" tool to create a column-by-column filter of the information out of BARS.

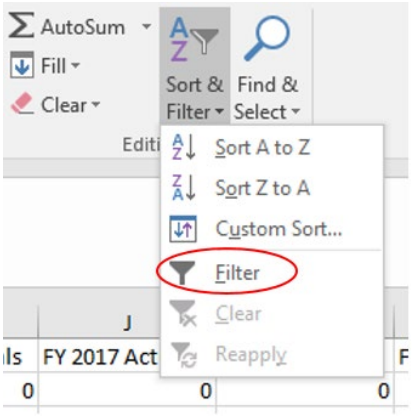
1. Highlight all of Row 1 of the spreadsheet.

	A	B	C	D	E	
1	Source	Unit	Program	Sub-Program	Object	Comp
2	App	A01	01	1111	01	0101
3	App	A01	01	1111	01	0102
4	App	A01	01	1111	01	0111

2. Find the "Sort & Filter" tool at the top-right of the Home tab in Excel.



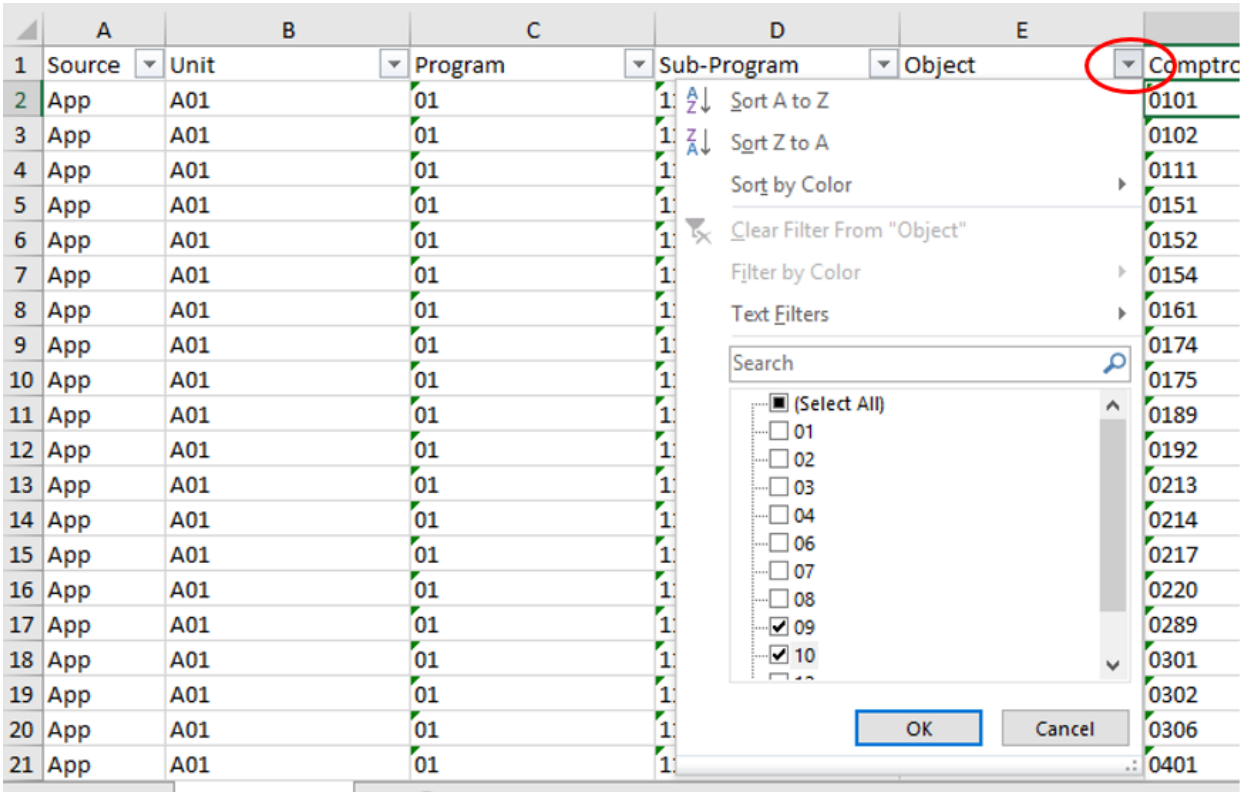
3. Select "Filter"



This will insert a filter for each column of the current spreadsheet, with the filter running off of Row 1 of each column. After clicking the downward arrow in the "Object" column, a list of

checkboxes of the column's text contents will pop up. This list of checkboxes can be used to include or hide lines with these categories in the spreadsheet.

Filter the spreadsheet to display only Object 09 and 10.



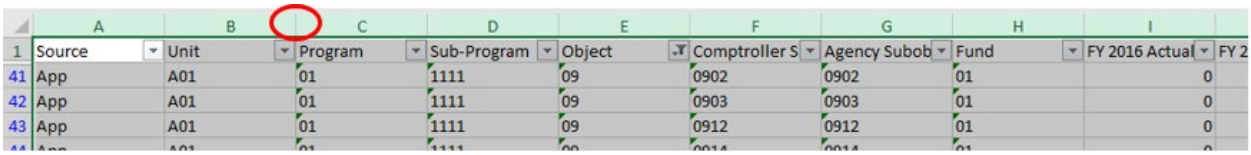
Users can use this tool to look specifically at individual programs, a list of subprograms, single objects, or even filter out all lines that are "$0" in in a given fiscal year.

Note: Users may also sort data using this feature.

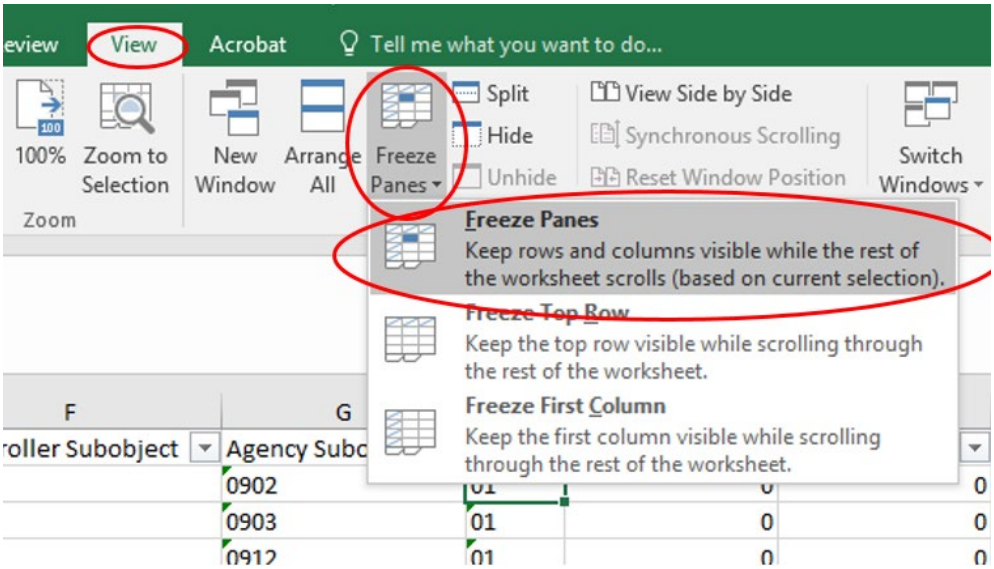
Step 7:

Now that the spreadsheet has been filtered for Object 09 and 10, use the "Freeze Pane" tool in Excel to freeze chart of accounts data to the left of the spreadsheet.

1. Highlight all of the columns that contain data and double-click on the margins between the columns (where it says "A, B, C…"). This will change the width of the columns such that no headers or data is hidden. By clicking in the margins of the columns, individual column widths may also be narrowed or expanded.



2. Click into the first cell that does not need to be frozen. For this exercise, it would be cell H2. Find the "View" tab, select "Freeze Panes" to open the drop-down menu, and click **Freeze Panes**. All columns from H and rightward will scroll with the rest of the page.



Step 8:

Once the panes have been frozen, scroll to the right to the "FY 20XX Current" column (Column N in the example).

	A	B	C	D	E	F	G	M	N	O
1	Source	Unit	Program	Sub-Program	Object	Comptroller Subobject	Agency Subobject	FY 2020 Target	FY 2020 Current	FY 2020 Adjustment
41	App	A01	01	1111	09	0902	0902		35000	
42	App	A01	01	1111	09	0903	0903		16600	
43	App	A01	01	1111	09	0912	0912		20000	
44	App	A01	01	1111	09	0914	0914		65000	
45	App	A01	01	1111	09	0915	0915		45997	
46	App	A01	01	1111	09	0933	0933		7500	

This column contains the current dollars in the system tied to each of those line items. Without action in the "FY 20XX Adjustment" (Column O in the image) in the form of added (positive) or subtracted (negative) dollars, nothing will be changed by the adjustment. Individual dollar amounts can be entered into this column to add or subtract to the existing values.

For more advanced tools for Excel, Step #9 shows the use of formulas to augment existing budget data.

Step 9:

With Objects 09 and 10 selected, go to the "FY 20XX Adjustment" column and click into the very top empty cell. As a tool, Microsoft Excel can grab data from one cell and manipulate it in another cell, called a "formula." This walkthrough will create two sample formulas.

Placeholder for Inflation

1. Click into that top-most empty cell in the "FY 20XX Adjustment" column in Column O. For the example above, that is cell O41.

	A	B	C	D	E	F	G	M	N	O
1	Source	Unit	Program	Sub-Program	Object	Comptroller Subobject	Agency Subobject	FY 2020 Target	FY 2020 Current	FY 2020 Adjustment
41	App	A01	01	1111	09	0902	0902		35000	
42	App	A01	01	1111	09	0903	0903		16600	
43	App	A01	01	1111	09	0912	0912		20000	
44	App	A01	01	1111	09	0914	0914		65000	
45	App	A01	01	1111	09	0915	0915		45997	

2. Type directly into the cell "=" and the directly adjacent cell in the "FY 20XX Current" column in Column N.

G	M	N	O
Agency Subobject	FY 2020 Target	FY 2020 Current	FY 2020 Adjustment
0902		35000	=N41
0903		16600	
0912		20000	
0914		65000	
0915		45997	

3. Once the cell has been selected, use the keyboard to type in the following formula " *.03". For the above example, that would be "=N41*.03".

G	M	N	O
Agency Subobject	FY 2020 Target	FY 2020 Current	FY 2020 Adjustment
0902		35000	=N41*.03
0903		16600	
0912		20000	
0914		65000	
0915		45997	

4. Press enter.

G	M	N	O
Agency Subobject	FY 2020 Target	FY 2020 Current	FY 2020 Adjustment
0902		35000	1050
0903		16600	

5. Click and hold the small green square in the bottom right corner of the frame surrounding the newly formulated value, and double-click or drag that icon all the way down to the end of the line item data shown. This will take the formula created in the original cell (O41 as shown above) and translate it to the remaining line items. This action allows formulas to be calculated across multiple lines, as might make sense when accounting for inflation in the FY 2021 agency budget request.

	A	B	C	D	E	F	G	M	N	O
1	Source	Unit	Program	Sub-Program	Object	Comptroller Subobject	Agency Subobject	FY 2020 Target	FY 2020 Current	FY 2020 Adjustment
41	App	A01	01	1111	09	0902	0902		35000	1050
42	App	A01	01	1111	09	0903	0903		16600	498
43	App	A01	01	1111	09	0912	0912		20000	600
44	App	A01	01	1111	09	0914	0914		65000	1950
45	App	A01	01	1111	09	0915	0915		45997	1379.91
46	App	A01	01	1111	09	0933	0933		7500	225
47	App	A01	01	1111	10	1002	1002		17640	529.2
48	App	A02	01	1111	10	1015	1015		25000	750
49	App	A03	01	1111	10	1019	1019		1500	45
50	App	A04	01	1111	10	1034	1034		16340	490.2
59										

6. Clean up decimals so that only whole numbers remain. This can be done by overwriting the formula in the cell with the new number *or* going a step further and adding a rounding formula into the equation, and then dragging that formula down again.

G	M	N	O
Agency Subobject	FY 2020 Target	FY 2020 Current	FY 2020 Adjustment
0902		35000	1050
0903		16600	498
0912		20000	600
0914		65000	1950
0915		45997	1380
0933		7500	225
1002		17640	529.2

- Or -

G	M	N	O
Agency Subobject	FY 2020 Target	FY 2020 Current	FY 2020 Adjustment
0902		35000	=round(N41*0.03, 0)
0903		16600	498
0912		20000	600
0914		65000	1950
0915		45997	1380

7. Confirm that the information makes sense for the agency request.

Intra-agency Target

1. If a given unit or program is provided with a target by a central budget office within an agency, Excel can be used to evenly or proportionally disperse specific amounts among existing line items. Begin by entering the amount to be dispersed at the bottom of the row of line items in the “FY 20XX Adjustment” column (Column O).

	A	B	C	D	E	F	G	M	N	O
1	Source	Unit	Program	Sub-Program	Object	Comptroller Subobject	Agency Subobject	FY 2020 Target	FY 2020 Current	FY 2020 Adjustment
41	App	A01	01	1111	09	0902	0902		35000	
42	App	A01	01	1111	09	0903	0903		16600	
43	App	A01	01	1111	09	0912	0912		20000	
44	App	A01	01	1111	09	0914	0914		65000	
45	App	A01	01	1111	09	0915	0915		45997	
46	App	A01	01	1111	09	0933	0933		7500	
47	App	A01	01	1111	10	1002	1002		17640	
48	App	A02	01	1111	10	1015	1015		25000	
49	App	A03	01	1111	10	1019	1019		1500	
50	App	A04	01	1111	10	1034	1034		16340	
59										10000

2. Next, sum the shown rows in the “FY 20XX Current” column at the bottom of the row of line items (Column N). This may be performed through the “=SUM” formula in Excel, shown below.

	G	M	N	O
	Agency Subobject	FY 2020 Target	FY 2020 Current	FY 2020 Adjustment
	0902		35000	
	0903		16600	
	0912		20000	
	0914		65000	
	0915		45997	
	0933		7500	
	1002		17640	
	1015		25000	
	1019		1500	
	1034		16340	
			=SUM(N41:N50)	10000

3. To disperse the provided target ($10,000), in the “FY 20XX Adjustment” column multiply that target by the proportion of the line item to the sum. Begin by selecting the top-most line item. You may also add in the rounding formula to shortcut any rounding issues.

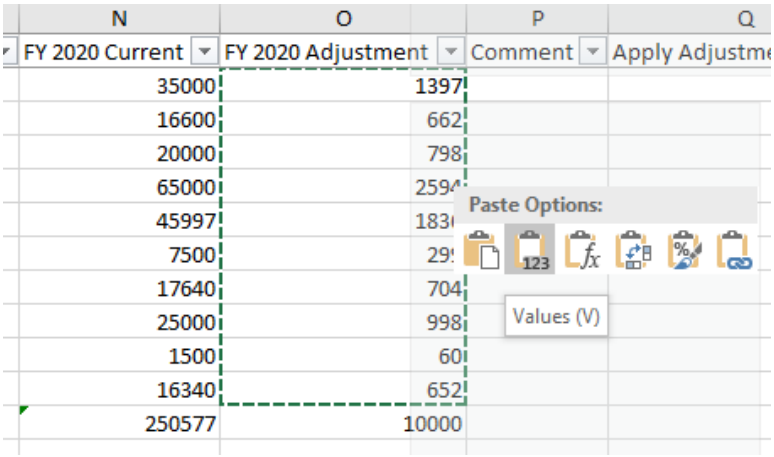
	G	M	N	O
	Agency Subobject	FY 2020 Target	FY 2020 Current	FY 2020 Adjustment
	0902		35000	=ROUND((N41/N59)*O59, 0)
	0903		16600	
	0912		20000	
	0914		65000	
	0915		45997	
	0933		7500	
	1002		17640	
	1015		25000	
	1019		1500	
	1034		16340	
			250577	10000

4. Once this formula has been calculated for the top-most cell, repeat this formula for each of the cells below holding the “total value” cells constant. This can be achieved by adding a “$” in front of the row number for the formula in the top-most cell, and copying and

pasting the formula to each of the cells below. Again, this action allows formulas to be calculated across multiple lines, as it might make sense when accounting for an intra-agency target in your agency's budget request.

G	M	N	O	P
Agency Subobject	FY 2020 Target	FY 2020 Current	FY 2020 Adjustment	Comme
0902		35000	1397	
0903		16600	662	
0912		20000	798	
0914		65000	2594	
0915		45997	=ROUND((N45/N$59)*O$59, 0)	
0933		7500	299	
1002		17640	704	
1015		25000	998	
1019		1500	60	
1034		16340	652	
		250577	10000	

5. Confirm that the data produced by the formula makes sense, and then copy and paste the "FY 20XX Adjustment" column data "as value" back into its location.



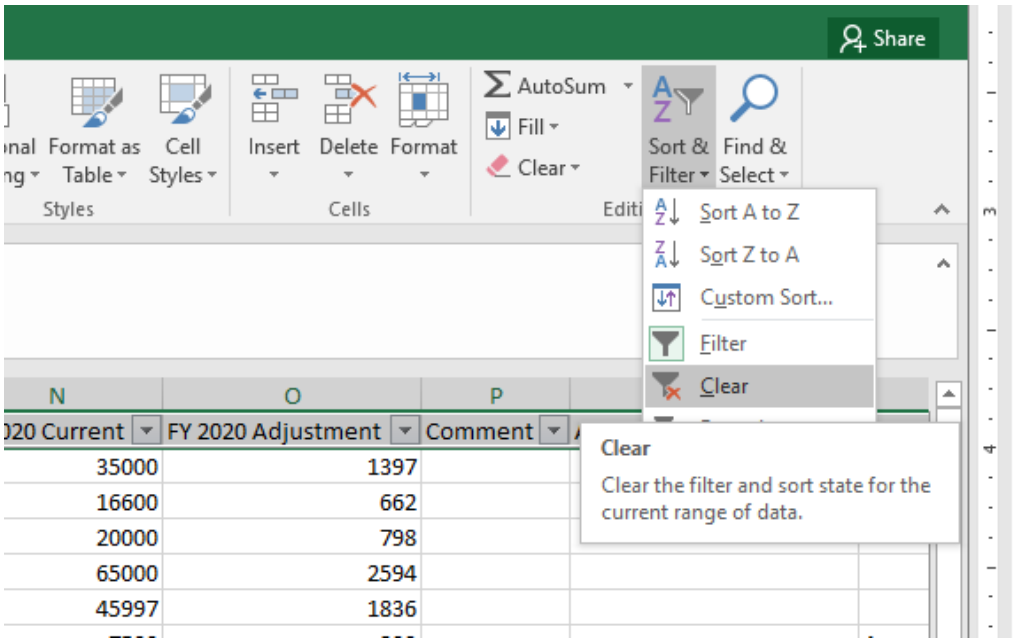
6. Delete the row with the "total value" cells (row 59 as shown above). Deleting these rows/cells should not affect the newly-created adjustment line-item detail created by the formula if the "copy and paste" action above was performed properly.

Note: Detail may be added into the empty section of the workbook, but may create extraneous detail in the import if not deleted. Tidying up the workbook prior to upload will reduce the chance of data issues with the import.

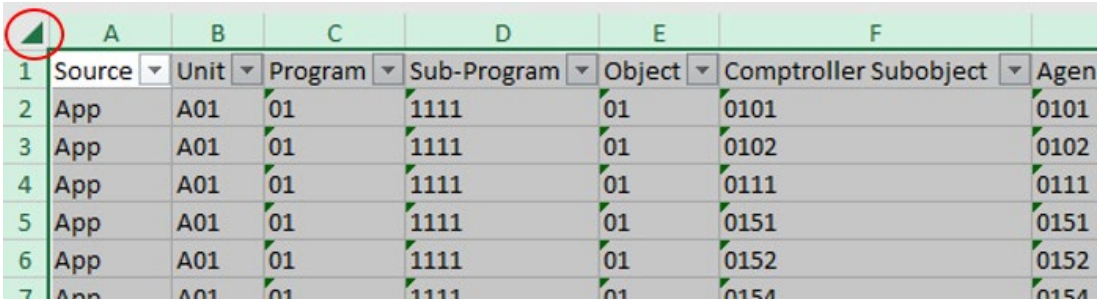
Step 10:

Once the adjustment values have been included in the "FY 20XX Adjustment" column and all extraneous data has been removed, the worksheet is ready for upload as an import file. However, Excel can also be used as a tool for advanced analysis for the budget and its complex data. By creating "Pivot Tables" the user can easily organize and analyze the data of their budget. This can be used to great effect to inform a single adjustment.

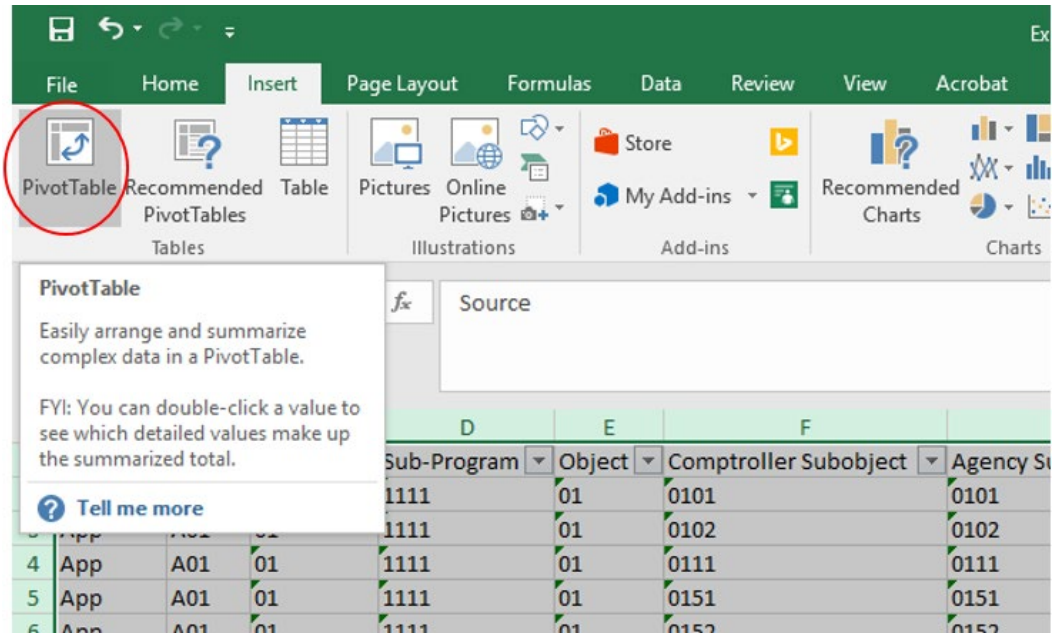
Clear the filter of the grid by highlighting the top row of the worksheet and using the “Clear” function. This can be found in the “Home” tab under the same “Sort & Filter” tool.



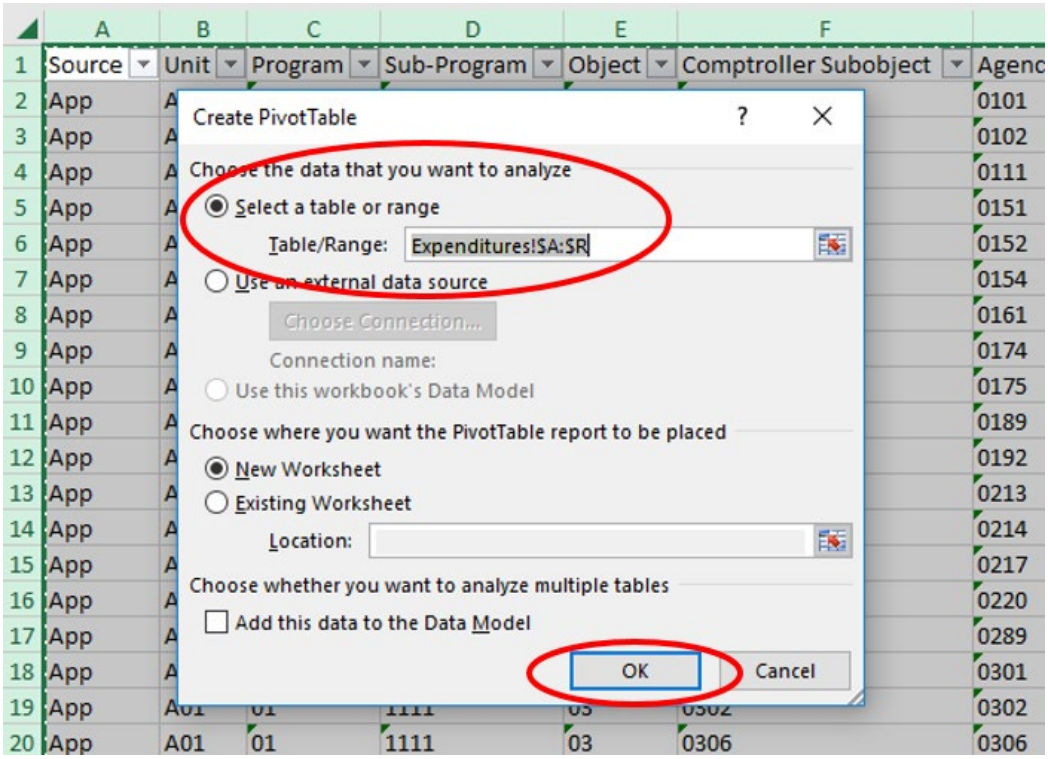
Click on the “arrow” icon at the top left of the worksheet grid. This arrow allows the user to “Select All” data currently within the grid.



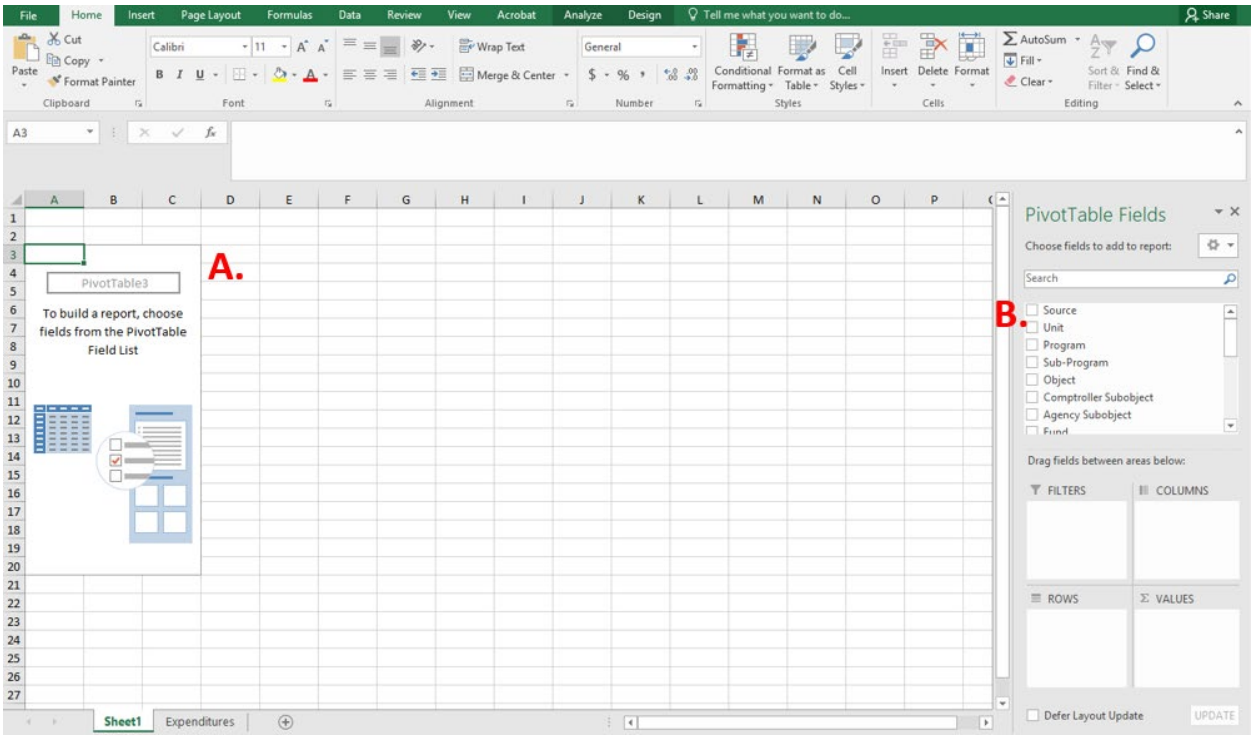
Once all of the data has been selected, go to the “Insert” tab at the top of the Excel page and click into the “PivotTable” tool.



If you have successfully used the "Select All" function, clicking this "PivotTable" button will bring up a dialogue box with the data pre-selected in the "Select a table or range" field. Click "OK."

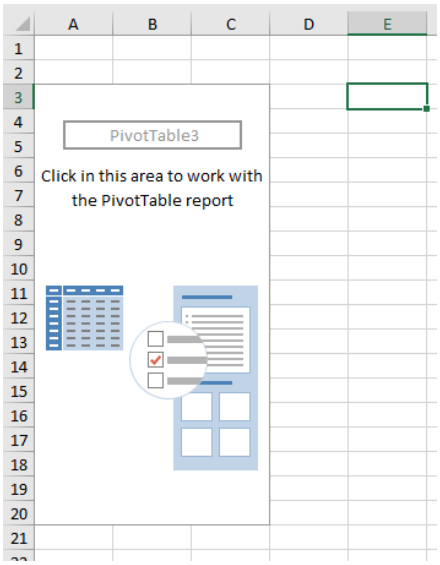


This will create a separate worksheet in the Excel workbook with the beginning framework of a Pivot Table in a new worksheet named "Sheet1."

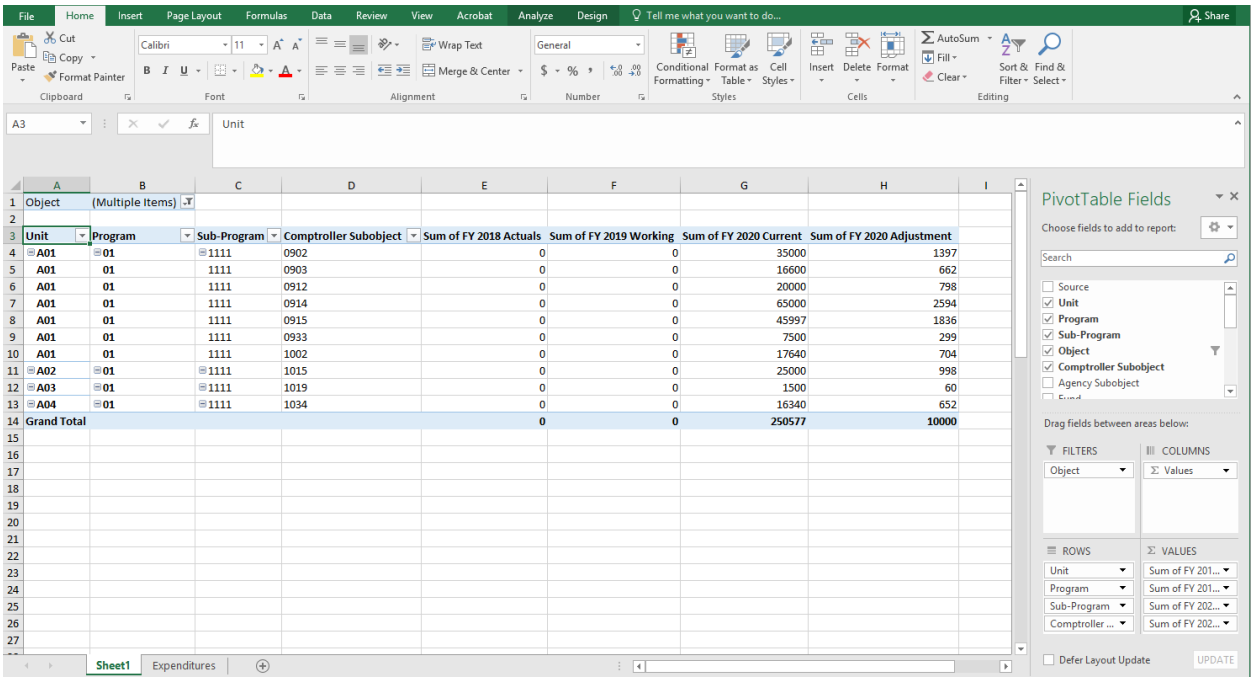


Step 11:

In "Sheet1," find the following window embedded in the grid, marked "A" above.



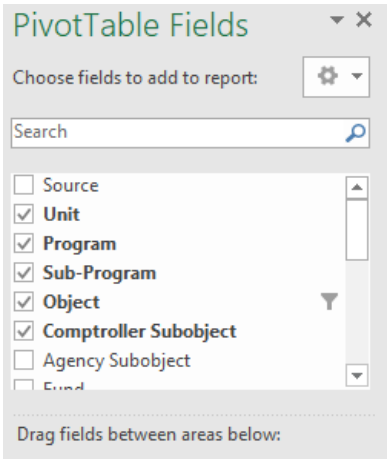
This space represents the "canvas" for the beginning of the Pivot Table. Begin by adding pieces of the dataset from section "B" (by either dragging them into one of the four layout boxes or clicking on the checkbox and adjusting from there) marked above. Pivot tables allow users to create customizable spreadsheets that incorporate data from the original worksheet as shown in the example below:



Object	(Multiple Items)						
Unit	Program	Sub-Program	Comptroller Subobject	Sum of FY 2018 Actuals	Sum of FY 2019 Working	Sum of FY 2020 Current	Sum of FY 2020 Adjustment
A01	01	1111	0902	0	0	35000	1397
A01	01	1111	0903	0	0	16600	662
A01	01	1111	0912	0	0	20000	798
A01	01	1111	0914	0	0	65000	2594
A01	01	1111	0915	0	0	45997	1836
A01	01	1111	0933	0	0	7500	299
A01	01	1111	1002	0	0	17640	704
A02	01	1111	1015	0	0	25000	998
A03	01	1111	1019	0	0	1500	60
A04	01	1111	1034	0	0	16340	652
Grand Total				0	0	250577	10000

Section B is broken up into five main parts:

Fields: Each of these "fields" represents a column header from the source spreadsheet. In the above example, each of the fields are the direct column headers found in the Expenditures grid in BARS and represent a mocked-up line item adjustment summary.



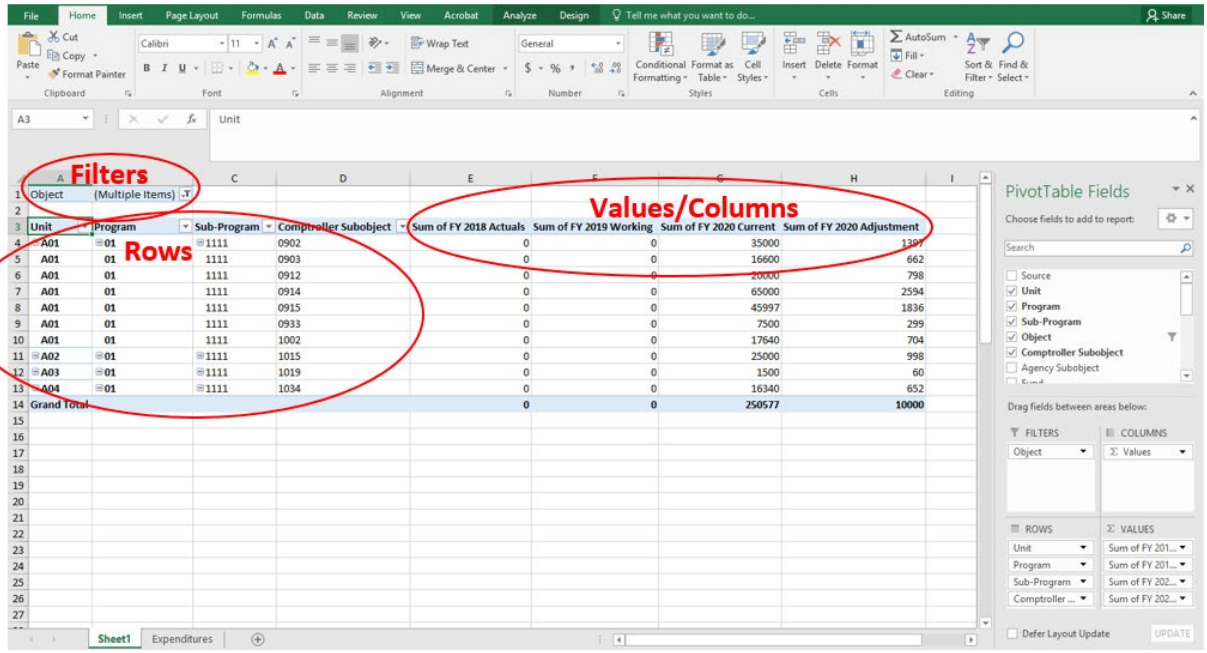
Filters: Fields dragged into this box create an overarching filter that allows data to be pre-selected and adjusted based on the needs of the user. Multiple fields can be added into this piece the layout, such as "Object" as shown in the above example which has been filtered to only show Objects 09 and 10.

Rows: Fields dragged into this box divide up the displayed data as independent factors in the reporting. The fields in the "Rows" layout box represent the data inputs which ultimately produce the data outputs in the "Values" layout box. As shown in the example above, "Unit," "Program,"

"Sub-Program," and "Comptroller Subobject" have been selected to display the familiar line item detail structure found in the original worksheet as well as the Expenditures tab in BARS.

Values: Fields dragged into this box represent filters on the dependent factors in the reporting. The Fields in the "Values" layout box represent these data outputs based on the layout created in the "Rows" layout box. As shown above, a three-year summary of the data has been selected in order to display the baseline for the data as it exists in BARS, as well as the "FY 2020 Adjustment" column, which provides a clear summary of all line item adjustments from the source worksheet.

Columns: Fields dragged into this box divide up the displayed data based on *type*, such as "Dollars" or Adjustment "Stage" or "Status" in the case of certain data pulled from BARS. Based on certain detail dragged into the "Values" layout box, this box will automatically populate with the column type most appropriate for that selection. In the example above, it has automatically populated to show the sum values of the filtered data.



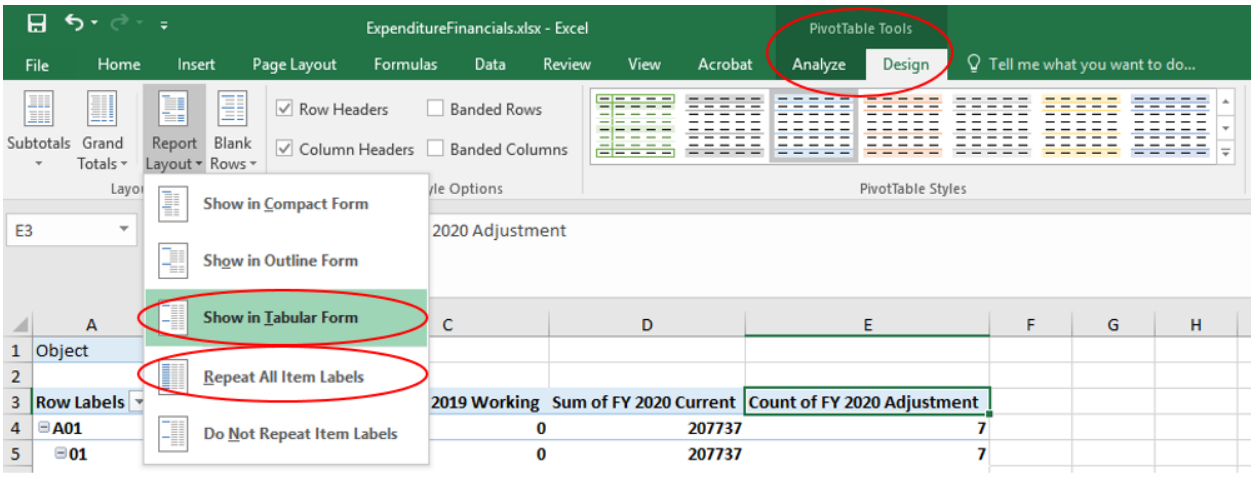
Step 12:

By simply dragging the above sections into the displayed layout boxes, the overarching design of the pivot table may still leave clarity to be desired. Replicating the above layout boxes results in the following design:

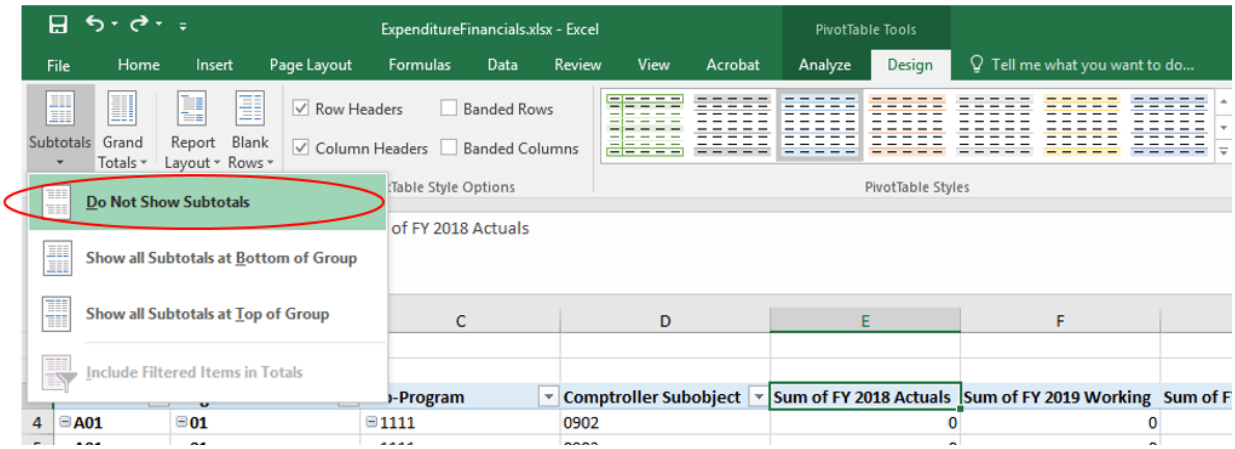
Object	(Multiple Items)			
Row Labels	Sum of FY 2018 Actuals	Sum of FY 2019 Working	Sum of FY 2020 Current	Count of FY 2020 Adjustment
A01	0	0	207737	7
01	0	0	207737	7
1111	0	0	207737	7
0902	0	0	35000	1
0903	0	0	16600	1
0912	0	0	20000	1
0914	0	0	65000	1
0915	0	0	45997	1
0933	0	0	7500	1
1002	0	0	17640	1
A02	0	0	25000	1
01	0	0	25000	1
1111	0	0	25000	1
1015	0	0	25000	1
A03	0	0	1500	1
01	0	0	1500	1
1111	0	0	1500	1
1019	0	0	1500	1
A04	0	0	16340	1
01	0	0	16340	1
1111	0	0	16340	1
1034	0	0	16340	1
Grand Total	0	0	250577	10

By using “Design” elements and adjusting “Value Field Settings” users can create a more familiar format in their pivot tables.

Begin by selecting the “Design” tab at the top of the Excel screen under “PivotTable Tools” and select “Show in Tabular Form” and “Repeat All Item Labels” under the Report Layout drop down menu. This will design the layout of the data such that data is repeated for each line and each “Row Label” receives its own discrete column.



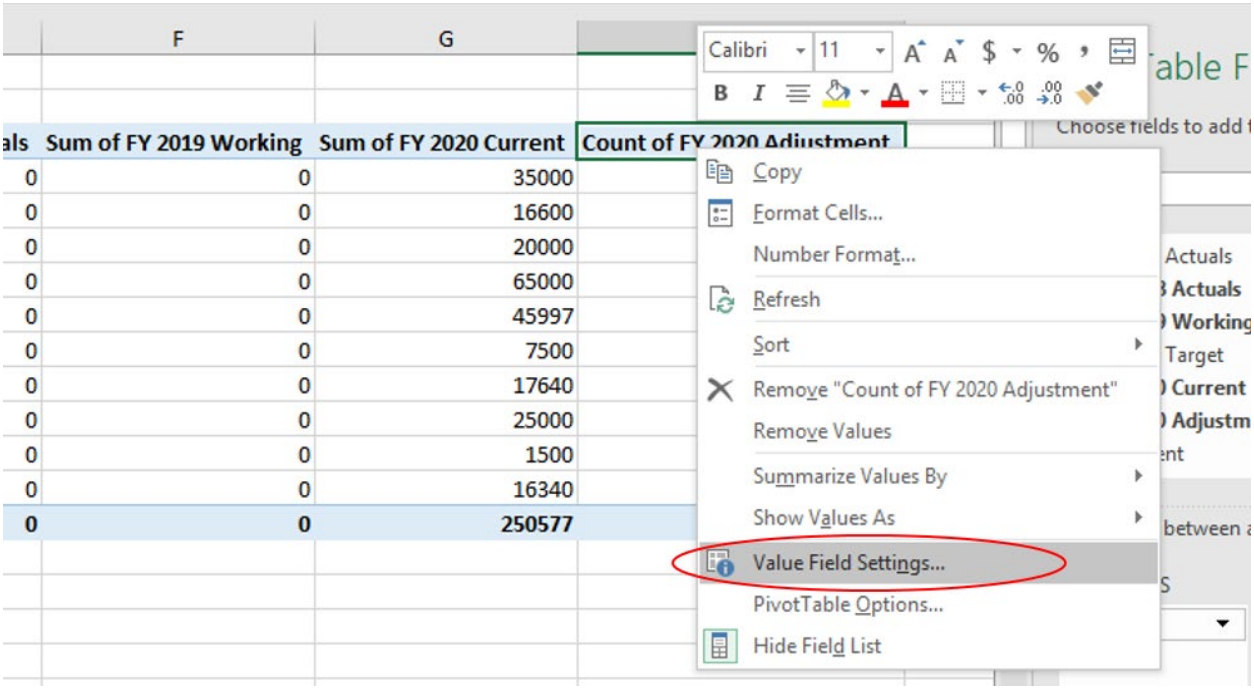
Then, under the Subtotals drop down menu select “Do Not Show Subtotals” to eliminate individual subtotals running off of each chart of accounts selection in the “Rows” layout box.



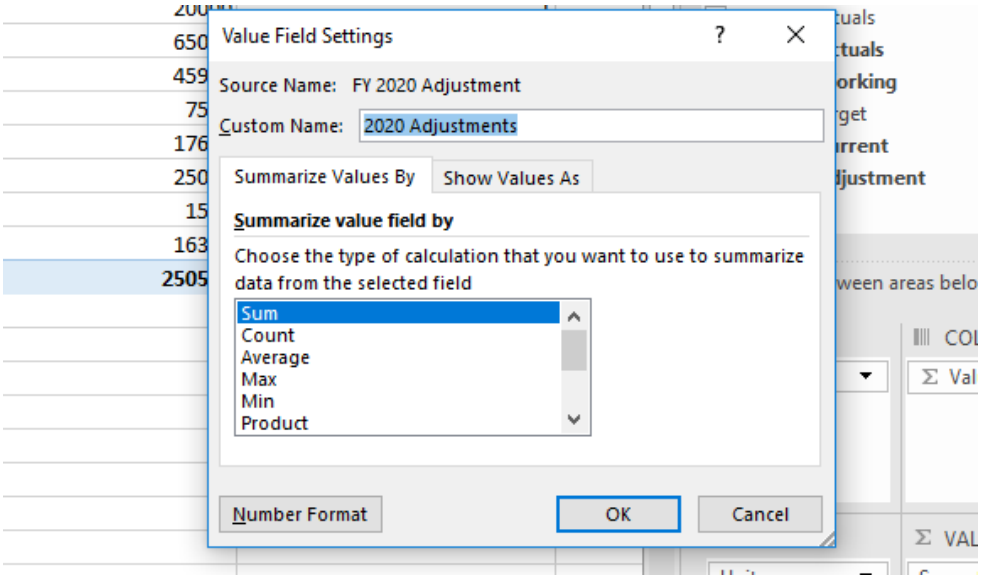
By using these two quick design changes, users can transform the data to read in a line-item fashion.

Step 13:

Once the design elements have been adjusted, right-click into the column titled “Count of FY 2020 Adjustment” and select “Value Field Settings…”



This will bring up a window that allows the individual column to be adjusted to the preferences of the user. Columns can be renamed and fields can be summarized differently. Rename the column to “2020 Adjustments” and select “Sum” under the “Summarize value field by” window and press OK.



By making this change to the value field, the data in the "2020 Adjustments" column will now report data the same way as the individual fiscal year columns, as a "Sum."

The finished product should ultimately look like the following:

	B	C	D	E	F	G	H
1	(Multiple Items)						
2							
3	Program	Sub-Program	Comptroller Subobject	Sum of FY 2018 Actuals	Sum of FY 2019 Working	Sum of FY 2020 Current	2020 Adjustments
4	01	1111	0902	0	0	35000	1397
5	01	1111	0903	0	0	16600	662
6	01	1111	0912	0	0	20000	798
7	01	1111	0914	0	0	65000	2594
8	01	1111	0915	0	0	45997	1836
9	01	1111	0933	0	0	7500	299
10	01	1111	1002	0	0	17640	704
11	01	1111	1015	0	0	25000	998
12	01	1111	1019	0	0	1500	60
13	01	1111	1034	0	0	16340	652
14				**0**	**0**	**250577**	**10000**